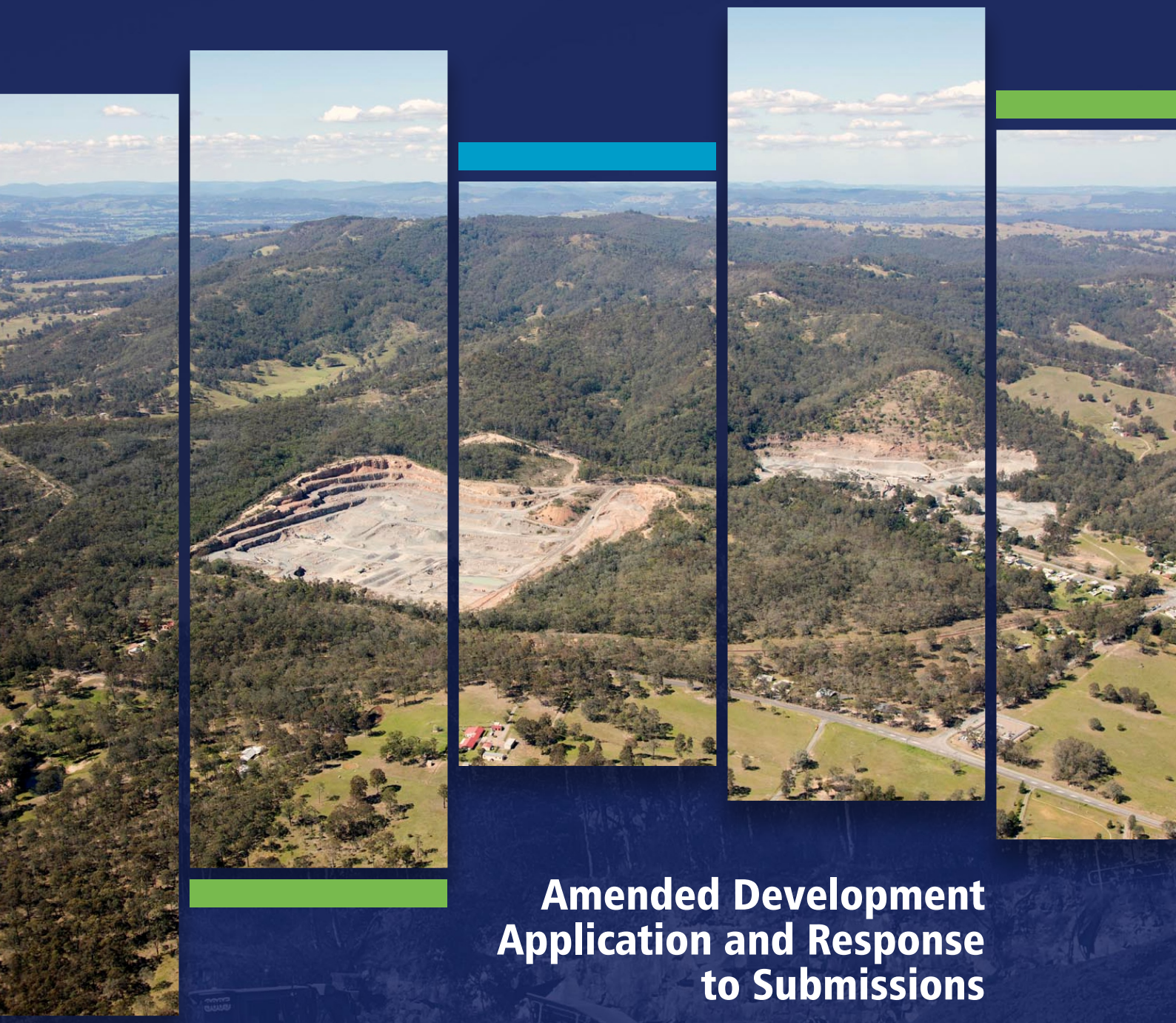
DARACON Group



Amended Development Application and Response to Submissions

May 2021

umwelt
Environmental & Social Consultants

MARTINS CREEK QUARRY EXTENSION PROJECT

Amended Development Application and Response to Submissions

FINAL

Prepared by
Umwelt (Australia) Pty Limited
on behalf of
Daracon Group

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Report No.	3957C/R01
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Document Status

Rev No.	Reviewer		Approved for Issue	
	Name	Date	Name	Date
FINAL	Kirsty Davies	25/05/21	Barbara Crossley	25/05/21

Executive Summary

Background

The Martins Creek Quarry (the quarry) is licensed by Buttai Gravel Pty Ltd, which is part of the Daracon Group (hereafter referred to as Daracon). The quarry is an existing hard rock quarry situated within the Dungog Local Government Area (LGA), approximately 7 kilometres (km) north of Paterson and 28 km north of Maitland, New South Wales (NSW).

The quarry was established in 1914 by the NSW Government Railways for the purpose of supplying railway ballast and other quarry materials to both the NSW railway network and Hunter Valley/Newcastle construction projects. Until late 2012, the quarry was operated continuously by various NSW Government transport departments, authorities and corporations.

In December 2012, Daracon secured a long term licence of the quarry and continued operations to produce high quality aggregates, ballast, road base, gabion and other specified materials used in road, railway, concrete and civil construction.

The Original Project

In late 2016, Daracon submitted an Environmental Impact Statement (EIS) for the Martins Creek Quarry Extension Project. This EIS was part of the development application process commenced in 2014, for a State Significant Development (SSD) (application number SSD 6612), requiring approval under Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). The application seeks approval for a proposed expansion of the quarry and to consolidate existing consents and operations under a single, modern development consent.

The Original Project assessed in the Monteath & Powys (2016) EIS sought approval for the expansion of the quarry into new extraction areas in the West and East Pit, and to haul by road transport up to 1.5 million tonnes (Mt) of material per annum (pa) over a 30 year period.

Submissions received during the EIS exhibition period raised substantial concern regarding the operational parameters of the Original Project, associated impacts on local communities and the level of assessment that was undertaken for Original Project EIS. Key concerns from the local communities related to traffic and transport (including the volume and frequency of truck movements and road safety), noise, blasting and vibration impacts, and impacts to rural amenity and lifestyles. Furthermore, some of the government agencies requested further information and/or revised impact assessments to adequately address the assessment requirements relating to noise, traffic and transport, air quality, water, land, biodiversity and rehabilitation.

The Amended Development Application Process

In response to the public and government agency concerns, Daracon engaged Umwelt to undertake extensive additional stakeholder engagement, and to conduct further detailed technical analysis and assessment to inform a thorough review of the proposed quarry and transport parameters, with the key objective to reduce environmental and social impacts. As an outcome of this process, Daracon have committed to reduce the extraction limits, operational hours and truck movements as part of the Revised Project.

An updated environmental assessment, including revised and updated technical studies, have been completed to evaluate the key project changes, provide requested additional information and comprehensively address the assessment requirements. Given the changes to the Original Project and to address the submissions on the EIS, this report has been prepared as an Amended Development Application (ADA) and Response to Submissions (RTS).

Updated assessments have been completed in accordance with the Secretary's Environmental Assessment Requirements (SEARs) for the Original Project and contemporary guidelines and policies, where relevant. Confirmation of the approval and requirements to amend the development application in accordance with clause 55 of the *Environmental Planning and Assessment Regulation 2000* (EP&A Regulation), was provided by Department of Planning, Industry and Environment (DPIE) on 6 November 2020. This report has been prepared by Umwelt (Australia) Pty Limited (Umwelt) to meet these ADA requirements, and to Respond to the Submissions on the Original Project, on behalf of Daracon.

In 2015 Dungog Council brought action in the Land and Environment Court asserting that the operations of the quarry were being carried out otherwise in accordance with the existing development consent. This process continued through to a court judgement in October 2018 and a further Court of Appeal judgement in June 2019. On 24 September 2019, the quarry was placed into limited operations within the parameters set out by the existing consents deemed as approved by the Court of Appeal. The Court of Appeal judgement did not specifically address all aspects of the existing approval rights in relation to use of the site for quarrying, processing and associated activities.

This ADA seeks approval for continued operation of a State Significant quarry, important to supply quality materials for the NSW construction industry, in accordance with a modern development consent. A contemporary development consent will provide clarity for Daracon and all relevant stakeholders on approved operations, including all reasonable and feasible controls to minimise environment and community impacts, going forward.

Stakeholder Engagement

Stakeholder engagement has been a key component of the ADA process with a review of submissions on the Original Project EIS and outcomes of more recent discussions, all providing valuable input from key stakeholders, members of neighbouring communities and local residents.

Outcomes of these discussions have informed the changes to the project design and also a number of the management and mitigation measures incorporated into the Revised Project.

The engagement program has included:

- Distribution of community information sheets which have provided relevant updates for key phases of the project and encouraged community members to participate in engagement activities or have a personal interview.

- Small group collaborative assessment forums addressing key issues of concern and interest including traffic and trucks, air quality and blasting, noise and social impacts.

- 198 face to face and phone interviews with members of the community and representatives from local services providers, businesses and representatives from special interest and community representative groups over two rounds of engagement.

- Project briefings and discussions with the Martins Creek Quarry Action Group (MCQAG).

- Establishment of a dedicated Social Pinpoint page to share project related information such as Revised Project presentations and information sheets and encourage involvement in engagement either via contact forms and/or an online survey.

- External meetings and briefings including with Local and State Government agencies.

Daracon has also engaged a dedicated Community Liaison Representative for the quarry with the intent that this role will continue should the Revised Project be approved, providing an ongoing conduit between the company and the community.

The Revised Project

In response to government agency and community feedback, the Revised Project now includes a number of amendments and improvements including:

- reduced road transportation volumes and reduced peak hourly truck movements
- refined operational hours
- reduced proposed disturbance footprint
- reduced proposed quarry operation approval term.

The key features of the Revised Project include:

- extraction of up to a maximum of 1.1 Mtpa of quarry product material over 25 years, transported by road and rail, with road transportation up to 500,000 tpa
- revised product transport arrangements, including:
    - reduced peak daily laden trucks of 140 per day (280 movements) for up to 50 days per year, otherwise 100 laden trucks per day (200 movements). The hourly peak consists of:
        - 20 laden trucks per hour (40 movements), Monday to Friday between 7.00am and 3.00pm
        - 15 laden trucks per hour (30 movements), Monday to Friday between 3.00pm and 6.00pm
    - no road haulage of quarry product on Saturday, Sunday or public holidays
    - no road haulage between 24 December and 1 January, inclusive
    - no trucks through Paterson Village before 6.45 am
    - increased quarry product transported by rail
    - removal of Haul Route 2 as a primary haul route (now proposed only to service local jobs as required)

- revised quarry operating hours of 7.00 am to 6.00 pm Monday to Saturday, with the exception of road haulage of quarry product which will only occur Monday to Friday, and no evening or night operation, apart from rail loading and transportation and necessary maintenance activities

- 16.8 ha reduction in the proposed disturbance footprint, including avoiding approximately 15.3 ha of native vegetation in the former East Pit (Lot 21 DP 773220)

- construction and use of a new access road and bridge crossing, over the North Coast rail line, to allow for direct access to Dungog Road (MR 101) for all heavy vehicle movements via the new access road, avoiding local road access through Martins Creek village, via the current Station Street entrance to the quarry

- other improvements along primary haulage route including upgrades to the Dungog Road and Gresford Road intersection; the King Street and Duke Street intersection (within the village of Paterson); and upgrades to the approach to Gostwyck Bridge

- extension of the rail spur to facilitate longer trains to transport more quarry product by rail, whilst minimising noise impacts on local residents

- establishment of noise bunds and noise attenuation of the existing fixed processing plant with further upgrades and replacements to reduce noise and air quality impacts

- progressive rehabilitation of the quarry.

A range of other mitigation strategies have been proposed to address the identified potential impacts relating to the Revised Project, and an overview of these is provided below.

Figure E.1 places the proposed maximum annual road transportation limit under the Revised Project into context when compared to historical operations at the quarry.

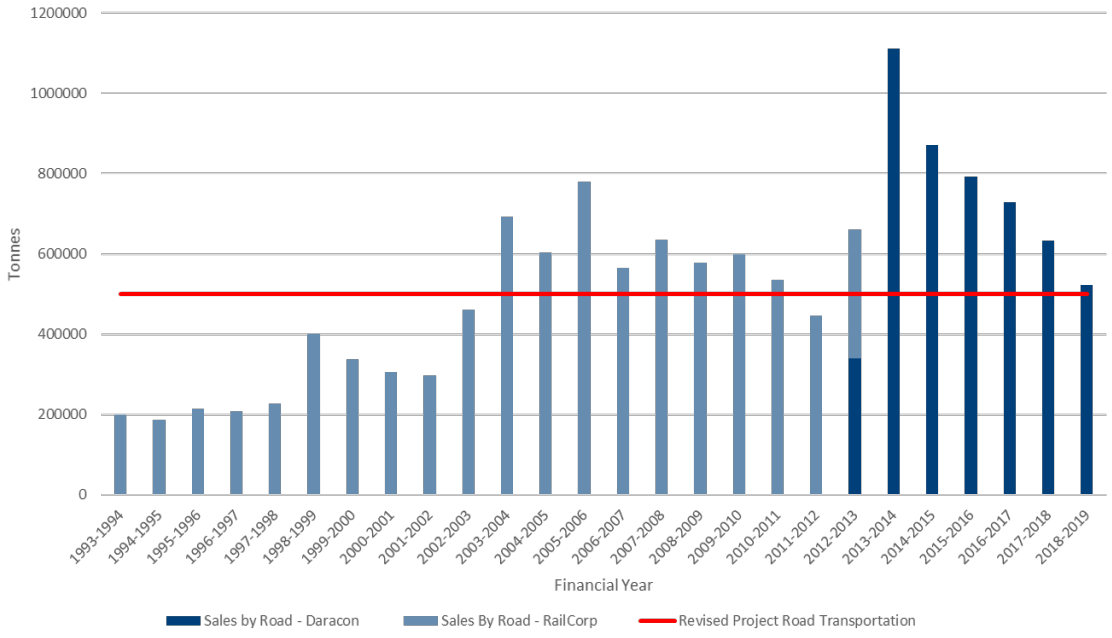


Figure E.1 Historical Road Tonnages – 1993 to 2019

As noted above, the proposed peak of 140 laden trucks per day (280 movements) is to be limited to only 50 days per year.

Need for the Revised Project

For many decades, the quarry has supplied and delivered high quality material and products for use in rail, concrete, asphalt and general civil construction, including products to meet the specifications of Transport for NSW (TfNSW), ARTC and Sydney Trains. Major customers of the quarry also include airports and port authorities, and various local councils. The quarry has also supplied many concrete, asphaltic concrete and road sealing customers, as well as infrastructure construction companies.

The quarry has demonstrated sustained market demand for a range of quarry products, including numerous regional and state significant infrastructure projects. There remains a high demand for the quarry products.

The Revised Project seeks the capacity for ongoing supply of construction material to regional markets of the Hunter and Central Coast, local markets, major regional infrastructure and to supplement Sydney markets. The resource has been identified as regionally significant with physical material properties conducive to the production of concrete aggregates and construction materials to very stringent specifications. The proposed development of the resource would make a significant contribution to the easing and securing of future construction material supply constraints and is considered to be an orderly and economical use of the land, optimising use of an existing quarry and processing facility with proven high quality products, with access to main road and rail transport.

Key benefits of the Revised Project include:

- Supply and delivery of high quality materials and products for use in rail, concrete, asphalt and general civil construction.
- Heavy construction materials play a vital role in delivering the infrastructure required to support population and economic growth in the Hunter Region and more broadly in NSW.
- Employment of approximately 22 full time equivalent employees.
- The Cost Benefit Analysis estimates a net benefit of $58 million to NSW in net present value (NPV) terms, with further details on economic benefits outlined below.
- Contributions to the improved maintenance of road infrastructure via a Voluntary Planning Agreement with the Dungog Shire Council and Maitland City Council.
- Community investment and sponsorship opportunities.

Environmental, Social and Economic Assessment Outcomes

This document includes a detailed assessment of the potential environmental, social and economic outcomes of the Revised Project and the identified management and mitigation measures that will be implemented to reduce or avoid these impacts.

A comprehensive Social Impact Assessment (SIA) has been undertaken to identify, assess and manage the potential negative impacts and enhance positive social impacts associated with the Revised Project on local and neighbouring communities. This SIA has been undertaken in accordance with the DPIE's Social Impact Assessment Guideline for State Significant mining, petroleum production and extractive industry development.

A number of issues have been raised during consultation activities with a summary of the issues and the frequency that they were raised during engagement presented in **Figure E.2** below. A key focus from a social impact perspective was the impact of the Revised Project on existing social amenity due primarily to trucks and traffic movements but also due to onsite quarrying activities; changes to the existing sense of community; and engagement related issues largely stemming from an existing distrust in Daracon and subsequently distrust in the company's ability to monitor and manage identified impacts.

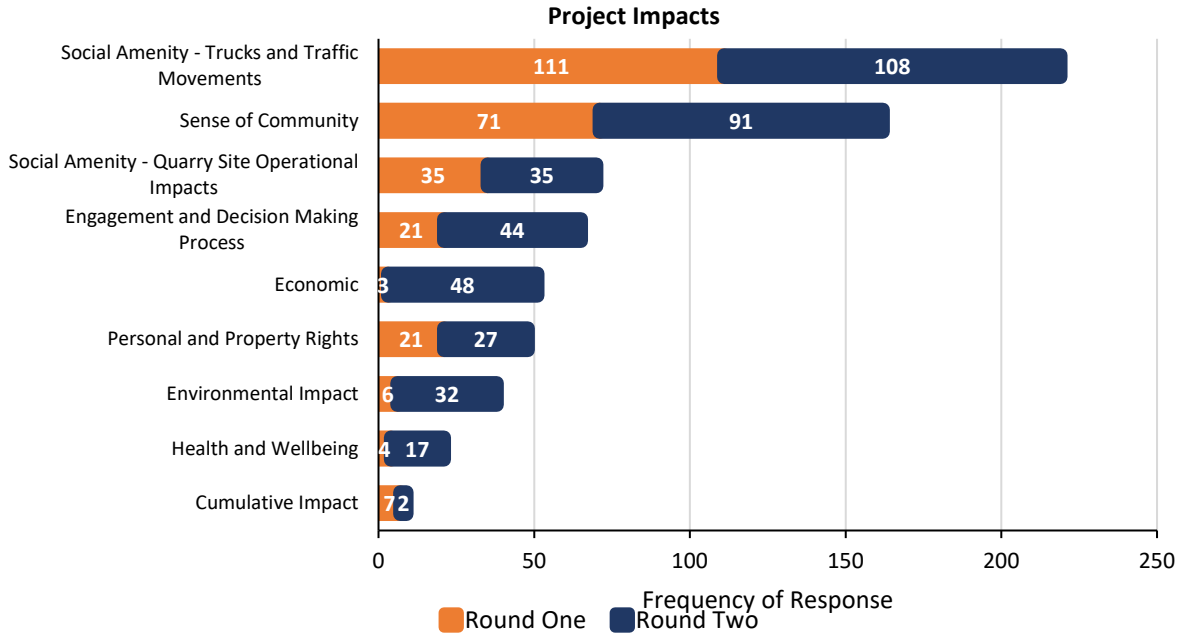


Figure E.2 Frequency of Issues – Overall Key Themes (Unprompted Issues)

Social

The SIA has identified a range of perceived social issues and impacts that Daracon would need to manage as a part of the Revised Project, if approved. Throughout the ADA and SIA process, a range of project design changes have been implemented to address these concerns, with mitigation and enhancement strategies identified, where possible, to minimise social impacts of the Revised Project.

Key negative social impacts predicted include impacts relating to social amenity (as a result of traffic related impacts), changes to sense of community and community cohesion and culture. In addition to these impacts, stakeholders have raised concerns relating to noise, personal safety, livelihoods and health and wellbeing impacts.

Positive impacts of relevance include potential economic benefits to the region and State through employment, procurement and business opportunities. The Revised Project will also provide for secured availability of construction materials for local markets.

Consideration of the identified concerns and stakeholder feedback on potential mitigation measures to address these has resulted in a number of changes to the Revised Project's parameters– largely related to proposed truck movements, hours of quarry operations and proposed monitoring and management activities.

In addition to these, a number of measures have been proposed, including:

- restriction of proposed maximum daily truck movements to only occur up to 50 days per year
- no road haulage of product on Saturdays (or weekend or public holidays)
- reduced truck movements between 3.00pm and 6.00pm weekdays to avoid times of higher community traffic and school pick up times
- quarrying activities to be planned around likely extra traffic days within the community
- reduced speed limits for quarry trucks travelling through Paterson Village
- investigation of the use of radar variable message signs
- review and update of Driver Code of Conduct
- provision of a Camera Monitoring Station at the King and Duke Street Intersection to enable truck identification as required and reduced truck speeds to 20-25km/ hr when travelling through this intersection
- regular and ongoing engagement with local bus companies and investigation of a system to identify rural bus stop pick up points to increase driver awareness
- a restructured **Community Engagement Strategy** that improves the accessibility and delivery of information and that targets issues of key community concern as identified through the SIA consultation program) through the following:
    - ongoing engagement of Daracon's existing dedicated Community Liaison Representative
    - commitment to working with a State Government appointed Chair to a re-established Community Consultative Committee (CCC) and ongoing evaluation of the CCC's effectiveness at meeting its intended objectives
- focusing future social investment / community contribution activities via a refocused **Community Contributions Program**
- implementation of **Local Employment and Procurement Policy** that encourages supporting businesses and recruiting locally where possible
- implementation of a **Voluntary Planning Agreement** with the Dungog Shire Council and Maitland City Council
- development and implementation of a **Social Impact Management Plan (SIMP)** that outlines how social and community impacts will be monitored, evaluated and managed with community engagement informing its development.

A range of additional impact management and mitigation measures have also been identified during the ADA and associated assessment process and have either been committed to or will be the subject of further investigation should the Revised Project be approved. Many of these are also of direct relevance to the SIA outcomes. Examples of these are presented in the relevant summary outcomes of other technical assessments.

While in combination it is expected that the implementation of these measures will minimise the extent to which social impacts may be felt and experienced, it is however still acknowledged that the outcomes of the Revised Project will be experienced differently throughout the community.

Roads and Traffic

The proposed road transportation limit of 500,000 tpa returns road haulage volumes to a level that is not inconsistent with road haulage volumes occurring for at least 8 years prior to Daracon secured its licence to operate the quarry, in 2012 (refer to **Figure E.1** above).

In addition to the reduced limits on transport volumes, peak hourly rates and product haulage times, there are also an extensive range of other proposed controls including updates to the Drivers Code of Conduct, additional traffic monitoring and auditing.

Several road improvement works are proposed as part of the Revised Project to improve traffic flow and road safety and minimise transport related impacts. In addition, Daracon are seeking an agreement with Dungog Shire Council and Maitland City Council on relevant road maintenance contributions for the life of the project.

The updated Traffic Impact Assessment concludes that traffic associated with the Revised Project would have an acceptable impact upon the operation of the key intersections along the primary haul route and is not expected to have any adverse impacts on the safety of the road network.

Noise

Noise is a key issue for the local community, particularly in relation to the historic operations at the quarry, including truck movements on site and off site via the public road network. A detailed Noise Impact Assessment (NIA) has been undertaken for the Revised Project in accordance with the NSW Noise Policy for Industry, 2017 (NPfI). The NIA has also considered road and rail traffic noise impacts associated with the Revised Project as well as the noise impacts from construction activities.

The design of the Revised Project was completed on an iterative basis to enable the minimisation of noise impacts as far as practicable. The Revised Project proposes several changes to the East Pit processing plant and rail loading system by incorporating noise bunds and walls and the extension of the rail spur to move loading operations further away from receivers.

Reasonable and feasible physical noise control measures and operational noise controls are proposed for the life of the Revised Project to further improve noise mitigation.

The detailed noise impact assessment completed for the Revised Project confirms that these measures will reduce operational noise levels experienced by many residences in close proximity to the existing quarry processing and rail loading area. That said, a number of these close residences will experience day time noise levels that are marginally to moderately above contemporary limits in accordance with the Noise Policy for Industry (NfPI) which are set to protect noise amenity for residences in a locality that interfaces with existing industrial facilities.

The extension of operations in the West Pit, the use of the new access road, and evening and night-time rail loading activities have all been assessed against the more stringent criteria for 'new development'. There are a number of residences that are predicted to be marginally or moderately impacted, with the three closest residences predicted to experience significant impacts during night-time rail loading activities. In accordance with the DPIE's Voluntary Land Acquisition and Mitigation Policy (2018), the significant and moderately impacted residences will be subject to proactive noise management and monitoring to guide operations and minimise the potential impacts of the Revised Project.

The detailed road noise assessment confirms that addition of quarry trucks at the capped maximum daily and hourly rates only results in an exceedance of the Environment Protection Authority's Road Noise Policy (RNP) criteria at one residence where it was not already calculated to exceed the criteria with the baseline traffic levels. Where the RNP criteria are already exceeded, or is predicted to be exceeded with quarry haulage, the predicted increase in road traffic noise due to the quarry trucks is predicted to be less than 2 dB. The RNP states that noise level increases of up to 2 dB are considered barely perceptible to the average person.

Air Quality

A comprehensive assessment of potential air quality impacts of the Revised Project has been completed, in accordance with relevant Environment Protection Authority guidelines. This assessment confirms that the Revised Project is not predicted to result in any exceedance of the applicable criteria that relate to dust or particulate matter in the air, blast fumes, or diesel exhaust emissions.

During community engagement, concerns were also raised in relation to the potential health impacts of crystalline silica. Ambient monitoring of respirable crystalline silica was conducted at the quarry boundary which, together with considering the relevant modelling and assessment, the air quality specialist concluded that the Revised Project is not expected to cause adverse air quality impacts with respect to crystalline silica.

Blasting and Vibration

During stakeholder engagement blasting impacts were identified by the community as an issue of concern, particularly in relation to the potential for damage to private property. A comprehensive assessment of potential blasting and vibration impacts of the Revised Project has been undertaken.

Daracon has continued to take this feedback on board and sought to address it through project design changes such as reducing the blasting window, and operational changes by committing to independent blast monitoring.

Detailed monitoring over many years, and further analysis prepared for the Revised Project confirms that ground vibration and blast overpressure levels can be managed to meet relevant blast emission criteria at all sensitive receiver locations through appropriate blast design and the implementation of appropriate control measures.

Biodiversity

Daracon has redesigned the quarry plan for the Revised Project resulting in a reduction of the quarry disturbance footprint of 16.8 ha. This results in avoidance of clearing 15.3 ha of native vegetation.

A comprehensive Biodiversity Assessment Report (BAR) has been prepared for the Revised Project. The potential ecological impacts of the Revised Project have been assessed following the NSW Framework for Biodiversity Assessment – NSW Biodiversity Offsets Policy for Major Projects (FBA).

Whilst Daracon has strived to minimise impacts on biodiversity through the design process, not all impact could be avoided by the proposed design and a detailed assessment of the impacts was undertaken of the Revised Project. The Revised Project will require the additional disturbance of approximately 21 ha of native vegetation from within the 127 ha of the Project Area.

Daracon is committed to delivering a Biodiversity Offset Strategy (BOS) that appropriately compensates for the unavoidable loss of ecological values as a result of the Revised Project. The BOS will be further developed in consultation with the Biodiversity Conservation Division and DPIE and based on the credits required to be retired to offset the impacts of the Revised Project as specified in the BAR and the offset options available under the BC Act, being:

- land based offsets through the establishment of new Stewardship Sites
- purchasing credits from the market, and/or
- paying into the Biodiversity Conservation Fund.

Daracon will prepare a Biodiversity and Rehabilitation Management Plan (BRMP) as part of the implementation of the Revised Project. The BRMP will set out all management and mitigation measures relating to biodiversity at the quarry.

Water Resources – Surface and Groundwater

Detailed, updated assessments have been completed in relation to surface and groundwater impacts. These assessments confirm:

- The Revised Project will not have a significant impact on surface or groundwater resources, including for downstream users.
- The Revised Project will no longer intercept a third order stream due to its reduced disturbance footprint, as a direct result of excluding proposed expansion of quarrying activities into new undisturbed areas to the east.
- The surface water assessment found that the Revised Project is not predicted to have significant impacts on downstream water quality, flows, flooding or water users.
- The assessment predicted that the Revised Project will have a similar groundwater drawdown impact to what is currently being experienced at the quarry. That is, there will be no impacts on private bores from the Revised Project and it will not cause any impact on any groundwater dependent ecosystems.
- Based on the predicted groundwater seepage rate, Daracon currently hold adequate licences for the Revised Project.
- Daracon will review the current water monitoring network and practices during the development of an updated Water Management Plan.

Historic Heritage

A Historical Heritage Assessment (HHA) was undertaken for the Original Project to identify and assess potential heritage impacts associated with the Original Project's proposed quarrying operations. The HHA concluded that there would be no impact on the heritage significance of the local heritage items, including Martins Creek Quarry.

During the exhibition of the Original Project EIS, there was a request for additional investigation to assess the potential heritage impacts associated with the proposed haulage route, particularly relating to heritage values in Paterson and Bolwarra.

The primary haulage route extends through two heritage conservation areas (HCAs), being the Paterson Village HCA, as defined under the Dungog LEP 2014, and the Bolwarra HCA, as defined under the Maitland LEP 2011, and passing in the vicinity of four State listed and 61 locally listed sites.

The Heritage Impact Statement (HIS) concluded that it is unlikely that the Revised Project will result in any adverse visual or physical impacts to the heritage significance of the HCAs or individually listed heritage items.

The implementation of mitigation measures to address traffic impacts are expected to prevent any impacts on heritage values associated with quarry truck movements.

Cultural Heritage

The quarry Project Area is located within the traditional country of the Wonnarua (sometimes spelt Wanaruah) people and Worimi people, whose history extends from the present day back many thousands of years. The Project Area is also within the modern-day Native Title registered claim of the Plains Clans of the Wonnarua People and is also within the Mindaribba Local Aboriginal Land Council (MLALC) boundary.

An Aboriginal Cultural Heritage Assessment Report (ACHAR) was prepared for the Original Project, in consultation with the Registered Aboriginal Parties (RAPs) and Knowledge Holder groups to assess the Aboriginal cultural heritage values of the Project Area and surrounds.

The assessment concluded that the quarry is located in an area of low Aboriginal archaeological potential and the proposed expansion of the quarry is unlikely to harm any known Aboriginal objects or cultural heritage values. Further the OEH recommended no further assessment was required, following review of the Original EIS.

Rehabilitation and Final Landform

Daracon is committed to the effective rehabilitation and closure of the quarry at the cessation of operations. The overarching principles which apply to the rehabilitation and closure of the Revised Project is the development of a safe, stable and non-polluting landform. This will be achieved through managing quarry assets, operations and rehabilitation on a progressive basis to work towards the final rehabilitation and closure of the quarry.

Several final land use options are available for the quarry. Currently, final land use is focused on promoting the rural landscape by establishing native grassland or exotic pastures in low lying areas whilst focusing on the re-introduction of pockets of woodland species across the benches consistent with endemic vegetation types.

Economic

A key benefit of the Revised Project includes the economic benefit to the State and region. Employment and economic benefits were the most common response from the community when they were asked to identify the benefits of the Revised Project during consultation.

The Economic Assessment describes a range of positive benefits from the Revised Project that will result at a local, regional and State level. These benefits include:

- continued employment of approximately 22 full time equivalent employees
- the Revised Project is estimated to provide a net benefit of $58 million to NSW, in net present value (NPV) terms

- the Revised Project is estimated to generate $11.5 million in NPV terms for Australia, of which $3.7 million is attributed to NSW
- the Revised Project is estimated to generate $1.5 million in royalties, payroll tax and Council rates in NPV terms
- the Revised Project is estimated to provide a net producer surplus attributed to NSW of $13.5 million in NPV terms.

Conclusion

The Revised Project has been assessed against the principles of ecologically sustainable development (ESD) as required by the EP&A Act. This assessment has indicated that the Revised Project is consistent with the principles of ESD.

Given Daracon's approach of reviewing the Revised Project design to minimise impacts, the social impacts of the Revised Project have been minimised where possible through project design and the proposed management and enhancement approaches.

On this basis, it would be reasonable to consider that with the implementation of the management, mitigation and offset measures proposed by Daracon, the Revised Project will result in a net benefit to the NSW community.

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1.0 Introduction

1.1 Project Background

The Martins Creek Quarry (the quarry) is operated by Buttai Gravel Pty Ltd, which is part of the Daracon Group (hereafter referred to as Daracon). The quarry is an existing hard rock quarry situated within the Dungog Local Government Area (LGA), approximately 7 kilometres (km) north of Paterson and 28 km north of Maitland, New South Wales (NSW) (refer to **Figure 1.1**).

The quarry was established in 1914 by the NSW Government Railways for the purpose of supplying railway ballast and other quarry materials to both the NSW railway network and Hunter Valley/Newcastle construction projects. Until late 2012, the quarry was operated continuously by various NSW Government transport departments, authorities and corporations.

In December 2012, Daracon secured a long term licence of the quarry and have been extracting material in order for the quarry to continue to produce high quality aggregates, roadbase, ballast, gabion and other specified materials used in road, railway, concrete and civil construction.

On 24 September 2019, the quarry was placed into a limited operation based on the approved parameters in line with judgment by the Court of Appeal (refer to **Section 1.4**).

In 2014, Daracon submitted a development application for the Martins Creek Quarry Extension Project. This application sought approval for the consolidation of the existing development approvals and the expansion of the quarry into new areas to extract and haul by road transport up to 1.5 million tonnes (Mt) of material per annum (pa) over a 30 year period (Monteath & Powys, 2014) (hereafter referred to as the Original Project).

The development application is being assessed as a State Significant Development (SSD) (application number SSD 6612), requiring approval under Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). The Secretary's Environmental Assessment Requirements (SEARs) were issued on 4 August 2016 (refer to **Appendix A**). An Environmental Impact Statement (EIS) was prepared and exhibited during late 2016 (Monteath & Powys, 2016). **Section 1.5** provides further detail on the Original Project.

Submissions received during the exhibition period raised substantial concern regarding the operational parameters of the Original Project, associated impacts on local communities and the level of assessment that was undertaken during the preparation of the EIS. Key concerns from the local communities related to traffic and transport (including the volume and frequency of truck movements and road safety), noise, blasting and vibration impacts and impacts to the rural amenity and lifestyles. Furthermore, some of the government agencies requested further information and/or revised impact assessments to adequately address the assessment requirements relating to noise, traffic and transport, air quality, water, land, biodiversity and rehabilitation.

After these submissions were received on the Original Project, Umwelt was engaged by Daracon, to undertake further stakeholder engagement to understand the issues (refer to **Section 5.0**) and prepare this Amended Development Application (ADA) and Response to Submissions (RTS), on behalf of Daracon.

In response to the public and government agency concerns, Daracon and Umwelt have undertaken extensive stakeholder engagement and a thorough review of the Original Project to redesign key operational parameters in order to reduce environmental and social impacts. In particular, Daracon have committed to reduce the extraction limits, operational hours and truck movements (the Revised Project), as further detailed in **Section 2.0**. An updated environmental assessment, including revised and updated technical studies, have been completed to evaluate the key project changes, provide requested additional information and comprehensively address the assessment requirements (as detailed in **Section 6.0**).

Given the changes to the Original Project and to address the submissions on the EIS, this report has been prepared as an ADA and RTS. Confirmation of the approval and requirements to amend the development application in accordance with clause 55 of the Environmental Planning and Assessment Regulation 2000 (EP&A Regulation), was provided by Department of Planning, Industry and Environment (DPIE) on 6 November 2020. This correspondence along with the SEARs is contained in **Appendix A**. This report has been prepared by Umwelt on behalf of Daracon, in accordance with the requirements included in **Appendix A** and the DPIE's Preparing an Amendment Report Guideline (DPIE, 2019) and Preparing a Submissions Report Guideline (DPIE, 2019).

Section 1.7 provides further details on the structure of this report.

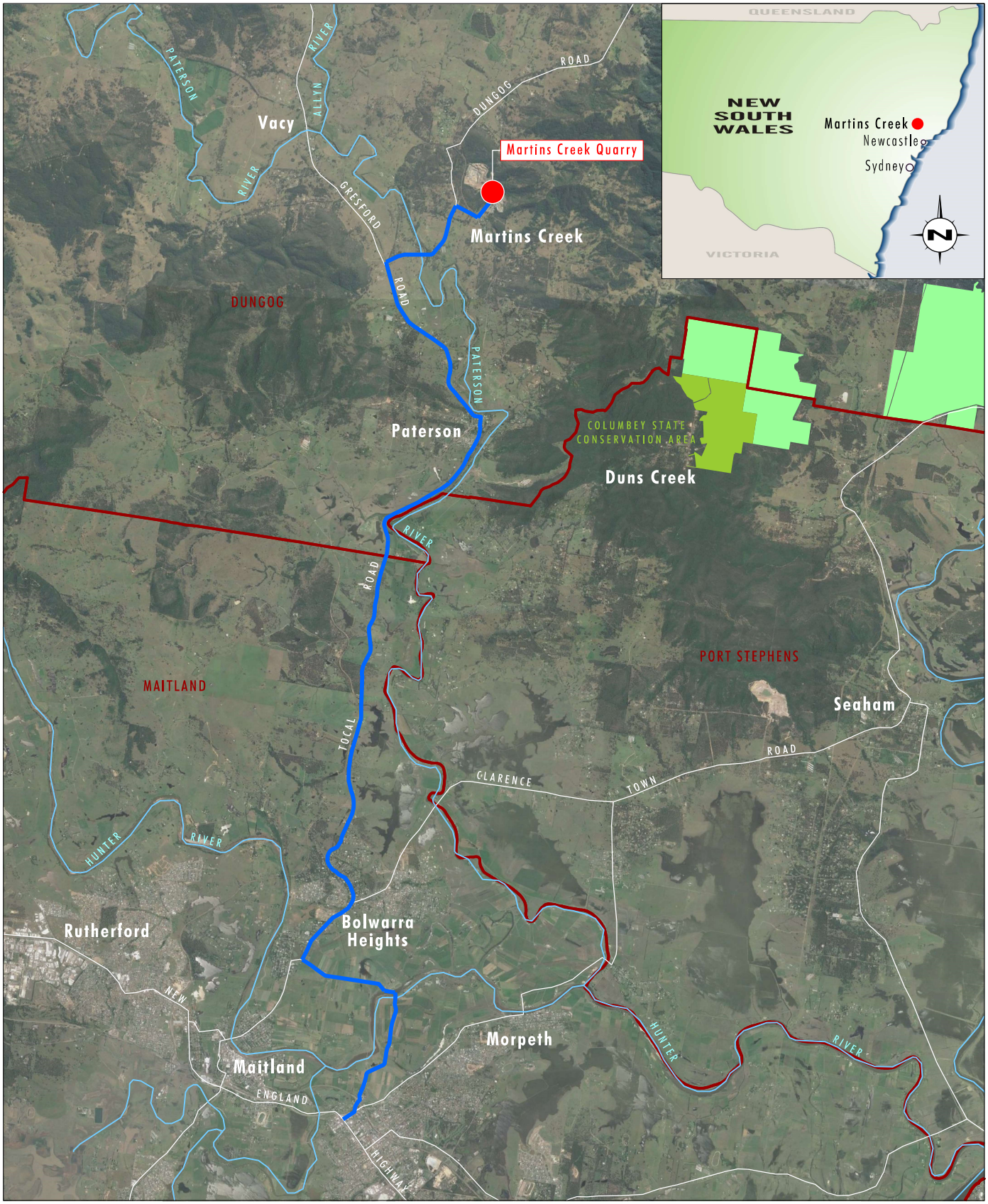


Image Source: Google Earth (2017)
Data Source: LPI (2019),
NSW National Parks and Wildlife Service (NPWS) Estate (Jan 2018)

0 2.0 4.0 6.0km
1:125 000

Legend

- Martins Creek Quarry
- Local Government Area Boundary
- Proposed Primary Haul Route

FIGURE 1.1

Locality Plan

1.2 The Proponent

The proponent for the Revised Project is Buttai Gravel Pty Ltd, trading as Daracon Quarries. Buttai Gravel is part of Daracon which was established in 1983 in Cessnock NSW. Daracon is a provider of a range of integrated civil construction services to public and private clients in the road, rail, landscape, quarrying and mining sectors. Hereafter the proponent is referred to as Daracon.

In addition to the quarry, Daracon currently operate a sandstone conglomerate quarry (Buttai Quarry) and a hard rock quarry (Ardglen Quarry) in the greater Hunter Region.

1.3 Existing Site Context

1.3.1 Location, Geology and Environmental Setting

The existing quarry is located on Station Street, Martins Creek with an existing disturbed area of approximately 48.6 hectares (ha). Directly to the west, the quarry is bound by the North Coast Railway Line with Vogeles Road and the village of Martins Creek to the south (refer to Figure 1.2).

The landscape is characterised by gently undulating to undulating low hills on Carboniferous sediments and volcanics in the Medowie Lowlands region and hilly landscape. The quarry slopes in a south west direction from a vegetated ridgeline south of Merchants road. Natural drainage of the quarry is divided into two catchments, both of which drain to the Paterson River approximately 1.5 km west of the quarry.

Martins Creek is underlain by Carboniferous volcanic and sedimentary sequences, approximately 350 million years old. The volcanic sequence of interest is Latite Tuff (hereafter referred to as Latite), known locally as andesite (VGT, 2021). The quarry is principally dominated by fresh latite, with some weathered latite and pockets of conglomerate, agglomerate and sandy clays. The materials found on site are suitable to create a variety of products in the construction industry (VGA 2021).

Quarry operations have been undertaken in two areas, namely the West Pit (south west of Station Street) and the Processing Area (east of Station Street). The quarry site comprises six different land parcels as shown on Figure 1.2. Quarrying to extract hard rock material has occurred in the pit area within the West Pit, on Lots 5, 6 DP 242210, and Lot 42 DP 815628 (refer to **Figure 1.2**), since the early 1990s. Processing, loading and transportation of quarry product is also well established in the Processing Area on Lot 1 DP 204377 and Lot 1 DP 1006375 (refer to **Figure 1.2**). The rail siding, rail loading facility, site compound, weighbridge, administration building, and transport of sale product is also located in the Processing Area.

1.3.2 Land Use, Zoning and Land Ownership

The quarry site has been used for quarrying purposes since 1914. For many decades, there have been private residences located in relative close proximity to the quarry in Station Street which is currently used to access the site, and more broadly in nearby Martins Creek village. While most of the surrounding land is utilised for agricultural purposes, rural residential land use has become more prominent in the general locality over the years. More recent rural residential subdivision has been established to the north and south of the Martins Creek village, and in Vacy, to the north and northwest of the West Pit (refer to **Figure 1.3**). Further details on existing land uses and potential impacts on land uses associated with the Revised Project, are provided in **Section 6.2.4**.

The North Coast Railway is located adjacent to the western boundary of the Project Area.



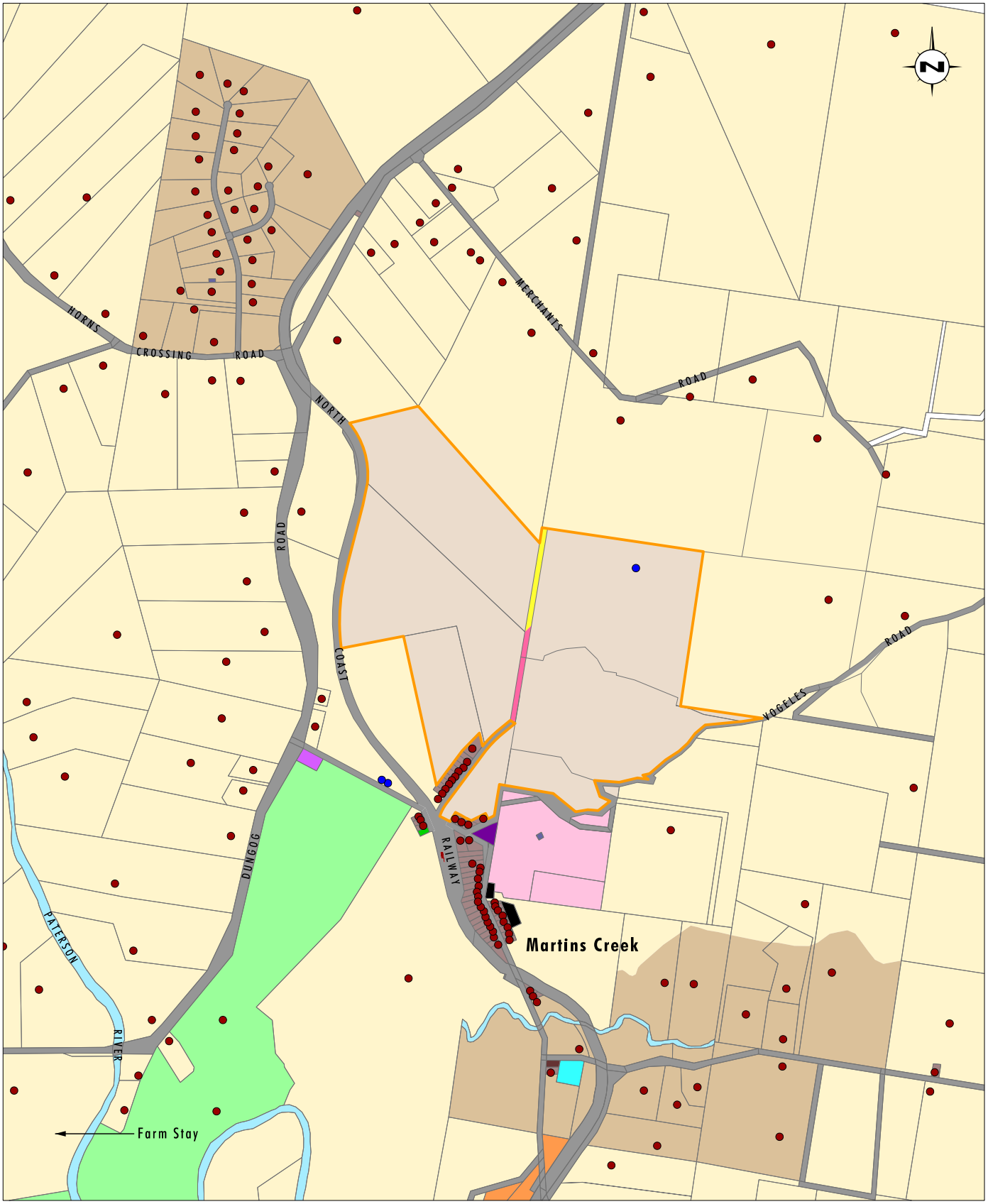
Image Source: Google Earth (2018)
Data Source: Daracon (2020)

0 100 250 500m
1:10 000

Legend
Existing Quarry Boundary

FIGURE 1.2

Existing Martins Creek Quarry



Data Source: Daracon (2020)

0 0.25 0.5 1.0km
1:20 000

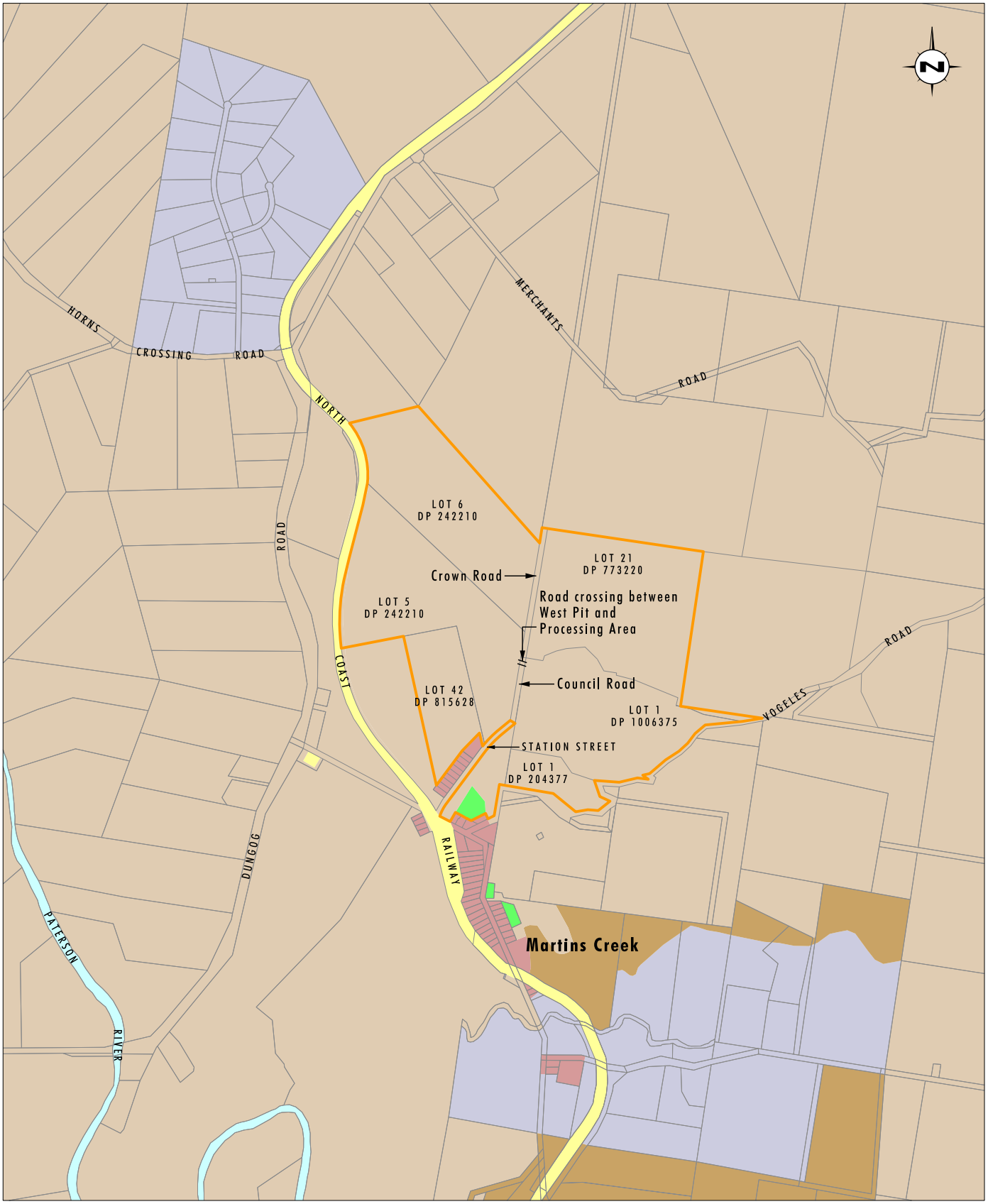
Legend

- Existing Quarry Boundary
- Agricultural Enterprises - Chicken Farm
- Daracon Owned Buffer Land
- Crown Land Paper Road
- Council Land Paper Road
- Electrical Transmission and Distribution
- Extractive Industries - Quarry
- Hunter Water
- Parks and Recreation
- Infrastructure
- Martins Creek Depot
- Village
- Large Lot Residential
- Rural and Rural Residential
- Church
- Fire Station (Rural Fire Service)
- Community Hall
- Train Station
- Martins Creek Public School
- Private Residence
- Quarry Owned Residence

FIGURE 1.3

Existing Land Use

File Name (A4): R01/3957_056.dgn
20200826 13.49



Data Source: Daracon (2020), Dungog LEP (2014)

0 0.25 0.5 1.0km

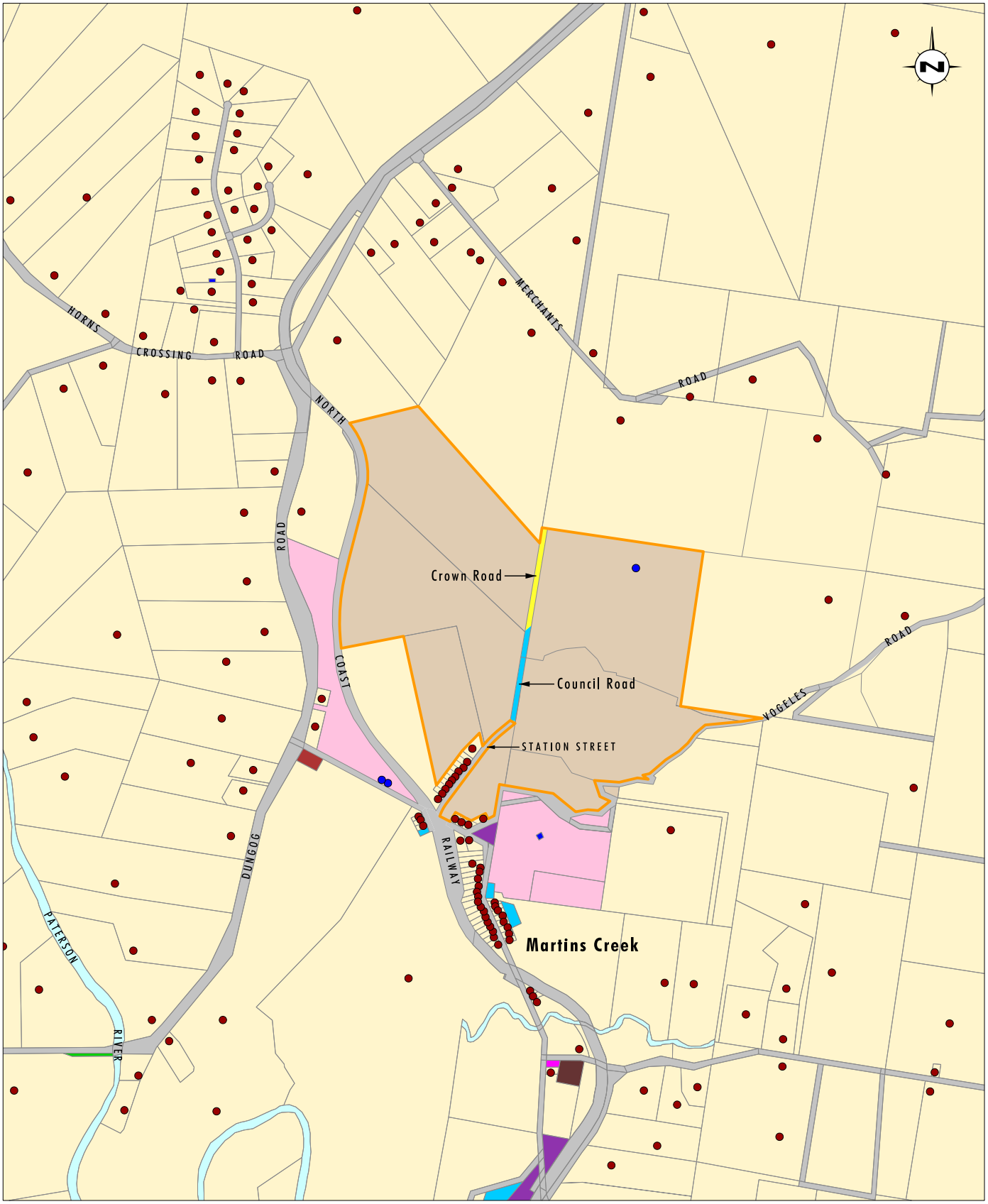
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Legend

- Existing Quarry Boundary
- RU1 - Primary Production
- E3 - Environmental Management
- RE1 - Public Recreation
- R5 - Large Lot Residential
- RU5 - Village
- SP2 - Infrastructure

FIGURE 1.4

Existing Land Zoning



Data Source: Daracon (2020)

0 0.25 0.5 1.0km

1:20 000

Legend

- Existing Quarry Boundary
- Daracon
- Council - Dungog
- Crown Road
- Diocese of Newcastle
- Essential Energy
- Hunter Water
- Minister for Public Works of NSW
- Minister for Education
- Private
- Quarry Owner
- Railway/Road
- State of NSW
- Private Residence
- Quarry Owned Residence

FIGURE 1.5

Surrounding Land Ownership

File Name (A4): R01/3957_023.dgn
20200826 14.03



Image Source: Google Earth (2018)
Data Source: Daracon (2020)

0 100 250 500m
1:10 000

Legend

- Existing Quarry Boundary
- MBV Quarries Pty Ltd

FIGURE 1.6

Quarry Land Ownership and Leases

Most of the land parcels that make up the quarry are zoned as RU1 – Primary Production (refer to **Figure 1.4**). A small portion of Lot 1 DP 1006375, on the south west edge, is listed as RE1 – Public Recreation under the Dungog Shire Council Local Environmental Plan (Dungog LEP). However, this area does not form part of the quarry operations. Further discussion on land zoning is provided in **Section 4.2.2**.

Figure 1.5 shows the land ownership of land parcels surrounding the quarry.

The existing quarry site is made up of six different land parcels with two different landowners (refer **Table 1.1** and **Figure 1.6**). The land is leased to Hunter Industrial Rental Equipment Pty Limited, licenced to Buttai Gravel Pty Ltd (Daracon) to undertake quarrying activities.

Buttai Gravel Pty Ltd (the proponent) operates the quarry under a license agreement with Hunter Industrial Rental Equipment Pty Limited.

Table 1.1 Summary of Land Ownership for Martins Creek Quarry

Land Parcel	Land Ownership	Lease Agreement
Lot 6 DP242210	MBV Quarries Pty Ltd	Hunter Industrial Rental Equipment Pty Limited (lease AI353347)
Lot 42 DP815628	MBV Quarries Pty Ltd	Hunter Industrial Rental Equipment Pty Limited (lease AI353347)
Lot 5 DP242210	MBV Quarries Pty Ltd	Hunter Industrial Rental Equipment Pty Limited (lease AH831349)
Lot 1 DP204377		
Lot 1 DP1006375		
Lot 21 DP773220		
Lot 4 DP 249026	MBV Quarries Pty Ltd	
Lot 2 DP 242210	County Property Holdings Pty Ltd	Related entity in the Daracon Group of Entities
Lot 10 DP 1209239	TfNSW/ARTC	Railway Corridor

Table 1.1 and **Figure 1.6** show the land ownership and relevant lease agreement information for each of the land parcels associated with the quarry.

The West Pit and the Processing Area are separated by a paper road owned by Dungog Shire Council (DSC) and Crown Land (refer to **Figure 1.5**). An internal haul road between the West Pit and the Processing Area traverses the Council-owned section of the paper road. The landowner is making applications for road closures. DSC have provided in principle agreement to establish an appropriate commercial arrangement to enable use of this section of road, and to close it from public access, subject to the Revised Project being approved.

ARTC have also provided in principle agreement for the proposed new access road to traverse the North Coast Railway Corridor, subject to approval of the detailed design and construct plans for the proposed bridge over the railway corridor.

1.3.3 Recent Operations

Quarrying in the West Pit (refer to **Figure 1.2**), comprises clearing and topsoil stripping, drilling and blasting, and loading of extracted material onto haul trucks for transportation to the Processing Area (refer to **Figure 1.2**). Sand washing and some mobile crushing and screening also occurs periodically in the West Pit. Operations in the Processing Area includes crushing and screening (primary, secondary and tertiary), mobile screening, product blending, product washing, pugmill operations, sales and distribution by both rail and road transport.

Since October 2018, the quarry operated in accordance with an Interim Environmental Management Plan (IEMP) which placed limits on extraction and processing volumes, truck numbers and operating hours.

The IEMP was revised between October 2018 and February 2019 to incorporate additional controls. During the period of 11 February 2019 to 24 September 2019, the quarry operated in accordance with the most recent IEMP as agreed to with DSC. This comprised the following key operating and transport parameters:

- extraction and processing of material limited to 125,000 tonnes (t) per three-month period
- product transport by road limited to 75,000 t per two-month period, with a maximum of 90 laden trucks per day and 20 laden truck per hour
- no transport of product was permitted on weekends or public holidays.

On 24 September 2019, the quarry was placed into limited operations within the parameters set out by the existing consents deemed as approved by the Court of Appeal (refer to **Section 1.4**).

1.3.4 Environmental Management

Quarry operations have been managed to minimise impacts on the surrounding environment and local community through an environmental management system based on the principles of the international standard ISO 14001: *Environmental management systems – Requirements with guidance for use.*

Operations at the quarry have been undertaken in accordance with the approved Integrated Facility Management Plan (IFMP) which covers the following matters:

- resource and waste management
- soil and water management
- flora and fauna (biodiversity) management
- air quality management
- noise management
- vibration management
- working with and storage of hazardous chemicals
- facility rehabilitation
- community liaison
- contaminated land management

- Aboriginal and non-aboriginal heritage
- flood management
- management of public safety.

The IFMP also contains specific sub-plans relating to surface water management, site dewatering management, noise and vibration and pollution incident response management at the quarry.

The existing environmental monitoring locations for air quality, water and blasting are listed below and provided on **Figure 1.7**:

- Air quality monitoring network includes four permanent dust deposition gauges, one high volume air sampler (HVAS) and one meteorological station. Additional gauges are installed for monitoring dust deposition as required. A temporary dust deposition gauge was installed in View Street, Vacy in May 2019 in response to community feedback at the Air and Blasting Collaborative Assessment Forum (CAF).
- Water quality monitoring network includes seven groundwater monitoring locations and three dam water discharge points.
- Blasting monitoring network includes three blast monitors that are placed outside of the quarry boundary. As required, extra blast monitors are used to ensure compliance at local residences, and for community concerns.



Image Source: Google Earth (2018)

0 200 400 600m

1:12 000

Legend

- Existing Quarry Boundary
- Groundwater Monitoring
- Blast Monitor
- Dust Deposition Gauge
- High Volume Air Sampler (PM_{10})
- Dam Water Discharge Point
- Temporary Dust Deposition Gauge
- Weather Station

FIGURE 1.7

Existing Martins Creek Quarry Environmental Monitoring Locations

File Name (A4): R01/3957_051.dgn
20210526 9.57

1.4 Land and Environment Court Proceedings

In 2015, DSC brought action against the lessee of the quarry land (Hunter Industrial Rental Equipment Pty Ltd) and the operator of the quarry (Buttai Gravel Pty Ltd) for breaching section 76A (now section 4.2) of the EP&A Act. DSC asserted that operations at the quarry were being carried out without consent otherwise than in accordance with an existing development consent granted in 1991 (1991 Consent).

On 12 October 2018, the Land and Environment Court (LEC) found that some operations at the quarry were contrary to the 1991 Consent and made various declarations and orders, including orders restraining the Respondents from carrying out certain activities. The LEC granted a three month stay of the orders until 12 January 2019. During the stay period, quarry operations were required to be undertaken in accordance with an IEMP until such time as this application was determined and all required consents, approvals and licences were granted.

The lessee and the operator lodged an appeal with the Court of Appeal and a further stay of the LEC orders was granted until the appeal was determined.

The Court of Appeal judgment was delivered on 20 June 2019. The Court of Appeal ordered that the quarry operator is restrained from:

a) using the land otherwise than as a quarry primarily for the purposes of winning railway ballast

b) excavating rock on Lot 6 DP 242210 without consent, and

c) permitting the transport of greatly more than 30% of the quarry products derived from rock excavated from the land by public road on an annual basis, without the approval of DSC.

Importantly, the Court of Appeal declined to make orders:

a) restricting extractive operations on Lot 5 to a specific area and depth, or

b) restraining the use of the Processing Area, provided that the only product extracted from the quarry is processed.

In addition, the LEC rejected an assertion by DSC that transport of product from the quarry was limited to 12 truckloads per day and this decision was not changed by the Court of Appeal.

The Court of Appeal also set aside a variation to Environment Protection Licence (EPL) 1378 that permitted an increase in the maximum extraction of product at the quarry from 500,000 tpa to 2 Mtpa. The effect of this order is that the EPL authorises, under the *Protection of the Environment Operations Act 1997* (PoEO Act), extraction and processing of activities with an annual capacity of 100,000 to 500,000 t.

A three month stay of the Court of Appeal orders was granted, until 20 September 2019. The stay was subject to conditions, including a requirement that all operations be conducted in accordance an amended IEMP.

In September 2019, an application was heard by the LEC to extend the stay for a period of 12 months, subject to continued operations in accordance with the IEMP conditions. The LEC refused to grant the extension of the stay, with the effect that the Court of Appeal's orders became operative.

On 24 September 2019 the quarry has operated within the parameters of the Court of Appeal orders. The Court of Appeal judgement did not specifically address all aspects of the existing approval rights in relation to use of the site for quarrying, processing and associated activities. A summary of the key parameters of approved operations, based on Daracon's legal advice, is provided in **Section 1.4.1**.

1.4.1 Approved Operations

The quarry comprises two distinct areas of operation; the parts of the quarry east of Station Street described as the Eastern Lands and the parts of the quarry west of Station Street described as the Western Lands.

Quarry operations in the Eastern Lands commenced in either 1914 or 1915 and expanded between 1952 and 1975. On 18 May 1999, DSC formally resolved to recognise and accept the existence of existing use rights on the Eastern Lands, for the processing of material. In so doing, DSC concurrently resolved that processing of materials on Lot 2 in DP 524511 (now part of Lot 1 DP 1006375) was limited to 449,000 t of bulk material per annum.

In 1991, development consent was granted by DSC for an extractive industry being a quarry winning material primarily for railway ballast on Lots 5 and 6 in DP 242210 (Western Lands), subject to conditions. After quarrying moved to the Western Lands in approximately 1993, the Eastern Lands continued to be used for the purpose of processing quarry materials. The LEC and Court of Appeal confirmed that there are continuing or existing use rights which apply to the Eastern Lands. Those rights are limited to the processing of materials extracted from the Western Lands.

The key parameters of the approved development include:

- extraction primarily for the purposes of winning railway ballast
- extraction of rock from Lot 5 DP 242210 (in Western Lands) and not from Lot 6 DP 242210
- extraction of up to 500,000 tpa (effectively limited by the activities authorised by the EPL licence)
- continuing use rights for the Eastern Lands for the processing of material extracted from the Western Lands
- tertiary processing on the Eastern Lands of up to 449,000 tpa
- no limit on the number of trucks subject, provided that not greatly more than 30% of material per annum is transported by truck
- no limit on proposed haul route on public roads.

1.5 Previous Assessment of the Original Project

The Original Project EIS (Monteath & Powys, 2016) sought approval for:

- consolidating existing operations and approvals
- expanding into new extraction areas and clearing approximately 36.8 ha of vegetation, to enable the extraction of up to 1.5 Mt of hard rock material per annum over an operating period of 30 years
- increasing the hours of operation to:
    - quarrying - 6.00 am to 6.00 pm (Monday to Saturday)

- processing - 6.00 am to 10.00 pm (Monday to Saturday)
- mixing and binding - 4.30 am to 10.00 pm (Monday to Friday) and 4.30 am to 6.00 pm (Saturdays)
- stockpiling, loading and dispatch of road transport - 5.30 am to 7.00 pm (Monday to Saturday)
- train loading - 24 hours per day, 7 days per week

- construction of a new access driveway and bridge
- rehabilitating the quarry.

Following review of the submissions, the then Department of Planning and Environment (DPE) (now DPIE), requested a comprehensive response to submissions to address concerns raised by the community and government agencies, to provide the requested additional information and/or revised impact assessments.

1.6 Key Project Changes for the Revised Project

Following detailed analysis of Agency and community feedback on the EIS and subsequent stakeholder engagement, Daracon committed to a number of key project design changes and additional mitigation and management measures to minimise the project's environmental and social amenity impacts. This included reductions in proposed extraction limits, changes to quarry operating hours, reduced road transportation volumes, increased rail transportation and a reduced Project disturbance area.

Activities have included further investigations into, and consideration of, the following:

- resource optimisation and quarry plan refinements to minimise environmental and community impacts
- commercial and operational elements in relation to operating hours, annual production volumes to be transported by road and peak truck volumes
- rail spur extension options to optimise rail transport volumes, reduce disturbance footprint and minimise noise
- rail transport/unloading options
- noise investigations and extensive measures to further mitigate impact on residents in Station Street and the village of Martins Creek
- further engineering design work on relevant intersection upgrades and other enhanced traffic and transport mitigation measures following community feedback (refer to **Section 2.8.2**).

This section outlines the key changes made to the Revised Project in response to submissions on the EIS for the Original Project. For a full project description of the Revised Project refer to **Section 2.0**, including a summary of the changes since the Original Project in **Table 2.1**.

1.6.1 Proposed Quarry Operations

The proposed quarry operations approval term sought for the Original Project was 30 years.

In response to feedback from the community, Daracon committed to decrease the proposed road transportation volumes for the Revised Project. Subsequent resource quantification was undertaken with the aim of optimising the existing quarry footprint and reducing the amount of vegetation clearing. Taking into account these parameters, Daracon is now seeking approval for a quarry operations approval term of 25 years.

1.6.2 Extraction Limit

The Original Project proposed an extraction limit of 1.5 Mtpa. In response to community feedback, Daracon have reduced the proposed total production and extraction limit for the quarry to a maximum of 1.1 Mtpa. This represents a reduction of 400,000 tpa (27% reduction) in the amount of material that is proposed to be quarried and transported from the quarry.

The proposed mode of transport for the maximum of 1.1 Mtpa product material is a combination of road and rail and has undergone the following revisions:

Road transport

- The annual tonnage transported by the road network is reduced from up to 1.45 Mtpa to a maximum of 500,000 tpa.
- Overall, the reductions from the Original Project to the Revised Project represents an annual reduction in the amount of quarry product transported by road of up to 950,000 tpa (65% reduction).

Rail transport

- To further reduce the impacts associated with transport of quarry product via road and still maintain an economically viable project, Daracon have committed to increase the amount of quarry product transported by rail.
- Daracon are planning to expand rail markets and gain access to rail unloading capacity, in order to enable greater transportation of product by rail to service the Sydney market. The local and regional market will continue to be serviced predominately by road transport.
- Daracon is seeking approval to extract up to 1.1 Mtpa of quarry product; transporting up to 500,000 tpa by road.
- If less than 600,000 tpa is transported by rail each year, then the unused capacity will be foregone for that year. That is, the maximum quarry production is capped at 1.1 Mtpa of quarry product, and the road transport rate is capped at 500,000 tpa irrespective of the rail transport rate.
- Subject to market demands, Daracon may increase the amount transported by rail, on a campaign basis, within the 1.1 Mtpa of quarry product.
- Daracon is planning for the rail loading extension at the quarry to be in place during Year 4 of the Revised Project.

Daracon have reduced the proposed total production and extraction limit for the quarry from 1.5 Mtpa to a maximum of 1.1 Mtpa. This represents a reduction of 400,000 tpa (27% reduction) in the amount of material that will be quarried and transported from the quarry, and includes a reduction of road transport by 950,000 t.

Through the Revised Project, Daracon is seeking to continuously service product needs of quarry product customers, while managing the impacts on the community. The proposed key project parameter of 500,000 tpa transported by road is calculated on the ability to achieve that objective, spread throughout a year of operations. Continuous sales throughout the year is essential to retain customers and the economic viability of the quarry.

1.6.3 Quarry Operating Hours

Daracon have made significant changes to the proposed hours of operation for the Revised Project compared to the Original Project. These are detailed in **Section 2.6**, and include no product haulage by road on a Saturday (or Sunday and Public Holidays), reduced hours of quarry operations, and other further restrictions to road haulage arrangements to reduce impacts on Paterson Village.

Further, blasting of quarry material will only occur between 11.00 am and 3.00 pm on Monday to Friday (previously 9.00 am to 3.00 pm), with no blasting on Saturdays, Sundays or Public Holidays.

1.6.4 Product Transportation

In order for the quarry to be feasible, it must be able to service the local and regional construction material markets and be commercially sustainable.

Daracon recognise that traffic and transport issues are the most significant issue for the Project, based on both submissions on the Original EIS and subsequent feedback during stakeholder engagement.

The Original Project proposed a peak of 215 laden trucks per day (430 movements) and 40 laden trucks per hour (80 movements). Daracon have subsequently revised the Project to seek approval for a peak of 140 laden trucks per day (280 movements) for up to 50 days per year, otherwise 100 laden trucks per day (200 movements). The hourly peak consists of:

- 20 laden trucks per hour (40 movements) Monday to Friday between 7.00 am and 3.00 pm
- 15 laden trucks per hour (30 movements), Monday to Friday between 3.00 pm and 6.00 pm.

This represents as a 50% reduction in peak hourly truck volumes compared to the Original Project.

The daily peak (maximum) laden trucks per day is proposed to be 140 per day (280 movements) to meet campaign requirements to service large regional construction projects, up to 50 days per year. The Revised Project proposes a limit of 100 laden trucks (200 movements) for the remainder of the year. Maximum truck movement parameters of 140 laden trucks per day and 20 laden trucks per hour (or 15 laden trucks between 3.00 pm and 6.00 pm) have been selected to allow peak customer requirements to be met, not as a continuous level of activity throughout a year. The frequency (number of days) of these parameters occurring is limited by the project parameter of 500,000 t being spread over a 12 month period, in line with customer requirements.

As noted previously, the limit of 500,000 tpa for the Revised Project is a 65% reduction compared with the Original Project in the total tonnes able to be transported by road from the quarry. Further, if the market permits, Daracon is committed to selling a higher proportion of quarry product by rail.

In addition, Daracon are not seeking approval for haul route 2 from the intersection of Tocal Road and Paterson Road, as a primary haul route. Haul route 2 will only be used to service local projects on or directly accessed from the route. It will not be used as a primary haul route. Similarly, other local roads may be used as required to service local projects on a campaign basis.

1.6.5 Project Disturbance Reduction

Daracon have undertaken further detailed resource quantification and quarry plan design work to optimise future operations and minimise environmental and community impacts. As a result, the proposed additional disturbance footprint for the Revised Project has been reduced by 16.8 ha. This includes avoiding approximately 15.3 ha of native vegetation in the former East Pit (Lot 21 DP 773220) which is no longer proposed to be disturbed as part of this application.

The Revised Project represents the culmination of a thorough process of reviewing project alternatives to address issues raised in agency and public submissions and further reduce environmental and social amenity impacts associated with the Original Project. A detailed consideration of Project alternatives is provided in **Section 2.12**.

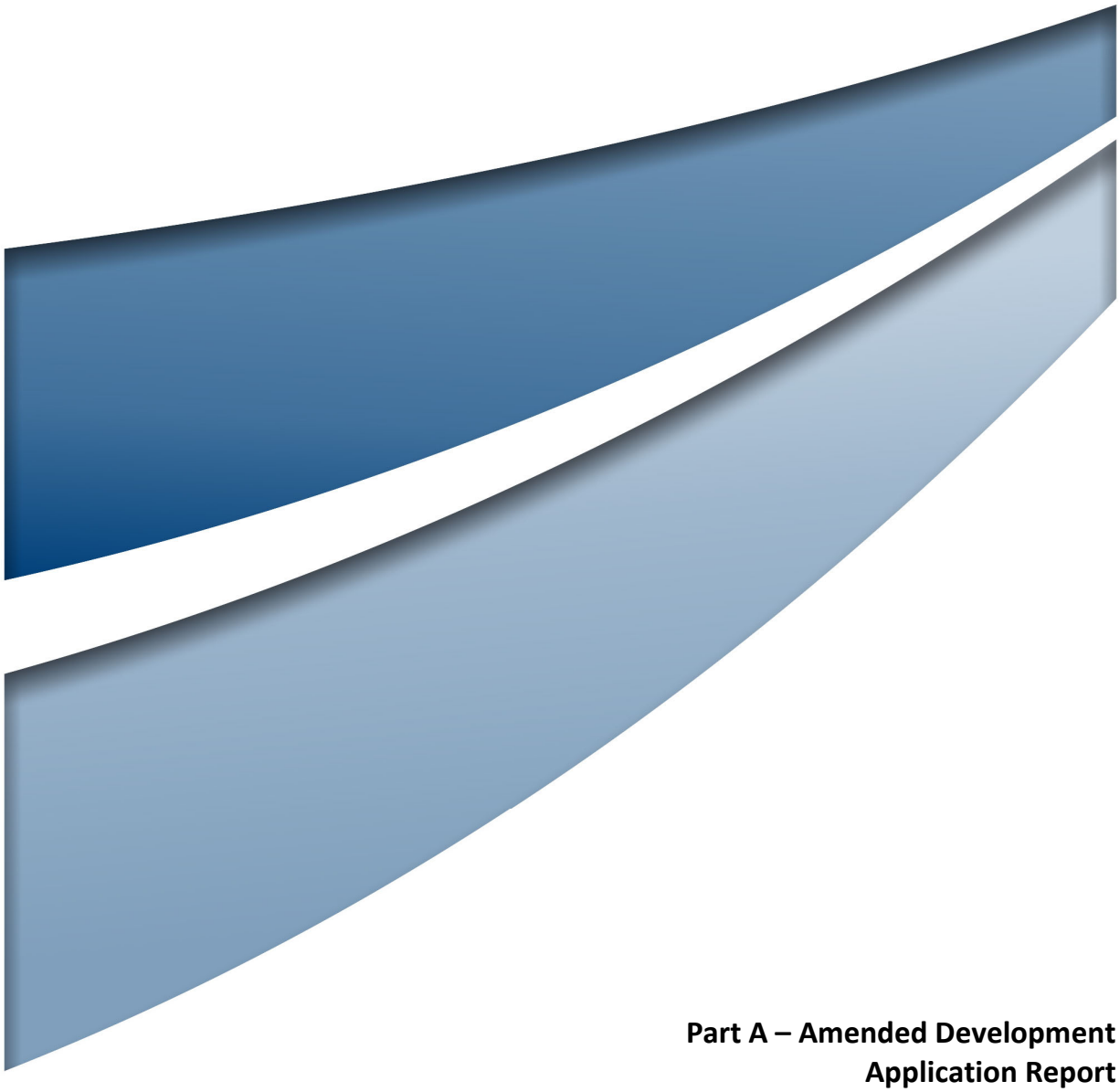
1.7 Structure of Report

The report is divided into two parts:

- **Part A** – Amended Development Application, and
- **Part B** – Response to Submissions Report.

Part A contains a description of the Revised Project, outlining the key changes to the Revised Project in response to the agency and community submissions. It also includes an updated evaluation of the strategic and statutory context for the Revised Project, a description of the comprehensive stakeholder engagement undertaken for the Revised Project, and an updated assessment of the key environmental, social and economic issues. Part A concludes with summarising the key management and monitoring measures to be implemented as part of the Revised Project and a consideration of the suitability of the site.

Part B provides detailed responses to the key issues raised by government agencies and the community during the public exhibition period.



Part A – Amended Development Application Report

2.0 Description of the Revised Project

Following review and consideration of the EIS submissions, Daracon has amended key operational parameters of the Original Project in order to further reduce environmental and social amenity impacts associated with transportation of quarry product, extraction of material and ongoing operation of the quarry. This involved a revision of the proposed extraction limits, hours of operation as well as truck movements and volumes.

Extensive stakeholder engagement has been undertaken since 2018 as part of the updated environmental assessment for the ADA and RTS. Following this process, Daracon considered the feedback provided, in particular from the local community, and made additional amendments to the Revised Project parameters, including further reductions in the amount of quarry product transported by road, peak truck movements, and operational hours.

This section describes the Revised Project proposed in the ADA.

2.1 Revised Project Objectives and Key Design Considerations

The following key objectives have guided the redesign of the operational parameters for the proposed extension of the quarry following the exhibition of the EIS:

- provide a long-term secure and independent supply of hard rock construction material, including rail ballast, to the local, regional, and greater Sydney market
- economic recovery of hard rock material within the quarry lease areas licenced by Daracon, maximising operational efficiencies within the quarry site whilst seeking to minimise environmental and social amenity impacts
- minimising social amenity, traffic and transport, noise, dust and visual impacts on the surrounding community over the life of the proposed quarry operations
- flexibility and contingency to adapt to future market and specification requirements
- flexibility and contingency for unplanned events (excessive rainfall, material quality variations, changes to bench or slope stability etc)
- develop an ongoing positive working relationship with the local community, through effective two-way communication in relation to management of impacts of quarry operations, and optimising benefits from quarry operations in terms of local employment and community contributions
- contribute to the local, regional and State economies through capital expenditure, employment and economic supply of construction materials.

As noted in **Section 1.6**, Daracon has considered community feedback and undertaken detailed quarry planning and design activities to optimise use of the existing resource and minimise environmental and community impacts.

As a result, the Revised Project now includes a number of amendments and improvements including:

- reduced road transportation volumes and reduced peak hourly truck movements
- refined operational hours

- reduced proposed disturbance footprint
- reduced proposed quarry operation approval term.

The key features of the Revised Project, including the changes since the Original Project are outlined in **Section 2.2**.

The Revised Project also includes a range of environmental and social management and mitigation measures, to minimise impacts and these are detailed in **Section 8.0**.

2.2 Key Features of the Revised Project

The key features of the Revised Project include:

- extraction of up to a maximum of 1.1 Mtpa of quarry product material over 25 years, with road transportation up to a maximum of 500,000 tpa
- revised product transport arrangements, including:
    - reduced peak daily laden trucks of 140 per day (280 movements) for up to 50 days per year, otherwise 100 laden trucks per day (200 movements). The hourly peak consists of:
        - 20 laden trucks per hour (40 movements), Monday to Friday between 7.00 am and 3.00 pm
        - 15 laden trucks per hour (30 movements), Monday to Friday between 3.00 pm and 6.00 pm
    - no road haulage of quarry product on Saturday
    - no road haulage between 24 December and 1 January, inclusive
    - no trucks through Paterson Village before 6.45 am
    - increased quarry product transported by rail
    - removal of Haul Route 2 as a primary haul route (now proposed only to service local jobs as required)
- revised operating hours of 7.00 am to 6.00 pm Monday to Saturday, with the exception of road haulage of quarry product which will only occur Monday to Friday, and no evening or night operation, apart from rail loading and transportation and necessary maintenance activities
- 16.8 ha reduction in the proposed disturbance footprint, including avoiding approximately 15.3 ha of native vegetation in the former East Pit (Lot 21 DP 773220)
- construction and use of a new access road and bridge crossing from Dungog Road, over the North Coast rail line, to allow for all heavy vehicle movements via the new access
- improvements at the Dungog Road and Gresford Road intersection and the King and Duke Street intersection (within the village of Paterson)
- upgrades to the approach to Gostwyck Bridge
- extension of the rail spur to facilitate longer trains to transport more quarry product
- establishment of noise bunds and noise attenuation of the existing fixed processing plant with further upgrades and replacements to reduce noise and air quality impacts

- progressive rehabilitation of the quarry.

The key features of the Revised Project are illustrated in **Figure 2.1**. Further to this, the key features of the Revised Project are summarised in **Table 2.1** along with a comparison against the Original Project.

Table 2.1 Comparison of the Key Features of the Original Project (as exhibited in 2016) against the Revised Project

Key Project Feature	Original Project (as per the exhibited EIS, 2016)	Revised Project (as per the ADA, 2021)
Proposed Quarry Operations Approval Term	30 years	25 years
Limits on Extraction	Total extraction of up to 1.5 Mtpa, of which up to 1.45 Mtpa on road for quarry sales transportation	Total extraction up to 1.1 Mtpa, with a combination of road and rail transportation
	Majority by road, approximately 50,000 tonnes by rail	A maximum of 500,000 tpa by road for quarry sales transportation
Quarry Extent	Original Project disturbance area of 82.2 ha, including previously cleared land	Revised Project disturbance area of 66 h, including previously cleared land – a reduction of 16.8 ha
Operating Hours	In pit quarrying operations - 6.00 am to 6.00 pm Monday to Saturday	In pit quarrying operations - 7.00 am to 6.00 pm Monday to Saturday No in-pit mobile crushing in the West Pit
		Blasting of quarry material only between 11.00 am and 3.00 pm Monday to Friday
		No blasting on Saturday, Sunday or Public holidays
	Evening/Night crushing and processing activities - 6.00 pm to 10.00 pm	No quarrying or processing during evening period (6.00 pm to 10.00 pm) No operations during night period (10.00 pm to 7.00 am) No crushing or processing prior to 7.00 am Monday to Saturday
	Pugmill mixing and binder delivery operations - 4.30 am to 10.00 pm Monday to Friday, 4.30 am to 6.00 pm Saturday	
	Sales loading and stockpiling for road transport - 5.30 am to 7.00 pm Monday to Saturday	No loading of product trucks prior to 7.00 am Monday to Friday
		No quarry trucks through Paterson prior to 6.45 am Monday to Friday
		No road haulage of quarry product on Saturday or between 24 December and 1 January

Key Project Feature	Original Project (as per the exhibited EIS, 2016)	Revised Project (as per the ADA, 2021)
	Loading and parking of trucks on site overnight	Provision for up to 10 unladen Daracon trucks (not contractors) to return to the quarry between 6.00 pm and 7.00 pm Monday to Friday to park in the quarry overnight and be loaded during this time in readiness for departure from 7.00 am the following morning. (Note: in the case of trucks loaded on Friday evening, departure will be no earlier than 7.00 am Monday morning.)
	Train loading - 24 hours/7 days per week	No change
	General Maintenance and Environmental Management Control – not specified	24 hours/7 days per week as required, including vehicles/trucks moving in and out of the site for maintenance purposes, as required
Rehabilitation	Rehabilitation of the Project Area	No change
Workforce Numbers	Operation – an additional 16 jobs at full capacity	Operation – 22 full time equivalent positions
	Construction and Decommissioning – up to 155 jobs	Construction, pre-clearing, rehabilitation and decommissioning – in the order of 120 jobs over the life of the construction/decommissioning, with a peak of 20-30 construction workers in any given phase.
Infrastructure Construction Activities	New access road and driveway including a bridge over the existing railway line	Further engineering design work has been undertaken on the access road. Access road and bridge is estimated to be completed within 4 years following Project Approval, subject to gaining relevant Road Act approvals from DSC for the intersection with Dungog Road and ARTC approvals and scheduled construction window to complete the railway bridge. The duration of construction work is estimated to be 50 weeks.
	Potential extension of internal rail siding	No change (Revised rail spur footprint following further design options).
Product Transportation	Maximum 215 loaded product trucks per day (430 movements per day)	Maximum of 140 loaded product trucks (280 movements) per day for 50 days per year, otherwise 100 loaded product trucks (200 movements).
	Maximum 40 loaded product trucks per hour (80 movements) per hour	Maximum of 20 loaded product trucks (40 movements) per hour between 7.00 am and 3.00 pm. Maximum of 15 loaded product trucks (30 movements) per hour between 3.00 pm and 6.00 pm.

Key Project Feature	Original Project (as per the exhibited EIS, 2016)	Revised Project (as per the ADA, 2021)
	Maintain the ability to transport quarry material via rail	No change
Road haul route	Route 1 - Martins Creek Quarry via Station Street, Grace Avenue, Dungog Road, Gresford Road, Tocal Road, Paterson Road, Flat Road, Pitnacree Road, Melbourne Street, New England Highway	No change to Primary Haul Route 1, however after the bridge and new access road is constructed there will be no haulage along Station Street and Grace Avenue.
	Route 2 - Martins Creek Quarry via Station Street, Grace Avenue, Dungog Road, Gresford Road, Butterwick Road, Clarence Town Road, Brandy Hill Drive, Seaham Road	No change.

2.3 Project Area

The Project Area is shown on **Figure 2.1** and comprises the existing West Pit and East Pit, Processing Area (detailed in **Section 1.3**), and the following features:

- new quarry access road
- rail spur extension
- southern Stockpile Area.

As noted in **Section 1.3.2**, the land parcels associated with the West Pit, East Pit and the Processing Areas are the subject of a licence from the lessee to the proponent.

There is a narrow strip of land which is a paper road separating the western and eastern sides of the quarry Project Area. Part of this paper road is owned by DSC and part is owned by Crown Land (refer to **Figure 2.1**). An internal haul road between the West Pit and the East Pit traverses the Council-owned portion of the paper road. DSC have provided in principle agreement to establish an appropriate commercial arrangement to enable use of this section of road, and to close it from public access.

The land associated with the proposed new quarry access road from Dungog Road is owned by the County Holdings Pty Ltd (Daracon Group) (Lot 2 DP 242210). This will also comprise a bridge over the existing rail line owned by Transport for NSW (TfNSW) (Lot 10 DP 1209239) (refer to **Figure 2.1**).

Land parcel details associated with the Project Area are provided in **Table 2.2**. The proposed disturbance footprint shown on **Figure 2.1** totals approximately 66 ha and comprises an additional disturbance of approximately 21 ha of native vegetation.

Table 2.2 Land Parcel Reference Names

Reference name	Land Parcel
West Pit	Lot 5 DP 242210
	Lot 6 DP 242210
	Lot 42 DP 815628
East Pit	Lot 21 DP 773220 (part)
	Lot 1 DP 1006375 (part)
Processing Area and proposed Southern Stockpile Area	Lot 1 DP 204377
	Lot 1 DP 1006375
Proposed Quarry Access Road	Lot 2 DP 242210
	Lot 10 DP 1209239

2.4 Proposed Quarrying Operations

2.4.1 Target Resource

The target resource is known as the Martins Creek 'Andesitic Ignimbrite', which is a hard and durable volcanic rock made up of predominantly plagioclase feldspar, with large white rhombohedra crystals. The petrographic analysis of the target resource is Latite Tuff (referred to as latite in this report) (VGT, 2021).

The quarry is underlain by carboniferous volcanic and sedimentary sequences, approximately 350 million years old. The target resource comprises a substantial, high quality hard igneous rock suitable for concrete aggregate, asphalt and sealing aggregate, ballast, gabion, rock fill, rock armour, road pavements, drainage and bulk fill operations.

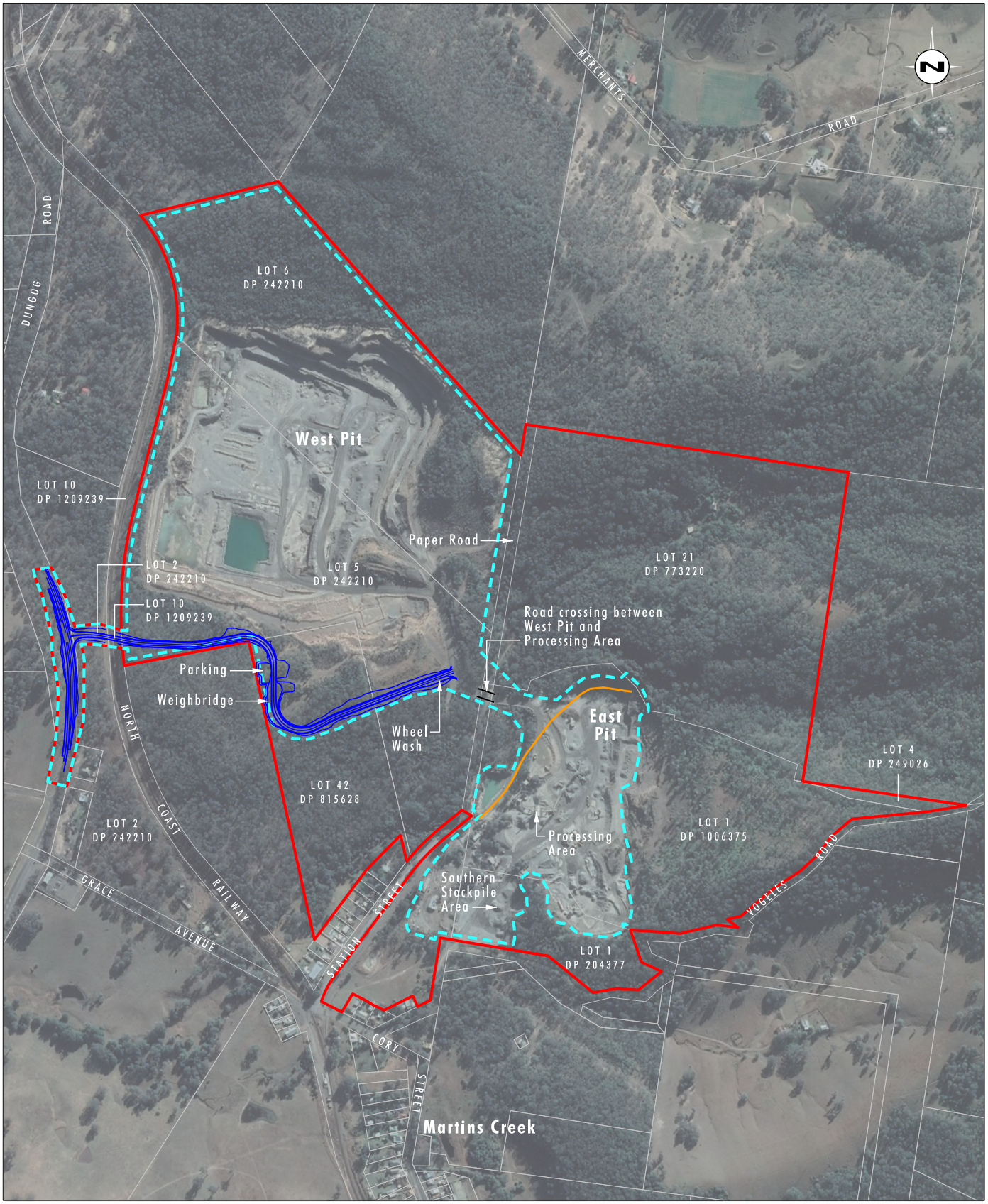


Image Source: Google Earth (2018)
Data Source: Daracon (2020)

0 100 250 500m
1:10 000

Legend

- Project Area
- Proposed Disturbance Area
- New Access Road
- Proposed Rail Siding Extension

FIGURE 2.1

Key Features of the Revised Project

2.4.2 Quarrying Process and Equipment

Clearing and topsoil stripping

As shown on **Figure 2.1**, future quarry operations will include extraction within currently disturbed areas and disturb approximately 21 ha of native vegetation within the Project Area (refer to **Section 6.10.2**).

For quarrying outside the current quarry disturbance, clearing of vegetation and stripping of topsoil is required, following inspection for the presence of fauna by a qualified ecologist. Vegetation clearing will be typically undertaken using a dozer and/or excavator. The vegetated material will be spread over rehabilitated areas after the placement of topsoil or placed on rehabilitated areas to create habitat structures and aid in soil stabilisation or stockpiled for future use.

Soil depths in the Project Area are typically less than 2.5 m, comprising shallow topsoil to a depth of approximately 0.5 metres (m) and a further 1 to 2 m of overburden (weathered rock, clay and earth), overlying bedrock. The depth of topsoil stripping will be determined on a day-to-day basis to enable maximum recovery of suitable topsoil. On a campaign basis, topsoil will be pushed into stockpiles using a dozer and then loaded using a front-end loader or digger into haul trucks for stockpiling. These stockpiles will be used in progressive rehabilitation and for storage for use in rehabilitation of the final quarry benches.

Topsoil will be stored in stockpiles which are a maximum of 3 m in height and will be planted with a cover crop if they are to remain in place for longer than 6 months. Where possible, freshly stripped topsoil will be placed directly onto areas identified for rehabilitation to reduce the potential for loss of soil structure and make best use of soil seed stores. Any additional topsoil needed for progressive rehabilitation will be brought to the Project Area as required.

Overburden removal and emplacement

The depth of weathering will be determined upon the rip ability of the material. A dozer can generally rip to 0.5 m below the surface and then the material is too hard and competent and must be blasted. The overburden is pushed into stockpiles by a dozer with ripping undertaken as necessary.

The overburden generally consists of soil, sub-soil and weathered latite. The volumes generated are generally low due to the thin soil profile, whilst the weathered latite can be used to create drainage aggregates, road base, gabion and fill products. Material not suitable for immediate processing will be stockpiled either to be used for processing and sale at a later date, for rehabilitation purposes, or for the noise mitigation bunds proposed as part of the Revised Project (refer to **Section 6.4.1** for detail regarding noise bunds). It is not anticipated, from exploration activities undertaken to date, or from experience, that a significant volume of material unsuitable for processing will be available for rehabilitation purposes.

Extraction

The Revised Project will involve the continued extraction of hard rock from the quarry by completing the extraction of the existing operational areas, expanding the operational area to new areas and increasing the depth of extraction to RL 10 m.

Bench Design

Typical bench design will continue to be an approximate face height of nominally 12 m (typically ranging between 8 to 12 m) and access to benches typically a minimum of 10 m. Ongoing periodic assessment of bench design and slope stability will be undertaken throughout the quarry's operation.

Drill and Blast

Following the removal of overburden, the target resource is drilled and blasted to allow the rock to be broken into sizes which can be readily handled and transported to the processing area. Drilling and blasting are conducted using experienced drill and blast contractors using hydraulically driven drilling rigs and contemporary bulk explosives pumped directly from delivery vehicles.

Daracon is committed to only blasting during the hours of 11.00 am to 3.00 pm Monday to Friday. No blasting will be undertaken on weekends or public holidays.

A detailed design is completed for each blast to ensure that vibration and blast overpressure limits are met. Where blasting operations face sensitive receivers, stemming heights are increased and Maximum Instantaneous Charge (MIC) lowered to limit the overall blast impacts. Blast design takes into account adverse weather conditions, which may include heavy cloud cover, temperature inversion and strong winds.

Blasts are initiated using electronic detonators where required to provide the maximum level of control over the explosive charge. No explosives are stored on site, with all explosives brought onto the quarry site as needed and loaded directly into the drill holes.

Blast monitors are located at the areas most affected by blasting operations, to the west, north and south of the quarry (refer to **Figure 1.7**). Three additional temporary blast monitors have been established to the north of the quarry in View Street, Merchants Road and Horns Crossing Road.

2.4.3 Loading and Haulage of Extracted Material

After each blast, a loader or excavator loads material into haul trucks at the quarry face. The haul trucks cart this material to the processing area to feed the primary jaw crushing station pad and/or directly into the dump hopper that feeds the primary jaw crushing station, refer to **Figure 2.2**. Rock is also transferred from the pad by wheeled front end loader into the dump hopper that feeds the primary jaw crushing station.

Large rock is hammered at the blast face to reduce the size to be either crushed, or loaded directly onto trucks, without being processed, and transported via the weighbridge directly to customers.

Haul Roads

The main haul road which provides access between the West Pit and proposed East Pit is approximately 1.2 km in length, with an approximate average width of 12 to 15 m wide. In-pit haul roads to access the West Pit extension areas will be established in locations that offer reduced gradients and suitable barriers/buffers to noise sources and sensitive receivers. Bunds and drains will be located along the edges of new haul roads to manage surface water. Haul roads will be maintained by track rolling and grading material from crushing activities. Haul roads may also be quarried during the life of the Revised Project which would result in width and grade changes to suit relevant pit design for safety and efficiency.

Roads will be watered using water carts, with additional contractor equipment brought to the quarry as necessary. The water carts will be filled using diesel pumps with stand pipes that are placed at the various water storage dams located around the quarry.

2.4.4 Mobile Equipment

An indicative list of the mobile equipment proposed to be used is provided in **Table 2.3**. For noise mitigation purposes, Daracon have committed to the purchasing of three smaller haul trucks that will replace the existing haul trucks, should approval be granted. These trucks will be used to haul blasted material to the Processing Area and are substantially quieter than the truck/s most recently used.

The equipment listed in **Table 2.3** may change during the life of the quarry to meet operational demands and reflect changes in technology. The mobile equipment fleet will be managed, however, to ensure that any changes in equipment types do not increase the environmental impact of the quarry operations.

Table 2.3 Typical Mobile Equipment

Typical Equipment	Typical Operational Function
Loader	Sales/pugmill/stockpile loading, product blending Face loader, sales loader, pugmill loader
Dozer	Stripping
Excavator	Secondary processing, stripping and bench development Secondary processing Rehabilitation, drainage and other miscellaneous works
Dump truck	Topsoil stripping/overburden removal, load and haul, secondary processing, stockpiling Secondary processing, stockpiling and overburden removal
Power Rock drill	Drilling for blasting activities
Mobile Screening	Crushing of quarry product Screening of quarry product
Watercart(s)	Dust suppression, miscellaneous jobs
Wash Plant	Sand and aggregate washing
Service Vehicles	Site maintenance tasks
Pumps fixed	Environmental management, pugmill operations, dust suppression
Pumps Mobile	Environmental management, pugmill operations, dust suppression
Diesel Generators	Maintenance tasks, back up temporary power source
Wheel wash	Vehicle wheel washing
Backhoe	General housekeeping, maintenance duties
Bobcat/Telehandler	General housekeeping, maintenance duties
Forklift	Unloading deliveries and moving items around site

Figure 2.3 shows a schematic of the processing plant and this is discussed further in **Section 2.5**.

2.4.5 Conceptual Quarry Plans

Approval is being sought for extraction of up to 1.1 Mtpa, for a period of approximately 25 years. The conceptual quarry stage plans and associated infrastructure for the Revised Project are shown on **Figure 2.4** to **Figure 2.9**.



Image Source: Google Earth (2018)
Data Source: Daracon (2020)

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Legend
Project Area

FIGURE 2.2

Existing Martins Creek Quarry Processing Area

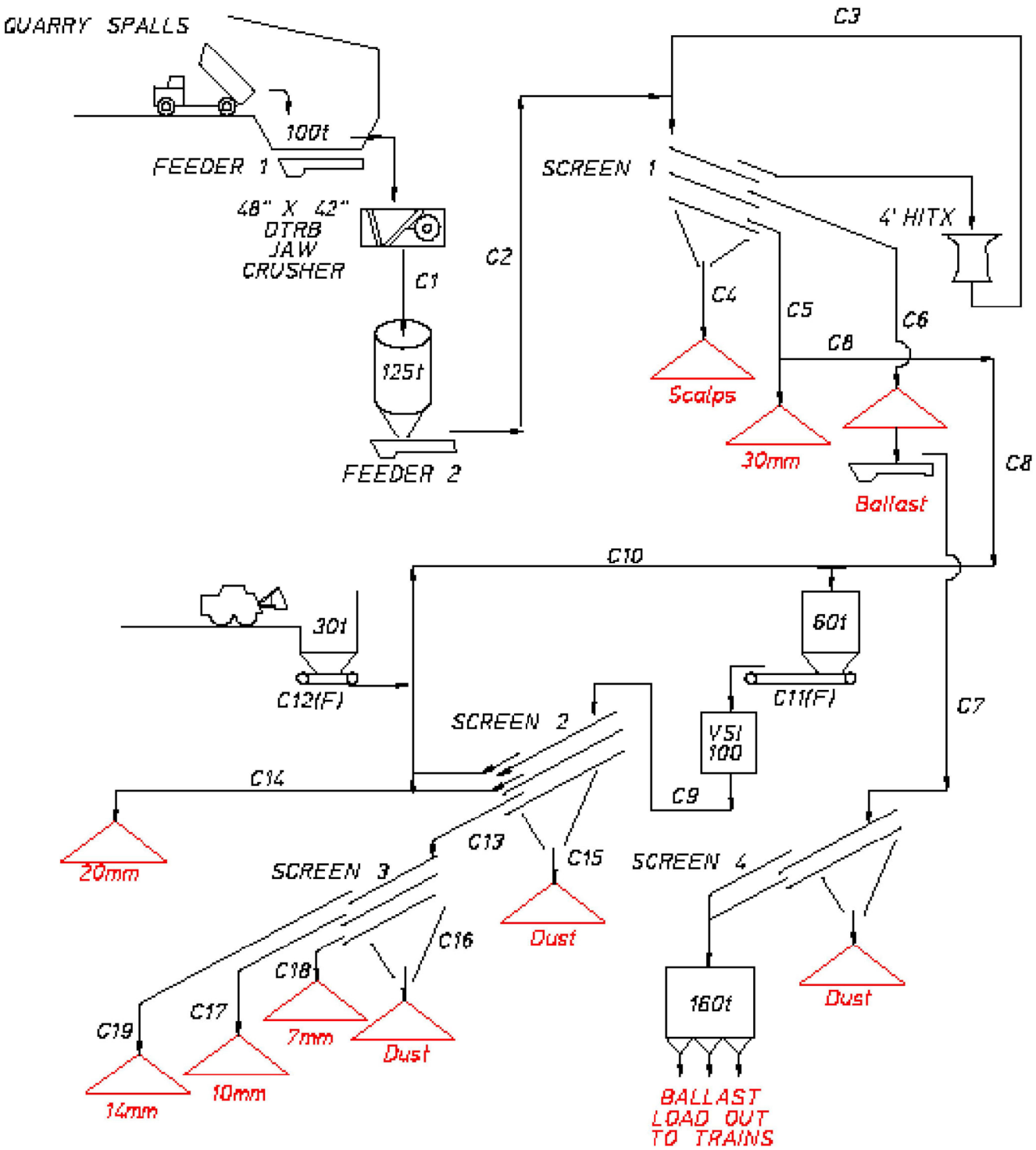


FIGURE 2.3

Martins Creek Quarry
Processsing Plant Schematic

Image Source: Darcon (2020)

File Name (A4): R01/3957_138.dgn
20150309 9.47

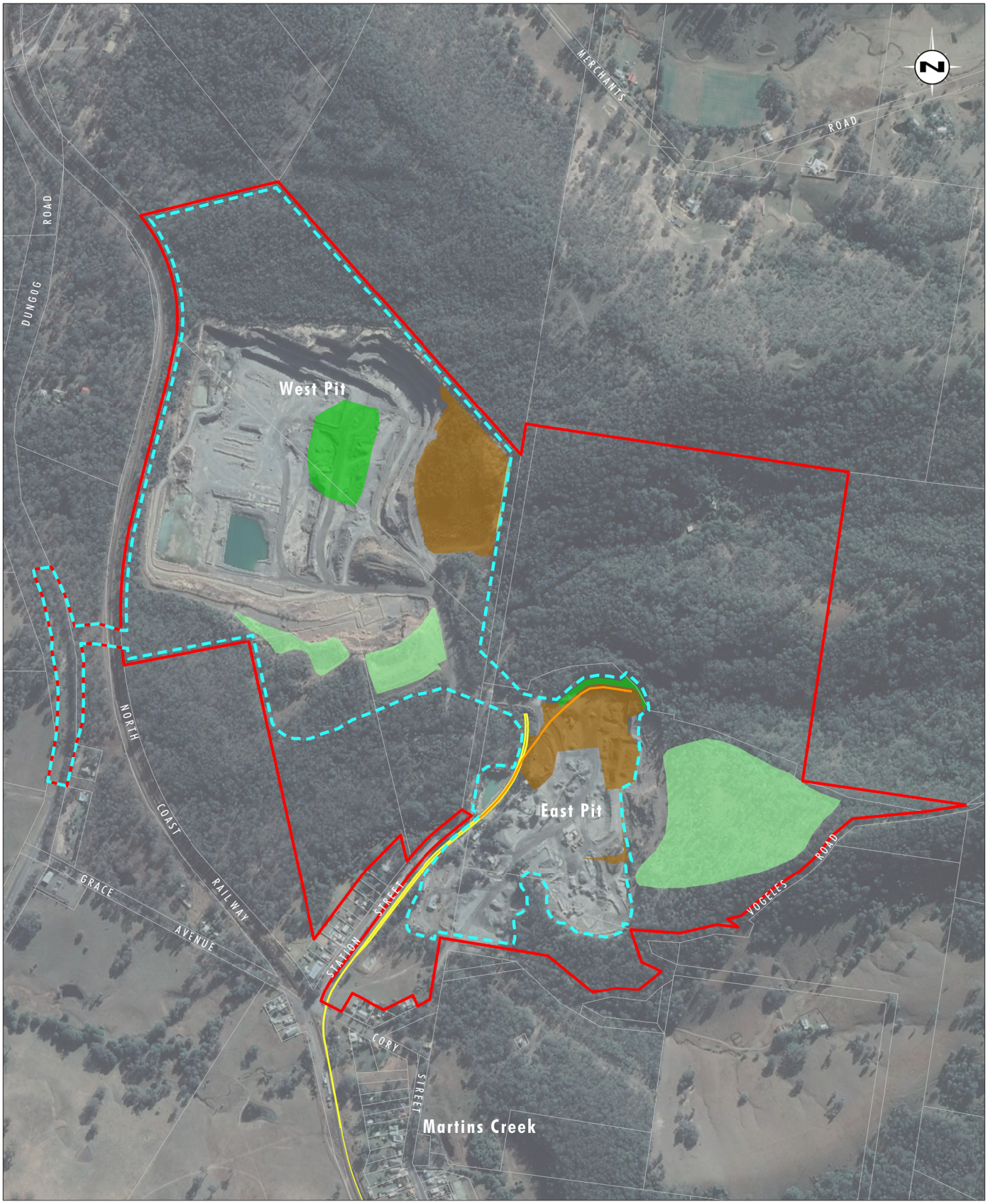


Image Source: Google Earth (2018)
Data Source: Daracon (2020)

0 100 250 500m
1:10 000

Legend

- Project Area
- Proposed Disturbance Area
- Existing Rail Siding
- Proposed Rail Siding Extension
- Active Quarry Area
- Rehabilitation Area
- Previous Rehabilitation Area

FIGURE 2.4

Conceptual Quarry Plan Year 2

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20201008 13.35

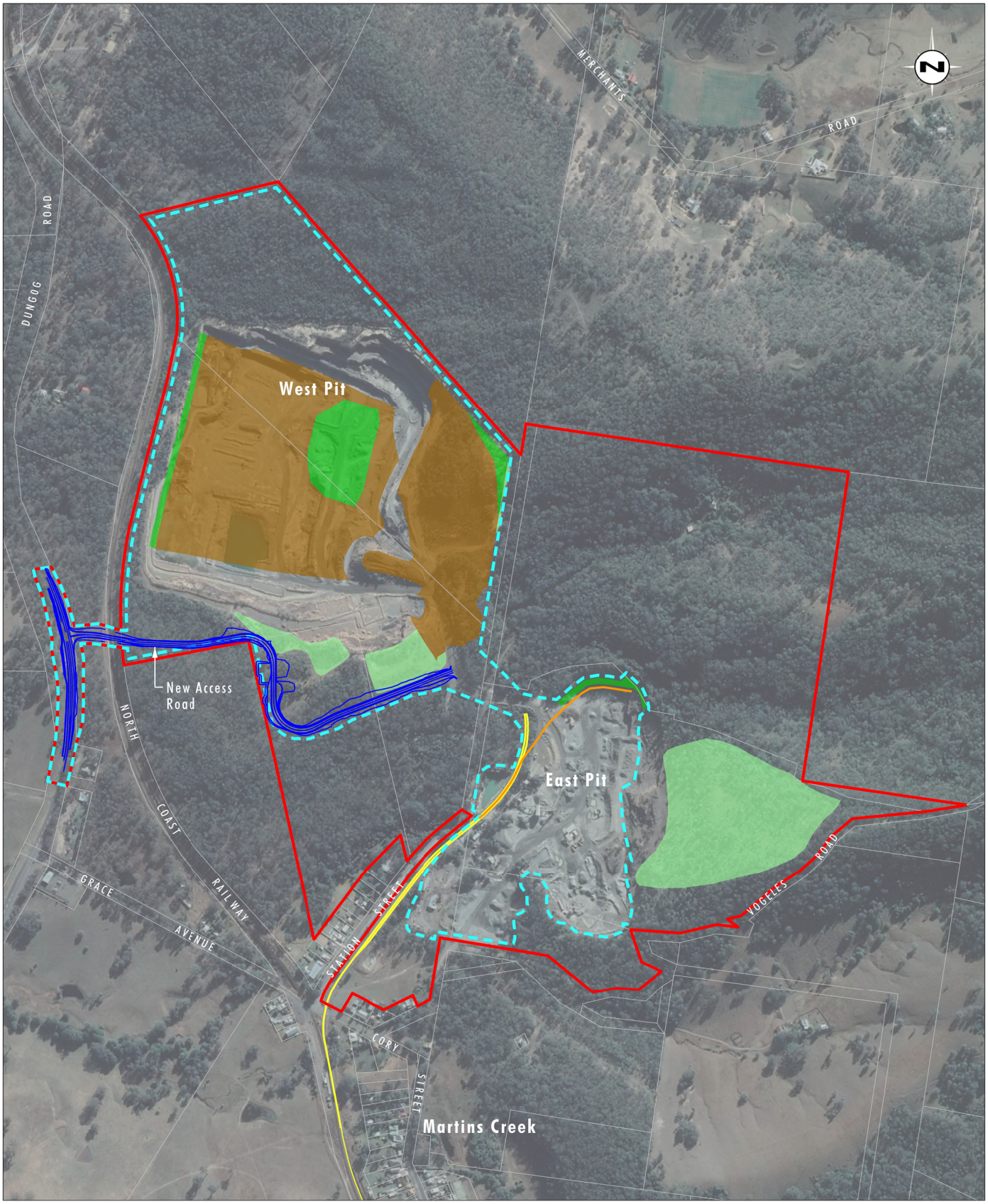


Image Source: Google Earth (2018)
Data Source: Daracon (2020)

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Legend

- Project Area
- Proposed Disturbance Area
- Existing Rail Siding
- Proposed Rail Siding Extension
- Active Quarry Area
- Rehabilitation Area
- Previous Rehabilitation Area
- New Access Road

FIGURE 2.5

Conceptual Quarry Plan Year 6

File Name (A4): R01/3957_097.dgn
20201007 15.17

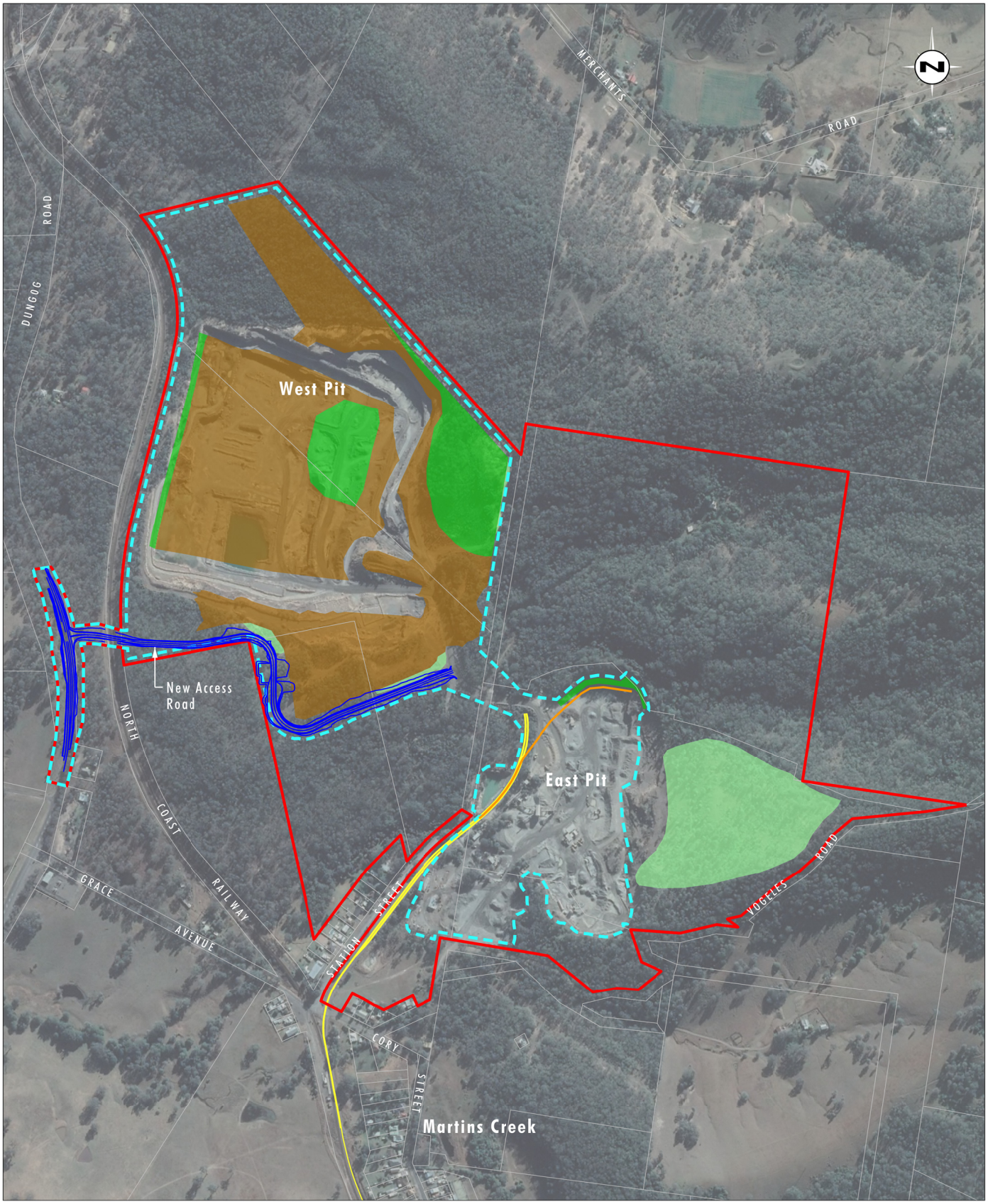


Image Source: Google Earth (2018)
Data Source: Daracon (2020)

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1:10 000

Legend

- Project Area
- Proposed Disturbance Area
- Existing Rail Siding
- Proposed Rail Siding Extension
- Active Quarry Area
- Rehabilitation Area
- Previous Rehabilitation Area
- New Access Road

FIGURE 2.6

Conceptual Quarry Plan Year 10

File Name (A4): R01/3957_098.dgn
20201008 13.36

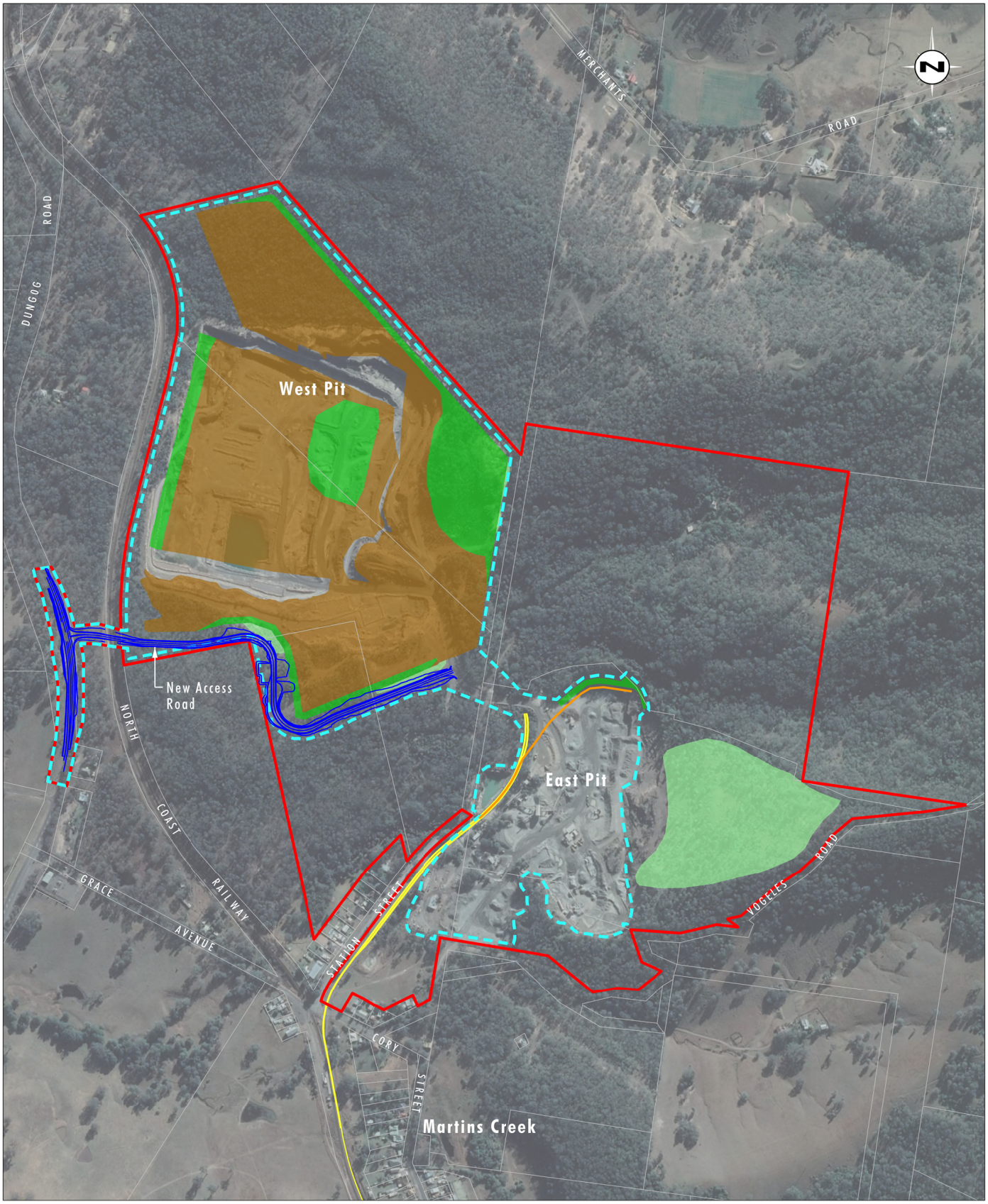


Image Source: Google Earth (2018)
Data Source: Daracon (2020)

0 100 250 500m
1:10 000

Legend

- Project Area
- Proposed Disturbance Area
- Existing Rail Siding
- Proposed Rail Siding Extension
- Active Quarry Area
- Rehabilitation Area
- Previous Rehabilitation Area
- New Access Road

FIGURE 2.7

Conceptual Quarry Plan Year 15

File Name (A4): R01/3957_101.dgn
20201008 13.38

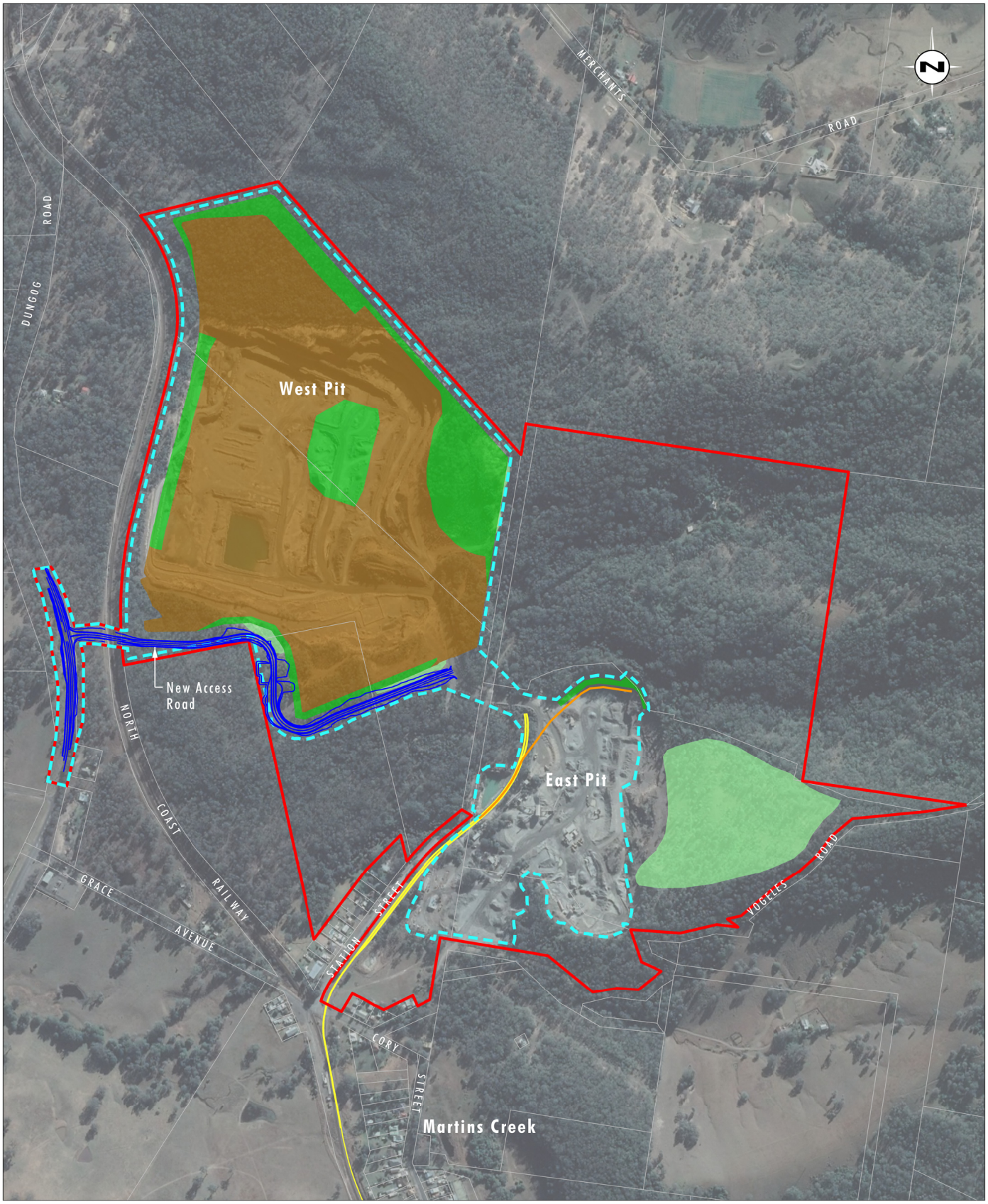


Image Source: Google Earth (2018)
Data Source: Daracon (2020)

0 100 250 500m
1:10 000

Legend

- Project Area
- Proposed Disturbance Area
- Existing Rail Siding
- Proposed Rail Siding Extension
- Active Quarry Area
- Rehabilitation Area
- Previous Rehabilitation Area
- New Access Road

FIGURE 2.8

Conceptual Quarry Plan Year 20

File Name (A4): R01/3957_102.dgn
20201008 14.13

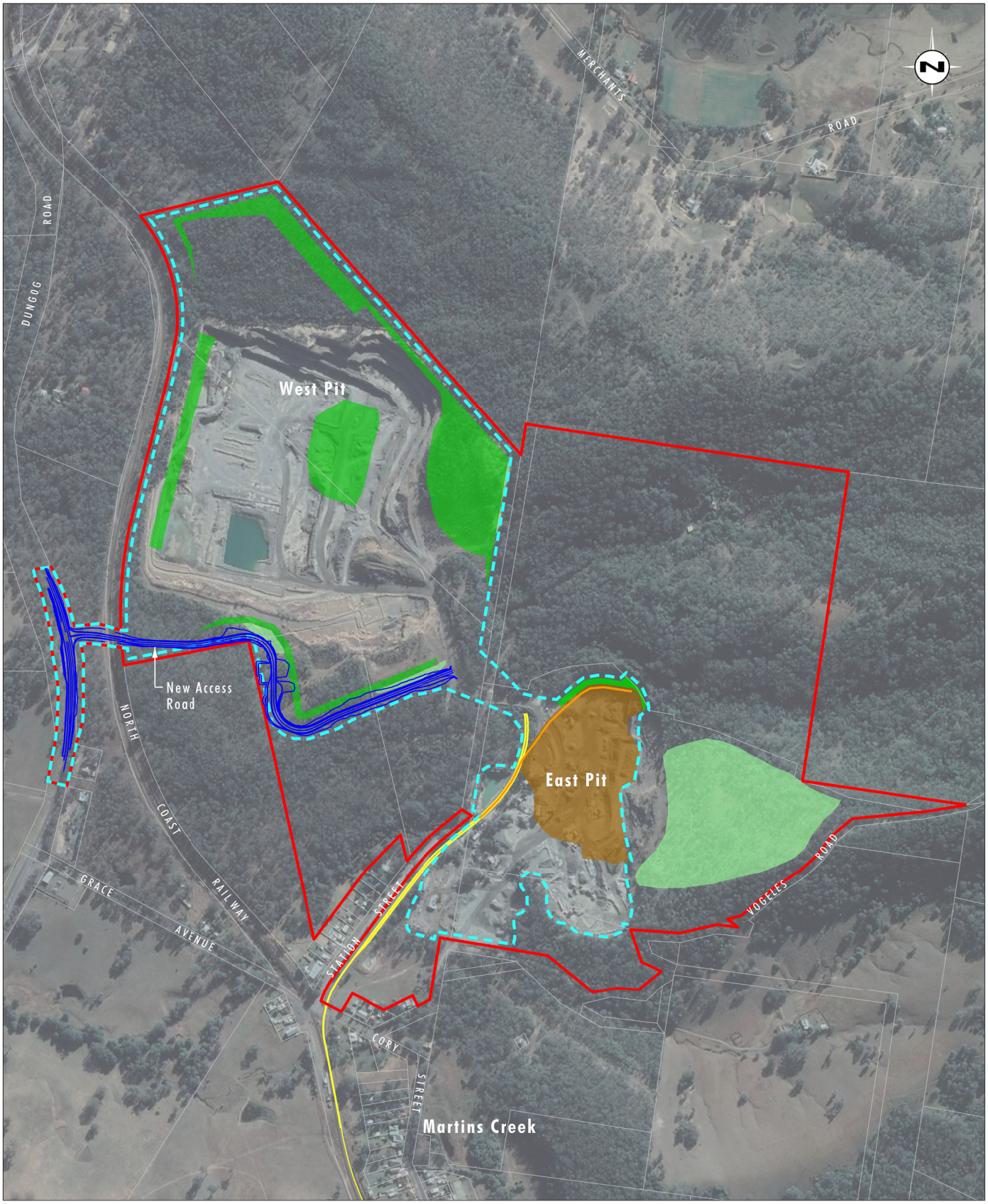


Image Source: Google Earth (2018)
Data Source: Daracon (2020)

0 100 250 500m
1:10 000

Legend

- Project Area
- Proposed Disturbance Area
- Existing Rail Siding
- Proposed Rail Siding Extension
- Active Quarry Area
- Rehabilitation Area
- Previous Rehabilitation Area
- New Access Road

FIGURE 2.9

Conceptual Quarry Plan Year 25

File Name (A4): R01/3957_103.dgn
20201008 14.15

Stage 1 (Until end of Year 2)

From project approval, until the end of Year 2, it is expected that quarrying will occur in the West Pit primarily along the eastern boundary (refer to **Figure 2.4**). During this time, excavation work and quarrying will also commence in the East Pit in preparation for construction of the rail spur extension, including a bench for trucks and excavators to traverse to load the rail wagons.

Rehabilitation will occur in a section of the West Pit where the proposed quarry floor has been reached, and along the top of the bench constructed in the East Pit.

Clearing vegetation to commence construction of the new quarry access road will also occur in Stage 1, as shown on **Figure 2.5**.

To reduce potential noise emissions, the following noise control measures will be constructed in the Processing Area, Southern Stockpile Area and along the haul road between the East and West Pits:

- 4 m noise barrier adjacent to the primary dump hopper
- noise barrier along part of internal haul road between the East Pit and West Pit
- noise barrier adjacent to the primary crusher
- noise attenuation of the primary surge bin
- 8 m noise barrier around the northern boundary of the Southern Stockpile Area to overlap an augmented landform adjacent the existing wheel wash
- 3 m noise barrier around the southern boundary of the Southern Stockpile Area
- installation of a fence along the western boundary of the Southern Stockpile Area adjacent the rail siding.

Stage 2 (Years 3 to 6)

During Years 3 to 6, quarrying will continue to progress inwards from the eastern boundary of the West Pit, as well as further south, including into some of the previously temporarily rehabilitated land. The lateral extent of the other previously quarried areas of the West Pit is not planned to increase during this time however quarrying will be undertaken deeper in the centre of the West Pit to an RL of 28 m (refer to **Figure 2.5**).

Rehabilitation will occur along the outer edge of the area on the eastern boundary of the West Pit and the first bench on the western edge of the West Pit.

The rail spur extension and construction of the new access road and bridge crossing from Dungog Road will also occur during this phase (refer to **Sections 2.7** and **2.8**).

Stage 3 (Years 7 to 10)

Quarrying will continue in the West Pit, including in the northern portion, progressing further to the north west. During this time, quarrying will also occur along the existing southern boundary of the West Pit, progressing further south through previous temporary rehabilitation areas, and towards the western boundary of the disturbance area (refer to **Figure 2.6**).

Rehabilitation will be extended on the eastern side of the West Pit.

Stage 4 (Years 11 to 15)

By Year 15, quarrying will be undertaken in the majority of the West Pit, continuing to progress in the north towards the north west and towards the west along the southern boundary of the West Pit (refer to **Figure 2.7**).

Rehabilitation will be extended along the western and north east boundaries of the West Pit and will commence along the southern boundary.

Stage 5 (Years 16 to 20)

By Year 20, extraction will continue deeper within the West Pit and continue to progress toward the west in both the northern and southern sections of the pit, reaching the maximum lateral extent of extraction (refer to **Figure 2.8**).

Rehabilitation will continue around the quarry benches in the north of the West Pit.

Stage 6 (Years 21 to 25)

From Year 21 until the end of the quarry life, quarrying will be undertaken in the East Pit, both progressing deeper and further south, including areas that were previously used for processing and product stockpiling. To allow for this, the fixed processing plant will be decommissioned and removed and processing will be undertaken with mobile crushing and screening plant (refer to **Figure 2.9**).

Rehabilitation activities will continue progressively throughout this stage with the remainder of the site to be fully rehabilitated after completion of quarrying activities in accordance with the Closure Plan (refer to **Section 6.19**).

Based on the quarry planning, the expected extraction volumes for each stage of the Project is shown in **Table 2.4**.

Table 2.4 Appropriate Extraction Volume over the Proposed Quarry Operation Approval Term

Stage	Approximate Quantity (tonnes)
Stage 1 – Year 0 to 2	1,760,000
Stage 2 - Year 3 to 6	3,980,000
Stage 3 – Year 7 to 10	3,150,000
Stage 4 – Year 11 to 15	4,580,000
Stage 5 – Year 16 to 20	4,070,000
Stage 6 – Year 21 to 25	4,880,000
Total	**22,420,000**

2.5 Proposed Processing Operations

2.5.1 Sand Washing

Coarse sand is a by-product of the extraction process and is used in various concrete specifications for a range of design requirements from house slabs through to bridges. Manufactured washed coarse sand is produced by running the by-product material through the sand washing plant located in the West Pit. It consists of a feed hopper, moisture pre-conditioning unit, sand washing, stockpiling conveyor and a water siltation dam. The sand washing plant is mobile and can be relocated to suitable locations as quarrying progresses.

Washout material, comprising fine silts, clays and rock particles, will be stockpiled within the West Pit and Southern Stockpile area as required for re-use during rehabilitation works at the quarry and is also for road base production. The washed coarse sand is stockpiled for sale.

2.5.2 Mobile Crushing and Screening

No approval is sought for in-pit mobile crushing in the West Pit. Some mobile crushing and screening may occur in the Processing Area on a campaign basis to suit operational needs. Towards the end of the quarry life when the quarrying extends further in the East Pit, (refer to **Section 2.4.5**) all processing of quarry product will occur using mobile crushing and screening equipment.

2.5.3 Fixed Plant

It proposed that the existing fixed plant layout would be utilised, refer to **Figure 2.2**. Existing infrastructure within the Processing Area includes the crushing and screening plant, pre-coated sealing and aggregates production plant, fuelling area, pugmill, rail siding, rail loading facility, site compound, administration building, weighbridge, workshop and maintenance and servicing area (as shown on **Figure 2.2**). The fuelling area will be replaced with mobile fuelling areas (refer to **Section 2.7.1**) and the weighbridge will be relocated when the new access road is constructed.

The existing fixed processing plant may be upgraded and or replaced throughout the life of the Revised Project as plant is required to be replaced, and/or technology changes. This will be managed, however, to ensure that any changes in equipment types do not increase the environmental impact of the quarry operations.

2.5.4 Crushing and Screening Process

The crushing plant consists of primary, secondary and tertiary crusher, conveyors, screens and other associated infrastructure (refer to **Figure 2.3**). The crushing and screening plant is located near the middle of the Processing Area and will be used in the production of course and fine aggregates.

As shown on **Figure 2.3**, the crushing and screen process passes rock through a series of crushers to reduce the rock into various sized fragments. The crushing process on its own does not result in uniformly sized rock fragments. A series of screens are therefore used following each crusher to sort the crushed rock into various size categories, resulting in a number of different crushed rock products. The production cycle consists of a three-stage crushing and screening process (primary, secondary and tertiary stages), with each stage producing finer aggregates.

Product material may vary to meet market demand and includes:

- fine crushed rock: minus 14 mm
- railway ballast
- road base gravels and rail capping
- asphalt aggregates: 40 mm, 28 mm, 20 mm, 14 mm, 10 mm and 7 mm
- sealing aggregates: 20 mm, 14 mm, 10 mm, 7 mm
- concrete aggregates: 20 mm, 14 mm, 10 mm, 7 mm, and blends thereof
- drainage aggregates: F20 mm, F14 mm, F10 mm, F7 mm

- manufactured sand and fill sand: minus 5 mm
- manufactured road base.

Gabion and mattress rock production is also undertaken at the quarry. Following extraction, the processing and stockpiling of this product is typically undertaken by mobile plant, however the fixed plant can also be set up to also produce these products.

2.5.5 Pugmill

The pugmill plant and associated storage and silos are located in the south east section of the Processing Area (refer to **Figure 2.2**). The pugmill will be used in the production of blended and moisture modified road base products. The pugmill has a series of paddles which mix and move material through the mill. When water is added, the pugmill enables consistent moisture control of the discharged product.

The pugmill feeds the materials through the mixing box to blend with binding and blending agents such as hydrated lime, slag/hydrated lime blends, slag lime cement triple blends, flyash and bottom ash. It is estimated that up to 20,000 tpa of blending agents will be brought onto the quarry via powder tankers for use in the pugmill.

The proponent is likely to be both a consumer and a supplier under the Coal Ash Exemption 2014. The Revised Project would be operated in accordance with the requirements and conditions of the Coal Ash Exemption 2014 and the Coal Ash Order 2014, or an EPL will be obtained to authorise storage of any coal ash and blended products (refer to **Section 4.2.4**).

2.5.6 Product Blending

From time-to-time external quarry products, such as ridge gravel and conglomerates, will be brought to the site to blend with the hard rock material from the Project to meet specifications for the production of capping material and other products. Blending of the different types of quarry product is undertaken typically with a wheeled loader moving between the stockpiles.

Ancillary truck movements associated with deliveries of fuels, pre-coat and additives (refer to **Section 2.5.5**) are included in the hourly and daily maximum specified for the Project. Other service and delivery vehicles are ad hoc and not regular, as such they have not been included in the truck movements. These movements will be minor in nature.

2.5.7 Pre-coated Sealing Plant

Located on the northern part of the Processing Area (refer to **Figure 2.2**), this plant will produce pre-coated sealing aggregates for use in road construction projects. The precoat plant consists of bitumen emulsion storage tanks, aggregate feed bin, and radial stockpiling conveyor with an integral emulsion mixing and spray unit. Material is placed into the aggregate feed bin using a wheeled loader. The 'coated' aggregate is loaded out into a stockpile ready for loading into trucks by front-end loader. As quarrying in the East Pit progresses, the pre-coat plant will be moved to the Southern Stockpile Area with the inclusion of noise bunding and environmental controls as required.

2.5.8 Product Stockpiling

Products will be stockpiled in readiness for dispatch in product specific stockpiles located in the Processing Area and in the Southern Stockpile Area (refer to **Figure 2.2**).

In the Processing Area, product will be stored in stockpiles with sizes dependent on the type of product and height of conveyor arms. Typically ballast stockpiles can be up to a height of 16 m, while secondary product stockpiles can be stockpiles up to 8 m in height. Stockpiles are fed by a series of conveyors that drop material directly onto the stockpiles. This product can also be moved to satellite stockpiles around the quarry site by loader, or by loading into a dump truck and tipping onto the satellite stockpile. Satellite stockpiles are to be in the Processing Area, Southern Stockpile Area and in the West Pit if required.

2.6 Hours of Operation

Daracon is seeking approval for the following operating hours:

- Quarry operations from 7.00 am to 6.00 pm Monday to Saturday, with the exception of road haulage of quarry product which will only occur Monday to Friday.
- Between 6.00 pm and 7.00 pm, provision for up to ten unladen Daracon trucks to return to the quarry for loading and parking at the quarry overnight, in readiness for departure from 7.00 am the following morning. (In the case of trucks loaded on Friday between 6.00 pm and 7.00 pm, departure will be no earlier than 7.00 am Monday morning).
- As an additional mitigation measure, blasting of quarry material will only occur between 11.00 am and 3.00 pm on Monday to Friday, with no blasting on Saturdays.
- No evening or night operation and no operation on Sundays or public holidays, apart from the following activities which may occur 24 hours seven days per week:
    - rail loading and transportation
    - necessary maintenance activities and/or environmental management controls, including vehicles/trucks moving in and out of the quarry for maintenance purposes as required.

Table 2.5 summarises the proposed hours of operation for the Revised Project.

Table 2.5 Proposed Hours of Operation

Activity	Proposed hours of operation
In-pit quarrying operations	7.00 am to 6.00 pm, Monday to Saturday No in-pit mobile crushing in the West Pit Blasting of quarry material 11.00 am to 3.00 pm Monday to Friday (no blasting Saturday)
Crushing and processing operations **Pugmill mixing and binder delivery operations**	7.00 am to 6.00 pm, Monday to Saturday 7.00 am to 6.00 pm, Monday to Saturday
Product loading and stockpiling for road transportation	7.00 am to 6.00 pm, Monday to Saturday
Loading and overnight parking (up to 10 Daracon trucks)	6.00 pm to 7.00 pm, Monday to Friday
Train loading	24 hours, 7 days per week
General maintenance and environmental management controls	24 hours, 7 days per week

2.7 Proposed Infrastructure

2.7.1 Refuelling Station

The existing refuelling station at the quarry will be removed as part of the Revised Project and replaced with a series of mobile bunded containers, the location of which will vary within the Processing Area and Southern Stockpile Area as the quarry progresses. All flammable and combustible liquids will be stored and handled in accordance with the requirements of Australian Standard AS 1940 – 2017 The storage and handling of flammable and combustible liquids the mobile bunded containers are expected to comprise:

- 20,000 Litre (L) self-bunded diesel storage and disposal
- self-bunded container 6 m x 2.4 m, 3000 L capacity for oil, transmission, grease etc
- self-bunded container 6 m x 2.4 m, 3000 L capacity for water treatment and pH correction.

2.7.2 New Site Access, Parking and Associated Infrastructure

Site Access and Railway Bridge

Consistent with the Original Project, a new site access road is proposed that will allow for direct vehicle access between the quarry and Dungog Road, to the north of Grace Avenue. This proposed new access involves a bridge crossing over the North Coast rail line. Once this new access has been constructed, all heavy vehicle movements will be via this new access. The existing access on Station Street will remain as per the current layout and will be maintained as a secondary access for emergency or unplanned disruptions only. As part of the Revised Project, the design and timing for the proposed new access road has been refined.

More specifically, the proposed new site access would involve:

- constructing a diverge taper and left turn lane from Dungog Road into Main Site Access road (AUL intersection)
- road widening on both sides of Dungog Road to accommodate a channelized right turn intersection (CHR) from Dungog Road into Main Site Access road and associated line marking and delineation
- for vehicles exiting Main Site Access road, providing storage for one design vehicle turning right onto Dungog Road (northbound) and new acceleration lane on Dungog Road (southbound)
- removing the existing redundant line marking on Dungog Road
- modification of existing property accesses on western side of Dungog Road
- providing new safety barriers and drainage infrastructure.

The proposed new access road will be approximately 7 m wide, sealed up to the vehicle wheel wash bay (refer to **Figure 2.10**) and regularly maintained by Daracon throughout the life of the Revised Project. The wheel wash will be constructed on the outbound truck path for dust suppression and to reduce tracking of material onto public roads.

It is proposed to construct the new site access road subject to gaining relevant approvals from DSC for the intersection with Dungog Road under section 138 of the *Roads Act 1993* (NSW), in addition to the relevant ARTC approval for construction of the bridge and to schedule the construction window to complete the railway bridge. It is estimated that the construction program will be completed within 50 weeks of obtaining these approvals, which is expected to be by the end of Year 4 after the Revised Project has commenced following approval.

The new access road will also require the construction of a new intersection on Dungog Road (refer to **Figure 2.10**). The new intersection will be designed and constructed in accordance with Austroads Standards plus in consultation with DSC and will allow for a sheltered right turn lane on Dungog Road to enable the new access to operate in a safe and appropriate manner.

The proposed bridge concept design includes a 2 m thick concrete twin/single lane bridge deck with concrete barrier kerbs, 5 bored piers at 5 m deep at each abutment and one bored pier under each wing wall return (refer to **Figure 2.11**). The proposed bridge will be designed and constructed above the current railway line in accordance with current standards and clearance requirements specified by ARTC.

Daracon have had ongoing discussions with both DSC with respect to the design of the intersection and ARTC regarding the location and concept design plans for the bridge.



Image Source: Google Earth (Aug 2018)
Data Source: Daracon (2020)

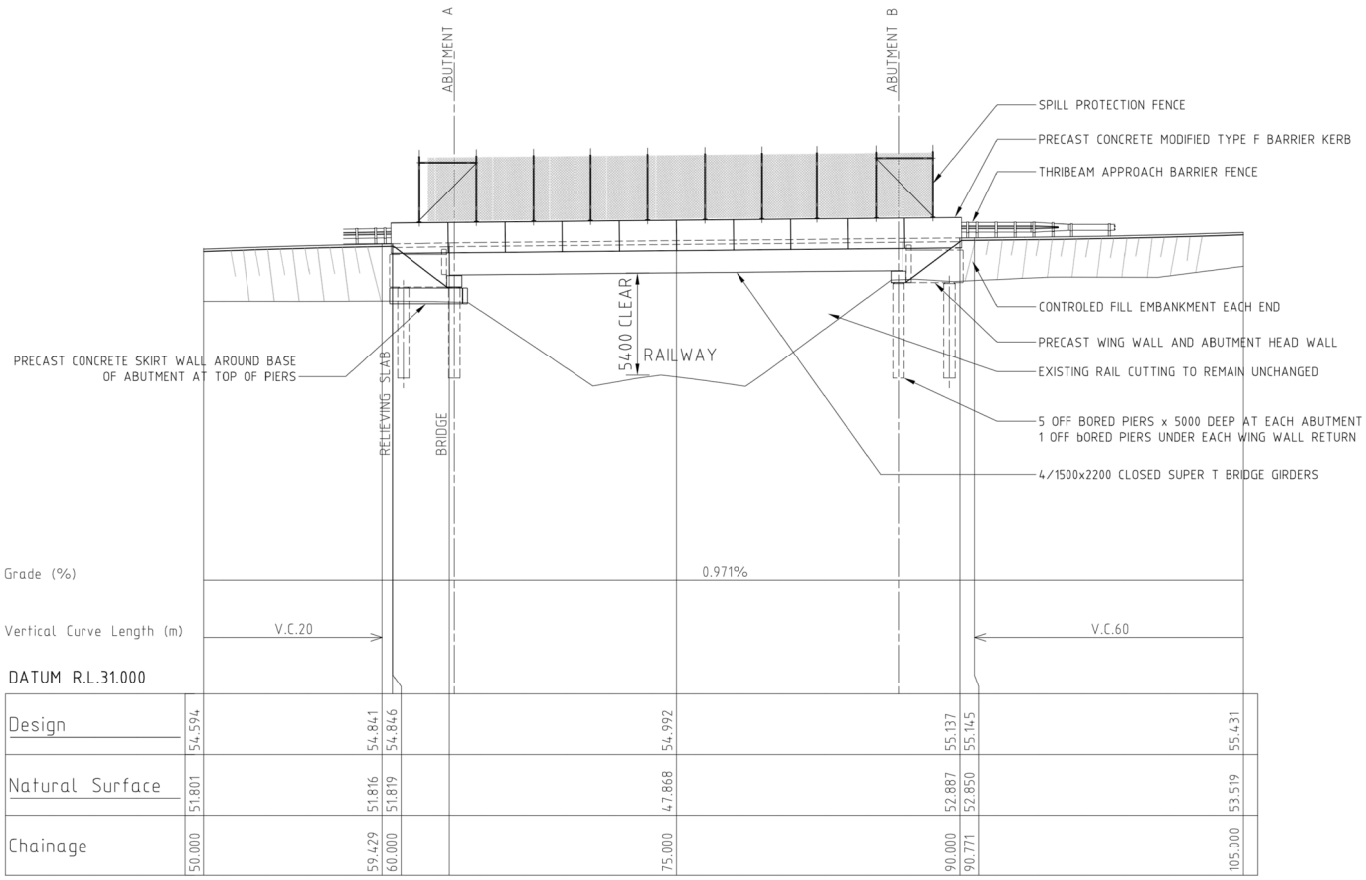
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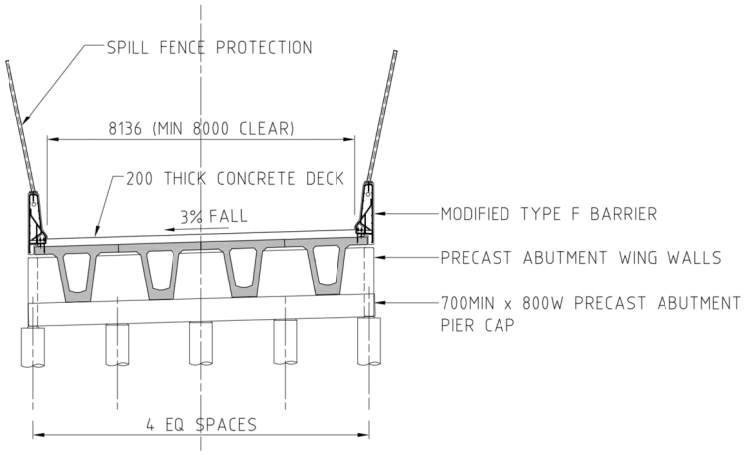
- Project Area
- New Access Road

FIGURE 2.10

Proposed New Access Road



TYPICAL BRIDGE ELEVATION



TYPICAL BRIDGE ABUTMENT B SECTION

FIGURE 2.11

Proposed Railway Bridge Conceptual Design

0 5 10 20m
1:400

Image Source: ACOR Consultants (NNSW) Pty Ltd

File name (A4): R01/3957_057.dgn
20200826 16.06

2.7.3 New Weighbridge and Weighbridge Office

The new weighbridge will be constructed on the new access road (refer to **Figure 2.10**). It will be a prefabricated structure comprising three segments, including an approach and departure slab attached to either end of the weighbridge. The weighbridge will be one way and a passing lane and will be constructed to allow vehicles not required to pass over the weighbridge to exit the quarry. Incoming heavy vehicles will give way to outgoing heavy vehicles.

Following construction of the new weighbridge, the existing weighbridge and wheel wash on the eastern side of the quarry will be removed.

The weighbridge office will be a proprietary portable office type solution or similar.

2.7.4 Parking

The new access road includes 12 carparks adjacent the weighbridge for employees and visitors (refer to **Figure 2.10**). The existing carparking area near the current entrance to the quarry from Station Street will also be retained for use by quarry employees (refer to **Figure 2.2**).

As discussed in **Section 2.6**, approval is being sought for up to 10 unladen Daracon trucks to return to the quarry between 6.00 pm and 7.00 pm Monday to Friday for product loading. These trucks will park overnight in the quarry to allow departure from 7.00 am on Monday to Friday. Overnight parking will be facilitated within the Southern Stockpile Area near the maintenance and servicing area (refer to **Figure 2.1**).

2.8 Product Transportation

Approval is being sought to transport product by road and rail, with road transportation up to a maximum of 500,000 tpa. The proposed primary road haulage route is shown on **Figure 2.13**. The remaining quarry product will be transported by rail via the existing rail network.

The Revised Project proposes a maximum of 140 loaded product trucks per day (280 movements per day) for 50 days per year, otherwise 100 loaded product trucks per day (200 movements per day). Road haulage would only occur between 7.00 am and 6.00 pm Monday to Friday. The Revised Project would result in a peak of:

- 20 laden trucks per hour (40 movements), Monday to Friday between 7.00 am and 3.00 pm
- 15 laden trucks per hour (30 movements), Monday to Friday between 3.00 pm and 6.00 pm.

There will be no road transportation of quarry product on Saturday, Sunday, public holidays or between 24 December and 1 January.

These maximum numbers are being sought to meet the requirements to service large regional construction projects and allow peak customer requirements to be met, not as a continuous level of activity throughout a year. The average hourly and daily truck movements associated with the Revised Project will be much lower than the peak. Further, the number of days this is likely to occur will also in effect be capped by the 500,000 tpa limit for transport by road.

The proposed road transportation limit of 500,000 tpa returns road haulage volumes to a level that is not inconsistent with road haulage volumes occurring prior to Daracon securing its licence in 2012 (refer to **Figure 2.12**). **Figure 2.12** illustrates that road transportation volumes proposed for the Revised Project are less than those previously transported by RailCorp, through the period of 2003-2004 to 2010-2011.

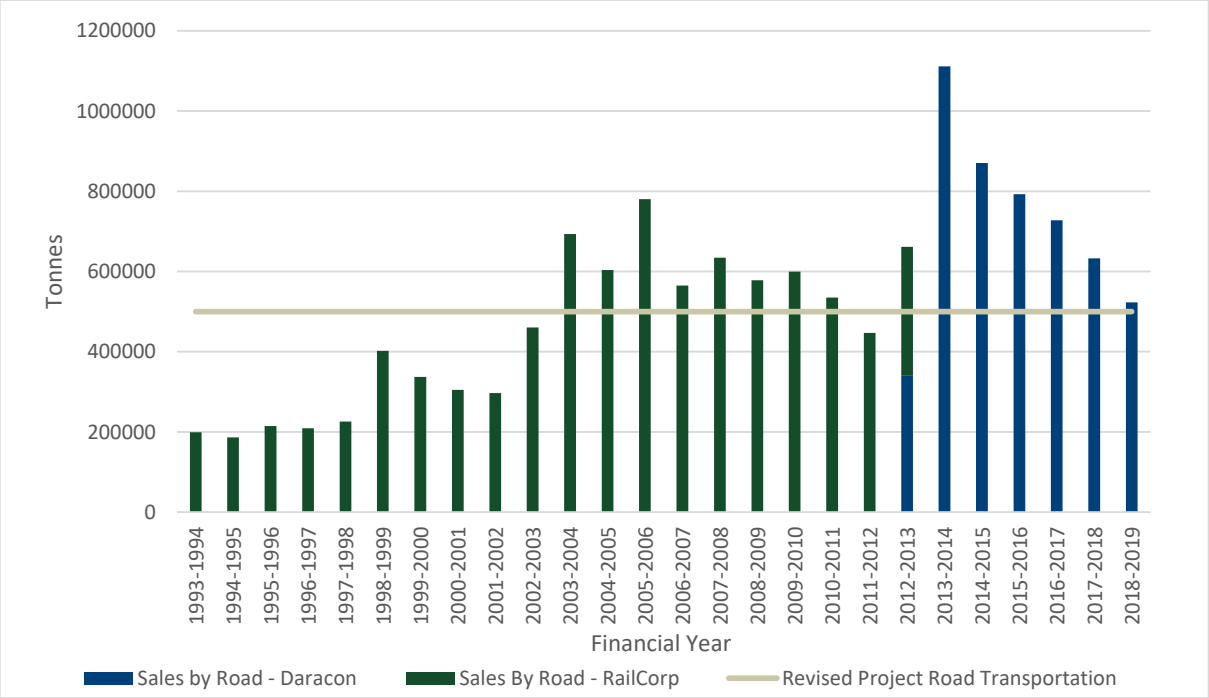


Figure 2.12 Historical Road Tonnages – 1993 to 2019

Approval is also being sought for up to 10 empty Daracon trucks to return to the quarry between 6.00 pm and 7.00 pm for loading in readiness for departure from 7.00 am on the following morning. (In the case of trucks loaded Friday evening, departure will be no earlier than 7.00 am Monday morning). This will avoid up to 10 empty truck movements travelling along the haul route and through Paterson before 7.00 am.

Refer to **Section 2.8.3** for further information on rail transportation of quarry product.

2.8.1 Haulage Route

The Revised Project is seeking approval to haul product on the road network via the primary haulage route 1 (described in **Table 2.6** and **Figure 2.13**). Other local roads may be used as required to service local projects on a campaign basis.

Table 2.6 Martins Creek Haulage Routes for the Revised Project

Haulage Route Proposed	Description
Primary Haulage Route 1	Martins Creek Quarry via Station Street, Grace Avenue, Dungog Road, Gresford Road, Tocal Road, Paterson Road, Flat Road, Pitnacree Road, Melbourne Street, New England Highway Note: after the bridge and new access road is constructed there will be no haulage along Station Street and Grace Avenue.

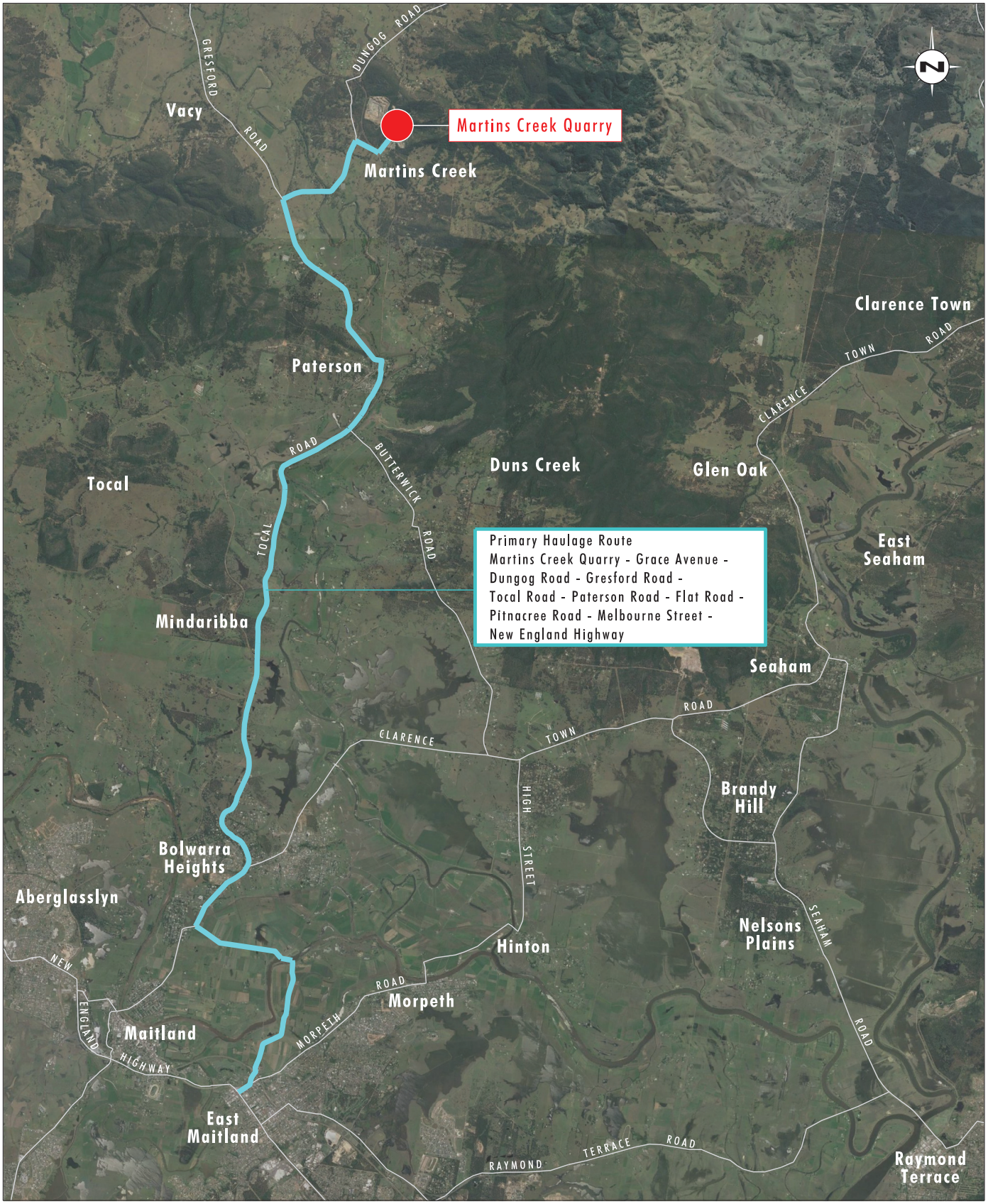


Image Source: Google Earth (Aug 2018)

0 2 4 6km

1:120 000

Legend

Primary Haulage Route

FIGURE 2.13

Proposed Haulage Route

2.8.2 Proposed Intersection and Bridge Approach Upgrades

As noted in **Section 2.7.2**, upgrade works are proposed at the intersection of the new quarry access road and Dungog Road. To maintain and improve the capacity, efficiency and safety of the road network used by the Revised Project, intersection and road upgrades are also proposed at the following locations:

- intersection of Dungog Road and Gresford Road
- intersection of King and Duke Streets (within the village of Paterson)
- approach to Gostwyck Bridge.

The location of the proposed intersection upgrades in relation to the Revised Project are shown on **Figure 2.14**.

A description of the intersection upgrades proposed at Dungog Road and Gresford Road and King and Duke Streets, as well as the proposed upgrade works for the approach to Gostwyck Bridge are described in **Table 2.7** and illustrated on **Figure 2.15** to **Figure 2.17**. No private land acquisition is required for the proposed works. Further information is provided in **Section 6.3**.

Table 2.7 Proposed Intersection and Bridge Approach Upgrades

Proposed Intersection and Bridge Approach Upgrades	Proposed works
Dungog Road and Gresford Road (Figure 2.15)	Daracon propose to: • realign Gresford Road north of the intersection with Dungog Road to locate road pavement more central to road reserve • refresh the line marking on the existing diverge taper and left turn lane from Gresford Road onto Dungog Road (AUL intersection) • remove the existing redundant line marking on Gresford Road • construct a channelised right turn intersection (CHR) incorporating storage length for 3 design vehicles turning right onto Dungog Road (eastbound) and associated line marking • realign Dungog Road on approach to intersection incorporating storage length for 1 design vehicle turning right onto Gresford Road (northbound) and diverge taper into acceleration lane on Gresford Road (southbound) • median, painted markings, give way sign and refreshed line marking on Dungog Road • remove the existing redundant line marking on Dungog Road • realign Gresford Road south of the intersection to locate road pavement more central to road reserve • extend existing acceleration lane and merge taper along revised Gresford Road alignment.
King and Duke Streets (within the village of Paterson) (Figure 2.16)	Daracon propose to: • relocate the existing driveway on the north side of the intersection slightly west to improve the space allocation for parking on either side of the driveway and improve carparking capacity along this northern kerb line • relocate existing direction and hazard signage on northern side of intersection • refresh the dividing line marking through the intersection • minor realignment of the footpath, kerb ramp and kerb & gutter on the south-western corner of the intersection to accommodate the design vehicle turn path

Proposed Intersection and Bridge Approach Upgrades	Proposed works
	• relocate existing 'No Stopping' sign in front of Telstra phone box to power pole adjacent to Post Office driveway, remove existing single carparking space to accommodate design vehicle turn path.
Gostwyck Bridge approach Figure 2.17)	Daracon propose to: • realign Dungog Road, incorporating a series of curves to raise driver awareness and associated new line marking • install Vehicle Activated Signage alerting drivers approaching the bridge to reduce speed • relocate existing hazard signage • remove redundant signage • modify existing property accesses as required on either side of Dungog Road.

2.8.3 Rail Spur Extension and Rail Transportation

There is direct rail access from the quarry onto the Main Northern railway line where the trains are directed by the ARTC Control Centre at Broadmeadow.

As noted in **Section 1.6.4**, to further reduce the impacts associated with transport of quarry product via road and still maintain an economically viable project, Daracon have committed to increase the amount of quarry product transported by rail. Daracon are planning to expand rail markets and gain access to rail unloading capacity, in order to enable greater transportation of product by rail to service the Sydney market.

Currently, the quarry is constrained by available train paths on the network and train loading hours which limits movements to one train per day. To alleviate some these constraints Daracon is seeking approval to load trains 24 hours per day and to construct an extension of the existing rail spur within the East Pit (refer to **Figure 2.1**), to enable the loading of trains, typically either 400 or 600 m in length (although train lengths vary). The rail spur will be extended by approximately 360 m and is planned to be constructed by the end of Year 4 of the Revised Project. Rail wagons will be loaded by front end loader or other train loading equipment.

The proposed changes to the rail spur will enable the full range of quarry products produced by the quarry, not just rail ballast, to be loaded onto trains. A rail dispatch rate of 600,000 tpa equates to an average 6 to 8 trains per week depending on train length. While campaign dispatch by ARTC is regular, demand that can be met by rail transportation will vary for the construction materials market. Rail loading is proposed for 24 hours per day to allow for up to 3 trains per 24 hour period to be dispatched to cater for demand.

Based on the access to the Main Northern railway line during the day and the train cycle time into the greater Sydney Region it is anticipated that Revised Project would normally load a maximum of two trains over a 24 hour period, one during the day and one during the evening/night time period. The third train loading during the evening or night time period would only be required occasionally to meet peak demands or to adapt to rail line capacity availability, track closures, breakdowns, etc.

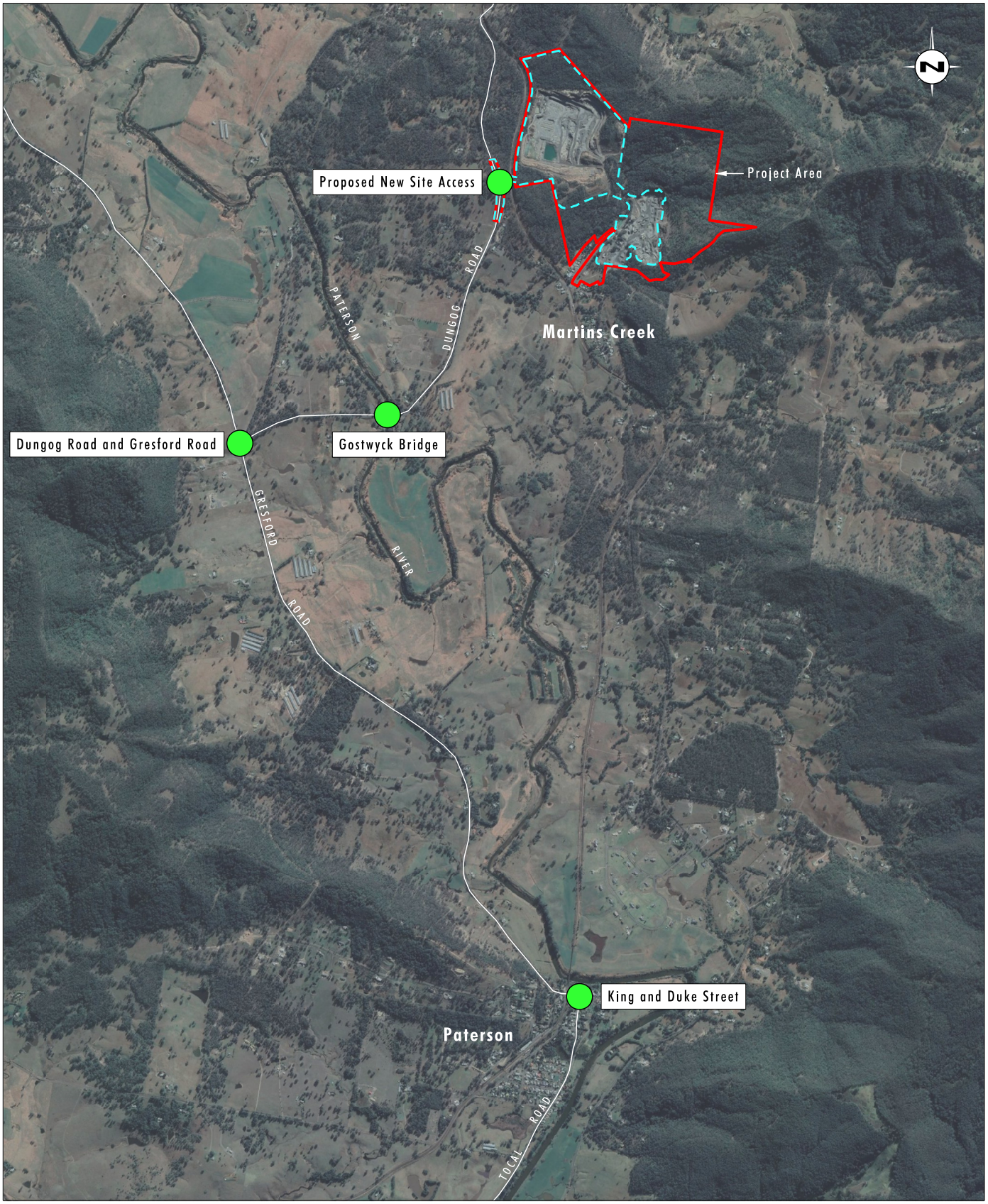


Image Source: Google Earth
Data Source: Daracon (2020)

0 0.5 1.0 1.5km
1:35 000

Legend

- Project Area
- Proposed Disturbance Area
- Proposed Intersection/Bridge Approach Upgrade

FIGURE 2.14

Location of Proposed Intersection and Bridge Approach Upgrades



Image Source: Google Earth (Jan 2018)
Data Source: Daracon (2020), Lyndsay Dynan (2020)

0 25 50 100m
1:2 000

Legend

Dungog Road and Gresford Road Intersection Upgrade

FIGURE 2.15

Proposed Dungog Road and Gresford Road Intersection Upgrade

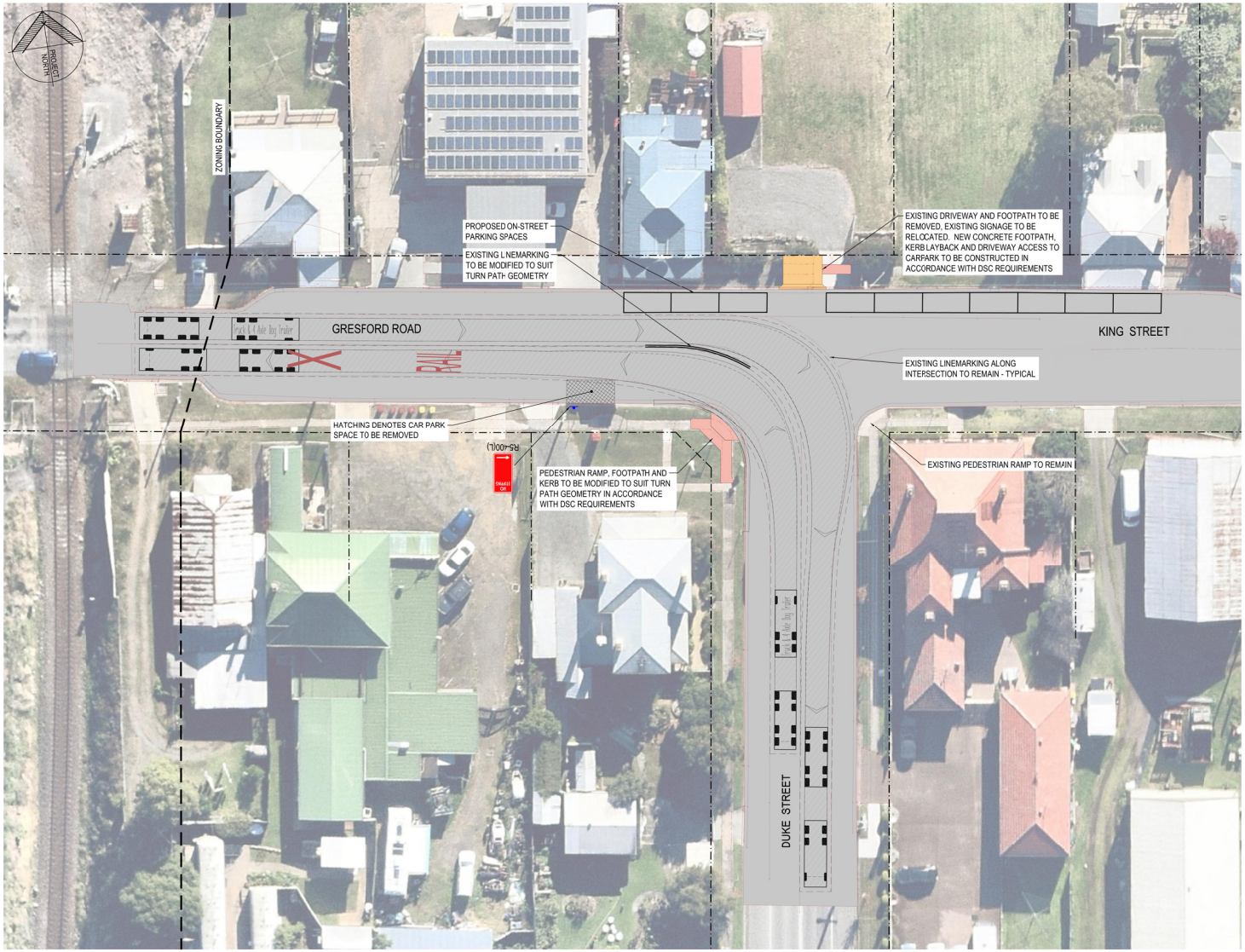


FIGURE 2.16

Proposed King Street and Duke Street Intersection Upgrade

Image Source: Lindsay Dynan (2020)



FIGURE 2.17

Proposed Gostwyck Bridge Approach Upgrade

0 25 50 75 m

1:1500

Image Source: Lindsay Dynan (2019)

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2.9 Construction Phase

As described in previous sections, construction of additional noise control bunds will occur during the first two years, following project approval. As outlined in **Section 2.7.1**, the Revised Project will also involve the relocation and reconstruction of the refuelling facility in Year 1 of operations. The construction of the access road, including the new intersection and rail bridge will require the longest duration and be subject to additional design and approvals processes. Subject to ARTC and DSC approvals for rail bridge, and intersection construction, respectively, it is expected that the new access road will be constructed and operational by the end of Year 4.

Daracon have been in consultation with DSC and ARTC and will seek to gain relevant approvals as soon as possible following development approval. Notwithstanding, there will be a period where access continues along Station Street and Grace Avenue. Intersection upgrades and the Gostwyck Bridge approach upgrade will also be subject to DSC approval, under the Roads Act.

Table 2.8 Estimated Construction Timing

Project Stage	Construction Activities
Project Approval to Year 5	• New quarry access road/quarry access road intersection with Dungog Road/quarry access road bridge over the Main Northern railway line/upgrades to intersections on haulage routes/upgrade to approach to Gostwyck Bridge • Construction of new weighbridge, offices, carparking and vehicle wheel wash • Noise wall in the Processing Area • Noise barriers on internal haul road • Noise wall at the boundary of Southern Stockpile Area • Sound attenuation of Primary Crusher Building, Secondary Crusher Building, Rail Loading Screen and surge bin • Rail siding extension
Year 20 to final	• Decommission of fixed crushing and processing plant and installation of mobile crushers and screens
	• Decommission all remaining quarry infrastructure including offices, weighbridge, wheel wash, portable crushing equipment

2.10 Quarry Workforce

2.10.1 Construction

Construction activities will occur at different times throughout the first 5 years following commencement of the Revised Project. Each of the construction activities referred to in **Table 2.8** will occur over different durations and may not all occur simultaneously. The total duration of construction activities related to the new quarry access road/quarry access road intersection with Dungog Road/quarry access road bridge over the Main Northern railway line is expected to be approximately 12 months. During these periods, the construction workforce numbers will vary and are expected to total in the order of approximately 120 personnel, with a peak of 20 to 30 personnel.

2.10.2 Operation

When the quarry is operating at full capacity, the workforce for quarrying operations are expected to be approximately 22 full time equivalent employees. In addition, contractors will be periodically engaged for various activities during the life of the quarry and may total in the order of 30 personnel. In addition to those directly employed by quarry operations, delivery truck drivers will also be engaged by the quarry for transport of material to customers. The number of drivers engaged on any particular day is dependent on the location of the customer to which product is being delivered on that day.

2.11 Rehabilitation

Rehabilitation of all disturbed areas will occur progressively with the timing of the work dependent on the rate of resource extraction in each area and achievement of the final levels of the quarry floor. A detailed description of proposed progressive rehabilitation and conceptual closure planning is provided in **Section 6.19**.

2.12 Consideration of Project Alternatives

The Revised Project represents the culmination of a thorough process of reviewing project alternatives to address issues raised in agency and public submissions and further reduce environmental and social amenity impacts associated with the Project. An overview of the Project alternatives considered during the process, is provided below.

2.12.1 Alternative Project Designs

Sections 1.6 and **2.0** describe the key project changes that have been adopted since exhibition of the Original Project. During this process of iterative project design, Daracon have considered the feasibility of a range of alternatives to key project design features. Key alternatives included the following projects aspects, which are described in further detail in the following sections:

- alternative quarry pit designs and quarry operational parameters
- alternative road haulage configurations and volumes
- options for road and parking enhancement in Paterson village, particularly in relation to King and Duke Streets
- alternative rail loading and rail spur considerations.

2.12.1.1 Alternative Pit Designs and Quarry Staging

The original quarry pit design proposed expansion of quarrying activities within the former East Pit (Lot 21 DP 773220) (refer to **Section 6.10**). The Revised Project now avoids extending the operations in the former East Pit, resulting in a material reduction in environmental impacts by:

- avoiding disturbance of approximately 15.3 ha of native vegetation
- avoiding disturbance of 3rd order stream in this part of the catchment
- reduced visual impacts, by avoiding clearance in the comparatively higher elevation area of the quarry resource.

The Revised Project's quarry pit design allows for the optimised use of the existing resource within and immediately surrounding the existing quarry pit and thereby minimising the disturbance footprint. This design approach achieves a balance between resource recovery and minimising environmental and social impacts.

Further, the proposed staging and design of quarry operations provides for:

- clearing of native vegetation in the additional disturbance area to be undertaken incrementally over a period of 15 to 20 years, with site rehabilitation further progressed incrementally from the initial two years of the Revised Project
- well shielded quarry operations, with no views into most of the quarry pit due to the nature of the adjoining landform and surrounding bushland
- relocation of quarry mobile equipment in noise enhancing weather conditions to lower, more shielded benches for periods of time, as needed to minimise noise impacts at surrounding private residences
- continuation of current blast practices, with well designed, targeted blasting to meet the needs of the quarry operations, whilst minimising blast impacts on the local community.

2.12.1.2 Alternative Quarry Product Transport Options

Alternative road haulage configurations and volumes

Daracon initially proposed an additional haul route, to the east via Paterson Road/Butterwick Road/ Clarencetown Road/Brandy Hill Drive/Seaham Road to connect with the Pacific Highway at Raymond Terrace. This option further proposed a daily peak of 215 laden trucks (430 movements) and 40 laden trucks per hour (80 movements).

Due to ongoing concern from the community and local stakeholders in relation to traffic and transport, alternative road haulage options and volumes were investigated.

The Revised Project now proposes only utilising one primary haul route, with Haul Route 2 no longer proposed as a primary haul route. Other roads would only be used to service local projects on a campaign basis on or directly accessed from the route. In addition, the Revised Project's daily peak laden trucks per day is proposed to be a peak of 140 per day (280 movements) for 50 days per year, otherwise 100 laden trucks per day (200 movements) and a peak of 20 to 15 laden trucks per hour (40 to 30 movements depending on time of day) to meet campaign requirements to service large regional construction projects, from time to time. In response to community concerns, Daracon have also reduced the frequency of truck movements to a peak of 15 laden trucks per hour between 3.00 pm and 6.00 pm. The reduction to 15 laden trucks per hour between 3.00 pm and 6.00 pm aims to further ameliorate traffic impacts during higher activity in Paterson village and interactions with school finishing times. The average daily truck movements associated with the Revised Project will be much lower than the peak, and the number of days this is likely to occur will also in effect be capped by the 500,000 tpa limit for transport by road.

The potential to bypass Paterson has also been raised during stakeholder engagement. Whilst there was previously a road corridor for a bypass allocated in DSC's local planning provisions, Daracon was advised in 2014 that DSC no longer supported that proposal. The land previously allocated as a bypass through the outskirts of Paterson have been developed for other purposes.

A further option considered by Daracon was using Martins Creek Road for empty trucks and the Paterson route for loaded trucks. This was initially investigated and determined that Martins Creek Road was not feasible due to physical and engineering constraints.

No road haulage of quarry product

The opportunity to avoid any road haulage of quarry product, and transporting all quarry product by rail, has often been raised during the community engagement process. Whilst Daracon now propose to significantly reduce the proportion of quarry product delivered by road, it is not feasible to continue quarry operations with no road haulage, and have all the quarry product transported by rail. Recently, Daracon have identified a rail receival facility in Western Sydney, which is feasible to use for delivery of quarry product to supply major construction industry demands for the Greater Sydney Metropolitan Area. On this basis, approximately 600,000 tpa (54.5%) of the proposed total quarry production of 1.1 Mtpa, will be transported by rail. Subject to market demands, Daracon may increase the amount transported by rail, on a campaign basis, within the 1.1 Mtpa of total quarry product.

Whilst Daracon are committed to continuing to investigate opportunities to minimise the need for road haulage to supply regional markets, it is not currently feasible. The ability of the quarry to increase rail distribution of aggregates within its current distribution area is limited by the lack of suitable rail unloading facilities, large number of product destinations and types, short haulage distances and the fact that a number of competing quarries use the road system as a more commercially viable and flexible supply to service the same markets.

Despite extensive investigation (refer to **Section 6.3.4.3)**, there is no current feasible option to use rail logistics to supply the local and regional market for the Revised Project.

In order for the quarry to be commercially viable, it must be able to service the local and regional construction material markets.

Paterson Village Road Treatment options King and Duke Street intersection design

Daracon considered alternative design options for the proposed upgrade of King and Duke Street intersection in Paterson. This included Daracon's initially preferred option with the following:

- Physical separation by means of raised median to provide physical guidance for vehicles to reinforce traffic manoeuvre around the bend and traffic island on King Street.
- Pedestrian crossing on King Street, providing pedestrian linkage at the intersection.
- Off street parking lot with ten additional parking spaces, on Lot 3 DP 758830.

Feedback from the community, particularly during the Traffic CAF was that the proposed design including a raised median in the road was not desired and therefore should not be considered. Further there was no alignment in the Traffic CAF feedback on:

- the locations of pedestrian crossings or even the utility of inclusion of pedestrian crossings as part of road enhancements,
- Daracon's offer to establish off-street parking.

During one of the most recent Social CAF sessions, there were a number of stakeholders that supported the inclusion of a pedestrian crossing in the design, and considered that the option of additional off-street parking would be beneficial given current parking constraints in Paterson Village, if the Revised Project was approved.

At this stage Daracon propose to proceed with the option outlined in **Section 2.8.2,** subject to the outcome of further discussions with DSC on road maintenance and VPA matters.

Alternative rail loading and rail spur considerations

Daracon have considered various configurations for the train loading rail spur including implementation of a rail loop and further extension of the proposed siding. Due to the existing topography and boundaries, these options do not appear to be viable and would require substantial additional disturbance of vegetation to replace the stockpiling areas that would be lost if they were implemented. These options would also likely result in additional noise propagation as some natural barriers would be removed to accommodate the additional infrastructure.

2.12.2 Alternative of Not Proceeding

If the Revised Project does not proceed, there are two main alternatives:

- Continue under the existing development consent. This option would consist of continuing current operations under the existing approvals framework, considering the Court of Appeal judgement. This option does not provide for a commercially viable extraction rate nor the extraction of a long term resource. It is therefore considered that this option is not viable.
- Withdraw the development application and close the quarry. The option was not considered a feasible alternative due to:
    1. The extent of valuable resources remaining in the lease areas.
    2. Lack of certainty over the rehabilitation requirements of the whole Project Area.
    3. Uncertainty around ongoing supply of construction materials to the local, regional and greater Sydney regions.

3.0 Strategic Need and Justification

3.1 Product and Market Analysis

The quarry has supplies and delivers high quality material and products for use in rail, concrete, asphalt and general civil construction, including products to meet the specifications of Transport for NSW (TfNSW), ARTC and Sydney Trains. Major customers of the quarry also include airports and port authorities, and various local Councils.

The quarry also supplies many concrete, asphaltic concrete and road sealing customers, as well as infrastructure construction companies. These customers reflect all facets of the industry including the major industry suppliers of construction materials, for example Boral, Hanson, Holcim, Metromix, EDI Downer and Fulton Hogan. The quarry also supplied major infrastructure providers such as CPB Contractors, Lend Lease, Seymour Whyte, John Holland, Fulton Hogan, Thiess, Ditchfield, Robsons, and Daracon Group.

The quarry provides a diverse range of products that are far more extensive than typically supplied within the hard rock quarrying industry. Often site specifications differ to that generally offered in the industry. The quarry has demonstrated sustained market demand for a range of quarry products over a number of years, including numerous regional and state significant infrastructure projects.

Generally, quarries target materials into a particular market sector. The quarry produces materials for supply to all sectors, including products to the highest specified requirements. This is an important point of difference between the quarry and other hard rock quarry producers in the Hunter Region. As discussed in this section, there is a high demand for the products produced at the quarry.

3.1.1 Market Sectors

The following quarry product categories or market sectors have been supplied by the quarry:

- **Aggregates** - includes concrete aggregates, asphalt aggregates, spray sealing aggregates, drainage aggregates, pipe bedding aggregates, stemming aggregates.
- **Manufactured Sand** - includes manufactured concrete sand, washed manufactured sand for concrete, manufactured sand for pipe bedding, washed manufactured sand for pipe bedding, manufactured sand for asphalt, washed manufactured sand for asphalt, fill sand, filtration sand, paving sand and stabilised bedding sand.
- **Pavement Construction Materials** - includes unbound sub-bases and bases, bound sub-bases and bases, airport bases and fine crushed rock, railway capping, structural and engineering fill.
- **Ballast (delivered by road)** - includes ballast for use as railway track ballast to the various rail authority specifications being ARTC, TfNSW (Sydney Trains), and light rail suppliers. It also includes ballast used as a coarse drainage product in mining, environmental works and septic systems.
- **Ballast (delivered by rail)** - includes ballast for use as railway track ballast only. It complies with the relevant rail authority specifications. This material is transported from the quarry in purpose designed rail wagons which in turn deliver material onto the existing railway tracks directly for maintenance and rectification purposes or at locations that are inaccessible by road. Martins Creek Quarry is the only quarry in the Lower Hunter with direct access to rail to allow delivery of ballast material to particular locations.

- **Rock and Gabion Materials** - includes sized and graded coarse rock products. These products include:
    - gabion and mattress rock for civil retaining and water course stabilisation and revetment works
    - sized rock for sea wall and watercourse revetment, stabilisation and landscaping works
    - rock fill applications in watercourses and areas of poor drainage, or locations where the water table is high and foundation characteristics are poor
    - for ground improvement, piling works and wick drains
    - in more recent times emergency works during storm events, securing and supporting eroded shorelines and embankments.

3.1.2 Market Area and Size

The location of the quarry allows it to service the markets the Hunter region, including Newcastle, Maitland, Cessnock, Singleton, Port Stephens, Lower Hunter and Muswellbrook, Scone, the Central Coast, Lower North Coast and Sydney Metropolitan regions.

The most recent local and regional demand for quarry products include the following LGAs with the largest markets for the sale of products:

- Newcastle City Council (40%)
- Maitland City Council (13%)
- Port Stephens Council (18%)
- Lake Macquarie Council (16%).

The remaining markets are in the wider Hunter region and include the DSC, Cessnock City Council, Singleton Council, Gloucester and the Upper Hunter Shire, in addition to the growing market in Sydney and the Central Coast.

Connected to the Main North Coast railway line, with direct access by rail from the quarry to the ARTC Control Centre at Broadmeadow, the quarry has the ability to deliver products to market by rail. Railway ballast is currently supplied by rail with an increase in product transported by rail subject to market demand and availability of rail paths on the Main North Coast railway line, and feasible access to rail unloading facilities in locations relevant to major infrastructure construction activities. As noted above, Martins Creek Quarry is the only quarry in the Lower Hunter with direct rail access.

3.1.3 Products

As discussed in **Sections 1.3.1** and **6.2.2**, the source rock at the quarry is a hard-igneous rock with analysis of dust and aggregate samples confirming suitability for a range of uses including road base, concrete manufacture, sealing aggregates and rail ballast (VGT, 2021).

Whilst the quarry primarily produces high quality ballast and aggregates, it also focuses on the design and manufacture of high-quality road pavement materials, in particular Stabilbase (RMS Dense Graded Base) and Stabilstone (RMS Heavily Bound Base). These high-quality pavement materials are produced during the crushing and screening process and then blended through a pugmill on site. Frequently, these materials are difficult to source readily as evidenced during 2020 without the availability of the quarry.

The quarry products generally range in size from approximately 0.3 m down to fine manufactured sand, however, larger sized products can be produced to customer specifications by by-passing the crushing and screening plant. The pre-coat plant at the quarry coats aggregate products with a bitumen emulsion for use in bitumen seal road works.

The quarry products have a range of applications including:

- railway ballast
- use of aggregates in concrete, bituminous surfacing, asphalt, landscape works, drainage works, road construction and gravel surfacing
- pavement construction materials, including road base for use in road construction, railway capping, structural and engineering fill
- rock for gabion baskets and wire mattresses used in civil retaining, stabilisation (e.g. road batters) and drainage works
- rock for coastal protective works
- manufactured sand for use in concrete, as fill and in landscaping applications
- oversize rock for landscaping, decorative and stabilisation works.

In order to assess the suitability of the resource of the quarry to the production of high quality construction materials, as well as to evaluate these products against those produced at other quarries within the region, samples of dust and aggregate were taken from the quarry (and six other quarries) and the following parameters tested:

- petrographics
- bulk density
- particle density
- pH
- conductivity.

The analysis of the results, presented and discussed in VGT (2021), demonstrates that the aggregates of the quarry display properties which are suitable for a range of uses where physical and chemical properties are an important consideration.

Table 3.1 lists the relevant Australian Standards and quality specification requirements of key transport authorities along with discussion as to how the quarry products meet the performance standard for the relevant engineering and construction applications.

The quarry produces materials to the highest performance standards and criteria. The quarry has been a particularly important supplier to the region's construction industry of some critical products, with these identified and explained in **Table 3.1** below.

Table 3.1 Key Product Performance Standards and Criteria Considerations

List of standards	Notes/Comments
Australian Standard – Aggregate and Rock for Engineering Purposes (AS 2758.0 – 2009)	Analysis of dust and aggregate samples has confirmed the rock can meet the required standards for concrete aggregates (Part 1), sealing aggregates (Part 2), Gabion and Mattress rock (Part 4), asphalt aggregates (Part 5), Armourstone (Part 6) and railway ballast (Part 7)
RMS R44 – Earthworks (Fill material to specialised RE-walls)	Compliant product is frequently difficult to obtain in large quantities without significant lead time
RMS R55 – Rock Filled Gabions and Mattresses	Compliant products are particularly difficult to source. Very limited sources that carry any stock that is in accordance with specifications.
RMS R73 - Construction of Plant Mixed Heavily Bound Pavement Course	As outlined below in further detail, the quarry was one of two sources of R73 Heavily Bound Base within the Hunter Valley with conforming material available to the market and one of two natural sources of fully compliant slow setting R73 (to the Hunter Spec) in the Hunter Valley.
RMS B80 – Concrete Work for Bridges	High strength aggregate requirements for the RMS B80 specification significantly reduce the options for material sources to meet this standard.
RMS 3051 – Granular Base and Subbase Materials for Surfaced Road Pavements	Availability of conforming RMS 3051 DGB20 Ed. 7 material is extremely limited and is impacting project deliverables significantly. In later 2020 the availability of the lesser grade RMS 3051 DGB20 Ed. 5 were also becoming exhausted in the market. Daracon believe that 2021 will continue to see a shortage of conforming gravel across the industry.
RMS 3071 – Selected Material in formation layers	Large major project quantities of conforming stockpiles continue to be difficult to source on a consistent basis.
RMS 3580 Aggregate Filter Materials for Subsurface Drainage	Demand for Concrete aggregates has reduced the availability of conforming drainage filter aggregates to the market.
Australian Track and Rail Corporation (ARTC) Ballast Specification – ETA 04-01	Ballast requirements have outstripped supply in 2020 in the Hunter Valley with many quarries exhausting resources. Difficulties obtaining ballast in compliance with ARTC specifications continues to be a problem in the Hunter Valley. Material is required to be transported increasingly longer distances to meet project requirements.
Transport for NSW (TFNSW) Ballast – T-HR-TR-00192-ST	The quarry is one of a handful of quarries to produce this specialised ballast for the Sydney/metro network.

A comparative analysis of these properties to those of other quarries supplying the Hunter region is provided in **Section 3.2**.

Whilst the quarry primarily produces aggregates, which the analysis of VGT (2021) confirms are suitable (and in many cases preferential to aggregates from other quarries – refer to **Section 3.2**) for a diverse range of end uses, it also focuses on the design and manufacture of high-quality road pavement materials, several of which are unique within the regional setting, and manufactured washed sand, as outlined below.

Unbound Road Base

As noted in **Table 3.1**, the Stabilbase product of the quarry is compliant in all aspects of the RMS 3051 Edition 7 specification and is approved by the RMS for use in all road categories including the maximum traffic loading category "A" for highway use.

There is no other source of material meeting this current RMS Category "A" requirement in regions from the Central Coast to the Upper Hunter and Stabilbase is registered with the RMS under their unique materials category.

Heavily Bound Base

As noted in **Table 3.1**, the Stabilstone product of the quarry is compliant in all aspects of the RMS R73 Edition 3 specification. Heavily Bound Base is critical to road infrastructure for state and local government roads subjected to high traffic volume and heavy loading.

For approximately 15 years Stabilstone had been one of only two products that met RMS heavily bound specification RN73. Heavily Bound Base is critical to road infrastructure for state and local government roads subjected to high traffic volume and heavy loading.

More recently the R73 heavily bound specification has seen Stabilstone be the material of choice, with slow setting binder requirements with which other heavily bound materials in the market are unable to comply. Other products requiring additional asphalt overlay thickness, to eliminate reflective cracking, at extensive additional costs to projects.

Manufactured Sand

The quarry produces high quality manufactured sand suitable for use in high quality concrete and asphalt products compliant to all applicable contemporary standards, most notably AS 2758.1 Aggregates and rock for engineering purposes - Part 1: Concrete aggregates (which was updated in 2014 to provide a full specification for manufactured fine aggregate).

The quarry is the only hard rock quarry in the Hunter offering washed manufactured sand to meet the requirements of high strength concrete specifications and coarse drainage sand for biofiltration and filter sand.

The ability to meet the requirements of AS 2758.1:2014 increases the importance of the quarry noting the increasing pressure on supply of sand to the Hunter, Sydney and other NSW markets (refer to **Section 3.3**).

3.2 Market Competitors

3.2.1 Hard Rock Resources

Hard rock quarries, particularly those that are suitable for high strength concrete and asphalt applications, are limited in the Hunter Region, and more broadly in NSW. An analysis of the regional geological setting completed as part of a Geological Assessment of the quarry (VGT, 2021) confirms that the Carboniferous and Permian aged volcanic geological formations from which these hard rock resources are available represent roughly 30 to 40 % of the region. Within the broader Volcanics geology, local variations in lithology generated through post consolidation movements, i.e. faulting, folding and uplift, further limit those areas of available rock with chemical and physical properties conducive to the production of high quality aggregates.

Due to the competing interests of residential, agricultural, scenic and conservation land uses, the availability of land for the development of quarrying operations to satisfy the growing demand for these products, is limited. Within the broader regional geological setting of the Lower Hunter Region, eight other hard rock quarries with the capacity to supply significant volumes of high strength aggregates and construction materials have been identified.

These were identified as:

- Brandy Hill Quarry (Hanson Pty Ltd)
- Karuah East Quarry (Hunter Quarries Pty Ltd)
- Seaham Quarry (Boral Quarries Pty Ltd)
- Allandale Quarry (Quarry Products Newcastle Pty Ltd)
- Karuah Quarry (Hunter Quarries Pty Ltd)
- Eagleton Quarry (Eagleton Rock Syndicate Pty Ltd)
- Karuah South Quarry (Wedgerock Pty Ltd)
- Hillview Quarry (Coastwide Materials Pty Ltd).

Three of these quarries, Eagleton Quarry, Karuah South Quarry and Hillview Quarry, are proposed only and are to be assessed and determined by the DPIE and/or the NSW IPC.

Table 3.2 provides a summary of the regionally significant hard rock quarries operating, or proposed to operate, within the Hunter region.

Table 3.2 Regional Quarries – Production and Resources

Quarry	Lithology	Production (t)	Resource (Mt)
Approved			
Martins Creek	Latite		
Karuah	Andesite/Ignimbrite	500,000	11.2
Karuah East	Andesite	1,500,000	29
Seaham	Ignimbrite	800,000	3.3
Allandale	Andesite	undefined[1]	undefined
Brandy Hill	Ignimbrite	1,500,000	undefined
Teralba	Conglomerate	1,200,000	22
	Sub-total	**>4,700,000**	**>65.5**
Proposed			
Martins Creek	Latite	1,100,000	22.4
Eagleton	Rhyolite	600,000	10
Karuah South	Ignimbrite	600,000	11.3
Hillview	Rhyolite	1,500,000	35
Stone Ridge	Rhyodacite / Dacite	1,500,000	45
Seaham (extension)	Ignimbrite	No change	5.0[2]
	Sub-total (proposed)	**5,300,000**	**128.7**
	Total (approved + proposed)	**10,000,000**	**194.2**

Note [1]: Environment Protection Licence limit of 2,000,000 tpa

Note [2]: Additional

Since September 2019, the quarry has not supplied any significant material volumes of construction materials into the greater Hunter regional market. Although the demand for construction materials was comparatively low during 2020 due to slowing of major upgrades, the following has occurred as a result in the marketplace:

- consistent use of quarry products from Jandra Quarry Possum Brush
- consistent use of quarry products from Pacific Blue Metal Possum Brush
- increased use of quarry products from greater Hunter and New England regions into the Newcastle market, namely:
    - SCE Hebden Quarry
    - Wilds Hebden Quarry
    - Willow Tree Gravels.

Further, highlighting the limited quarry product supply issues for the region, during this period the following quarries have had issues supplying materials due to limitations on the current operations:

- SCE Hebden.
- Boral Currabubula reached its limits prior to the end of 2020.
- BMR Quarries reached their limits for 2020.
- Ardglen Quarry – extremely limited supply in 2020 while awaiting amended approvals.
- Braeside Quarry – consent has lapsed.
- Mackas Sand – fill sand and topsoil, no longer available, potentially indefinitely, supply exhausted and remaining materials more likely to be kept for higher value products.
- Concrush, SCE Mayfield and Boral recycling Kooragang Island – limited new feed for concrete recycled materials. Same for EBH and others on the Central Coast. This problem is much larger in the Sydney region with recyclers struggling for feed.
- Quarry Products – Allandale continue to have limited aggregate and roadbase supply available.

Considering the civil and infrastructure works being fast tracked in the Hunter region, as currently being evidenced on existing projects by limitations in supply of quarry products, there is great concern and the real possibility of the demand being unable to be met in the construction materials market. Supporting this is the status of a number of quarry resources reaching the limit of their operations, including:

- Peats Ridge Boral.
- Kulnura Hanson.
- Seaham Boral recently had their proposal denied to quarry deeper in the existing pit, meaning current capacity is approximately 3.3 Mt of resource. A new SSDA will be required to gain access to more resource, and this process can take many years.
- As noted above, it is also believed that Allandale Quarry has a limited life.

The importance of the quarry as a reliable quality resource for the region, to meet product demand and product quality requirements within the market, is readily evident by reviewing the quarry's significant customers. They include major companies and businesses that have their own resources in the region from which to source either hard rock quarry products, conglomerate quarry products or sand quarry products (including Boral, Hanson, Holcim, Metromix, Redicrete and EDI Downer).

3.2.2 Sand Resources

Sand is an equally important commodity in the manufacture of concrete and construction generally. Concrete is a carefully blended product of cement, water, course and fine aggregates, each element as important as the other. Previously, in the Hunter and Sydney region the fine aggregate portion has been met mostly by extracting sands from rivers or near river deposits as unconsolidated sand and gravel. Exhausted resources, regulatory and residential pressures have all but eliminated this type of resource.

The quarry produces high quality manufactured sand suitable for use in high quality concrete and asphalt products compliant to all applicable contemporary standards. The quarry is unique in that it is the only hard rock quarry in the Hunter offering washed manufactured sand to meet the requirements of high strength concrete specifications and coarse drainage sand for biofiltration and filter sand.

Other sand suppliers on the Newcastle sand dunes only provide a mid-size sand grain, as these sources have been carefully sorted and sized by the wind for thousands of years.

The other known independent supplier of the sand mix to the concrete batching plants in the Newcastle and Hunter region is a river gravel quarry known as Dalswinton Quarry. Dalswinton Quarry's consent was due to lapse in November 2019, however, approval is being sought to quarry up to 500,000 tpa (from a resource of 5 Mt).

Teralba Quarry (Metromix) does provide a washed concrete sand but quality and volumes available to independent concrete manufacturers are unknown.

If the quarry and Dalswinton Quarries cease to operate then the next nearest known independent supplier is Maroota, north west of Sydney.

3.3 Demand for Additional Extractive Resource

Heavy construction materials play a vital role in delivering the infrastructure required to support population and economic growth in NSW (Cement Concrete and Aggregates Australia (CCAA), 2018). These materials are a significant contributor to the overall costs of construction, and on delivering infrastructure and construction projects. For example:

- 63 Mt of sand, rock aggregate and gravel, are used in the construction of NSW homes, workplaces, public buildings and roads each year. This includes approximately 25 Mt of pre-mixed concrete (10,000,000 m^3), which requires approximately 12 Mt of aggregate and 7 Mt of sand.
    - Construction of a typical house, including driveway and landscaping, uses about 110 t of aggregate and 53 m^3 of concrete.
    - 1 km of highway uses up to 25,000 t of crushed rock.
    - 1 km of suburban roadway requires 5,000 t of crushed rock, 750 t of concrete for footpaths, kerbs and gutters and 450 t of asphalt for road surfacing.
    - 1 km of railway requires 2,000 t of aggregate.
    - A high-rise building can use up to 1,000 t of aggregate per floor.

- Each Australian requires 8 tpa of quarry materials (hard rock aggregates, sand, gravel and fill) to support the building of roads, houses and infrastructure to service their needs. As the population continues to grow therefore, the demand for these resources will also increase.

The construction sector, supported by an efficient heavy construction materials supply chain, provides the engine for the NSW economic growth. Cement, concrete, stone and sand are the critical materials that enable the NSW construction industry, employing 370,000 workers and contributing 45% of the NSW taxation revenue base (CCAA, 2020).

As discussed in **Section 3.2.1**, access to suitable resources is limited both by geology, local lithology and competing land uses. To be cost-efficient, sustainable and generally economically viable, quarries and their major consumers need to be relatively close to markets with good transport links to enable conveyance of the high volumes of materials. For these reasons, maximising the output from existing approved or proposed quarry development is important to securing access to the resources needed to sustain the future growth.

3.3.1 Current and Anticipated Market Requirements

Demand for products from the quarry will be driven by a combination of:

- infrastructure development – State or Federal spending on roads, rail, ports, schools, housing, hospitals, etc
- private investment – commercial development, industrial development and residential construction.

The Hunter Region is Australia's largest regional economy with a projected population increase of 130,000 by 2036 and a further 80,000 by 2056 (NSW Government, 2016). The Hunter Regional Plan 2036 estimates that an additional 70,000 dwellings will be needed in the region by 2036, of which 44,200 will be in the Maitland LGA. Based on the average consumption figures for quarry materials, up to 6.9 Mt of quarry products will be required annually, of which approximately 7.7 Mt of hard rock aggregates and 4.5 Mt of sand will be required for the production of concrete for housing alone. In addition, the NSW Metropolitan Plan for Sydney 2036 forecasts show Sydney's population is expected to grow by 1.7 million in 2036. Add to this the potential growth on the Mid North Coast, then NSW could potentially see an increase in these three regions of over 1.8 million people. The infrastructure that needs to support this growth is significant.

To support economic growth and enhance liveability in the Hunter Region, the NSW Government established the Hunter Infrastructure and Investment Fund (HIIF) with the aim of improving and developing the region's infrastructure. Over a period of four years, $450 million was allocated to the HIIF for the funding of projects such as the Lake Macquarie Football Centre, Singleton Gym and Swim Complex, Hunter Sports High School, John Hunter Children's Hospital, Nelson Bay Road, New England Highway and Wine Region Roads.

Furthermore, the NSW Budget 2020-21, announced in November 2020, will continue to invest in an infrastructure program over the next 4 years, with a record infrastructure pipeline of $107.1 billion to ensure the delivery of projects across the State, including:

- $10.4 billion for Sydney Metro West
- $9.2 billion for Sydney Metro – Western Sydney Airport
- $2.2 billion for the Sydney Gateway project - a new high capacity road connection from Sydney Airport and Port Botany to the new WestConnex St Peters Interchange

- $10.7 billion investment in Health infrastructure over the next four years
- $7.7 billion invested in Education and Skills infrastructure, with over $1.4 billion in new schools infrastructure funding for new and upgraded schools, and $100 million for asset replacement and maintenance for TAFE NSW to deliver quality training services.

Current upcoming TfNSW Major Projects over the next 5 years in the Hunter Region include:

- Golden Highway Intersection Upgrade (2021)
- Inner City Bypass – Jesmond to Rankin Park (fast tracked to begin construction 2022)
- Muswellbrook Bypass (begin construction 2022)
- Singleton Bypass – (fast tracked to begin construction 2023)
- Hexham Straights upgrade (estimated 2023 construction)
- M1 – Beresfield to Raymond Terrace (estimated 2024 construction).

In addition, the federal government announced in May 2021 a $66 million investment in widening the Williamtown runway. The project includes a seven and a half metre extension on either side of the runway, which will allow planes such as the Boeing 787, the Boeing 777, the Airbus A350 to land at the Newcastle Port Stephens Airport.

Federal, State and regional strategy documents recognise that Australia will require significant investment in infrastructure to maintain and increase productivity. Noteworthy documents include the following:

- Future Transport 2056: Regional NSW Services and Infrastructure Plan prepared by TfNSW (2019) identifies key transport priorities for regional NSW, including new road, rail and port infrastructure, as well as upgrades to existing infrastructure. This strategy document identifies the Hunter as NSW's largest and fastest growing region, with population increasing from 730,000 in 2016 to 860,000 in 2036 and 940,000 in 2056. Specific to the Hunter region, this strategy document identifies road by-passes of regional centres (new roads), better rail connection (rail upgrades) and establishment of a freight corridor for the lower hunter (new roads and rail). TfNSW (2016).
- The Strategic Regional Land Use Plan: Upper Hunter Infrastructure (NSW Government, 2012) identified maintaining and improving infrastructure, particularly road and rail capacity, as a key deliverable for the region.
- The Hunter Regional Plan 2036 (NSW Government, 2016) identifies population growth and plans for expanding transport networks and inter-regional transport connections.
- National Remote and Regional Transport Strategy (2015).
- Australian Infrastructure Plan (2016).
- NSW State Infrastructure Strategy (2014) identifies 30 investment recommendations for infrastructure projects valued at a combined $18.9 billion including targeting productive regional industries and connected regional communities.

There are also a number of local strategies and Council operational plans which envisage the construction of new and upgraded infrastructure. As identified in **Section 3.3.1**, the construction of new infrastructure, particularly that for road and rail transport, requires large volume of quarry products.

3.4 Rationale for the Martins Creek Quarry Extension

3.4.1 Establishing Quarry Operation

The quarry is well-established as an important extractive resource in the Hunter Region. The quarry has been servicing the local construction industry and larger Federal and State government infrastructure projects in the wider Hunter Region by processing and delivering high quality aggregates and associated specialised quarry products. These include coarse and fine aggregate, pre-coat aggregate, manufactured and modified road base and washed coarse manufactured sand used in road, railway, concrete and civil construction. As these resources are limited in the Hunter region, the products supplied from the quarry are of significant importance for both the Hunter and NSW economies.

As an existing development, with a resource estimate the subject of this development application of 22 Mt, continued operation would reduce the requirement for the establishment of an alternative quarry development elsewhere. Notwithstanding the geological, lithological and land use constraints identified in locating a suitable resource within the region (as discussed in **Section 3.1.2**), continued operation of an existing development would be more in keeping with the precautionary principle, as impacts would be known or better able to be predicted.

Regional Demand

The forecasted growth within the Hunter Region (TfNSW, 2019) will increase baseline market need for hard rock quarry products to service the demand for building and construction materials. Based on a population of 860,000 in 2036, the demand for construction materials for the maintenance of the Hunter region population alone would grow to at least 6.9 Mt annually. As identified in **Section 3.3.1**, significant investment in regional infrastructure is planned which will significantly increase the demand for quarry products. Considering the currently approved production volumes of larger (SSD) quarries in the region (4.7 Mt), this is unlikely to be sufficient to supply future demand. If the additional hard rock resources of the proposed new and expanded quarry operations (including that of Martins Creek Quarry) are included, this annual supply would rise to approximately 9.1 Mt which would ease the pressure on supply.

This notwithstanding, additional pressure on supply of quarry products within the Hunter is likely as significant growth in Sydney creates ongoing and increased demand for concrete and road surfacing aggregates. The quarry products required to produce these materials are in ever reducing supply from within the Sydney basin and as a result will be imported from regions such as the Hunter to supply demand. This is already evident with the requirement for the approved Brandy Hill Quarry expansion to supply the greater Sydney market. This demand is most likely to affect the quarries of those companies with vertically integrated supply chains, i.e. those which also produce concrete. As an independent quarry operation, Daracon will not be subject to the same pressure to supply Sydney concrete plants and therefore provide greater certainty of supply of quarry products into the Hunter region.

Quarry Resource Properties

Importantly, various petrological and other testing of materials taken from the quarry and other quarries in the region illustrate that the physical and chemical properties of the material meets all required standards for concrete production, road and rail construction, marine armour rock, rip rap, revetment or rockfill. In fact, the testing undertaken by VGT (2021) confirms that in many cases the latite (strong and durable andesite) resource has properties better than those of the other quarries. Considering the significant constraints on identification of land with the right geological and lithological properties free from other land use constraints, the estimated 22.4 Mt of latite would provide a significant boost to regional supply.

The quarry currently produces two unique hard rock products to satisfy specific TfNSW/RMS road building specifications. These materials are considered especially important for the construction of heavily trafficked roads and supply of these would assist in the objectives of the NSW and Federal governments to improved regional infrastructure and transport networks.

The production of a manufactured sand product which the requirements of high strength concrete specifications (of AS 2758.1:2014) is also of significance and increases the importance of the quarry as a supplier of construction materials. It has been recognised for almost 20 years, initially by Pienmunne & Whitehouse (2001) and through subsequent strategic analysis of construction material supply and demand, that supply of washed sand for concrete production would need to be increasingly sourced from outside the Sydney basin. As of 2016, up to 1 Mt of sand, including fine sand, was being imported to the Sydney market as local supplies within the greater Sydney metropolitan area were exhausted (NSW Trade & Investment, 2016[1]). With increasing volumes of sand to be imported to Sydney, greater pressure is likely to be placed on sand supplies in locations such as the Hunter, Mulwaree and Shoalhaven regions. As the availability of natural sand resources reduces over time, greater reliance will be placed on the availability of manufactured sands. As identified in **Section 3.1.3**, the quarry is the only hard rock quarry in the Hunter offering washed manufactured sand to meet the requirements of high strength concrete specifications (of AS 2758.1:2014) and coarse drainage sand for biofiltration and filter sand.

Transport Networks

The quarry is connected to the Main North Coast railway line with direct access by rail from the quarry to the ARTC Control Centre at Broadmeadow.

It is anticipated that it will have a significant place in the State market due to the potential utilisation of the rail siding. Railway ballast has been supplied by rail, predominately rail ballast for rail infrastructure purposes. However, Daracon is continuing to investigate the commercial viability of transporting other quarry products to more distant markets utilising rail distribution, including to service the greater Sydney region.

Further to this, the quarry is near the Greater Newcastle/Sydney Metropolitan regions via the Hunter Expressway/M1 (Pacific Highway). This not only allows for economic delivery of quarry products to these markets, it allows straightforward access to many of the major infrastructure upgrade projects nominated in **Section 3.3.1**.

3.5 Summary

The proposed continued operation and extension of the quarry is intended for the ongoing supply of construction material to regional markets of the Hunter and Central Coast, local markets, major regional infrastructure and to supplement Sydney markets. The resource has been identified as regionally significant and with properties conducive to the production of concrete aggregates and construction materials to nominated specifications. The proposed development of the resource would provide for the easing and securing of future supply constraints and is considered to be an orderly and economical use of the land, optimising use of an existing quarry and processing facility with proven high quality products, with access to main road and rail transport.

[1] NSW Trade & Investment, 2016, Geological Survey of NSW : Minerals & Land use Assessment, NSW Offshore Sand Review, published by the NSW Department of Trade and Investment, Regional Infrastructure and Services, August 2016

4.0 Updated Strategic and Statutory Context

The following section details the strategic and statutory context for the Revised Project and discusses the application of the planning provisions to the Revised Project.

4.1 Commonwealth Legislation

4.1.1 Environment Protection and Biodiversity Conservation Act 1999

Under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), approval by the Commonwealth Minister for the Environment is required for any action that may have a significant impact on matters of national environmental significance. These matters are:

- World Heritage properties
- National Heritage places
- wetlands of international importance
- threatened species and ecological communities listed under the EPBC Act
- migratory species
- Commonwealth marine areas
- the Great Barrier Reef Marine Park
- nuclear actions
- a water resource, in relation to coal seam gas development and large coal mining development
- Commonwealth land.

If an 'activity' is likely to have a significant impact on a matter of national environmental significance, then it may be a 'controlled action' and should be referred to the Commonwealth Minister for the Environment for consideration.

The only provisions of the EPBC Act which are potentially relevant to the Revised Project relate to potential impacts on migratory species, threatened species, or ecological communities listed under the EPBC Act. None of the other matters would be impacted by the Revised Project.

On 21 July 2016, the Commonwealth Department of Agriculture, Water and the Environment (DAWE) declared the Original Project a controlled action requiring approval under the EPBC Act from the Commonwealth Minister for the Environment due to its potential impacts on the following matters of national environmental significant:

- Slaty Red Gum (*Eucalyptus glaucina*) – Vulnerable
- Koala (*Phascolarctos cinereus*) combined populations of Qld, NSW and the ACT – Vulnerable
- Regent Honeyeater (*Anthochaera phrygia*) – Critically Endangered
- Swift Parrot (*Lathamus discolour*) – Critically Endangered

- Spot-tailed Quoll (*Dasyurus maculatus maculatus*) SE mainland population – Endangered
- Hunter Estuary Wetlands – a wetland of international importance (Ramsar wetland).

A copy of the determination of the Original Project as a controlled action is provided in **Appendix A**. The assessment path for the Project is under the bilateral agreement between the Commonwealth and NSW Governments and DAWE has issued its assessment requirements which have been incorporated into the SEARs for the Project (refer to **Section 4.2.1.2**). **Section 7.0** and **Appendix K** detail the assessment undertaken in accordance with the DAWE assessment requirements. In addition, the Biodiversity Assessment Report prepared by Conacher Consulting Pty Ltd contains the results of the search of the Protected Matters Tool (AGDE 2016) for EPBC Act listed threatened and migratory species recorded within 10 km of the Project Area (refer to **Appendix K**).

4.1.2 Native Title Act 1993

The *Native Title Act 1993* is administered by the National Native Title Tribunal. The Tribunal is responsible for maintaining a register of native title claimants and bodies to whom native title rights have been granted. The Act prescribes that native title can be extinguished under certain circumstances, including the granting of freehold land. The Project Area is located within freehold land. A 'paper road' runs between the east and west sides of the quarry (west of Lot 21 DP 773220 and Lot 1 DP 1006375) which is part Crown road and part DSC Road (refer to **Figure 1.4**). Daracon and the Landowner have made applications to Crown Lands and DSC in respect of road closure.

A search of the Register of Native Title Claims did not identify any registered claims within the Project Area.

4.2 NSW Legislation and Policies

There are a substantial number of legislative instruments in NSW which regulate the environmental impact of development. The primary instrument is the EP&A Act which regulates the planning and environmental assessment and approval process for development in NSW. The application of the EP&A Act and subordinate legislation to the Revised Project is discussed in **Sections 4.2.1** and **4.2.2**. The operation of other NSW state environmental legislation in regard to the Revised Project is discussed in **Sections 4.2.3** and **6.0** in relation to specific Revised Project impacts where relevant.

Section 4.2.4 discusses the key strategic policies that have relevance to the design and operation of the Revised Project and which have been considered in the environmental assessment of the Revised Project. In addition to the policies discussed in **Section 4.2.4**, there are a large number of impact specific guidance documents and policies that have been considered as part of the environmental assessment of the Revised Project, these are identified and discussed in the relevant impact assessment sections in **Section 6.0**.

4.2.1 Environmental Planning and Assessment Act 1979

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

The objects of the EP&A Act are set out in Section 6 of the Act and are outlined in **Table 4.1**, including a discussion of how the Revised Project seeks to achieve consistency with these objectives. In order to meet these objectives, the EP&A Act prescribes a number of approval and assessment pathways for new development and modifications to existing development. These pathways are determined by environmental planning instruments such as local environmental plans and State Environmental Planning Policies.

Table 4.1 Objectives of the Environmental Planning and Assessment Act 1979

Objective	Consistency of the Revised Project
(a) to promote the social and economic welfare of the community and a better environment by the proper management, development and conservation of the State's natural and other resources	The Revised Project represents a continuation of a long-standing historical land use that is permissible under existing environmental planning instruments (refer to **Section 4.2.2**). The ADA includes a comprehensive assessment of the positive and negative social, economic and environmental impacts associated with the Revised Project. Substantial changes have been made to the Revised Project to minimise the potential adverse impacts of the on the environment and local community (as discussed in **Sections 1.6**, **2.0** and **6.0**). The ADA includes an overall assessment of the merits of the Revised Project having regard for these issues (refer to **Section 9.0**).
(b) to facilitate ecologically sustainable development by integrating relevant economic, environmental and social considerations in decision-making about environmental planning and assessment	The environmental assessment completed for the Revised Project provides the consent authority with a comprehensive assessment of the positive and negative social, economic and environmental impacts associated with the Revised Project and considers these impacts in the context of the principles of ecologically sustainable development including inter-generational equity and the precautionary principle (refer to **Sections 6.0** and **9.0**). The stakeholder engagement processes undertaken for the Revised Project has provided extensive opportunities for community views on the Revised Project to be documented for consideration in the decision-making processes of both the proponent and the consent authority.
(c) to promote the orderly and economic use and development of land	The Revised Project represents a continuation of a long-standing historical land use and is an extension of an existing operating quarry. Extractive industries are permissible with consent in the Project Area. Consideration of the compatibility of the proposed development with surrounding land uses has been provided in **Sections 6.2** and **9.2** and a cost benefit analysis of the Revised Project is provided in **Section 6.14**. The overall merits of the Revised Project are considered in the ADA along with assessment of alternatives to the Revised Project.
(d) to promote the delivery and maintenance of affordable housing	Whilst not directly relevant, it should be noted that the quarry supplies a range of construction materials for local and regional markets, contributing to the cost-effective construction of infrastructure and provision of materials as part of the supply chain for ongoing delivery of affordable housing development.
(e) to protect the environment, including the conservation of threatened and other species of native animals and plants, ecological communities and their habitats	The Revised Project has been specifically redesigned to minimise social amenity and environmental impacts as detailed in **Sections 2.0** and **6.0**. The ADA includes a comprehensive assessment of the Revised Project's potential impacts on terrestrial and aquatic ecosystems. All impacts on terrestrial ecosystems will be fully offset in accordance with relevant NSW Government policy. The Revised Project is not predicted to have a significant impact on aquatic ecosystems.

Objective	Consistency of the Revised Project
(f) to promote the sustainable management of built and cultural heritage (including Aboriginal cultural heritage)	The Revised Project has been specifically redesigned to minimise social amenity and environmental impacts as detailed in **Sections 2.0** and **6.0**. The long history of quarry development in the Project Area has resulted in landscape modification. The Revised Project will not impact on any identified Aboriginal sites. The Project Area is considered to have low archaeological values and a low potential for objects to occur within the Project Area.
(g) to promote good design and amenity of the built environment	The Revised Project represents a continuation of a long-standing historical land use. The Revised Project is not inconsistent with the existing land uses in the area. The Revised Project includes the construction of additional proposed infrastructure including a weighbridge, rail spur extension, intersection and bridge approach upgrades. The proposed intersection and bridge approach upgrades will be visible to road commuters and a small number of private residences. The design and construction of any built items will aim to be as sympathetic to the surrounding environment as possible.
(h) to promote the proper construction and maintenance of buildings, including the protection of the health and safety of their occupants	Any buildings will be designed in accordance with relevant engineering and safety standards.
(i) to promote the sharing of the responsibility for environmental planning and assessment between the different levels of government in the State	Relevant Government agencies have been consulted during the preparation of the ADA and will be provided an opportunity to review the ADA and provide comment. The views of agencies have been considered in the design of the Revised Project and will be considered as part of the assessment process.
(j) to provide increased opportunity for community participation in environmental planning and assessment	The local and regional community have been provided with a range of opportunities to participate in the environmental assessment process. Details of community and stakeholder consultation undertaken during the project redesign and updated environmental assessment process for the Revised Project is summarised in **Section 5.0**. Further opportunity for community participation will be provided following submission of this documentation to the DPIE and the public exhibition process.

4.2.1.1 Approval Pathway

State Significant Development (SSD)

Clause 8(1)(b) and clause 7(1)(a) of Schedule 1 of State Environmental Planning Policy (State and Regional Development) 2011 (SRD SEPP) declares development for the purposes of extractive industry with a resource in excess of 5 Mt as SSD. Development consent under Divisions 4.1 and 4.7 of Part 4 of the EP&A Act is required before the proposed extension can be carried out.

The ADA will be determined by the IPC under delegation from the Minister for Planning.

Permissibility

The majority of the Project Area is zoned RU1 Primary Production under the provisions of the LEP (refer **Figure 1.4**). Under the provision of the Dungog LEP, extractive industries are permissible with development consent in RU1 Primary Production. A small section of land within Lot 1 DP204377, located towards the southern extent of the Project Area, is zoned RE1 – Public Recreation. This area does not form part of the quarry's operations. It is also outside of the proposed disturbance footprint and will therefore not be impacted by the Revised Project.

As the development is permissible with consent, the Minister (or delegate) can approve the carrying out of the Revised Project.

4.2.1.2 Assessment Requirements

As SSD, the Revised Project is subject to the general assessment requirements under Part 4 of the EP&A Act as amended by the requirements under Part 4 Division 4.1 of that Act. The requirements are discussed below.

Section 4.15 Matters for Consideration

Under Part 4, the consent authority, in this case the Independent Planning Commission (IPC), must have regard to the matters set out in section 4.15 of the EP&A Act. The matters for consideration by the consent authority and where they have been addressed in this ADA and RTS Report are provided in **Table 4.2**.

Table 4.2 Section 4.15 Matters for Consideration

Matters for Consideration	Relevant Section
(a) The provisions of: **Any environmental planning instrument**	**Sections 4.2.1** and **4.2.2**
Any proposed instrument that is or has been the subject of public consultation under this Act and that has been notified to the consent authority (unless the Secretary has notified the consent authority that the making of the proposed instrument has been deferred indefinitely or has not been approved)	**Sections 4.2.2** and **4.2.3**
Any development control plan	Not applicable due to operation of Clause 11 of SRD SEPP.
Any planning agreement that has been entered into under section 93F, or any draft planning agreement that a developer has offered to enter into under section 93F	Not applicable. Planning agreements not yet entered into, however discussions with DSC and Maitland City Council (MCC) have commenced.
The regulations (to the extent that they prescribe matters for the purposes of this paragraph)	**Section 4.2.1**
Any coastal zone management plan (within the meaning of the Coastal Protection Act 1979) that applies to the land to which the development application relates	Not applicable. Revised Project not subject to any coastal management plan.
(b) The likely impacts of that development, including environmental impacts on both the natural and built environments, and social and economic impacts in the locality	**Section 6.0** and **Appendix C** to **Appendix N**
(c) The suitability of the site for the development	**Sections 6.2** and **9.2**
(d) Any submissions made in accordance with this Act or the regulations	Part B - **Sections 12.0** to **14.0**
(e) The public interest	**Section 9.0**

The ADA has also addressed the SEARs provided for the Original Project which were issued by DPIE on 4 August 2016. The SEARs outline the specific requirements to be addressed as part of the relevant environmental assessment. A copy of the SEARs is contained in **Appendix A** with a checklist of the SEARs and where they have been addressed in this ADA.

4.2.2 Environmental Planning Instruments

There are a number of environmental planning instruments that are potentially applicable to the Revised Project; these are discussed below.

4.2.2.1 Local Environmental Plans

Dungog Local Environmental Plan 2014

The Project Area is located within the Dungog LGA and is subject to the Dungog LEP. The proposed extension of the quarry can be defined as 'Extractive Industries' under the provisions of the Dungog LEP.

Extractive Industries 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.

The Project Area is largely located within land zoned RU1 Primary Production with a small portion within RE1 – Public Recreation. The permissibility of the Revised Project within these zones is discussed in **Section 4.2.1**.

The objectives of the RU1 Primary Production zone are as follows:

> *to encourage sustainable primary industry production by maintaining and enhancing the natural resource base*
>
> *to encourage diversity in primary industry enterprises and systems appropriate for the area*
>
> *to minimise the fragmentation and alienation of resource lands*
>
> *to minimise conflict between land uses within this zone and land uses within adjoining zones*
>
> *to provide for recreational and tourist activities that are compatible with the agricultural, environmental and conservation value of the land*
>
> *to promote the rural amenity and scenic landscape values of the area and prevent the silhouetting of unsympathetic development on ridgelines.*

The Revised Project is considered to be consistent with these principles, as the quarry is an economically productive industry and is not likely to impact any rural and agricultural uses in the locality. As discussed in **Section 6.2**, the low soil fertility and slope of the landforms across the Project Area limits the potential for sustainable agricultural use of the land in a manner that is both financially and environmentally responsible. There are no known commercial farming operations in the immediate locality and no agricultural areas would be removed from production or agricultural use as a result of the Revised Project. The proposed final land use (refer **Section 6.19.1**) is focused on promoting the rural landscape by establishing native grassland or exotic pastures in low lying areas whilst focusing on the re-introduction of pockets of woodland species across the benches consistent with endemic vegetation types.

Dungog Development Control Plan 2018

The Dungog Development Control Plan 2018 (Dungog DCP) does not apply to SSD under clause 11 of the SRD SEPP.

4.2.3 State Environmental Planning Policies

The following State Environmental Planning Policies (SEPPs) are relevant to the consideration of the ADA for the Revised Project.

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

The Extractive Industries SEPP regulates the permissibility and assessment requirements for mining, petroleum production and extractive industries and related development. Part 3 of the Extractive Industries SEPP requires specific matters to be considered in relation to development applications for extractive industry developments or applications that will affect existing or proposed operations.

Clause 12 of the Extractive Industries SEPP, extracted below, requires the consent authority to consider the compatibility of proposed extractive industry developments with existing land uses in the area.

> ***12 Compatibility of proposed mine, petroleum production or extractive industry with other land uses***
>
> *Before determining an application for consent for development for the purposes of mining, petroleum production or extractive industry, the consent authority must:*
>
> *(a) consider:*
>
> *(i) the existing uses and approved uses of land in the vicinity of the development;*
>
> *(ii) whether or not the development is likely to have a significant impact on the uses that, in the opinion of the consent authority having regard to land use trends, are likely to be the preferred uses of land in the vicinity of the development; and*
>
> *(iii) any ways in which the development may be incompatible with any of those existing, approved or likely preferred uses.*
>
> *(b) evaluate and compare the respective public benefits of the development and the land uses referred to in paragraph (a) (i) and (ii); and*
>
> *(c) evaluate any measures proposed by the applicant to avoid or minimise any incompatibility, as referred to in paragraph (a) (iii).*

The Revised Project is within an area which has been subject to quarrying since the early 1910s, with this quarrying activity coexisting with neighbouring land uses for over 90 years. The Revised Project is therefore considered to be compatible with existing land use of the quarry and broadly compatible with the surrounding land uses. Key elements of the Revised Project have been designed to minimise impacts on surrounding land uses. The compatibility of the Revised Project with surrounding land uses is considered in more detail in **Section 6.2.4**.

Clause 12A of the Extractive Industries SEPP requires the consent authority to consider the voluntary land acquisition and mitigation policy (VLAMP) before determining an application. The VLAMP (2018) has been considered in the Noise Impact Assessment (NIA) and Air Quality Impact Assessment (AQIA) (refer to **Appendix D** and **Appendix E** respectively) and is further discussed in **Section 4.2.4**.

Clause 13 of the Extractive Industries SEPP requires the consent authority to consider the potential impact of proposed extractive industry on other mining, petroleum production or extractive industry projects or potential resources. Hanson Construction Materials (Hanson) operates the Brandy Hill hard rock quarry located approximately 20 km south-east of the quarry. The Brandy Hill Expansion Project was approved by the IPC of NSW on 16 July 2020. The Revised Project now proposes a single haul route, avoiding potential material cumulative traffic impacts with the approved Brandy Hill operations (refer to **Section 6.3**).

Daracon will continue to consult with Hanson regarding matters such as information sharing and management of any interaction issues and management of cumulative impacts. The Revised Project will not cumulatively interact with any other mining, petroleum or extractive industry operations or known resources.

Clause 14 of the Extractive Industries SEPP requires the consent authority to consider the impact of a proposed extractive industry project on the natural resources and whether specific environmental management conditions (relating to water resources, biodiversity and greenhouse gas emissions) should be imposed on the development if approved. The Revised Project's potential impact on natural resources is dealt with in detail in **Section 6.0** (specifically, **Section 6.6** (greenhouse gas), **Sections 6.8** and **6.9** (groundwater and surface water) and **Section 6.10** (biodiversity)) and Project specific commitments regarding the management of potential environmental impacts are contained in **Section 8.0**.

Clause 15 of the Extractive Industries SEPP requires the consent authority to have regard to the efficiency of a proposed extractive industry development in terms of its ability to optimise extraction of the target resources. A key outcome of the Revised Project is the optimisation of the recovery of hard rock material within the quarry lease areas licenced by Daracon. This is discussed in more detail in **Section 2.1**.

Clause 16 of the Extractive Industries SEPP requires the consent authority to consider whether or not the extractive industry under consideration should be subject to conditions restricting the use of public roads, including in residential areas or near schools. Traffic and noise impacts associated with the Revised Project have been addressed in **Sections 6.3** and **6.4** respectively, with the full reports provided in Appendices D and E respectively.

Clause 17 of the Extractive Industries SEPP requires a consent authority determining a development application for an extractive industry to consider imposing conditions regarding the rehabilitation of land affected by the proposed development extraction areas will be progressively rehabilitated as the Revised Project progresses and the Project Area will be fully rehabilitated as part of the closure process following completion of quarrying. Progressive rehabilitation is discussed in further detail in **Section 6.19**.

State Environmental Planning Policy (Koala Habitat Protection) 2020/2021

SEPP (Koala Habitat Protection) 2021 (Koala Habitat SEPP 2021) was made and commenced on 17 March 2021. The Koala Habitat SEPP 2021 applies across all zones in the 8 Sydney Metropolitan Councils and Central Coast and to zones other than RU1, RU2 and RU3 for the remaining 74 councils. State Environmental Planning Policy (Koala Habitat Protection) 2020 (Koala Habitat SEPP 2020) applies to the RU1, RU2 and RU3 zones in the 73 LGAs, including Dungog LGA.

Koala Habitat SEPP 2020 aims to encourage the proper conservation and management of areas of natural vegetation that provide habitat for koalas to ensure a permanent free-living population over their present range and reverse the current trend of koala population decline. The Koala Habitat SEPP 2020 replicates the objectives and provisions of the previous SEPP No. 44 - Koala Habitat protection (SEPP 44), which was in force from 1995 through to 2019.

The Koala Habitat SEPP 2020 applies to the extent that the Revised Project is located within an LGA listed in the SEPP, and a consent authority is restricted from granting development consent for proposals on land identified as core koala habitat without the preparation of a plan of management.

Dungog LGA is listed in Schedule 1 of the Koala Habitat SEPP 2020 and therefore the SEPP applies to the Revised Project as it is zoned RU1 (refer to **Section 4.2.1.1**).

An extensive biodiversity assessment (refer to **Section 6.10**) has been conducted for the Revised Project and includes a koala habitat assessment. The Project Area contains areas of Potential Koala Habitat, in accordance with the Koala Habitat SEPP 2020. In keeping with the SEPP, the Project Area is also likely to contain Core Koala Habitat as a resident population of the koala is considered to be present, as evidenced by two recent sightings of individuals and historical records of a koala population (as outlined in **Appendix J**). DSC does not have a Koala Plan of Management and is not the determining authority, therefore the provisions of the Koala Habitat SEPP 2020 do not apply.

Impact avoidance, mitigation and management measures have been applied to the Revised Project and the impacts to this species will also be offset in accordance with the requirements of relevant policies (refer to **Section 6.10**).

State Environmental Planning Policy 33 – Hazardous and Offensive Development (SEPP 33)

SEPP 33 requires the consent authority to consider whether an industrial proposal is a potentially hazardous industry or a potentially offensive industry. A hazard assessment is completed for potentially hazardous development to assist the consent authority to determine acceptability.

A hazard and risk assessment was completed for Revised Project (refer to **Section 6.15**). This assessment concluded that none of the hazardous materials to be stored at the Project are above SEPP 33 screening thresholds. As such, a Preliminary Hazard Analysis (PHA) is not required to be undertaken for the Project. The assessment also concluded that the maximum delivery quantity of Class 3 (II), Class 2.1 and Class 8 materials will not exceed the screening thresholds. Therefore, a transport route evaluation is not required.

State Environmental Planning Policy 55 – Remediation of Land (SEPP 55)

SEPP 55 aims to provide a state-wide planning approach to the remediation of contaminated land and to reduce the risk of harm to human health and the environment by consideration of contaminated land as part of the planning process. Under SEPP 55, a consent authority must not consent to the carrying out of development on land unless it has considered any potential contamination issues.

There are no contaminated sites currently recorded within the Project Area, however activities carried out at the quarry have the potential to cause contamination if not properly managed. The management of contamination risks is discussed further in **Sections 6.15** and **6.16**. Given the proposed use of the Project Area continues to be for quarrying activities and rail use associated with the quarry, no preliminary land contamination investigation is required.

State Environmental Planning Policy (State and Regional Development) 2011

The SRD SEPP declares that the Revised Project (as development for the purposes of extractive industry with a resource in excess of 5 Mt) is SSD. The application of the SRD SEPP is largely limited to the issue of approval pathway and is discussed in further detail in **Section 4.2.1**.

4.2.4 Other State Legislation

A summary of the other State environmental and planning legislation potentially relevant to the Revised Project is provided in **Table 4.3**.

Table 4.3 Summary of Other State Legislation and Relevance to the Revised Project

Regulatory Instrument	Application to Revised Project	Approval Required?
Biodiversity Conservation Act 2016 (BC Act)	The BC Act establishes mechanisms for the: • management and protection of listed threatened species of native flora and fauna (excluding fish and marine vegetation) • listing of threatened species or key threatening processes • development and implementation of recovery and threat abatement plans • declaration of critical habitat • consideration and assessment of threatened species impacts in development assessment process • management and regulation of actions that may damage critical or other habitat or otherwise significantly affect threatened species, populations and ecological communities. The Revised Project has been assessed under the provisions of the *Biodiversity Conservation (Savings and Transitional) Regulation (2017)*, as further discussed in **Section 6.10**.	No – the Revised Project is being assessed under the Framework for Biodiversity Assessment
Crown Land Management Act 2016 (CLM Act)	The CLM Act provides for the ownership, use and management of Crown land in NSW. Crown land may not be occupied, used, sold, leased, licensed, dedicated, reserved or otherwise dealt with unless authorised by this Act. The Minister may grant a 'relevant interest' such as a lease, licence or permit, over Crown land for the purpose of any infrastructure, activity or other purpose that the Minister thinks fit. Approvals will be required to undertake works in the land located within the Project Area that is currently declared as Crown road reserve unless they are closed or converted to freehold and sold prior to impact. As noted earlier, a 'paper road' runs between the east and west sides of the quarry (west of Lot 21 DP 773220 and Lot 1 DP 1006375) which is part Crown road and part Council Road (refer to **Figure 1.4**). The landowner has made an application to NSW Crown Land in respect of road closure.	No
Dams Safety Act 2015	The Dams Safety Act requires that Dam Safety NSW ensure that any risks that may arise in relation to dams (including any risks to public safety and to environmental and economic assets) are of a level that is acceptable to the community. Dams Safety NSW may, by order published in the Gazette, declare a dam or proposed dam to be a declared dam for the purposes of this Act. The Revised Project does not include the construction of any dams that are likely to be declared dams under the *Dams Safety Act 2015*.	No
Environmentally Hazardous Chemicals Act 1985	Under the *Environmentally Hazardous Chemicals Act 1985* a licence is required for any storage, transport or use of prescribed chemicals. Should such a licence be required under this Act during the life of the Revised Project, Daracon or the relevant contractor will obtain a licence prior to the storage, transport or use of prescribed chemicals.	If required

Regulatory Instrument	Application to Revised Project	Approval Required?
Explosives Act 2003	The *Explosives Act 2003* is administered by SafeWork NSW. Under this act a licence is required for the storage of explosives on site. It is proposed that no explosives will be stored on site, with all explosives brought onto the quarry site as needed and loaded directly into the drill hole.	No
Heritage Act 1977 (Heritage Act)	The *Heritage Act* makes provisions to conserve the environmental heritage of the State. It provides for the identification and registration of items of State heritage significance, provides for the interim protection of items of State heritage significance, constitutes the Heritage Council of NSW and confers on it functions relating to the State's heritage. As SSD, it is not necessary to obtain approvals under the provisions of the *Heritage Act 1977* in relation to activities approved under Part 5.1 of the EP&A Act. However, this does not exempt the Revised Project from requiring heritage assessment, which may identify heritage/archaeological sites and provide recommendations for their management, and the consideration of the provisions of the relevant statutory controls. An assessment of heritage issues has been completed for the Revised Project, refer to **Section 6.10**.	No
National Parks and Wildlife Act 1974 (NPW Act)	The object of the NPW Act relate to conserving their State's natural and cultural heritage; fostering public appreciation, understanding and enjoyment of their State's natural and cultural heritage; and managing any lands reserved for the purposes of conserving and fostering public appreciation and enjoyment of the State's natural and/or cultural heritage. Under section 86 of the NPW Act, it is an offence to harm an Aboriginal object, except where authorised by an Aboriginal heritage impact permit issues under section 90 of the Act. As SSD, it is not necessary to obtain approvals under the provisions of section 90 of NPW Act. An Aboriginal cultural heritage assessment has been completed for the Revised Project, refer to **Section 6.12**.	No
Protection of the Environment Operations Act, 1997 (POEO Act)	***Quarrying and Processing Activities*** The POEO Act provides an integrated system of licensing for polluting industries. Schedule 1 of the POEO Act identifies types of development that require an Environment Protection Licence (EPL). "Crushing, grinding or separating" and "extractive activities…if they involve the extraction or processing of more than 30,000 t of extractive materials per year" are listed in Schedule 1. Daracon currently holds EPL 1378 issued under the POEO Act for the current quarrying operations. The licence regulates water quality and the volume of water discharges and requires dust and meteorological monitoring at the quarry. It is expected that modification to this licence would be required should approval for the Revised Project be granted.	Yes

Regulatory Instrument	Application to Revised Project	Approval Required?
	Storage and use of coal ash The POEO Act requires an EPL for the storage and application to land of waste, including fly ash or coal ash, which the proponent intends to use in blended products. An EPL will not be required to store or stockpile coal ash, or otherwise apply it to land, if a resource recovery exemption applies. Clause 93 of the *Protection of the Environment Operations (Waste) Regulation 2014* enables the EPA to issue resource recovery exemptions 'where the application of a waste material to land, its use as a fuel, or use in connection with a process of thermal treatment is a bona-fide, fit-for-purpose, re-use opportunity rather than a means of waste disposal' (EPA 2015). The Coal Ash Exemption 2014 applies to the following: (a) Coal ash and coal ash blended with other materials (blended coal ash) that is, or is intended to be, applied to land as an engineering material. Coal ash means coal combustion products (CCPs), fly ash or furnace bottom ash from burning Australian black coal. (b) Any person who applies, or intends to apply, coal ash or blended coal ash (a consumer). (c) The premises at which the actual or intended application of coal ash or blended coal ash is carried out. If the conditions of the Coal Ash Exemption are complied with, each consumer is exempt from certain requirements under the POEO Act, including the requirement to obtain licences for waste storage and application of waste to land. Conditions of the Coal Ash Exemption 2014 including the following: (a) At the time the coal ash is received at the premises, the material must meet all chemical and other material requirements for coal ash or blended coal ash required under the Coal Ash Order 2014. (b) In cementitious mixes, the consumer can only apply coal ash or blended coal ash to land where it complies with a relevant specification or Australian Standard or supply agreement. The proponent is likely to be both a consumer and a supplier under the Coal Ash exemption. The Revised Project will be operated in accordance with the requirements and conditions of the *Coal Ash Exemption 2014* and the *Coal Ash Order 2014*, or an EPL will be obtained to authorise storage of any coal ash and blended products	
Roads Act 1993 (Roads Act)	The *Roads Act 1993* is administered by the Roads and Maritime Services (RMS) [now Transport for NSW (TfNSW)]. TfNSW is the roads authority for all freeways. The Minister administering the *Crown Land Management Act 2016* is the roads authority for all Crown roads. The council of a local government area is the roads authority for all public roads within the area, except freeways and Crown roads or other public roads for which another entity is declared by the regulations to be the roads authority. Consent of the appropriate roads authority is required under section 138 of the Roads Act to work on or above a road or to connect a road to a classified road.	Yes

Regulatory Instrument	Application to Revised Project	Approval Required?
	Consents under section 138 will be required for road works, including: • new site access road off Dungog Road • upgrade of intersection at Dungog Road and Gresford Road • upgrade of intersection at King and Duke Street (within the village of Paterson) • upgrade of approach to Gostwyck Bridge. The closure of any public road must also follow the procedure under the Roads Act. Proposed road works will be designed in consultation with Council and the RMS/TfNSW, in accordance with Austroads Guidelines.	
Water Management Act 2000 (WM Act)	The WM Act regulates the taking, interception, storage and use of surface water and groundwater within areas subject to water sharing plans. The *Water Act 1912* regulates water use and access in areas of NSW where water sharing plans under the WM Act have not yet been gazetted. The *Aquifer Interference Policy* (AIP) clarifies the requirements for obtaining water licences for aquifer interference activities under NSW water legislation and establishes and objectively defines considerations in assessing and providing advice on whether more than minimal impacts might occur to a key water-dependent asset. The AIP requires that, where mining or any other activity will take water from a source covered by a water sharing plan (WSP), a water access licence is required under the WM Act to account for this loss of water. Daracon hold sufficient water licences for the Revised Project under the relevant provisions (refer to **Sections 6.8** and **6.9**). As SSD, a water use approval under section 89; a water management work approval under section 90; an activity approval (other than an aquifer interference approval) under section 91 are not required.	No
Planning for Bushfire Protection 2019 (PBP 2019)	The aims and objectives of PBP 2019 is to provide for the protection of human life and minimise impacts on property from the threat of bush fire, while having due regard to development potential, site characteristics and protection of the environment. Extractive industry is considered to fall within 'other development' under Section 8 of PBP 2019. In order to comply with PBP 2019 development must satisfy the aims and objectives of PBP 2019, consider any specific requirements and propose an appropriate combination of bushfire protection measures. It is considered that the Revised Project will not increase the potential for, or the severity of bushfires within the locality and the risk of onsite activities igniting fire or the spread of bushfire across the Project Area will continue to be addressed through the implementation of appropriate bushfire protection measures. A bushfire threat assessment is provided in **Section 6.15.3**.	No

4.2.5 Relevant Strategic Regional Policies

4.2.5.1 Upper Hunter Strategic Regional Land Use Plan 2012 (SRLUP)

The key strategic policy guiding the assessment of extractive industries development in the Upper Hunter Valley region of NSW is the NSW Government's Upper Hunter Strategic Regional Land Use Plan 2012 (Upper Hunter SRLUP). The Upper Hunter SRLUP was approved in September 2012 and applies to the Revised Project. The Upper Hunter SRLUP has been developed to provide a strategic framework for delivering the necessary context for government investment priorities, servicing strategies and local environmental plan development for the Upper Hunter. The stated objective of the Upper Hunter SRLUP is to balance the strong economic growth in Regional NSW with the protection of valuable agricultural land and the sustainable management of natural resources.

Amongst the various land use types, the Strategy recognises the importance of numerous extractive resource operations supplying local and regional needs, including non-energy resources such as hard rock aggregate, sand and gravel. The Project Area is identified within the Strategy as one such 'other mineral resource' (Map 4).

The areas surrounding the Project Area are not identified as Strategic Agricultural Land and it is considered that the ongoing quarrying activities will not impact on any strategic rural activities.

The Upper Hunter SRLUP also identifies key planning challenges and policy responses to other social, economic and environmental issues in the Upper Hunter Valley which are of relevance to the Revised Project including:

- infrastructure
- economic development and employment
- housing and settlement
- community health and amenity (including air quality, noise, visual amenity and water quality)
- natural environment (including the identification of targeted conservation areas and habitat corridors)
- cultural heritage.

Each of the above issues have been considered in the assessment of the Revised Project's potential environmental impacts (refer to **Section 6.0**) and proposed mitigation measures (refer to **Sections 6.0** and **8.0**)

4.2.5.2 Hunter Regional Plan 2036

The Hunter Regional Plan 2036 is the NSW Government's strategic long term plan for guiding land use planning decisions for the Hunter Region until 2036. The Regional Plan sets out four regionally focused goals for the Hunter Region, being:

- the leading regional economy in Australia
- a biodiversity-rich natural environment
- thriving communities
- greater housing choice and jobs.

The regional plan aims to strengthen the region's economic resilience, protect its well established economic and employment bases and build on its existing strengths to foster greater market and industry diversification. In particular, the intent of the Regional Plan 2036 is to transform the productivity of the Upper Hunter, plan for greater land use compatibility, protect and connect natural areas and sustain water quality and security. The Revised Project aligns to the following 'directions' in the Regional Plan:

- Direction 11 is aimed at managing the ongoing use of natural resources.
- Direction 13 is based on managing the compatibility of land uses in particular identifying and protecting important agricultural land, including intensive agricultural clusters.
- Direction 15 notes the importance of monitoring and managing the impacts of existing land uses, and in the future those associated with growth, will be essential to protect the quality and security of the region's water supplies.
- Direction 26 is based on delivering infrastructure to support growth and communities and identifies has an action to 'ensure growth is serviced by enabling and supporting infrastructure'.
- Direction 11 is relevant to the Revised Project as it recognises the need to manage the ongoing use of natural mineral resources and to develop land use plans that respond to the lifecycle of the extractive resource area to provide all stakeholders with certainty around the long term use and productive value of the land.
- Direction 13 is related to how the Revised Project aligns with the Upper Hunter SRLUP which is discussed in **Section 4.2.4**.
- Direction 15 is addressed through the range of management, mitigation and monitoring measures committed to for the Revised Project as discussed throughout **Section 6.0** and as summarised in **Section 8.0**.
- Direction 26 relates to how the Revised Project will continue to service the growing construction markets and supply heavy construction materials for planned infrastructure projects across the Hunter region.

4.2.5.3 Voluntary Land Acquisition and Mitigation Policy

In September 2018, the NSW government published the revised VLAMP for State Significant Mining, Petroleum and Extractive Industry Developments (NSW Government, 2018). This document describes the NSW Government's policy for voluntary mitigation and land acquisition to address noise and dust (particulate matter) impacts from state significant mining, petroleum and extractive industry developments.

Noise and air quality impacts are discussed in detail in **Sections 6.4** and **6.5** and include consideration of VLAMP.

4.2.5.4 Dungog Local Infrastructure Contributions Plan 2019 and Maitland City Wide Section 94 Contributions Plan 2016

Sections 7.11 and 7.12 of the EP&A Act enables councils or other consent authorities to levy contributions of land or money for the provision, extension or augmentation of public amenities and services that may be required due to development. Should the Revised Project be approved, Daracon will be required to make annual financial contributions to both DSC and MCC in the form of a Planning Agreement, in accordance with Section 7.11 of the EP&A Act.

Daracon will continue consultation with DSC and MCC in relation to an appropriate Planning Agreement.

5.0 Stakeholder Engagement and Identification of Environmental and Community Issues

This section provides a brief overview of the EIS submission analysis and initial community issues raised (refer to **Section 5.1.1**), with further detail of the submission analysis and response to submissions provided in Part B **Sections 11.0** to **14.0** of this report.

This section also provides details of the comprehensive stakeholder engagement program implemented as part of the ADA process and detailed Social Impact Assessment (SIA) for the Revised Project, including additional agency and community engagement (refer to **Sections 5.2** and **5.3** respectively). A summary of current key stakeholder issues is provided in **Section 5.4**, with further detail provided in the SIA in **Appendix O**.

5.1 Historic Engagement Overview

Previously Daracon implemented a range of mechanisms for engaging with relevant stakeholders as part of standard business operations and for the purposes of the 2016 EIS process (as summarised in **Table 5.1**).

Table 5.1 Summary of Original EIS Stakeholder Engagement and Information Provision Mechanisms

Approach	Details
Stakeholder Engagement Mechanisms	
Martins Creek Quarry Community Consultative Committee (MCQCCC)	The MCQCCC was established in September 2014 as the main consultative mechanism and met monthly during the preparation of the EIS, with the first meeting being held in October 2014. The primary objectives of the MCQCCC was to provide a forum for open discussion between representatives of the company, the community, the council and other stakeholders on issues directly relating to the development application, the quarry's current operations and community relations. The MCQCCC operated under a defined Terms of Reference established in collaboration with DSC and the Paterson Progress Association. The meetings were attended by attendees and group representatives established by council during the formation of the committee, with the minutes published on the quarry web page, and hard copies available at Paterson Post Office and Paterson IGA Grocery Store. General public also attended from time to time as observers. The previous MCQCCC as a formal entity is no longer active, with the most recent meeting of that former group held in June 2016 where the members voted and agreed not to continue to meet. Should the Revised Project be approved, it is expected that a condition of consent will be the establishment of a Community Consultative Committee (CCC) before the commencement of construction in accordance with the DPIE's Community Consultative Committee Guidelines: State Significant Projects (2019). Daracon has committed to re-establishing the CCC and following a written request from Daracon, DPIE appointed an independent chair for the MCQ CCC, Mr Wej Paradise, and has recently replaced Mr Paradise (due to availability constraints). On 20 November 2020, Daracon were advised by DPIE that the new Independent Chairperson of the CCC is Mr Michael Silver. Membership for a new CCC is yet to be established.

Approach	Details
Project Briefings	Targeted project briefings held with key stakeholder groups, for example Department of Premier and Cabinet, DSC, MCC, Paterson Progress Association, Bolwarra Heights Residents Group.
Personal meetings and letters	Consultation with all agencies and groups identified in the SEARs. Initial contact with the relevant government agencies and service providers commenced in December 2014.
Information Provision Mechanisms	
Company website	A dedicated Martin's Creek Quarry page on the Daracon corporate website. MCQCCC meeting minutes and community updates are posted on this site when available.
Information Line	Established a community information line for enquiries regarding the proposal.
Newsletter updates	Periodic updates on the activities of the MCQCCC were also provided in local newsletters including The Paterson Post and Gresford News. A community update newsletter was also distributed to the community in November 2016 to summarise the project proposal when the EIS was placed on public exhibition. An additional update was provided in November 2017 via letterbox drop and on the company website to provide further information on the project's status.
Letterbox drops	Letterbox drops on an as needs basis regarding issues that may be relevant to the neighbouring community, e.g. two drops in April 2015 regarding Extended Hours of Operation and in November 2017 regarding a project progress update post EIS exhibition. Regular letterbox drops are also undertaken to provide advice of upcoming blasting activities and have also been made more recently (post commencement of limited operations in September 2019) in the event of planned operational activities under the terms of the IEMP. Since joining Daracon's Martins Creek Quarry team, the Community Liaison Representative has also distributed 'request to contact slips' to those residences for which the company had no contact information in order to establish a mechanism for contact and information sharing.
Notification subscriptions	Email notification subscription service from the quarry. Primarily provided information about blasting activities at the quarry.
Community Complaints Line	A complaints phone number (1300 663 151) and email address (martinscreek@daracon.com.au).

5.1.1 Summary of EIS Submission Analysis

The Original Project was placed on public exhibition from 13 October 2016 to 24 November 2016. During the public exhibition period 887 submissions were made on the Original Project. This included 14 government agency submissions and 873 community, interest group or organisation submissions.

Of the 14 government agency submissions, three were council submissions and 11 were agency submissions. DSC objected the Original Project and ARTC supported the Original Project. All other agencies did not identify that they oppose the Original Project, however, several agencies made submissions seeking further clarification regarding aspects of the assessment of the Original Project. These submissions are discussed in detail in **Section 12.0**.

Of the 873 submissions from community members, interest groups and organisations, a total of 419 (48 %) were objections, 447 (51 %) were in support and seven (7) (7 %) provided comment (refer to detailed analysis in **Section 11.1**).

The most frequently raised theme from the community submissions was impacts on the community, with key concerns in relation to:

- traffic and transport impacts (373 submissions)
- public health and safety impacts (291 submissions)
- noise impacts (257 submissions)
- loss of social amenity (227 submissions)
- air quality impacts (160 submissions)
- blasting and vibration impacts (160 submissions)
- visual impacts (15 submissions).

A total of 297 submissions from community, interest groups and organisations raised issues relating to the project design of the Original Project.

Further issues raised included:

- current operations and management, including compliance with the existing development consent (110 submissions)
- Daracon's reputation in the community and social licence to operate (40 submissions)
- court proceedings relating to the quarry that were being undertaken at the time of the Original Project application (15)
- complaints processes for the existing operations (10).
- Issues in regard to procedural matters included:
- unsatisfactory community consultation by Daracon in relation to the Original Project (20 submissions)
- the NSW Government planning process (13 submissions)
- adequacy of assessments completed for the Original Project (13 submissions).

5.2 Stakeholder Engagement Following EIS Exhibition

Following the exhibition of the EIS (Monteath & Powys, 2016), a comprehensive stakeholder engagement strategy was developed as part of the ADA process and SIA assessment to guide future stakeholder engagement activities. This strategy was informed by a detailed review and analysis of submissions made during the public exhibition of the EIS (as outlined in **Section 11.0**).

The stakeholder engagement strategy was aimed to:

- inform and seek feedback from stakeholders during the design and development of the Revised Project
- identify key issues to inform the updated assessment of the Revised Project
- seek feedback from stakeholders to identify and refine proposed mitigation measures to seek to further minimise environmental and community impacts.

The outcomes of the stakeholder engagement strategy have informed various aspects of the Revised Project and the ADA process including the SIA (refer to **Section 6.13** and **Appendix O**). A summary of the process of additional stakeholder engagement is outlined below, and further discussion of the key issues raised during the stakeholder engagement is provided in **Section 6.13**.

5.2.1 Stakeholder Identification

A wide range of stakeholders have been identified and involved over key phases of the engagement program. Stakeholder identification was largely undertaken using inputs from several sources including:

- review of publicly available documents undertaken to support the profiling of the local and regional community (including a review of recent media and local community service directories) and the identification of salient stakeholder issues in the relevant communities (refer to **Section 6.13.1**)
- outcomes of historical engagement (where available)
- review of submissions on the EIS for the Original Project (Monteath & Powys, 2016)
- snowball sampling i.e. contacts made from initial sources providing contact details of additional stakeholders to be engaged.

Key stakeholders included:

- service providers, local businesses and special interest group representatives, as outlined in **Table 5.2** and **Table 5.3**
- residents and community members living in proximity to the Project Area and/or the proposed haul route (Haul Route 1).

Residents were largely drawn from the localities neighbouring the quarry including Martins Creek itself, and Vacy. The views of those residents and community members located along haulage routes, including Paterson, Bolwarra and Bolwarra Heights were also sought via invitations to participate in the engagement program, with invitations shared via a number of mechanisms including:

- direct contact with community members, key stakeholder and representatives from community and special interest groups (e.g., Martins Creek Quarry Action Group, Bolwarra Heights Community Group, Paterson Progress Association and the Brandy Hill Seaham Action Group, etc.)
- an expression of interest to participate in engagement activities or to have a personal interview included in the Community Information Sheets No. 1 and 2
- notices included in the Paterson Psst
- via a dedicated Martins Creek Quarry Social Pinpoint page.

Table 5.2 Consulted Stakeholders by Location – Personal Interviews

Stakeholder Category	Post Code*	Locality	Number of Participants		
			Round One	Round Two	Total
Residents/ Community Interest Group Members	2320	Bolwarra	4	5	9
		Bolwarra Heights	4	10	14
		Maitland	-	1	1
		Mindaribba	-	1	1
	2321	Duns Creek	2	2	4
		Woodville	1	1	2
	2324	Brandy Hill	3	2	5
	2381	Premier	-	1	1
	2420	Hilldale	2	1	3
		Martins Creek	12	28	40
		Wallarobba	-	1	1
	2421	Paterson	23	31	54
		Vacy	17	6	23
	-	Missing/ Unknown**	1	17	18
	Sub Total		**69**	**107**	**176**
Businesses and service providers		Maitland	1	-	1
	2323	East Maitland	1	-	1
		Martins Creek	1	-	1
		Dungog	1	-	1
	2421	Paterson	6	**7**	13
		Vacy	1	-	1
		Tocal	1	-	1
	-	Other (Gresford, Lukintyre and Thornton)	3	7	3
	Sub Total		**15**	**7**	**22**
TOTAL			**84**	**114**	**198**

Table 5.3 Consulted Organisations and Representative Groups

Stakeholder Category	Organisation/Location
Community/Special Interest Groups	Bolwarra Heights Community Group
	Brandy Hill and Seaham Action
	Country Women's Association
	Martins Creek Quarry Action Group
	Paterson Progress Association
	Voice of Wallalong and Woodville
Indigenous	Mindaribba Local Aboriginal Land Council
Service Providers	Grace Coaches
	Hunter Valley Buses
	Linq Buslines
	Paterson Public School
	Martins Creek Public School
	Tilly's Childcare Centre
	Tocal College
	Vacy Primary School
Businesses	CBC Bed & Breakfast & Café
	Court House Hotel
	Dillon & Sons (Dungog)
	Paterson Auto Repairs
	Paterson Gallery
	Paterson IGA
	Stockers and Partridge
	Stylz on Track Hairdresser
	Paterson Chemist
	Paterson Post Office
	Paterson Butcher
	CBC Bed & Breakfast & Café
	Paterson Tavern
	PRD Real Estate (East Maitland)
	River Realty (Maitland)

5.2.2 Engagement Approach and Methodology

The engagement program was implemented in two key phases during the ADA and SIA processes, as outlined below, to allow a participatory approach to assessment and to involve the community and other local and regional stakeholders in the clarification and confirmation of project issues and identification of strategies to address negative impacts and enhance positive impacts.

- Phase 1 SIA engagement – Introduction to the Project team, the Revised Project and ADA process. Phase 1 consisted of two key stages, namely:
    - Expressions of interest to a broad range of stakeholders to participate in the engagement program as well as gather community concerns and feedback to inform the updated environmental assessment and revised technical studies for the Response to Submission process (during June to September 2018)
    - Present and discuss outcomes of draft technical assessments on key issues of concern, identification of any further perceived issues and opportunities relating to the Revised Project and collaboratively discuss possible strategies to mitigate impacts and enhance opportunities (during March to June 2019)
- Phase 2 SIA Engagement – Additional project changes to the Revised Project and key assessment outcomes. Feedback was provided on additional project refinements following the Phase 1 engagement and the change in the quarry operations during September 2019, including an update on key outcomes of the draft environmental and social studies as a result of the project changes and management strategies with the aim of consolidating proposed management strategies through stakeholder feedback and endorsement (during July 2020 to February 2021).

The engagement methods utilised were selected based on a detailed stakeholder identification and analysis (refer to **Section 5.2.1**), completed prior to strategy implementation, and were chosen to facilitate stakeholder involvement. Further details of the engagement methods undertaken, and stakeholders consulted in each of these phases, are outlined in the following sections with a summary of the issues raised by stakeholders included in **Section 5.4**.

The stakeholder engagement program has provided Daracon with valuable input from key stakeholders and local community residents regarding the impacts of the quarry's recent operations, as well as identifying any perceived impacts associated with the revised Project. This information has been used to inform the Revised Project design, planning and assessment phases.

In addition, a comprehensive SIA has been undertaken as part of the updated environmental assessment process. The SIA has assessed and predicted the likely consequences of the Revised Project in social terms and involved understanding potential impacts from the perspectives of those involved in a personal, community, social or cultural sense. The SIA is included as **Appendix O** and is discussed further in **Section 6.13**.

5.2.2.1 Community Engagement Mechanisms

A summary of the key community engagement mechanisms undertaken during the engagement program is summarised in **Table 5.4**.

Table 5.4 Stakeholder Engagement Mechanisms

Activity	Description
Meetings with the Martins Creek Action Group (MCQAG)	Members of the Umwelt project team and representatives from Daracon attended the following **MCQAG meetings in 2018**. **26 March 2018**: Introduction to Umwelt and the RTS process, outcomes of the submission analysis and proposed approach to the RTS document preparation and accompanying engagement program. **22 May 2018**: Discussion of proposed changes to the existing operations, a RTS project status update and upcoming engaged activities. **18 December 2018**: General update, review of the SSD approval path, study updates and future engagement opportunities. **9 January 2019**: MCQAG representatives attended the Umwelt office to provide the Project team an overview of history of the quarry and the Group's key concerns relating to the Revised Project. **10 September 2020**: General update of activities undertaken since quarry placed in limited operations in September 2019 and proposed activities moving forward.
Community Consultative Committee (CCC) Meeting	**Project briefing on 22 May 2018** to previous members of the MCQCCC to share information about the ADA process and obtain committee member feedback on the proposed approach.
Updates in the Paterson Psst	Updates included in the local Paterson Psst community newsletter at key project stages. **July 2018**: to inform the community that Umwelt consultants were undertaking engagement activities to discuss the status of and seek views on Daracon's proposed project and to invite them to make contact if they would like to have a meeting or discussion. **February 2019**: to provide an update with regards to the Collaborative Assessment Forums series on key issues of concern and encourage community members to register interest if they had not done so already. **September 2020**: to inform the community that Daracon have considered community input and have completed further Revised Project feasibility investigations, detailed design refinements and have considered additional mitigation measures. To inform that the Community Information Sheet No.2 has been distributed and to acknowledge the appointment of Daracon's Community Liaison Representative and development of the Social Pinpoint engagement platform. **October 2020**: to inform the community that there had been additional information uploaded to Social Pinpoint with responses to some frequently asked questions and provide contacts details of the team if they wanted additional information.

Activity	Description
Personal and group interviews (face to face and phone) with proximal neighbours and community members	Personal (face to face and phone) meetings with proximal neighbours and other community members to validate issues of concern and social impacts identified during submission analysis and identify additional issues and possible mitigation and enhancement strategies and views on proposed project changes and the extent to which they addressed impacts. For Round One stakeholders (community and businesses) were **contacted personally during June to August 2018 by phone** and asked if they would like to participate in an interview at a convenient time. Expressions of interest to participate in the engagement program were also included in a Community Information Sheet distributed to neighbouring and local residents and businesses (refer to **Table 6.53**) and in an article included in the Paterson Psst with Umwelt Social Team contact details. Personal interviews were predominantly conducted face to face (74 face to face and 4 via telephone). An additional 100 contact attempts were made with community stakeholders where voicemails were left, emails with additional information were sent, and conversations were had where stakeholders responded that they would be in contact with the project team should they decide they were interested in participating in an interview. A total of 22 people declined an offer for an interview. During Round Two, from August 2020 to March 2021, contact was made via phone, email or text message to Round One participants, residents proximal to the quarry, community groups and organisations, and local business, service providers and Indigenous group representatives to invite them to be involved in an interview. Community members were also offered the option to complete an online survey. In total, 114 participants were involved in personal interviews (phone or face-to-face) or completed an online survey. Personal (face to face and phone) meetings with landholders proximal to the quarry to discuss the outcomes of noise impact assessment, collect stakeholder feedback and suggestions for mitigation measures. This engagement was undertaken by Daracon representatives and noise specialist and involved: • **July - August 2020**: engagement with Martins Creek residents (Station and Cory Streets) on further work to reduce future noise impacts. • **November - December 2020**: engagement with landholders in close proximity to the quarry with potential operational noise impacts, including personal visits and delivery of property-specific information regarding draft noise impact assessment results and proposed mitigation measures. • 70 property-specific information sheets were prepared and personally delivered to landholders.
Meetings and Project briefings with businesses and service providers	Personal interviews to identify specific issues of concern and associated appropriate management responses. Interviews with businesses and service providers also informed consideration of specific issues included within the SIA.

Activity	Description
Community Information Sheets	Development and distribution of Community Information Sheets to near neighbours and key stakeholders at key stages. Each information sheet also provided Daracon and Umwelt contact details for further information and/or to request a personal project interview or briefing. **Community Information Sheet 1 (June 2018)**: Included a Revised Project update post EIS public exhibition, outcomes of submission analysis and identified issues of concern and an overview of the RTS process. **Community Information Sheet 2 (July 2020)**: Outlined key Revised Project changes that were made in light of feedback from community engagement activities since 2019. Discussed the ADA and RTS process and key steps to date and moving forward. Introduced Social Pinpoint, an online engagement platform for information provision, including Revised Project presentations and information sheets and encouraged in ongoing engagement either via the discussion forums and survey tools. **Community Information Sheet 3 (May 2021)**: Provided a summary of assessment outcomes from the ADA process. The Community Information Sheets were distributed to approximately 3700 households nearby to the quarry and along the haulage route including Martins Creek, Vacy, Paterson, Tocal, Bolwarra, Bolwarra Heights, Duns Creek, Mindaribba and Woodville. Community Information Sheet 1 was distributed via Australia Post's unaddressed mail service. Community Information Sheet 2 and 3 were hand delivered, due to community feedback that some residents did not receive the first Information Sheet. Copies of both were also left in prominent locations, i.e., Paterson Post Office, Dungog Shire Council building, Vacy General Store, Paterson Country Café and Daracon reception. An electronic version was also emailed to local community representative groups for their information and distribution to members, e.g., Martins Creek Quarry Action Group, Paterson Progress Association. Information sheets were also emailed to members of the community who contacted the Project Team and indicated that they had not received a copy by post but would be interested in receiving.
Vacy Fair Stall	**Drop-in stall at the Vacy Fair on 9 September 2018** to share information about the updated environmental assessment and revised technical studies to be undertaken for the Revised Project to address DPIE feedback on the EIS for the Original Project and to provide a forum for feedback. Representatives from Daracon and Umwelt were present to address questions. A total of 21 individuals visited the stall and engaged in detailed questions and answers with the team.

Activity	Description
Face to face and phone interviews with other groups	**Face to face and phone discussions with three local bus companies during March to July 2019** with regards to local bus routes and how these intersect with the proposed haul route for the project.
	Phone interviews during March to July 2019 with three local real estate agents based in Dungog and Maitland with regards to trends in the property market in the communities of interest. Targeted engagement from with Paterson businesses regarding proposed intersection upgrades, parking and road changes.

Collaborative Assessment Forums (CAF)	A **series of collaborative assessment forums (CAFs) were held throughout the ADA and RTS process** to collaboratively discuss the outcomes of key technical assessments and identified mitigation strategies. The sessions also sought community feedback in relation to the suggested strategies and obtain community ideas and input into other possible strategies to address the identified impacts.
	Prior to each CAF, participants were provided with a pre-read booklet outlining key information relating to the CAF topic, to inform their participation. After each CAF participants were provided with an information pack containing:
	• summary of the meeting notes including issues and questions captured in the CAF
	• a copy of the presentation slides from the CAF
	• feedback relating to the issues raised in the CAF including:
	  ○ frequently Asked Questions, with answers based on information available to date, and
	  ○ commitments from Daracon in response to the community's feedback, including short term actions to be implemented as part of current operations, further investigations as part of the current assessment process, and management strategies relating to future operation.
	CAFs were held on the following dates:
	• Air and Blasting: 14 March 2019; with a total of 16 participants attended.
	• Traffic and Transport: 23 and 24 July 2019; a total of 39 participants attended.
	• Noise: 15 December 2020: held online, 5 registered attendees with additional non-registered attendees also online.
	• Social impact assessment: 11 and 12 February 2021; a total of 27 participants attended.

Email and phone correspondence	Phone calls and emails relating to the SIA process to landholders, as required, to organise meetings, provide information and/or respond to questions relating to the SIA process, including the CAFs.
Daracon Website	Provision of information relating to the Revised Project, including a copy of the CISs and other information committed to at the CAFs, made available on the Daracon website. For example: • blast notification protocol • provision of data from additional dust deposition gauge established at View Street • Code of Conduct • links to Social Pinpoint site (refer below for further information) • Community Information Sheets.
Online Survey	Development of an online survey that was made available to community members via email (sent to over 160 email addresses) and on the Social Pinpoint website.

Activity	Description
Social Pinpoint Website	Provision of a Social Pinpoint website (https://umwelt.mysocialpinpoint.com/martins-creek-quarry), an online interactive engagement platform providing key Revised Project information and access to the SIA consultation tool to facilitate meaningful engagement and to keep the community informed throughout the assessment process. Site included information relating to Revised Project design changes, information sheets, CAF pre-read material, presentations and outcome summaries, and Q&A of frequently asked questions. The Social Pinpoint site also included links to the online survey and communication portals where community members could subscribe to receive project updates or log a question for the project team. When new content was uploaded to Social Pinpoint, an email notification was sent to stakeholders who had registered interest in received project updates (over 160 email addresses).

5.3 Agency Engagement

Daracon have undertaken ongoing engagement with local, State and Federal government representatives throughout the planning and environmental assessment process for the Revised Project. A summary of ongoing government consultation undertaken is provided in **Table 5.5** below.

Table 5.5 Summary of Ongoing Government Agency Engagement Since Exhibition of the EIS

Agency name	Date	Purpose
NSW Government Agencies		
DPIE	22 November 2017	A meeting was held with DPIE to introduce the project team, provide an update on works completed since the EIS exhibition and the project refinement considerations as well as discuss the proposed approach to project submission and the proposed stakeholder consultation program.
	30 May 2018	A meeting was held with DPIE to discuss further project refinements, provide an update on the progress of the environmental assessment and technical studies, and discuss proposed stakeholder engagement activities.
	20 February 2019	Letter to DPIE advising that haul route 2 is no longer a part of the SSDA.
	12 June 2019	Meeting with DPIE to provide an update on the noise assessment including the proposed criteria around the processing area.
	3 August 2020	Meeting including DPIE, Daracon and Umwelt via video conference to provide a presentation and update on the Revised Project.
	7 September 2020	Letter to DPIE requesting confirmation of the ADA process.
	6 November 2020	Letter from DPIE confirming approval of the ADA process.
TfNSW	10 May 2018	A meeting was held with RMS (now TfNSW) to introduce the project team, provide an update on works completed since the EIS exhibition and the preferred project parameters. The response to traffic submissions and the Gostwyck Bridge and previous correspondence from RMS were also discussed.
	15 June 2018	A meeting was held with RMS, the project team, and the technical specialist to discuss the Gostwyck Bridge engineering report.

Agency name	Date	Purpose
	20 February 2019	Letter from Daracon advising that haul route 2 is no longer a part of the SSDA.
	30 May 2019	Meeting with RMS to discuss the updated Gostwyck Bridge engineering report.
	31 May 2019	Meeting with RMS to discuss options for approaches to Gostwyck Bridge (traffic lights v's traffic calming options) and 2 options for King and Duke Street intersection upgrades.
Crown Lands	22 January 2019	Email correspondence to Crown Lands inquiring whether any further information is needed in relation to the road closure application, noting the last correspondence was on 29 November 2017.
	18 February 2019	Telephone discussion to follow up on the road closure application. Crown Lands indicated that a report was being prepared for determination but could not provide a timeframe.
	25 February 2020	Following numerous emails and phone calls, email correspondence received from Crown Lands advising no further update regarding road closure application and will advise once decision has been made.
	24 September 2020	Following numerous emails and phone calls, email and phone message left for Crown Lands to enquire on revised timeframe for a decision.
NRAR	27 June 2019	Email to NRAR referring to phone message and seeking assistance to arrange a meeting to discuss Martins Creek SSDA and including email trail showing previous requests over an extended period.
	13 August 2019	Following a number of communications regarding meeting arrangements, meeting confirmed for 4 September 2019 at NRAR Office Newcastle.
	4 September 2019	Presentation to the NRAR to provide an update on the Project and discuss the Surface Water Impact Assessment, Groundwater Impact Assessment and licensing requirements.
EPA	26 August 2019	Presentation to the EPA to provide an update on the Project and discuss the results of the Air Quality Impact Assessment and Surface Water Impact Assessment.
Local Government		
DSC	23 April 2018	A meeting was held with DSC to introduce the project team, provide an update on works completed since the EIS exhibition and the project refinement considerations as well as discuss the proposed approach to project submission and the proposed stakeholder consultation program.
	18 June 2018	Meeting with the Councillors to introduce the project and give an overview of the quarry history and strategic need, provide an update on works completed since public exhibition of the EIS. The revised project parameters and proposed consultation approach were also discussed.
	15 February 2019	Meeting held at DSC to provide a progress update and discuss consultation moving forward.
	20 February 2019	Letter from Daracon advising that Haul Route 2 is not part of the SSDA.

Agency name	Date	Purpose
	27 February 2019	Meeting to discuss proposed road/intersection designs, follow up on previous letter requesting pavement data, asked for advice on who to talk to regarding the DSC road closure.
	22 May 2019	Met with DSC to provide an update on the revised intersections designs.
	18 July 2019	Meeting to provide project update ahead of Traffic CAF, extension of Stay of Orders and Council road in Project Area.
	27 February 2020	Meeting with Lindsay Dynan and DSC to discuss the Dungog/Gresford Road and King and Duke Street intersections and the revised access road design (both previously and going forward).
	11 August 2020	Meeting with DSC, Daracon and Umwelt via video conference to provide a presentation and update on the Revised Project.
	27 August 2020	Letter from Daracon advising DSC of quarry operation schedule, including blasting events, in September 2020. Letter confirms community advice about operation schedule and blasting events is also being distributed.
	23 September 2020	Letter from Daracon to DSC requesting written confirmation of Council's agreement with the road upgrade/intersection designs.
	7 December 2020	Meeting with DSC to provide a presentation and update on the Revised Project
	12 April 2021	Meeting with DSC to provide a provide a presentation on consultation activities and key assessment outcomes of the ADA process.
MCC	20 February 2019	Letter from Daracon advising that Haul Route 2 is not part of the SSDA.
	13 April 2021	Meeting with MCC to provide an update on the Revised Project and discuss VPA.
Port Stephens Council	20 February 2019	Meeting held at Port Stephens Council to advise that Haul Route 2 is no longer part of the SSDA.

5.4 Key Community Issues

5.4.1 Community Issues

Section 6.13, and the SIA in **Appendix O**, provide detailed records and analysis of the issues raised during community engagement. A summary of key themes is provided in this section.

For the purpose of the analysis of community issues, stakeholder issues have been presented graphically in aggregate and differentiate between issues raised during Round One and Round Two. Supporting discussion identifies any notable issues and / or opportunities as highlighted by particular stakeholder groups. This discussion recognises that many consulted representatives of the community groups, business and service providers were also typically local residents, therefore issues were often also raised in that context.

Overarching issue themes identified during the personal discussions are presented in **Figure 5.1**. As shown, the most frequently raised issues by consulted stakeholders related to impacts to social amenity associated with trucks and traffic movements, followed by sense of community, the decision-making process and social amenity associated with quarry site operations. A total of 70 stakeholders in Round One (90%) and 79 (or 75%) of consulted stakeholders in Round Two, raised issues regarding the Revised Project.

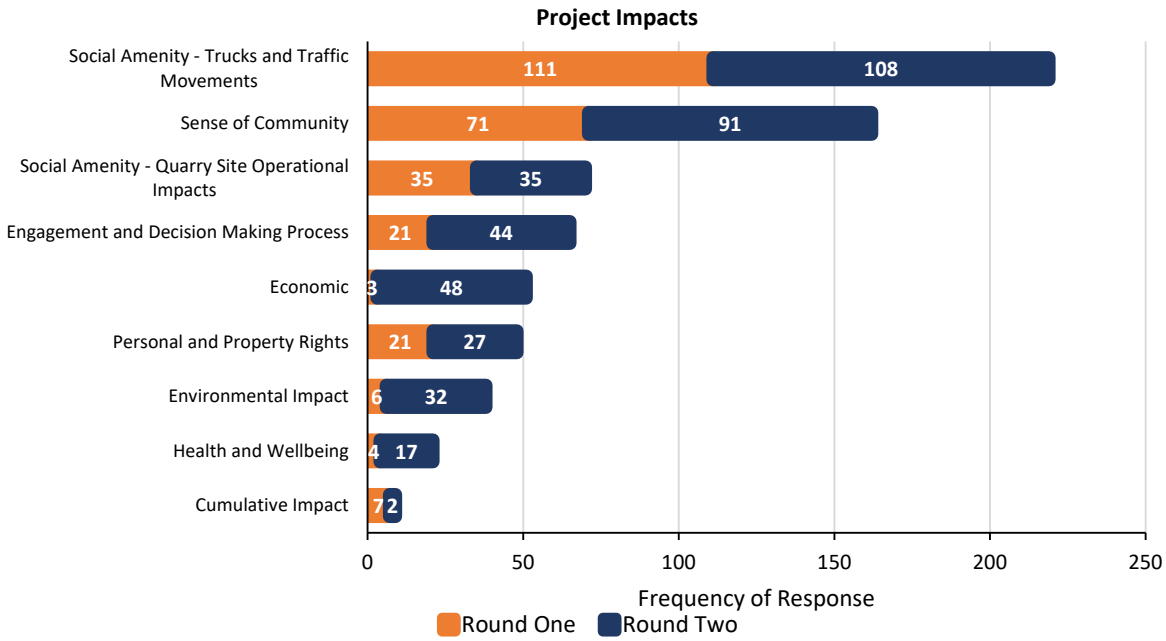


Figure 5.1 Frequency of Issues – Overall Key Themes (Unprompted Issues)

Round One: n=78, 10 missing[2] (Community = 64, Business and Services = 6)
Round Two: n=114, 27 missing (Community = 74. Business and services = 5)
Multiple Response allowed.

During Round One, in addition to being asked to identify issues and opportunities associated with the quarry, participants were also presented with a (prompted) list of potential project impacts known to be associated with similar types of operations, in order to identify the level of concern specifically attached to each of these when considering the Revised Project (refer to **Figure 5.2**). Prominent prompted issues of concern were largely consistent with those that had been identified when asked via free call. Average ratings for each prompted impact are charted in **Figure 5.3**.

[2] Indicates that the number of respondents who did not provide an answer to the survey question.

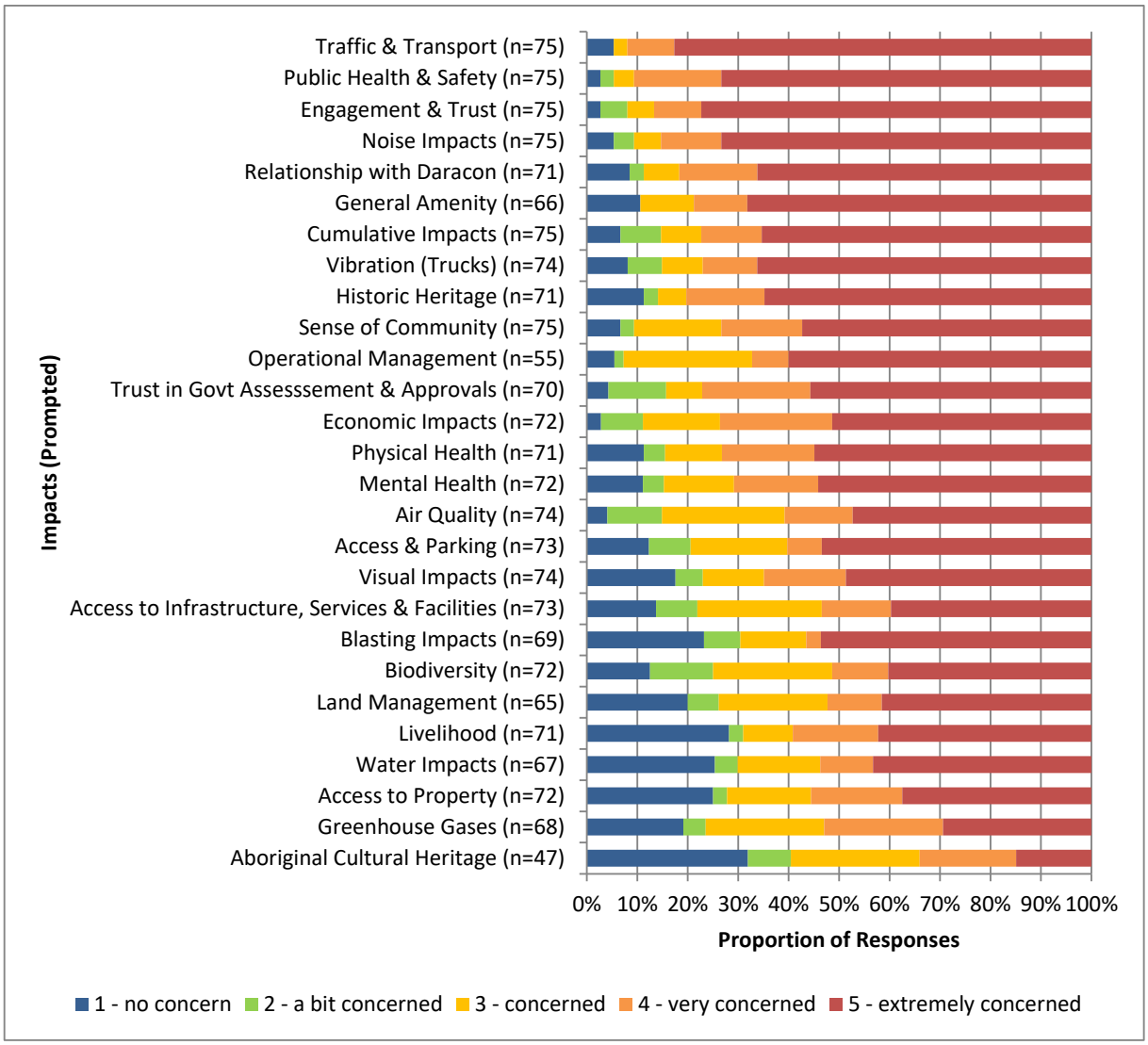


Figure 5.2 Levels of Concern Attached to Prompted Issues – Overall

Total n = 78 (Round One)

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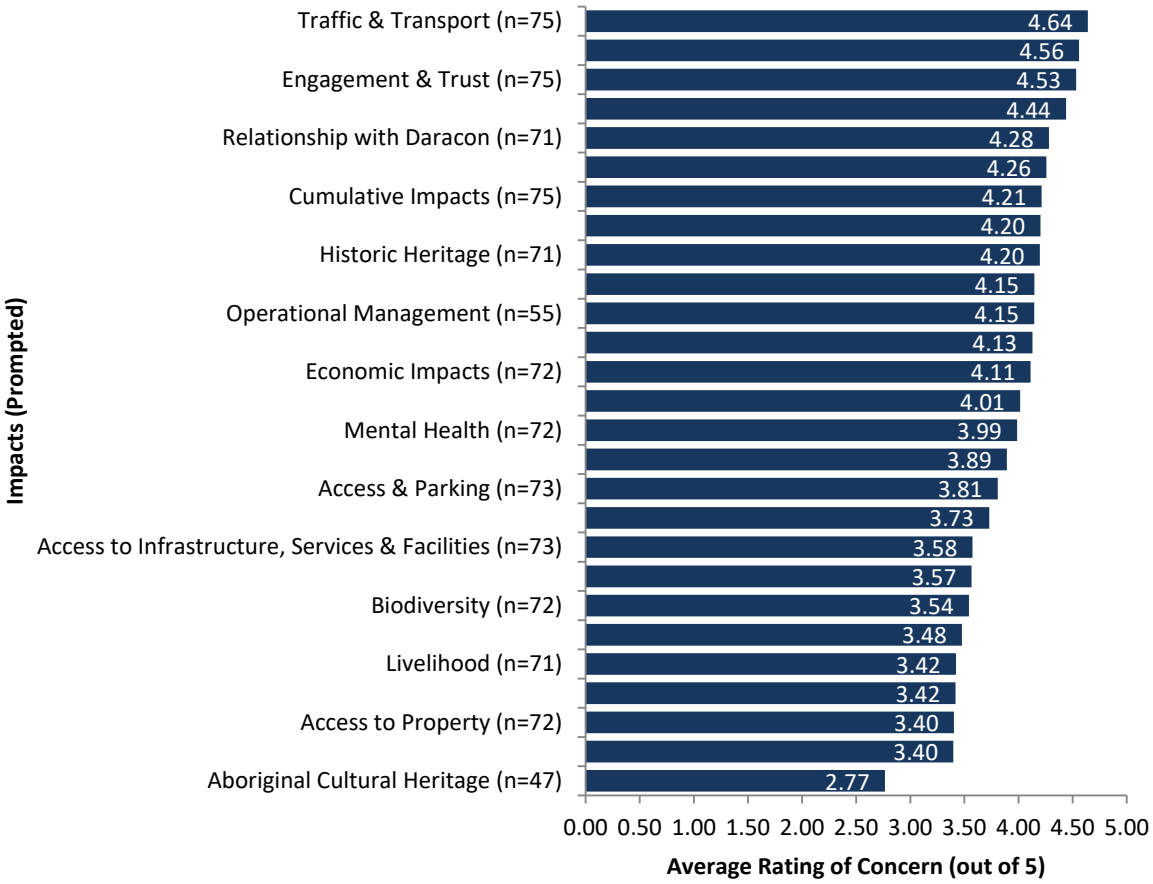


Figure 5.3 Round One Prompted Issues – Average Ratings of Concern

Total n = 78 (Round One Participants)

As outlined in the SIA, identified social impacts across a range of social impact categories, as defined in the SIA guideline, were identified during the two engagement rounds with these impacts generally reflecting the fears and aspirations of the stakeholders consulted. It should be noted, social impacts are not mutually exclusive, with interrelationships existing between social impact categories, themes and issues. **Figure 5.4** presents the reported social impact themes as related to categories identified in the SIA guideline. As is illustrated in the matrix presented at **Figure 5.4**, the social impacts identified are often relevant to more than one social impact category, given that social impacts are not mutually exclusive and are often highly interrelated. For example, potential impacts to social amenity as a result of traffic and truck movements, are perceived by stakeholders to impact on their way of life, their health and well-being, and their access to and use of surroundings.

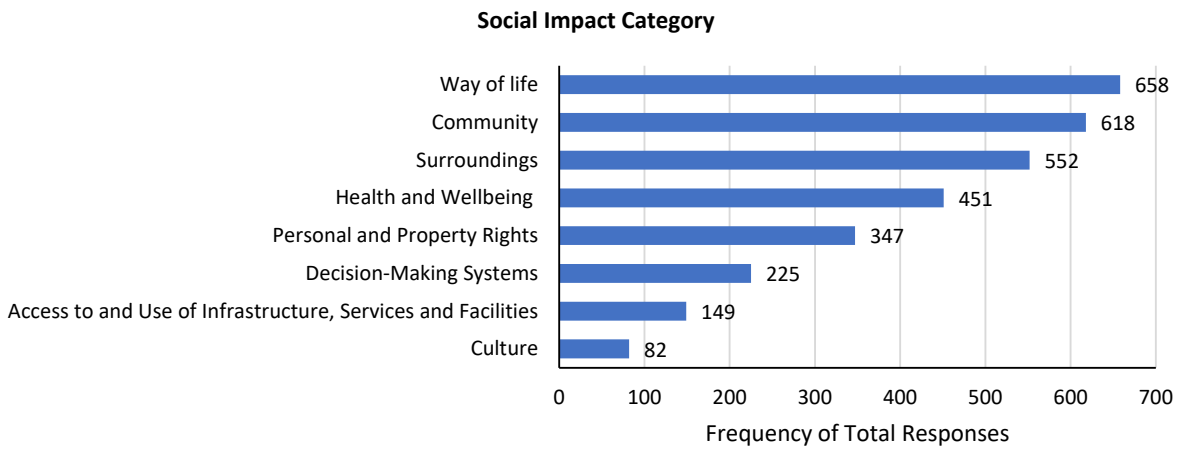


Figure 5.4 Impacts Identified by Social Impact Category (DPIE 2017)

Round One: n=78; Round Two: n=114; Multiple responses allowed.

Social impact themes and key associated issues of concern as identified during consultation activities are further described in the SIA (refer to **Appendix O**). Qualitative quotes from personal discussions and other engagement forums have also been provided to highlight stakeholder sentiment as recorded to provide further context to the impacts noted.

Respondents during Round One of engagement were also asked 'do you think that the disadvantages of the Project would outweigh the advantages?'. Of the 52 respondents that provided an answer, 24 (46%) agreed with the statement, 18 (35%) disagreed and 10 (19%) were unsure. This is reflected in the SIA with the majority of the impacts that were raised by respondents in Round 2 being negative (79%) as opposed to positive (21%).

Community member concerns as identified during consultation activities have also been analysed by locality. As **Figure 5.5** outlines, the issue of trucks and traffic movements and sense of community impacts were the highest concern across all localities by a large margin, particularly for Paterson residents.

Operational impacts such as blasting, noise and dust were predominantly raised by those living in close proximity to the quarry such as Martins Creek and Vacy, making up 19 and 14% respectively of the issues raised for both localities.

Residents of Brandy Hill and Woodville in particular were concerned with the decision-making process and how it relates to social licence to operate, breaching of consent conditions and trust in the decision-making process. Concern with the decision-making process was also an issue for people living in Vacy, Martins Creek, Bolwarra Heights and Bolwarra.

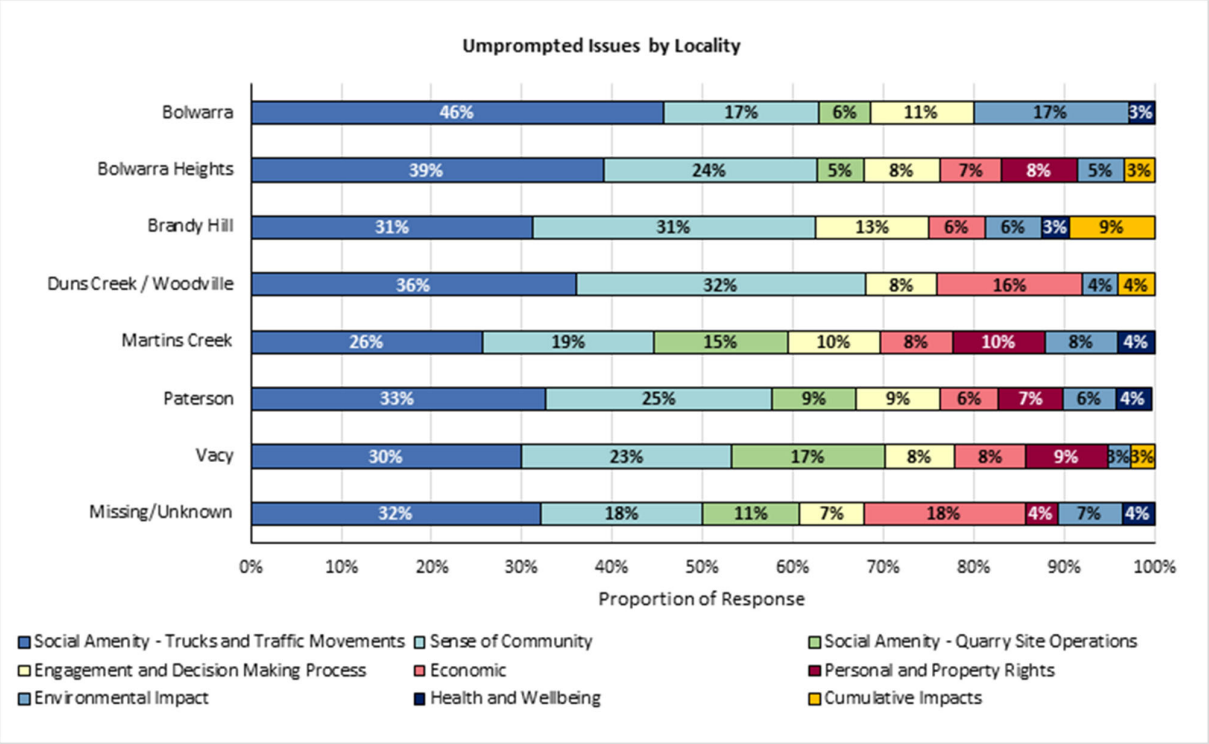


Figure 5.5 Unprompted Issues by Locality

Round One: n = 78, Round Two n= 114

As described in **Sections 1.6** and **2.0**, extensive changes were made to the Revised Project seeking to address community concerns and issues raised during the engagement process. **Section 6.0** provides the details of the environmental social impact assessment prepared in accordance with the relevant government requirements and taking account of feedback from the community. The detailed SIA outcomes are summarised in **Section 6.13**, and the full suite of proposed mitigation and monitoring measures are detailed in **Section 8.0**.

6.0 Revised Project Environmental Assessment

6.1 Identification of Key Environmental and Community Issues

The key environmental and community issues for the Revised Project requiring detailed investigation as part of the updated environmental assessment were identified through consideration of:

- the environmental and planning context for the locality (refer **Sections 1.0** and **4.0**)
- submissions received during the exhibition of the Original Project EIS (refer to **Section 5.1**) and outcomes of the ongoing stakeholder engagement process (refer **Sections 5.2** to **5.4**)
- SEARs, dated 4 August 2016, issued for the Original Project and further advice from DPIE in relation to the ADA process (refer to **Appendix A**)
- the risk analysis of potential environmental and social impacts associated with the Revised Project (refer to **Section 6.1.1**)
- updated baseline studies completed as part of the preparation of the ADA (refer **Sections 6.2** to **6.19**).

The extensive stakeholder engagement and social impact assessment processes undertaken for the Revised Project (refer to **Section 5.2** and **Appendix O**) identified the issues which stakeholders consider to be the key issues for the Revised Project that require assessment as part of the ADA. The highest-ranking stakeholder issues (based on number of responses) and where they are addressed in the ADA are:

- traffic and transport (refer to **Section 6.3**)
- noise (refer to **Section 6.4**)
- air quality (refer to **Section 6.5**) and blasting (refer to **Section 6.7**)
- water resources including groundwater (refer to **Section 6.8**) and surface water (refer to **Section 6.9**)
- biodiversity (refer to **Section 6.10**)
- social amenity and impacts to the community (refer to **Section 6.13**)
- economic contribution including employment (refer to **Section 6.14**)
- public health (refer to **Section 6.18**)
- rehabilitation and future land use (refer to **Section 6.19**).

Further details of the issues raised by stakeholders are outlined in **Section 6.13** and **Appendix O**.

6.1.1 Preliminary Environmental Risk Assessment

A preliminary environmental risk analysis was undertaken for the Revised Project to identify the key issues requiring updated, detailed assessment to as part of the ADA process.

The key operational parameters of the Revised Project have been designed to minimise environmental and social amenity impacts on the surrounding environment and communities. This involved further reductions in the following operational parameters:

- proposed extraction limits
- road transportation volumes and peak hourly truck movements
- operating hours
- proposed Project disturbance footprint
- proposed quarry operation approval term, to 25 to 30 years.

The outcomes of the preliminary environmental risk analysis are provided in **Table 6.1**. The following sections provide a detailed assessment of the key issues associated with the Revised Project.

Table 6.1 Preliminary Environmental Risk Assessment

Aspect	Preliminary Environmental Assessment	Further Assessment Required?
Land Resources	The Revised Project will not impact on land resources within the quarry's Project Area by changing the existing topography and relocating soil resources. Most of the topography within the Project Area has been heavily modified by past quarrying activities which has been occurring at the quarry since the early 1910's. The quarry site is underlain by Carboniferous volcanic and sedimentary sequences, approximately 350 million years old. The resource quantities within the existing and proposed extraction areas have been estimated using a detailed geological model developed from the extensive exploration program undertaken at the quarry (refer to **Section 6.2**).	No
Land Use	The Revised Project have the potential to interact with surrounding land uses. A detailed assessment of impacts on land use has been provided in **Section 6.2**.	Yes, refer to **Section 6.2**
Traffic and Transport	The Revised Project seeks to transport by rail and road, with up to 500,000 tpa of quarry product via road. The Revised Project further seeks to transport up to 140 loaded trucks per day (280 two way movements) for 50 days per year, otherwise 100 loaded trucks per day (200 two way movements) (Monday to Friday only). The hourly peak of truck movements will be up to 20 loaded trucks per hour (40 two way movements) between 7.00 am and 3.00 pm, and 15 loaded truck movements (30 two way movements) between 3.00 pm and 6.00 pm. No transport of quarry product is proposed on Saturday, Sunday, public holidays or between 24 December and 1 January, inclusive. The primary haulage route (Haul route 1) will be via Flat Road and Melbourne Street to connect with the New England Highway, thus removing most trucks from the routes via Lorn and Brandy Hill which have been historically used for the quarry site. Several road improvement works are proposed as part of the Revised Project to improve traffic flow and road safety and minimise transport related impacts. These will be designed in consultation with the relevant road authority and in accordance with Austroads Guidelines. A new site access is proposed directly off Dungog Road. An updated traffic impact assessment has been completed for the Revised Project. The Traffic Impact Assessment is provided in full as **Appendix C** , with the results and recommended management measures summarised in **Section 6.3**.	Yes, refer to **Section 6.3**

Aspect	Preliminary Environmental Assessment	Further Assessment Required?
Noise	The Revised Project proposes several changes to the East Pit (processing plant area) by incorporating noise bunds and walls and the extension of the rail spur to move loading operations further away from receivers. Reasonable and feasible physical noise control measures and operational noise controls are proposed for the life of the Revised Project to further improve noise mitigation. A detailed NIA has been completed for the Revised Project. The assessment is provided as **Appendix D**, with the results summarised in **Section 6.4**.	Yes, refer to **Section 6.4**
Air Quality	Emissions to air as a result of the Revised Project would be generated from a variety of activities including material handling, material transport, processing, wind erosion and blasting. These emissions would mainly comprise particulate matter (PM) in the form of deposited dust, total suspended particles (TSP) which includes particulate matter with equivalent aerodynamic diameter of 10 microns or less (PM_{10}) and 2.5 microns or less ($PM_{2.5}$) from general quarrying activities, fume (oxides of Nitrogen (NO_x)) from blasting and minor emissions from machinery exhausts (PM, NOx and Carbon Monoxide (CO)). A revised air quality impact assessment has been completed to quantify and assess the potential air quality impacts associated with the Revised Project. The assessment is provided in full as **Appendix E**, with the results summarised in **Section 6.5**. **Section 6.5.6** describes a range of mitigation and management measures has been incorporated into the design of the Revised Project to further minimise air quality impacts.	Yes, refer to **Section 6.5**
Greenhouse Gas and Energy	The extraction of quarry material will change the greenhouse gas and energy profile of the operation from that previously proposed and therefore an updated greenhouse gas and energy assessment has been undertaken to quantify the emissions associated with the Revised Project. The assessment is provided in **Appendix F**, with the results summarised in **Section 6.6**.	Yes, refer to **Section 6.6**
Blasting and Vibration	Blasting as part of the Revised Project will be undertaken during the hours of 11.00 am to 3.00 pm Monday to Friday, with no blasting on weekends or public holidays. Consistent with recent operations, a detailed design will be completed for each blast to ensure that vibration and blast overpressure limits are met. The blast design will consider adverse weather conditions, which may include heavy cloud cover, temperature inversion and strong winds. Blasting activities will be compliant with the ANZECC 1990 guidelines and licence criteria with the implementation of existing blast management protocols and risk mitigation measures. The current monitor locations have been assessed as appropriate as these are representative of most residences, including those closest to the quarry. A summary of the key findings of the blasting assessment is provided in **Section 6.7**, with the full assessment provided in **Appendix G**.	Yes, refer to **Section 6.7**

Aspect	Preliminary Environmental Assessment	Further Assessment Required?
Groundwater	The Revised Project has the potential to result in additional dewatering requirements and groundwater drawdown which in turn could impact on alluvial aquifers of the Paterson River, downstream water users and Groundwater Dependent Ecosystems (GDEs). A comprehensive groundwater impact assessment was completed for the Revised Project. The assessment found that while the proposed extension to the extraction area would intercept groundwater at an estimated rate of between 5.7 ML per year to 22.4 ML per year, the Revised Project will not result in adverse impacts on groundwater or groundwater users with the implementation of the proposed management measures. A licence allocation of 33 ML per year is held by the quarry. A summary of the key findings of the groundwater impact assessment is provided in **Section 6.8**, with the full assessment provided in **Appendix H**.	Yes, refer to **Section 6.8**
Surface water	The Revised Project and associated Water Management System (WMS) has the potential to impact on surface water resources due to the presence of ephemeral creeks in the Project Area, additional discharges to water courses and increased demand for potable water to meet production requirements. A comprehensive surface water impact assessment, including an operational water balance assessment, was completed for the Revised Project. Although controlled discharge volumes and frequencies are expected to increase with the Revised Project, the maximum volume of uncontrolled discharges (typically having higher TSS concentrations) is expected to decrease and discharged water quality would continue to meet the EPL 1378 criteria. The ongoing surface water licencing requirement is estimated to be approximately 9.8 ML/year once the voids reach spill level. However, further water management system monitoring (inventories, usage and discharges) and groundwater modelling will be undertaken as part of closure planning to inform the final void recovery model and refine the ongoing surface water licencing estimate. A summary of the key findings of the surface water impact assessment is provided in **Section 6.9**, with the full assessment provided in **Appendix I**.	Yes, refer to **Section 6.9**
Biodiversity	The Revised Project will require the disturbance of an area of approximately 22 ha of native vegetation from within the 127 ha of the Project Area. The biodiversity impacts of the Revised Project will be offset in accordance with the requirements of the *Framework for Biodiversity Assessment* (FBA) and the EPBC Act Environmental Offsets Policy, as discussed in **Section 6.10.7**. Rehabilitation of all disturbed areas will be completed using natural landform design principles and revegetation techniques to return a stable, natural looking landform and sustainable vegetation communities that are consistent with and enhance the surrounding landscape. A summary of the key findings of the Biodiversity Assessment Report (BAR) is provided in **Section 6.10** including the key ecological values of the Project Area, outcomes of the FBA process and details of the Biodiversity Offset Strategy (BOS) for the Revised Project. The full BAR, including the appended BOS, is provided in **Appendix J**.	Yes, refer to **Section 6.10**

Aspect	Preliminary Environmental Assessment	Further Assessment Required?
Historic Heritage	The Revised Project's primary haul route is proposed between East Maitland (in the south) and the quarry (in the north), traversing the LGAs of Dungog and Maitland. The proposed route extends through two heritage conservation areas (HCAs), being the Paterson Village HCA, as defined under the Dungog LEP 2014 and the Bolwarra HCA as defined under the Maitland LEP 2011. In addition, four State listed and 61 locally listed items are located alongside the primary haul route, although not in the immediate proximity of the route. As requested by DPIE, further assessment of the impacts of road haulage on these HCAs and individually listed heritage items has been completed in an updated Heritage Impact Statement (HIS) as outlined in **Section 6.11** , with the full assessment provided in **Appendix K**. The scope of the HIS was limited to only investigate and evaluate the potential heritage related impacts to result from the Revised Project's road haulage along the length of the primary haul route. The previous heritage assessment undertaken by Niche as part of the 2016 EIS has adequately addressed other heritage related impacts associated with the proposed quarrying operations. As outlined in **Section 6.11**, the HIS found that the Revised Project is unlikely to result in any adverse visual or physical impacts to the heritage significance of the heritage items along the route. Furthermore, the proposed mitigation measures outlined in **Section 6.11.4** is expected to prevent any impacts on heritage values (including minor cosmetic damage) associated with quarry truck movements.	Yes, refer to **Section 6.11.**
Aboriginal Cultural Heritage	The quarry is located in an area of low Aboriginal archaeological potential. The Aboriginal Cultural Heritage Assessment Report (ACHAR) undertaken for the Original Project (summarised in **Section 6.12.4**) concluded that the proposed expansion of the quarry will not likely harm any known Aboriginal objects or cultural heritage values (Niche, 2016). Further the OEH recommended no further assessment was required, following review of the Original EIS. Mitigation measures and management protocols described in **Section 6.12.5** should be implemented to ensure appropriate protections are in place to manage discoveries of Aboriginal objects or places at the quarry during operations.	No, refer to **Section 6.12**
Social amenity	Impacts on social amenity have been frequently raised by the community as a key issue. The potential impacts of the Revised Project on the local community have been assessed and methods used to engage the local community in the Revised Project planning and impact assessment processes have been documented in accordance with current DPIE guidelines. The assessment is provided in full in **Appendix O**, with the assessment results and social management and monitoring measures summarised in **Section 6.13**.	Yes, refer to **Section 6.13**
Economic	The potential impacts of the Revised Project on the local, regional and state economy have been assessed in accordance with current DPIE guidelines, with the results summarised in **Section 6.14**. The full report is provided as **Appendix P**.	Yes, refer to **Section 6.14**

Aspect	Preliminary Environmental Assessment	Further Assessment Required?
Hazard and Risk	A preliminary risk screening has been completed for the Revised Project in accordance with SEPP 33 and is included in **Section 6.15**. In addition, the quarry's Project Area has been identified as containing bushfire prone land and a bushfire threat assessment is provided in **Section 6.15.3**.	Yes, refer to **Section 6.15**
Waste Management	The Revised Project will generate similar waste streams and waste volumes to that of recent operations at the quarry. Waste will continue to be managed in accordance with existing site practices in accordance with relevant legislative requirements.	No, refer to **Section 6.16**
Visual Amenity	Potential visual impacts of the Revised Project will be limited to the addition of the new processing plant and equipment within the processing area, new quarrying areas within the West Pit and Proposed East Pit. Given the reduction in the proposed quarry area, a revised assessment of the potential impact on visual amenity has been undertaken and is provided in **Section 6.17**.	Yes, refer to **Section 6.17**
Public Health and Safety	Public health and safety have been assessed based on a risk screening assessment approach to identify potential adverse impacts on public safety, including health. The detailed assessment of each potential risk has been undertaken in accordance with relevant legislation and guidelines, and by appropriately qualified specialists and is presented in **Section 6.18**.	Yes, refer to **Section 6.18**
Final Landform and Rehabilitation	Effective rehabilitation and closure of the Martins Creek Quarry at the cessation of operations will be achieved through progressive rehabilitation and managing quarry operations, as outlined in **Section 6.19**, to work towards the final rehabilitation and closure of the quarry. Rehabilitation at the quarry will consider the existing and future quarry areas to build on existing rehabilitation undertaken and to address long term rehabilitation of quarried and disturbed areas. Key aspects associated with rehabilitation include rehabilitation of the quarry benches and available areas surrounding the quarry pit with a final void to remain at the quarry. The final land use will focus on promoting the rural landscape by establishing native grassland or exotic pastures in low lying areas whilst focusing on the re-introduction of pockets of woodland species across the benches consistent with endemic vegetation types. As detailed in **Section 6.19**, the final land use will be subject to further investigation during the development of detailed Quarry Closure plan three years prior to the cessation of quarrying activities.	Yes, refer to **Section 6.19**

6.2 Land Resources and Land Use

As an extractive industry development, the Revised Project will impact on the land resources within the Project Area by changing the existing topography and relocating soil resources. The potential impacts of the Revised Project on land resources and the potential for land use conflicts are discussed in this section, whilst subsequent sections of this report deal with other environmental aspects that have the potential to result in direct or indirect impacts on surrounding land uses (for example air quality, noise, blasting and water).

6.2.1 Landforms and Topography

The topography of the Project Area is characterised by gently undulating to undulating low hills on Carboniferous sediments and volcanics in the Medowie Lowlands region and hilly landscape. The lower topographic areas are associated with drainage lines. Most of the topography within the Project Area has been heavily modified by historic operations of the quarry which has been occurring since its establishment in the early 1910s. The extent of past quarrying activities is demonstrated on **Figure 1.2.**

The quarry is located on the south-west facing slope of a ridgeline with an elevation of up to 150 mAHD. The ridgeline provides a topographic barrier between the quarry and private rural residential properties to the northeast. The gently undulating terrain around the Project Area are predominately cleared due to historic agricultural (dairying, beef cattle and poultry) and non-agricultural (timber production) land use, with occasional areas of tall open forest or woodland with a shrub understory.

The Project Area is located within the Paterson River/Allyn River catchment, which forms part of the Hunter River catchment as described in **Section 6.9.2**. A first order and a second order ephemeral stream drain runoff from the local catchment north of the West Pit which flows into the Paterson River approximately 1.5 km west of the quarry. The alluvial flats associated with the Paterson River are around 9 mAHD. The location of the key drainage lines within and surrounding the Project Area is shown on **Figure 6.1**.

As discussed above, the topography of the Project Area has been substantially affected since the commencement of quarrying in the 1900s. Previous operations in the Project Area have altered the landform creating temporary landforms. The Revised Project will further alter the existing topography and landform within the Project Area through the proposed expansion of the quarrying activities. The proposed changes to the landform are discussed in **Section 6.19**.

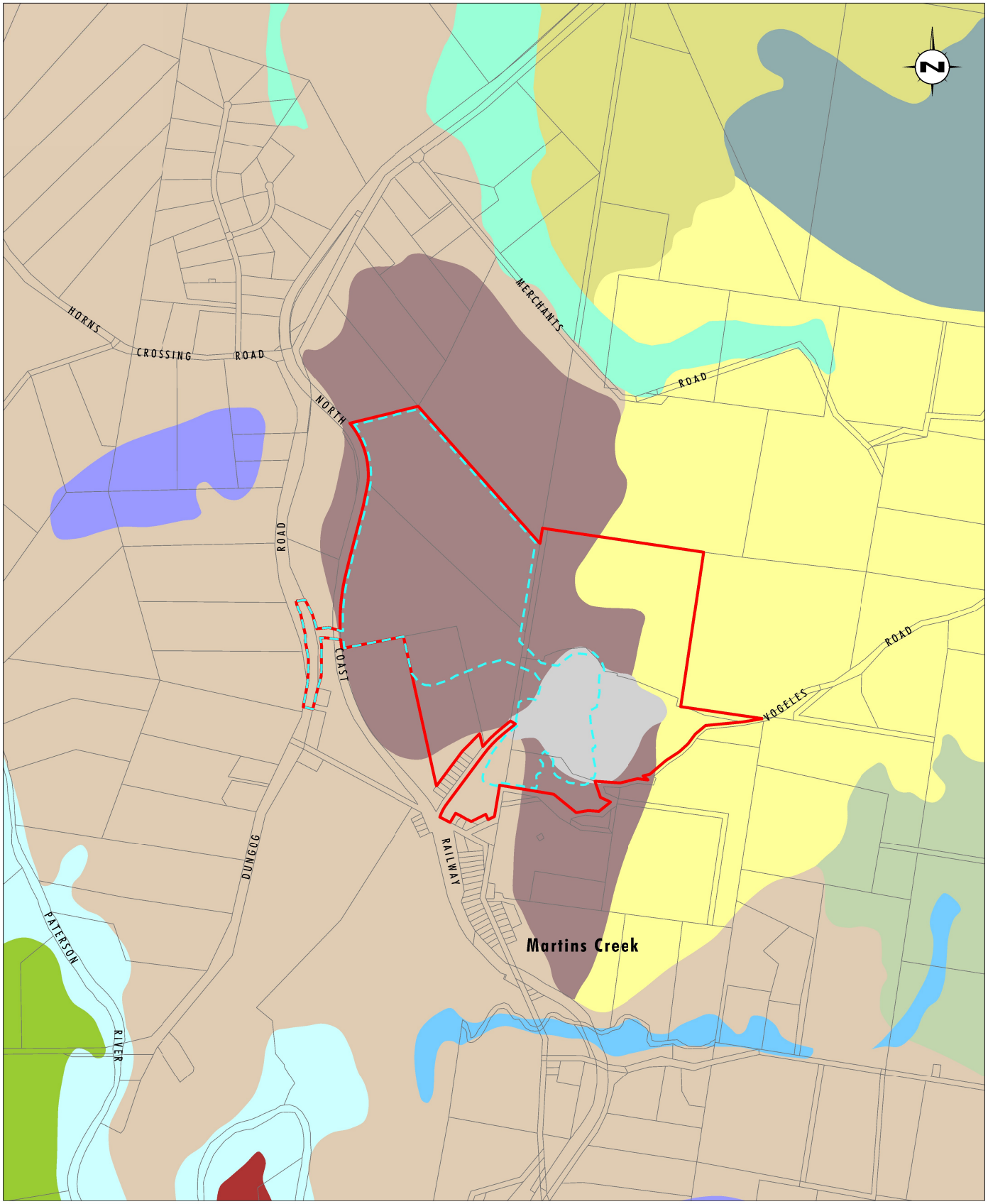
As part of the Revised Project, rehabilitation will focus on promoting the rural landscape by establishing native grassland or exotic pastures in low lying areas whilst focusing on the re-introduction of pockets of woodland species across the benches consistent with endemic vegetation types. The key objective of rehabilitation will be to return a stable, natural looking landform and sustainable vegetation communities that are consistent with and enhance the surrounding landscape. The proposed rehabilitation strategy and conceptual final landform for the Revised Project is discussed further in **Sections 2.11** and **6.19**. The proposed final land use is discussed in **Section 6.19.1**.

6.2.2 Soil Resources

This section describes the landform and soil context of the Project Area and surrounding lands. It presents information from published regional scale land and soil mapping and more detailed project specific soil mapping and testing.

6.2.2.1 Soil Landscapes within the Project Area

The soil types occurring within the Project Area are mapped on the Dungog 1:100,000 Soil Landscapes Map Sheet and described in Henderson (2000). Soil landscapes identified as being present in the Project Area include Ten Mile Road (tm), Brecon (br) and Birdsview (bi) (Henderson, 2000). The location of these soil landscapes and their relationship to the Project Area is shown on **Figure 6.1**.



Data Source: Daracon (2020), OEH (NSW June 2017)

0 0.25 0.5 1.0km
1:20 000

Legend

- Project Area
- Proposed Disturbance Area
- Birdsview
- Black Camp Creek
- Brecon
- Clarencetown
- Disturbed Terrain
- Gardiners Road
- Hilldale
- Paterson River
- Rivermead
- Sandy Creek
- Ten Mile Road
- Vacy
- Welshmans Creek

FIGURE 6.1

Soil Landscape Mapping Units

Ten Mile Road (tmr)

The Ten Mile Road soil landscape dominates the Project Area and is described as undulating low hills on carboniferous sediments and acid volcanics in the Medowie Lowlands and Clarence Town Hills regions (Henderson, 2000). The Ten Mile Road soil landscape has a high-water erosion hazard, localised shallow soils, high run on and seasonal waterlogging and strongly to extremely acid soils of low fertility.

Soils comprise moderately deep (55 cm) to deep (>200 cm), well to imperfectly drained brown Soloths (Db1.41), yellow Soloths (Dy2.41, Dy3.41), and shallow (<45 cm), well-drained Bleached Loams/Lithosols (Um2.12, K-Um2.12). Qualities and Limitations of the Ten Mile Road soil landscape include high water erosion hazard, localised shallow soils, high run-on and seasonal waterlogging, strongly to extremely acid soils of low fertility.

Birdsview (bi)

The Birdsview Colluvial soil landscape is on the eastern portion of the quarry and is described as rolling to steep hills on Carboniferous sediments in the Paterson Mountains region (Henderson, 2000). Slopes are up to 45%, local relief is 100 to 260 m and the elevation is up to 300 m.

Soils of the Birdsville Colluvial landscape comprise moderately deep (80 - 120 cm) well drained Yellow Podzolic Soils, with shallow (20 to 30 cm) well drained Bleached Loams and Lithosols on stony ridge crests, and deep (>200 cm) well drained Red Podzolic Soils where siltstones and deeply weathered polymictic conglomerates outcrop. The soils of the Birdsville Colluvial landscape have the following qualities and limitations: steep slopes, mass movement hazard (localised), rock outcrop (localised), water erosion hazard, high run on, foundation hazard (localised) and shallow soils (localised).

Brecon (br)

The Brecon soil landscape is on the western portion of the quarry and is described as undulating rises to low hills on Carboniferous sediments and ignimbrites, and possible alluvial terrace material in the Paterson Mountains and Clarencetown Hills regions (Henderson, 2000). Slopes are commonly 2 to 10% with local relief of up to 30 m and elevation to 70 m. Crests are broad (>300 m), sideslopes are long (>300 m) and gently inclined with slopes of 2 - 10%. Occasional rock outcrop (2 to 10%) occurs on upper slopes. Drainage lines are narrow (<2 m) and incised.

Soils of the Brecon landscape comprise moderately deep (50 to >130 cm), well to imperfectly drained brown Soloths (Db1.41) and yellow Soloths (Dy2.41) with some shallow (40 cm), rapidly drained Lithosols (Um1.42) on crests and some deep (>180 cm), well-drained Brown Podzolic Soils (Db1.11, Db2.11). Soils have the following qualities and limitations: water erosion hazard, foundation hazard due to highly plastic, moderate shrink-swell (reactive) subsoils, high run-on and seasonal waterlogging on lower slopes. Minor sheet erosion commonly occurs on upper slopes where vegetation is cleared. Minor to moderate gully erosion occurs in some drainage lines.

As can be seen from **Figure 6.1**, the Ten Mile Road soil landscape dominates the Project Area, with smaller areas of the Birdsview and Brecon soil landscapes in the east and south-west of the Project Area. The soil landscapes of the Project Area are generally texture contrast profiles of varying depths and have low fertility. They are subject to a number of hazards that affect their suitability for agricultural uses, including steep slopes, rock outcrop, seasonal waterlogging on lower slopes, susceptible to sheet erosion and potential for poor drainage.

6.2.2.2 Geology and Resource Description

The Project Area is underlain by Carboniferous volcanic and sedimentary sequences, approximately 350 million years old. The volcanic sequence of interest is known as the Martins Creek Andesitic Ignimbrite[3], as identified in the Newcastle 1:100,000 geology sheet (Gorbert V. & Chesnut W., 1975).

The faces and floor of the quarry are dominated by latite (a volcanic rock locally known as Andesite) which is mostly free of structural strains such as faults, thrusts and folding. Analysis of the fresh Latite undertaken by VGT Pty Limited (VGT, 2021) (refer to **Appendix B**) showed that the rock is volcanic rock which is hard and durable and is made up of predominantly Plagioclase Feldspar, both large and small fragments indicating a two-stage cooling process. The calculated volume of latite within the Revised Project's proposed extraction area is approximately 22.4 Mt (VGT, 2021).

There are some exposures of underlying red sandstone and claystone, known as metasediments, in parts of the quarry floor. This underlying sequence is most likely to be identified as Cll (the Wallaringar Formation).

The depth of weathering is determined upon the rip ability of the material. A dozer can generally rip to 0.5 m below the surface and then the material is too hard and competent and must be blasted. The yellow surfaces seen in the quarry are very thin iron stains found on the joints and do not compromise the strength of the material (VGT, 2021).

Testing is routinely undertaken for engineering properties including but not limited to rock strength, sizing and shape. Material encountered at the quarry is a hard igneous rock suitable for concrete aggregate, asphalt and sealing aggregate, ballast, gabion, rock fill, rock armour, road pavements, drainage and bulk fill operations (Qualtest, 2019).

The overburden or waste generated throughout the life of the quarry will consist of soil, sub-soil and weathered latite. The amounts generated are considered to be low due to the thin soil profile approximately 15 cm thick, whilst the weathered Latite can be used to create drainage aggregates, roadbase, gabion and fill products.

Soil and sub soil will be removed as part of the stripping. Weathered latite will be very similar to the fresh latite, except it will generally have higher clay content. Generally, material not suitable for processing at any given time will be stockpiled. This material can either later be used for processing, or if no suitable application can be determined, used for rehabilitation purposes. It is not anticipated that a significant volume of material that is not suitable for processing, will be available for rehabilitation purposes.

6.2.2.3 Land and Soil Capability

Land and Soil Capability (LSC) is the ability of the land to sustain a range of land uses and land management practices in the long term without degradation of soil, land, air and water resources (OEH 2012, drawing on Dent and Young 1981, Emery 1986 and Sonter and Lawrie 2007). The LSC classes of the Project Area were assessed in accordance with the requirements of the *Land and Soil Capability Assessment Scheme* (OEH 2012).

The LSC classes identify limitations on the type and intensity of use as a result of the physical attributes of the soil and the extent to which intensive management is required to prevent on and off-site degradation under varying land uses. The classification does not necessarily reflect existing land uses; rather, it indicates the potential of the land for different agricultural purposes, while maintaining the quality of natural assets.

[3] A localised term for this material, but petrographics identify it as Latite tuff, and for the purposes of this report is referred to as latite.

Table 6.2 presents the descriptions for the eight LSC classes currently used in NSW and an indication of their presence in the Project Area. The LSC classes identified within the Project Area are also mapped in **Figure 6.2**.

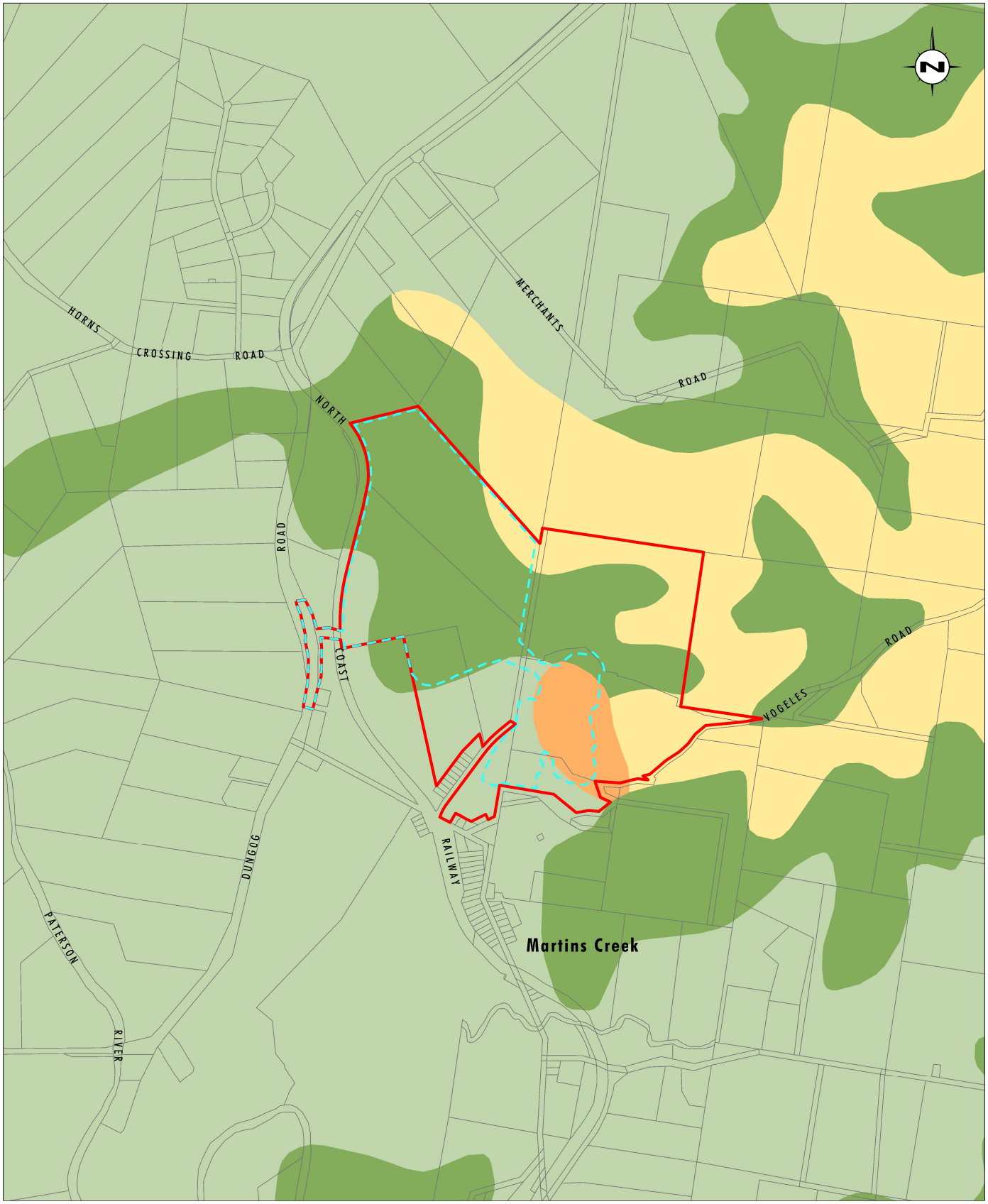
The majority of the Project Area is currently moderately suited for cropping, high intensity grazing and horticulture (LSC Class 4), with a small portion of low suitability (LSC Class 6). However, the topography and proximity of the LSC Class 4 land to the existing pit voids and processing area at the quarry would most likely restrict its use for agriculture. The LSC Class 6 on the eastern border of the Project Area is not suited for agricultural use.

All of the land required to be disturbed within the Project Area has moderate to severe (LSC Class 4) limitations to agriculture in their present state. It is noted that following rehabilitation the majority of the Project Area is proposed to be LSC Class 6 with the final void area being LSC Class 8. While this proposed final landform LSC could be suitable for low intensity grazing, the current proposed final land use is for the majority of the Project Area to be rehabilitated for biodiversity offsets and does not include agricultural uses.

Table 6.2 LSC Classes and Their Presence in the Project Area

LSC Class	General Information	Area Present within the Revised Project's Project Area (ha)	Area Present within the Revised Project's Disturbance Footprint (ha)
Land capable of a wide variety of land uses (cropping, grazing, horticulture, forestry, nature conservation)			
1	Extremely high capability land (very slight to negligible limitations): Land has no limitations. No special land management practices required. Land capable of all rural land uses and land management practices	Not present	Not present
2	Very high capability land (slight but significant limitations): Land has slight limitations. These can be managed by readily available, easily implemented management practices. Land is capable of most land uses and land management practices, including intensive cropping with cultivation	Not present	Not present
3	High capability land (moderate limitations): Land has moderate limitations and is capable of sustaining high impact land uses, such as cropping with cultivation, using more intensive, readily available and widely accepted management practices. However, careful management of limitations is required for cropping and intensive grazing to avoid land and environmental degradation.	Not present	Not present

LSC Class	General Information	Area Present within the Revised Project's Project Area (ha)	Area Present within the Revised Project's Disturbance Footprint (ha)
Land capable of a variety of land uses (cropping with restricted cultivation, pasture cropping, grazing, some horticulture, forestry, nature conservation)			
4	Moderate capability land (moderate to severe limitations): Land has moderate to high limitations for high impact land uses. Will restrict land management options for regular, high impact land uses such as cropping, high intensity grazing and horticulture. These limitations can only be managed by specialized management practices with a high level of knowledge, expertise, inputs, investment and technology.	26.9 ha	10.9 ha
5	Moderate- low capability land (severe limitations): Land has high limitations for high impact uses. Will largely restrict land use to grazing, some horticulture (orchards), forestry and nature conservation. The limitations need to be carefully managed to prevent long term degradation.	Not present	Not present
Land capable for a limited set of land uses (grazing, forestry and nature conservation, some horticulture)			
6	Low capability land (very severe limitations): Land has very high limitations for high impact land uses. Land use restricted to low impact land uses such as grazing, forestry and nature conservation. Careful management of limitations is required to prevent severe land and environment degradation.	65.6 ha	44.7 ha
Land generally incapable of agricultural land use (selective forestry and nature conservation)			
7	Very low capability land (extremely severe limitations): Land has severe limitations that restrict most land uses and generally cannot be overcome. Onsite and off-site impacts of land management practices can be extremely severe if limitations are not managed. There should be minimal disturbance of native vegetation.	21.2 ha	2.2 ha
8	Extremely low capability land (extreme limitations): Limitations are so severe that the land is incapable of sustaining any land use apart from nature conservation. There should be no disturbance of native vegetation.	2.4 ha	Not present



Data Source: Daracon (2020), NSW Department of Environment, Climate Change and Water (2010)

0 0.25 0.5 1.0km
1:20 000

Legend

- Project Area
- Proposed Disturbance Area
- 4 Suitable for Grazing with Occasional Cultivation
- 6 Suitable for Grazing with no Cultivation
- 7 & 8 Other
- M Mining and Quarrying Areas

FIGURE 6.2

Land and Soil Capability within Project Area

6.2.3 Contaminated Land

A search of the EPA's NSW Contaminated Lands Public Record Register undertaken for the quarry did not identify any areas of contaminated land. The Project Area has been used extensively for quarrying since the 1910s. Apart from localised contamination associated with the refuelling facility, there are no known areas of contamination within the Project Area or areas identified as contamination risks based on past land uses. The localised contamination associated with the refuelling facility located within the quarry processing area, will be remediated as part of the process of planned relocation of that facility, to meet current standards.

As with all activities that involve earthworks and quarrying, activities carried out as part of the Revised Project have the potential to cause localised contamination if not properly managed. Consistent with when Daracon have operated the quarry, controls will be put in place to manage this risk as part of the Revised Project including appropriate chemical handling and storage procedures, appropriate waste management systems, spill and emergency response procedures and equipment, and regular inspection and reporting processes. The management of contamination risks as part of the Revised Project is discussed further in **Section 6.15** and the management of waste is discussed further in **Section 6.16**.

The Acid Sulphate Soil Planning maps prepared by DSC indicate that the Project Area is not affected by acid sulfate soils.

6.2.4 Land Use Assessment

6.2.4.1 Existing Land Use

As identified in **Section 1.3.2**, the Project Area and its surrounds exist on land currently zoned under the Dungog LEP as zoned as RU1 – Primary Production, RU5 – Village, E3 – Environmental Management, R5 – Large Lot Residential, RE1 – Public Recreation and a small area of SP2 Infrastructure associated with the rail corridor. These zonings control the land uses which may or may not occur on these lands.

The RU1 Primary Production zone is the dominant zoning for land occupied by the Project Area and extending north, east and west to surrounding private properties and other parcels of land (refer to **Figure 1.4**). Three small parcels of RE1 Public Recreational land lies south of the Project Area. One of these parcels are within the boundary of the Project Area and will not be impacted by the Revised Project. Also located to the south of the Project Area, are some pockets of land zoned RU5 Village, which comprises residential lots and road corridors associated with Martins Creek. Land zoned R5 Large Lot Residential lies to further north and south of the Project Area and is associated with rural residential and agricultural land uses.

Parcels of densely vegetated land zoned E3 Environmental Management lie further south of the Project Area. Columbey National Park and Wallaroo National Park are located approximately 5 and 16 km south east of the Project Area respectively, these are zoned E1 National Parks and Nature Reserves.

The locality surrounding the Project Area is dominated by agricultural land use with large rural residential lots established over the years. The agricultural land uses are dominated by grazing activities with a mixture of cattle grazing, dairying and poultry. The land use to the south of the Project Area is a combination of private residential properties, public recreation, commercial and road infrastructure associated with Martins Creek (refer to **Figure 1.3**). Outside of agriculture and rural residential land uses, the area surrounding the Project Area and on the haul route generally consist of small rural holdings and rural villages including:

- Martins Creek (immediately south of the Project Area)

- Vacy (approximately 2 km north west of the Project Area)
- Paterson (approximately 5 km south of the Project Area), on the Primary Haul Route
- Mindaribba (approximately 12 km south of the Project Area), on the Primary Haul Route
- Bolwarra Heights (approximately 16 km south of the Project Area), on the Primary Haul Route
- Bolwarra (approximately 17 km south of the Project Area), on the Primary Haul Route.

The closest privately owned residences are located immediately south (refer to **Figure 1.3** and **Figure 1.6**). Other sensitive receiver locations include scattered privately owned rural residential lots approximately 300 m west, 800 m north and 1.2 km east of the Project Area.

There are a number of other quarries farther afield of the Project Area. These include the Karuah Quarry (approximately 60 km to the east), Seaham Quarry (approximately 40km to the south east), Allandale Quarry (approximately 46 km to the south west) and Brandy Hill Quarry (approximately 20 km to the south east). At the time of the preparation of this document, all of the quarries were operating.

6.2.4.2 Impact on Adjoining Land Uses

As required by Clause 12 of the Extractive Industries SEPP (refer to **Section 4.2.3**), when considering a development application for an extractive industry project, the consent authority must have regard to the aspects identified in **Table 6.3**.

Table 6.3 Extractive Industries SEPP Clause 12 Land Use Impact Considerations

Aspect Requiring Consideration	Assessment
The existing uses and approved uses of land in the vicinity of the development	The Project Area has historically been used for quarrying activities since the early 1900s, with this quarrying activity coexisting with neighbouring land uses for over 100 years. The area surrounding the Project Area and on the haul route generally consist of small rural holdings and rural villages.
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 land surrounding the quarry and along the haul route is primarily small villages, rural residential and small rural holdings. The quarry has been historically been used for over 100 years. It is unlikely that the Project Area or area surrounding the quarry would be utilised for alternate land uses based on current land zoning under the Dungog LEP (refer to **Section 6.2.4**). The haul route utilises the existing road network which has historically been utilised for product transportation from the quarry. Traffic and amenity related issues associated with the Revised Project have been assessed (refer to **Section 6.3** – traffic and transport, **Section 6.4** – noise and **Section 6.5** – air quality). The Noise Impact Assessment indicates that relevant criteria may be exceeded for some residences adjacent to the Project Area (refer to **Section 6.4**). Other than the potential noise impacts to three residences, the Revised Project is not expected to have a significant impact on surrounding land uses.

Aspect Requiring Consideration	Assessment
Any ways in which the development may be incompatible with any of those existing, approved or likely preferred uses	The Revised Project is within an area which has been subject to quarrying since the early 1900s, with this quarrying activity coexisting with neighbouring land uses for over 100 years. The Revised Project will expand the historic quarrying activities and extraction of quarry material into new resource rich areas at the existing quarry. The Revised Project is therefore considered to be compatible with existing land use of the quarry and broadly compatible with the surrounding land uses. Key elements of the Revised Project have been designed to minimise impacts on surrounding land uses, as detailed in **Section 6.0**.
Evaluate and compare the respective public benefits of the development and other land uses	Assessed throughout **Section 6.0** generally. The Revised Project will occur within the existing quarry into new resource rich areas. The evaluation of public benefit is provided in **Sections 6.13** and **6.14**. The assessment of land use interactions is a key component of the updated environmental assessment, with assessments of impacts on other land uses through health and amenity impacts (e.g. dust, noise, blasting, visual) and physical impacts (e.g. water, soils, topography, biodiversity etc.). Following completion of detailed assessments of each of these matters, it is concluded that while some impacts are predicted, the Revised Project is expected to be able to continue to coexist with the surrounding agricultural and non-agricultural land uses in the region. The Economic Impact Assessment indicates that the Revised Project is estimated to provide a net benefit to NSW, including for the local community.
Evaluate any measures proposed by the applicant to avoid or minimise any incompatibility.	The proposed measures to avoid or minimise any incompatibility are summarised in **Section 8.0**, and include measures to minimise the traffic and transport, air quality, water, noise, blasting and visual impacts of the Revised Project (amongst others), provide a sustainable final landform and land use, and maximise the economic benefits of the Revised Project.

6.3 Traffic and Transport

A comprehensive Traffic Impact Assessment (TIA) (refer to **Appendix C**) has been prepared by Seca Solutions Pty Ltd to assess the road traffic impacts of the Revised Project. The assessment was undertaken in accordance with the SEARs for the Original Project (dated 4 August 2016), the Austroads *Guide to Traffic Management*, the *Road Design Guide* and *Guide to Traffic Generating Developments* published by the RMS/TfNSW. The assessment is an update to the previous traffic assessment that was prepared for the Original Project (SECA, 2016), and addresses the agency submissions relating to the 2016 TIA.

Daracon recognise that traffic and transport issues are of key concern to the community (refer to **Section 5.4**), in particular with regards to the volume of truck movements, transportation hours, road safety and road capacity, noise emissions, emissions to air, truck vibrations and social amenity impact. Consequently, Daracon have undertaken a thorough review of the Original Project to redesign key operational parameters in order to reduce environmental and social amenity impacts, in particular in relation to traffic and transport as outlined in **Section 6.3.1**.

6.3.1 Project Design Changes

To reduce traffic impacts associated with the operation of the quarry, Daracon have committed to the following revised operational parameters as part of the redesign of the conceptual quarry plan for the Revised Project:

- reduction in tonnes transported by road to 500,000 tpa
- reduction in peak trucks per hour to 20 loaded vehicles per hour (40 movements) between 7.00 am and 3.00 pm, or 15 loaded vehicles per hour (30 movements) between 3.00 pm and 6.00 pm
- road haulage of quarry product to occur 7.00 am to 6.00 pm Monday to Friday, with no haulage of quarry product on Saturday, Sunday or public holidays
- no trucks through Paterson prior to 6.45 am Monday to Friday
- removal of Haul Route 2 as a primary haul route (now proposed only to service local jobs as required)
- all trucks entering and leaving the quarry will observe a reduced speed limit of 40 km/hour through the town of Paterson, with further reduction to 20 to25 km/hr around the King and Duke Street intersection.

Further traffic controls proposed as part of the Revised Project are set out in **Section 6.3.5**. In addition, a number of road improvement works are proposed to improve road safety and traffic flows. These will be designed in consultation with the relevant road authority and in accordance with Austroads Guidelines.

6.3.2 Assessment Methodology

The TIA undertaken for the Revised Project comprised the following:

- characterisation of existing traffic conditions through review of the historic and recent operations of the quarry and traffic count data as available
- undertaking intersection surveys during weekday AM and PM peak periods along the primary haul route to establish current traffic volumes. Specifically, this involved counts at the following intersections:
    - Dungog Road/Gresford Road
    - Paterson Road/Tocal Road
    - Paterson Road/Flat Road
    - Pitnacree Road/Melbourne Street/Lawes Street
    - Melbourne Street/New England Highway
- undertaking automatic tube traffic counts along key roads on the primary haul route to establish current traffic volumes. Specifically, this involved collecting traffic data over a 24-hour period for a three-week duration on the following roads:
    - Dungog Road, midway between Grace Ave and Gresford Road
    - Gresford Road, north of Paterson
    - Tocal Road, midway between Paterson and Bolwarra Heights

- Paterson Road, between Bolwarra Heights and Flat Road
- Flat Road midway between Paterson Road and Melbourne Street

- undertaking additional automatic tube traffic counts to the north of Church Street in Paterson, when there were no activities occurring at the quarry
- traffic modelling and intersection analysis using Sidra modelling software and an assessment of traffic impacts and any required management measures.

6.3.3 Existing Road and Rail Network

6.3.3.1 Road Network

Primary Road Connection

The major transport route through the area is regional road MR 101 that connects from East Maitland (at the New England Highway) via Bolwarra, Paterson, Wallarobba, Wirragulla, Dungog, Dingadee and Walshpool Bridge to The Bucketts Way. There is a branch from Paterson Road, Bolwarra via Flat Road and Pitnacree Road, Pitnacree to Melbourne Street, East Maitland Street. MR 101 is currently a regional road, however DSC has applied for the MR101 to be a State Road.

The existing road network surrounding the quarry is typical of a rural road standard and carries a wide range of vehicles including quarry trucks from other quarries in the region. The current road layout does not conform with the Austroads requirements in a number of locations in relation to pavement alignment and corridor width/clear zones as these roads were built to historic standards rather than current Austroads design standards.

The primary haul route for the quarry utilises the above regional route with vehicles exiting the New England Highway onto Melbourne Street, then travelling along Pitnacree Road and Flat Road to join Paterson Road (as identified on **Figure 2.11**). The primary haul route is about 28 km long and passes through the Dungog LGA and Maitland LGA. Historic and recent operations at the quarry utilised additional haul routes, to connect with the New England Highway and Pacific Highway at Raymond Terrace.

Key intersections along the proposed primary haul route where trucks associated with the quarry are required to give way are:

- Dungog Road/Gresford Road: give way control with Gresford Road being the priority road
- Paterson Road/Flat Road: three-way roundabout
- Pitnacree Road/Melbourne Street: four-way traffic signal control
- Melbourne Street/New England Highway: four-way traffic signal control.

The data collected during the intersection survey completed for the Revised Project enabled an assessment to be completed of the current road network performance (refer to **Section 6.3.2**). The operation of the intersections surveyed was assessed by calculating the amount of delay to vehicles using an intersection and, amongst other performance measures, gives a Level of Service (LoS) rating which indicates the relative performance of traffic movements within the intersection.

There are six LoS measures ranging from A (very low delay and very good operating conditions) to F (over saturation where arrival rates exceed intersection capacity). Typically, a LoS D or better is considered to be acceptable, however a LoS E may be acceptable if it also operates with a low degree of saturation.

The results indicate that all intersections, apart from the traffic signals at Pitnacree Road/Melbourne Street/Lawes Street and New England Highway/Melbourne Street, provide a very high standard of operation with the results yielding an overall LoS A or B on each approach with minimal delays and congestion. The signal-controlled intersections at Pitnacree Road/Melbourne Street/Lawes Street and Melbourne Street/New England Highway are both currently operating close to capacity, with considerable delays and congestion on some approaches. The intersection of the New England Highway and Melbourne Street are currently operating at a LoS of E/D (AM peak/PM peak).

Traffic data showed that the AM peak was generally 8.15 am to 9.15 am and pm peak was generally 4.30 pm to 5.30 pm. Traffic movements associated with the quarry is busiest during AM peak hour, while the PM peak traffic movements associated with the quarry are minimal due to a drop off in material being delivery beyond 4.00 pm. Traffic counts completed along the primary haul route indicated that daily traffic volumes are reasonably balanced in both directions, with a slight bias in movements southbound (outbound) in the AM peak towards Maitland and the New England Highway. This is reflective of commuter type trips to the major centres such as Maitland and Newcastle (to the south of the quarry) for work and education requirements. During the PM peak periods, the traffic flows with a bias for northbound movements, which is reflective of reverse commuter trips heading home after work, educational and retail activities.

A detailed description of the existing road network is provided in **Appendix C**.

Site Access

The main access to the quarry is currently via Station Street, from Grace Avenue and Dungog Road, which provides a route through to Gresford Road (refer to **Figure 2.13**). This current main access to the site allows for two-way traffic movements of both light and heavy vehicles. Visibility at this location also allows drivers in trucks exiting the quarry to safely determine suitable gaps in the through traffic movements along Grace Avenue to exit Station Street. Whilst the posted speed limit is 50 km/h in this location, the road alignment in this location encourages drivers to travel below this limit.

A second access is available via Vogeles Road, to the east of Station Street, which provides an alternative access that is utilised infrequently during train loading and for plant haulage (refer to **Figure 2.13**).

Traffic Safety and Accident History

A review of the existing road network along the primary haul route has highlighted that parts of the current road network layout do not conform with Austroads standards. They include:

- lack of space between the intersection of Station Street and the railway crossing and road alignment across railway crossing
- one-way bridge operation at Gostwyck Bridge on Dungog Road
- lack of sheltered right turn lane on Gresford Road for drivers turning right into Dungog Road
- tight road alignment on 90^{o} bend at Gresford Road/Duke Street in Paterson
- lack of pavement width on Tocal Road at Bolwarra Heights.

Accident data provided by the RMS (now TfNSW) (refer to **Appendix C**) showed that the overall number of accidents are low with no reportable accidents identified to be associated with the operations of the quarry. In addition, Daracon have confirmed that since operating the quarry there have been no record of any reportable or significant accidents associated with the truck movements in and out of the quarry site along the haul route.

Overall, the current road network is assessed to be generally satisfactory for road safety issues, with the key road network issues being those identified above.

Pavement Condition

The Pavement Condition Index (PCI) is a summarised score given to each road section based on a weighted combination of the different distresses affecting the pavement. A pavement without any distresses showing would have a PCI equal to 10. Each different type of distress discovered results in this score being lowered by an amount depending on the type and severity of the distress. A pavement with a PCI of zero would be in very poor condition (although PCI values can go negative when a pavement is very severely distressed). The types of distresses that are considered when determining a PCI score include roughness, rutting, all cracking, wide cracking, stripping/ravelling and potholing.

The current condition of the southbound lanes of the haul route based on a pavement condition survey undertaken in November 2018, is summarised in **Table 6.4**.

Table 6.4 Current Condition of Road Pavements (Southbound Lanes)

Condition Attribute	Dungog Roads	Maitland Roads
Road Length	12.75 km	15.7 km
Average Roughness (NAASRA)	85.0	52.9
Average Rut Depth	5.7 mm	4.7 mm
Average Cracking (% of surface affected)	4.5 %	6.0 %
Average Pavement Condition Index (PCI)	7.9	8.2
Average Strength (Modified Structural No.)	3.8	6.0

The condition survey showed that, although much of the haul route is in fair to good condition, there is also a proportion of the route that is in poor to very poor condition. It further indicates that the Maitland roads tend to be in better condition and have stronger pavements as compared to the Dungog roads (SMEC, 2021).

Gostwyck Bridge

The Gostwyck Bridge (BN1461) crosses the Paterson River on Dungog Road, approximately 3.7 km south west of Martins Creek and approximately 3 km north of Paterson, as shown on **Figure 2.16**.

The bridge has a total span of about 100 m and consists of a single main steel Pratt truss span supported by concrete piers and flanked by six timber girders approach spans. The carriageway width is approximately 5.5 m between kerbs and carries a narrow two lanes for light vehicles or one lane for heavy vehicles. The internal truss height clearance from the deck to the overhead bracing is 5.5 m. In general, the bridge is in good condition (FBE, 2020).

Although not on a B-Double route, the Gostwyck Bridge is open to general access vehicles. In 2016 (at the time of the exhibition of the EIS) the bridge carried around 900,000 t or 30,000 heavy vehicles (up to 50.5 t trucks) annually.

The bridge is listed on the NSW State Heritage Inventory, the Dungog Local Environment Plan 2014 and the Roads and Maritime Section 170 Heritage Register. The bridge is considered to have a high heritage significance at a local level (FBE, 2020). A detailed description of the Gostwyck Bridge is provided in **Appendix M**.

Public Transport

There are three main school bus service operators within the locality of the quarry, whose routes pass through or intersect the Revised Project's primary haulage route. There are a number of informal bus stops along the primary haul route that cater for school students.

Martins Creek railway station is approximately 500 m south of the quarry entrance on Station Street. The station is located on the Hunter railway line providing a link to Newcastle and beyond through to Sydney to the south and to Dungog to the north. Maitland station, located on the Hunter line 27 km to the south of the quarry, provides access to services to the west towards Singleton and beyond.

Pedestrian and Cyclist Facilities

There are currently no pedestrian or cyclist's facilities provided along the majority of the primary haulage route outside of the urban areas. In the rural settings for the roads, the distance between urban centres discourages casual cycling use and cyclists using these rural roads are generally more proficient and accepting of the rural environment for cycling. Roads around Martins Creek and Paterson appeal to weekend riders as part of a casual ride who are more confident of riding bikes in these environments. These riders typically ride at the weekend and less so during the week.

No footpaths are provided in Martins Creek village, which is attributed to the lack of commercial properties, and it is considered that there is little demand for pedestrian movements within this location.

Through Paterson there are footpaths provided in a non-continual manner. These paths are in the centre of the town where they cater for local pedestrian demands in the village centre of Paterson.

Through Bolwarra Heights, a footpath is provided on the eastern side of Tocal Road that allows for local connections and access to the school buses that run on this section of the road. South of Paterson Road there is a footpath constructed on the western side of the road which extends through to Victoria Road providing a connection to the sports fields and Bolwarra Public School.

Footpaths are provided within East Maitland, reflective of the much higher pedestrian demands and the urban development.

6.3.3.2 Rail Network

The quarry is equipped with a rail siding that is connected to the Main North Coast railway line via a connection adjacent and south of Martins Creek Station (refer to **Figure 2.1**). The siding can accommodate all contemporary rolling stock types and hook and pull operators, although train lengths are limited to approximately 345 m. Rail access to the quarry siding is via a road level crossing adjacent to the property boundary at Cory Street, Martins Creek. This level crossing is part of the ARTC network.

During train loading, the Station Street road entrance to the quarry is blocked and all road traffic is diverted through Vogeles Road to enter and exit the quarry through a back gate.

6.3.4 Assessment of Impacts

6.3.4.1 Operational Transport via Road

During operations, the quarry will need to accommodate both light vehicles and heavy vehicles with the largest vehicle being a truck and dog combination. Light vehicles will include staff vehicles as well as small trucks associated with general maintenance and supplies. The majority of the quarry product hauled by road would utilise a truck and dog combination, with other product being moved using semi-trailers and rigid trucks.

Daracon also has need for the occasional larger vehicle, including low loader floats for moving heavy machinery on and off site as required. Over size and/or over mass vehicles would be required infrequently and would be subject to separate specific permits from TfNSW and DSC.

Daily Traffic Flows

The Revised Project will be limited to a maximum of 20 loaded product trucks per hour and a maximum of 140 loaded product trucks per day, giving a maximum of 40 two-way movements per hour and 280 two-way movements per day on peak days. Peak road haulage operations will typically occur during the morning period and on a campaign basis, as well as a period in the afternoon when Daracon trucks are returning to the quarry. Daily ancillary truck movements associated with deliveries of fuels, pre-coat and additives have been are included in the Revised Project's maximum proposed trucking rates. Other service and delivery vehicles are ad hoc and not regular, as such they have not been included in the truck movements. These movements will be minor in nature.

Table 6.5 compares the road capacity of the primary haul route with quarry trucks, as proposed with the Revised Project, and without any quarry truck movements.

Table 6.5 Road Capacity Based on RMS Guide to Traffic Generating Developments using Mid-Block Flows

Location	Speed Limit	Road Type	% Heavy	Terrain	LoS (No Quarry Operation)	LoS (With Revised Project)
Dungog Road	80	Rural	18%	Rolling	B	B
Gresford Road	80	Rural	12%	Rolling	C	C
Paterson Township*	50	Urban	-	-	B	B
Tocal Road	100	Rural	10%	Rolling	C	C
Paterson Road	60	Urban	-	-	D	D
Flat Road	80	Rural	5%	Rolling	D	D

* Flows through Paterson Township taken as higher of flows recorded on Gresford Road and Tocal Road (=Tocal).

The results show that while there will be an overall increase in traffic along the primary haul route due to the Revised Project, the traffic volumes generated would not result in a change in the existing mid-block capacity at any of the above roads as a result of the Revised Project.

Peak Hour Impacts on Key Intersections

Results of the SIDRA modelling allowing for the Revised Project's maximum truck movements per hour along the primary haul route, including a future growth scenario, are presented in **Table 6.6**.

Table 6.6 SIDRA Results Along Haulage Route for 2030 with the Revised Project's Proposed Quarry Truck Flows (20 Inbound and 20 Outbound per hour) Plus 2% Growth Per Annum

Approach	Level of Service	Average Delay (S)	95% Queue (m)
Dungog Road/Gresford Road			
Gresford Road (from Bolwarra Heights)	A / A	6.0 / 3.8	3.5 / 5.5
Dungog Road	A / A	7.9 / 7.9	2.6 / 2.4
Gresford Road (from Vacy)	A / A	0.3 / 0.3	0 / 0
Overall	**A / A**	**4.4 / 4.2**	**3.5 / 5.5**

Approach	Level of Service	Average Delay (S)	95% Queue (m)
Paterson Road/Tocal Road			
Paterson Road (from Bolwarra)	A / A	3.5 / 4.0	4.8 / 10.7
Paterson Road (from Largs)	A / A	5.9 / 6.2	0.5 / 0.8
Tocal Road (from Paterson)	A / A	0.2 / 0.5	0 / 0
Overall	**A / A**	**3.3 / 3.7**	**4.8 / 10.7**
Paterson Road/Flat Road			
Flat Road (from East Maitland)	A / A	12.2 / 10.1	12.7 / 13.7
Paterson Road (from Bolwarra)	A / A	7.1 / 6.8	47.1 / 22.3
Paterson Road (from Maitland)	A / A	5.6 / 6.1	12.1 / 30.0
Overall	**A / A**	**7.5 / 7.2**	**47.1 / 30.0**
Melbourne Street/Pitnacree Road/Lawes Street			
Lawes Street	E / F	63.4 / 81.7	93 / 139
Melbourne Street (from New England Hwy)	C / C	35.9 / 36.5	213 / 162
Pitnacree Road	F / F	75.9 / 89.9	157 / 131
Melbourne Street (from Morpeth)	B / B	26.0 / 28.1	104 / 276
Overall	**D / D**	**46.4 / 45.6**	**213 / 276**
Melbourne Street/New England Highway			
New England Highway (from Newcastle)	F / D	75.3 / 50.1	457 / 255
Melbourne Street (from Morpeth)	F / E	83.9 / 62.8	230 / 146
New England Highway (from Maitland)	C / E	30.5 / 53.3	224 / 415
Melbourne Street (South)	D / D	54.5 / 54.7	87 / 99
Overall	**E / D**	**59.2 / 53.9**	**457 / 415**

The results in **Table 6.6** show the intersections of Dungog Road/Gresford Road, Paterson Road/Tocal Road and Paterson Road/Flat Road would continue to provide a very high standard of operation during the operation of the Revised Project, with the results yielding an overall LoS A on each approach with minimal delays and congestion.

Table 6.6 further shows that the traffic movements associated with the Revised Project will have an acceptable impact upon the overall operation of the signalised intersections of Pitnacree Road/Melbourne Street/Lawes Street and Melbourne Street/New England Highway. Whilst these intersections are predicted to suffer delays, this would be due to the continual traffic growth along the New England Highway in this location rather than a direct impact of the Revised Project.

Traffic flows associated with the Revised Project represent a small increase over the existing flows through the Melbourne Street/New England Highway intersection. In the AM peak between 8.15 am and 9.15am the total flows were 4,451 and the quarry traffic represents an increase of 0.89% over these flows. In the PM peak between 4.30 pm and 5.30 pm, the quarry traffic generated through the intersection represents a 1.09% increase.

As such, additional traffic movements associated with the Revised Project would have an acceptable impact upon the operation of the key intersections along the primary haul route.

Site Access

During the early phase of the Revised Project, all vehicle access will be via the existing access on Station Street. Whilst the current layout of the Station Street/Grace Avenue intersection does not comply with current Austroads Guidelines, it has operated as a single vehicle access to the quarry for the majority of the life of the quarry and has allowed for safe and appropriate two-way traffic movements (with no recorded accidents at this location). Existing controls for the level crossing will continue to advise vehicle drivers of approaching trains which improves road safety.

A new site access off Dungog Road (refer to **Section 2.7.2**) is proposed to be constructed by the end of Year 4 after the Revised Project has commenced, should the Revised Project be approved. The new access will allow for heavy vehicle access via Dungog Road directly onto the quarry, thereby removing truck movements along Station Street, Grace Avenue and the level railway crossing adjacent Station Street. Once the new access is constructed, the Station Street access would only be used for temporary/emergency access. If required, over size/over mass vehicles will use the new access with these vehicles operating under a separate approval process as required with the relevant road authorities. As the new site intersection on Dungog Road will be designed and constructed in accordance with Austroads Guidelines, with approval from the road authority, safe access to the quarry will be provided whilst catering for safe through traffic movements.

Road Safety

The Revised Project is not expected to have any adverse impacts on the safety of the road network or other road users. **Table 6.6** shows that the key intersections would continue to operate at current capacity with the implementation of the Revised Project.

Road improvement works are proposed as part of the Revised Project to alleviate existing road safety concerns and improve traffic flow. These will be designed in consultation with the relevant road authorities and in accordance with Austroads Guidelines. The proposed road works (detailed in **Section 2.8.2**) will provide the following benefits to be experienced with the Revised Project:

- New main site access – A new access to the quarry on Dungog Road will remove all quarry related trucks from Station Street and Grace Street and the existing access will only be used by light vehicles in an emergency event.

- Gresford/Dungog Road intersection – Will provide a sheltered right turn lane on Gresford Road to improve road safety, by reducing or eliminating the potential for rear end type accidents. The upgrade will direct all through traffic to steer to the left of any vehicle waiting to turn right at this location. This upgrade is in line with RMS/TfNSW policy (RMS Publication 17.336 version 2.0 dated 31/8/2017) which no longer permits Rural Type AUR intersection controls and requires a Rural CHR type intersection. The upgrade will further extend the acceleration lane improving road safety.

- King and Duke Street intersection - Upgrade the 90-degree bend in Paterson with a refresh of the diving line marking through the intersection to delineate and separate opposing traffic. The upgrade will allow for the relocation of the driveway on the north side of the intersection to improve space allocation for on street parking.

- Gostwyck Bridge approach upgrade - The upgrade will allow for the realignment of Dungog Road by incorporating a series of curves to raise driver awareness and associated new line marking, as well as Vehicle Activated Signage (VAS) alerting drivers approaching the bridge to reduce speed.

In addition, Daracon commit to implement a range of driver conduct and other traffic controls (as outlined in **Section 6.3.5**) to further mitigate any potential road safety impact to be associated with trucks from the Revised Project.

Public Transport, Pedestrians and Cyclists

Consultation with bus companies highlighted the fact that the recent operations did not result in any road safety concerns. Truck drivers associated with the quarry are required to drive in strict adherence to the road rules and continual observance of the Martins Creek Quarry Drivers Code of Conduct, including a reduction of speed to 40 km/h when passing a stationary bus. It is therefore expected that the Revised Project will have an acceptable impact on public transport, including the safety of public transport users.

Regarding pedestrians and cyclists, the rural nature of the locality implies that most pedestrian movements occur within the urban locations only. Pedestrian movements are typically concentrated in the centre of towns (Paterson, Bolwarra Heights, and East Maitland) where there are footpaths provided to allow for connection between the various commercial elements within the town. The rural location together with distances between Maitland and other major centres in the area discourages casual cycling outside of the town areas. The locality is however a popular destination for weekend riding with cycling enthusiasts. The Revised Project no longer proposes truck movements on Saturday, Sunday or public holidays, when most cyclists' enthusiasts are out on the road.

It is considered that with the additional traffic management and mitigation measures proposed (refer to **Section 6.3.5**), the Revised Project will have an acceptable impact in terms of pedestrian and cyclist safety.

Gostwyck Bridge

Investigations by FBE (2020), including load testing and structural assessment, have found the steel truss span operating as a one lane bridge is capable of supporting vehicle loads of up to 68 t B-Doubles (refer to **Appendix M**). The bridge has also been found to have a remaining fatigue life well in excess of 90 years under a usage of approximately 900,000 tpa. Additionally, the assessment indicated that if BD68 vehicles are used in place of TD50.5 vehicles, the estimated remaining fatigue life of the structure is still greater than 100 years at the proposed transportation rate of 500,000 tpa. It is therefore concluded that the Revised Project will not have any adverse impact on the structure of the Gostwyck Bridge due to an increase in truck movements over the bridge (FBE, 2020).

In addition, as described in **Section 2.8.2**, it is proposed that the bridge approach be upgraded as part of the Revised Project through the realignment of Dungog Road by implementing a series of curves, including new line marking and Vehicle Activated Signage alerting drivers approaching the bridge to reduce speed. These works are targeted to raise driver awareness and improve road safety along this section of the primary haul route.

Road Pavement

A detailed road pavement report has been prepared by SMEC (2021) (refer to **Appendix L**). This provides detailed analysis of the expected contribution that proposed quarry haulage will make to road pavement deterioration, based on maximum proposed haulage volumes. This analysis provides detail to inform the process of determining relevant road maintenance contributions for Maitland and Dungog LGA's. On the basis that Daracon will contribute towards road maintenance and pavement upgrades, any impacts on the road pavement resulting from the transport of product from the Revised Project would be mitigated, should the Revised Project be approved.

Cumulative Traffic Impacts

The assessment of operational traffic impacts shown in **Table 6.6** included background traffic growth of 2% per year up to 2030 (10 year period), including existing and approved truck movements associated with the Brandy Hill Quarry. This background traffic growth is considered adequate to account for the cumulative impact of other projects in the region that have been approved but have not yet commenced. The assumed growth rate of 2% per year is considered conservative given that future traffic volume increases on the road network are likely to be lower than annual increases over the last decade.

The TIA found that the traffic movements associated with the Revised Project will have an acceptable impact upon the overall operation of the principal intersections along the primary haul route. Whilst the two signalised intersections are predicted to suffer from increasing delays, this would be due to the continual traffic growth along the New England Highway in this location rather than a direct impact of the Revised Project.

6.3.4.2 Construction Traffic

As described in **Section 2.9**, several construction activities are planned to occur at different times over the first 5 years of the Revised Project, should the project be approved.

Works associated with the proposed ongoing operations at the quarry (such as noise bunds, the rail siding extension, and the new main access road) will be located within the Project Area. There will be demands for light vehicle access for construction staff and heavy vehicles up to semi-trailers for delivery of building materials. Truck movements associated with the delivery of road base products during the proposed road upgrade works will be apportioned within the operational daily limit of 140 outbound truck loads per day (worst case). The anticipated workforce and associated traffic required for the construction are as follows:

- 20 to 30 personnel, generating 20 to 30 light vehicle trips arriving at the quarry between 6.30 am and 7.00 am and departing between 6.00 pm and 6.30 pm
- generally up to 10 heavy vehicles per day (supplying concrete pours and other material).

The construction of the proposed intersection and bridge approach upgrade works will result in some short-term traffic interruptions and delays on the local road network. Traffic related impacts associated with these works will be controlled by project specific Traffic Control Plans (TCPs) which will be prepared prior to each portion of work commencing. Once works are complete, the upgraded intersections and bridge approach will result in an overall improvement to the local road network.

A site-specific Construction Traffic Management Plan (CTMP) will be prepared for the Revised Project prior to the works commencing at the quarry. This will be prepared in accordance with RMS Traffic Control at Work Sites manual and will include TCPs to control traffic though and in/out of the construction site. During construction work, traffic control measures will be in place at the construction zones to manage road safety and the safety of the construction staff. The requirements of the traffic control will be determined as part of the construction work and this could include speed reduction through the construction zone and associated delays to through traffic movements.

Overall, it is expected that construction related traffic will have a minor impact on the local road network.

6.3.4.3 Operational Transport via Rail

The Revised Project seeks to transport up to 500,000 tpa via road with the remaining product transported via rail. If the market permits, Daracon is committed to increasing the quantity of quarry product by rail, up to a maximum of 1.1 Mtpa. Quarry products will be transported via rail in response to market demands.

There is direct rail access from the quarry onto the Main Northern railway line where the trains are directed by the ARTC Control Centre at Broadmeadow.

Currently, the quarry is constrained by available train paths on the network and train loading hours which limits movements to one train per day. To alleviate some these constraints Daracon is seeking approval to load trains 24 hours per day and to construct an extension of the existing rail spur within the East Pit (refer to **Figure 2.1**), to enable the loading of trains, typically either 400 or 600 m in length (although train lengths vary). The rail spur will be extended by approximately 360 m and is planned to be constructed by the end of Year 4 of the Revised Project.

Based on the access to the Main Northern railway line during the day and the train cycle time into the greater Sydney Region it is anticipated that Revised Project would normally load a maximum of two trains over a 24 hour period, one during the day and one during the evening/night time period. The third train loading during the evening or night time period would only be required occasionally to meet peak demands or to adapt to rail line capacity availability, track closures, breakdowns, etc.

No road haulage of quarry product

The opportunity to avoid any road haulage of quarry product, and transporting all quarry product by rail, has often been raised during the community engagement process. Whilst Daracon now propose to significantly reduce the proportion of quarry product delivered by road, it is not feasible to continue quarry operations with no road haulage, and have all the quarry product transported by rail. Recently, Daracon have identified a rail receival facility in Western Sydney, which is feasible to use for delivery of quarry product to supply major construction industry demands for the Greater Sydney Metropolitan Area. On this basis, approximately 600,000 tpa (54.5%) of the proposed total quarry production of 1.1 Mtpa, will be transported by rail. Subject to market demands, Daracon may increase the amount transported by rail, on a campaign basis, within the 1.1 Mtpa of total quarry product.

Whilst Daracon are committed to continuing to investigate opportunities to minimise the need for road haulage to supply regional markets, it is not currently feasible. The ability of the quarry to increase rail distribution of aggregates within its current distribution area is limited by the lack of suitable rail unloading facilities, large number of product destinations and types, short haulage distances and the fact that a number of competing quarries use the road system as a more commercially viable and flexible supply to service the same markets.

Despite extensive investigation (refer to **Appendix N**), there is no current feasible option to use rail logistics to supply the local and regional market for the Revised Project.

In order for the quarry to be commercially viable, it must be able to service the local and regional construction material markets.

6.3.5 Management and Mitigation

Daracon have committed to constructing a new access road on Dungog Road to allow heavy vehicle access via Dungog Road directly onto the quarry. As a result, trucks will no longer need to travel via Station Street, Grace Avenue and the level railway crossing adjacent Station Street. Detailed concept design for the new access road and new intersection on Dungog Road will be prepared in consultation with DSC and ARTC. The proposed main access, including the fly-over bridge over the rail line, will be designed and constructed in accordance with Austroads and TfNSW standards and clearance requirements specified by ARTC.

In order to guide traffic management during the construction of the new access road, a CTMP will be prepared in consultation with DSC prior to construction commencing. This will be prepared in accordance with RMS Traffic Control at Work Sites manual and will include TCPs to control traffic through and in / out of the construction site. During this construction work, traffic control measures will be in place on Dungog Road to manage road safety and the safety of the construction staff. The requirements of the traffic control will be determined as part of the construction work and this could include speed reduction through the construction zone and associated delays to through traffic movements.

Further road improvement works as described in **Section 2.8.2** are proposed as part of the Revised Project to address existing road safety concerns within the road network. These will be designed in consultation with the relevant road authorities and in accordance with Austroads Guidelines. Project specific CTMPs will be prepared in consultation with the road authority prior to the commencement of construction for each of these works.

Should the Revised Project be approved, Daracon have committed to the continued implementation of existing operational traffic controls and a review and update of these controls for the Revised Project, including:

- continued rigorous assessment and pre-qualification process prior to the engagement of any transport subcontractors, including thorough review of subcontractor's relevant management processes and procedures to ensure compliance with the Heavy Vehicle National Law (HVNL) and associated Chain of Responsibility (CoR)
- all drivers attending the quarry are required to sign and adhere to the Driver Code of Conduct. The current Driver Code of Conduct is published on Martins Creek Quarry page of Daracon website at: https://daracon.com.au/storage/app/media/Enviro%20and%20Quarries%20Documents/Martins%20Creek/Martins-Creek-Code-of-Conduct.pdf
- the Driver Code of Conduct will require drivers to report any substantial road pavement irregularities in Paterson, and along the entire primary haul route, with these reports being passed on to DSC or MCC for attention
- reinforce through regular communication and consultation the truck speed limits in the Driver Code of Conduct, including:
    - 40 km/hr through Paterson, Bolwarra and Vacy
    - 20-25 km/hr at the intersection of King and Duke Street Paterson
    - 20 km/hr on Station St Martins Creek
- review and update the Driver Code of Conduct annually and as the need arises
- undertake regular audits of transport subcontractors to ensure compliance with the HVNL and CoR
- conduct regular monitoring, spot checks and observation of driver behaviour
- investigate all complaints and potential breaches of Daracon's Traffic and Transport policies and procedure to the fullest extent possible and initiate disciplinary action as required
- continue planning to expand rail markets and gain access to rail unloading capacity, in order to enable greater transportation of product by rail
- if Daracon is called upon to assist in providing quarry material in response to an emergency event it will advise the community, DSC and the EPA, at the soonest possible opportunity, in accordance with any emergency response plan enacted by the relevant State or National authority
- explore additional opportunities to further monitor driver conduct and truck convoying, as suggested by the community, including fleet management technologies as they become available and GPS monitoring for non-Daracon vehicles
- Daracon commit to plan quarry activities, and revise haulage as required around days when there is extra traffic in Paterson due to community events, e.g. Tocal Field Days, car show events, Baptist Church events and funerals.

In order to capture the traffic management measures described above, Daracon will also prepare and implement a TMP in consultation with TfNSW, DSC and MCC, should the Revised Project be approved. The TMP will include:

- the haulage route and traffic types to be used for the Revised Project

- the measures to be implemented to:
    - ensure compliance with the traffic operating conditions committed to by Daracon
    - minimise traffic safety issues and disruption to local road users, including minimising potential for conflict with school buses
    - minimise the transmission of dust and tracking of material onto the surface of public roads from vehicles exiting the quarry
    - confirm truck speed limits through Paterson, Bolwarra, Vacy and Martins Creek
    - participate in transport management investigations initiated by DSC or MCC
- include the Driver Code of Conduct.

6.4 Noise

A detailed NIA has been undertaken by Umwelt to assess the potential noise impacts associated with the Revised Project in accordance with the SEARs. The SEARs for the Original Project make reference to the NSW EPA Industrial Noise Policy, 2000 (INP). The INP was replaced in October 2017 by the NSW Noise Policy for Industry, 2017 (NPfI) (EPA, 2017). In accordance with the transitional arrangements, and with consideration to the date of issue of the SEARs (4 August 2016), the provisions of the NPfI and other relevant guidelines have been applied to this assessment. As noted in **Section 1.1**, confirmation of the applicable policies and guidance material was provided by DPIE on 6 November 2020 (refer **Appendix A**). Accordingly, the project noise criteria have been developed with consideration to the NPfI. As an existing industrial noise source, the NIA has taken into account both the historical operational aspects of the quarry and the proposed expansion of the quarry operations.

This assessment has also considered road and rail traffic impacts associated with the Revised Project as well as the noise impacts from construction activities in accordance with the NPfI, the Interim Construction Noise Guideline (ICNG) (EPA 2009), the NSW Road Noise Policy (RNP) (DECCW 2011) and the Rail Infrastructure Noise Guideline (RING) (EPA 2013). The VLAMP – for State Significant Mining, Petroleum and Extractive Industry Developments (2018) has also been taken into account in considering residual noise impacts and potential mitigation options.

The NIA further considers the matters raised by the government agencies in respect to noise following the exhibition of the 2016 EIS for the Original Project. A summary of the key findings of the NIA is provided in this section and the full report is provided in **Appendix D**.

6.4.1 Project Design Changes

As discussed in **Section 5.4**, noise is a key issue for the local community, particularly in relation to the historic operations at the quarry, including truck movements on site and off site via the public road network. Noise generated at the quarry is proposed to be actively managed through the implementation of a performance-based, adaptive approach that has been focused on implementing appropriate operational controls and strategies to proactively minimise potential noise impacts.

This approach to management of noise impacts is a proven and effective tool for minimising noise impacts from operations and has formed the basis for the detailed design process for the Revised Project and the identification of reasonable and feasible noise mitigation measures.

The design and planning of the Revised Project noise modelling was completed on an iterative basis to enable the minimisation of noise impacts as far as practicable.

Extensive work has been undertaken to optimise quarry plans, rail and road haulage configurations and assessment of mitigation and management measures. Key features of the Revised Project that are related to the management and mitigation of potential noise impacts from the operation include:

- rail spur extension into the northern end of the East Pit, approximately 10 m below the current ground level and relocation of train loading facilities
- construction of a dedicated access road onto Dungog Road removing trucks off Station Street (except for emergency purposes), following ARTC approval for detailed design plans and construction of a new rail bridge. The access road will be commissioned as early as possible, and by the end of Year 4, from project approval
- significant changes to the proposed hours of operation for the Revised Project compared to the Original Project (refer to **Section 2.6**) and reductions in maximum truck movements (refer to **Section 2.8**).

In addition to the design controls above, Daracon are committed to implementing a range of reasonable and feasible physical and operational noise mitigation measures. Physical noise control measures include noise barriers in key locations, noise attenuation of processing equipment, and replacement of parts of the processing plant with new attenuated equipment (refer to **Figure 6.3**). Operational noise controls for the life of the Revised Project include commitments to no in-pit mobile crushing in the West Pit, use of three new smaller trucks operating in the West Pit, and continuous noise monitoring with predictive weather forecasting and real-time monitoring alerts to allow modification of operations where appropriate (refer to **Section 6.4.6**). These controls have been factored into the noise model for the Revised Project in order to demonstrate the proposed quarrying operations can meet the project noise trigger levels.



Image Source: Google Earth (2018)
Data Source: Daracon (2020)

0 50 100 150m
1:3 000

Legend

- Project Area
- New Cladding to Roof and Walls
- Proposed Noise Bund (3m high)
- Proposed Concrete Wall (8m high)
- Proposed Concrete Wall (up to 4m high)
- Proposed Earth Barrier
- Proposed Fence (1.5m to 1.8m high)

FIGURE 6.3

Proposed Physical Noise Control Measures

6.4.2 Assessment Methodology

The NPfI documents the procedures to be used to assess the noise from industrial noise sources scheduled under the PoEO Act. The first step in the application of the NPfI involves determining the project noise trigger levels (PNTLs) for the development. PNTLs are not limits but are the benchmark levels above which noise management measures are required to be considered. PNTLs are based on the project intrusiveness noise level and project amenity noise level for a particular location as defined by the NPfI.

The project intrusiveness noise level protects against significant changes in noise levels and is established by reference to existing background noise levels. The project amenity noise level is set based on the approved use of the land and is designed to manage cumulative noise impacts from industry thereby protecting the amenity for particular land uses.

The determination of the PNTLs also takes into consideration the noise levels from an existing development when the development has been operating for more than 10 years. As specific areas within a landscape can have a variety of approved land uses and different acoustic environments, the area surrounding a proposed development will generally have different PNTLs.

6.4.2.1 Quarry Noise Receivers

The privately-owned residential receivers that could potentially be affected by noise from the Revised Project are shown on **Figure 6.4**.

Noise Assessment Groups (NAGs), presented in **Table 6.7**, have been allocated to areas surrounding the Revised Project that have similar acoustic environments and a similar noise management requirement. These areas have been defined giving consideration to topographical features that may enhance or attenuate the transmission of noise, the relative location of other noise sources (such as rail and road traffic) and the relative location to the Revised Project. NAGs 1 to 4 take into account the noise generated by the existing quarry operations. NAGs 5 to 14 are assessed as the equivalent of a new development.

The process for determining what PNTLs apply to different receivers is detailed in the NIA and discussed in **Section 6.4.2.2** below.

Table 6.7 Receiver Areas and Noise Assessment Groups

Receiver Area	Description
NAG 1	Station Street – located immediately to the south-west of the processing plant area
NAG 2	The northern section of Cory Street and western end of Douglas Street – located immediately to the south of the processing plant area
NAG 3	Grace Avenue – located immediately to the south-west of the processing plant area on the western side of the North Coast Railway Line
NAG 4	The southern section of Cory Street to the south of the processing plant
NAG 5	Grace Avenue between Martins Creek and Dungog Road
NAG 6	West of Dungog Road to the south-west of the Revised Project
NAG 7	West of Dungog Road to the west of the Revised Project and immediately to the west of the proposed new access road
NAG 8	Mowbray Lane to the west of the Revised Project
NAG 9	West of Dungog Road immediately to the north-west of the quarry area
NAG 10	Horns Crossing Road the north-west of the quarry area

Receiver Area	Description
NAG 11	Vacy the north-west of the quarry area
NAG 12	Merchants Road to the north and northeast of the Revised Project
NAG 13	Vogeles Road to the east of the Revised Project
NAG 14	The area to the south of the Revised Project including Black Rock Road, Cook Street, and the area south of Grace Avenue east of Dungog Road

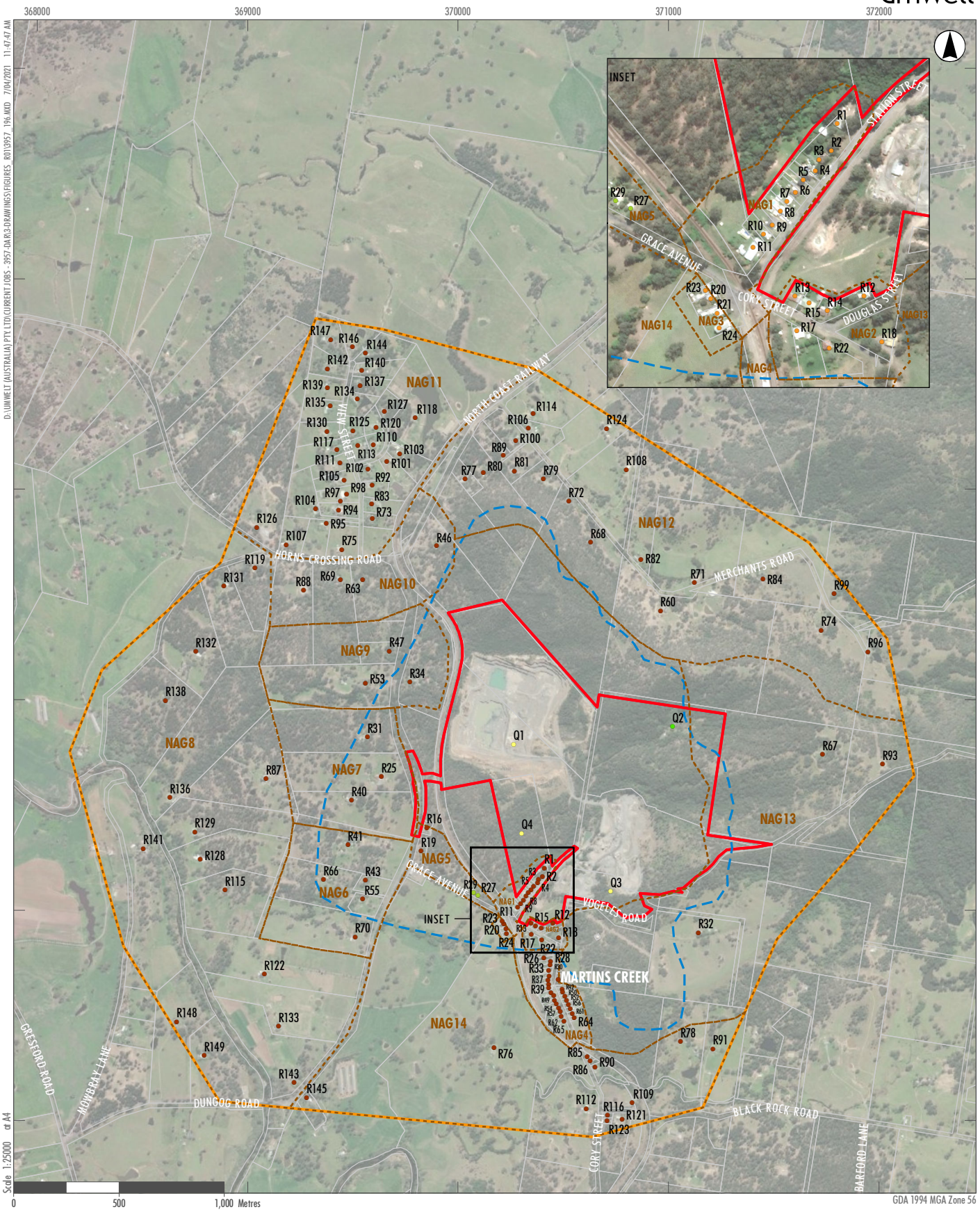
6.4.2.2 Establishing Project Noise Trigger Levels

The process for assessing changes to an existing development differs from a new development. Section 6 of the NPfI defines the process for assessing noise impacts associated with changes to existing operations and has the overall objective to improve the environmental performance of existing industrial sites. The assessment process outlined in Section 6 of the NPfI is based on the guiding principles of Section 45 of the POEO Act Part 3.1 which provides that consideration should be given to practical measures that could be taken 'to prevent, control, abate or mitigate pollution'.

The Revised Project is a change to an existing operation and Section 6 of the NPfI provides the process for identifying project noise trigger levels for upgrades or expansion of an existing industrial site:

> *For an industry that has been in operation for more than 10 years and existing site operations exceed the project amenity noise level, the project amenity noise level may be adopted as the project noise trigger level to assess existing, and existing plus proposed site operations.*

Section 6.4.2.3 outlines the project noise amenity levels applicable to the noise receivers identified in **Figure 6.4**. **Section 6.4.2.4** describes the project intrusive noise levels for the receivers based on the monitoring of the existing acoustic environment in the region surrounding the quarry. The application of Section 6 of the NPfI for the setting of PNTLs for the existing operation at the quarry, is discussed in **Section 6.4.2.5**. **Section 6.4.2.6** summarises the resulting PNTLs adopted for the assessment of operational noise impacts.



Legend

- Project Area
- Noise Receiver Modelling Area
- Indicative Noise Management Zone
- Noise Assessment Groups

Modelled Noise Receivers

- Quarry General
- Quarry Receiver
- Proponent Owned/Managed
- Sensitive Receiver

Image Source: ESRI (2020) Data source: DSFI (2020)

FIGURE 6.4

Privately Owned Residential Receivers

6.4.2.3 Project Amenity Noise Levels

The establishment of the *project amenity noise levels* is required for setting the PNTLs. The project amenity noise levels are based on the recommended amenity noise levels applicable to each designated land use. Based on Table 2.3 of the NPfI, the following land use categories apply:

- Rural Residential land use category for the designated RU1/R5 land.
- Suburban Residential land use category for the designated RU5 land.

The project amenity noise level for industrial developments is nominally set at the recommended amenity noise level (NPfI Table 2.2) minus 5 dB. Exceptions to this method can be applied if the area is subject to high traffic noise levels, or forms part of a major industrial cluster, or is a region with high existing industrial noise levels, or no other industries are present in the area. As the Revised Project is the only industrial development in the region, the exception in the NPfI is applicable, and therefore the project amenity noise level can be set at the recommended amenity noise level.

The project amenity noise levels for all receivers surrounding the quarry are provided in **Table 6.8.**

Table 6.8 Project Amenity Noise Levels, dB(A)

Receiver/land use category	Time of day[1]	Recommended amenity noise level LAeq,period	Project amenity [2] noise level LAeq,period	Project amenity [3] noise level LAeq,15 minute
Rural Residential	Day Period	50	50	53
	Evening Period	45	45	48
	Night Period	40	40	43
Suburban	Day	55	55	58
	Evening	45	45	48
	Night	40	40	43
School Classroom – Internal	Noisiest 1-hour period when in use	35 (internal) 45 (external)	35 (internal) 45 (external)	38 (internal) 48 (external)
Community Buildings - Active recreation area	When in use	55	55	58

Note: [1] Day period is 7.00 am to 6.00 pm Monday-Saturday and 8.00 am to 6.00 pm Sunday and Public Holidays, evening period is 6.00 pm to 10.00 pm and night period is 10.00 pm to commencement of day period.
[2] The project amenity noise level is set at the recommended amenity noise level is the Revised Project is the only source of industrial noise in the region.
[3] The LAeq,period project amenity noise level is represented as a 15-minute LAeq by the addition of 3 dB.

6.4.2.4 Project Intrusiveness Noise Levels

The project intrusiveness noise level ($L_{Aeq,15minute}$) is defined as the rated background noise level (RBL) plus 5 decibels. The RBL is determined by measurement of the long-term background LA90 noise level and calculated in accordance with the NPfI Fact Sheets A and B.

The RBLs for the Revised Project have been derived from noise loggers placed at four locations surrounding the existing quarry.

The analysis of the monitoring data and supporting attended monitoring results is presented in Appendix 1 of the NIA (refer to **Appendix D**).

The monitoring data was filtered for appropriate meteorological conditions as per the procedures outlined in the NPfI Fact Sheet B to determine the RBLs. The derived project intrusiveness noise levels based on the RBLs are shown in **Table 6.9**.

Table 6.9 Derived Project Intrusiveness Noise Levels, LAeq 15 minute dB(A)

Unit ID/Receiver Area	Rating Background Level			Project Intrusiveness Noise Level		
	Day [1]	Evening [1]	Night [1]	Day [1]	Evening [1]	Night [1]
ML A - NAG 1/2	36	31	30 (25) [3]	41	36	35
ML B – NAG 3/4	35 (32) [2]	30 (24)	30 (21) [3]	40	35	35
ML C – NAG 5/6/7/8	35 (30) [2]	30	30 (27) [3]	40	35	35
ML D – NAG 9/10/11	35 (34) [2]	30 (25) [3]	30 (22) [3]	40	35	35

Note: [1] Day period is 7.00 am to 6.00 pm Monday-Saturday and 8.00 am to 6.00 pm Sunday and Public Holidays, evening period is 6.00 pm to 10.00 pm and night period is 10.00 pm to commencement of day period.
[2] Where the day RBLs are less than 35 dB(A) then RBL is set at 35 dB(A).
[3] Where the evening or night RBLs are less than 30 dB(A) then RBL is set at 30 dB(A).

6.4.2.5 Application of Section 6 of the NPfI

As an existing industrial site, planning on upgrading and expanding the operations at the quarry, Section 6 of the NPfI has been considered in the setting of PNTLs.

The noise levels from the existing approved operations are presented in Appendix 2 of the NIA (refer to **Appendix D**). The project amenity noise levels for NAGs 1, 2, 3 and 4 (refer to **Section 6.4.2.3**) are the recommended amenity noise levels for the Suburban Residential land use category. The project intrusiveness noise levels are based on the measurement of the existing acoustic environment (refer to **Section 6.4.2.4**).

It is noted that the process outlined in Section 6 of the NPfI only applies to the day time operating conditions as the existing approved operations are not predicted to exceed the relevant project amenity noise criteria during the evening or night-time periods.

The PNTLs for each receiver within each NAG, including the adopted levels for NAGs 1, 2, 3 and 4 is discussed in following section.

6.4.2.6 Project Noise Trigger Levels

The existing noise emissions from the quarry (based on the monitoring and noise modelling results) have been used to establish PNTLs for the assessment of the day-time operation of the East Pit processing area of the Revised Project. As noted in **Section 6.4.2.1**, NAGs 1 to 4 take into account the noise generated by the existing quarry operations.

For new developments, the PNTL is established as the most stringent of the project intrusiveness noise level and project amenity noise level. The return and loading of road trucks during the day/evening shoulder period, train loading during the evening and night-time period, the expansion of the West Pit extraction area and use of the new access road to Dungog Road have all been assessed as new development. NAGs 5 to 14 are assessed as the equivalent of a new development.

The PNTLs for each NAG are shown in **Table 6.10**. The PNTLs for the non-residential receivers are shown in **Table 6.11**. The PNTLs for each receiver within each NAG is presented in Appendix 3 of the NIA (refer to **Appendix D**).

Table 6.10 Project Noise Trigger Levels – Residential Receivers

Receiver Area	Period	Intrusiveness Noise Level [1] $L_{Aeq,15min}$ dB(A)	Amenity Noise Level [2] $L_{Aeq,period}$ dB(A)	Project Noise Trigger Level [3] $L_{Aeq,15min}$ dB(A)
NAG 1/2	Day	Derived for each property in Appendix 2 of the NIA		
	Evening	36	48	**36**
	Night	35	43	**35**
NAG 3/4	Day	Derived for each property in Appendix 2 of the NIA		
	Evening	35	48	**35**
	Night	35	43	**35**
NAG 5/6/7/8	Day	40	53	**40**
	Evening	35	48	**35**
	Night	35	43	**35**
NAG 9/10/11	Day	40	53	**40**
	Evening	35	48	**35**
	Night	35	43	**35**
NAG 12/13/14	Day	40	53	**40**
	Evening	35	48	**35**
	Night	35	43	**35**

Notes:
1. The intrusiveness noise levels are based on the minimum assumed RBLs from the NPfI plus 5 dB.
2. The amenity noise levels are based on the recommended amenity noise levels for rural residential (RU1/R5) and suburban residential (RU5) areas from Table 2.2 of the NPfI plus 3 dB to convert from a period level to a 15-minute level.
3. The project noise trigger levels are the most stringent value of the intrusiveness and amenity noise levels.

Table 6.11 Project Noise Trigger Levels for Non-Residential Receivers, LAeq, 15 minute dB(A)

Receiver Area/ID	Period	Amenity Noise Level $L_{Aeq,period}$ dB(A)	Project Noise Trigger Level $L_{Aeq,15min}$ dB(A)
NAG 2 Martins Creek Fire Shed	Day	55	58
	Evening	55	58
	Night	55	58
NAG 4 Martins Creek Community Hall	Day	55	58
	Evening	55	58
	Night	55	58
NAG14 Martins Creek School	Day	45	48
	Evening	45	48
	Night	45	48

The PNTLs for the evening shoulder period between 6.00 pm and 7.00 pm Monday to Friday are proposed to be set at 38 dB(A) for NAGs 1 and 2. This is midway between the project intrusiveness noise level in **Table 6.9** of 41 dB(A) and the evening PNTL in **Table 6.10** of 36 dB(A). The PNTLs for evening shoulder period for NAGs 3 to 14 are proposed to be set at 37 dB(A), midway between the project intrusiveness noise levels in **Table 6.9** of 40 dB(A) and the evening PNTLs in **Table 6.10** of 35 dB(A).

6.4.2.7 Maximum Noise Level Event (Sleep Disturbance) Criteria

The sleep disturbance noise goal for each defined receiver area is provided in **Table 6.12**, individual receiver criteria for each receiver are provided in the NIA (refer to **Appendix D**). The assessment of maximum noise level events is discussed in **Section 6.4.4**.

Table 6.12 Sleep Disturbance Noise Goal for Residential Receiver Areas, LAeq, 15 minute and LAFmax dB(A)

Receiver Area	Sleep Disturbance Noise Goal			
	$L_{Aeq,15minute}$		L_{AFmax}	
	RBL +5	Max 40 or RBL + 5	RBL + 15	Max 52 or RBL + 15
NAG 1/2	35	40	45	52
NAG 3/4	35	40	45	52
NAG 5/6/7/8	35	40	45	52
NAG 9/10/11	35	40	45	52
NAG 12/13/14	35	40	45	52

6.4.2.8 Cumulative Noise Criteria

The *recommended amenity noise levels* represent the objective for total industrial noise at a receiver location, whereas the project amenity noise level represents the objective for noise from a single industrial development at a receiver location. Where cumulative industrial noise is not a necessary consideration because no other industries are present in the area, or likely to be introduced into the area in the future, the recommended amenity noise level (from Table 2.2 of the NPfI) is assigned as the project amenity noise level. This is the case for the Revised Project as the quarry is the only industrial noise source in the area.

6.4.2.9 Construction Noise Criteria

Construction activities will generally be undertaken within standard construction hours (7.00 am to 6.00 pm Monday to Friday, 8.00 am to 1.00 pm Saturday). However, work may be required outside of standard hours for construction of the new haulage road to meet ARTC requirements for track possession.

The EPA recognises that construction activities could potentially generate higher noise levels than those of an industrial operation. The ICNG provides noise management criteria for construction activities. The criteria are intended to guide the need for, and the selection of, feasible and reasonable work practices to minimise construction noise impacts. The ICNG provides noise management criteria for construction activities. The criteria are intended to guide the need for, and the selection of, feasible and reasonable work practices to minimise construction noise impacts.

The ICNG notes that a residential receiver is 'noise affected' if the LAeq,15minute construction noise level exceeds the rating background noise level by more than 10 dB during recommended standard hours. A residential receiver is 'highly noise affected' if the LAeq,15minute construction noise level exceeds 75 dB(A).

Outside recommended standard hours a residential area is 'noise affected' if the LAeq,15minute construction noise level exceeds the rating background noise level by more than 5 dB.

The construction noise management levels for residential receivers are provided is Section 3.1 of the NIA (refer to **Appendix D**).

6.4.2.10 Road Traffic Noise Criteria

The EPA's NSW RNP (DECCW, 2011) sets out criteria for road traffic noise through the provision of a framework that addresses traffic noise issues associated with new developments, new or upgraded road developments, or planned building developments.

During the early stages of the Revised Project until the new access road is constructed, the primary access route to and from the quarry will continue to be along Station Street and Grace Avenue to Dungog Road and Gresford Road through to Melbourne Street, East Maitland. Following the completion of the new access road from the quarry to Dungog Road the primary road haul route to and from the quarry will be Dungog Road, Gresford Road to Paterson township, Tocal Road to Bolwarra Heights, Paterson Road between Bolwarra Heights and Flat Road, Glenarvon Road and Pitnacree Road to Melbourne Street, East Maitland.

Table 6.13 outlines the road traffic noise criteria for the Revised Project for residential land uses. Under the road category definitions provided in Table 2 of the RNP, Dungog Road is considered as an arterial road while Station Street and Grace Avenue are considered as local roads.

Table 6.13 Road Traffic Noise Assessment Criteria for Residential Land Uses

Road Category	Type of Project/Land Use	Assessment Criteria dB(A)	
		Day 7.00 am – 10.00 pm	Night 10.00 pm to 7.00 am
Freeway/arterial/ sub-arterial road	Existing residences affected by additional traffic on existing freeways/arterial/sub-arterial roads generated by land use developments	$L_{Aeq, (15\ hour)}$ 60 (external)	$L_{Aeq, (9\ hour)}$ 55 (external)
Local road	Existing residences affected by additional traffic on existing local roads generated by land use developments	$L_{Aeq, (1\ hour)}$ 55 (external)	$L_{Aeq, (1\ hour)}$ 50 (external)

Source: NSW Road Noise Policy (DECCW 2011)

Table 6.14 outlines the road traffic noise criteria for the Revised Project for non-residential land uses.

Table 6.14 Road Traffic Noise Assessment for Non-residential Land Uses

Existing sensitive land use	Assessment Criteria dB(A)		Additional considerations
	Day 7.00 am – 10.00 pm	Night 10.00 pm to 7.00 am	
1. School classrooms	$L_{Aeq, (1\ hour)}$ 40 (internal) when in use	-	In the case of buildings used for education or health care, noise level criteria for spaces other than classrooms and wards may be obtained by interpolation from the 'maximum' levels shown in AS 2107:2000 (Standards Australia, 2000).

Existing sensitive land use	Assessment Criteria dB(A)		Additional considerations
	Day 7.00 am – 10.00 pm	Night 10.00 pm to 7.00 am	
3. Places of worship	$L_{Aeq, (1\ hour)}$ 40 (internal)	$L_{Aeq, (1\ hour)}$ 40 (internal)	The criteria are internal, i.e. the inside of a church. Areas outside the place of worship, such as a churchyard or cemetery, may also be a place of worship. Therefore, in determining appropriate criteria for such external areas, it should be established what in these areas may be affected by road traffic noise. For example, if there is a church car park between a church and the road, compliance with the internal criteria inside the church may be sufficient. If, however, there are areas between the church and the road where outdoor services may take place such as weddings and funerals, external criteria for these areas are appropriate. As issues such as speech intelligibility may be a consideration in these cases, the passive recreation criteria (see point 5) may be applied.
5. Open space (passive use)	$L_{Aeq, (15\ hour)}$ 55 (external) when in use	-	
8. Child care facilities	Sleeping rooms $L_{Aeq, (1\ hour)}$ 35 (internal) Indoor play areas $L_{Aeq, (1\ hour)}$ 40 (internal) Outdoor play areas $L_{Aeq, (1\ hour)}$ 55 (external)	-	Multi-purpose spaces, e.g. shared indoor play/sleeping rooms should meet the lower of the respective criteria. Measurements for sleeping rooms should be taken during designated sleeping times for the facility, or if these are not known, during the highest hourly traffic noise level during the opening hours of the facility.

6.4.2.11 Rail Noise

Non-network Rail Line

The following components of non-network rail-related activities were considered in the NIA:

- movement of rolling stock on the rail spur within the boundary of the Revised Project
- movement of rolling stock beyond the boundary of the industrial premises on a non-network rail line (the rail spur) that is used exclusively to service an industrial site.

Within the Project Area boundary, the movement of rolling stock on the rail spur form part of the industrial development and is assessed as part of the industrial premises using the NPfI. This includes activities such as rail loading, wagon shunting and idling locomotives.

The Revised Project is seeking approval to extend the rail spur, and as a result relocate the rail loading and wagon shunting activities north of the east pit processing area. This will move the locomotives off the section of the rail spur line opposite the Station Street receivers except when the trains enter and leave the quarry.

The noise from the section of track opposite the Station Street receivers is assessed against the recommended acceptable LAeq noise levels in Appendix 3 of the RING for non-network rail lines reproduced in **Table 6.15**.

Table 6.15 Recommended Noise Level from Non-network Rail Lines Servicing an Industrial Site, dB(A)

Receiver/land use category	Time of day[1]	Amenity LAeq Noise Level from Non-network Rail LIne, LAeq,period		Pass-by noise level[2], LAmax, 95th%ile
		Acceptable	Recommended Maximum	
Suburban	Day	55	60	85
	Evening	45	50	85
	Night	40	45	85
Community Buildings - Active recreation area	When in use	55	55	85

Note: [1] Day period is 7.00 am to 6.00 pm Monday-Saturday and 8.00 am to 6.00 pm Sunday and Public Holidays, evening period is 6.00 pm to 10.00 pm and night period is 10.00 pm to commencement of day period.
[2] Based on the technical note 10 under Tables 1, 2 and 3 of the RING

Network Rail Line

Noise emissions from the North Coast Line and the Main Northern Rail Line are regulated via ARTC's EPL (EPL 3142). Section L2 of EPL 3142 does not nominate specific environmental noise limits but notes that:

> *It is an objective of this Licence to progressively reduce noise impacts from railways systems activities to the noise level goals of 65 dB(A) Leq,(day and evening time from 7.00 am - 10.00 pm), 60 dB(A) Leq,(night time from 10.00 pm - 7.00 am) and 85dB(A) (24 hr) max pass-by noise, at 1 m from the facade of affected residential properties.*

Appendix 2 of the RING specifies similar rail noise assessment trigger levels for rail traffic generating developments (refer to **Table 6.16**).

Table 6.16 Noise Criteria for Rail Traffic due to the Project, dB(A)

Type of Development	Noise trigger levels dB(A) External [1]	
	Day (7.00 am – 10.00 pm)	Night (10 .00pm – 7.00 am)
Rail traffic-generating development	Development increases existing LAeq, period rail noise levels by greater than 0.5 dB and predicted rail noise levels exceed:	
	65 LAeq, day-time 15 hour OR 85 LAmax (95th%ile)	60 LAeq, night-time 9 hour OR 85 LAmax (95th%ile)

Source: Rail Infrastructure Noise Guideline (EPA 2013)
Note [1] Refer to RING technical notes for further definition of terms

6.4.3 Noise Prediction

6.4.3.1 Operational Noise Model

The noise modelling was undertaken using the proprietary software Environmental Noise Model (ENM). The software utilises terrain data, source and receptor locations and heights, source sound power levels and input meteorological conditions to predict noise levels. The software accounts for ground effects, geometric spreading, air absorption, acoustic shielding and meteorological enhancement in its predictions.

Noise predictions were undertaken for the day, evening and night time periods and incorporated a range of mitigation measures committed to by Daracon as described in **Section 6.4.6**. The modelling considered the effect of 470 different meteorological conditions on noise propagation, from 140 potential operational scenarios, at 150 receivers. The meteorological conditions used in the modelling are based on actual meteorological data obtained from the site.

The noise modelling inputs for the Revised Project considered a scenario representative of reasonable worst-case noise emissions from quarry operations during 5 stages: Years 2, 6, 10, 15 and 20. The NIA assessed Year 2 separately to Years 6, 10, 15 and 20. Year 2 representative of the 4-year transition period during which not all the noise controls would be in place. For the Year 2 operating scenario, it was assumed the existing rail loading facility will still be used until the construction of the new rail spur is completed. It is also assumed trucks will use the existing entrance on Station Street, until the new access road is constructed.

The predicted noise levels for this transitional period consider two operating scenarios, with and without the operation of the existing rail loading facility. Both operating scenarios include rock extraction from the West Pit, operation of the processing plant and dispatch of the capped peak hourly truck movements modelled as 20 laden truck movements per hour.

The peak operating condition modelled of 20 laden trucks per hour represents short term operating conditions which only occur when the quarry is supplying material to large infrastructure projects. These rates cannot be maintained over the whole day or for extended periods without exceeding the daily cap on truck movements or the annual cap of road haulage volumes. To enable residents impacted by the Revised Project to understand the impacts likely to occur under more usual operating conditions, an assessment of a scenario of 12 laden truck movements per hour was also undertaken to represent more 'usual' operations.

Further information on the operational noise models, including the noise sources and modelled plant and equipment are presented in the NIA in **Appendix D**.

Meteorological Conditions

Certain meteorological conditions may increase noise levels by focusing soundwave propagation paths at a single point. Such refraction of sound waves will occur during temperature inversions (i.e. atmospheric conditions where temperatures increase with height above ground level) and where there is a wind gradient (i.e. wind velocities increasing with height above ground level) and there is a supporting wind direction from the source to the receiver.

Standard meteorological conditions and noise-enhancing meteorological conditions have been considered and the detail of the analysis of meteorological data obtained from the site is provided in Appendix 5 of the NIA (refer to **Appendix D**). The meteorological assessment method was also developed further through the use of a probabilistic modelling approach to help further design the quarry operating parameters, discussed further below.

Modelling parameters

The NPfI's approach to accounting for noise-enhancing weather conditions based on the analysis of the meteorological data was used in the NIA.

A probabilistic noise modelling approach was adopted to help design the operating parameters of the Revised Project and assess the effectiveness, reasonableness and feasibility of different mitigation measures. The approach allows the impact of the temporal variations in the meteorological conditions on the propagation of sound from the source to the receiver to be considered. The probabilistic modelling approach includes the iterative implementation of the noise control strategies to determine the percentage of the time each strategy, such as machine relocation or shut down, need to be implemented and enables the Proponent to determine whether particular measures are reasonable or feasible based on their cost and/or effect on production. Reasonable and feasible noise mitigation measures identified through the probabilistic modelling were incorporated into the modelling of the Revised Project under the NPfI noise enhancing meteorological conditions.

6.4.3.2 Construction Noise Model

Noise models were prepared to assess the impacts of the noise associated with the construction of the new access road and the noise mitigation measures to be constructed within the East Pit processing area. The two activities that are likely to generate noise at the nearest receivers to those activities are the construction of the new access road and the construction of the noise attenuation bund/barrier at the nearest receivers to those activities. The noise model of the new access road construction scenario included multiple noise sources distributed along the new road alignment. The noise bund/barrier scenario included multiple noise sources grouped within the processing area.

The typical construction equipment likely to be utilised for each phase of construction was included in the construction noise models. The sound power levels (SWL) of this equipment are outlined in the NIA, refer to **Appendix D**.

ENM's Single Point Calculation feature was used to determine the $L_{Aeq,15minute}$ construction noise levels at the nearest residential receiver locations. The predicted noise impacts, presented in **Section 6.4.4.5**, are representative of the noise levels that could be experienced when the construction activities are at the closest location to the receivers shown on **Figure 6.4**. That is, the predicted noise impacts are the maximum likely noise levels over any given 15-minute period.

6.4.3.3 Road Traffic Noise Model

The road traffic noise levels have been predicted using the Calculation of Road Traffic Noise (CoRTN) algorithms. Road traffic noise calculations were performed using CoRTN for four scenarios, as described in the NIA (refer to **Appendix D**).

6.4.4 Modelling Results and Assessment

This section provides an overview of the findings of the NIA as assessed against relevant PNTLs.

6.4.4.1 Operational Noise: Day Time Year 2

The NIA assesses Year 2 separately to Years 6, 10, 15 and 20 as not all the noise controls will be in place by Year 2. For the Year 2 operating scenario, it is assumed the existing rail loading facility is still in place and being used as the construction of the new rail spur will not be complete. It is also assumed the construction of the new access road will not be complete and trucks will be using the existing entrance on Station Street.

The residential receivers where the predicted noise levels for Year 2 could exceed the relevant day-time PTNLs are identified in Table 6.17. The predicted noise levels for Year 2 consider two operating scenarios, one with and one without the operation of the existing rail loading facility. Both operating scenarios include rock extraction from the West Pit, operation of the processing plant and dispatch of the capped peak hourly truck movements modelled as 20 laden truck movements per hour (worst case).

Table 6.17 Maximum Predicted Year 2 Day-time $L_{Aeq,\ 15\text{-minute}}$ Noise Levels with and without the Existing Rail Loading Facility Operating for Capped Peak Hourly Truck Movements Modelled as 20 Laden Truck Movements per Hour, dB(A)

Rec ID	Ass. Grp	PNTL	Exceed PNTL Year 2 With Rail Loading			Exceed PNTL Year 2 Without Rail Loading		
			≤ 2 dB	≥ 3 but ≤ 5 dB	> 5 dB	≤ 2 dB	≥ 3 but ≤ 5 dB	> 5 dB
R001	NAG01	58	-	-	64	-	-	-
R002	NAG01	58	-	-	66	-	-	-
R003	NAG01	58	-	-	66	-	-	-
R004	NAG01	58	-	-	67	-	-	-
R005	NAG01	58	-	-	64	-	-	-
R006	NAG01	58	-	62	-	-	-	-
R007	NAG01	58	60	-	-	-	-	-
R008	NAG01	58	60	-	-	-	-	-
R009	NAG01	58	59	-	-	-	-	-
R036	NAG04	50	51	-	-	-	-	-
R042	NAG04	50	51	-	-	-	-	-
R045	NAG04	50	51	-	-	-	-	-
R050	NAG04	49	51	-	-	-	-	-
R052	NAG04	50	51	-	-	-	-	-
R054	NAG04	49	50	-	-	-	-	-
R056	NAG04	49	51	-	-	-	-	-
R057	NAG04	49	50	-	-	-	-	-
R058	NAG04	47	-	51	-	-	-	-
R059	NAG04	48	50	-	-	-	-	-
R061	NAG04	47	-	50	-	-	-	-
R062	NAG04	47	48	-	-	-	-	-
R064	NAG04	46	-	49	-	-	-	-
R065	NAG04	46	-	49	-	-	-	-
R019	NAG05	40	-	-	46	-	-	-
R041	NAG06	40	-	-	46	-	43	-
R043	NAG06	40	-	44	-	-	-	-
R055	NAG06	40	-	-	47	-	43	-
R066	NAG06	40	-	-	48	-	44	-
R070	NAG06	40	-	-	48	-	44	-
R025	NAG07	40	-	45	-	-	44	-
R031	NAG07	40	-	44	-	-	44	-

Rec ID	Ass. Grp	PNTL	Exceed PNTL Year 2 With Rail Loading			Exceed PNTL Year 2 Without Rail Loading		
			≤ 2 dB	≥ 3 but ≤ 5 dB	> 5 dB	≤ 2 dB	≥ 3 but ≤ 5 dB	> 5 dB
R040	NAG07	40	-	45	-	-	43	-
R115	NAG08	40	-	43	-	41	-	-
R122	NAG08	40	-	44	-	41	-	-
R129	NAG08	40	41	-	-	-	-	-
R133	NAG08	40	-	44	-	41	-	-
R141	NAG08	40	41	-	-	-	-	-
R143	NAG08	40	-	43	-	-	-	-
R145	NAG08	40	42	-	-	-	-	-
R148	NAG08	40	41	-	-	-	-	-
R149	NAG08	40	41	-	-	-	-	-
R034	NAG09	40	-	-	47	-	-	47
R047	NAG09	40	-	45	-	-	45	-
R053	NAG09	40	-	44	-	-	44	-
R046	NAG10	40	42	-	-	42	-	-
R063	NAG10	40	42	-	-	42	-	-
R069	NAG10	40	41	-	-	41	-	-
R075	NAG10	40	41	-	-	-	-	-
R073	NAG11	40	41	-	-	41	-	-
R083	NAG11	40	41	-	-	41	-	-
R092	NAG11	40	41	-	-	41	-	-
R098	NAG11	40	41	-	-	-	-	-
R102	NAG11	40	41	-	-	41	-	-
R067	NAG13	40	41	-	-	41	-	-
R076	NAG14	40	-	-	47	41	-	-
R112	NAG14	40	42	-	-	-	-	-
			29	15	12	12	9	1

Predicted Noise Impacts greater than 5 dB above the PNTL for Year 2

For operating conditions where the existing rail load facility is operating, the maximum predicted $L_{Aeq,15minute}$ exceeds the PNTL by more than 5 dB at 12 receiver locations. This is a reduction in the noise impacts at these most affected proximate private residences relative to those experienced during previous operations due to the early implementation of some noise mitigation measures. However, this is a transitional noise impact which will be further reduced following the completion of the new rail loading facilities and new access road by the end of Year 4.

For operating conditions where the existing rail load facility is not operating, the maximum predicted $L_{Aeq,15minute}$ exceeds the PNTL by more than 5 dB at only 1 property (R034). The noise impacts at this property is primarily driven by operational noise from the West Pit and is largely unaffected by the rail loading facilities.

Predicted Noise Impacts greater than or equal to 3 dB above, but less than or equal to 5 dB above the PNTL for Year 2

For operating conditions where the existing rail load facility is operating, the maximum predicted $L_{Aeq,15minute}$ greater than or equal to 3 dB above, but less than or equal to 5 dB above the PNTL could occur at 15 receiver locations. However, as above, these are transitional noise levels and will be further reduced following the completion of the new rail loading facilities and new access road. It is noted that the noise impacts in NAGs 7 and 9 remain similar under both Year 2 operating scenarios indicating it is operational noise from the West Pit driving these impacts.

6.4.4.2 Operational Noise: Day time Years 6,10, 15 and 20

The residential receivers where the predicted operational noise levels could exceed the relevant day-time PTNL is presented in **Table 6.18**. The NIA assessment of operational noise in Years 6, 10, 15 and 20 included rock extraction from West Pit, operation of the processing plant, dispatch of the capped peak hourly truck movements modelled as 20 laden truck movements per hour along the new access road and train loading at the northern extension of the rail spur. These are the maximum predicted day-time noise levels for capped peak hourly truck movements. The results for each individual receiver (including residential and non-residential) are provided in the NIA, refer to **Appendix D**).

The predicted operational noise levels for Years 6, 10, 15 and 20 of the Revised Project under likely noise enhancing meteorological conditions with operational management controls in place are presented as composite noise contours (all modelled meteorological scenarios) in **Figure 6.5**. The contours for each individual meteorological scenario for each modelled year are presented in the NIA, refer to **Appendix D**.

Table 6.18 Predicted Maximum Years 6, 10 15 and 20 Day0time $L_{Aeq,\ 15\ minute}$ Noise levels for Capped Peak Hourly Truck Movements Modelled as 20 Laden Truck Movements per Hour, dB(A)

Rec ID	Ass. Grp	PNTL	Exceed PNTL		
			≤ 2 dB	≥ 3 but ≤ 5 dB	> 5 dB
R016	NAG05	40	-	45	-
R019	NAG05	40	-	44	-
R041	NAG06	40	-	43	-
R043	NAG06	40	42	-	-
R055	NAG06	40	-	43	-
R066	NAG06	40	42	-	-
R070	NAG06	40	-	44	-
R025	NAG07	40	-	-	48
R031	NAG07	40	-	44	-
R040	NAG07	40	-	45	-
R034	NAG09	40	-	45	-
R047	NAG09	40	-	43	-
R053	NAG09	40	42	-	-
R046	NAG10	40	-	44	-
R063	NAG10	40	42	-	-
R069	NAG10	40	42	-	-
R075	NAG10	40	41	-	-
R088	NAG10	40	42	-	-
R073	NAG11	40	42	-	-

Rec ID	Ass. Grp	PNTL	Exceed PNTL		
			≤ 2 dB	≥ 3 but ≤ 5 dB	> 5 dB
R083	NAG11	40	42	-	-
R094	NAG11	40	41	-	-
R097	NAG11	40	41	-	-
R098	NAG11	40	41	-	-
R105	NAG11	40	41	-	-
R067	NAG13	40	-	43	-
R093	NAG13	40	41	-	-
			14	**11**	**1**

Noise impacts associated with trucks using the new access road are a key driver of noise impacts at a number of receivers to the west of the quarry. The results presented in **Table 6.16** represents the noise impacts associated with operating at the capped maximum hourly dispatch rate of product from the Revised Project of 20 laden truck movements per hour (worst case).

Predicted Noise Impacts greater than 5 dB above the PNTL for Years 6, 10, 15 and 20

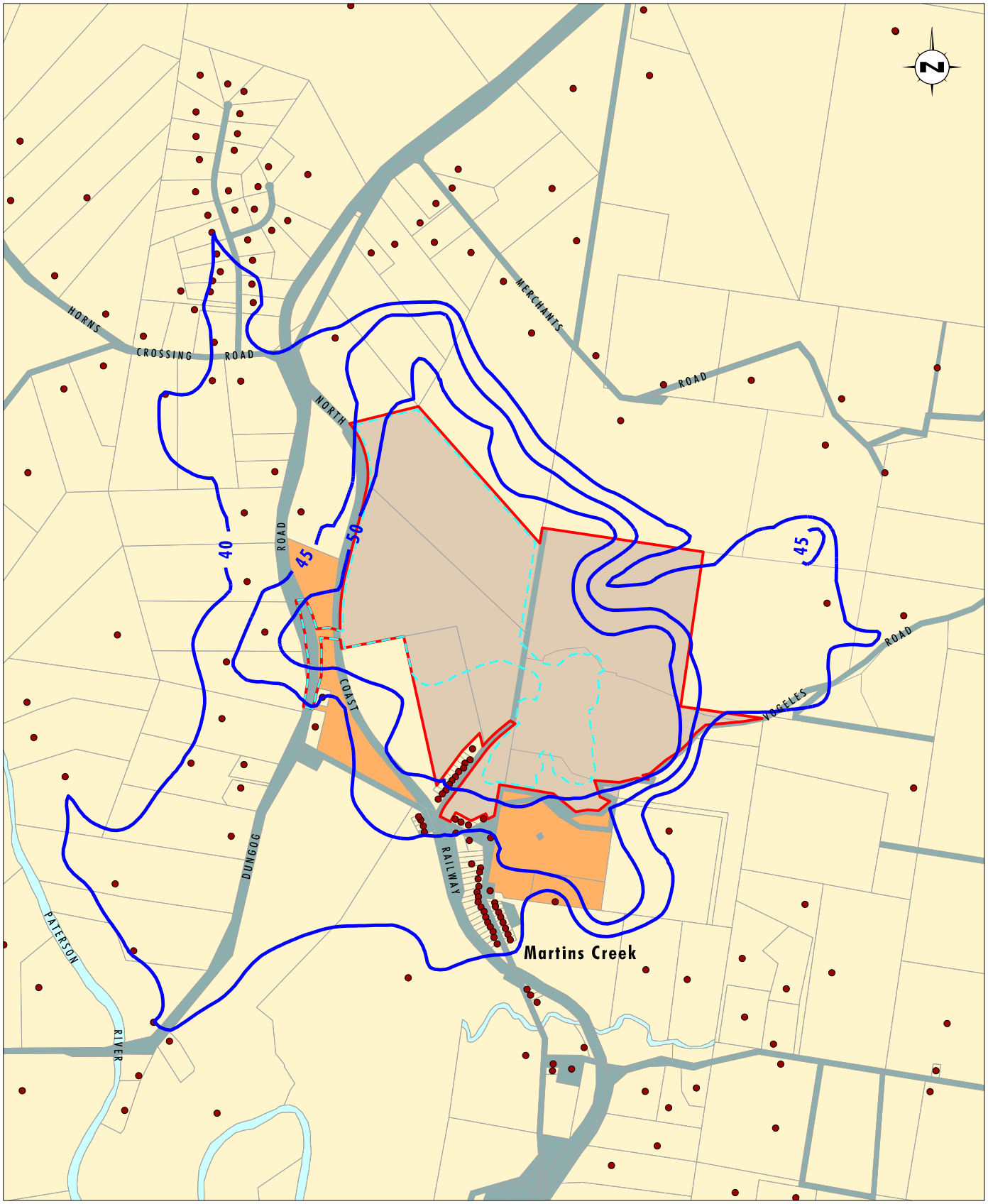
For operating conditions where the maximum of 20 laden truck movements per hour is occurring, the maximum predicted $L_{Aeq,15minute}$ exceeds the PNTL by more than 5 dB at 1 receiver location (R025). The predicted noise impact at R015 is primarily associated with activities in the West Pit and the new access road.

Predicted Noise Impacts greater than or equal to 3 dB above, but less than or equal to 5 dB above the PNTL for Years 6, 10, 15 and 20

For operating conditions where the maximum of 20 laden truck movements per hour is occurring, the maximum predicted $L_{Aeq,15minute}$ greater than or equal to 3 dB above, but less than or equal to 5 dB above the PNTL could occur at 11 receiver locations.

Usual Operating Conditions

As noted in **Section 6.4.3.1**, the peak operating condition modelled of 20 laden trucks per hour represents short term operating conditions which only occur when the quarry is supplying material to large infrastructure projects. An analysis of historical truck dispatch rates indicates that, for 80% of the operating period, truck numbers are unlikely to exceed 12 laden truck movements per hour. To enable residents potentially impacted by the Revised Project to understand the impacts likely to occur under more usual operating conditions, this usual level of laden truck movements was also modelled using the same meteorological conditions as used for the 20 laden truck scenario. This modelling indicated that the worst case noise level at the most affected receiver location (R025) under these usual conditions would be reduced by 4 dB to a maximum of 44 dB(A) (i.e. between 3 - 5 dB above the PNTL). Under these usual operating conditions, only 6 properties were predicted to exceed the PNTL by between 3 - 5 dB.



Data Source: Daracon (2020)

0 0.25 0.5 1.0km
1:20 000

Legend

- Project Area
- Proposed Disturbance Area
- Daracon
- Private
- Quarry
- Water
- Other
- Worst Case Noise Contours dB(A)
- Private Residence

FIGURE 6.5

Predicted Noise Impacts

6.4.4.3 Operational Noise: Evening Shoulder Period

The Revised Project includes the loading of up to 10 road trucks during the evening shoulder period from 6.00 pm to 7.00 pm Monday to Friday. The residential receivers where the predicted noise levels for the loading of trucks during Years 2, 6, 10, 15 and 20 could exceed the relevant evening shoulder PTNL are presented in **Table 6.19**.

Table 6.19 Predicted Maximum Year 2, 6, 10, 15 and 20 LAeq-15minute Noise Levels for Truck Loading during the Evening shoulder Period from 6.00pm to 7.00pm, dB(A)

Rec ID	Ass. Grp	Shoulder PNTL	Exceed the relevant evening shoulder period project noise trigger levels		
			≤ 2 dB	≥ 3 but ≤ 5 dB	> 5 dB
R001	NAG01	38	-	43 [1]	-
R002	NAG01	38	-	-	44 [1]
R003	NAG01	38	-	-	44 [1]
R004	NAG01	38	-	43 [1]	-
R005	NAG01	38	-	41 [1]	-
R016	NAG05	37	-	40	-
R070	NAG06	37	38	-	-
R025	NAG07	37	-	42	-
R040	NAG07	37	39	-	-
			2	**5**	**2**

Note [1] Maximum predicted noise levels in NAG01 occur during Stage 1 (modelled as Year 2) prior to completion of the new access road to Dungog Road through Lot 5.

The predicted noise levels from the arrival and loading of up to 10 trucks during the 1 hour evening shoulder period from 6.00 pm to 7.00 pm Monday to Friday could exceed the proposed shoulder PNTL at two receiver locations by more than 5 dB. It is noted that this does not represent an increase in noise levels relative to day time operations but rather the lower evening (and consequent proposed evening shoulder PNTL levels).

Five receiver locations could exceed the proposed should evening PNTL by between 3 dB and 5 dB.

The exceedances at the 5 properties in NAG01 (including the 2 by more than 5 dB) occur only during Stage 1 (modelled as Year 2) of the Revised Project prior to completion of the new access road. The completion of the new access road will result in a reduction of up to 5 dB in the maximum predicted noise levels for the 5 properties in NAG01 identified in **Table 6.19**.

6.4.4.4 Operational Noise: Evening and Night-time

The evening and night-time operating scenario modelled included the loading of rail wagons with rock product using front end loaders in the northern section of the east pit processing area, following completion of the rail spur extension, and locomotives at idle within the property. The locomotives have been modelled in the area to the north of the current quarry entrance at the northern end of Station Street.

The predicted noise levels at each receiver are presented in Appendix E of the NIA for the loading of trains during the evening and night-time periods of Years 6, 10, 15 and 20 under calm and enhancing meteorological conditions.

The properties where the evening and night-time noise levels are predicted to exceed the PNTL by more than 5 dB are those located close to these loading operations, being R001, R002 and R003.

Monitoring of actual noise levels after the rail extension is in place will be undertaken during the day time period. These monitored day time levels will be used to confirm predicted noise levels during evening and night time periods, prior to rail loading in these periods.

Maximum Noise Events (Sleep disturbance)

Noise sources that could lead to sleep disturbance are typically transient noises and often have tonal characteristics. No rock excavation or processing activities will occur during the evening or night-time period. Activities that could lead to sleep disturbance include:

- loading of rail wagons using front end loaders
- use of smart broadband 'Quacker' reversing alarms.

ENM's Single Point Calculation feature was used to determine noise levels from sleep disturbance events at the nearest residential receiver locations under calm and noise enhancing meteorological conditions. The predicted LA1,1minute noise levels associated with activities that could result in sleep disturbance are presented in Appendix E of the NIA, refer to. Results show that night-time noise levels will not exceed sleep disturbance noise goals at any residential receivers.

6.4.5 Residual Operational Noise Impacts

Residual noise impacts occur when the best achievable noise levels predicted for a private residential receptor are greater than the relevant PNTLs, and all feasible and reasonable source and pathway noise mitigation measures have been considered.

The relevant VLAMP noise mitigation and acquisition criteria are set out in **Table 6.20**. The criteria apply to operational noise impacts of the Revised Project on privately owned land.

Table 6.20 Characterisation of Noise Impacts and Potential Treatments (Table 1 from VLAMP)

If the predicted noise level minus the project noise trigger level is:	And the total cumulative industrial noise level is:	Characterisation of impacts:	Potential treatment:
All time periods **0-2 dB(A)**	Not applicable	Impacts are considered to be **negligible**	The exceedances would not be discernible by the average listener and therefore would not warrant receiver-based treatments or controls
All time periods **3-5 dB(A)**	≤ recommended amenity noise levels in Table 2.2 of the NPfI; or > recommended amenity noise levels in Table 2.2 of the NPfI, but the increase in total cumulative industrial noise level resulting from the development is ≤ 1 dB	Impacts are considered to be **marginal**	Provide mechanical ventilation/comfort condition systems to enable windows to be closed without compromising internal air quality/amenity

If the predicted noise level minus the project noise trigger level is:	And the total cumulative industrial noise level is:	Characterisation of impacts:	Potential treatment:
All time periods **3-5 dB(A)**	> recommended amenity noise level in Table 2.2 of the NPfI, and the increase in total cumulative industrial noise level resulting from the development is > 1 dB	Impacts are considered to be **moderate**	As for marginal impacts but also upgraded façade elements like windows, doors or roof insulation, to further increase the ability of the building façade to reduce noise levels
Day and evening **>5 dB(A)**	≤ recommended amenity noise levels in Table 2.2 of the NPfI	Impacts are considered to be **moderate**	As for marginal impacts but also upgraded façade elements like windows, doors or roof insulation, to further increase the ability of the building façade to reduce noise levels
Day and evening **>5 dB(A)**	> recommended amenity noise levels in Table 2.2 of the NPfI	Impacts are considered to be **significant**	Provide mitigation as for moderate impacts and voluntary land acquisition provisions
Night **>5 dB(A)**	Not applicable	Impacts are considered to be **significant**	Provide mitigation as for moderate impacts and voluntary land acquisition provisions

Source: Table 1 of VLAMP, NSW Government 2018

Day-time Operations

Where the noise impacts cannot achieve the PNTLs, both the NPfI and VLAMP (refer to **Table 6.21**) provide guidelines for the assessment of the residual noise impacts. The method of assessing residual noise impact differs between the NPfI and the VLAMP. However, the VLAMP has been specifically developed as the policy to be applied for the assessment of residual impacts for quarry and mining operations.

The residual impacts for the day-time operations and the VLAMP characterisation of the impacts are provided in **Table 6.21**.

Table 6.21 Residual Impact Assessment

Assessment Description	Receiver Location(s)	Residual Impact, dB			VLAMP Characterisation of Impacts
		PNTL	Predicted	Difference	
Day-time Operational Noise - Year 2					
Without rail loading	R034	40	47	> 5 dB	Moderate
	R041, R055, R040	40	43	≥ 3 but ≤ 5 dB	Marginal
	R066, R070, R025, R031, R053	40	44		
	R047	40	45		

Assessment Description	Receiver Location(s)	Residual Impact, dB			VLAMP Characterisation of Impacts
		PNTL	Predicted	Difference	
With rail loading	R001	58	64	> 5 dB	Moderate
	R002, R003	58	66		
	R004	58	67		
	R005	58	64		
	R019, R041	40	46		
	R055, R034, R076	40	47		
	R066, R070	40	48		
	R006	58	62	≥ 3 but ≤ 5 dB	Marginal
	R058	47	51		
	R061	47	50		
	R064, R065	46	49		
	R043, R031 R122, R053, R133	40	44		
	R025, R040, R047	40	45		
	R115, R143	40	43		
Day-time Operational Noise - Years 6, 10, 15 and 20					
Worst case operations with 20 laden trucks per hour	R025	40	48	> 5 dB	Moderate
	R016, R040, R034	40	45	≥ 3 but ≤ 5 dB	Marginal
	R019, R070, R031, R046		44		
	R041, R055, R047, R067		43		
Usual operations with 12 laden trucks per hour	R034	40	45	≥ 3 but ≤ 5 dB	Marginal
	R016, R025		44		
	R031, R040, R047		43		

Day/Evening Shoulder Period

The residual impacts following completion of the new assess road to Dungog Road for the day/evening shoulder period and the VLAMP characterisation of the impacts are provided in Table 6.22.

Table 6.22 Residual Day/Evening Shoulder Impact Assessment

Assessment Description	Receiver Location(s)	Residual Impact, dB			VLAMP Characterisation of Impacts
		PNTL	Predicted	Difference	
Day/Evening Shoulder Period Operational Noise - Years 6, 10, 15 and 20 [1]					
Return and loading of up to 10 road trucks	R016	37	40	≥ 3 but ≤ 5 dB	Marginal
	R025	37	42		

Notes: [1] The predicted maximum noise levels for NAG01 occur during Stage 1 (modelled as Year 2) prior to completion of the new access road to Dungog Road. As a transitional impact, these impacts have not been included in the residual impact assessment.

Evening and Night-time Operations

The indicative (based on modelling) residual impacts for the evening and night-time operations and the VLAMP characterisation of the impacts are provided in Table 6.23. As discussed in **Section 6.4.4.4**, monitoring of actual noise levels after the rail extension is in place, will be undertaken to confirm predicted noise levels during evening and night time periods, prior to rail loading in these periods.

Table 6.23 Residual Evening and Night-time Impact Assessment

Assessment Description	Receiver Location(s)	Residual Impact, dB			VLAMP Characterisation of Impacts
		PNTL	Predicted	Difference	
Evening Operational Noise - Years 6, 10, 15 and 20					
Train loading	R001	36	43	> 5 dB	Moderate
	R002, R003	36	40	≥ 3 but ≤ 5 dB	Marginal
Night-time Operational Noise - Years 6, 10, 15 and 20					
Train loading	R001 [1] R002, R003 [2]	35 35	44 41	> 5 dB	Significant
	R004, R005, R017	35	38	≥ 3 but ≤ 5 dB	Marginal

Note: [1] Characterised as significant under the NPfI
[2] Characterised as moderate under the NPfI at the predicted maximum noise level is less than equivalent 15-minute amenity noise level (where the equivalent 15-minute amenity noise level is calculated as amenity noise level plus 3dB)

Application of the VLAMP for significant impacts is discussed further in **Appendix D**.

6.4.5.1 Construction Noise

The predicted construction noise levels at each receiver is presented in the NIA (refer **Appendix D**) for the modelled construction activities under calm and enhancing meteorological conditions.

6.4.5.2 Rail Noise

To mitigate rail noise impacts from trains on the non-network rail spur line the Revised Project will move these activities into the northern section of the East Pit processing area through the extension of the rail spur. This removes locomotives from opposite the residential properties on Station Street during the loading activity and enables the trains to park within the property boundary to the north of the current quarry entrance at the northern end of Station Street. The predicted rail noise impacts from trains on the non-network rail spur line will still include impacts associated with trains entering and leaving the quarry premises along the rail spur opposite the residential properties on Station Street. The LAeq for a pass-by event equates to a $L_{Aeq,15minute}$ noise level of 57 dB(A).

During the daytime period, more than twenty pass-by events could occur without exceeding the Recommended Acceptable L_{Aeq} noise level at the closest receivers on Station Street.

Over the four-hour evening period, only one pass-by event is possible before the Recommended Acceptable L_{Aeq} noise level at the receivers on Station Street is exceeded. During the evening period more three pass-by events could occur without exceeding the recommended maximum LAeq noise level at the closest receivers on Station Street.

During the night-time period, a single pass-by event would result in the Recommended Acceptable LAeq noise level at the receivers on Station Street being exceeded, but two pass-by events could occur before the Recommended Maximum LAeq noise level is exceeded.

Network constraints limit the number and timing of train movements that can service the quarry. These constraints currently limit the existing approved operations in terms of daily train movements and the time of train movements. As a result of these constraints, there would be no increase in the period based LAeq,Day-time or LAeq,Night-time noise levels due to train movements from quarry on network rail lines.

6.4.5.3 Road Traffic Noise

Road traffic noise levels with and without quarry trucks have been calculated for the road traffic noise receivers along the proposed primary haul route using the software package CoRTN. The modelling results indicate that baseline/existing road traffic noise levels without the quarry trucks present exceed the RNP (DECCW, 2011) criteria for some receivers due to existing traffic rates and proximity to the road.

The addition of quarry trucks at the capped maximum of 140 laden trucks per day (280 movements) and the capped maximum of 20 laden trucks per hour only results in an exceedance of the RNP Criteria at one receiver where it was not already calculated to exceed the criteria with the baseline traffic levels. Where the RNP criteria are already exceeded or is predicted to be exceeded the predicted increase in road traffic noise due to the quarry trucks is predicted to be less than 2 dB. The RNP states that noise level increases of up to 2 dB are considered barely perceptible to the average person.

The modelled scenarios with the addition of quarry trucks at the capped maximum of 140 laden trucks per day (plus the return trip) and the capped maximum of 20 laden trucks per hour represent worst-case traffic conditions. During usual operating conditions, road noise impacts would be lower than the levels predicted for the maximum operating scenarios.

Reduced Road Noise Due to Access Changes

There will be a reduction in the road traffic noise levels for properties in Station Street, the northern end of Cory Street and Grace Avenue Road traffic once the new access road is constructed and the road haul trucks no longer access the Quarry via Station Street. The results of this analysis and applicable criteria for each receiver are presented in the NIA, refer **Appendix D**.

The results show a 9 to 13 dB reduction in the road traffic noise levels for properties in Station Street, the northern end of Cory Street and Grace Avenue once the new access road is constructed and the quarry trucks no longer access the quarry via Station Street.

6.4.5.4 Cumulative Noise

As discussed in **Section 6.4.2.8**, an assessment of the cumulative operational noise impacts as a result of the Revised Project were not deemed required as there are no other industries present in the locality, or likely to be introduced into the locality in the future. The nearest quarry is Brandy Hill Quarry, located approximately 20 km from Martins Creek Quarry.

Additionally, the recommended amenity noise levels represent the objective for total industrial noise at a receiver location, whereas the project amenity noise level represents the objective for noise from a single industrial development at a receiver location. Where cumulative industrial noise is not a necessary consideration because no other industries are present in the area, or likely to be introduced into the area in the future, the recommended amenity noise level (from Table 2.2 of the NPfI) is assigned as the project amenity noise level. This is the case for the Revised Project as the quarry is the only industrial noise source in the area.

6.4.6 Noise Management, Mitigation and Monitoring

6.4.6.1 Construction Noise

Prior to the commencement of works, a Construction Noise Management Plan (CNMP) will be prepared and implemented in accordance with the requirements of the ICNG. The CNMP will take into consideration measures for reducing the source noise levels of construction equipment by construction planning and equipment selection where practicable. The CNMP would also outline the standard reasonable and feasible mitigation measures required to reduce the noise impact from construction activities. Where standard mitigation measures have been implemented and the noise levels still exceed the noise management levels, the following additional mitigation measures can be adopted:

- Notification letterbox drop or equivalent to provide advanced warning of works detailing work activities, times over which these will occur, impacts and mitigation measures.
- Specific notifications to identified stakeholders to provide additional information when relevant and informative to more highly affected receivers than covered in general letterbox drops.
- Phone calls and individual briefings detailing relevant information made to identified/affected stakeholders providing tailored advice and to provide the opportunity for stakeholders to comment on the proposed work and specific needs.
- Individual briefings to inform stakeholders about the impacts of high noise activities and mitigation measures that will be implemented, with the opportunity to comment on the project. Where the resident cannot be met with individually then an alternative form of engagement should be used.
- Respite offers should be considered where there are high noise-generating activities near receivers.
- Verification measurement to check noise levels and follow up reasonable complaints.

A Community Liaison Plan would be prepared prior to construction to identify all potential stakeholders and best practice methods for consultation with these groups during construction. The plan would also encourage feedback and facilitate opportunities for the community and stakeholders to have input into the project, where practicable. The Community Liaison Plan would also include contact details for a 24-hour construction response line, Project Infoline and email address for ongoing stakeholder contact throughout the construction phase. The community would be kept informed of construction progress, activities and impacts in accordance with the Community Liaison Plan.

6.4.6.2 Operational Noise

The identification and assessment of operational controls and reasonable and feasible noise controls have been considered throughout the Revised Project design process and incorporated into detailed noise modelling, as discussed in **Section 6.4.1**. The incorporation of these reasonable and feasible noise control measures has reduced the potential noise impacts associated with the Revised Project as far as practicable.

Daracon commits to review and update the existing Noise Management Plan (NMP) and then implement the updated plan for the Revised Project. The NMP will detail the monitoring and management controls to be implemented to manage noise impacts associated with the Revised Project including ongoing implementation of the proactive and reactive management protocols in response to noise trigger levels defined in the plan. The revisions to the NMP will focus on the changes relevant to the Revised Project with the existing noise management processes identified in the approved NMP being applied to the Revised Project where relevant and remaining valid for activities and areas outside the quarry boundary.

Daracon commits to the implementation of the following physical noise controls as part of the Revised Project to assist in managing noise emissions from the quarry:

- Noise barrier adjacent to the primary dump hopper and part of the internal haul road between the West Pit and East Pit
- Noise barrier adjacent to the primary crusher
- Noise attenuation of the primary surge bin
- 8-m noise barrier around the southern boundary of the existing East Pit processing plant area to overlap an augmented landform adjacent the existing wheel wash bay
- New cladding of the secondary screen and crusher building including a mass layer for the roof, northern, southern and western walls. Additionally, cladding of the existing open areas at the base of the building for the northern, western and southern facades.
- Attenuated replacement of the tertiary crusher and tertiary surge bin
- 3-m noise barrier around the southern boundary of the Southern Stockpile Area
- Installation of a fence between the western boundary of the Southern Stockpile Area and adjacent rail siding.

The probabilistic noise modelling indicated mobile equipment management was a key aspect to managing the ongoing noise impacts, especially during noise-enhancing meteorological conditions. Daracon will implement both proactive and reactive noise control strategies informed by real-time noise and meteorological monitoring systems. Proactive noise management will involve the discussion and planning of activities in advance of potentially adverse conditions. Specifically, the proactive noise management approach will include:

- implementation of a system to provide environmental personnel with a daily forecast of expected conditions in the vicinity of the operation, particularly with regard to the potential for noise enhancing meteorological conditions
- using noise forecasts for daily operational planning
- modifying the planned quarrying activities, as appropriate, to minimise or avoid the potential noise impacts including but not limited to:
    - to enable the continued progression of the quarry area topsoil and overburden will be stripped using a bulldozer and excavator on a campaign basis
    - machines working on the higher, more exposed benches in the West Pit will be relocated during periods of noise-enhancing meteorological conditions
    - quarrying activity on the higher benches to be scheduled for times when the dominant prevailing weather conditions do not enhance the noise propagation towards the receivers to the west and north of the West Pit. Quarrying activity on the higher benches to be prioritised when the appropriate conditions occur
    - reducing the number of machines operating in the West Pit, moving a specific machine into a location that is acoustically shielded so that other machines can continue to operate, or the complete shut down of the West Pit

- managing the West Pit activities to compliment the truck movements on the access road through Lot 5 to Dungog Road. During periods of high truck movement and weather conditions that enhance the noise propagation, this may include shutting down some or all activities within the West Pit
- re-scheduling drilling in exposed locations for periods when the weather conditions do not enhance the noise impacts.

Based on the findings from the NIA the proposed noise monitoring network for the Revised Project is shown in **Figure 6.6**. This figure identifies two locations where real-time noise monitors will be set up and five locations where attended monitoring for compliance assessment will be completed. The proposed locations for attended monitoring are considered to be representative of the most sensitive noise receivers. The monitoring locations shown in **Figure 6.6** will be reviewed periodically to ensure monitoring is undertaken at appropriate representative locations. Daracon will conduct a detailed review of both the proposed and existing sites following determination of the development application to confirm that the monitoring network provides adequate coverage of the Project Area in order to validate the NIA predictions and monitor compliance with relevant criteria. Daracon will update the existing Noise Management Plan and then implement the updated plan for the Revised Project. This will include the revised noise monitoring program.

The VLAMP provides guidance on the approach to managing noise impacts in excess of the target PTNLs. Daracon will continue to consult with potentially impacted residents regarding management of noise associated with the Revised Project in accordance with the requirements of the VLAMP.



Image Source: Google Earth (2018)
Data Source: Daracon (2019), Department of Finance, Services & Innovation (2019)

0 250 500 750m
1:15 000

Legend

- Project Area
- Attended Noise Monitoring Location
- Realtime Noise Monitoring Location

FIGURE 6.6

Proposed Noise Monitoring Locations

6.5 Air Quality

A comprehensive assessment of potential air quality impacts of the Revised Project has been prepared by Jacobs Group (Australia) Pty Limited (Jacobs). This assessment has been prepared in accordance with the *EPA's Approved Methods of the Modelling and Assessment of Air Pollutants in New South Wales* (EPA, 2016) (Approved Methods) and the SEARs. The assessment also considers the matters raised by government agencies in respect to air following the exhibition of the 2016 EIS (refer to **Part B, Section 12.0**).

As outlined in **Sections 5.1** and **5.4**, air quality impacts were identified by the community as one of the key issues of concern and Daracon considered this to be a key issue for the Revised Project. As described below Daracon has continued to take this feedback on board and sought to address concerns through operational changes and as part of the planning and design stages of the Revised Project.

The design and planning of the Revised Project has closely considered air quality impacts and incorporated air quality mitigation and management measures into the Revised Project design. Key measures included in the Revised Project design that have minimised air quality emissions include:

- reduction of the overall disturbance footprint by approximately 16.8 ha through optimisation of the proposed extraction within the West Pit and therefore reducing the area of operations that could generate dust
- reduced operational hours which would reduce the running of processing equipment, stockpiling and transportation of material and thereby reduce the amount of dust generated by the operation of the Revised Project
- limiting the number of haulage routes (where feasible), thus minimising associated dust generation and diesel emissions
- progressive rehabilitation of disturbed areas to reduce wind generated dust, where feasible
- ongoing implementation of the air quality management practices of the previous operations at the quarry.

This section sets out the key findings of the updated AQIA provided in full as **Appendix E**.

6.5.1 Potential Air Quality Issues

Emissions to air as a result of the Revised Project would be generated from a variety of activities including those from general quarrying operations, material handling, material transport, processing, wind erosion and blasting. These emissions would mainly comprise particulate matter (PM) in the form of deposited dust, total suspended particles (TSP) which includes particulate matter with equivalent aerodynamic diameter of 10 microns or less (PM_{10}) and 2.5 microns or less ($PM_{2.5}$) from general quarrying activities, fume (oxides of Nitrogen (NO_x)) from blasting and minor emissions from machinery exhausts (PM, NO_x and Carbon Monoxide (CO)).

Air quality issues were also identified through consultation with local stakeholders as part of a CAF on Air Quality and Blasting held in March 2019. The results of the draft AQIA were summarised and provided to local stakeholders prior to the CAF. The CAF was attended by project team members from Daracon and Umwelt, including the air quality specialist from Jacobs.

As a result of the review of the Revised Project activities and outcomes of the CAF engagement, the potential air quality issues activities have been identified as:

- dust (that is, particulate matter in the form of TSP, deposited dust, PM_{10} or $PM_{2.5}$) from the general quarrying activities
- fume (that is, NO_x emissions) from blasting
- emissions of substances from machinery exhausts, that is, diesel exhaust emissions such as NOx, PM_{10} and $PM_{2.5}$
- crystalline silica due to the crushing of rock.

6.5.2 Assessment Criteria

A range of different categories of dust are relevant to the assessment process. Dust concentration refers to airborne dust (or PM) and is measured in micrograms per cubic metre (µg/m^3). There are various classifications of dust and relevant criteria are typically prescribed for TSP, PM_{10}, $PM_{2.5}$ and deposited levels. TSP relates to all suspended particles which are usually in the size range of zero to 50 micrometres (µm). PM_{10} refers to particulate matter with a diameter less than 10 µm and $PM_{2.5}$ refers to particulate matter with a diameter less than 2.5 µm. Dust deposition levels refer to the quantity of all dust particles that settle out of the air as measured in grams per square metre per month (g/m^2/month).

Table 6.24 presents the relevant criteria for these air pollutants as nominated by the EPA's Approved Methods, along with additional information on the source of the criteria where relevant. The criteria of the current Approved Methods (EPA, 2016) have been applied to existing and potential sensitive receptors such as residences, schools and hospitals[4].

Table 6.24 EPA Air Quality Assessment Criteria

Substance	Averaging Time	Criterion	Source
Particulate Matter (PM_{10})	24-hour	50µg/m^3	EPA (2016)/DoE (2016)
	Annual	25µg/m^3	EPA (2016)/DoE (2016)
Particulate Matter ($PM_{2.5}$)	24-hour	25µg/m^3	EPA (2016)/DoE (2016)
	Annual	8µg/m^3	EPA (2016)/DoE (2016)
Particulate Matter (TSP)	Annual	90µg/m^3	EPA (2016)/NHMRC (1996)
Deposited Dust	Annual (maximum increase)	2g/m^2/month	EPA (2016)/NERDDC (1998)
	Annual (maximum total)	4g/m^2/month	EPA (2016)/NERDDC (1998)
Nitrogen dioxide (NO_2)	1-hour	246µg/m^3	EPA (2016)/NEPC (1998)
	Annual	62µg/m^3	EPA (2016)/NEPC (1998)
Respirable crystalline silica (as $PM_{2.5}$)	Annual	3 µg/m^3	VEPA (2007)*
Carbon monoxide (CO) (mg/m^3)	1-hour	30 mg/m^3	EPA (2016)
	8-hour	10 mg/m^3	EPA (2016)

* There are no impact assessment criteria for respirable crystalline silica in NSW so the criterion from the Victorian EPA (VEPA) has been adopted.

[4] Projects exhibited prior to 20 January 2017 do not require assessment against the more stringent criteria of the 2016 Approved Methods.

The EPA air quality assessment criteria relate to the total concentration of air pollutant in the air (that is cumulative) and not just the contribution from project-specific sources. Therefore, background air quality needs to be established to assess the potential impacts of the Revised Project against these criteria. In circumstances where background levels are elevated, the Approved Methods requires "*… that no additional exceedances of the impact assessment criteria will occur as a result of the proposed activity and that best management practices will be implemented to minimise emissions of air pollutants as far as is practical*".

Also relevant to the assessment of air quality impacts is the VLAMP (2018) which identifies criteria (for particulate matter) for voluntary mitigation and land acquisition to address dust impacts from State significant mining, petroleum and extractive industry developments. The VLAMP identifies voluntary mitigation rights as applicable where, even with best practice management, the development contributes to exceedances of the criteria in **Table 6.25** at any residence or workplace.

Table 6.25 VLAMP Mitigation Criteria for Particulate Matter

Substance	Averaging Time	Mitigation Criterion	Impact Type
Particulate Matter ($PM_{2.5}$)	Annual	8µg/m³*	Human Health
	24-hour	25µg/m³**	Human Health
Particulate Matter (PM_{10})	Annual	25µg/m³*	Human Health
	24-hour	50µg/m³**	Human Health
Particulate Matter (TSP)	Annual	90µg/m³*	Amenity
Deposited Dust	Annual	2g/m²/month**	Amenity
	Annual	4g/m²/month*	Amenity

* Cumulative Impact (i.e. increase in concentrations due to the development plus background concentrations due to all other sources)
** Incremental Impact (i.e. increase in concentrations due to the development alone), with up to 5 allowable exceedances of the criteria over the life of the development

Voluntary acquisition rights may apply where, even with best practice management the development contributes to exceedances of the criteria in **Table 6.26** at any residence or workplace on privately owned land or on more than 25% of any privately owned land where there is an existing dwelling or where a dwelling could be built under existing planning controls.

Table 6.26 VLAMP Acquisition Criteria for Particulate Matter

Substance	Averaging Time	Mitigation Criterion	Impact Type
Particulate Matter ($PM_{2.5}$)	Annual	8µg/m³*	Human Health
	24-hour	25µg/m³**	Human Health
Particulate Matter (PM_{10})	Annual	25µg/m³*	Human Health
	24-hour	50µg/m³**	Human Health
Particulate Matter (TSP)	Annual	90µg/m³*	Amenity
Deposited Dust	Annual	2g/m²/month**	Amenity
	Annual	4g/m²/month*	Amenity

*Cumulative Impact (i.e. increase in concentrations due to the development plus background concentrations due to all other sources)
** Incremental Impact (i.e. increase in concentrations due to the development alone), with zero allowable exceedances of the criteria over the life of the development

The particulate matter levels for comparison in **Table 6.26** and **Table 6.27** must be calculated in accordance with the Approved Methods (EPA 2016).

6.5.3 Existing Air Quality Environment

6.5.3.1 Sensitive Receiver Locations

Sensitive receivers surrounding a quarry include residences on privately owned land, unoccupied privately-owned land where dwelling entitlement exists, schools, hospitals and commercial premises. The locations of sensitive receivers surrounding the quarry are shown on **Figure 6.7**.

Receivers Q1, Q3 and Q4 have been allocated to on-site locations within the Project Area boundary, these have been included as part of the modelling process and are not sensitive receivers. Receiver Q2, also within the Project Area boundary, is a quarry-owned residence.

6.5.3.2 Meteorological Conditions

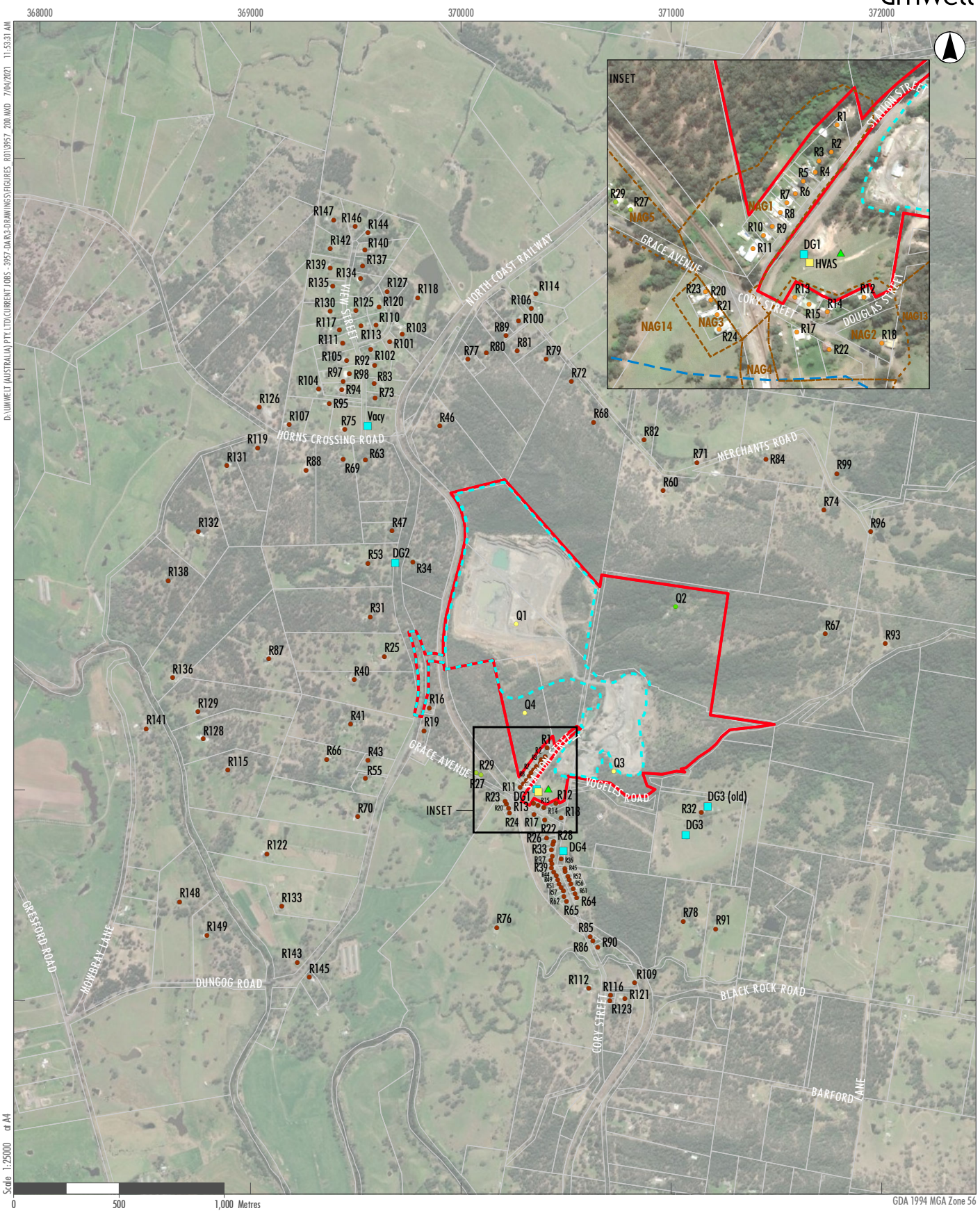
The AQIA analysed data from the existing operating meteorological station on Station Street, approximately 300 m southwest of the quarry processing plant (refer to **Figure 6.7**) to establish background meteorological conditions of the quarry setting. Hourly records of temperature, wind speed and wind direction for five recent years of data, 2015 to 2019 were analysed in order to confirm suitability for the dispersion modelling. **Table 6.27** presents a summary of the recorded data.

Table 6.27 Annual Statistics from meteorological Data Collected at the Quarry Meteorological Station

Statistic	2015	2016	2017	2018	2019
Percent complete (%)	95	90	67	100	100
Mean wind speed (m/s)	0.9	1.2	1.5	1.4	1.4
99th percentile wind speed (m/s)	3.0	4.1	5.7	5.3	5.4
Percentage of calms (%)	38	30	24	30	35
Percentage of winds >6 m/s (%)	0.1	0.1	0.5	0.5	0.4

The annual and seasonal wind patterns are shown in **Figure 6.8**. The wind roses show that the most common winds are from the northwest, east and south although winds can occur from most directions. This pattern is evident in most of the years presented, to various extents, indicating that the data from any of the recent five years could be considered as representative for modelling purposes. Mean wind speed over the period of analysis was in the order of 1.3 m/s, with the percentage of calms ranged between 24 and 38%. Of the five years, four provide the minimum 90% record for the period however, 2015 has been selected as the mean wind speed and percentage of calms[5] present conditions more conducive to higher pollutant concentrations (and thereby providing a more conservative assessment of impact). 2015 also has an advantage from a calibration perspective in that the measured air quality was not adversely impacted by bushfires and dust storms which was the case for the 2018 and 2019 years.

[5] Higher frequency of calm conditions typically leads to higher predictions of ground-level concentrations as these conditions are often associated with poor dispersion whereby any dust emissions disperse more slowly and allow higher concentrations to exist for extended periods of time.



Legend

- Project Area
- Proposed Disturbance Area
- Dust Deposition Guage
- High Volume Air Sampler (PM10)
- Meteorological Station

Modelled Noise Receivers

- Quarry General
- Quarry Receiver
- Quarry Receivers/Daracon Owned
- Sensitive Receiver

FIGURE 6.7

Local Setting and Location of Sensitive Receivers

Image Source: ESRI (2020) Data source: DSFI (2020)

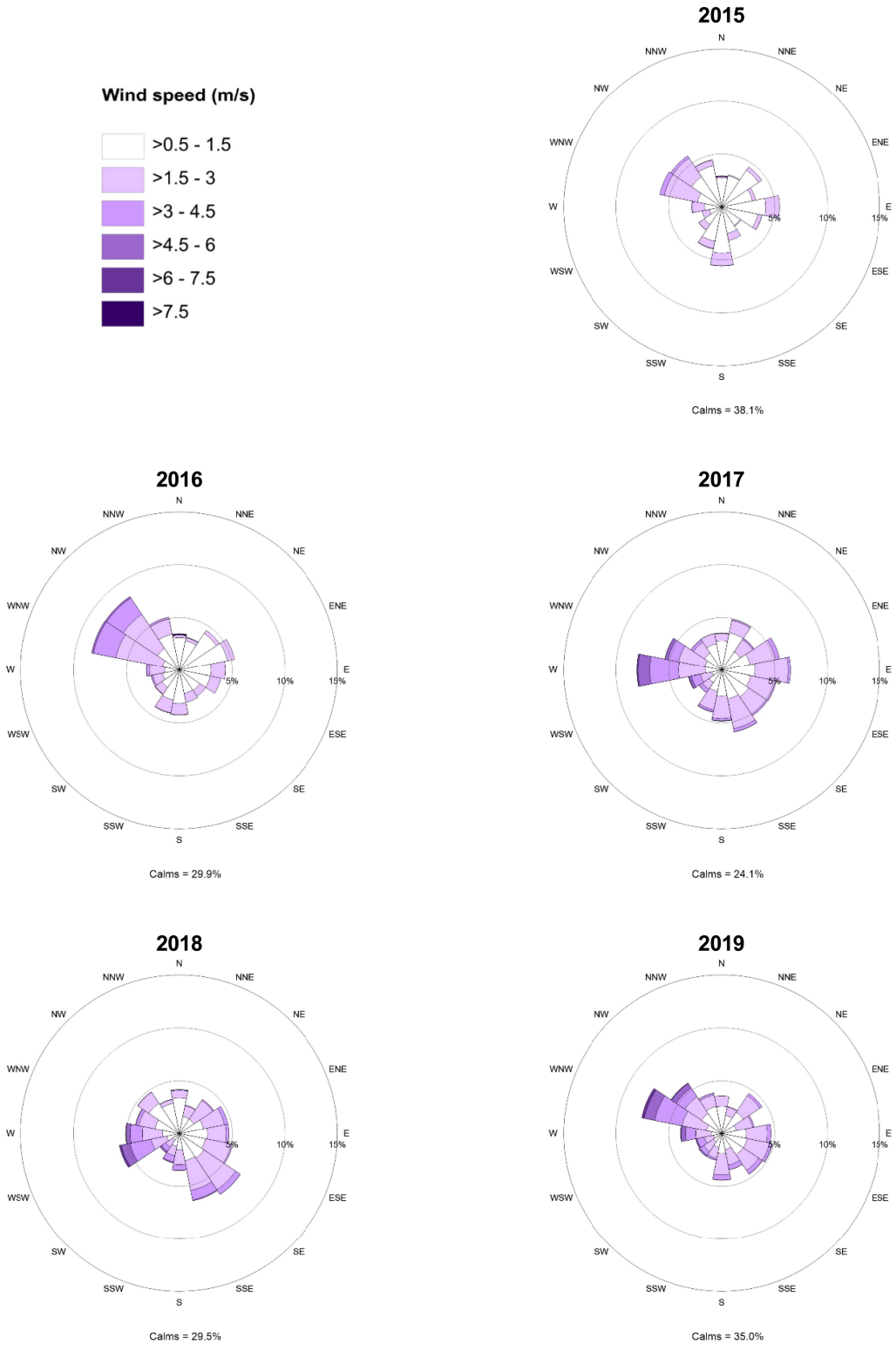


FIGURE 6.8

Annual Wind-roses

Image Source: Jacobs (2020)

6.5.3.3 Existing Monitoring

Background air quality has been established to allow for the potential impact of the Revised Project to be assessed against the air quality criteria nominated in **Section 6.5.2**. In establishing the background concentration of the particulate matter and gaseous pollutants identified in **Section 6.5.1**, the contribution to existing air quality of the operating quarry has been considered. The following sources of data have been used to establish background air quality:

- Five deposited dust gauges located on and surrounding the quarry (refer to **Figure 6.7**). Data has been collected from DG1 to DG3 since 2013, and from DG4 since 2015. In 2017, DG3 was moved slightly south west (labelled 'DG3' on **Figure 6.7**), with a new dust deposition gauge installed in Vacy in 2019 (labelled 'Vacy' on **Figure 6.7**).
- A High Volume Air Sampler (HVAS) located adjacent to the quarry meteorological station on Station Street, Martins Creek (refer to **Figure 6.7**). The HVAS has collected PM_{10} data every 6 days since 2013.
- Office of Environment and Heritage (OEH) air quality monitoring station located at Singleton (approximately 40 km west of the quarry). $PM_{2.5}$ and NO_2 are both monitored at this location. It is noted that another OEH monitoring station is located at Beresfield approximately 30 km to the south of the quarry. The Singleton location has been identified by Jacobs (2020) as more representative of the Martins Creek setting as Singleton has a lower population density and the monitor is situated in a rural residential area that has closer environmental characteristics to Martins Creek.

The following provides a brief discussion of the results of monitoring of each of the key air pollutants and summary of the established background concentrations.

Deposited Dust

Between January 2013 and June 2020, deposited dust monitoring has generally indicated compliance with the 4g/m²/month criteria (refer to **Table 6.28**). After monitoring was first established in 2013 and 2014, elevated deposited dust concentrations were observed at DG3, however, after further investigation by Daracon it was confirmed that there were issues with contamination of DG3 due to activities on a neighbouring property. As a result, and in consultation with the EPA, DG3 was subsequently relocated in September 2017 to its current position (refer to **Figure 6.7**).

An additional dust deposition gauge was included in the air quality monitoring network for the quarry at a location in View Street, Vacy, during May 2019. Monitoring data is published on the quarry web

Table 6.28 Deposited Dust Levels

Year	DG1	DG2	DG3	DG4	Vacy**	Criterion
2013	1.3	1.2	10.4***	1.1	-	4
2014	1.4	0.8	11.7***	0.7	-	
2015	1.1	0.9	2.4***	0.9	-	
2016	0.9	1.5	1.9***	0.9	-	
2017	1.6	1.2	4.8***	1.7	-	
2018	2.1	2.3	2.0	1.0	-	
2019	2.2	3.3	2.5	1.3	2.1	
2020	1.9*	2.3*	2.9*	1.2*	1.2*	

*Data available to June 2020 **Vacy gauge installed on 9 May 2019 ***Data from old location for DG3

The measured dust deposition from January 2013 to June 2020 indicate good air quality with respect to deposited dust levels.

Particulate Matter - PM_{10}

Since commencement of monitoring in 2013 and up until 2019, PM_{10} concentrations measured at the quarry HVAS have exceeded the EPA's air quality assessment criteria only once, on 18 July 2018 (refer to **Table 6.29**) due to a regional dust storm event. The absence of any other recorded exceedances of the 24-hour average PM_{10} criteria suggests that the activities at the existing quarry had not caused adverse off-site air quality impacts with respective to PM_{10}. This is despite air quality conditions in the Dungog region being clearly influenced by the drought conditions in 2017 and 2018 and lower than average rainfall.

During 2019, there were a number of instances when the 24-hour average PM_{10} concentrations exceeded 50 µg/m^3. Specifically, there were four measurement days when the 24-hour average PM_{10} concentration exceeded 50 µg/m^3. All four reported exceedances align with a period of unprecedented bushfires across the southeast of Australia. The quarry was placed into limited operations on 24 September 2019 and was therefore not a significant contributor to local air quality after this date.

For the first six months of 2020, the PM_{10} concentrations had not exceeded 50 µg/m^3.

Table 6.29 Summary of Measured PM_{10} Concentrations near the Quarry

Year	Maximum 24-hour Average (µg/m^3)	Annual Average (µg/m^3)
2013	49	15
2014	41	17
2015	34	13
2016	32	12
2017	40	15
2018	64 (regional event on 18 July and drought conditions)	19
2019	93 (bushfires around 22 November and drought conditions)	23
2020	35*	13*

*Data available to June 2020

Particulate Matter – $PM_{2.5}$

The measured $PM_{2.5}$ concentrations (OEH monitoring station at Singleton) from the period of 2013 to 2019 are shown in **Table 6.30**.

Table 6.30 Summary of Measured $PM_{2.5}$ Concentrations (Singleton)

Year	Maximum 24-hour Average (µg/m^3)	Number of days above 24-hour average criteria	Annual Average (µg/m^3)
2013	23	0	7.9
2014	29*	1	7.8
2015	25	0	7.6
2016	28*	2	7.9
2017	30*	1	8.2**
2018	19	0	8.1**
2019	69*	22	10.9**
2020	46***	5***	9.7***

* Exceeds criteria of 25 µg/m^3 which came into effect as an assessment criterion on 20 January 2017 (previously the criteria was 30 µg/m^3)
** Exceeds the criteria of 8 µg/m^3 which came into effect as an assessment criterion on 20 January 2017 (previously no criterion)
*** Data available to June 2020

From 2013 to 2016, the maximum 24-hour average $PM_{2.5}$ concentrations have generally been below the EPA assessment criterion with clear seasonal variation observed, associated with higher concentrations in winter due to wood smoke from domestic heating.

Table 6.30 shows there was one day in 2017 when the measured 24-hour average $PM_{2.5}$ concentration at Singleton exceeded 25 µg/m^3, and 22 days in 2019. From 2013 to 2016, the annual averages were close to 8 µg/m^3, exceeding this level in 2017, 2018 and 2019 respectively. The first 6 months of 2020, the measured 24-hour average $PM_{2.5}$ concentration at Singleton has exceeded 25 µg/m^3 on 5 days; four of these days were in early January 2020 and influenced by bushfire smoke. It is noted that the quarry was placed into limited operations on 24 September 2019 and was therefore not a significant contributor to local air quality after this date.

Particulate Matter – TSP

No known monitoring of TSP is conducted in the vicinity of the quarry. Background levels have subsequently been derived from an established relationship between TSP and PM_{10} concentrations for rural environments in NSW, where the average PM_{10} concentrations are typically 40 % of the TSP concentrations (Minerals Council 2000).

Nitrogen Dioxide (NO_2)

Data from the OEH monitoring station at Singleton show that the maximum and annual average NO_2 concentrations have been well below the EPA criteria of 246 µg/m^3 and 62 µg/m^3 respectively (**Table 6.31**).

Table 6.31 Summary of Measured NO_2 Concentrations (Singleton)

Year	Maximum 1-hour Average (µg/m³)	Annual Average (µg/m³)
2013	84	18
2014	74	16
2015	66	16
2016	66	16
2017	74	17
2018	72	16
2019	76	14
2020	68*	12*

* Data available to June 2020

Assumed Background

Considering the monitoring data presented for the local and regional setting, **Table 6.32** presents the assumed background concentrations of the key pollutants. In establishing background concentration, the data collected in 2015 has been selected as most representative as production at the quarry most closely matched the production level proposed by the Revised Project.

Table 6.32 Assumed Background Air Quality (Martins Creek)

Substance	Averaging time	Assumed background level that applies at sensitive receptors	Source
PM_{10}	24-hour	34 µg/m^3	Station Street HVAS (2015)
	Annual	13 µg/m^3	Station Street HVAS (2015)

Substance	Averaging time	Assumed background level that applies at sensitive receptors	Source
$PM_{2.5}$	24-hour	34 µg/m^3	OEH Singleton monitoring station (2015)
	Annual	7.6 µg/m^3	OEH Singleton monitoring station (2015)
TSP	Annual	33 µg/m^3	Estimate based on Station Street HVAS (2015)
Deposited dust	Annual	2.3 g/m^2/month	DDG3 (2015)
Nitrogen dioxide (NO_2)	1-hour	66 µg/m^3	OEH Singleton monitoring station (2015)
	Annual	16 µg/m^3	OEH Singleton monitoring station (2015)
Carbon monoxide (CO)	1-hour	0.7 mg/m^3	RMS Tool for Roadside Air Quality (Jacobs, 2020)
	8-hour	0.7 mg/m^3	RMS Tool for Roadside Air Quality (Jacobs, 2020)

6.5.4 Methodology

The revised AQIA has followed the Approved Methods (EPA 2016) which specifies how assessments based on the use of atmospheric dispersion models should be completed along with impact assessment criteria of particulate matter and selected gaseous emissions. It is noted that the original assessment of impacts on air quality was completed generally in accordance with a previous version of the Approved Methods (2016). The 2016 version of the Approved Methods introduces revised and more stringent criteria for particulate matter concentrations, compared to the criteria that were used to assess the Original Project in the EIS (Monteath & Powys, 2016).

The AQIA relies upon the use of an air dispersion model, CALPUFF, to predict ground-level concentrations and deposition levels from identified emission sources and comparing these to the air quality criteria identified in **Section 6.5.2**. The CALPUFF model incorporates meteorological and dispersion modelling to simulate complex meteorological patterns and model the effect of this and local topography on the dispersion and deposition of particulate matter and gaseous emissions.

6.5.4.1 Meteorological Modelling

CALPUFF requires information on the meteorological conditions in the modelled region. The meteorological station at the quarry does not collect sufficient data for meteorological modelling. The closest station with suitable data is operated by the Bureau of Meteorology at Williamtown, which is approximately 30 km to the southeast of the quarry. Data from the Williamtown station was input into the CSIRO's prognostic model known as The Air Pollution Model (TAPM) with surface observations at the quarry meteorological station used to generate a local meteorological data set for the local setting.

6.5.4.2 Dispersion Modelling

Particulate Matter

Emissions were estimated by analysing the material handling schedule, equipment listing and quarry plans in order to identify the location and intensity of emission generating activities. Dust emission inventories were then developed for each of the following four operational scenarios:

- existing operations, at the typical extraction rate, for comparison with future operations
- Year 2, representing proposed future operations, and assuming maximum production at 1.1 Mtpa
- Year 10, representing proposed future operations, and assuming maximum production at 1.1 Mtpa
- Year 20, representing proposed future operations, and assuming maximum production at 1.1 Mtpa.

The locations of the modelled emissions sources are identified on Figure 10 of the AQIA (**Appendix E**). The AQIA (refer to **Appendix E**) provides a more detailed description of the dispersion modelling which provides for the prediction of pollutant concentration at 1,169 discrete receptors, including the sensitive receptors to the quarry over a 10 x 10 km region to allow for contouring of results. It is noted that as the model considers all quarry activities for all proposed hours of operation, for every day of the year, the model predictions will have likely over-estimated the quarry contribution to local air quality. Furthermore, pit retention (retention of dust particles within the open pits) and the effects of rainfall have not been included in the model scenarios.

Blast (Fume) Emissions

Particulate matter emissions from blasting are included as part of the 4 scenarios noted above.

Blasting activities have the potential to result in fume produced under non-ideal explosive conditions of the ammonium nitrate/fuel oil (ANFO) and is visible as an orange/brown plume. Blast fumes comprise of NO_x, of which approximately 10% comprise NO_2 which has been linked to adverse health effects. Of the remaining NO_x, the nitric oxide (NO) will oxidise to NO_2 at a rate depending on prevailing atmospheric conditions including temperature, humidity and the presence of other substances in the atmosphere such as ozone.

The CALPUFF model was also used to predict potential NO_2 concentrations due to blasting based on a series of assumptions outlined in **Appendix E**.

6.5.4.3 Transport Emissions

The AQIA has quantified the potential particulate matter (PM_{10} and $PM_{2.5}$), NO_2 and carbon monoxide (CO) emissions using the RMS's Tool for Roadside Air Quality (TRAQ) air quality screening tool. TRAQ adopts emission factors from the EPA's Motor Vehicle Emissions Inventory and uses the CALINE air dispersion model to predict the maximum near roadside air pollutant concentrations.

6.5.4.4 Crystalline Silica

Ambient monitoring of respirable crystalline silica at the quarry was conducted on 14 June 2019. The monitor was fitted with a PVC filter to allow for analysis of crystalline silica and was installed on the Project Area boundary, downwind of the quarrying activities on a day representative of normal operations.

Results from the sampling were used to estimate a maximum annual average respirable crystalline silica concentration at the quarry boundary for comparison with the relevant assessment criteria (refer to Table 6.24).

6.5.5 Assessment of Air Quality Impacts

This section provides an overview of the findings of the AQIA as assessed against relevant EPA assessment criteria.

The main objective of the modelling was to predict the potential change in air quality as a result of the Revised Project, that is, the incremental change from previous operations to proposed operations. In doing so, the contribution of the quarry to the historical air quality has been taken into account. This approach represents a "Level 1" assessment according to the Approved Methods (EPA 2016) whereby assumed maximum background levels have been combined with the predicted Revised Project increment.

Air quality contours for predicted worst case annual average PM10, PM2.5, TSP and dust deposition concentrations for all years modelled and the predicted maximum 24-hour average PM_{10} and $PM_{2.5}$ (composite of all modelled years) are provided in this section, further detail is provided in **Appendix E**.

The modelling indicates that there will be very little change in contribution from the Revised Project beyond the Project Area boundary, for all particulate matter classifications (PM_{10}, $PM_{2.5}$, TSP and dust deposition), with no exceedances of the EPA criteria at any of the sensitive receiver locations.

6.5.5.1 Particulate Matter Emissions

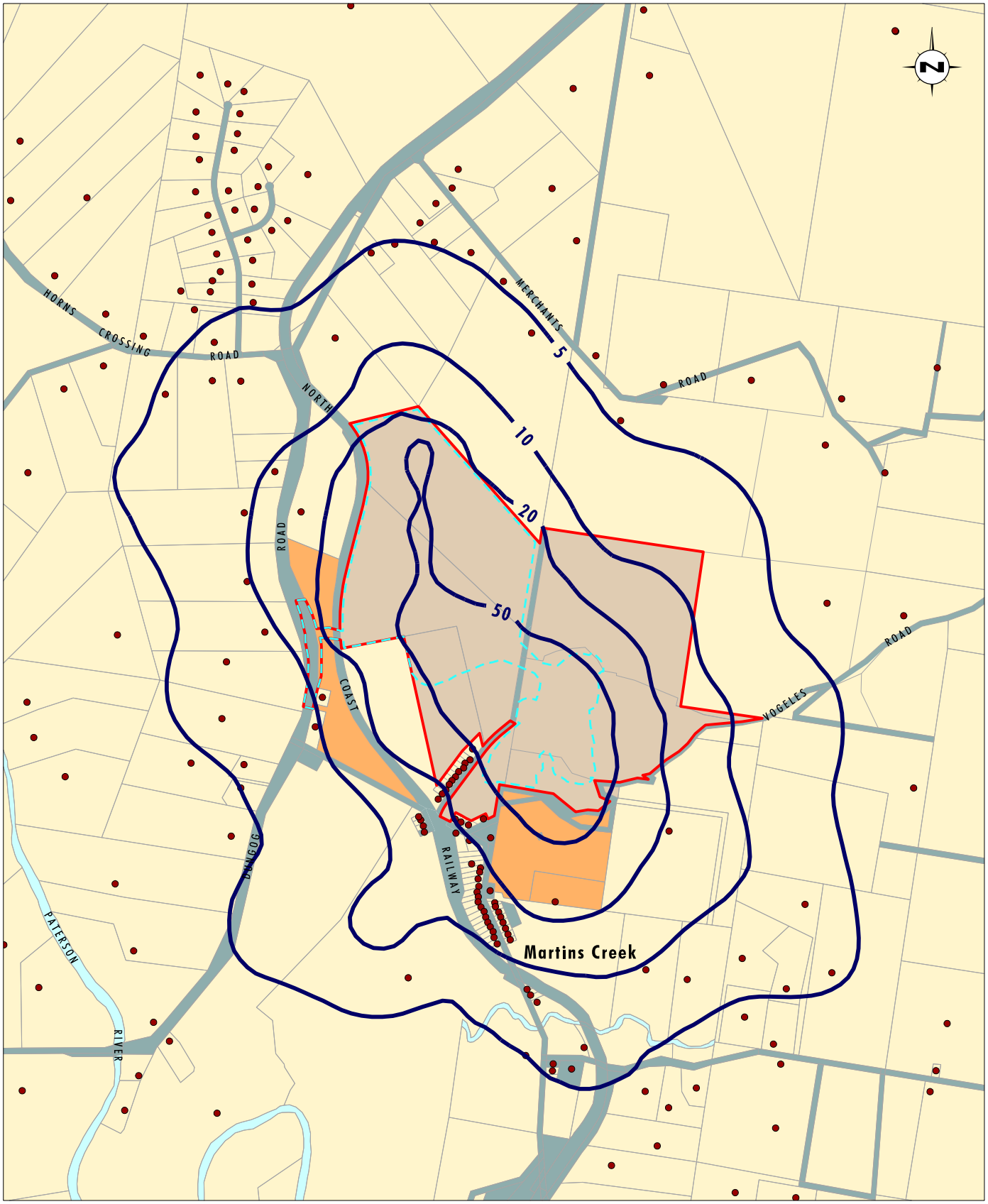
Particulate Matter - PM_{10}

The Revised Project is not predicted to result in any exceedance of the applicable annual average and maximum 24-hour average PM_{10} criteria at any private sensitive receivers (refer to **Table 6.33**). **Figure 6.9** and **Figure 6.10** provide composite contours for the predicted maximum 24-hour average and annual average PM_{10} concentrations for all modelled years, respectively.

Table 6.33 Predicted PM_{10} Concentrations at Nearest Properties

Receiver ID	Criteria	Revised Project				Background	Cumulative		
		Previous	Year 2	Year 10	Year 20		Year 2	Year 10	Year 20
Predicted maximum 24-hour average PM_{10} concentrations ($\mu g/m^3$)									
R1	50	39	33	30	50	34	28	25	45
R5	50	22	19	18	28	34	31	30	40
R10	50	14	12	11	18	34	32	31	38
R12	50	22	19	17	29	34	30	30	41
R16	50	9	7	7	11	34	32	32	36
R25	50	9	5	6	9	34	30	31	34
R31	50	7	6	8	10	34	33	34	36
R32	50	14	14	13	19	34	35	34	39
R34	50	12	12	12	15	34	34	34	37
R46	50	5	4	5	7	34	33	34	36
R48	50	23	19	19	26	34	30	29	37
R60	50	3	4	3	5	34	35	34	36
R63	50	6	3	5	7	34	31	33	35
R67	50	2	2	2	4	34	34	34	35
R68	50	4	4	4	5	34	34	34	36
R74	50	2	2	2	3	34	34	34	35
Predicted annual average PM_{10} concentrations ($\mu g/m^3$)									
R1	25	14.5	12.6	12.2	19.1	13	11	11	18
R5	25	8.5	7.3	7.2	11.1	13	12	12	16
R10	25	5.3	4.5	4.5	6.9	13	12	12	15
R12	25	7.4	6.2	6.1	9.4	13	12	12	15
R16	25	3.5	2.5	3.0	4.3	13	12	12	14
R25	25	2.8	1.5	2.1	3.0	13	12	12	13
R31	25	2.0	1.0	1.5	2.1	13	12	12	13
R32	25	2.3	2.2	2.1	2.9	13	13	13	14
R34	25	2.6	1.0	1.8	2.5	13	11	12	13
R46	25	0.9	0.6	0.9	1.3	13	13	13	13

Receiver ID	Criteria	Revised Project				Background	Cumulative		
		Previous	Year 2	Year 10	Year 20		Year 2	Year 10	Year 20
R48	25	4.4	3.9	3.8	5.1	13	13	12	14
R60	25	0.6	0.6	0.7	0.9	13	13	13	13
R63	25	0.8	0.5	0.8	1.1	13	13	13	13
R67	25	0.3	0.3	0.3	0.5	13	13	13	13
R68	25	0.6	0.6	0.7	0.9	13	13	13	13
R74	25	0.2	0.2	0.2	0.3	13	13	13	13



Data Source: Jacobs (2020)

0 0.25 0.5 1.0km

1:20 000

Legend

- Project Area
- Proposed Disturbance Area
- Daracon
- Private
- Quarry
- Water
- Other
- Worst Case Max 24 hour PM10 ($\mu g/m^3$)
- Private Residence

FIGURE 6.9

Predicted Maximum 24-hour Average PM10 Concentrations - Composite of all Modelled Years

File Name (A4): R01/3957_202.dgn
20210526 9.50



Data Source: Jacobs (2020)

0 0.25 0.5 1.0km

1:20 000

Legend

- Project Area
- Proposed Disturbance Area
- Daracon
- Private
- Quarry
- Water
- Other
- Worst Case Annual PM10 ($\mu g/m^3$)
- Private Residence

FIGURE 6.10

Predicted Annual Average PM10 Concentrations - Composite of all Modelled Years

File Name (A4): R01/3957_203.dgn
20210526 9.48

Particulate Matter - $PM_{2.5}$

Predicted $PM_{2.5}$ concentrations (refer to **Table 6.34**) indicate that the incremental change in the contribution from the Revised Project would not cause exceedances of the EPA criteria. The cumulative $PM_{2.5}$ concentrations are predicted to remain below both the 24-hour and annual average criteria, as shown in **Figure 6.11** and **Figure 6.12** respectively.

The assumed background maximum 24-hour average $PM_{2.5}$ concentration at Singleton (34µg/m³), already exceeds the criterion of 25µg/m³. That is, the Revised Project is not predicted to increase the incremental contribution to 24-hour average $PM_{2.5}$ and therefore would not result in any additional exceedances of criteria. Furthermore, the ambient concentrations of $PM_{2.5}$ within the Martins Creek area is likely to be lower than Singleton.

Table 6.34 Predicted $PM_{2.5}$ Concentrations at Nearest Properties

Receiver ID	Criteria	Due to Quarry				Background	Cumulative		
		Previous	Year 2	Year 10	Year 20		Year 2	Year 10	Year 20
Predicted maximum 24-hour average $PM_{2.5}$ concentrations (µg/m³)									
R1	25	7.0	5.7	5.3	8.1	14	13	12	15
R5	25	4.1	3.4	3.3	4.7	14	13	13	15
R10	25	2.7	2.2	2.1	3.2	14	14	13	14
R12	25	3.9	3.3	3.0	4.7	14	13	13	15
R16	25	1.8	1.3	1.4	2.0	14	14	14	14
R25	25	1.7	0.9	1.1	1.7	14	13	13	14
R31	25	1.4	1.2	1.5	1.9	14	14	14	14
R32	25	2.3	2.4	2.2	3.0	14	14	14	15
R34	25	2.2	2.2	2.3	2.8	14	14	14	15
R46	25	1.0	0.6	1.0	1.4	14	14	14	14
R48	25	4.4	3.5	3.3	4.6	14	13	13	14
R60	25	0.6	0.7	0.7	0.9	14	14	14	14
R63	25	1.1	0.6	1.0	1.3	14	14	14	14
R67	25	0.5	0.5	0.5	0.7	14	14	14	14
R68	25	0.7	0.7	0.7	1.0	14	14	14	14
R74	25	0.5	0.5	0.5	0.7	14	14	14	14
Predicted annual average $PM_{2.5}$ concentrations (µg/m³)									
R1	8	2.5	2.1	2.0	3.1	5.5	5.1	5.0	6.1
R5	8	1.5	1.2	1.2	1.9	5.5	5.2	5.2	5.9
R10	8	1.0	0.8	0.8	1.2	5.5	5.3	5.3	5.7
R12	8	1.3	1.1	1.0	1.6	5.5	5.2	5.2	5.8
R16	8	0.6	0.4	0.5	0.8	5.5	5.3	5.4	5.6
R25	8	0.5	0.3	0.4	0.5	5.5	5.3	5.4	5.5
R31	8	0.4	0.2	0.3	0.4	5.5	5.3	5.4	5.5
R32	8	0.4	0.4	0.4	0.5	5.5	5.5	5.5	5.6
R34	8	0.5	0.2	0.3	0.4	5.5	5.2	5.4	5.5
R46	8	0.2	0.1	0.2	0.2	5.5	5.4	5.5	5.6
R48	8	0.8	0.7	0.7	0.9	5.5	5.4	5.4	5.6

Receiver ID	Criteria	Due to Quarry				Background	Cumulative		
		Previous	Year 2	Year 10	Year 20		Year 2	Year 10	Year 20
R60	8	0.1	0.1	0.1	0.2	5.5	5.5	5.5	5.6
R63	8	0.2	0.1	0.1	0.2	5.5	5.4	5.5	5.5
R67	8	0.1	0.1	0.1	0.1	5.5	5.5	5.5	5.5
R68	8	0.1	0.1	0.1	0.2	5.5	5.5	5.5	5.6
R74	8	0.0	0.0	0.0	0.1	5.5	5.5	5.5	5.5

Particulate Matter - TSP

No private sensitive receivers (being dwellings or other buildings regularly occupied on a daily basis) are predicted to experience exceedances of the annual average TSP criterion (90 µg/m^3) at any stage of the Revised Project. The cumulative annual average TSP predictions for all modelled stages of the Project are shown in **Figure 6.13**.

Particulate Matter - Dust Deposition

No private sensitive receivers (being dwellings or other buildings regularly occupied on a daily basis) are predicted to experience exceedances of the annual average dust deposition criterion of 4g/m^2/month at any stage of the Revised Project (refer **Table 6.36**). The cumulative annual average dust deposition predictions for all modelled stages of the Revised Project are shown in **Figure 6.14**.



Data Source: Jacobs (2020)

0 0.25 0.5 1.0km

1:20 000

Legend

- Project Area
- Proposed Disturbance Area
- Daracon
- Private
- Quarry
- Water
- Other
- Worst Case Max 24 hour PM2.5 ($\mu g/m^3$)
- Private Residence

FIGURE 6.11

Predicted Maximum 24-hour Average PM2.5 Concentrations - Composite of all Modelled Years

File Name (A4): R01/3957_204.dgn
20210526 9.48



Data Source: Jacobs (2020)

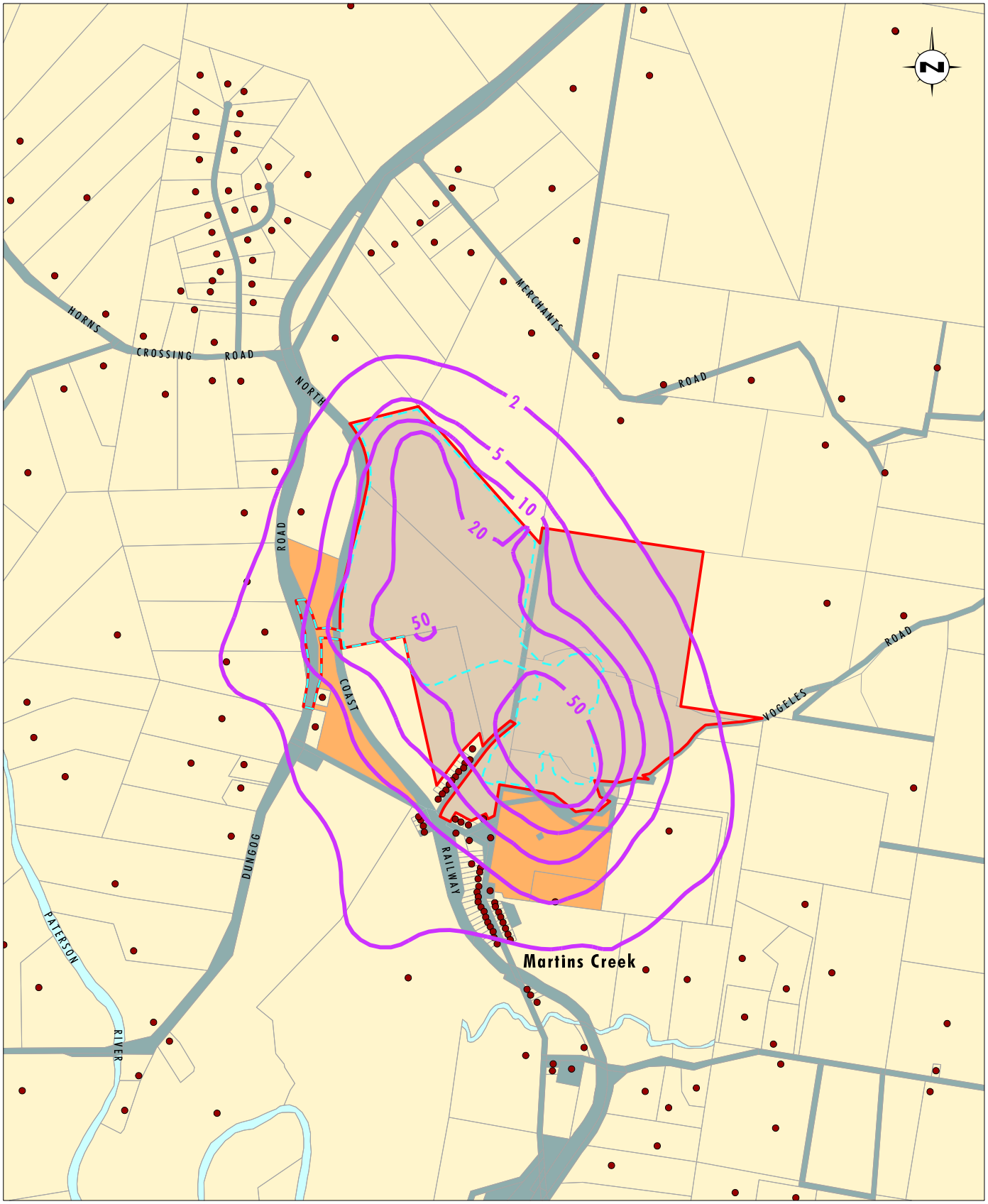
0 0.25 0.5 1.0km
1:20 000

Legend

- Project Area
- Proposed Disturbance Area
- Daracon
- Private
- Quarry
- Water
- Other
- Worst Case Annual PM2.5 ($\mu g/m^3$)
- Private Residence

FIGURE 6.12

Predicted Annual Average PM2.5 Concentrations - Composite of all Modelled Years



Data Source: Jacobs (2020)

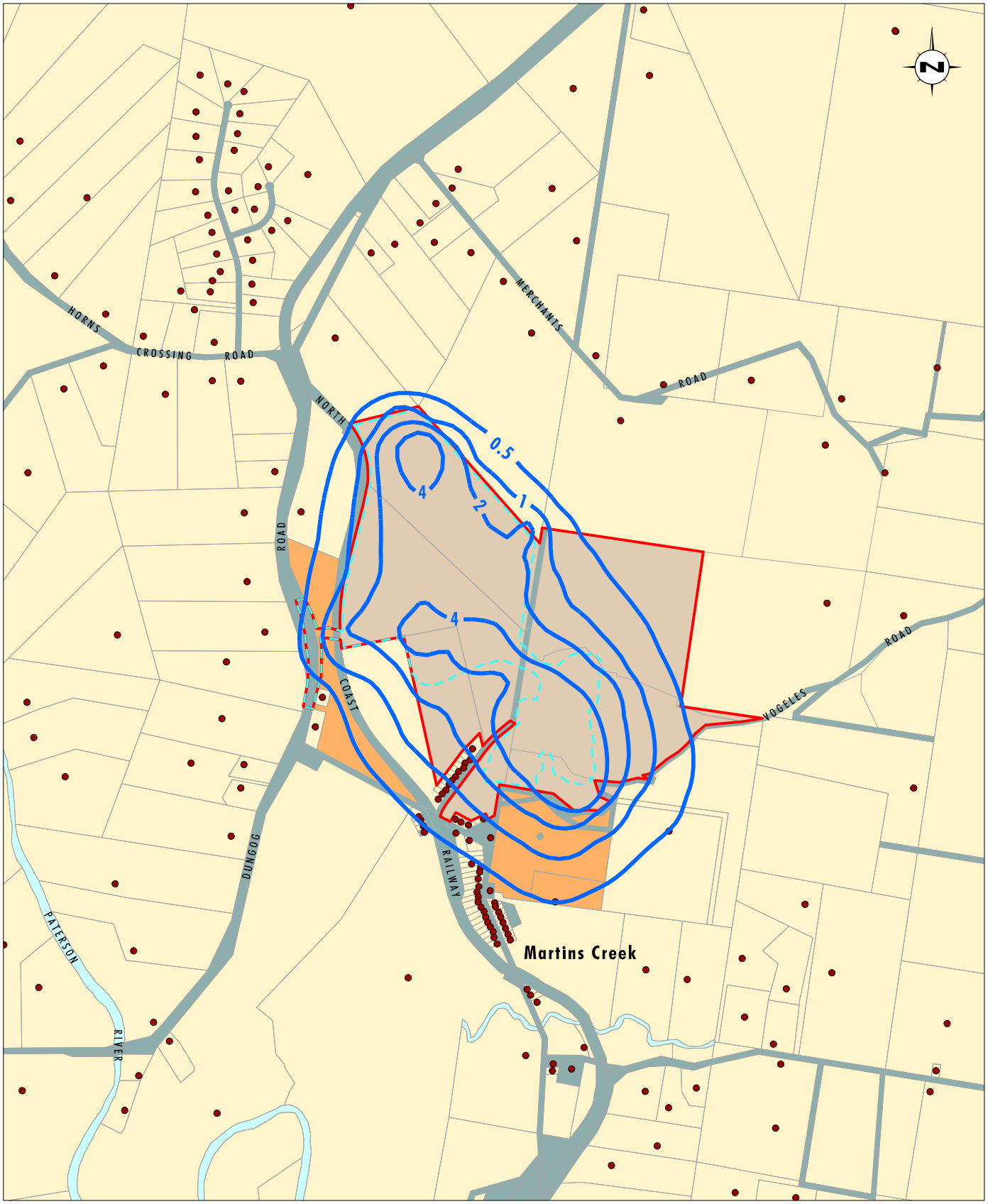
0 0.25 0.5 1.0km
1:20 000

Legend

- Project Area
- Proposed Disturbance Area
- Daracon
- Private
- Quarry
- Water
- Other
- Worst Case Annual TSP ($\mu g/m^3$)
- Private Residence

FIGURE 6.13

Predicted Annual Average
TSP Concentrations - Cumulative



Data Source: Jacobs (2020)

0 0.25 0.5 1.0km
1:20 000

Legend

- Project Area
- Proposed Disturbance Area
- Daracon
- Private
- Quarry
- Water
- Other
- Worst Case Annual Dust Deposition (g/m²/per month)
- Private Residence

FIGURE 6.14

Predicted Annual Average Dust Deposition

There is potential for the annual average dust deposition due to the Revised Project to exceed the 2 g/m^2/month at R1 (on Station Street). As discussed in the AQIA, the increase due to the Revised Project will be in the order of 0.5 g/m^2/month; an increase that is below the EPA's 2 g/m^2/month criterion for a "maximum increase". Continued monitoring in the Station Street area (DG1) will be undertaken to verify that the contribution of the Revised Project is within the predicted modelling results, and that there is continued implementation of dust management and mitigation measures.

Table 6.35 Predicted Dust Deposition at Nearest Properties

ID	Criteria	Due to Quarry				Background	Cumulative		
		Previous	Year 2	Year 10	Year 20		Year 2	Year 10	Year 20
Predicted annual average dust deposition (g/m^2/month)									
R1	4	1.8	1.5	1.5	2.3	2.4	2.2	2.2	2.9
R5	4	1.0	0.8	0.9	1.3	2.4	2.3	2.3	2.7
R10	4	0.6	0.5	0.6	0.8	2.4	2.3	2.4	2.6
R12	4	0.7	0.6	0.7	0.9	2.4	2.3	2.3	2.6
R16	4	0.3	0.2	0.3	0.4	2.4	2.3	2.4	2.5
R25	4	0.2	0.1	0.2	0.3	2.4	2.3	2.4	2.5
R31	4	0.2	0.1	0.2	0.2	2.4	2.3	2.4	2.4
R32	4	0.4	0.4	0.4	0.5	2.4	2.4	2.4	2.5
R34	4	0.4	0.1	0.3	0.4	2.4	2.2	2.3	2.4
R46	4	0.1	0.1	0.1	0.2	2.4	2.4	2.4	2.5
R48	4	0.4	0.4	0.4	0.5	2.4	2.4	2.4	2.5
R60	4	0.1	0.1	0.1	0.1	2.4	2.4	2.4	2.5
R63	4	0.1	0.1	0.1	0.1	2.4	2.4	2.4	2.4
R67	4	0.1	0.1	0.1	0.1	2.4	2.4	2.4	2.4
R68	4	0.1	0.1	0.1	0.1	2.4	2.4	2.4	2.5
R74	4	0.0	0.0	0.0	0.0	2.4	2.4	2.4	2.4

6.5.5.2 Blast Fume Emissions

Figure 19 of the AQIA (refer to **Appendix E**) shows the predicted maximum 1-hour average NO_2 concentrations due to post-blast fume. These results indicate that even under worst-case meteorological conditions applying the conservative assumptions nominated in **Section 6.5.4**, concentrations at the nearest sensitive receiver (R1) are less than 20 µg/m^3. With the addition of maximum background levels (66 µg/m^3 from **Table 6.33**) the results demonstrate compliance with the EPA's criteria of 246 µg/m^3.

6.5.5.3 Diesel Exhaust Emissions

Emissions from diesel exhausts associated with off-road vehicles and quarry plant and equipment have been assessed as part of the AQIA. As discussed in **Section 2.4**, the Revised Project proposes to largely use the existing equipment fleet that is already in place at the quarry. The most significant emissions from diesel exhausts are products of combustion including CO, NO_2 and particulate matter (PM_{10} including $PM_{2.5}$). The NO_2 and PM_{10} (including $PM_{2.5}$) have been considered as part of the AQIA.

Modelling of the potential NO_2 concentrations associated with diesel use as part of the Revised Project indicates a maximum 1-hour average concentration at the nearest sensitive receiver (R1) of approximately 20 µg/m^3 or less. With the addition of maximum background levels of 66 µg/m^3, the predicted levels readily comply with the criteria of 246 µg/m^3.

Predicted annual average NO_2 concentrations at the nearest sensitive receiver (R1) are approximately 10 µg/m^3 or less. With the addition of background levels of 16 µg/m^3, the predicted levels comply with the EPA criteria of 62 µg/m^3. All other surrounding private receivers are more distant and are predicted to have lower levels than those predicted at the nearest residence.

6.5.5.4 Road Transport

Table 6.36 presents the predicted maximum near roadside concentrations of key air quality indicators, as predicted by TRAQ.

Table 6.36 Predicted Maximum near Roadside Concentrations due to Diesel Exhaust Emission

Substance	Criterion	Averaging time	Due to diesel exhaust emissions	Background level	Cumulative
CO (mg/m^3)	30 mg/m^3	1-hour	<0.1	0.7	0.7
	10 mg/m^3	8-hour	<0.1	0.7	0.7
NO_2 (µg/m^3)	246 µg/m^3	1-hour	3.7	66.0	69.7
	62 µg/m^3	Annual	0.7	16.0	16.7
PM_{10} (µg/m^3)	50 µg/m^3	24-hour	2.3	34.0	36.3
	25 µg/m^3	Annual	0.9	13.0	13.9

Emissions are predicted to remain well below the nominated EPA criteria and are therefore unlikely to lead to any adverse air quality impacts.

6.5.5.5 Crystalline Silica

Dust from quarrying activities such as crushing may contain silica. An assessment of potential impacts was completed as part of the AQIA. The potential impacts have been informed by ambient monitoring carried out at the quarry and from the model predictions presented in the AQIA.

The assessment assumed that the maximum annual average respirable crystalline silica concentration at the quarry would be 4.2 µg/m^3, should quarry operations persist for 11 ½ hours each day, every day of the year (refer to **Table 6.37**). This assumption will overstate the annual average concentration since the quarry does not, and is not proposed to, operate every day of the year. Table 6.38 shows that the estimated maximum annual average respirable crystalline silica concentration at the site boundary is 2 µg/m^3, a result which is below the 3 µg/m^3 criterion noted by the Victorian EPA. Concentrations further from the site boundary, including at sensitive receptors, will be lower than 2 µg/m^3.

Table 6.37 Estimated Annual Average Crystalline Silica Concentration at the Quarry Boundary

Substance	Criterion	Measured Result (14 June 2019)	Estimated annual average at site boundary (Corrected for the Revised Project)
Respirable crystalline silica	3 µg/m^3	4.2 µg/m^3	2.0 µg/m^3

In addition, respirable crystalline silica is a subset of $PM_{2.5}$; therefore, its concentrations will be lower than the $PM_{2.5}$ concentrations. As discussed in **Section 6.5.5.1**, the predicted annual average $PM_{2.5}$ concentrations due to the Revised Project will be less than 3 µg/m^3 at all private sensitive receptors.

Considering the above monitoring and modelling outcomes, the AQIA concludes that the Revised Project is not expected to cause adverse air quality impacts with respect to crystalline silica.

6.5.5.6 Construction Phase Emissions

Air quality impacts during construction would largely result from dust generated during earthworks and other engineering activities associated with the quarry construction works. Dust emissions from construction works have the potential to cause nuisance impacts if not properly managed.

Material handling quantities in the construction phase are currently not known but are anticipated to be much lower than the material handling quantities in the operations phase. Consequently, the air quality impacts during construction will be lower than during operations. However, as for the operations phase, it is important that exposed areas be stabilised as quickly as possible and that appropriate dust suppression methods be used to keep dust impacts to a minimum.

Dust management will require the use of water carts, the defining of trafficked areas, the imposition of site vehicle speed limits and constraints on work under extreme unfavourable weather conditions, such as dry wind conditions. Monitoring would also continue to be carried out during the construction phase to assess compliance with EPA criteria.

6.5.5.7 Assessment Results Summary

The key outcomes of the AQIA indicate:

- Very little change in contribution from the Revised Project is expected beyond the Project Area boundary, for all particulate matter classifications (PM_{10}, $PM_{2.5}$, TSP and dust deposition), with no exceedances of the EPA criteria at any of the sensitive receiver locations.
- Emissions from blasting and associated fume are not expected to result in any adverse air quality impacts, based on model predictions which show compliance with EPA criteria.
- Emissions from truck diesel exhausts travelling on public roads are not expected to result in any adverse air quality impacts based on modelling which showed that maximum near roadside concentrations would not exceed EPA criteria.
- Monitoring and modelling suggest that the Revised Project is not expected to cause adverse air quality impacts with respect to crystalline silica.

Based on the results of the revised AQIA, with the implementation of the proposed management measures nominated in **Section 6.5.6**, it is concluded that the Revised Project would not cause adverse air quality impacts on surrounding receivers or the local air shed.

6.5.6 Air Quality Management and Monitoring

Daracon is committed to effectively managing the air quality impacts associated with the Revised Project and will implement a range of dust management measures for the key dust generating activities.

The key measures that will be implemented and that have been incorporated into the modelling of the dust impacts of the Revised Project include:

- all trucks travelling between the pits and ROM stockpiles, or between stockpiles and crushers, would be restricted to clearly marked haul routes
- a water truck would be operated to reduce dust lift-off from internal roads and stockpile areas
- all vehicles travelling on internal unsealed roads are limited to a speed appropriate for the conditions and safety, i.e. 20 km/hr

- the location and scale of activities which generate dust emissions would be modified and limited during periods of dry and windy weather
- mobile crushing would cease to be undertaken within the pit areas. Water sprays would be applied at transfer points on mobile crushing undertaken within the processing area
- the following components of the fixed plant will have cladding applied (as outlined in **Section 6.4.6**):
    - screen two and three
    - tertiary crusher and hopper
    - primary screen and secondary crusher building
    - primary crusher
    - surge bin
- water sprays would continue to be used at key transfer points within the processing plant
- water would be applied to stockpiles and hardstand surfaces to prevent dust lift-off
- establishment of a new bitumen sealed quarry access road up to the wheel wash
- all trucks leaving the quarry will make use of the wheel wash facility to limit dust tracking onto the public road network
- trucks entering and leaving the quarry that are carrying loads will be covered at all times, except during loading and unloading.

Daracon will continue to implement the air quality monitoring program consisting of five dust deposition gauges, one high volume air sampler and one meteorological station. Daracon will continue to publish the air quality monitoring data on its website.

6.6 Greenhouse Gas and Energy

A detailed Greenhouse Gas and Energy Assessment (GHGEA) has been completed for the Revised Project by Umwelt. This assessment has been undertaken in accordance with the SEARs, issued on 4 August 2016 and includes:

- estimating direct and indirect (Scopes 1, 2 and 3) greenhouse gas (GHG) emissions associated with the Revised Project
- estimating energy use directly associated with the Revised Project
- qualitatively assessing how the Revised Project's GHG emissions may impact the environment
- estimating the impact of the Revised Project's emissions on State, national and international GHG emission targets/policies
- assessing reasonable and feasible measures to minimise the GHG emissions of the Revised Project and ensure energy use efficiency.

A summary of the key findings of the GHGEA is provided in this section and the full report is provided in **Appendix F**.

6.6.1 Methodology

The GHGEA has considered the energy usage and GHG emission impacts associated with each phase of the Revised Project, namely construction and operations. It also evaluated potential GHG emission mitigation and energy efficiency measures for the Revised Project's operational activities.

The GHGEA was prepared with regard to the National Greenhouse Accounts (NGA) Factors (2018) (DoE 2018) and incorporates the principles of The Greenhouse Gas Protocol 2004. The Greenhouse Gas Protocol (the Protocol) provides an internationally accepted approach to greenhouse gas accounting. The Protocol provides guidance on setting reporting boundaries, defining emission sources and dealing with issues such as data quality and materiality.

Three 'Scopes' of emissions (Scope 1, Scope 2 and Scope 3) are defined for GHG accounting and reporting purposes. These scopes are outlined below:

- **Scope 1 emissions** are direct emissions which occur from sources owned or controlled by the reporting entity, over which they have a high level of control (such as fuel use)
- **Scope 2 emissions** are those generated from purchased electricity consumed by the reporting entity, which can be easily measured and can be influenced through energy efficiency measures. Scope 2 emissions physically occur at the facility where electricity is generated, that is, the power station
- **Scope 3 emissions** are indirect emissions that are a consequence of the activities of the reporting entity, but occur at sources owned or controlled by another reporting entity (e.g. outsourced services, emissions from use of products).

Scope 1 and 2 emissions were calculated based on the methodologies and emission factors contained in the National Greenhouse Accounts (NGA) Factors 2019 (DoEE 2019).

Scope 3 emissions associated with product transport were calculated based on fuel efficiency factors contained in the National Greenhouse Gas Inventory: Analysis of Recent Trends and Greenhouse Gas Indicators (AGO 2007). Other Scope 3 emissions were calculated using methodologies and emission factors contained in the NGA Factors 2019 (DoEE 2019).

The GHGEA boundary was developed to include all significant Scope 1, 2 and 3 emissions. **Figure 6.15** demonstrates how the assessment boundary interacts with the potential emission sources under Daracon's operational control and other emission sources associated with the Revised Project.

Further detail on the assessment methodology can be found in **Appendix F**.

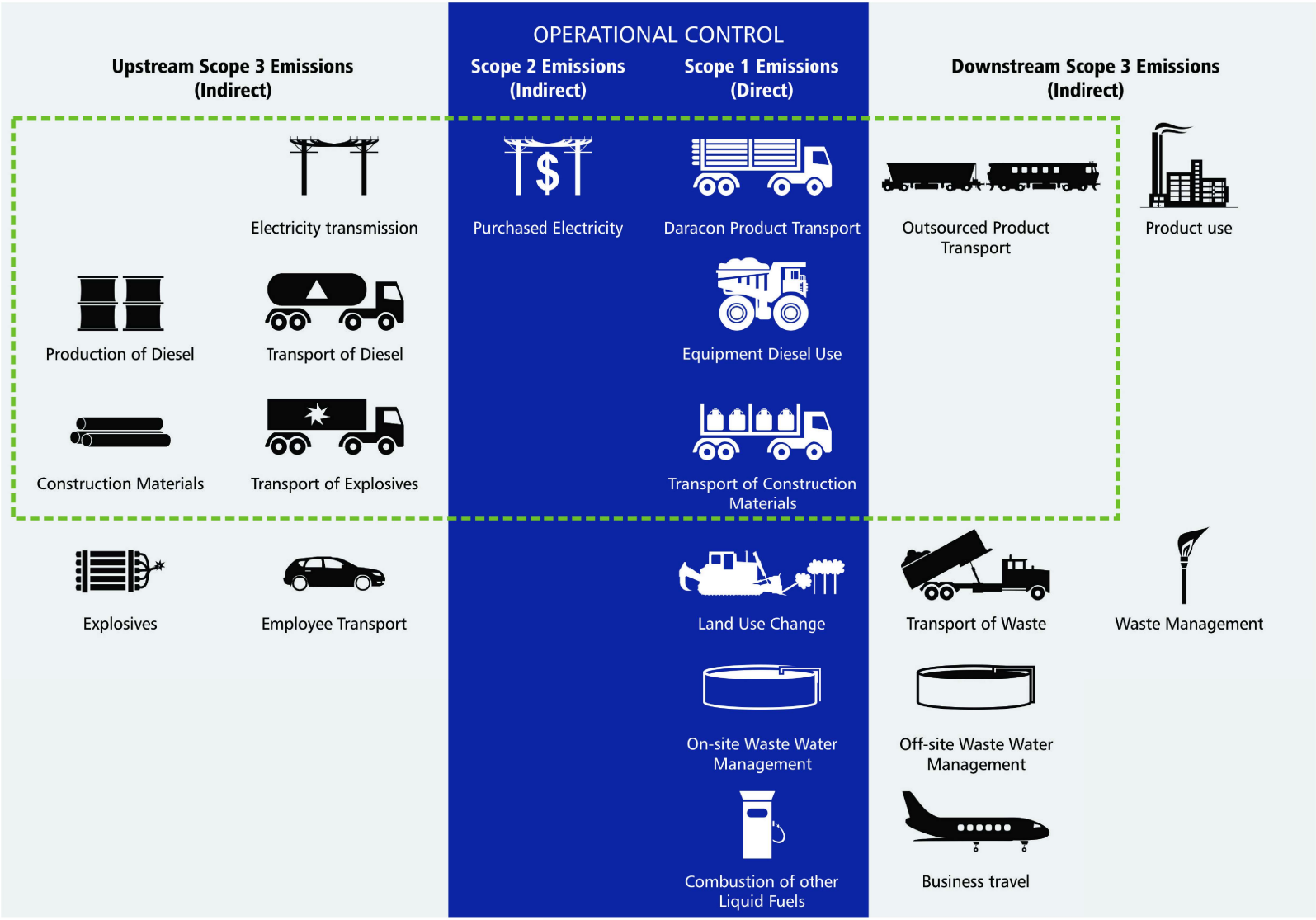


FIGURE 6.15

Greenhouse Gas Assessment Boundary

6.6.2 Impact Assessment Results

This section assesses the GHG emissions associated with the construction and operational phases of the Revised Project.

Construction activities considered in this assessment include:

- a new access road from Dungog Road
- a heavy vehicle bridge over the North Coast rail line
- upgrading the intersection of Dungog Road and Gresford Road
- upgrading the intersection of King Street and Duke Street in the village of Paterson
- extending the rail spur to facilitate longer trains.

For the operational phase, this section further considers the annual emissions of the Revised Project at its estimated average production rate of 906,000 tpa, and the total emissions of the Revised Project over its proposed 25-year project life.

Energy Use

The Revised Project's energy requirements will primarily be met through diesel and electricity consumption, and will include:

- construction activities to require approximately 3,600 Gigajoules (GJ) of energy from diesel
- the operational phase to require approximately 77,200 GJ per annum when operating at its maximum approved limit, with approximately 1,929,000 GJ of energy from diesel and grid electricity over a 25-year project life.

Greenhouse Gas Emissions

The estimated construction and operational stage emissions for the Revised Project are shown in detail in **Appendix F**.

These predicted emissions include:

- approximately 5,000 t CO2-e of Scope 1 emissions per annum, at its maximum approval limit, with in the order of 122,000 t CO2-e of Scope 1 emissions over the 25 years, primarily from operating on-site equipment and transporting products
- approximately 1,800 t CO2-e of Scope 2 emissions per annum, at its maximum approval limit, and a total of about 45,000 t CO2-e of Scope 2 emissions over the 25 years, from consuming electricity
- approximately 7,000 t CO2-e of Scope 3 emissions per annum, at its maximum approval limit, resulting in about 170,000 t CO_2-e Scope 3 emissions over 25 years. The majority of Scope 3 emissions are associated with transporting products to consumers.

In summary, the Revised Project is predicted to generate or be associated with the GHG emissions provided in **Table 6.38** during the operational life of the Revised Project.

Table 6.38 Greenhouse Gas Emissions Over the Life of the Revised Project

GHG Emissions	tCO_2-e	% of total emissions
Scope 1	122,000	36%
Scope 2	45,000	13%
Scope 3	170,000	51%
TOTAL	**336,000**	**100%**

On an annual basis, the Revised Project could generate up to approximately 5,000 t CO2-e Scope 1 emissions per annum. The Revised Project's annual emissions are well below National Greenhouse Gas and Energy Act 2007 (NGHGE Act) reporting thresholds (25,000 t CO2-e pa) and Safeguard Mechanism thresholds (100,000 t CO2-e pa). The Scope 1 emission intensity of the Revised Project is similar to other hard rock quarries approved for operation in NSW.

Over the life of the quarry, the Revised Project can also be associated with 45,000 t CO2-e and 170,000 t CO2-e of Scope 2 and 3 emissions respectively. The Revised Project does not generate a large demand for electricity, and the majority of Scope 3 emissions are associated with product transport. Approximately 78% of total Scope 1 and 3 emissions are associated with product transport.

6.6.3 Impact Assessment Summary

The GHG emissions generated by the Revised Project have the potential to impact the physical environment and the emission reduction objectives of State, national and international governing bodies. The following assessment makes the distinction between environmental impacts and impacts on policy objectives.

6.6.3.1 Impact on the Environment

The Revised Project's GHG emissions will be highly mobile and generated up and down the supply chain. The accumulation of GHG in 'carbon sinks' is the primary impact of the Revised Project's GHG emissions. Anthropogenic GHG emissions accumulate in three major carbon sinks – the ocean (30%), terrestrial plants (30%) and the atmosphere (40%) (BOM and CSIRO 2014).

The accumulation of GHG in the atmosphere is an important driver of global warming, sea level rise and climate change (IPCC 2013). Sea level rise and climate change may have many ramifications for the natural and built environment. The accumulation of GHG in the ocean is also an important driver of ocean acidification (IPCC 2013).

The Revised Project's direct emissions (Scope 1) are forecast to be approximately 5,000 t CO2-e per annum.

To put the Revised Project's emissions into perspective, if Paris Agreement signatories achieve their Intended Nationally Determined Contributions (INDCs), global GHG emissions are forecast to reach 53,000,000,000 t CO2-e per annum by 2025 (UNEP 2016). During operation, the Revised Project may contribute approximately 0.0000094 % to global emissions per annum (based on its projected Scope 1 emissions). The relative environmental impact of the Revised Project is likely to be relative to its proportion of global GHG emissions.

The Scope 2 and 3 emissions associated with the Revised Project should not be compared against global emissions, as global emissions only represent Scope 1 emissions (i.e. the sum of all individual emission sources).

6.6.3.2 Impact on Climate Change

The Intergovernmental Panel on Climate Change (IPCC) defines climate change as a change in the state of the climate that can be identified by changes in the mean and/or variability of its properties, and persists for an extended period, typically decades or longer (IPCC 2007). Climate change is caused by changes in the energy balance of the climate system. The energy balance of the climate system is driven by atmospheric concentrations of GHG and aerosols, land cover and solar radiation (IPCC 2007).

Climate change models forecast many different climate change impacts, which are influenced by future emission scenarios. Climate change forecasts also vary significantly from region to region. A qualitative assessment of climate change requires a regional reference and future emission trajectory assumptions.

CSIRO has modelled Australian climate change projections for 2030 and 2090, using IPCC scenarios RCP2.6, RCP4.5 and RCP8. The Representative Concentration Pathway (RCP) scenarios represent a range of future emission pathways, which include a relatively low emissions future (RCP2.6) though to a relatively high emissions future (RCP8). Further discussion on these scenarios is provided in **Appendix F**.

The Revised Project, in isolation, is unlikely to influence global emission pathways. Future emission pathways will largely be influenced by global scale issues such as; technology, population growth and greenhouse gas mitigation policy.

The extent to which global emissions and atmospheric concentrations of GHG have a demonstrable impact on climate change will be largely driven by the global response to reducing total global emissions that includes all major emission sources and sinks.

6.6.3.3 Impact on Policy Objectives

Australian Targets

Under the Paris Agreement, the Australian Government has committed to reducing GHG emissions by 26 to 28 %, on 2005 levels, by 2030 (Commonwealth of Australia, 2015). To meet the requirements of the Paris Agreement, Australia will also have to develop interim targets for 2020 and 2025. Australia's Nationally Determined Contribution (NDC) is summarised in Table 4.1 of the GHGEA (**Appendix F**).

If Australia achieves its 28 % mitigation commitment under the Paris Agreement, the DAWE (previously DoEE) estimates that the Australian economy must set a mitigation trajectory which will save approximately 762,000,000 t CO2-e between 2021 and 2030 (DoEE 2018).

In the context of a SSD, the Revised Project is not expected to be a significant source of GHG emissions.

Australia's current national greenhouse gas mitigation policy framework caps facility level emissions via the Safeguard Mechanism, and funds mitigation projects through the Emissions Reduction Fund. The Revised Project is not large enough to be regulated by the Safeguard Mechanism.

NSW Policy

The NSW Government has developed its NSW Climate Change Policy Framework, which aims to deliver net-zero emissions by 2050, and a State that is more resilient and responsive to climate change (OEH 2016).

Under the NSW Climate Change Policy Framework, NSW has committed to both follow the Paris Agreement and to work to complement national action. The key policy directions under the NSW Climate Change Policy Framework are summarised in Table 4.3 of the GHGEA (**Appendix F**).

The Revised Project is unlikely to affect the objectives of the NSW Climate Change Policy Framework.

6.6.4 Greenhouse Gas and Energy Management and Mitigation

Daracon have incorporated a range of GHG mitigation measures available for a quarry operation into the Revised Project design that will minimise potential Scope 1 and Scope 2 GHG emissions and improve energy efficiency. The energy efficiency of quarry operations is driven by energy use and productivity. Energy efficiency is maximised when equipment is operated at optimal capacity. Daracon's quarry planning process optimises operational productivity through scheduling, haul road design and equipment selection.

The GHGEA evaluated the Revised Project's planned GHG mitigation measures against what may be considered best practice GHG management. The evaluation considered a range of potential management measures targeting the key contributors to Scope 1 and Scope 2 emissions, including management of onsite diesel use efficiency and electricity use efficiency. A summary of the measures found by Daracon to be both technically feasible and financially reasonable for the Revised Project, and which are therefore proposed to be implemented, is provided in **Table 6.39**. The detailed evaluation of all measures is provided in **Appendix F**.

Table 6.39 Proposed Scope 1 and Scope 2 Greenhouse Gas Mitigation Measures

Proposed Mitigation Measure	Application to the Revised Project
On-site diesel use	
Fuel efficient equipment	New equipment purchased will be assessed for fuel use efficiency. Hybrid or other technology will be considered as technology evolves.
Alternative fuels such as Biodiesel, CNG or Hydrogen	Daracon may investigate utilising alternate fuels where practicable.
Blasting strategies to improve extraction efficiency	Blast design will be focused around fragmentation efficiency and continuously updated from results of previous blasts.
Haul trucks	
Limiting the length of material haulage routes	Quarry development plan is designed to minimise the length of haul roads.
Optimizing ramp gradients	Ramp gradients will be optimised within the quarry footprint for fuel use efficiency.
Fuel efficient haul trucks	New equipment purchased will be assessed for fuel use efficiency. Hybrid and other technology will be considered as technology evolves.
Increasing haul truck payload	Payloads will be maximised under the conditions imposed by OEM safety guidelines.
Improving rolling resistance of haul roads	Roads to be maintained to Daracon policy and consistently maintained.
Reducing idling times	The number of haul trucks on site will be optimised to eliminate queuing and minimise idle time. Loaders are selected to load in the most efficient time.
Alternative fuels such as Biodiesel, CNG or Hydrogen	Daracon may investigate utilising alternate fuels where practicable.
Electricity use	
Upgrade processing equipment to reduce electricity consumption	Energy efficiency will be an important selection criterion when purchasing new equipment. Daracon is committed to replacement of the existing tertiary crusher with new plant which is more efficient.
High efficiency motors	Daracon is committed to implementing all economically reasonable energy efficiency opportunities.

Proposed Mitigation Measure	Application to the Revised Project
Variable Speed Drives	Daracon is committed to implementing all economically reasonable energy efficiency opportunities.
Optimising motor size to load	Daracon is committed to implementing all economically reasonable energy efficiency opportunities.
On-site renewable energy (solar)	Daracon is committed to implementing all economically reasonable energy efficiency opportunities.

6.7 Blasting and Vibration

A comprehensive assessment of potential blasting and vibration impacts of the Revised Project has been undertaken by Peter Bellairs Consulting Pty Ltd (Peter Bellairs, 2021). This assessment has been prepared in accordance with the SEARs for the Original Project, which require an assessment of the likely blasting impacts of the development on people, buildings, animals, infrastructure and significant natural features having regard to the relevant ANZECC guidelines.

As outlined in **Section 5.4**, during the recent stakeholder engagement blasting impacts were identified by the community as an issue of concern, particularly in relation to the potential for damage to private property. This is consistent with the community feedback that was received during the exhibition of the EIS in 2016. As described in this section, Daracon has continued to take this feedback on board and sought to address it through project design changes such as reducing the blasting window, and operational changes by committing to independent blast monitoring (**Section 6.7.4**).

Daracon has a demonstrated track record of managing blasting impacts from its quarrying operations with no exceedances of the relevant ground vibration criteria at the private residences, and one blast induced air overpressure result above 115 dBL (but less than 120 dBL) at the Gully Monitor (located at 336 Dungog Road) over a 6.5 year period, extending from 1 March 2013 to 19 August 2019 (consisting of 158 blasts). In addition, the EPA undertook an independent monitoring audit involving 13 separate blasts from the quarry during 29 March 2018 to 27 August 2018 at a location in View Street, Vacy. Based on the data collected during the audit, the EPA considered that Daracon's vibration and overpressure monitoring undertaken was appropriate for complying with the conditions of the EPL with no breaches of the EPL limits or conditions.

Additionally, in response to community concerns in relation to property damage resulting from blasting activities, Daracon commissioned an independent inspection, monitoring and reporting relating to blast vibrations from the quarry at a residence in Vacy during 2019. The peak particle velocity of the measured blast was measured at a magnitude of 10 to 20 times lower than the levels likely to cause damage to residential properties. The assessment indicated that the residence had not been damaged due to blasting operations at the quarry.

A summary of the key findings of the Blasting Impact Assessment (BIA) is provided in this section and the full report is provided in **Appendix G**.

6.7.1 Methodology

Ground vibration and blast overpressure predictive models were developed to assess the potential blasting impacts of the Revised Project. The models were developed based on a review of vibration and blast overpressure monitoring data collected from recent quarrying operations over a 6.5 year period, extending from 1 March 2013 to 19 August 2019 (involving 158 blasts).

Modelling was undertaken for representative quarry years and considered 6 different blast designs, including the closest privately-owned residences to assess the potential air overpressure and vibration generation from blasting. The blast designs included both decked blast designs and standard designs, as further detailed in the BIA (**Appendix G**).

As with recent operations, each blast is designed for the specific geological conditions associated with that blast and site laws applicable to the blasts are considered in the design to ensure that relevant criteria will be met at each of the nearest sensitive receptor locations. The controls implemented include the current blast management measures identified in the BIA (**Appendix G**).

6.7.1.1 Blast Sensitive Locations

A number of blast sensitive locations surrounding the Project Area were identified for consideration in the BIA. These are shown on **Figure 6.16** and include:

- private residences
- public infrastructure including public roadways
- State emergency services facilities
- Martins Creek village amenities
- Telecommunication infrastructure
- identified historic heritage items from the historic heritage assessment (refer to **Section 6.11**).

As shown on **Figure 1.5**, the majority of land surrounding the Project Area is rural residential with the closest private residence (R1) located approximately 22 m to the south of the East Pit processing area.

6.7.1.2 Blast Assessment Criteria

The blast assessment criteria relevant to the Revised Project based on the identified blast sensitive locations identified in **Section 6.7.1.1** are outlined below.

Criteria for Human Comfort

The relevant blast assessment criteria associated the with human comfort level is ANZECC, 2019 (refer to **Table 6.40**), the ANZECC air overpressure and vibration criteria is aimed at human discomfort which is significantly lower than those that generate the onset of damage to buildings, therefore, adherence to these minimise the possibility of building damage caused by blasting.

Table 6.40 Residential Blast Impact Criteria for Human Comfort

Receiver	Peak Particle Velocity (mm/s)	Allowable Exceedance	Overpressure (dBL)	Allowable Exceedance
Residence on privately owned land	5	5% of the total number of blasts over a 12-month period	115	5% of the total number of blasts over a 12-month period
	10	0%	120	0%

Ground Vibration Criteria

The blasting criteria for vibration at the quarry currently prescribed by the EPL issued for the site (EPL 1378) are:

- 95% of the blasts in each annual reporting period must be less than or equal to 5mm/s PPV
- 5% of the blasts in any annual reporting period can be greater than 5mm/s but less than or equal to 10mm/s
- Under no circumstances shall any blast be greater than 10mm/s PPV.

Air Overpressure Criteria

The current criteria under EPL 1378 for blast induced air overpressure for the quarry are:

- 95% of the blasts in each annual reporting period must have air overpressures of less than or equal to 115 dBL
- 5% of the blasts allowed to be greater than 115 dBL but less than or equal to 120 dBL
- No blasts shall exceed 120 dBL.

Criteria for Infrastructure, Buildings and Historical Sites

The EPL does not adopt any specific criteria for blast related impacts on structures.

The ANZEC air overpressure and vibration criteria, aimed at human discomfort, is significantly lower than those that generate the onset of damage to residences and thus adherence to these minimise the possibility of residence damage caused by blasting.

Guidelines regarding vibration limits for quarry owned infrastructure are provided in AS 2187.2-2006 "Explosives - Storage and Use - Part 2: Use of Explosives". These limits are used as the assessment criteria for the Revised Project. The relevant vibration limits include:

- 25 mm/s for occupied non-sensitive sites, such as factories and commercial premises
- 100 mm/s for unoccupied structures of reinforced concrete or steel construction
- 133 dBL - recommended airblast overpressure limit for damage control; this limit is recommended as a safe level that will prevent structural/architectural damage from blasting.

The same limit for public roads and concrete bridges was presented in ACARP Report No. C14057. The recommendations in regard to vibration exposures for concrete bridges are also provided in AS 2187.2-2006 (i.e. for unoccupied structures of reinforced concrete or steel construction).

- Vibration levels for roadways/concrete bridges are specified as follows:
- Public roads – 100 mm/s PPV
- Concrete bridges – 100 mm/s PPV

The vibration limits for railway lines have been known to vary from 50mm/s to 200mm/s PPV. This report uses 100mm/s PPV from AS2187.2-2006- Storage and Use – Use of Explosives for concrete and steel structures. These vibration limits are used as the assessment criteria for the Revised Project.

The full methodology of the BIA can be found in **Appendix G**.

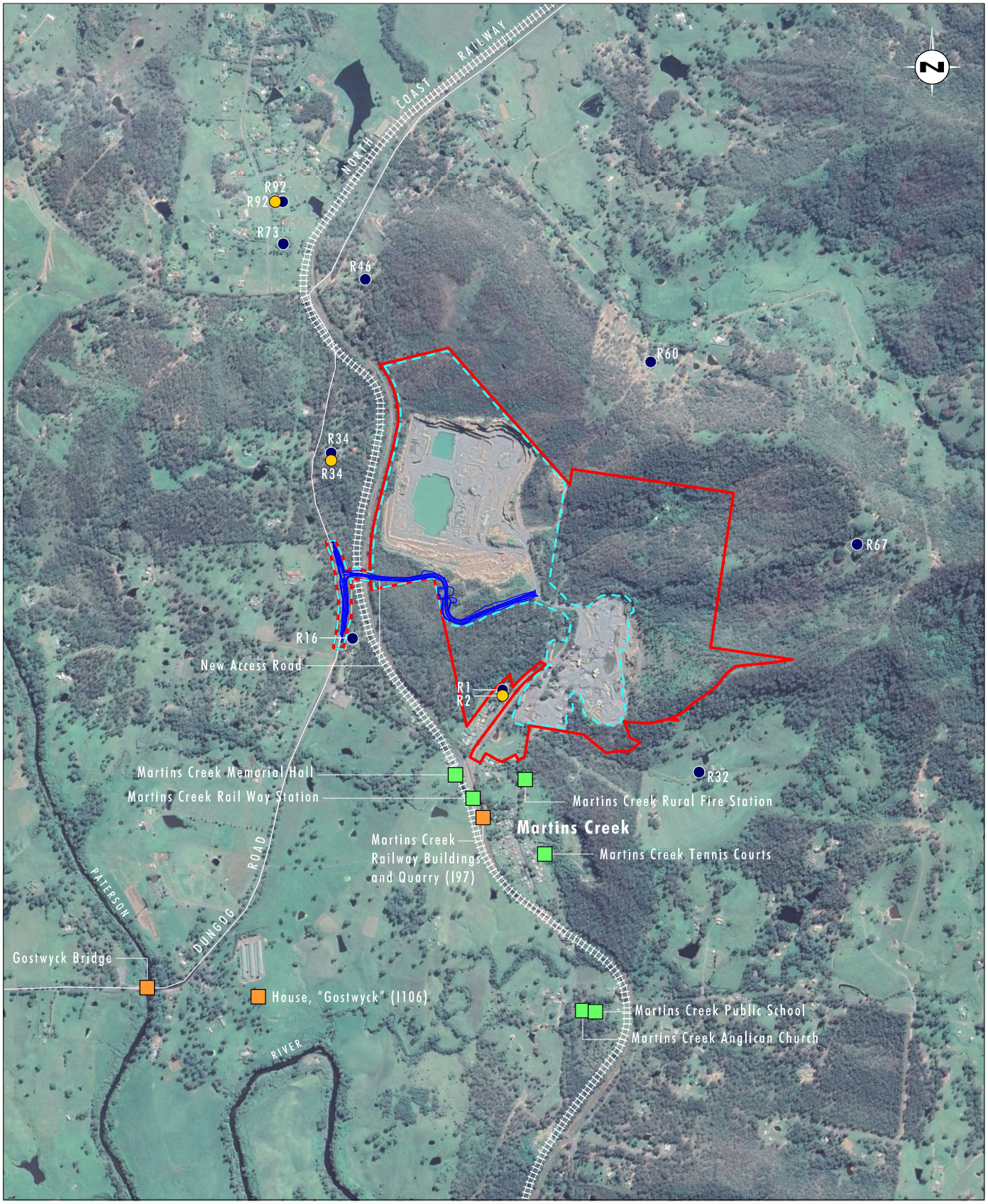


Image Source: Google Earth (2020)
Data Source: Peter Bellairs Consulting (2021)

0 0.25 0.5 1.0km
1:20 000

Legend

- Project Area
- Proposed Disturbance Area
- Residence Location
- Blast Monitoring Location
- Historic Heritage Sites
- Infrastructure/Building/Facility
- New Access Road
- Road
- Railway

FIGURE 6.16

Blast Sensitive Locations

6.7.2 Existing Monitoring Regime

The quarry has three existing blast monitors associated with the quarry and its EPL and are outlined in **Table 6.41** and refer to **Appendix G**

Table 6.41 Location of Existing Blast Monitors

Blast Monitor Identification Number	Location
Blast monitor 1	336 Dungog Road
Blast monitor 2	Quarry back gate
Blast monitor 3	Corner Wakaya Close and View Street Vacy

In response to community concern and to inform the assessment process, three additional temporary blast monitors were established at the following locations:

- 19 View Street, Vacy
- Merchants Road, Martins Creek
- 9 Horns Crossing Road, Vacy.

The temporary blast monitor at 19 View Street was established in December 2018 in consultation with the EPA, to monitor six blasts from the quarry, and correlate the results with those from Blast Monitor 3 (currently situated at the corner of Wakaya Close and View Street, Vacy). Based on the results, the EPA will determine the most appropriate and representative location for Blast Monitor 3 to monitor impacts to the north/north west of the quarry. Blast Monitor 3 will be re-located based on the outcomes of EPA review.

The temporary blast monitor at Merchants Road, Martins Creek was established in March 2017 following the receipt of blast complaints within the area. The temporary blast monitor at 9 Horns Crossing Road, Vacy was established in December 2018, following a meeting with the resident. Since December 2018, there have been 5 blasts monitored at the temporary blasting locations (21 December 2018, 17 January 2019, 5 February 2019, 21 February 2019 and 27 March 2019). On each occasion, the blasts did not exceed the lower limits of the residential blast impact criteria for human comfort (ANZEC 1990) refer to **Table 6.41**.

6.7.2.1 Independent Blast Monitoring

Independent monitoring of blast induced vibration and air overpressure has also been undertaken on two separate occasions without the knowledge of Daracon about the time of the monitoring, and involved:

- Daracon commissioned a specialist blast monitoring company to undertake an independent blast monitoring audit. The results confirmed the quarry blast monitoring data for the blast monitored.
- The second and far more extensive monitoring audit was conducted by the EPA, which included monitoring of 13 separate blasts from the quarry during 29 March 2018 to 27 August 2018 at a location in View Street, Vacy. The EPA found that the vibration and overpressure monitoring undertaken during the EPA's review period was appropriate for complying with the conditions of the EPL, with no breaches of the EPL limits or conditions.

In addition, Lindsay Dynan Consulting Engineers were engaged to undertake inspections, monitoring and reporting relating to blast vibrations from the quarry. A representative structure (residential dwelling) was selected for the blast monitoring assessment, being 24 View Street, Vacy due to its proximity to the quarry and for its typical residential construction style. The assessment indicated that the peak particle velocity of the measured blast was of a magnitude 10 to 20 times lower than the levels likely to cause damage to residential properties. The assessment found that the dwelling at 24 View Street, Vacy has not been

damaged by the blasting operations at the quarry. Similarly, due to the representative selection of the property, and its proximity to the quarry, it is considered unlikely that any other residential buildings, located in View Street, Vacy, have been damaged due to the blasting operations at the quarry (Lindsay Dynan, 2019).

6.7.3 Assessment

The results of the BIA indicate that ground vibration and blast overpressure levels can be managed to meet relevant blast emission criteria at all sensitive receiver locations through appropriate blast design and the implementation of appropriate control measures. Daracon has a demonstrated track record of managing blasting impacts as discussed in **Section 6.7** and each blast will be designed to comply with the relevant criteria and the design practice at Daracon incorporates a factor of safety to provide for unexpected conditions (that is, blasts are designed to result in impacts below the limit, not on the limit).

6.7.3.1 Private Residences

The blast assessment found that potential impacts associated with blasting activities can be managed so that relevant blast criteria are met at all private residences, by undertaking blasting in accordance with a detailed design process that considers operational, geological and environmental constraints for each blast.

Consistent with previous practices at the quarry, a detailed blast design process will be undertaken for each blast in order to establish the charge masses required to meet the relevant blast emission criteria at all private residences.

With the continued implementation of the blast management measures, the Revised Project is not anticipated to pose a risk in terms of fly rock associated with blasting. All blasts will continue to be recorded by video. Should any unexpected instances of flyrock occur, the cause of the event will be investigated to inform any necessary changes to blast design and controls.

6.7.3.2 Infrastructure

The BIA included an assessment of vibration exposures and blast overpressure from the Revised Project on adjacent infrastructure and buildings, including:

- Public infrastructure, including public roadways: Dungog Road, Gresford Road, Gostwyck Bridge, the North Coast Railway and Martins Creek Railway Station
- Emergency services: Martins Creek Rural Fire Station
- Martins Creek amenities: public parks, Martins Creek Anglican Church, Martins Creek Public School, ten-nis courts and memorial hall
- Telecommunications Infrastructure
- Quarry owned infrastructure (offices, workshop, processing plant) and proposed new main access road and bridge over the railway line.

Predictions of ground vibration and blast overpressure for the above listed infrastructure and buildings were found to be below the applicable criteria limit for all modelled charge masses and can be managed effectively to a level below the applicable vibration limit criteria.

6.7.3.3 Heritage Items

The following identified historic heritage items were assessed for potential vibration exposures and blast overpressure from the Revised Project:

- Martins Creek railway buildings and quarry (I97)
- House, “Gostwyck” (I106)
- The Gostwyck bridge (I107)
- Corner’s flour mill (I110)
- House, “Hayward” (I105).

Predictions of ground vibration and blast overpressure for the identified historic heritage items were found to be well below the applicable criteria for all modelled charge masses.

6.7.3.4 Livestock

In the absence of allowable blasting criteria for livestock, even if on a conservative basis, the same criteria as the comfort level of humans are applied, no concerns for the wellbeing of livestock are identified for the Revised Project.

6.7.3.5 Cumulative Impacts

There are a number of operating quarries in the Hunter Valley. The closest quarry to the Revised Project is the Brandy Hill Quarry which is located approximately 20 km to the south east. Due to the significant distance from other quarrying operations, cumulative impacts associated with blasting are not considered likely.

6.7.3.6 Conclusion

Blasting activities at the quarry have demonstrated compliance, with the implementation of existing blast management protocols and risk mitigation measures, with the ANZECC 1990 guidelines and licence criteria.

The three current licenced monitor locations have been assessed as appropriate as they are representative of the vast majority of residences, including those closest to the quarry.

The use of the existing blasting measures and the ability to manage blast induced vibration and air overpressure will enable the Revised Project to meet the guidelines and relevant licence criteria.

6.7.4 Blasting Mitigation and Management Measures

Daracon will implement the appropriate blast management controls necessary to meet the relevant criteria for private residential receivers, heritage items and infrastructure. Daracon have committed to the following blast mitigation and management measures:

- Daracon will continue to manage blasting practices for the Revised Project within a reduced blasting window. That is, between the hours of 11.00 am - 3.00 pm Monday to Friday, with no blasts being fired on weekends or public holidays.
- Daracon will continue to undertake blasting for the Revised Project in accordance with a detailed blast design process that considers operational, geological and environmental constraints, with the design and size of each blast determined to meet these constraints and meet blasting criteria. The detailed blast design process will seek to maximise blast efficiency, and minimise potential vibration, overpressure, dust and fume impacts. Blasts will be designed to achieve compliance with the site-specific blast conditions.

- Daracon commit to independent blast monitoring to be undertaken for three blasts within the first year of the Revised Project by an independent qualified person, and in consultation with the EPA. Daracon will consult with the Martins Creek CCC and/or representative of DSC in relation the monitoring times and locations. Independent monitoring would be conducted 3 times per year, every 5 years thereafter.

- Daracon will continue to implement the existing blast monitoring regime at three locations, as established under EPL 1378, and will review and update the blast monitoring as required to cover the sensitive receivers located in the vicinity of the Project Area.

- Daracon will continue to consult with residents via letter box drops to inform them of the blast time the following day as well as an SMS or email on the day of the blast notifying neighbours of the time of day the blast is to occur.

Daracon will develop a Blast Management Plan in consultation with the EPA, should the Revised Project be approved. The Blast Management Plan will:

- describe the measure that will be implemented to:
    - ensure compliance with the blasting criteria and operating conditions
    - avoid blasting during unfavourable climatic conditions
- detail the monitoring program for evaluating and reporting on compliance with the relevant conditions
- include a protocol for identifying any blast-related exceedance, incident or non-compliance and for notifying DPIE and relevant stakeholders of these events
- include public notification procedures to enable members of the public, particularly surrounding residents, to get up-to-date information on the proposed blasting schedule
- include a protocol for investigating and responding to blast-related complaints.

6.8 Groundwater

A comprehensive assessment of potential groundwater impacts of the Revised Project has been undertaken by Australasian Groundwater and Environmental Consultants (AGE). The groundwater impact assessment (GIA) has been prepared in accordance with the SEARs (**Appendix A**) and in response to government agency (most notably the EPA) and community submissions during the exhibition period of the EIS (refer to **Part B**, **Section 12.0**).

Further, the GIA has been prepared in accordance with the relevant requirements of the *Water Management Act 2000* (WM Act), rules and requirements of the Water Sharing Plan for the Nambucca Unregulated and Alluvial Water Sources (DPIW, 2016) and relevant NSW water planning policies and guidelines, most notably the NSW Aquifer Interference Policy (AIP) (NOW, 2012).

A summary of the key findings of the GIA, which can be reviewed in full as **Appendix H**, is provided in this section.

6.8.1 Existing Environment

6.8.1.1 Aquifers

The geological setting is identified as a mixed assemblage of Carboniferous aged volcaniclastic and sedimentary sequences (VGT, 2021) with the quarry extracting from the volcaniclastic Martins Creek Ignimbrite Member (latite) of the Isismurra Formation. The blue-grey latite, which dips to the west at around 5° - 8° reflecting the general dip of the existing topography, is underlain by the sedimentary sequences of the Wallaringa Formation, a bedded lithic sandstone and conglomerate. The contact zone between the two formations forms a thin zone of metamorphosed sediments (a meta-sandstone) and is readily distinguished by its red-brown colouration.

Two aquifer systems occur within the local setting of the quarry, and are:

- Within the metamorphosed meta-sandstone associated with the contact between the volcanic and sedimentary rock assemblages (immediately below the quarry).
- Within the alluvium along the Paterson River (approximately 1.2 km to the south west of the quarry).

6.8.1.2 Local Hydrogeological Conditions

Monitoring of groundwater, both standing water levels and water quality, has been undertaken at the quarry since 2016. Four bores were installed in 2016 (MW01, MW02, MW03 and MW04) and a further three installed in 2018 (MW05, MW06 and MW07); refer **Figure 6.17**. Groundwater levels are monitored continuously using down-hole data loggers with results downloaded twice a year. Manual groundwater level dips and groundwater quality sampling is undertaken annually.

The results of monitoring have indicated minimal fluctuation in groundwater levels over the period of monitoring, with fluctuations associated with rainfall or discharge to the extraction area. **Figure 6.17** presenting the interpreted groundwater levels. The groundwater levels are representative of the potentiometric head levels within the meta-sandstone aquifer and are higher than the elevation of the meta-sandstone, indicating that the aquifer is likely semi-contained.

The results of groundwater quality monitoring indicate some variation, with water quality ranging from fresh (849 µS/cm) to brackish (3,702 µS/cm) and pH from 6.93 to 7.36. Due to the relatively short residence time of groundwater within the system, groundwater quality at any given location is likely to be a function of the composition of surficial material that the water was exposed to as well as the geochemistry of the igneous rock at any given location. The randomised nature of ejecta associated with tuffaceous material causes the geochemistry of the latite to be highly variable. This, in combination with the relatively compartmentalised nature of the strata due to the presence of, results in variable groundwater quality at the quarry.

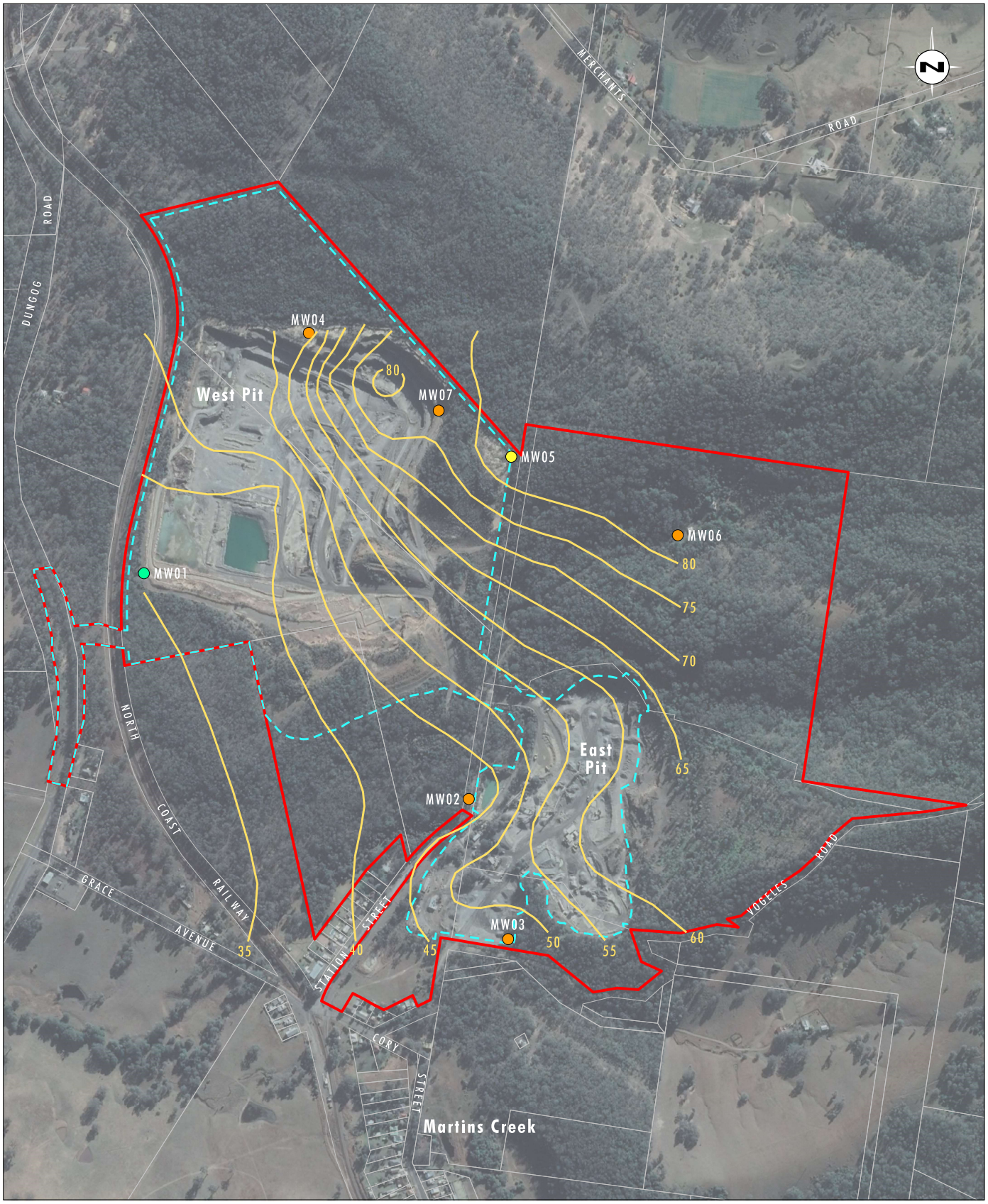


Image Source: Google Earth (2018)
Data Source: Daracon (2020), AGE (2021)

0 100 250 500m
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Legend

- Project Area
- Proposed Disturbance Area
- Groundwater Level Contour (mAHD)
- Ignimbrite Monitoring Bore
- Meta-sandstone Monitoring Bore
- Wallaringa Sst Monitoring Bore

FIGURE 6.17

Hydrogeological Setting

6.8.1.3 Groundwater Users

A search of the NSW Groundwater database identified 6 registered bores within a 5 km radius of the quarry (refer to Figure 6.17), of which only two are active with an authorised purpose of water supply (refer to **Table 6.42**). Both are located outside of the mapped extent of the latite and as such do not source water from the water bearing meta-sandstone aquifer that is present at the quarry beneath the latite. The closest active bore is more than 1 km from the east pit of the quarry and is not directly downgradient of the groundwater around the quarry as it is located to the south.

Table 6.42 Registered Bores within 2 km of Project Area

Station	Easting	Northing	Installation Date	Depth (m)	Purpose
GW032456	370768	6396028	1/03/1969	18.3	Water supply
GW032556	366431	6398528	1/05/1968	36.6	Water supply

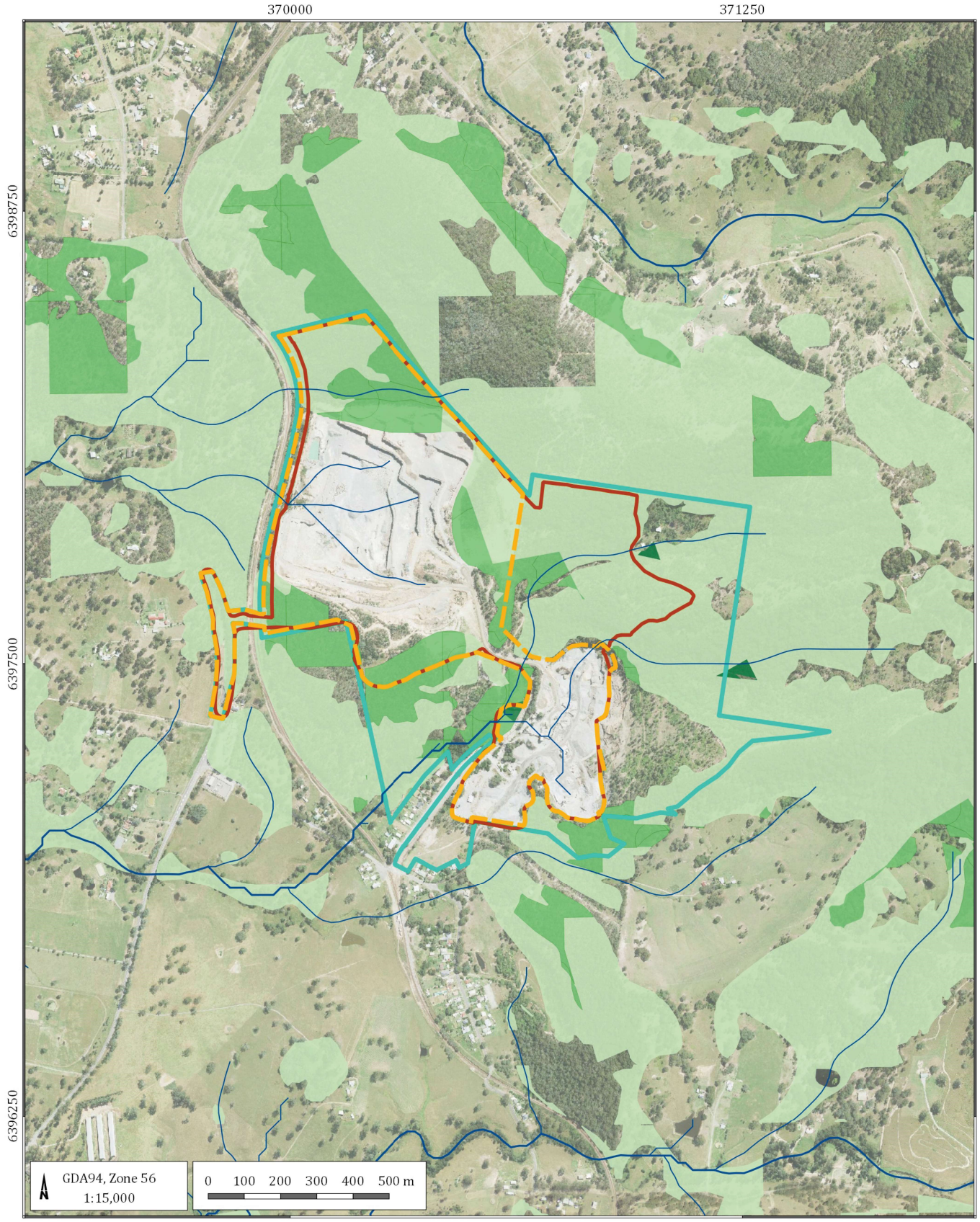
6.8.1.4 Groundwater Dependent Ecosystems

Groundwater Dependent Ecosystems (GDEs) are ecological communities that are dependent, either entirely or in part, on the presence of groundwater for their health or survival. An assessment of BoM's GDE Atlas indicates that there are no aquatic GDEs and several terrestrial GDEs of low, moderate and high potential in the vicinity of the quarry (refer to **Figure 6.18**). The potential terrestrial GDEs in the downgradient areas are all of low or moderate potential (refer to **Figure 6.18**). There can be discrepancies between mapped areas and true on-site ecological characteristics (AGE, 2021).

As outlined in **Appendix H**, there appears to be little to no impact on the vegetation communities located within or immediately surrounding the Project Area associated with the existing quarry operations.

It is not clear if any communities are terrestrial GDEs, as there is no direct evidence regarding tree root access to groundwater at the quarry. All bores except MW02 and MW06 have groundwater levels that are typically deeper than 10 m below surface. While opportunistic groundwater use by vegetation may be occurring in low-lying areas, the presence of these communities in areas where the water table is well over 10m below ground level indicates these communities are not dependent on groundwater.

There are no high priority GDEs as identified in NSW Government water sharing plans in close proximity to the quarry.



Legend

- 1.0000 - 2.0000
- Drainage
- Project Area
- Original Project Disturbance Area
- Revised Project Disturbance Area

Potential terrestrial GDEs

- High potential GDE - from regional studies
- Moderate potential GDE - from regional studies
- Low potential GDE - from regional studies

Image Source: AGE (2021)

FIGURE 6.18

Groundwater Dependent Ecosystems

6.8.1.5 Conceptual Groundwater Model

Based on the data collected through the desktop and field investigations, AGE (2021) has established a conceptual groundwater model for the quarry (refer to **Figure 6.19**), the key features of which are:

- The groundwater resource in the vicinity of the Revised Project is limited due to the low-porosity of the latite. A thin aquifer is present at the base of the latite at the metamorphosed contact with the underlying Wallaringa Sandstone Formation. The contact zone forms a thin zone of alteration which allows water to enter and move between the two formations.
- Rainfall recharge is limited (3 to 5%) and typically occurs by rainfall moving down vertical fractures in the latite. Inflow to the existing quarry area occurs after rainfall events (> 20mm/day), where these fractures are exposed in the current quarry face or near the contact with underlying sandstone and overlying latite where the thin aquifer exists. Seepage typically last for about 10 days or more after rainfall.
- Groundwater flow is a general reflection of topography, occurring to the south and south west towards the alluvium associated with the Paterson River. As such, the quarry pits are currently intermittent "through-flow" features, as they receive seepage from upgradient faces, and then allow infiltration to downgradient areas for transient periods post-rainfall.
- Groundwater flow follows the dipping surface topography and metamorphosed contact zone with some discrete groundwater flow networks within the compartmentalised strata of the latite.
- A hydraulic gradient of between 0.032 to 0.069 (representative the minimum and maximum) to the southwest towards the Paterson River (based on the measured groundwater levels).
- A hydraulic conductivity value of 1.5×10^{-1} m/day (based on the results obtained from falling head tests conducted in the quarry groundwater bores).
- Limited use as water supply source, as bore density in the region of the quarry is low.

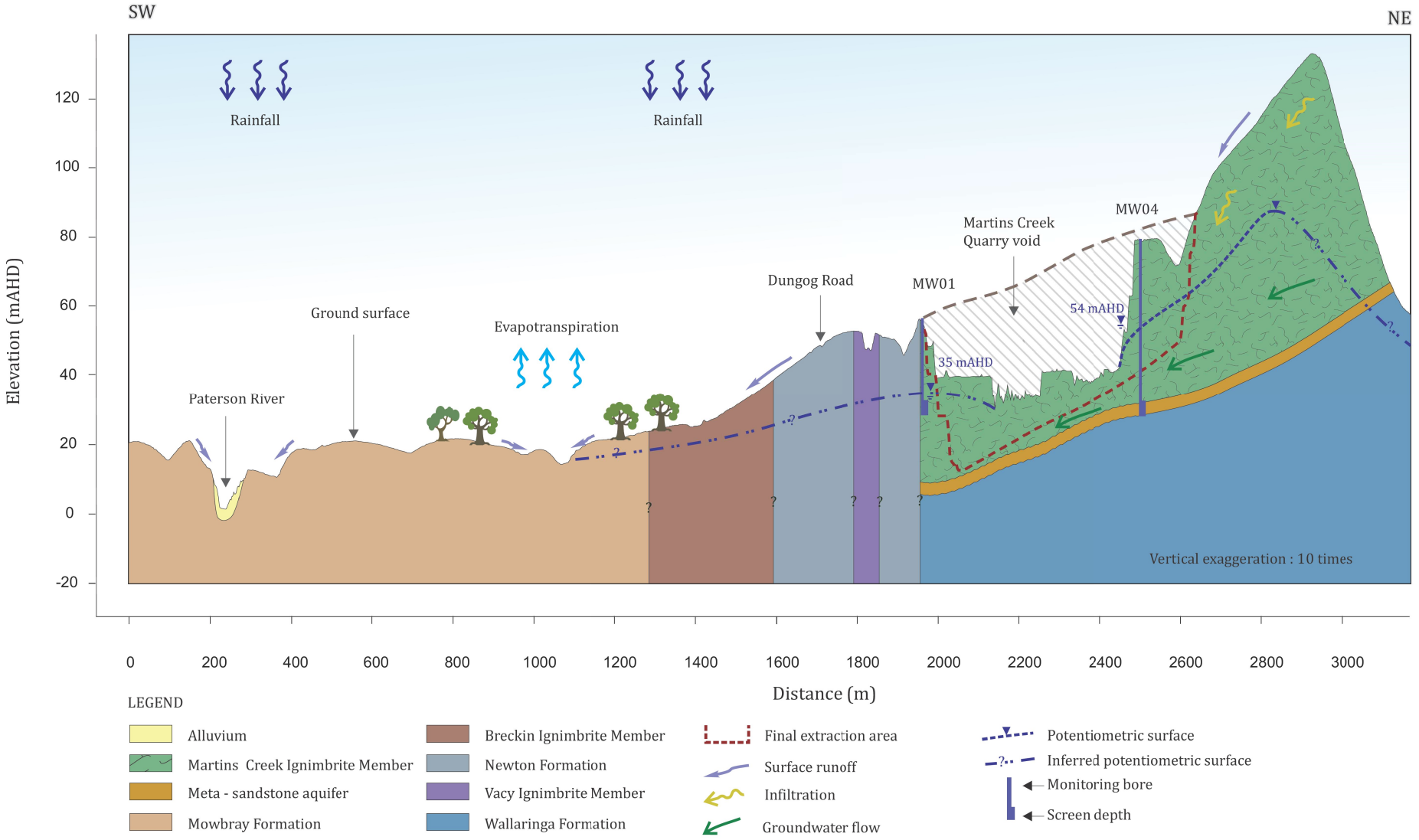


FIGURE 6.19

Conceptual Groundwater Model

Image Source: AGE (2021)

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20210526 9.14

6.8.1.6 Water Licencing

The quarry is located within the Water Sharing Plan for the Paterson Regulated River Water Source, with the groundwater interception allocation for the quarry provided for under Section 115 of the *NSW Water Act 1912*.

Daracon holds Licence 20BL173933, originally issued under Section 115 of the *Water Act 1912*, to extract up to 33 ML annually from this groundwater source. A search of the WaterNSW – NSW Water Register – indicates this licence has not been converted to a water access licence and is not subject to a water sharing plan (AGE, 2021).

6.8.1.7 NSW Aquifer Interference Policy

The AIP (NOW, 2012) clarifies the requirements for obtaining water licences for aquifer interference activities under NSW water legislation and establishes and objectively defines considerations in assessing and providing advice on impacts. The AIP requires that where development will result in a loss of water from a water source covered by a water sharing plan (WSP), a water access licence is required under the WM Act to account for this loss of water.

Applicants seeking project approval for SSD are required to provide estimates of all quantities of water likely to be taken from any water source during and following cessation of the activity and assess impacts against the AIP. While approvals under Sections 89, 90 and 91 of the WM Act are not required for SSDs, Fact Sheet 7 – Quarrying and Extractive Industries issued by the NSW Department of Primary Industries – Office of Water in July 2014 (DPI-Water, 2014), confirms that potential impacts of the Revised Project on groundwater sources, including groundwater users, GDEs and groundwater dependent culturally significant sites, be assessed against the minimal impact considerations of the AIP. If the predicted impacts are less than the Level 1 minimal impact considerations, then these impacts will be considered as acceptable.

The quarry is situated within a water source that is categorised as a 'less productive groundwater source' on the basis of low water supply bore numbers and expected low yields.

6.8.2 Potential Impacts

The key potential impacts due to the Revised Project are as follows:

- interception of groundwater
- dewatering requirements more than the current water licence entitlement
- groundwater drawdown and impact on water users within the vicinity
- impacts on alluvial aquifers of the Paterson River, and water users which rely upon this water source
- reduced availability of groundwater to GDEs.

6.8.3 Assessment Methodology

Analytical methods and analysis of data collected during quarry operations were used to estimate seepage rates into the quarry. Analytical methods use mathematical relationships to simulate idealised conditions and are based on a range of simplifying assumptions representing the groundwater system. A detailed description of the assessment methodology is included in **Appendix H**.

6.8.4 Groundwater Impact Assessment

6.8.4.1 Seepage Rates (Water Take)

Analytical groundwater modelling results estimated the Revised Project's seepage rate based on four scenarios (refer to **Section 6.8.3**).

The most probable estimated seepage rates (assuming a dry year with a high gradient, or a wet year with a low gradient) range from 5.7 ML per year to 22.4 ML per year across the Revised Project stages in the West Pit, and from 6.2 ML per year to 8.2 ML per year in the East Pit (from Year 25).

The results show that three of the four prediction scenarios estimate seepage for the West Pit will consistently fall within the current licence annual amount of 33 ML per year (refer to **Section 6.8.1.6**).

Estimated seepage for the West Pit under the wet year scenario (which is unlikely to persist over the quarry life) is predicted to exceed the licence allocation in Year 21. Accordingly, monitoring of pit inflows is recommended (refer to **Section 6.8.5**) to compare these seepage estimates to site observations over the Revised Project stages

6.8.4.2 Groundwater Drawdown

The GIA predicted that the Revised Project, while intercepting groundwater at the rate nominated in **Section 6.8.4.1**, will have a similar drawdown impact to what is currently being experienced at the quarry. That is, local drawdown effects only (with 250 m of the pit in an upgradient direction and, conservatively, 500 m of the pit in a downgradient direction), with a magnitude of about 2 m/yr. It is recommended (refer to **Section 6.8.5**) that drawdown be monitored and compared to predictions.

The difference in elevation between the Paterson River and the quarry (with the quarry being approximately 100 m higher) means that there is negligible chance that the quarry may draw water from the alluvium.

6.8.4.3 Groundwater Users

Both of the active registered bores located within 5 km of the quarry are located outside of the mapped extent of the Martins Creek Ignimbrite Member and as such do not source water from the meta-sandstone aquifer. Therefore, no impacts on these bores are expected from the Revised Project.

6.8.4.4 Other Aquifers

As noted in **Section 6.8.4.2**, no drawdown impact on groundwater due to the Revised Project is predicted. Furthermore, there is no connection between the primary water bearing strata (metamorphosed contact zone) below the quarry and Paterson River alluvium negating any possibility that the quarry may act as a sink for alluvial water.

6.8.4.5 Groundwater Dependent Ecosystems

No high priority GDEs, as identified in a water sharing plan, are located within the Project Area. The absence of aquifer depressurisation observed in quarry monitoring bores (excepting MW04, which is adjacent the pit) indicates that low or moderate potential GDEs at the quarry would likely be unaffected. Further, current communities near MW04 (where the water table is declining) shows no signs of declining health. This is strongly indicative that the communities located immediately up slope from MW04 are not groundwater dependent.

This notwithstanding, as the Revised Project is not predicted to result in any additional drawdown, it would not have any additional impact on these ecosystems.

6.8.4.6 Water Licensing

The predicted seepage rate due to the Revised Project is between 5.7 ML per year and 22.4 ML per year (compared to a recent estimate of past and current seepage which is 10.3 ML per year; AGE 2021).

Daracon have a current licence allocation of 33 ML per year. Based on the predicted seepage rate, Daracon hold adequate licences for the Revised Project.

6.8.4.7 Aquifer Interference Policy Minimal Impact Considerations

An assessment against the Level 1 minimal impact considerations specified for 'less productive' aquifers is provided in Table 6.43.

Table 6.43 Aquifer Interference Policy Level 1 Minimal Impact Considerations for Less Productive Aquifers

Parameter	Minimal Impact Consideration	Assessment
Water Table	Less than or equal to a 10% cumulative variation in the water table, allowing for typical climatic 'post water sharing plan' variations, 40 m from any: • High priority GDE OR • High priority cultural significant site listed in the schedule of the relevant water sharing plan OR • A maximum of a 2 m water table decline cumulatively at any water supply work unless make good provisions apply	• No Impact. • No drawdown of groundwater due to the Revised Project is predicted. • No Culturally Significant Sites or high priority GDEs located within the proposed quarry extension area according to the North Coast Fold Belt Coast Groundwater Source Rules Summary Sheet. • No impact on the Paterson River alluvium. • No impact on registered bores.
Water Quality	Any change in the groundwater quality should not lower the beneficial use category of the groundwater source beyond 40 m from the activity. No increase of more than 1% per activity in the long-term average salinity in a highly connected surface water source at the nearest point to the activity	• No Impact. • The Revised Project is not anticipated to affect the beneficial use category or salinity.

6.8.5 Groundwater Management and Monitoring Commitments

Daracon will prepare and implement a comprehensive Water Management Plan (WMP) in consultation with DPIE Water, should the Revised Project be approved. In relation to groundwater, the WMP will include:

- baseline data of groundwater levels, yield and quality for groundwater resources potentially impacted by the Revised Project
- a description of the groundwater management system

- groundwater performance criteria, including trigger levels for investigating any potentially adverse groundwater impacts
- a groundwater monitoring program
- a protocol for identifying and investigating any exceedances of the groundwater performance criteria and for notifying DPIE and relevant stakeholders of these events.

Daracon will review the current monitoring network and practices during the development of the WMP, with regular review included in the procedures of the WMP.

The existing groundwater monitoring network consisting of seven bores, each of which is fitted with a continuously recording datalogger, will continue to be monitored with the dataloggers will be downloaded every 6 months. As the extraction area extends, relevant bores will be decommissioned and replaced beyond the extent of the quarry. In addition, as the future quarrying may extend below the local water table, additional monitoring downgradient of MW01 is recommended, to detect and quantify potential drawdown.

Groundwater monitoring results will be reported annually as part of the Annual Review and published on the quarry website.

6.9 Surface Water

A comprehensive assessment of the potential surface water impacts of the Revised Project has been undertaken by Umwelt. This assessment has been undertaken in accordance with the SEARs for the Original Project and has regard to the agency submissions relating to the previous *Water Quality Impact Assessment – Martins Creek Quarry Extension Project* (WQIA) (JM Environments, 2016) submitted with the original development application. Specifically, the DPIE, EPA, OEH, DPI – Water and Hunter New England Health.

A summary of the key findings of the Surface Water Impact Assessment (SWIA) is presented in this section, with the full report provided in **Appendix I**.

6.9.1 Regulatory Context

The WM Act is the key piece of legislation for water resources management in NSW. Under the Act, Water Sharing Plans (WSPs) have been developed to protect the environmental health of water sources, whilst securing sustainable access to water for all users. The WSPs specify maximum water extractions and allocations and provide licenced and unlicensed water users with a clear picture of when and how water will be available for extraction.

The quarry is located within the area regulated by the Hunter Unregulated and Alluvial Water Sources Water Sharing Plan (the WSP) which commenced in 2009. The WSP is divided in three Extraction Management Units (EMUs); the Greater Hunter EMU, the Hunter Regulated River Alluvium EMU and the Lake Macquarie EMU. Further, the WSP is divided into 40 water sources corresponding to sub-catchment boundaries. The quarry is located within the Paterson/Allyn Rivers Water Source of the Greater Hunter EMU.

The PoEO Act is the key piece of environment protection legislation that regulates pollution control (including water pollution) in NSW and is administered by the EPA.

6.9.2 Existing Surface Water Environment

6.9.2.1 Catchment Areas and Flows

The Project Area lies within the Paterson River Catchment downstream of the confluence with the Allyn River. The Paterson and Allyn River have total catchment areas of approximately 277 km² and 367 km² respectively (Hunter Water, 2019) (refer to **Figure 6.20**). Approximately 605 gigalitres (GL) of rainfall is received by the Paterson/Allyn River catchment each year, based on the total rainfall received at Tocal (938.8mm).

The Project Area is approximately 1 km east of the Paterson River, a major tributary of the Hunter River which in turns flow into the Hunter Estuary Wetland (a Ramsar site). The confluence of the Paterson and Hunter River is approximately 20 km south of the Project Area with the Ramsar site approximately 30 km south of the Project Area.

Natural drainage of the Project Area is divided into to two sub-catchments, both of which drain to the Paterson River (refer to **Figure 6.20**).

The West Pit is located within the northern quarry catchment with runoff from a portion of this catchment now draining into the pit area. A 1st order ephemeral stream and a 2nd order ephemeral stream drain runoff from the catchment north of the existing West Pit drain in a westerly direction converging with a number of other minor streams to form a 4th order stream that flows into the Paterson River. To the south of the West Pit, an unnamed 1st order ephemeral stream drains runoff from a small undisturbed area to the south of the West Pit before converging with other ephemeral streams to the west of Dungog Road, including the 4th order stream that flows into the Paterson River approximately 1.5 km west of the quarry (refer to **Figure 6.20**).

Runoff from the undisturbed catchment upslope of the existing Processing Area, where the East Pit is to be developed, is drained by an unnamed 2nd order ephemeral stream to the north of the existing Processing Area and an unnamed 3rd order ephemeral stream also to the north of the existing Processing Area. The streams converge near the north-west corner of the existing processing area with the combined 3rd order stream flowing southerly via a culvert under the main haul road, then south-westerly and off-site at the south west corner of the quarry site.

6.9.2.2 Surface Water Quality

Receiving Water Quality

A network of water quality monitoring sites (shown on **Figure 6.21**) is sampled for physico-chemical parameters and nutrients on a regular basis in accordance with Daracon's surface water quality monitoring programme.

As part of the SWIA (refer to **Appendix I**), results of the monitoring were compared with the NSW Water Quality Objectives (WQOs) for the Hunter River Catchment. The WQOs values and parameters reviewed in the assessment are the default trigger values presented in the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (Australian and New Zealand Environment and Conservation Council (ANZECC, 2000)) for physical and chemical stressors for south-east Australia for slightly to moderately disturbed ecosystems.

The results described below show that the water quality parameters are generally highly variable across the monitoring network:

- All 2015 Electrical Conductivity (EC) results for the location upstream of the quarry (RW1) are within the NSW WQO range (125 – 2,200 □S/cm) for the relevant WQOs, while one of the three 2015 pH results was just below the WQO range (6.5 – 8.5).
- All 2015 EC and pH results for the location downstream of the quarry (RW2) were within the respective NSW WQO ranges and all Total Recoverable Hydrocarbons (TRH) results were below the limit of detection.
- The higher 2015 Total Suspended Solids (TSS) concentration results at both the upstream and downstream monitoring locations for the 4 February 2015 may be attributed to sediment entrained in runoff from the broader catchment associated with significant rainfall in late January 2015 (40 mm on 28/01/15). TRH concentrations were all found to be below the laboratory limit of detection (LOD) of 0.7 mg/L for both the upstream and downstream monitoring locations.
- All Allyn River upstream and Paterson River downstream baseline water quality monitoring results for pH and EC were within the respective NSW WQO ranges. No Allyn River or Paterson River turbidity or TSS results exceeded the respective WQO range/value.
- NO_x and Total Nitrogen (TN) concentrations in the Paterson River were typically low with very few results exceeding the respective WQOs:
    - 6 of 20 downstream results and 2 of 20 upstream results exceeded the NOx WQO of 0.04 mg/L
    - 3 of 20 downstream results and 3 of 20 upstream results exceeded the TN WQO of 0.5 mg/L.
- Only one Total Phosphorus (TP) monitoring result at the upstream Allyn River location exceeded the WQOs value, where 8 of 20 results at the downstream monitoring location exceeded the WQOs value.
- All pH results for the ephemeral 2nd and 3rd order streams were below the WQO range and is likely be attributable to the slightly to moderately acidic soils and decay of organic matter in the undisturbed upslope catchment.
- NO_x and TN concentrations in the ephemeral streams were recorded above the respective WQOs for all but one sample collected from Ephemeral 1. As these samples are collected from upstream of the quarry, these elevated levels are not due to the quarry and are representative of background conditions. TP results for the ephemeral streams were below the WQO value.

A more detailed analysis of receiving water quality monitoring results is provided in Section 2.2.3 of the SWIA (refer to **Appendix I**).

Site and Discharge Water Quality

Section 2.2.4 of the SWIA (refer to **Appendix I**) provides an analysis of water quality monitoring from samples taken from Dams 1 and 3 (both during discharge and of stored water) (refer to **Figure 6.21**). Routine water quality monitoring is not undertaken for Dam 2 as runoff captured in Dam 2 is typically transferred to Dam 1 for either reuse or treatment and offsite discharge, however, surplus water complying with EPL discharge criteria may be discharged directly from Dam 2 (refer to **Section 6.9.3**). In summary, the water quality of discharged water has met the WQOs for the quarry (refer to **Appendix I**).

6.9.2.3 Water Users

For the 2019/2020 financial year there were a total of 25,523.9 unit shares allocated across 375 Water Access Licenses (WALs) in the Paterson/Allyn Rivers Water Source. Since implementation of the Hunter Unregulated and Alluvial WSP in 2009, the Paterson/Allyn Rivers Water Source and the Paterson River Tidal Pool Water Source areas. There are 18 WALs (with a combined 943.5 unit shares) in the Paterson Regulated River Water Source and Paterson River Tidal Pool Water Source for properties in the river reach downstream of the quarry to the railway bridge at Paterson. The associated works approvals for the WALs indicate that all are for irrigation purposes with two also indicating industrial use water demands.

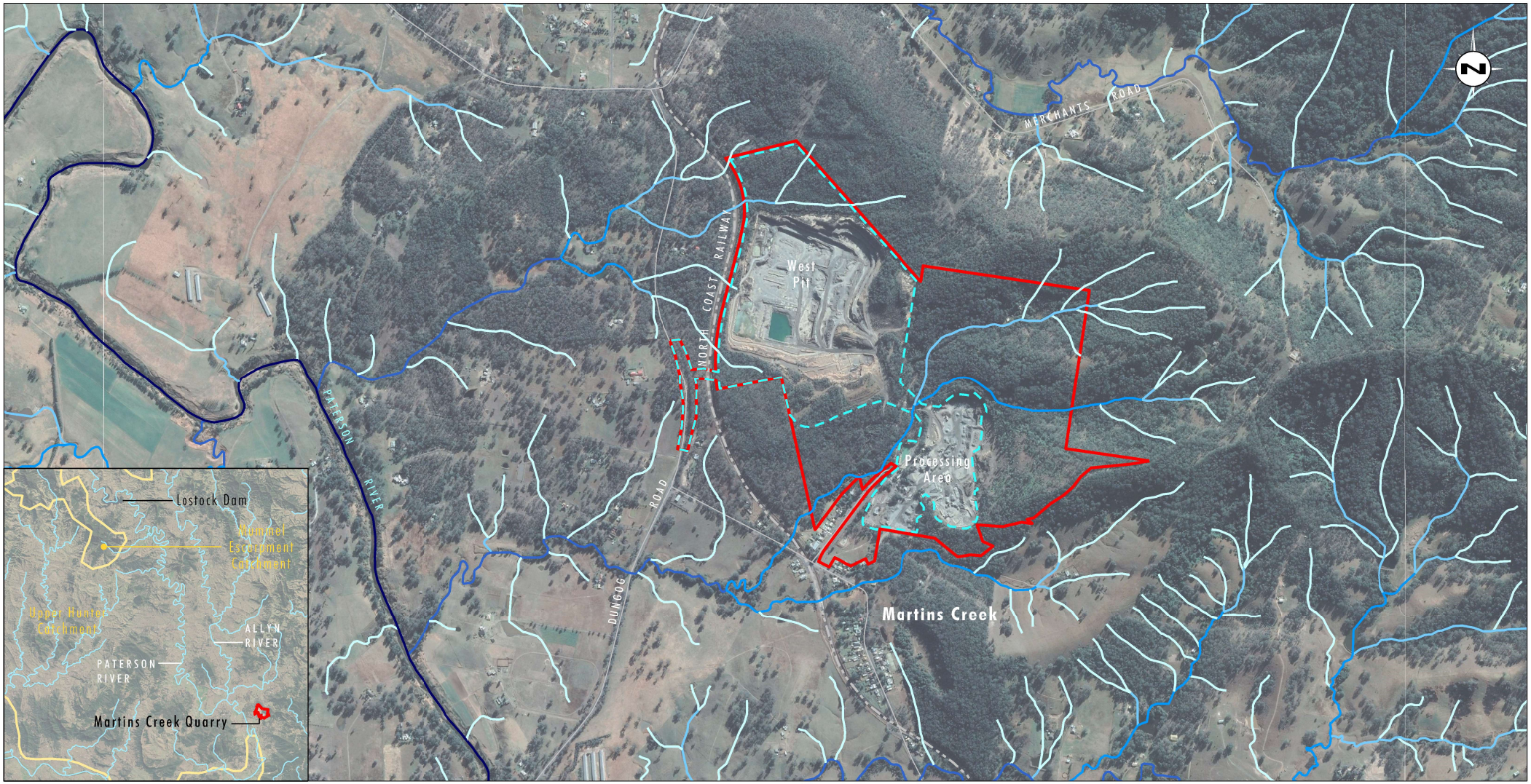


Image Source: Google Earth (Jan 2018)
Data Source: Daracon (2020), CANRI

0 0.25 0.5 1.0km
1:20 000

Legend

- Project Area
- Proposed Disturbance Area
- Catchment Area
- 1st Order Stream
- 2nd Order Stream
- 3rd Order Stream
- 4th Order Stream
- 5th Order Stream

FIGURE 6.20

Catchment Context

File Name (A4): R01/3957_212.dgn
20201120 14.48

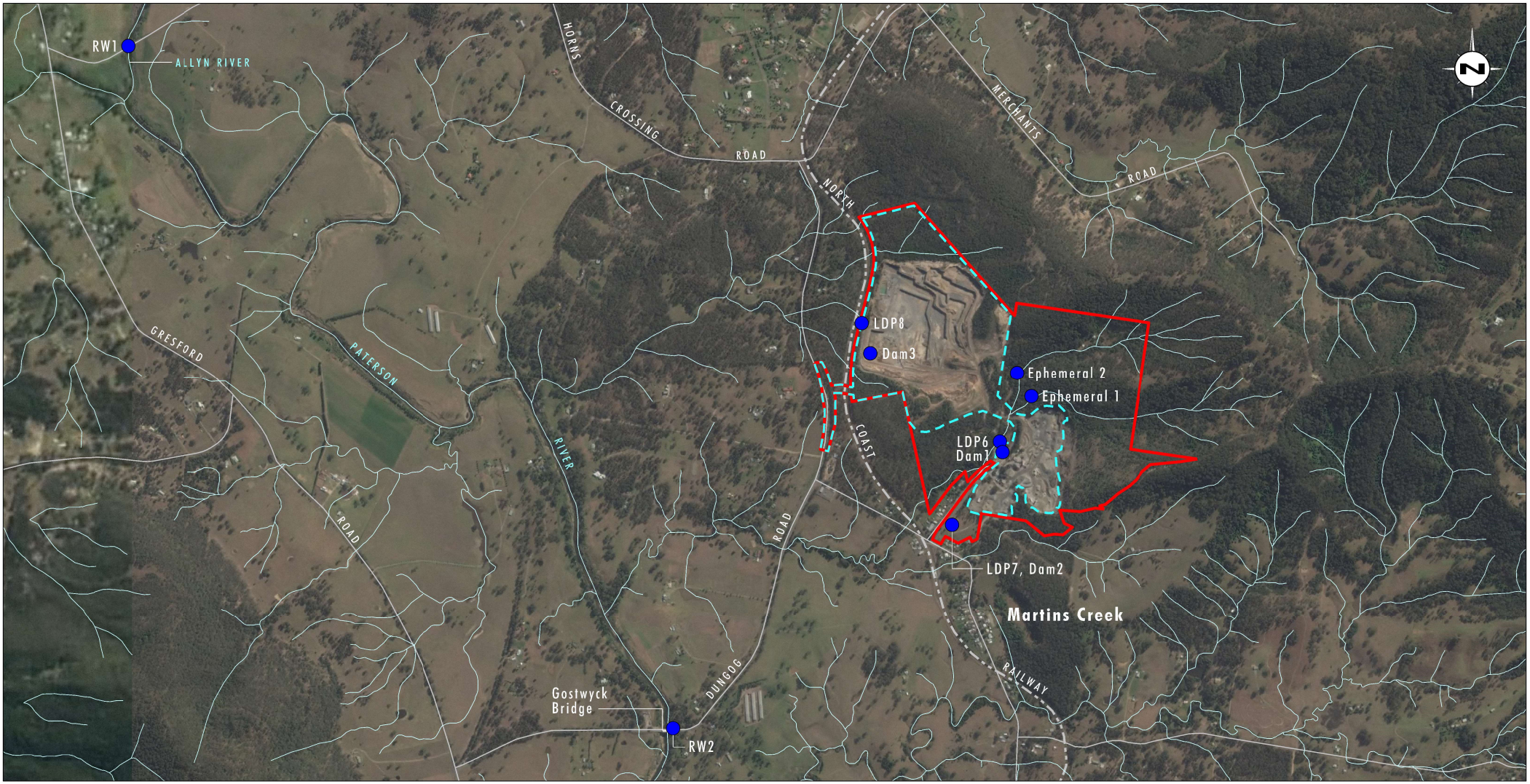


Image Source: Google Earth (Jan 2018)
Data Source: Daracon (2020)

0 0.25 0.5 1.0km
1:25 000

Legend

- Project Area
- Proposed Disturbance Area
- Water Quality Monitoring Locations

FIGURE 6.21

Water Quality Monitoring Locations

File Name (A4): R01/3957_213.dgn
20201119 10.43

6.9.3 Existing Surface Water Management Systems

6.9.3.1 Quarry Water management System (WMS)

Daracon have an existing Water Management System (WMS) in place at the quarry to contain potentially contaminated water for reuse or treat (if required) to achieve water quality discharge criteria prior to release at the licenced discharge points (LDPs). Water is reused at the quarry for haul road dust suppression and some demands at the Processing Plant. Where possible, clean water is directed around disturbed areas, however, in some areas clean and dirty water have not been separated, as this is impractical due to the steep terrain upslope of the quarry.

The three primary catchments of the WMS direct capture and manage water as follows (refer to **Figure 6.22** and **Figure 6.23**):

- Dam 1 - Runoff from the Processing Area and undisturbed upslope catchment is diverted to Dam 1 with discharge from LDP 6, as required. Dam 1 has a capacity of 13 ML.
- Dam 2 - Runoff from the administration offices, southern stockpile area and undisturbed upslope catchment is diverted to Dam 2, from where it is typically transferred to Dam 1 for either reuse or treatment and offsite discharge. Surplus water complying with EPL discharge criteria may be discharged directly from Dam 2 via LDP 7. Dam 2 has a capacity of 0.9 ML.
- Dam 3 - Runoff from east of the West Pit, rainfall runoff of the West Pit and groundwater inflows are diverted to Dam 3 with offsite discharge via LDP 8. A diversion bank located along the northern edge of the West Pit prevents in-flow of surface runoff from the upslope undisturbed catchment to the WMS. Steep terrain prevents the construction of a diversion bank to the east of the West Pit and as a result there is some mixing of clean and dirty water. Dam 3 has a capacity in excess of 400 ML, however, as the retention of large quantities of water may impede extractive operations, water is periodically discharged via LDP 8.

The current WMS, which incorporates hoses, pumps and chemical dosing equipment, is operated to treat water prior to discharge at LDPs 6, 7 and 8. Typically, surplus water captured in Dam 2 is transferred to Dam 1 for treatment prior to discharge. Where the quality of water stored does not meet EPL discharge criteria, water is dosed with appropriate chemicals and recirculated from Dam 3 through the Holding Dam (refer to **Figure 6.22**) to provide mixing and enhanced water quality prior to discharge via the recirculation piping/hoses to LDP 8. Flocculants are dosed to aid settling of solids and sulphuric acid dosing is used to lower the pH.

6.9.3.2 Erosion and Sediment Controls

Erosion and sediment controls (ESCs) are installed or constructed within areas of the quarry where the movement of sediment is likely. Further detail on the ESCs, inspection checklists and maintenance record sheets for these catchments are provided in the quarry Storm Water Management Control Plan (SWMCP) (refer to **Appendix I**). The SWMCP also details ESCs for pre-strip areas which include sediment fencing, temporary sediment basin(s) and hydromulching.

6.9.3.3 Amenities Water Management

Water for amenities purposes is supplied via a tank connected to the Hunter Water potable water supply and gravity fed to the amenity buildings. Amenities wastewater is collected in a tank and periodically removed from site by a licensed contractor.



Image Source: Google Earth (Aug 2018)
Data Source: Daracon (2020)
Note: 5m Contour Interval

0 100 250 500m
1:10 000

Legend

- Project Area
- Clean Water Management System Catchment
- Dirty Water Management System Catchment
- Dirty Water Dam
- Water Quality Monitoring Locations
- 1st Order Stream
- 2nd Order Stream
- 3rd Order Stream
- 4th Order Stream
- Culvert

FIGURE 6.22

Existing Quarry Water Management System Plan

File Name (A4): R01/3957_214.dgn
20201119 10.45

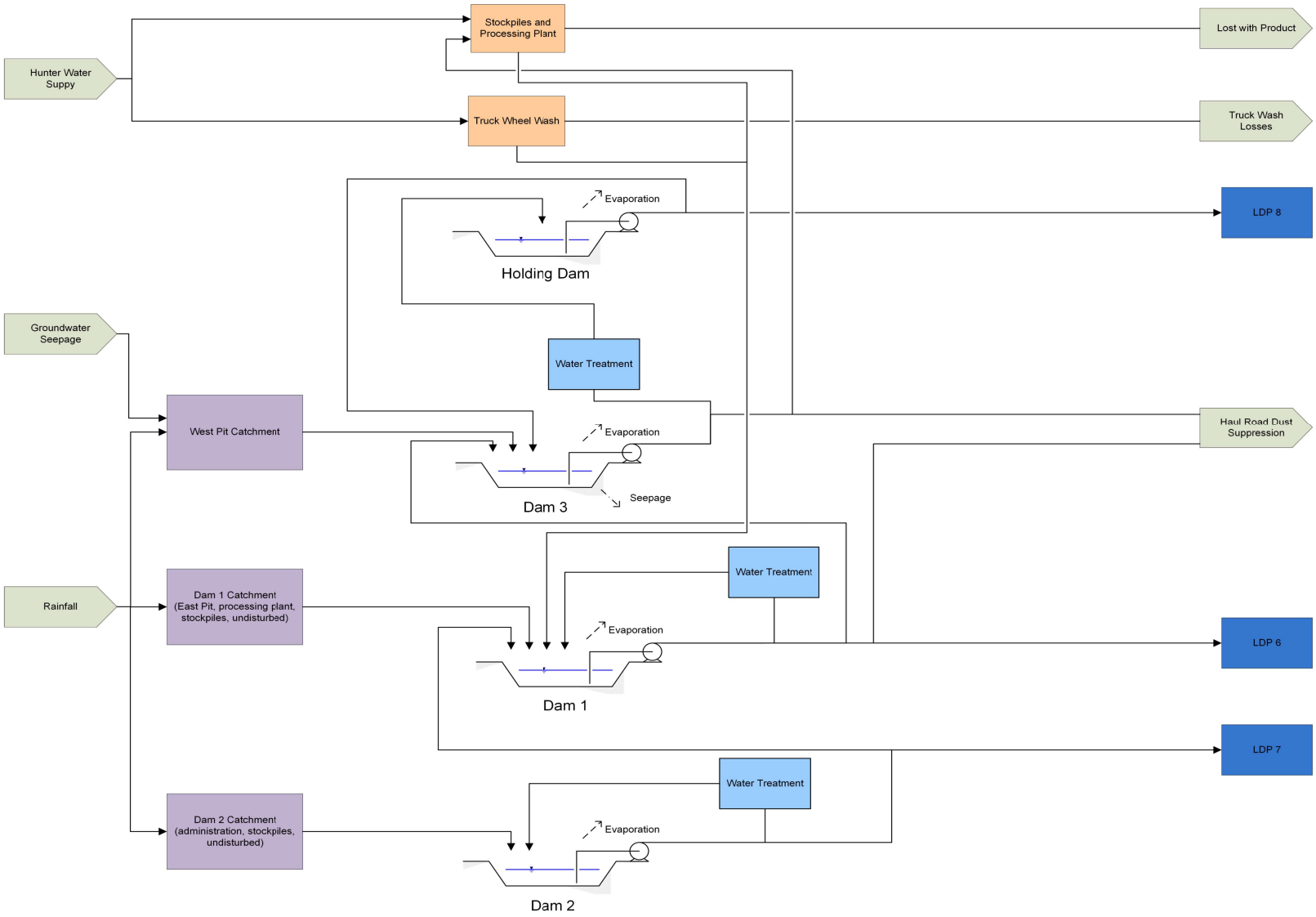


FIGURE 6.23

Existing Quarry
Water Management System Schematic

6.9.4 Proposed Surface Water Management System

6.9.4.1 Quarry Water Management System Improvements

The WMS will be modified over the life of the Revised Project to incorporate additional upslope catchments associated with the extended open cut pit catchments, an additional pit sump in the East Pit and associated pumps and pipes. **Figure 6.24** and **Figure 6.25** present a plan and schematic diagram of the proposed final extent of the WMS.

Daracon has investigated options to divert the streams to be intercepted around the proposed West Pit, however the steepness of the terrain precludes the construction of diversion drains. As a result, clean and dirty water will not be separated, similar to existing operations. The capacity of Dam 2 will be increased to comply with Blue Book Volume 2E requirements.

Runoff captured in the new East Pit sump will be transferred to Dam 1 or Dam 3 for reuse, or treatment of the proposed Year 25 WMS and off-site discharge (as required) in accordance with EPL 1378.

The proposed WMS will continue to meet the water quality values in accordance with the WQOs and criteria of EPL during discharge. The proposed WMS will be documented in the quarry's WMP. Relevant aspects of the Martins Creek Groundwater Impact Assessment (AGE 2021) (refer to **Section 6.8** and **Appendix H**) will also be included in the WMP.

6.9.4.2 Amenities Water Management

Water for amenities purposes will continue to be supplied via a tank connected to the Hunter Water potable water supply and gravity fed to the amenity building.

Daracon will implement an inspection and water quality testing program to ensure amenities water quality meets the Australian Drinking Water Guidelines – Version 3.5 (ADWG) (National Health and Medical Research Council, 2011).

Amenities wastewater will continue to be collected in a tank and periodically removed from site by a licensed contractor.

Daracon will document the functionality of the amenities water management system and associated procedures and inspections in the SWMP.

6.9.4.3 Erosion and Sediment Control

As part of the Revised Project, Daracon will revise the ESCs, inspection checklists and maintenance record sheets presented in the existing SWMCP and include these in a site Soil and Water Management Plan (SWMP) that will incorporate the existing SWMCP, findings from this SWIA and the Martins Creek Groundwater Impact Assessment (AGE 2021).

6.9.5 Water Balance

A detailed operational water balance assessment has been completed for the Revised Project as part of the SWIA (refer to **Appendix I**). Inflows to the water balance include site rainfall, groundwater inflows and potable water imported from Hunter Water reticulate supply.

A daily time step water balance model was developed in GoldSim to simulate the performance of the Existing (Approved) Operation and the proposed operational stages:

- Year 15 (representing the first design stage with the maximum production rate of 1,100,000 tpa and water demands) and
- Year 20 (representing the maximum extent of the quarry WMS with a lower production rate of 1,050,000 tpa and a worst case with respect to rainfall runoff inflows).

Further detail on the water balance model inputs, assumptions and underlying data sources is provided in the SWIA (refer to **Appendix I**).

Year 25 was not modelled as there will be no extraction in the West Pit and as such, the requirement for discharge will be limited given the large available water storage capacity in the West Pit void.

A final void recovery water balance model was also developed in GoldSim to assess whether the West Pit Void and East Pit Void will fill and spill to the downstream environment and the anticipated post operational surface water licensing requirements. The results from this modelling are presented in **Section 6.9.6**.

Gross Water Balance

The gross water balance results (see **Table 6.44**) indicate that the Existing, Year 15 and Year 20 will operate with a water surplus in median years.

Table 6.44 Gross Water Balance Results (ML)

Operating Scenarios	10th Percentile	50th Percentile	90th Percentile
Existing (Approved)	9.4	105.6	201.2
Year 15	-22.7	95.5	218.4
Year 20	-29.0	89.6	214.4

With the additional inflows from undisturbed upslope catchments in Year 15 and Year 20, the water surplus are predicted to be offset by increased operational demands (processing and haul road dust suppression) resulting in marginally smaller surpluses in median to wet years.

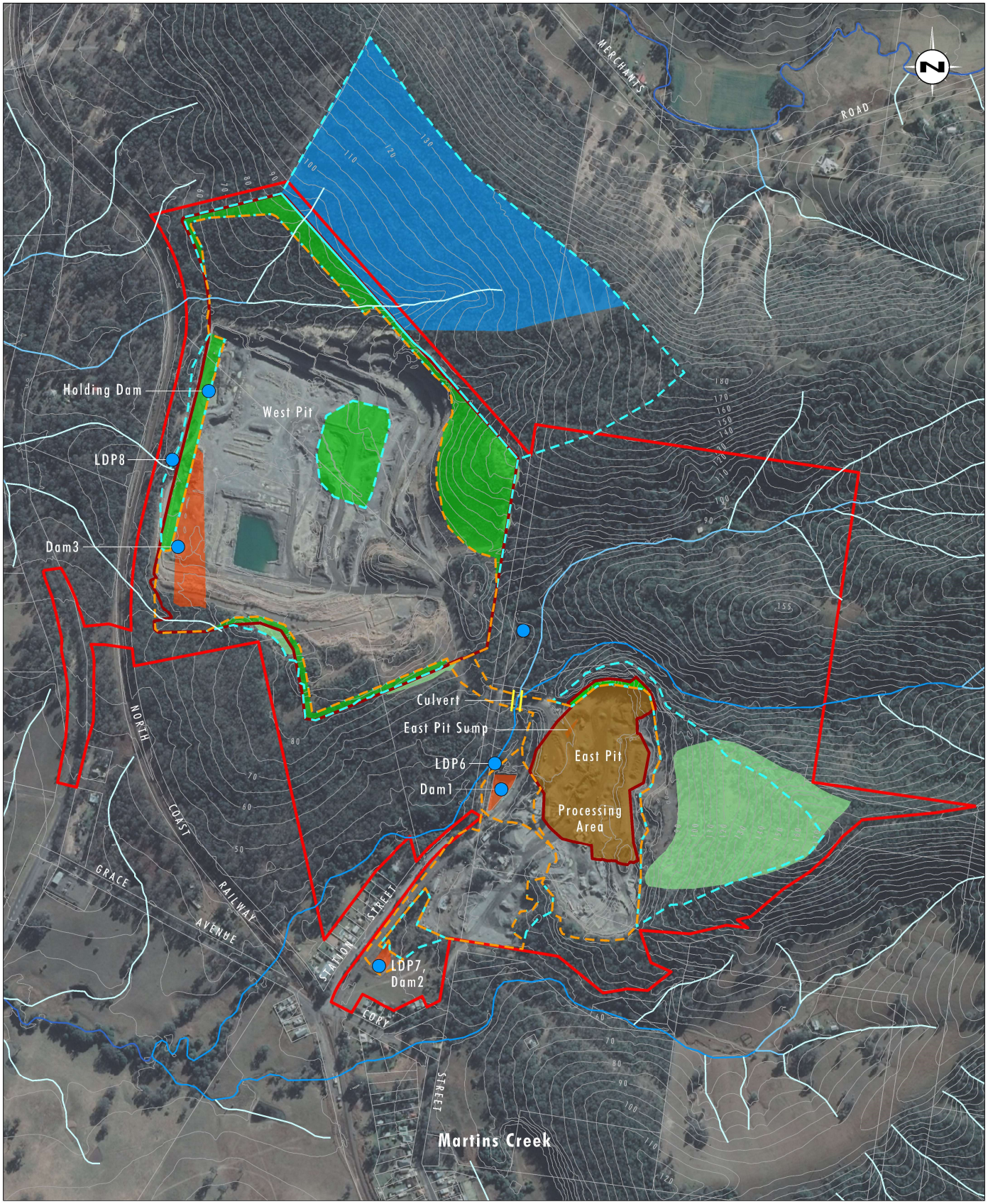


Image Source: Google Earth (Aug 2018)
Data Source: Daracon (2020)
Note: 5m Contour Interval

0 100 250 500m
1:10 000

Legend

- Project Area
- Clean Water Management System Catchment
- Dirty Water Management System Catchment
- Dirty Water Dam
- Additional Intercepted Catchment
- Year 25 Pit Extent Boundary
- Water Quality Monitoring Locations
- Active Quarry Area
- Rehabilitation Area
- Previous Rehabilitation Area
- 1st Order Stream
- 2nd Order Stream
- 3rd Order Stream
- 4th Order Stream
- Culvert

FIGURE 6.24

Proposed Water Management System Plan - Final Staging

File Name (A4): R01/3957_216.dgn
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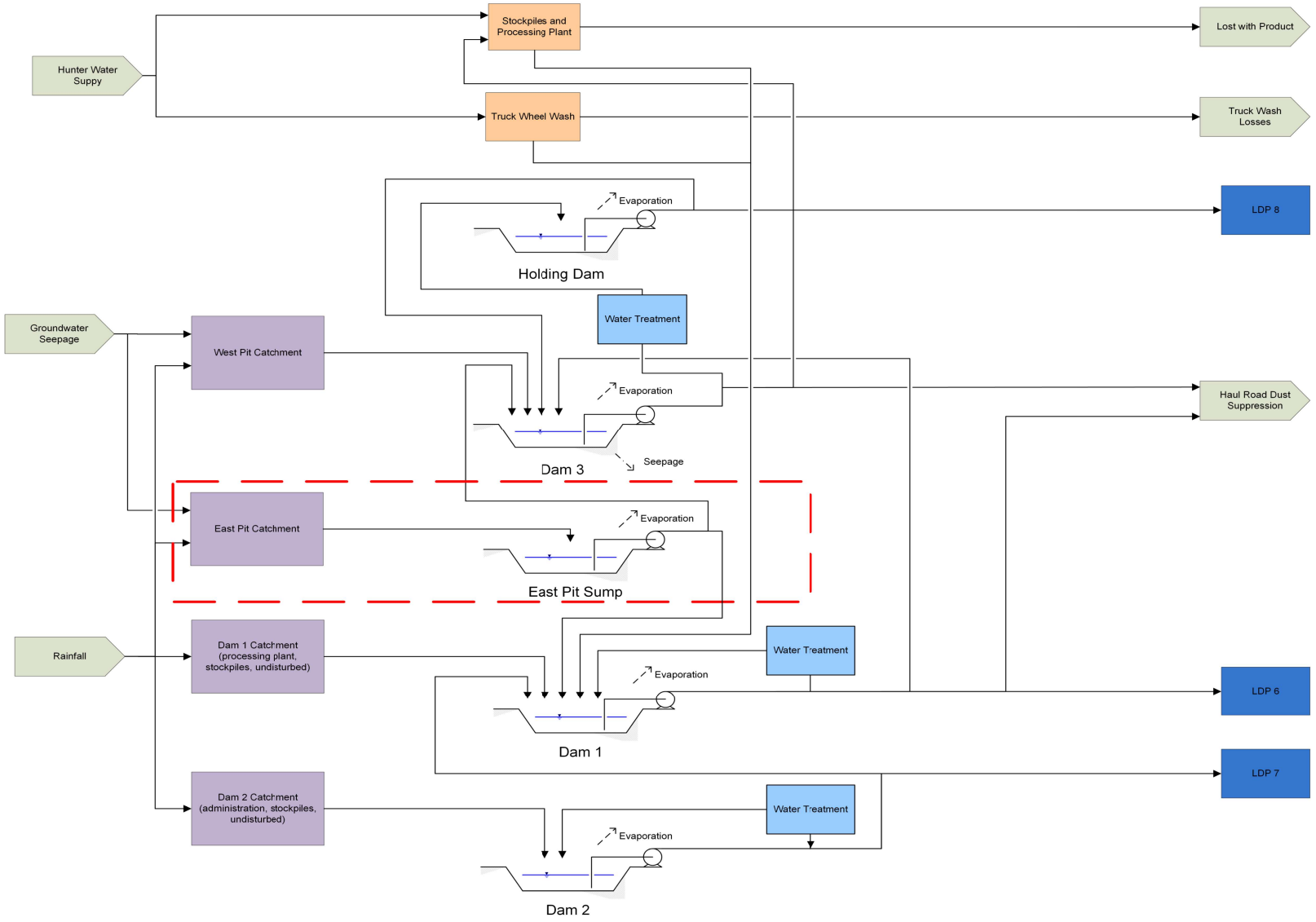


FIGURE 6.25

Proposed Water Management System Schematic - Final Staging

Table 6.45 presents the predicted minimum, average and maximum potable water imports for the Existing, Year 15 and Year 20 operating scenarios.

Table 6.45 Potable Water Import (ML/year)

Operating Scenarios	Minimum	Average	Maximum
Existing (Approved)	24.1	35.8	51.7
Year 15	62.6	76.9	96.3
Year 20	58.9	76.1	99.4

Reliance on potable water imports is expected to increase due to the increase in operational demands (processing and haul road dust suppression) compared to the Existing Approved Operation. Expanding the range of processing demands that may utilise captured stormwater rather than potable water only and maintaining higher water inventories within the WMS would reduce potable water demands.

Discharges

The water balance model predicts that in average and high rainfall years the volume of controlled discharges, and the average number of days when controlled discharges would be required increases by 29% and 55% respectively.

For the Year 15 and Year 20 scenarios, it is predicted that on average approximately 62% and 63% of the additional runoff captured in the quarry WMS will be returned to the downstream environment via controlled discharges respectively.

The water balance modelled predicts there would be uncontrolled discharges under average and high rainfall conditions (see **Table 6.46** and **Table 6.47**).

Table 6.46 Uncontrolled Discharges (ML/year)

Operating Scenarios	Minimum	Average	Maximum
Existing (Approved)	0.0	7.9	62.0
Year 15	0.0	6.4	59.6
Year 20	0.0	6.4	59.7

Table 6.47 Uncontrolled Discharge Frequency (Discharges/year)

Operating Scenarios	Minimum	Average	Maximum
Existing (Approved)	0	2	6
Year 15	0	1	4
Year 20	0	1	4

[1] *The 'frequency' of uncontrolled discharge events is used as such events may occur across more than one day but will be reported as a single event.*

The frequency of uncontrolled discharges for the Year 15 and Year 20 operating scenarios are predicted to be slightly reduced compared to the Existing operation. This is a result of the proposed increase in Dam 2 capacity to meet Blue Book Volume 2E requirements.

No uncontrolled discharges were predicted from Dam 3 (i.e. the West Pit) and the frequency of uncontrolled discharges from Dam 1 and Dam 2 is less than the expected frequency indicated in Volume 2E of the Blue Book for sediment basins sized for a 90th percentile 5 day rainfall event (i.e. 2 to 4 spills per year).

6.9.6 Final Landform and Void Water Recovery

6.9.6.1 Final Landform

The final landform will generally reflect the Year 25 quarry staging plan incorporating a final void with two effective water storages, the West Pit Void and the East Pit Void. Dam 1 and Dam 2 will both be backfilled during the quarry rehabilitation phase. The quarry infrastructure areas (processing plant, workshops and administration) will be removed/demolished at the end of the quarry extraction phase and these areas will be revegetated. ESCs for areas undergoing rehabilitation will remain in place until an adequate vegetation cover is established.

The pit voids will remain as exposed hard rock surfaces with a high runoff potential. Groundwater inflows to the West Pit Void and East Pit Void are expected to continue at an equivalent rate to those predicted for the operational quarry phase when the stored water elevations are low, with the inflow rate decreasing as void water elevations increase. **Figure 6.26** presents the conceptual final landform plan showing catchments and final void lakes.

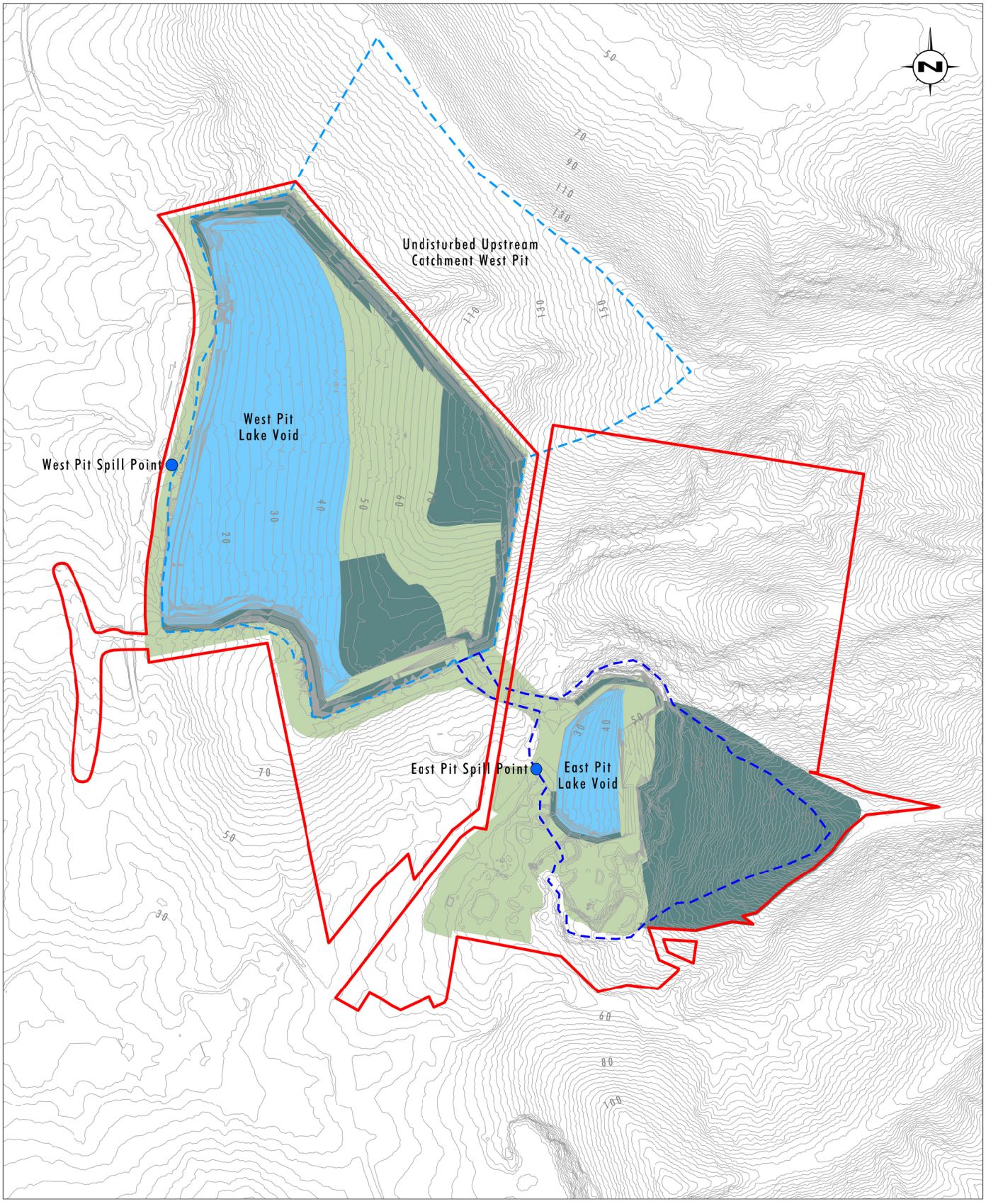
6.9.6.2 Final Void Recovery

Based on the final staging landform, the West Pit Void will have a capacity of approximately 2,890 ML and spill at an elevation of 45 mAHD while the East Pit Void will have a capacity of approximately 290 ML and spill at 50 mAHD (refer to **Figure 6.26**).

The climate data and runoff model parameters used for the operational water balance model (refer to **Appendix I**) have been used for the final void recovery modelling. As groundwater outflows from the West Pit Void and East Pit Void were not provided in the GIA, groundwater inflows and outflows have been excluded from the final void recovery water balance model. Modelling of groundwater outflows will be undertaken in the future to allow incorporation of both groundwater inflows and outflows in the final void recovery model for quarry closure planning. It should be noted that groundwater inflows to the final voids will initially be similar to the seepage flows to the operational quarry pits which are less than 5% of the surface water runoff inflows to the pits. As the void water levels rise above the water table, groundwater inflows from the upslope highwall face will reduce and recharge rates to the groundwater source via the pit floor and downslope highwall face will increase. Accounting for groundwater inflows to the final voids, and recharge from the final voids to the groundwater source, is not expected to result in an appreciable difference to the modelled final void recovery rates or estimated surface water take estimates.

The final void water balance model predicts that the water elevations in the West Pit Void and East Pit Void will take approximately 22 years to reach spill level (45 mAHD) and the East Pit Void will recover within 8 years to reach spill level (50 mAHD).

The predicted annual average volume of water spilled from the final voids of approximately 63.1 ML is less than the average annual runoff for an area equivalent to the final void catchment of 84.6 ML/year. However, the proposed ongoing surface water quantity monitoring program (refer to **Section 6.9.8**) will be used to develop a detailed understanding of quarry WMS catchment runoff characteristics and groundwater inflows which will allow refinement of the final void recovery model and provide greater confidence in ongoing surface water licensing predictions.



Data Source: Daracon (2020)
Note: Contour Interval 2m

0 100 250 500m
1:10 000

Legend

- Project Area
- East Pit Catchment
- West Pit Catchment
- Rehabilitation Area - Native and Pasture Grass
- Rehabilitation Area - Native and Pasture Grass with Pockets of Woodland Species
- Pit Void Lake
- Spill Point

FIGURE 6.26

Conceptual Final Landform Catchments

6.9.7 Assessment of Surface Water Impacts

The Revised Project has the potential to impact on natural and existing surface water systems. This includes the potential to impact on:

- catchment areas and flow volumes in downstream watercourses
- flooding, including flow rates, velocities and depths
- water quality in downstream watercourses
- geomorphological and hydrological values of watercourses, including environmental flows
- riparian and ecological values of watercourses, including the Hunter Estuary wetlands Ramsar site (approximately 30 km downstream of the quarry)
- water users, both in the vicinity and downstream of the Revised Project.

The Revised Project will no longer intercept a 3rd order stream due to its reduced disturbance footprint, as a direct result of excluding proposed expansion of quarrying activities into new undisturbed areas to the east.

6.9.7.1 Water Quality

Historically, the controlled discharge water quality results demonstrate that the quarry consistently meets the discharge criteria for EPL 1378. While controlled discharge volumes and frequencies are predicted to increase with the Revised Project, the discharge water quality is expected to continue to meet the EPL 1378 criteria as:

- the same water treatment processes and controlled discharge management practises will continue to be implemented; and
- it is not proposed to increase the daily discharge rates and the quarry water treatment processes and controlled discharge management practises have been demonstrated to achieve EPL water quality criteria at historical discharge rates.

Furthermore, with proposed additional water storage on-site it is predicted that the maximum volume of uncontrolled discharges will decrease slightly which will have a positive impact on downstream water quality.

6.9.7.2 Water Quantity and Flows

The Revised Project will result in an increase in the capture of upslope catchment runoff in the quarry WMS, however, the water balance model predicts that on average the majority (between 60% and 75%) of the additional captured runoff will be returned via controlled discharges to the downstream environment (refer to **Section 6.9.5**). As a result, the impacts on flows to downstream water users are expected to be negligible with respect to flows in the Paterson River. Surface water licensing requirements are discussed in **Section 6.9.8** and **Appendix I**.

The volume of potable water imported is expected to increase on average by approximately 110% relative to the Existing Operation (Approved) due to the increase in operational demands (processing and haul road dust suppression). Daracon will include a potable water usage reduction strategy in the revised SWMP following approval and a program for implementation of water savings measures will be developed within 12 months of commencement of operations. Ongoing potable water usage reduction performance will be reported as part of the Annual Review process.

6.9.7.3 Stream Stability

The water balance modelling undertaken for the Revised Project an increase in controlled discharge water volumes (up to 29%) and frequencies (up to 52%) (refer to **Section 6.9.5** and **Appendix I**).

However, as peak discharge flow rates will remain unchanged and previous periods of prolonged discharges did not cause stream stability issues, most notably a discharge of approximately 100 ML of water over a 47 day period in 2016, impacts on stream stability are expected to be negligible.

6.9.7.4 Hunter Estuary Wetlands Ramsar Site

The maximum modelled discharge (6.5 ML/day) from the quarry represents approximately 1% of the mean recorded Paterson River flow (628 ML/day) at the WaterNSW Gostwyck gauging station (site 210079) and would represent an even smaller percentage of total Paterson River discharge to the Hunter River approximately 29 km further downstream.

The estimated average annual flow to the Hunter Estuary is 1,971,000 ML/year (NSW Department of Water and Energy, 2009). Based on an average daily flow, the maximum predicted quarry discharge of 6.5 ML would represent 0.12% of total flow to the Hunter Estuary.

Given the significant distance from the quarry to the downstream Hunter Estuary Wetlands Ramsar site, discharges will be greatly diluted and any impacts (including water quality and a reduction in freshwater flows) on the Hunter Estuary Wetlands Ramsar site are expected to be negligible.

6.9.8 Water Licencing

The quarry pits, due to their interception of the first and second order stream and requirement for water to be managed to prevent pollution risks, is an excluded work. Water take that falls directly within the quarry area is therefore not 'water take' which is licensable. Intercepted catchment from 'clean' upstream or upslope areas is however licensable subject to harvestable rights consideration.

As indicated in the SWIA (refer to **Appendix I**) the harvestable right for the quarry land parcels with a total area of 123.5 ha is estimated to be 11.7 ML/year.

A final void recovery water balance indicates that the average annual volume of water spilled from the final voids is less than the average annual runoff for an area equivalent to the final void catchment (i.e. 84.6 ML/year). When taking into account the harvestable right of 11.7 ML/year for the land holding, the estimated ongoing long term surface water licensing requirement for the final landform would be approximately 9.8 ML/year.

There will be a greater licensing requirement for the period prior to when the final voids fill and commence spilling downstream. The final void recovery water balance predicts that the East Pit will fill to spill level after approximately 8 years (prior to West Pit) following quarry closure. Up until this time, the surface water licensing requirement will be 84.6 ML/year. The licensing requirement after 8 years and up until the West Pit commences spilling (which is predicted to occur after approximately 22 years) is estimated to be 59.0 ML/year (based on predicted average East Pit spill volumes of 25.6 ML/year).

A review of recent water trading in the Paterson/Allyn Rivers water source indicate permanent licence entitlements could be obtained (refer to **Appendix I**).

6.9.9 Managing and Mitigation Measures

As outlined in **Section 6.8.5**, Daracon will prepare a WMP for the Revised Project in consultation with DPIE Water, should the Revised Project be approved. In relation to surface water, the WMP will include:

- baseline data on surface water flows and water quality
- surface water impact assessment criteria, including trigger levels for investigating any potentially adverse impacts, and surface water management performance measures
- a detailed description of the surface water management system on the site, including the:
    - clean water diversion system
    - erosion and sediment controls
    - dirty water management system
    - water storages
- a program to monitor and report on:
    - any surface water discharges
    - the effectiveness of the water management system
    - surface water flows and quality in watercourses and/or waterbodies that could potentially be impacted by the development
- a site water balance, including details of:
    - sources and security of water supply
    - water use and management on the site
    - any off-site discharges or water transfers
    - reporting procedures, including the annual preparation of a site water balance
- a protocol for identifying and investigating any exceedances of the surface water impact assessment criteria and for notifying DPIE and relevant stakeholders of these events

Further, Daracon will implement the following management and mitigation measures should the Revised Project be approved to management impacts on surface water resources:

- All runoff captured within the quarry would continue to be treated through the quarry WMS (which includes flocculation, coagulation and pH correction) prior to discharge to ensure the water quality criteria of the EPL continues to be met.
- ESCs would continue to be implemented in accordance with Landcom's *Managing Urban Stormwater Volume 1* (Landcom, 2004) and *Volume 2E Mines and Quarries* (DECC, 2008) (the Blue Book) during stripping/development of new extraction areas or any other ground disturbing activities. The ESCs would be identified and regularly reviewed and updated as part of the quarry SWMP.
- Ongoing water quality monitoring at sites upstream and downstream of the quarry to enable the development of site-specific water quality trigger values in accordance with ANZG 2018. The site-specific trigger values will be used to initiate investigation in the event of any deviations in receiving water quality from the normal water quality range.

- In the event of water source restrictions, Daracon would limit production to ensure environmental controls, i.e. dust suppression, are maintained as a priority with the available water supply.
- A potable water usage reduction strategy will be included in the WMP following approval and a program for implementation of water savings measures developed within 12 months of commencement of operations. Ongoing potable water usage reduction performance will be reported as part of the Annual Review process.
- Potable water from the amenities water reticulation system will be sampled on a biannual basis and analysed to ensure the water meets the requirements of the ADWG (National Health and Medical Research Council, 2011). The amenities water supply tank will be inspected monthly for any potential contamination with organics or other materials.

6.10 Biodiversity

A comprehensive Biodiversity Assessment Report (BAR) has been prepared by Conacher Consulting (refer to **Appendix J**) for the Revised Project in accordance with the SEARs (dated 4 August 2016) and in response to government agency and community submissions during the exhibition of the EIS (refer **Part B**, **Sections 12.0** to **14.0**). Furthermore, the BAR has been prepared to address the Guidelines for preparing Assessment Documentation relevant to the EPBC Act provided by DPIE and to assess the potential ecological impacts of the Revised Project following the NSW Framework for Biodiversity Assessment – NSW Biodiversity Offsets Policy for Major Projects (FBA).

The FBA process is a credit driven system where calculators provided by the NSW government are populated with ecological data about the site to generate 'impact credits'. The Revised Project is then required to offset these credits through a biodiversity offset strategy (BOS). A BOS has been prepared separately by Conacher for the Revised Project which is appended to the BAR (**Appendix J**).

As outlined in **Sections 5.1** and **5.4**, biodiversity impacts were identified by the community and other key stakeholders as one of the key issues of concern. In a response to address this concern, Daracon has redesigned the quarry plan for the Revised Project by committing to no quarrying in the previously proposed East Pit, resulting in a reduction of the quarry disturbance footprint of 16.8 ha, which includes avoiding the clearance of 15.3 ha of native vegetation within Lot 21 DP 773220. A comparison of the Original Project's disturbance footprint and the Revised Project's disturbance footprint is provided in **Figure 6.27**. As described in **Sections 2.11** and **6.19**, rehabilitation will focus on promoting the rural landscape by establishing native grassland or exotic pastures in low lying areas whilst focusing on the re-introduction of pockets of woodland species across the benches consistent with endemic vegetation types. The objectives of this rehabilitation are to return a stable, natural looking landform and sustainable vegetation communities that are consistent with and enhance the surrounding landscape.

With regard to Daracon's approach to the design and planning of the Revised Project potential biodiversity impacts have been recognised and thoroughly considered throughout the project planning process and as described further in this section through the principles of avoid, mitigate and offset have been considered and addressed.

Whilst Daracon has strived to minimise impacts on biodiversity through the design process, not all impact could be avoided by the proposed design and a detailed assessment of the impacts was undertaken of the Revised Project. The Revised Project will require the disturbance of approximately 21 ha of native vegetation from within the 127 ha of the Project Area, as shown in **Figure 6.27**.

A summary of the key findings of the BAR is provided in this section including details of the key ecological values of the Project Area and the outcomes of the FBA process. The full BAR report is provided in **Appendix J**.

6.10.1 Methodology

An initial assessment of vegetation mapping by Sivertsen et al., (2011) and Somerville (2009) was undertaken to determine potential plant community type and boundaries within the Project Area and inform and provide a reference point for initial site investigations.

A foot traverse of the Project Area was undertaken which focused on inspection of all topographically distinct areas and areas of potentially different vegetation types. During the initial site traverse a map of the vegetation types present was generated with the aid of a hand-held GPS device which showed in 'real-time' the location of the surveyor in relation to a current Google satellite photograph. The initial map was then further refined during subsequent site visits. Observations were made of the dominant flora species present and further refinement of the site vegetation map was completed with the aid of a hand-held GPS Device and through air photograph interpretation, particularly for the dry rainforest vegetation and the areas dominated by Eucalyptus glaucina, due to the obvious changes in vegetation pattern and colour in the aerial imagery.

The identified Plant Community Types (PCTs) were subject to plot surveys in accordance with the FBA Methodology Stratification Requirements (NSW OEH 2014a). A detailed description of the plot surveys undertaken are provided in **Appendix J**. The classification of these communities was undertaken through analysis of the vegetation plot data collected from the Project Area and use of the NSW Bionet Vegetation Classification Tool. The threatened ecological community listings within the EPBC and BC Acts were reviewed to determine those with potential to occur within the site.

The vegetation of the Project Area was surveyed over multiple sampling periods ranging from 2014 to 2018. Flora surveys included floristic plots, targeted surveys and opportunistic surveys in order to accurately sample the vegetation communities and potentially occurring threatened flora species within the Project Area.

Targeted surveys for threatened flora species were undertaken in a 10 m wide belt transect search, in accordance with the NSW Guide to Surveying Threatened Plants (NSW OEH 2016) on 3 October 2018 and 9 October 2018. Additional targeted searches were undertaken during several site traverses throughout 2014 and 2015. For a detailed description with regards to the targeted surveys for threatened flora species refer to **Appendix J**.

Targeted surveys were completed for candidate 'species credit' threatened fauna in accordance with the Field Survey methods – Field survey methods for environmental consultants and surveyors when assessing proposed development or their activities on site containing threatened species (NSW DEC 2004a), Threatened Biodiversity Survey and Assessment: Guidelines for Developments and Activities (NSW DEC 2004b) and Threatened Species Survey and Assessment Guidelines: Field Survey Methods for Fauna – Amphibians (NSW DECC 2009). Fauna survey methods included a range of survey techniques including targeted searches, call playback, diurnal searches, spotlighting, baited infra-red camera survey and meandering transects. For more detail with regards to the targeted surveys for threatened fauna species refer to **Appendix J**.

Following completion of the field survey, the BioBanking Credit Calculator (BBCC) Version 4.0 was applied in accordance with FBA methodology (OEH 2014) to calculate the credit requirements for the Revised Project.

6.10.2 Project Disturbance Footprint

The Revised Project will require the disturbance of approximately 21 ha of native vegetation from within the approximate 127 ha of the Project Area as shown in **Table 6.48**. Processing operations will continue to be undertaken on disturbed areas within the processing area shown in **Figure 6.27**. No vegetation clearing is proposed within the existing processing area.

Table 6.48 Proposed Footprints

Site component	Area
Project Area	127 ha
Disturbance footprint	66 ha
Area of native vegetation within the proposed disturbance footprint	21 ha

6.10.3 Key Biodiversity Values

The following sections provide a summary of the key biodiversity values for the Project Area.

6.10.3.1 Native Vegetation

Four PCTs have been identified and mapped within the Project Area. These are:

- HU 816 Spotted Gum – Narrow-leaved Ironbark shrub-grass open forest of the Central and Lower Hunter
- HU 619 Slaty Red Gum grassy woodland on hinterland foothills of the southern North Coast
- HU 755 Whalebone Tree - Red Kamala dry subtropical rainforest of the lower Hunter
- HU 798 White Mahogany – Spotted Gum – Grey Myrtle semi mesic shrubby open forest of the central and lower Hunter Valley.

Figure 6.28 shows the vegetation communities mapped within the Project Area. The BAR (**Appendix J**) provides detailed descriptions of these communities.

Parts of some of the above PCTs were also identified as conforming to listed TECs. Three TECs listed under the BC Act and one TEC listed under the EPBC Act were recorded being:

- Central Hunter Valley Eucalypt Forest and Woodland Critically Endangered Ecological Community as listed within the EPBC Act
- Lower Hunter Spotted Gum Ironbark Forest in the Sydney Basin and NSW North Coast Bioregions as listed within the BC Act
- Central Hunter Ironbark-Spotted Gum-Grey Box Forest in the NSW North Coast and Sydney Basin Bioregions as listed within the BC Act
- Lower Hunter Valley Dry Rainforest in the Sydney Basin and NSW North Coast Bioregions as listed within the BC Act.

The distribution of the TECs is shown on **Figure 6.30**.

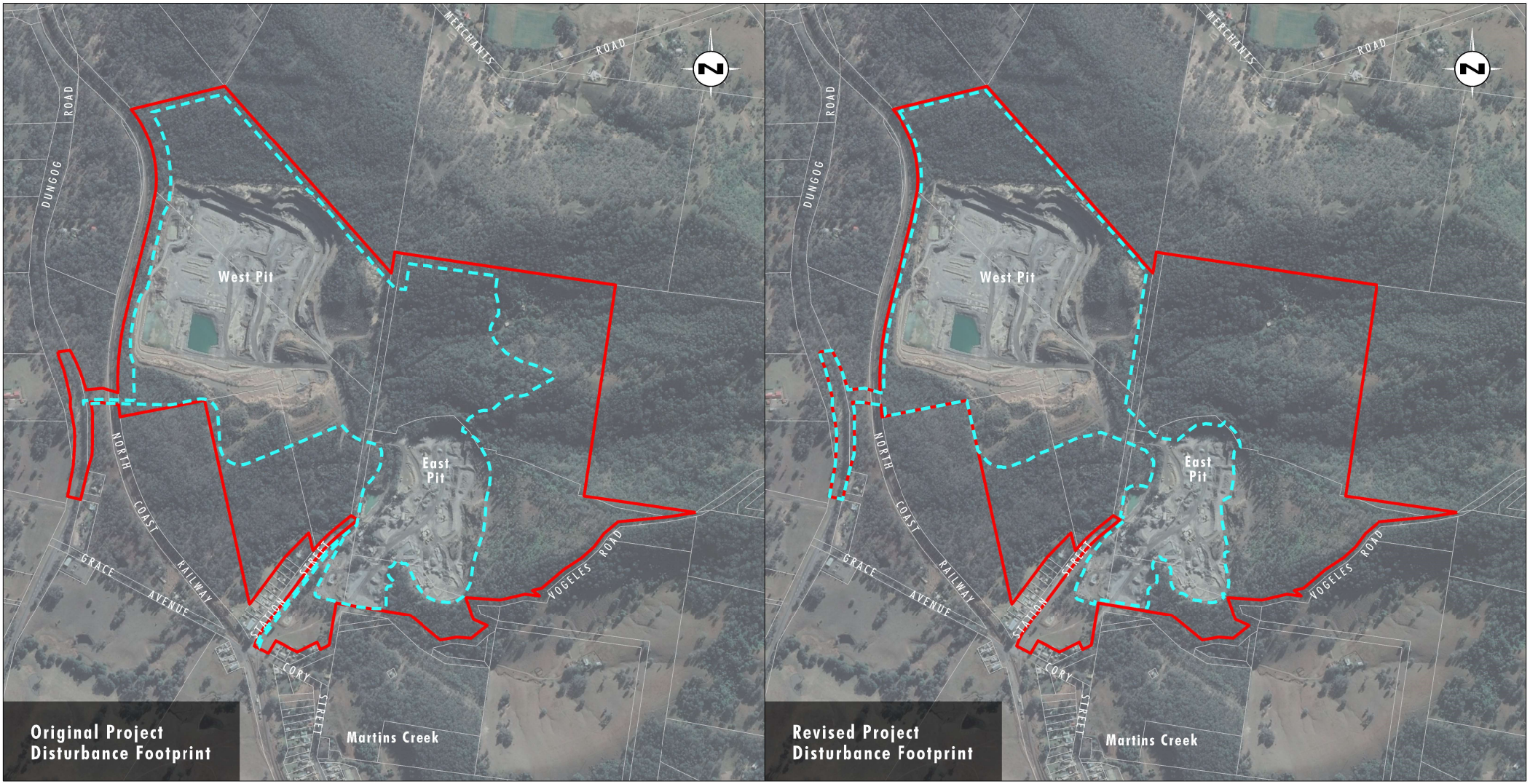


Image Source: Google Earth (2018)
Data Source: Daracon (2020)

0 250 500 750m
1:15 000

Legend
- Project Area
- Disturbance Area

FIGURE 6.27

Comparison of the Original Project's Disturbance Footprint to the Revised Project's Disturbance Footprint

File Name (A4): R01/3957_233.dgn
20140214 9.05

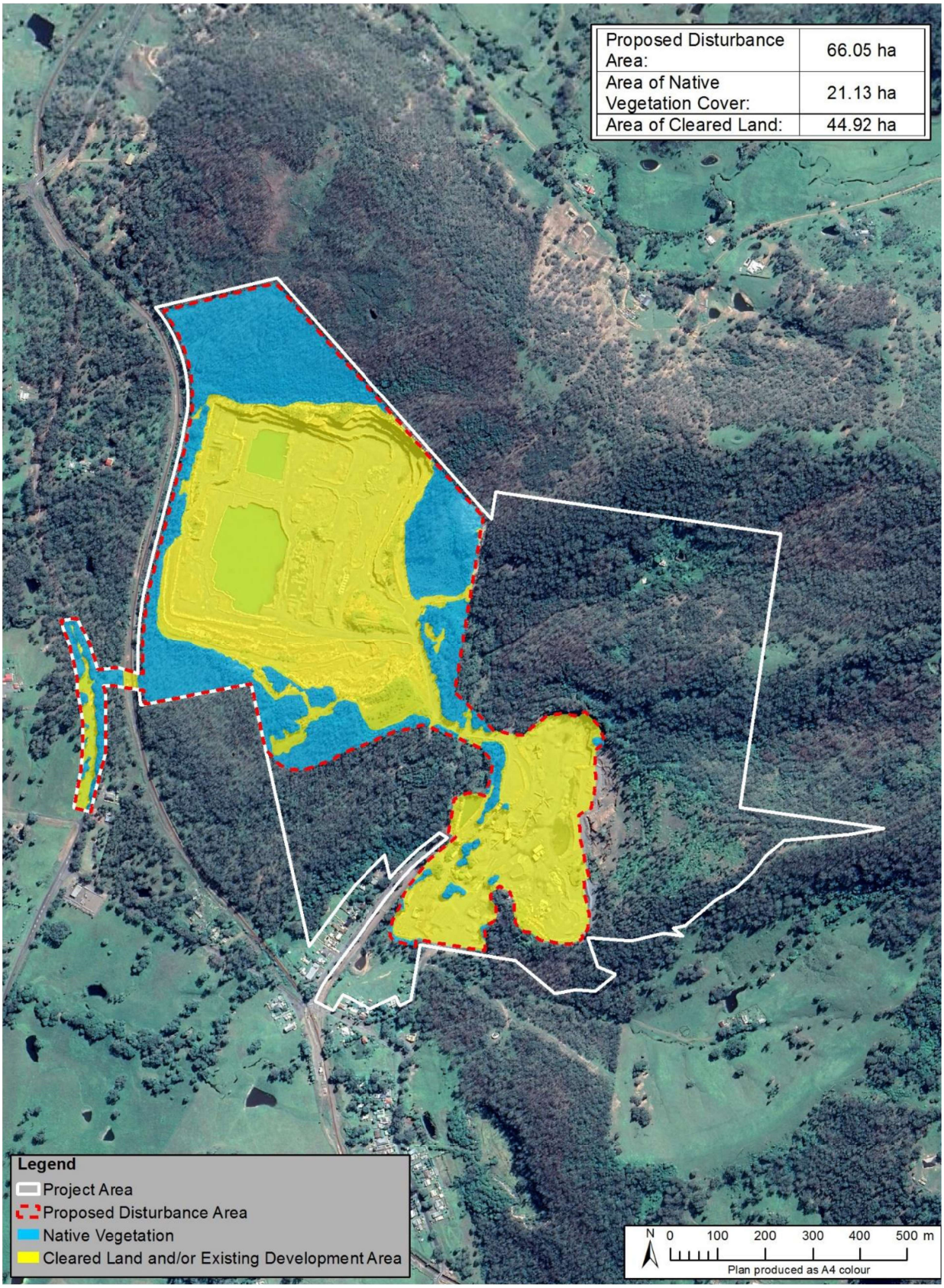


FIGURE 6.28

Native Vegetation Extent within Project Area

Image Source: Conacher Consulting's Biodiversity Assessment Report (2021)

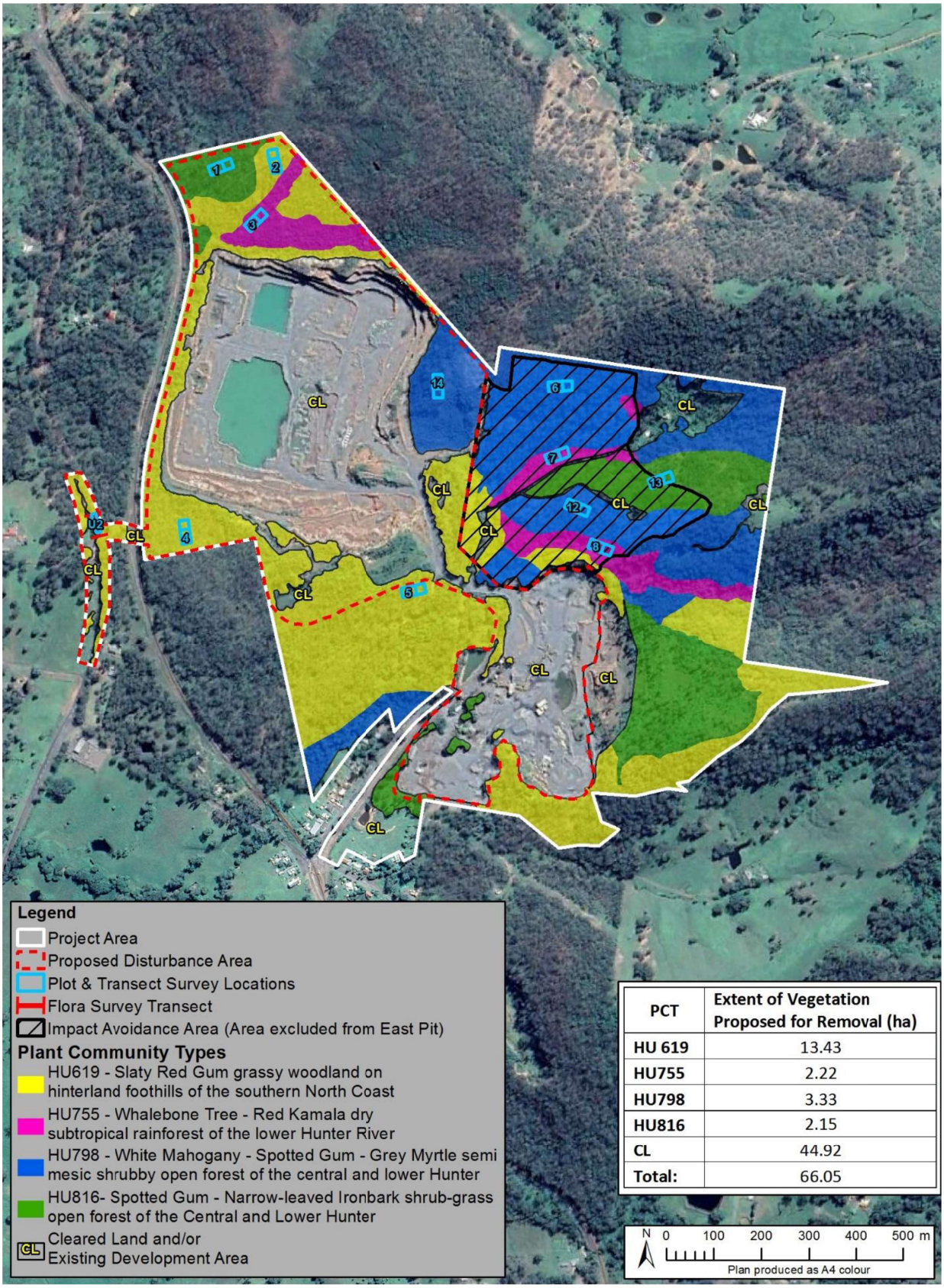


FIGURE 6.29

Plant Community Types within the Project Area

Image Source: Conacher Consulting's Biodiversity Assessment Report (2021)

File Name (A4): R01/3957_220.dgn
20150309 9.47

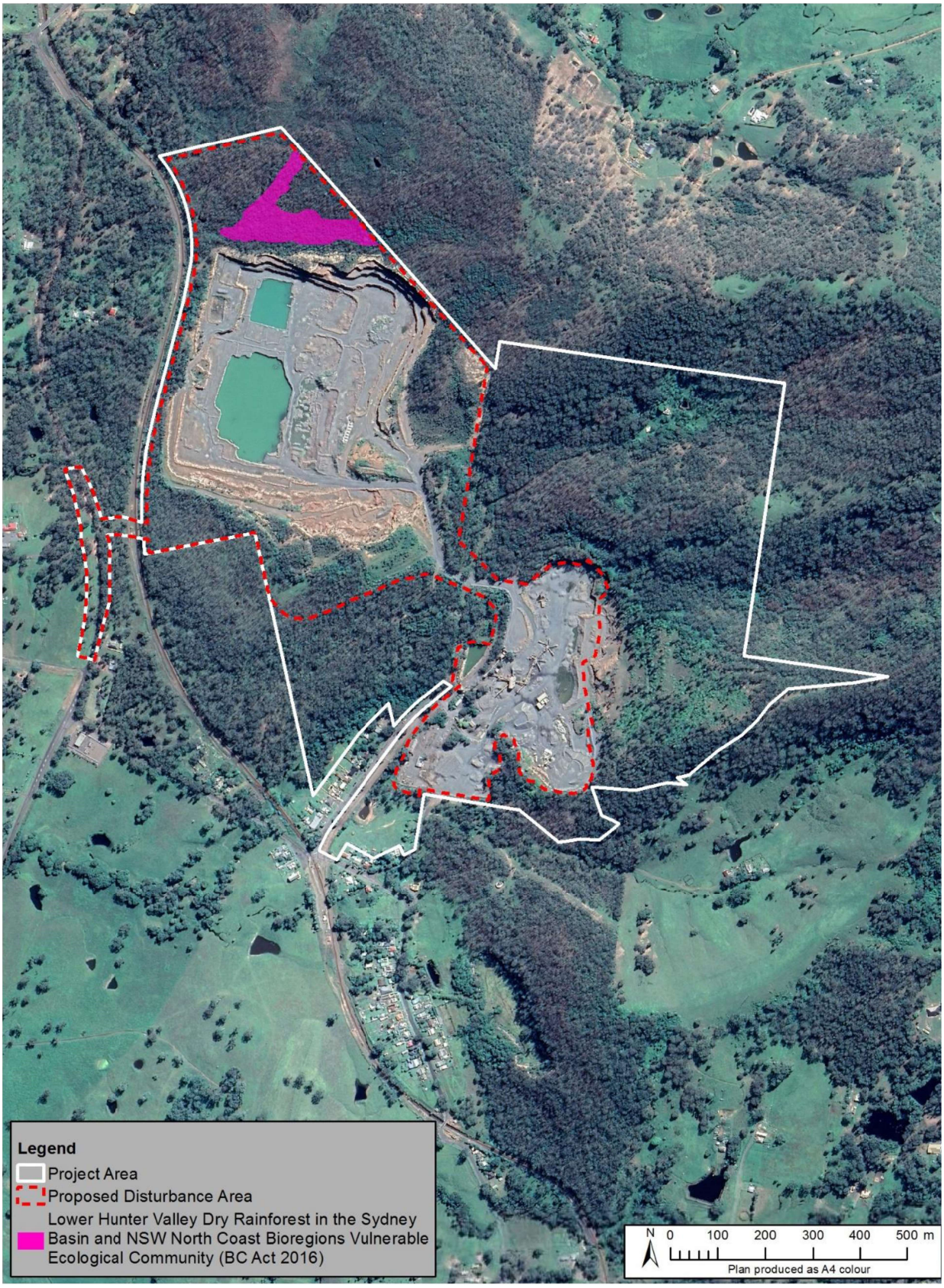


FIGURE 6.30

Threatened Ecological Communities within the Project Area

Image Source: Conacher Consulting's Biodiversity Assessment Report (2021)

File Name (A4): R01/3957_221.dgn
20150309 9.47

6.10.3.2 Threatened Flora and Fauna Species

The FBA methodology categorises species as either ecosystem-credit species or species-credit species which are defined as:

- **ecosystem-credit species** – species that can be reliably predicted to occur in PCTs and have a high likelihood of occurring on the Project Area. Therefore, targeted surveys for ecosystem-credit species are not required
- **species-credit species** – species that cannot be reliably predicted based on a PCT, distribution or habitat criteria. These species require targeted survey effort to determine their presence or otherwise on the site.

All non-threatened species and some threatened species are ecosystem species and therefore do not require further specific assessment under the FBA methodology. The remaining threatened species are species-credit species and require further assessment and, where relevant, the calculation of impact species-credits under the FBA methodology.

Ecosystem Credit Threatened Species

The following ecosystem credit threatened fauna were observed within or adjoining the Project Area during surveys:

- Little Lorikeet (*Glossopsitta pusilla*)
- Speckled Warbler (*Pyrrholaemus sagittatus*)
- Varied Sittella (*Daphoenositta chrysoptera*)
- Powerful Owl (*Ninox strenua*)
- Squirrel Glider (*Petaurus norfolcensis*)
- Grey-headed Flying-fox (*Pteropus poliocephalus*) (ecosystem credit for foraging habitat)
- Yellow-bellied Sheathtail-bat (*Saccolaimus flaviventris*)
- Eastern Coastal Free-tailed Bat (*Micronomus norfolkensis*)
- Little Bent-winged Bat (*Miniopterus australis*)
- Large Bent-winged Bat (*Miniopterus orianae oceanensis*)
- Greater Broad-nosed Bat (*Scoteanax rueppellii*) (previous surveys only)
- Southern Myotis (*Myotis macropus*) (ecosystem credit for foraging habitat).

Species Credit Threatened Species

The following species credit threatened species were recorded in the Project Area during surveys undertaken for this assessment:

- Slaty Red Gum (*Eucalyptus glaucina*) – 2887 individuals
- Brush-Tailed Phascogale (*Phascogale tapoatafa*) – species habitat polygon – 21 ha
- Southern Myotis (*Myotis macropus*) – species habitat polygon – 13.80 ha

- Koala (*Phascolarctos cinereus*) – species habitat polygon – 21 ha.

A range of other threatened species were predicted to occur by the BBCC and were therefore also considered in the assessment.

EPBC Act Listed Migratory Species

The following migratory species listed under the EPBC Act were observed within the Project Area during surveys:

- Rufous Fantail (*Rhipidura rufifrons*)
- Black-faced Monarch (*Monarcha melanopsis*).

These species were observed during summer surveys within the drainage lines which run through the eastern parts of the Project Area. Commonwealth listed species are discussed in further detail in **Section 7.0**.

6.10.4 Avoidance and Mitigation Measures

6.10.4.1 Avoidance

During the design of the Revised Project, alternative quarrying options have been considered in order to minimise the environmental impacts associated with the Revised Project whilst maximising the economic resource recovery. Key elements of the Revised Project have been designed to ameliorate the impacts on significant biodiversity features, such as threatened species, endangered populations, TECs and their habitats. The approach was to avoid biodiversity impacts where practicable and maximise use of existing disturbed areas. It is noted that avoidance can be challenging for resource projects as by necessity the resource extraction occurs where the resource is and this limits the ability to 'move' an impact, whereas there is more ability to relocate infrastructure or other project components.

These design decisions reduced the overall impact of the Revised Project on matters of biodiversity significance. The proposed disturbance footprint of the Revised Project largely avoids the highest quality remnant forest and woodland occurring on the eastern part of the Project Area.

The design changes implemented for the Revised Project (as outlined in **Section 1.6**) that ameliorated the impacts of the Revised Project on significant biodiversity features have resulted in the following:

- a reduction in disturbance of native vegetation through the refinement of the project footprint - approximately 15.3 ha of undisturbed vegetation in the former East Pit (Lot 21 DP 773220) is no longer proposed to be disturbed as part of this application
- relocation of arboreal fauna in hollow bearing trees to adjoining habitat areas prior to clearing
- avoidance of impacts on three groupings of scrub turpentine (*Rhodamnia rubescens*) trees.

6.10.4.2 Mitigation Measures

Daracon will prepare and implement a Biodiversity and Rehabilitation Management Plan (BRMP) in consultation with BCD and DSC, should the Revised Project be approved. The BRMP will:

- describe the short, medium, and long-term measures to be undertaken to:
    - implement the BOS, including how impacted species under the EPBC Act would be suitably offset

- retain and manage the remnant vegetation and fauna habitat on the site
- ensure compliance with the rehabilitation objectives

- include detailed performance and completion criteria for evaluating the performance of the rehabilitation of the site, including triggers for remedial action, where these performance or completion criteria are not met
- include a detailed description of the measures to be implemented on the site to:
  - minimise impacts on fauna, including undertaking pre-clearance surveys
  - supervision of clearing works to be undertaken by a qualified and experienced ecologist
  - manage potential indirect impacts on threatened plant and animal species
  - minimise the amount of clearing within the approved disturbance area where reasonable and feasible
  - protect vegetation and fauna habitat outside the approved disturbance area
  - control weeds and feral pests, with consideration of actions identified in relevant threat abatement plans
  - control erosion
  - control unrestricted access
  - progressively rehabilitate the site and minimise disturbance areas
- include a seasonally-based program to monitor and report on the effectiveness of the above measures, progress against the detailed performance and completion criteria, and any progressive improvements that could be implemented to improve biodiversity outcomes
- monitor and report on the impacts of the development on groundwater dependent ecosystems and riparian vegetation, and identify trigger levels for the remediation of any material impacts to these ecosystems
- identify the potential risks to the successful implementation of the final rehabilitation, and include a description of the contingency measures to be implemented to mitigate against these risks
- include details of who would be responsible for monitoring, reviewing, and implementing the plan.

6.10.5 Assessment of Biodiversity Impacts

The construction and operation of the Revised Project will result in a range of direct impacts on biodiversity values within the proposed disturbance footprint of the Revised Project. Direct impacts include loss of native vegetation and fauna habitats, habitat fragmentation or isolation, altered hydrology regimes and the potential incremental decline in quality and extend of habitat as a result of clearing works and works associated with the construction and operation of the Revised Project. **Table 6.49** outlines the impacts of the Revised Project on vegetation communities and the biodiversity credit required to be offset to counterbalance this impact.

Some minor indirect impacts associated with deterioration in water quality, dust, noise and vibration, decline in genetic diversity, weeds and feral animals may occur during the construction and operational phases, however, once the proposed rehabilitation has become established, the long-term connectivity of the area will be improved. These indirect impacts will be similar to those experienced with the historic and more recent operations at the quarry and will therefore not substantially change with the Revised Project. Mitigation measures for indirect impacts are summarised in **Section 6.10.4.2** with a full description in the BAR (**Appendix J**). These include feral animal and weed control, control systems for noise, dust, lighting and blasting, restriction of access and vegetation clearing procedures.

Table 6.49 Direct Impacts of the Revised Project on Native Biodiversity Features

Ecological Feature	Extent within Development Footprint (ha)	Number of Impact Credits Generated
Plant Community Type		
HU 619 Slaty Red Gum grassy woodland on hinterland foothills of the southern North Coast	13.43	830
HU 755 Whalebone Tree - Red Kamala dry subtropical rainforest of the lower Hunter	2.22	166
HU 798 White Mahogany – Spotted Gum – Grey Myrtle semi mesic shrubby open forest of the central and lower Hunter Valley	3.33	249
HU 816 Spotted Gum – Narrow-leaved Ironbark shrub-grass open forest of the Central and Lower Hunter	2.15	166
Species-credit Threatened Species		
***Eucalyptus glaucina* (Slaty Red Gum)**	2887 individuals over 13.43 ha	40,418
***Myotis macropus* (Southern Myotis)**	13.80	304
***Phascogale tapoatafa* (Brush-tailed Phascogale)**	21.13	423
***Phascolarctos cinereus* (Koala)**	21.13	549

The biodiversity impacts of the Revised Project will be offset in accordance with the requirements of the FBA and the EPBC Act Environmental Offsets Policy, as discussed in **Section 6.10.7**.

6.10.6 Matters of National Environmental Significance

On 21 July 2016 the then DoEE (now DAWE) has determined that the proposed action is likely to have a significant impact on:

- Slaty Red Gum (*Eucalyptus glaucina*) – Vulnerable
- Koala (*Phascolarctos cinereus*) combined populations of Qld, NSW and the ACT – Vulnerable
- Regent Honeyeater (*Anthochaera phrygia*) – Critically Endangered
- Swift Parrot (*Lathamus discolour*) – Critically Endangered
- Spot-tailed Quoll (*Dasyurus maculatus maculatus*) SE mainland population – Endangered
- Hunter Estuary Wetlands – a wetland of international importance (Ramsar wetland).

DAWE further required that evidence be provided of why other EPBC Act listed threatened species and communities likely to be located in the Project Area or in the vicinity will not be significantly impacted in accordance with the Matters of National Environmental Significance - Significant Impact Guidelines 1.1 EPBC Act (Significant Impact Guidelines).

A protected matters search (DAWE 2020) has been completed as part of the BAR undertaken by Conacher (2021) for nationally listed threatened species and ecological communities within 5 km of the Project Area. The species identified from the search are further assessed for potential occurrence in Table 8.1 of the BAR (refer to **Appendix J**) as discussed in **Section 7.0**.

Potential impacts on the MNES are discussed in **Section 7.0** and **Appendix J** in accordance with the DAWE assessment requirements.

6.10.7 Biodiversity Offset Strategy

Daracon is committed to delivering a BOS that appropriately compensates for the unavoidable loss of ecological values as a result of the Revised Project.

The BOS, included in **Appendix J**, has been prepared in accordance with the Stage 3 requirements of the FBA (NSW OEH 2014a), the Biobanking Assessment Methodology (BAM) (NSW OEH 2014b) and the NSW Biodiversity Offsets Policy for Major Projects (NSW OEH 2014c). The BOS will be further developed in consultation with the BCD and DPIE and based on the credits required to be retired to offset the impacts of the Revised Project as specified in the BAR and the offset options available under the BC Act:

- land based offsets (determined in accordance with the BAR and the offset rules in the BC Regulation) through the establishment of new Stewardship Sites
- purchasing credits from the market, and/or
- paying into the Biodiversity Conservation Fund.

Calculated biodiversity credit requirements of the Revised Project have been identified as:

- 1,411 ecosystem credits for four native plant community types
- 40,418 *Eucalyptus glaucina* (Slaty Red Gum) credits
- 304 *Myotis macropus* (southern myotis) credits
- 423 *Phascogale tapoatafa* (brush-tailed phascogale) credits
- 549 *Phascolarctos cinereus* (Koala) credits.

As outlined in **Section 6.10.4.2**, a BRMP will be prepared as part of the implementation of the Revised Project, in accordance with the requirements of BAM (NSW OEH 2016)

6.11 Historic Heritage

Niche Environment and Heritage prepared a Historical Heritage Assessment (HHA) as part of the 2016 EIS to identify and assess potential heritage impacts associated with the Original Project's proposed quarrying operations. The HHA concluded that there would be no impact on the heritage significance of the local heritage item, being the Martins Creek Quarry (Item I07 on the Dungog LEP 2014), as the significance of the quarry is assessed as restricted to local historical heritage values; the original extent and historical setting of the quarry has largely been lost through continuous use and expansion of the site; and the proposed development that will be carried out on the part of the allotment containing the local heritage item will only consist of low impact exploration activities. The HHA recommended that no further historical heritage assessment was necessary prior to the commencement of extraction and exploration works.

During the exhibition of the EIS, a number of agencies have requested additional investigation to assess the potential heritage impacts associated with the proposed haulage route, particularly relating to heritage values in Paterson and Bolwarra. Accordingly, a Heritage Impact Statement (HIS) (**Appendix K**) has been prepared by Umwelt as part of the ADA process to assess the potential heritage impacts associated with the Revised Project's primary haulage route, in particular:

- potential vibration impacts (if any) of the proposed number and frequency of trucks on the structural integrity of listed heritage items
- potential impacts to the significance of the conservation area as a result of the number and frequency of trucks travelling through a conservation area
- the impacts of proposed intersection and bridge approach upgrade works on the curtilage and significance of listed items and any conservation areas.

The scope of the HIS is limited to the above specifically to respond to the request for additional assessment contained within the submissions received from DSC, DPIE, Heritage NSW and the Paterson Progress Association (PPA).

The HHA prepared by Niche Environment and Heritage to support the EIS (Monteath & Powys, 2016) addressed all non-haulage route components of the Original Project to the satisfaction of the DPIE and other relevant government agencies.

6.11.1 Historical Context

The Revised Project's primary haulage route is proposed between East Maitland in the south and the quarry in the north, traversing the LGAs of Dungog and Maitland (refer to **Figure 6.31**). The route extends through the suburbs of East Maitland, Bolwarra Heights, Mindaribba, Paterson and Martins Creek.

As shown on **Figure 6.31**, the primary haulage route extends through two heritage conservation areas (HCAs), being the Paterson Village HCA, as defined under the Dungog LEP 2014 and the Bolwarra HCA as defined under the Maitland LEP 2011, and passing in the vicinity of four State listed and 61 locally listed sites.

It is noted that many of the listed sites are not in immediate proximity to the proposed haulage route, however, they have been identified and included for discussion to provide context to the local heritage setting.

The established significance of the two HCAs, along with the details of the State and locally listed sites are outlined in Section 3.0 of the HIS (**Appendix K**).

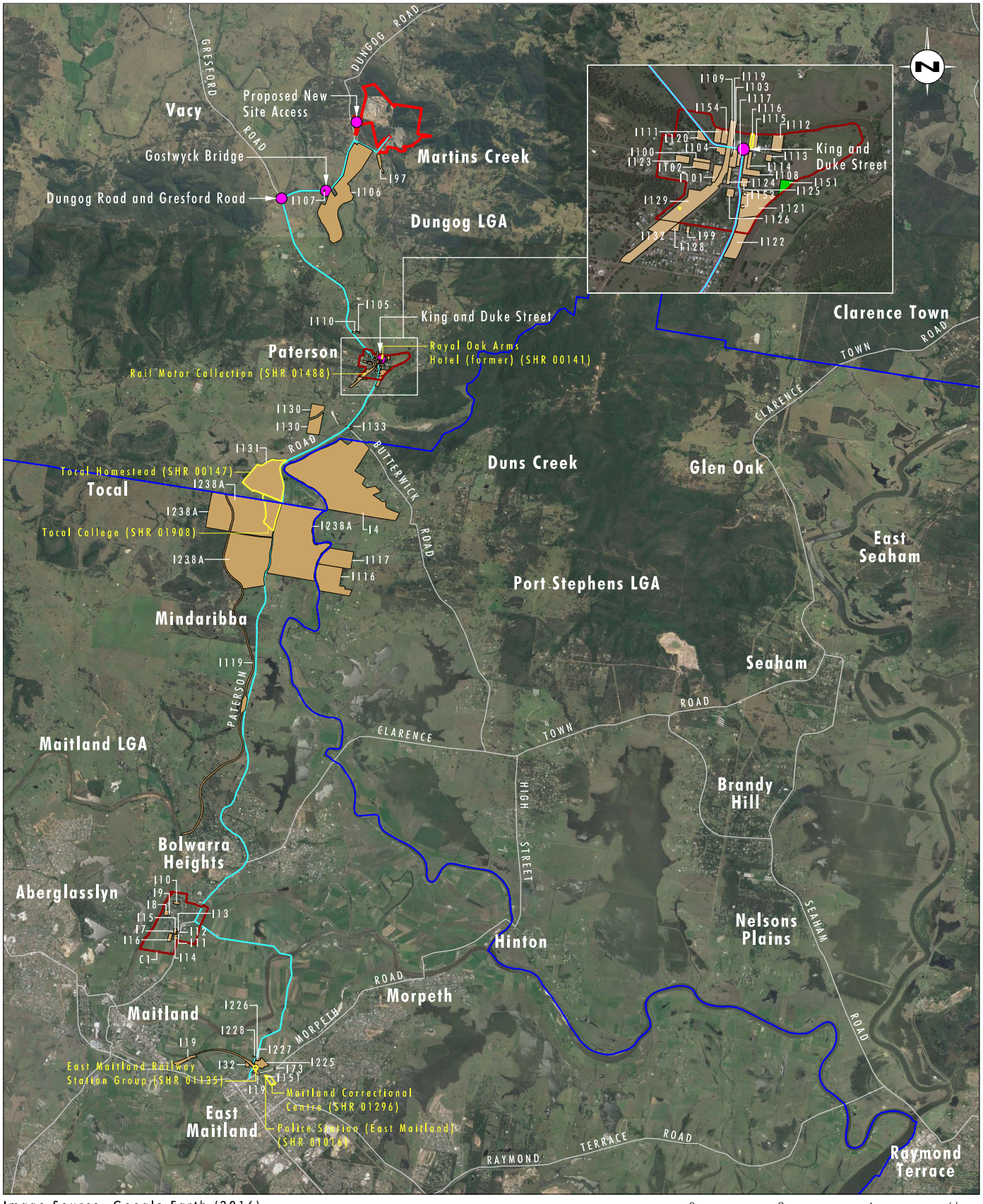


Image Source: Google Earth (2016)

0 2 4 6km

1:120 000

Legend

- Project Area
- Haulage Route
- Local Government Area (LGA)
- Item - General
- Item Archaeological
- Conservation Area - General
- State Heritage Site
- Proposed Intersection/Bridge Approach Upgrade

FIGURE 6.31

Proposed Haulage Route and Listed Heritage Items

File Name (A4): R01/3957_222.dgn
20210526 10.05

6.11.2 Proposed Activities and Potential Impacts

The only physical works proposed as part of the haulage route that will occur in association with a heritage item or area are within the Paterson HCA, at the intersection of King and Duke Street, and road upgrade works proposed in the vicinity of the Gostwyck Bridge (Item ID107 on the Dungog LEP 2014 and listed on Roads and Maritime's s170 Heritage and Conservation Register). No physical works are proposed within or in the vicinity of the listed curtilage of any other listed items, including the Bolwarra HCA, being either State or locally listed items.

The Revised Project has the potential to impact on the Paterson HCA and the locally listed Gostwyck Bridge due to the proximity of proposed road works to occur in association with these heritage items or sites.

In addition, the proposed increase of truck movements associated with the Revised Project has the potential to impact on the Gostwyck Bridge.

Vibration due to construction works and modified traffic levels could potentially impact on local buildings of heritage significance.

6.11.3 Assessment of Impacts

6.11.3.1 Paterson HCA

The proposed works at the King/Dyke Street intersection (refer to **Section 2.8.2**) will be at-grade, or close to at-grade, meaning that they will not be readily visible within general views to or within the Paterson HCA or individually listed heritage items.

Existing kerbs, gutters and footpaths are contemporary and their re-alignment and reconstruction in a like-for-like manner will not result in any adverse visual impacts to the existing aesthetic significance or general visual presentation of the HCA or listed heritage items located therein.

All physical works will be undertaken in association with contemporary fabric of no identified heritage significance.

6.11.3.2 Gostwyck Bridge

A detailed assessment of the structural condition of the bridge, undertaken by Focus Bridge Engineering (FBE) (FBE, 2020) found that the Gostwyck Bridge has adequate capacity to accommodate the proposed truck movements. The assessment concluded that there would be no need for additional improvement works to the bridge as a result of the Revised Project, beyond the regular inspections and maintenance regimes planned and implemented by TfNSW (FBE, 2020).

In addition, the physical works associated with the approach upgrade (refer to **Section 2.8.2**) will not occur within the listed curtilage for this item and will therefore not result in any physical impacts to this item. Furthermore, these works would maintain and improve the existing visual presentation of the eastern approach to the bridge.

As such, there are no identified impacts to Gostwyck Bridge as a result of the Revised Project.

6.11.3.3 Assessment of Impacts Caused by Vibration

Vibration impacts generally only arise when a heavy vehicle hits a pothole, speed bump or other irregularity at speed and the energy from the impact is then transferred through the ground to adjoining buildings.

The areas where truck movements associated with the Revised Project are in proximity to heritage buildings is the Paterson HCA. The road surface within the Paterson HCA is a bitumen pavement and, when properly maintained, does not contain irregulates that would induce significant vibration impacts. A review of the Vibration Guidelines and academic studies (for example Basekar et al, 2015) indicate that vibration impacts from trucks under any conditions on bitumen roads is unlikely to cause structure damage to heritage buildings but can have cosmetic effects in extreme cases. The key factor in determining vibration impacts is irregular road surfaces (e.g. cobbles, corrugations or potholes) and the speed of the vehicle (see for example Crispino 2001).

Since the original application, Daracon have committed to reduced truck numbers per hour and a speed limit for trucks driving through the King and Duke Street intersection, in Paterson.

Consistent with the findings of academic studies, the Vibration Guidelines recommend:

> *Mitigation techniques could therefore include the restriction of use of heavy vehicles on particular roads, limiting speed and reducing the occurrence of surface irregularities such as potholes and speed humps.*

As recommended in **Section 6.11.4,** Daracon will include a requirement in the Driver Code of Conduct to report any substantial road pavement irregularities in Paterson, with these reports being passed on the DSC for attention. Directions will also be given to drivers alerting them of any identified road irregularities to enable them to minimise speeds where these occur when driving through Paterson. It is noted that these instructions are also consistent with good operating practice as it reduces wear and tear on vehicles and improves vehicle safety and driver comfort.

Furthermore, Daracon have also committed to reducing truck speeds through Paterson to 40km/hr, with further reduction to 20 to 25km/hr around the King and Duke Street intersection.

The combination of reduced truck speeds and appropriate road maintenance is consistent with the recommendations in the Vibration Guidelines.

Adverse impacts on heritage items in Paterson HCA associated with traffic induced vibration are considered to be unlikely given the controls to be implemented by Daracon (refer to **Section 6.11.4**) and the financial contributions towards road maintenance.

6.11.3.4 Conclusion

The HIS concluded that it is unlikely that the proposed intersection works within the Paterson HCA will result in any adverse visual or physical impacts to the heritage significance of this HCA or individually listed heritage items. In addition, there are no identified impacts to the listed Gostwyck Bridge as a result of the proposed bridge approach works.

The implementation of mitigation measures outlined in **Section 6.11.4** is expected to prevent any impacts on heritage values (including minor cosmetic damage) associated with quarry truck movements.

6.11.4 Mitigation Measures

The following mitigation measures are proposed as part the Revised Project to minimise historic heritage related impacts:

- Daracon committed to contribute to road maintenance costs associated with truck haulage and these funds will enable DSC to ensure road conditions within Paterson are appropriately maintained.

- Insertion of a requirement in the Driver Code of Conduct to report any substantial road pavement irregularities in Paterson, with these reports being passed on the DSC for attention.

- Directions to be given to drivers alerting them of any identified road irregularities to enable them to minimise speeds where these occur when driving through Paterson.

- Daracon committed to reducing truck speeds through Paterson to 40 km/hr, with further reduction to 20 – 25 km/hr around the King and Duke Street intersection.

- All kerb and other road infrastructure to be reinstated following the proposed works within the Paterson Village HCA to replicate that removed to allow for the King and Duke Street intersection works.

6.12 Aboriginal Cultural Heritage

Daracon and Umwelt would like to acknowledge the Traditional Owners of the Martins Creek Quarry Project Area – the Wonnarua people and Worimi people – and pay respect to their cultural heritage, beliefs and continuing relationship with the land.

We pay respect to the Elders, both past and present, for they hold the memories, traditions, culture and hopes of Aboriginal people in the area.

The quarry Project Area is located within the traditional country of the Wonnarua (sometimes spelt Wanaruah) people and Worimi people, whose history extends from the present day back many thousands of years. The Project Area is also within the modern-day Native Title registered claim of the Plains Clans of the Wonnarua People and is also within the Mindaribba Local Aboriginal Land Council (MLALC) boundary.

An Aboriginal Cultural Heritage Assessment Report (ACHAR) was prepared by Niche Environmental and Heritage (Niche) in support of the EIS (Monteath & Powys, 2016) for the Original Project, in consultation with the Registered Aboriginal Parties (RAPs) and Knowledge Holder groups to assess the Aboriginal cultural heritage values of the Project Area and surrounds. This assessment included background investigations, consultation with Aboriginal stakeholders, and a cultural heritage survey conducted with Aboriginal stakeholders.

This section provides a summary of the findings of the ACHAR (Niche, 2016) that considered the likely impacts on the Aboriginal heritage (cultural and archaeological), in accordance with the SEARs. Based on the findings of the ACHAR (summarised in **Section 6.12.4**) the assessment concluded that the quarry is located in an area of low Aboriginal archaeological potential and the proposed expansion of the quarry is unlikely to harm any known Aboriginal objects or cultural heritage values. Further the OEH recommended no further assessment was required, following review of the Original EIS.

6.12.1 Local Aboriginal History

The ACHAR describes that, before European settlement, the Dungog LGA was occupied by a sub-group of the Wonnarua people known as the Gringai who lived in the areas of Paterson and Gresford (Niche, 2016).

Some observations of the traditional way of life of Aboriginal people in the area have been recorded by early colonial settlers to the district. R.E Anderson noted of Martins Creek that the first European family to settle there in 1851 had Aboriginals as their only neighbours. They traded bread clothing and flour for honey (Koettig, 1988).

Aboriginal people lost their homes and hunting grounds from the 1830's onward, as European population increased and spread through the county side. The local Aboriginal population dwindled to almost zero by the turn of the century.

To this day, the Wonnarua and Worimi people continue to live in the area. They maintain a strong and active interest in their cultural heritage through participation in the development process, education and community development.

The Worimi Local Aboriginal Land Council was established in 1984, and the Wonnarua Nation Aboriginal Corporation was established in 1999.

6.12.2 Previously Recorded Items

Searches undertaken as part of the AHCAR (Niche, 2016) include:

- National Heritage Registers - no heritage listings relevant to the Project Area were identified
- NSW State Heritage Register - no Aboriginal heritage sites listed on the register were relevant to the Project Area
- State Heritage and Conservation (s.170) Registers - no Aboriginal heritage sites listed on the register were relevant to the Project Area
- Dungog LEP - no Aboriginal heritage sites listed in the plan were relevant to the Project Area
- National Parks and Wildlife Act Registers (AHIMS) – the database identified three Aboriginal objects within the original proposed extraction area (shown on **Figure 6.32**), namely #38-4-0214 comprising an isolated artefact, #38-4-0217 and #38-4-0218 both comprising one scarred tree. Two Aboriginal objects (AHIMS38-4-0213 and #38-4-0215) (shown on **Figure 6.32**) were identified near the proposed new access road that connects the main haul road and Dungog Road.



Image Source: Google Earth (2018)
Data Source: Daracon (2020), Niche (2016)

0 250 500 750m
1:15 000

Legend

- Project Area
- Proposed Disturbance Area
- Isolated Find
- Open Camp Site
- PAD
- Scarred Tree

FIGURE 6.32

Location of AHIMS Sites

File Name (A4): R01/3957_223.dgn
20201120 16.17

6.12.3 Previous Survey Results

During the field survey conducted for as part of the ACHAR, Item 38-4-0217 was located and determined not to be a culturally modified tree, and hence not an Aboriginal object under the NPW Act. An arborist report was undertaken for Item 38-4-0217 that concurred the findings in the ACHAR (Abacus Tree Services, 2016). Subsequently, a submission was made to the then OEH requesting the AHIMS records be amended. On 16 June 2016, OEH confirmed that the site card entry #38-4-0217 has been updated to "not a site".

Item 38-4-0218 could not be located during the field survey and it was concluded that it no longer exists. A Site Impact Recording Form was submitted to OEH and the AHIMS register has since been amended to identify the site as 'destroyed'.

The ACHAR also identified Items 38-4-0213; 38-4-0214 and 38-4-0215 as inside the boundaries of the quarry, shown on **Figure 6.32**. Item 38-4-0214 could not be found during the field survey and due to the complete loss of topsoil at the site at the listed location, it was determined that the site has low archaeological potential. Items 38-4-0213 and 38-4-0215 were found to be in the Project Area boundary near the proposed new access road.

6.12.4 Summary of ACHAR Findings

The ACHAR concluded that the quarry is in an area of low Aboriginal archaeological potential and the proposed expansion of the quarry is unlikely to harm any known Aboriginal objects or cultural heritage values.

While the assessment found that the expansion of the quarry as proposed by the Original Project would harm Aboriginal object AHIMS #38-4-0214, the site could not be re-located during the field survey and the listed isolated artefact could not be found. Site 38-4-0214 was located on highly disturbed land and it was highly unlikely that artefacts survived in sub-surface deposits due to the lack of soil observed in the area.

Aboriginal objects AHIMS #38-4-0213 and #38-4-0215 are approximately 2.7 km from the new access road (**Figure 6.32**) and outside the proposed disturbance footprint for the Revised Project.

6.12.5 Aboriginal Cultural Heritage Management Measures

Within 12 months of an approval, an Aboriginal Cultural Heritage Management Plan (ACHMP) will be prepared for the quarry in consultation with Heritage NSW and RAPs, should the Revised Project be approved. The ACHMP will describe the measures to:

- ensure all workers receive suitable Aboriginal cultural heritage inductions prior to carrying out any activities which may cause impacts to Aboriginal objects or Aboriginal places
- protect, monitor and/or manage identified Aboriginal objects
- protect Aboriginal objects located outside the disturbance area from impacts of the development
- manage the discovery of human remains and any new Aboriginal objects or Aboriginal places, including detailed provisions for burials, over the life of the development.

In addition, the RAPs will be consulted and further survey completed, to inform any further mitigation measures required as part of the final design and construction process for the new access road, prior to the commencement of clearing of land (initial ground works).

In the unlikely event that suspected human remains are encountered during construction, all work in the area that may cause further impact, must cease immediately and:

- the location, including a 20 m curtilage, should be secured using barrier fencing to avoid further harm
- the NSW Police must be contacted immediately
- no further action is to be undertaken until the NSW Police provide written notification to Daracon
- if the skeletal remains are identified as Aboriginal, Daracon or their agent must notify the Heritage NSW, RAPs and cease works in the area.

6.13 Social Impact

A comprehensive SIA of the Revised Project has been undertaken by Umwelt to identify, assess, manage potential negative impacts and enhance positive social impacts associated with the Revised Project on local and neighbouring communities. SIA is an approach to predicting and assessing the likely consequences of a proposed action in social terms and developing options and opportunities to improve social outcomes. Best practice SIA is participatory and involves understanding impacts from the perspectives of those involved in a personal, community, social or cultural sense, to provide a complete picture of potential impacts, their context and meaning.

The SIA has been prepared in accordance with the requirements of DPE's *Social impact assessment guideline for State significant mining, petroleum production and extractive industry development* (DPE, 2017) (the SIA Guideline), in accordance with the SEARs (dated 4 August 2016) and in response to government agency and community submissions during the exhibition of the EIS (refer to **Part B, Sections 12.0** to **14.0**). The SIA is also consistent with the *Social Impact Assessment: Guidance for assessing and managing the Social Impacts of projects International Association for Impact Assessment* (International Association for Impact Assessment, 2015).

As discussed in **Sections 5.1** and **5.4**, engagement with the community has been a key component of the SIA program, at key phases of the assessment, to afford a participatory approach, and has involved proximal landholders and local and regional stakeholders in the scoping of project issues and identification of strategies to address (negative) and enhance (positive) project impacts. This engagement has been guided by a comprehensive stakeholder engagement program, involving consultation with a broad range of stakeholders for the Revised Project ADA and SIA (as outlined in **Section 5.2**).

Given the established presence of the quarry in the community, key community issues that have been raised historically include concerns regarding traffic and transport including the use of trucks to transport quarry product, noise, air quality, blasting, biodiversity and rehabilitation, social amenity as well public health and wellbeing. The design of the Revised Project included consideration of these previously raised issues as part of the project planning and assessment process.

Daracon have committed to put in place a range of strategies, management and mitigation measures to address these key issues. A summary of the key findings of the SIA is provided in this section and the full report is provided in **Appendix O**.

6.13.1 Methodology

SIA is an approach to predicting and assessing the likely consequences of a proposed action in social terms and developing options and opportunities to improve social outcomes. Best practice SIA is participatory and involves understanding impacts from the perspectives of those involved in a personal, community, social or cultural sense, to provide a complete picture of potential impacts, their context and meaning.

A best practice approach to SIA has been adopted for the Revised Project, that integrates international and NSW SIA guideline requirements. The SIA has involved key phases of work that include:

- **Preparatory Planning** - undertaking appropriate planning for the Revised Project with the review of submissions made on the EIS for the Original Project and the development of a stakeholder engagement strategy to inform the preparation of the SIA.
- **Profiling** - defining the baseline social context in which the Revised Project is based.
- **Scoping** - identifying key social impacts/issues relevant to the Revised Project.
- **Assessment and Prediction of Impacts** - evaluating and predicting positive and negative social impacts.
- **Strategy Development** - identifying strategies to minimise negative impacts and enhance positive impacts associated with the Revised Project.
- **Monitoring and Evaluation** – development of a framework outlining how social impacts should be monitored and evaluated should the Revised Project proceed.

Engagement with the community has also been undertaken at key phases of the SIA, to afford a participatory approach to assessment and the involvement of the community and other local and regional stakeholders in the clarification and confirmation of issues and concerns and in the identification of strategies to address negative and enhance positive impacts relating to the Revised Project.

As part of preparing a SIA for the Revised Project, a wide range of stakeholders have been identified and involved over a number of key phases (refer to **Section 5.0** and **Appendix O**).

Stakeholder identification was largely undertaken using inputs from a number of sources including:

- Review of publicly available documents undertaken to support the profiling of the local and regional community (including a review of recent media and local community service directories) and the identification of salient stakeholder issues in the relevant communities.
- Outcomes of historical engagement (where available).
- Review of submissions on the EIS for the Original Project (Monteath & Powys 2016).
- Snowball sampling i.e., contacts made from initial sources providing contact details of additional stakeholders to be engaged.

As outlined in **Section 5.5**, key stakeholder group who were engaged to inform the SIA include:

- residents and community members living in proximity to either the quarry or the proposed haul route, including representatives from special interest and community groups
- key stakeholders including service providers, local businesses and Mindaribba Local Aboriginal Land Council.

In addition to the above, 17 RAPs were also specifically consulted during the Original EIS with regards to cultural heritage and associated values within the Project Area.

Stakeholders were contacted via multiple means, including via phone and emails. Additional contact attempts were also made with those community stakeholders who had responded that they would be in contact with the project team should they decide they were interested in participating in an interview.

Relatively low rates of decline were recorded during the SIA process, with reasons for decline largely included lack of interest or too busy to complete a survey/interview. To a lesser extent, stakeholder decline was attributed to being unaffected by the Revised Project, consultation fatigue or perceived conflict of interest (as an employee) or the stakeholder had moved from the area. **Appendix O** provides an overview of the number of stakeholders consulted across each stakeholder group category during the preparation of the SIA for the Revised Project.

6.13.2 Operational Context

Analysis of submissions following exhibition of the Original Project EIS, MCQAG community survey results and the quarry's complaints register highlight similar issues of concern from the community relating to the recent operations, namely around truck movements and the number of trucks and associated impacts on public health and safety. In addition, this analysis highlights that perceptions of Daracon are largely negative.

Analysis of the submissions made during 2016 for the EIS for the consolidation of existing development approvals and expansion of quarry (Monteath & Powys 2016) highlighted that approximately 50% of the submissions were negative and 50% were positive with:

- positive submissions largely from Daracon employees or those with a relationship with the company and focused on the economic benefits of the Original Project
- negative submissions were largely from community members with concerns raised around transport and traffic, followed by issues of public health and safety and noise.

For their submission for the EIS, the MCQAG completed a community survey in 2015 which highlighted similar issues of concern relating to truck movements, number of trucks, road and bridge condition and safety concerns.

The number of complaints received for the quarry has fluctuated since 2014. The most frequent responses were in relation to the impact on roads and user safety (refer to **Appendix O**). There was a large decrease in the number of complaints made from 2019 through to March 2021 compared to the preceding years which can be attributed to Daracon operating at a reduced production level from February through to September 2019, when the quarry was then placed into limited operations.

6.13.3 Social Profiling

A baseline social profile gathers knowledge from both primary and secondary data sources to increase understanding of the existing social environment in which a project is proposed. According to the International Association for Impact Assessment (IAIA) *SIA Guidelines* (2015), a baseline social profile should provide: documentation and analysis of the local historical setting; relevant data to enable the evaluation and audit of social impacts and associated management strategies; and afford a complete picture of the local cultural context; as well as a greater understanding of local values.

The SIA Guideline (DPE 2017) also outlines what a social baseline study should include, namely:

- a description of the project's area of social influence
- quantitative indicators and qualitative descriptions relevant to each potential social impact, building on any relevant indicators identified during scoping, and sourced through a combination of desktop research and primary data collection (including from other specialist studies undertaken for the EIS).

The SIA Guideline emphasises that the social baseline should be tailored to the specific project context and include meaningful data to inform the SIA. The baseline should also include analysis of any relevant data trends and provide a benchmark from which potential impacts can be assessed, and any change monitored.

Profiling provides a comprehensive summary of the key characteristics of the people of a community or Project area and is concerned with developing a detailed understanding of the social and economic context of potentially affected communities. For the purpose of this assessment, the following components have been considered in the development of the social baseline profile for the Revised Project, namely:

- **Geographic scope:** identification of the communities of interest relevant to the current assessment.
- **Governance:** summary of relevant structures of governance at local, state and federal levels.
- **Historical context**: review of the history of local communities, including their culture and values.
- **Development context and response to change**: assessment of development issues within the communities of interest and the response of local landholders and community residents to this change.
- **Community capitals/assets:** assessment of community capitals to identify areas of vulnerability and resilience across the communities of interest.
- **Key community values, issues and concerns:** documentation of current community issues in the region as identified in key planning documents, regional studies and the local media.

Data sources utilised in the preparation of this profile section, relevant to the Project Area, include:

- ABS Census (ABS, 2011, 2016); Social Health Atlas (PHIDU 2020) and other social indicator datasets
- local and State government reports
- existing environmental assessments/SIAs (relevant to the area)
- research reports and publications
- review of local and regional media
- consultation with key stakeholders and landholders in the region.

The social profile is a necessary component of the SIA and provides a foundation from which social impacts associated with the proposed Revised Project may be assessed and predicted.

The quarry is located within the LGA of Dungog Shire in NSW. The Dungog LGA is part of the Hunter region, and the Lower Hunter sub-region which lies over 75 km to the west of the city of Newcastle and 215 km north of Sydney. The LGA is comprised of the major population centres of Dungog, Clarence Town, Gresford, Vacy, Martins Creek and Paterson and has a population of 8,900 people (ABS 2016).

Dungog LGA is bordered by Singleton LGA to the west, Upper Hunter LGA to the north-west, Mid Coast to the north-east and Port Stephens LGA and the Maitland City LGA to the south.

It is important as part of the social profile of an SIA to define the geographic scope relevant to the SIA.

At just less than 1 km away, Martins Creek is the closest township to the quarry with Paterson and Vacy also in close proximity at approximately 4 km and 5.5 km away respectively. The townships of Bolwarra and Bolwarra Heights are approximately 20 km away from the quarry in the Maitland LGA, however these townships are also likely to have an interest in the impacts and opportunities resulting from operations at quarry due to being located along the primary haul routes for the Revised Project.

In the SIA, the primary social area of influence has been defined as the localities and communities immediately proximal to the quarry, the Dungog LGA and the state of NSW, for comparative assessment. These relevant ABS areas of interest including the State Suburb Code (SSC) are listed below:

- Martins Creek (SSC)
- Paterson (SSC)
- Vacy (SSC)
- Dungog LGA
- NSW State.

It is acknowledged that given the nature of the Revised Project with regards to the transport of product, that the impacts for the Revised Project are likely to also be felt further afield within other communities, including those along the primary haul route. Therefore, relevant socio-economic indicators for Bolwarra and Bolwarra Heights as key localities along the haul route have also been included where relevant.

It is also acknowledged that there are a number of additional suburbs both surrounding the quarry and existing along the haul route including (but not limited to) Mindaribba, Tocal, Duns Creek and Hilldale. Given the low populations within many of these communities, the majority of data captured in the ABS census and other sources is typically withheld or randomly adjusted in order to safeguard residents' anonymity. Given this, these suburbs have not been focused on in the community profile. The intent is not to ignore the importance of these suburbs or the potential impact that the Revised Project may have on residents, instead for the purposes of profiling it is considered that the social and economic indicators for these suburbs are largely consistent with those of the primary communities of interest.

As outlined in the SIA, engagement has occurred with a variety of stakeholders across suburbs within in the Maitland and Dungog LGAs and the impacts on residents of localities more along the haulage route have also been assessed separately to the impacts that relate to those residing within proximity to the quarry and within the broader regional community.

From the social profile analysis undertaken in the SIA (refer to **Appendix O**), it is possible to assess key areas of community resilience and risk within in the Dungog LGA and the study areas proximal to the Revised Project. The social profile has utilised a community assets (or capitals) approach in defining the strengths and vulnerabilities of the community across five key areas – natural, social, human, physical and economic.

Issues and opportunities which arose from the data analysis in the community profile for the region are listed below:

- Increasing employment opportunities in the LGA to limit economic leakage to surrounding communities.
- Increase housing affordability and availability across the region to attract and retain workers, locals and investment.
- Increase population growth across the LGA, particularly working-aged people, to increase the LGAs revenue base.
- Addressing the accommodation and health needs of an aging population.
- Maintaining natural landscape features and rurality of the region.

- Protecting existing agricultural assets including water storage, agricultural lands and natural assets through management and land use planning.
- Increasing health outcomes and decreasing adult participation in health-risk factors such as smoking, obesity and risky drinking.
- Digital connectivity across the LGA enabling strong local, national and global communications.

The community profile shows weak physical capital, however the potential for stronger economic capital in the form of mineral and agricultural assets providing the basis for maintaining existing social, economic and human capital across Dungog LGA. Opportunities to further develop the capital of Dungog LGA and the townships of Martins Creek, Paterson and Vacy should build on existing capital and support local needs and aspirations:

- Diversifying existing economic opportunities into tourism, local retail and services, agriculture.
- Attract economic investment into the LGA to support local employment and business opportunities.
- Assist in mitigating the impact of extractive industries.
- Assist in raising public awareness of land management strategies.
- Assist in maintenance of natural assets including weed and pest control.
- Assist in essential infrastructure maintenance and works such as road and sewerage repair and maintenance.
- Increasing public transport infrastructure to assist residents to remain connected.
- Further development of community events and cultural facilities.
- Assist in developing positive cultural, artistic, community and Aboriginal and non-Aboriginal cultural heritage outcomes.
- Assist in the development of age-appropriate events and facilities for youth.
- Assist in developing aged-care, mental health and specialist health services.
- Housing development to promote migration and retention of skilled workers and retention of existing younger segments of the population.
- Improve telecommunications across the LGA for personal and business use.
- Investment in liveability and development of Dungog as a steppingstone to the regions natural feature.

6.13.4 Perceived Issues and Opportunities

A key component of the SIA is the process of understanding, from the local community and business perspective, the issues, values and uses associated with the assessment area, and specifically the identified issues of concern and potential opportunities associated with the Revised Project.

Engagement activities undertaken to support the SIA program had three main objectives:

- to ensure that key stakeholders have an opportunity to participate in the SIA program
- to identify noted issues/impacts associated with the Revised Project

- to identify strategies for management and opportunities for enhancement of reported social impacts.

These objectives were achieved through consultation with:

- **Residents and community members:** living in proximity to either the quarry and its proposed haul route, e.g., those residing in Martins Creek, Paterson, Vacy, Bolwarra.
- **Special interest groups:** including community groups, indigenous representative and resident representative groups.
- **Service providers:** based in Bolwarra, Paterson, Vacy and Tocal.
- **Local business:** particularly business owners/operators in Paterson.

As highlighted in **Section 5.0**, engagement activities have been undertaken over two key rounds; June - August 2018 during which time 78 individuals participated in discussions either via personal or group interviews; and again commencing July 2020 with follow up interviews and discussions during this second round continuing until March 2020 (a total 114 stakeholders participated in interviews during this second round). Activities that have been undertaken to support the preparation of the SIA are outlined in further detail in **Appendix O**.

As outlined in **Section 5.4.1**, the key issues for the community were:

- social amenity – trucks and traffic movements
- sense of community
- engagement and decision making processes
- social amenity – quarry site operational impacts
- economics
- personal and property rights
- environmental impact
- health and wellbeing
- cumulative impacts.

Further details on community issues raised during consultation are provided in **Section 5.4.1** and **Appendix O**.

6.13.5 Assessment of Social Impacts

The aim of the SIA is to assess the proposed changes to the existing social environment (of which the existing quarry is a part), as a result of the Revised Project proceeding.

The SIA has utilised data from a number of sources to develop a layered picture of the potential social impacts arising from the Revised Project. This section further assesses the social impacts associated with the Revised Project, providing a detailed ranking of impacts according to a number of key criteria, as defined in the SIA Guideline. These criteria relate to:

- **Extent** – the geographical area affected by the impact or number of proportion or people or population groups who are affected.

- **Impact Timing/Duration** - when in the Revised Project the potential social impacts are expected to occur e.g. pre-construction, construction, operation, closure, post-closure and the timeframe over which the impact occurs.

- **Vulnerability/Sensitivity** – identification of who specifically is to be affected (directly, indirectly or cumulatively), including susceptibility or vulnerability of people, receivers or the receiving environment to adverse changes caused by the impact.

- **Stakeholder significance risk ranking** - the importance placed or level of concern that those potentially affected feel about the social matter.

- **Impact Severity** – the potential level of social risk posed by the negative social impact and the scale or degree of change from the existing condition as a result of the impact.

In order to prioritise the identified social impacts, a risk-based framework has been adopted. Traditionally, the technical risk assessment process has not been greatly amenable to the inclusion of social impacts. One key adaptation of the approach is that both the technical assessment outcomes (technical ratings) and stakeholder reported views of social impacts are assessed. This approach is consistent with Sandman's risk equation (Risk = Hazard + Outrage) (Sandman 1997), which acknowledges possibly low correlation between a risk's technical 'hazard' (how much harm it's likely to do) and its 'outrage' (how upset it's likely to make people).

Stakeholder views and perceptions regarding the significance of risk/impact is considered an independent and no less valid component of risk. It is worth noting that stakeholder perceptions vary between individuals and groups with no single perception more important than another. However, for the purpose of assessment the most common, or what is judged to be the general perception/sentiment of a stakeholder group has been used as a measure of perceived stakeholder risk or impact. These views have been presented in risk tables as stakeholder perceived significance.

The integration of the outcomes of technical ranking (severity) with stakeholder ranking of impacts, thus affords a true integration of expert and local knowledge in SIA and enables both types of risk to be addressed in the development of impact mitigation, amelioration and enhancement strategies. Such an approach is acknowledged in the SIA Guidelines in relation to estimating material effects.

Prioritising impacts in this integrated manner ensures that appropriate assessment and mitigation strategies can be developed that not only address impacts that may require more technical management but also those impacts that are considered by stakeholders as of high risk/importance/concern. Stakeholder concerns regarding an impact are just as important to manage as they have the potential to result in elevated levels of community concerns, complaints and grievances if not addressed appropriately.

As outlined in **Section 6.13.4** a range of social impacts and issues of concern have been identified in relation to the Revised Project that require prioritisation for assessment and appropriate management/enhancement and relate to the social impact categories outlined in **Section 6.13.4**. The categories relate to the following social impact categories:

- way of life
- community
- surroundings
- health and wellbeing
- personal and property rights

- decision making systems
- access to and use of infrastructure, services and facilities
- culture.

It should also be noted that social impacts are often not mutually exclusive and are not simple relationships between a single root cause and a single effect. Social impacts can be direct, indirect and cumulative. Immediate impacts lead to various consequences that in turn affect all other aspects of the life, health and wellbeing of the affected individuals and community, including its physical, psychological (mental/emotional), social, economic and spiritual dimensions, and the opportunities that are available to people (Esteves et. al.). For example, higher order impacts such as traffic and truck movements resulting in flow on impacts such as impacts on sense of community and enjoyment of amenity.

The SIA provides an evaluation of the significance of each potential negative and positive social impact without mitigation. The assessment is undertaken using the impact characteristics through the application of a consequence and likelihood framework as identified in the SIA Guideline (DPE 2017).

The social risk matrix that considers both the consequences of the social impact (minimal, minor, moderate, major and catastrophic) and the likelihood of the impact occurring (rare, unlikely, possible, likely and almost certain) is then used to determine an overall risk assessment of the social impact as 'low', 'moderate', 'high' or 'extreme'.

The SIA provides an overall summary of the social impacts in relation to the Revised Project (refer to **Appendix O**). The SIA has identified the most significant (high) social risks, based on the consideration of both stakeholder perceptions and mitigated technical risk analysis, to be:

- Impacts on social amenity associated with directly with trucks and traffic movements due largely to the existing and future volumes of trucks and traffic movements and flow on effects such as increases in noise, changes to air quality, impacts on local road infrastructure and potential for interactions with the public.
- Impacts on social amenity associated directly with onsite quarry site operations such as air quality, noise, blasting and vibration.
- Changes to sense of community including rural amenity, character of the locality and how people went about their lives due to truck movements and onsite activities at the quarry.
- Trust in the decision-making processes, Daracon and associated engagement activities.

Other issues identified were related to property damage and property prices (personal and property rights), economic impacts such as perceived impacts on livelihoods and possible economic opportunities associated with employment and the application and use of the quarry resource and concerns regarding health and wellbeing, largely mental impacts for some community members due to increased stress and anxiety.

It is important to acknowledge that the ratings of both likelihood and consequence or magnitude – and therefore overall significance – typically have both subjective and objective components, as this depends on a combination of people's individual experiences and/or perceptions as well as the outcomes of technical evaluations. While a review of all rankings has been undertaken considering community views and additional proposed mitigation post the receipt of community feedback, and consequently some risk significance levels have been adjusted slightly, it is important to highlight that the risk rankings as presented within the SIA do not all reflect the views of community stakeholders.

6.13.6 Management and Enhancement Measures

As noted in the SIA Guideline (DPE 2017), strategies need to be developed to ensure that there is a clear connection between the measure proposed and the significant social impact being mitigated or enhanced. Strategies to be implemented may differ in their effectiveness and/or ability to alleviate impacts, with some residual social impacts remaining, in the case of negative impacts. The acceptability of any residual impact remaining post implementation will also be discussed. Furthermore, certain measures may collectively address a number of different negative social impacts and potentially enhance positive impacts.

In response to the predicted social impacts associated with the Revised Project, Daracon are proposing a number of management and enhancement strategies. These measures focus on the mitigation of negative social impacts and strategies to enhance positive social impacts in relation to the Revised Project, particularly in the local community and surrounding area where the Revised Project is located. The strategies proposed also include measures to address any impacts that are of ***'high'*** concern to potentially affected people and groups, but which are not considered significant from a technical perspective.

Significant changes have been made to the project design and operational parameters to minimise impacts as much as possible as part of the assessment process, details of these changes are summarised in **Section 1.6**. The project design changes have, where possible, incorporated early community feedback and suggestions on the Revised Project, expressed through submissions on the Original Project EIS and since, to the greatest extent possible and where practicable.

During both Round One and Round Two of engagement, key project changes were presented to stakeholders, who were asked to indicate their level of satisfaction with the proposed changes. These project changes were met with mixed feedback, with the majority of stakeholders indicating that many of these still did not go far enough. Detailed analysis of views expressed to each of the Revised Project's iterative changes has been included in **Appendix O**.

Given that the Revised Project relates to the continuation of operations at the existing quarry (albeit in a substantially modified form) there are a number of existing management-based strategies and approaches in place at the quarry that would continue to be applied should the Revised Project proceed, however these have also been modernised to reflect current expectations and also to reflect the larger proposed scale of the operation. These approaches/strategies are summarised throughout **Sections 6.0** and **8.0** and **Appendix O**.

Strategies that are proposed to address the significant social impacts relating to the Revised Project have been developed through review of:

- strategies identified in the technical assessments
- existing Daracon management approaches
- relevant projects and studies relating to social impact management
- SIA experience across other projects
- community identified strategies (as identified through the SIA engagement program - both during personal meetings, the series of issue specific CAFs – and also additional sources such as submissions on the EIS and a survey of community residents undertaken by MCQAG).

As noted above, a suite of mitigation and enhancement strategies and measures are proposed to address significant social impacts predicted as part of the Revised Project. While certain strategies address specific social and environmental impacts, others serve to address a number of the salient social impact categories

and themes, given the interrelated nature of social impacts. Therefore, each of the strategies proposed may address social risk to varying degrees.

Additional social criteria have also been considered in the development of relevant strategies, including an assessment of the vulnerability of key stakeholders to impacts and how these are experienced, particularly locality residents that reside in close proximity to the quarry and the haulage route (refer to **Appendix O**).

Mitigation and enhancement strategies proposed to address significant social impacts include:

- restriction of proposed maximum daily truck movements to only occur up to 50 days per year
- reduced truck movements between 3-6pm weekdays to avoid higher community traffic / school pick up times
- no road haulage of product on Saturdays (or weekend, public holidays or between 24 December and 1 January)
- planning quarry activities around extra traffic days / community events in Paterson Village / Tocal
- regular consultation with local bus companies
- school visit program to encourage road safety awareness
- reduced speed limits for quarry trucks travelling through Paterson Village
- investigation of the use of radar variable message signs
- review and update of Driver Code of Conduct, including driver training relating to buses
- establishment of a Camera Monitoring Station at the King and Duke Street Intersection in Paterson Village to enable identification of relevant trucks associated with any complaints or enquiries
- implementation of a regular independent audit process to assess compliance with Driver Code of Conduct and other road haulage commitments
- environmental management plans such as noise, air quality, blasting, traffic and heritage
- Daracon Community Contributions and Sponsorship Program
- a restructured Community Engagement Strategy that improved accessibility and delivery information provision that targets identified concerns
- implementation of Local Employment and Procurement Policy that encourages supporting businesses and recruiting locally where possible
- establishing VPAs
- preparation and implementation of a SIMP.

6.13.6.1 Community Engagement Strategy

In recognition of the existing strained relationship with elements of the local community and of the view that historic engagement activities have been considered inadequate, Daracon proposes to develop a more structured Community Engagement Strategy that affords further development of company-community relationships through regular and effective engagement and communication.

This strategy will assist in guiding the quarry's future community engagement and social investment activities.

The key objectives of the Community Engagement Strategy will be to assist Daracon to:

- focus current engagement activities within the community on those issues of key concern to the community (as identified through the SIA consultation program)
- ensure that the quarry's community contributions and sponsorships are focused on identified community preferences and areas of need
- track and monitor community issues and perceptions of the quarry over time and evaluation of the success of management to manage social impacts.

The strategy will therefore target:

- Information provision and engagement:
    - Ongoing targeted provision of information that addresses the quarry's day to day operations in general and future development and expansion plans more specifically.
    - Engagement mechanisms that will assist in further identifying and predicting any additional consequences and impacts associated with the Revised Project should it be approved.
- **Monitoring and management:** addressing the continued management and monitoring of community concerns identified via the stakeholder engagement program.
- **Social investment/community contribution projects:** a more strategic and structured approach to community investment and sponsorships that targets sponsorship of local community projects, through the restructuring of existing community group sponsorship guidelines to:
    - include criteria with a focus on specific project preferences that are aligned to the Daracon's and community preferences
    - increase existing recognition and awareness of Daracon's role in the community.

Information Provision and Engagement

Consultation with residents as part of the SIA at Round One, revealed that emails, newsletters and the local paper were the most preferred method of information provision on the project. In addition, based on feedback from consultation participants to date, other suggestions to improve engagement and communication efforts have included:

- a genuine engagement and collaborative approach
- regular (quarterly) provision of monitoring outcomes – although the environmental monitoring report format was not a preferred mechanism
- improvements in blasting notifications system
- regular information provision and community engagement and accessibility of information.

Daracon will also make the following information and documents publicly available on its website:

- all current statutory approvals
- all approved strategies, plans and programs required under conditions of a development consent

- minutes of CCC meetings
- regular reporting on the environmental performance and comprehensive summaries of the monitoring results
- contact details to enquire about the development or to make a complaint
- a complaints register, updated monthly
- copies of Annual Reviews and audit reports prepared as part of any Independent Environmental Audit of the Revised Project and Daracon's response to the recommendations in any audit report.

Monitoring and Management

Daracon will continue to employ a dedicated Community Liaison Representative to manage the ongoing engagement associated with the Revised Project and monitoring and management commitments relating to social and environmental impacts as detailed in the SIMP and other environmental management plans.

Specific activities to facilitate monitoring to ensure that community concerns, with respect to the quarry's existing and future operations are well managed include:

- preparation of a SIMP that addresses the Revised Project (refer to **Section 6.13.7**)
- ongoing monitoring via engagement.

Daracon is also committed to trialling a Community Monitoring or Social Impact Diary whereby representative residents along the transport route and proximal to the quarry are asked to record for example, traffic issues in a diary format for feedback to the CCC or to the Daracon Community Representative as appropriate. Such a program will allow for integration of community collected data with operational data from site, e.g. comparison of perceived and actual blasting times or noise exceedance, etc. and encourages community participation in monitoring and management. This could also be used in conjunction with other community monitoring mechanisms, e.g. personal dashcam recordings.

6.13.6.2 Daracon Community Contributions and Sponsorship Program

While Daracon has an existing community contributions and sponsorship program, it is intended within this is a targeted focus on the quarry that is more strategically focused on the allocation of contributions and donations and allows the company to work with the local community to effectively manage the negative impacts of the operation and to enhance any potential benefits of the quarry.

The community contributions and sponsorship program would be funded through a monetary contribution by Daracon. It is intended that the quantum of the monetary contribution and mechanism for management of the community contributions and sponsorship program will be resolved following project approval, and implemented once the scope and timing of projects to be funded has been agreed.

The focus for the revised Daracon's Community Contributions and Sponsorship Program would therefore include:

- mitigating the direct and indirect impacts of the quarry on the local community
- enhancing positive impacts associated with the presence of the operation in the community
- working collaboratively with local residents and key stakeholders to focus on sponsorships and in-kind contributions that target impact areas and enhance local values with a focus on Martins Creek and the village of Paterson

- developing projects and programs that are consistent with community needs, values and aspirations
- contributing to local communities and better targeting investment spend locally.

The existing donations and sponsorship program would see a shift towards assessing applications and distribution of donations to community-led initiatives, with a clear set of criteria for assessment of applications with funding criteria aligning with the areas of focus arising from the SIA and identified community needs. This is to be achieved through the development of a Community Contributions and Sponsorship policy that includes funding criteria and a process to determine priorities. Community investment and sponsorships will only be in strict accordance with this policy.

The establishment of funding criteria will involve key stakeholders therefore it is intended that the development of criteria for this investment will be determined in collaboration with the CCC once formed. Having a dedicated Community Relations Representative to manage the program will ensure local level insight and an understanding of community needs is combined with the company's existing donations management and administration. **Appendix O** provides an example of a proposed approach to the development and implementation of the Community Contributions and Sponsorship Program.

Suggestions for a range of projects and sponsorship opportunities have been presented by community members during engagement activities and also identified within the MCQAG survey of the community (2015). These suggestions along with opportunities also identified by Daracon are presented at **Table 6.50** and will be considered in collaboration with the CCC should the project be approved.

Table 6.50 Potential Sponsorship and Community Investment Projects

Theme	Description
Sense of Community	• Provision of support (monetary and in-kind) to local community organisations e.g. Paterson Historical Society • Paterson ad Martins Creek village entry signs (sponsor local design competition) • Support for local festival/events, heritage-based tourism • Assistance to local social, and sports clubs • Beautification of parks and public amenities at Martins Creek and Paterson e.g. parks, recreational grounds • Support for local events e.g. Carols in the Park • Sale of quarry product to local landscapers at reduced costs for local purchase
Education	• Road safety programs - Big Trucks, Little People – school based road safety education program • Youth focused programs • Support for local schools

Theme	Description
Environment	• Native animal care and rehoming/Native animal trust • Native bush regeneration • Weed eradication programs • Landcare.
Heritage / Tourism	• Maintain or enhance local heritage buildings/values within Paterson village • Support for heritage-based tourism

6.13.6.3 Local Employment and Procurement Policy

While quarries do not typically have high workforce numbers, Daracon will seek to continue to employ and procure from local sources to the greatest extent possible to enhance any economic benefits of the Revised Project in the locality where possible.

This strategy will seek to:

- increase employment opportunities for those within the local community who are interested in pursuing employment with Daracon by advertising locally
- offer apprenticeships and traineeships to local youth
- maximise the use of local suppliers in procurement activities at the quarry where feasible.

6.13.6.4 Voluntary Planning Agreement

Should the Revised Project be approved, Daracon will be required to make annual financial contributions to both DSC and MCC in the form of a VPA, in accordance with section 7.11 of the EP&A Act. These VPAs are still subject to negotiation.

While Daracon is not responsible for how contributions are used by the Councils, and it is anticipated that contributions would largely be put towards the maintenance of roads used for haulage of quarry products, it is possible that the VPA could also contribute towards meeting other local community needs. The VPA has not been finalised at the time of preparation of this report and is subject of ongoing consultation.

6.13.7 Monitoring of Social Impacts

Monitoring and evaluation are key components of an SIA process to identify any unanticipated impacts that may arise as a result of a project. The analysis and research conducted for a SIA provides a foundation for the ongoing monitoring and adaptive management of social impacts over the life of a SSD resource project.

Daracon will develop a Social Impact Management Plan (SIMP) that defines and guides the monitoring and evaluation activities for the quarry. The SIMP will be developed in accordance with the SIA Guideline and will:

- identify opportunities to enhance positive and mitigate negative social and economic impacts of the Revised Project on affected communities
- detail adaptive management and mitigation strategies to address potential impacts of the Revised Project identify appropriate stakeholder responsibilities
- identify appropriate monitoring, reporting and review mechanisms, including the purpose of monitoring and the parameters that will be monitored and how and when monitoring data will be collected

- outline a process to engage with relevant stakeholders and communities, with a focus on practical mechanisms for the community to collaborate and record their observations and experiences of social impacts and any proposed community participation in monitoring
- include an incident notification and reporting process, including providing applicable information to the community
- develop a process for reviewing the above elements to assess whether they are still appropriate, and whether any new issues have emerged that should be included in ongoing monitoring
- develop a process for making monitoring results and associated information publicly available, including any revisions to the monitoring and management framework.

The SIMP would outline suitable and proportionate social impact monitoring and adaptive management arrangements for the Revised Project that include the above elements, as well as proposed timing and frequency of monitoring and public reporting of results.

Proponents should also consider strategies to involve potentially affected people and groups in the adaptive management approach, including (but not limited to) grievance and feedback mechanisms; and where relevant, existing and potential management and enhancement strategies employed to manage the predicted risks should be outlined.

The SIMP would be developed in consultation with DPIE, the CCC and other and key stakeholders. Further details are provided in **Appendix O**.

6.13.8 Summary

The SIA has been conducted in accordance with the SIA Guidelines (2017) and has involved a comprehensive range of assessment and engagement methods to identify, predict and assess the social impacts associated with the Revised Project.

The SIA has provided a detailed social baseline profile for the context in which the Revised Project is located, including an analysis of issues and opportunities facing the key communities of interest, with a focus on the broader Dungog LGA and communities proximal to the quarry and the haulage route across differing community capital areas. Discussion of key developments and events in the LGA has been used to understand the process of communities' response to change.

Engagement with the community has been a key component of the SIA program and has been supported by documentary and data review.

The SIA has identified a range of perceived social issues and impacts that Daracon would need to manage as a part of the Revised Project. Throughout the ADA and SIA process, a range of project design changes have been implemented to address these concerns; with mitigation and enhancement strategies identified, where possible, to minimise social impacts of the Revised Project.

As outlined in **Section 5.4**, the level of concern relating to the Revised Project varies across stakeholder groups and geographic location.

Key negative social impacts predicted include impacts relating to social amenity (as a result of traffic related impacts), changes to sense of community and community cohesion and culture. In addition to these impacts, stakeholders have raised concerns relating to noise, personal safety, livelihoods and health and wellbeing impacts.

Positive impacts of relevance include potential economic benefits to the region and State through employment, procurement and business opportunities. The Revised Project will also provide for secured availability of construction materials for local markets.

As has been highlighted in the SIA, project development brings benefits and costs that are not always evenly distributed across individuals and stakeholder groups and as a result, where social impacts are predicted it is the role of a SIA to outline how such impacts can or cannot be managed.

A number of mitigation and enhancement strategies are proposed to address potential social impacts relating to the Revised Project where possible including:

- Development of a dedicated Martins Creek Quarry Community Investment Program that strategically focuses the allocation of contributions and donations and allows the company to work with the local community to effectively manage the negative impacts of the operation and to enhance any potential benefits of the quarry.
- Local employment and procurement policy.
- A revised Community Engagement Program that seeks to monitor ongoing community and stakeholder concerns and evaluate the success of management and mitigation measures. It will also target stakeholder identified engagement and information preference.
- Implementation of a VPA with the DSC and MCC.
- Implementation of environmental management plans.
- Development and implementation of a SIMP for the ongoing monitoring and management of social impacts, with community engagement informing its development.

These mitigation and enhancement measures have been identified to, where possible, address the social impacts identified and are based on a combination of stakeholder engagement and feedback and practitioner expertise on other project developments. The development of a SIMP will allow for the ongoing tracking of the success of implemented mitigation measures in addressing identified issues of concern and enhancing opportunities associated with the Revised Project to the greatest extent possible.

6.14 Economics

The SEARs required a detailed assessment of the costs and benefits of the development as a whole, and whether it would result in a net benefit for the NSW community.

An updated, comprehensive Economic Impact Assessment (EIA) has been undertaken by Ernst and Young (EY) for the Revised Project. The EIA is based on a cost benefit analysis (CBA) and local effects analysis (LEA) prepared under the framework established in the *Guidelines for the economic assessment of mining and coal seam gas proposals* (the Guidelines) released by the NSW Government in December 2015.

In addition, the Guidelines require an estimate of the potential costs generated by the Revised Project. To estimate the environmental, social and transport-related costs, EY have incorporated the *Technical Notes supporting the guidelines for the Economic Assessment of Mining and Coal Seam Gas Proposals* into the analysis.

The key findings of the EIA are discussed in the following sections and the full report is provided in **Appendix P**.

6.14.1 Cost Benefit Analysis

The Guidelines set out the CBA framework to measure the net benefits of the Revised Project to the NSW community. **Table 6.51** provides a summary of how these net benefits are measured.

Table 6.51 Cost Benefit Analysis Framework as Defined in the Guidelines

Direct Benefits	Indirect Benefits	Indirect Costs
The net benefits that accrue to NSW from the direct operations of the proposed quarry Includes: • Net producer surplus attributable to NSW • Royalties payable • Company tax attributable to NSW	The net benefits that are generated for parties that economically interact with the proposed quarry Includes: • Net economic benefits to landowners • Net economic benefits to NSW employees • Net economic benefits to NSW suppliers	Social costs generated by the proposed mine, borne by the NSW community Includes: • Net environmental, social and transport-related costs • Net public infrastructure costs • Loss of surplus to other industries

In net terms, the Revised Project is forecast to generate up to 1.1 Mtpa and average approximately 900,000 t of output per year.

Based on the production assumptions and the real price assumptions in **Appendix P**, the Revised Project is expected to generate additional real revenue of just under $540 million in undiscounted 2020 Australian dollars. This equates to $224.4 million real revenue in net present value (NPV) terms based on a 7% real discount rate.

Based on the Guidelines, the direct benefits to NSW of the Revised Project are derived from 3 sources:

- the net producer surplus generated by the Revised Project that is attributable to NSW (estimated using cash outlays and revenues)
- the share of company tax payments that are attributable to NSW
- other tax payments such as royalties and payroll tax that are paid to the NSW and local government.

The Revised Project is estimated to potentially generate an operating surplus of $13.5 million in NPV terms (refer to Table 6.52). As outlined in the EIA, $11.5 million in NPV terms is payable in the form of corporate taxes, leaving a net producer surplus of $13.5 million in NPV terms. It is estimated the Revised Project will potentially generate $28.3 million in total profit in NPV terms over the period 2022 to 2046. At a company tax rate of 30 per cent, the company tax estimate is $11.5 million in NPV terms, of which $3.7 million is attributable to NSW (refer to Table 6.52). The Revised Project will result in an annual payment of $135,000 in payroll tax over the 25 years. Therefore, over the life of the Revised Project, a total of $1.5 million in NPV terms of payments to the NSW Government.

Table 6.52 Summary of Direct Benefits of the Revised Project (NPV)

Net financial benefit	NPV ($M)
Net producer surplus attributed to NSW	13.8
Royalties, payroll tax and Council rates	1.5
Company income tax apportioned to NSW	3.7
Total direct financial benefit attributable to NSW	**19.0**

Consistent with the Guidelines, the indirect benefits of the Revised Project are summarised in **Table 6.53**. The total indirect benefits are estimated to be $38.8 million in NPV terms. The main source of these benefits is the $26 million in benefits to suppliers and $12.8 million in benefits to employees in NPV terms.

Table 6.53 Summary of Indirect Benefits of the Revised Project (NPV)

Indirect benefits	NPV ($M)
Net economic benefit to workers	12.8
Net economic benefit to suppliers	26
Total indirect benefit	**38.8**

The indirect costs of the Revised Project are classified as:

- net public infrastructure costs
- estimated loss of surplus to other industries
- net environmental, social and transport-related costs
- net environmental costs.

The Revised Project is expected to generate minor environmental, social and transport-related costs, above those generated by the approved operations as outlined in **Table 6.54**.

Table 6.54 Summary of Indirect Costs ($ million)

Indirect costs	NPV ($M)
Environmental costs	13.9
Loss of surplus to other industries	-
Net public infrastructure costs	-
Residual value of land	-
Total indirect costs	**13.9**

The CBA is based on comparing the net direct and indirect benefits and subtracting the indirect costs of the Revised Project compared against the baseline scenario or the approved operations where the Revised Project does not occur. The results are summarised in **Table 6.55**.

The Revised Project is estimated to provide a net benefit to NSW. This net benefit is estimated to be $58 million in NPV terms. This is comprised of $19 million and $39 million in direct and indirect benefits, respectively. The incremental indirect costs of the Revised Project are estimated to be $500.

Table 6.55 Estimated Net Benefit of the Revised Project ($ million)

Benefits	NPV*	Costs	NPV*
Direct benefits		**Direct costs**	
Net producer surplus attributed to NSW	13.8		
Royalties, payroll tax and Council rates	1.5		
Company income tax apportioned to NSW	3.7		
Total direct benefits	**19.0**	**Total direct costs**	**-**
Indirect benefits		**Indirect costs**	
Net economic benefit to NSW workers	12.8	Environmental impact	12.3
Net economic benefit to NSW suppliers	26.2	Loss of surplus to other industries	-
		Net public infrastructure cost	-
		Residual value of land	-
		Other costs	1.6
Total indirect benefits	**39.0**	**Indirect Costs**	**13.9**
Total Project economic benefit	58.0	Incremental cost of Revised Project	0.0005
NPV of project - ($m)	**58.0**		

The Revised Project is predicted to generate potential direct benefits of:

- corporate taxes of $11.5 million in NPV terms for Australia, of which $3.7 million is attributed to NSW
- royalties, payroll tax and Council rates of $1.5 million in NPV terms
- net producer surplus attributed to NSW of $13.5 million in NPV terms.

The potential indirect benefits of the Revised Project are related to the impacts that it will have to the NSW economy through suppliers. Supplier benefits are estimated to be $26.1 million in NPV terms over the life of the Revised Project. NSW worker benefits are $12.8 million in NPV terms.

As outlined in the EIA, the Revised Project is expected to result in indirect costs on the NSW community of $13.9 million in NPV terms, of which the majority are borne by Daracon (and accounted for in the operating costs of the Revised Project for mitigation and management). Only the incremental indirect costs associated with greenhouse gas emissions are not borne by Daracon (externalities). These externalities total just $500 in NPV terms.

Sensitivity Analysis

As outlined in **Appendix P**, a sensitivity analysis was undertaken consistent with the Guidelines. The sensitivity analysis considers all key areas of the CBA, particularly prices, key costs (both capital expenditure and operating costs) and worker benefits.

Where there are considered to be higher levels of uncertainty with the figures, a range of plus/minus 25% is used. In areas where the figures are deemed more certain, a range of plus/minus 10% is used.

The sensitivity analysis shows that the estimated potential net benefits are robust in the sense that they remain positive after testing all key assumptions underpinning the analysis.

In isolation, the estimated potential net benefit of the Revised Project is most sensitive to the price assumptions underpinning the analysis. The lower bound estimate of potential net benefits, which takes a pessimistic assumption around product prices, capital expenditure, and operational expenditure, as well as worker and supplier benefits, yields an estimated potential net benefit of $4.8 million in NPV terms.

The potential net benefits are sensitive to the discount rate used for the analysis. Under the central case assumptions, the Revised Project is expected to generate $57.6 million of potential net benefit using a 7% discount rate. Using a 4% discount rate increases the potential net benefit to $88.3 million. Conversely, a 10% discount decreases the potential net benefit to $38.4 million.

6.14.2 Local Effects Analysis

The LEA uses a similar framework to the CBA but is focussed on the net economic impacts to the local community. The Guidelines refer to the local area as being consistent with the relevant Statistical Area (SA3) as defined by the Australia Bureau of Statistics. In the case of the Revised Project, the location used for the LEA is the Lower Hunter SA3. SA3 includes the localities of Singleton and Cessnock, and towns like Wollombi in the southern end of the region and Chichester in the north.

The LEA accounts for the economic benefits to the Lower Hunter region only. It does not include any economic benefits that may accrue to the major regional centres that are located adjacent, including Maitland and Newcastle or the broader Hunter region.

Underpinning the LEA are the assumptions that:

- no net producer surplus accrues to the region
- no company income tax accrue to the Lower Hunter SA3 region
- based on information supplied by Daracon, 100% of intermediate inputs will be supplied from the SA3 region.

It is expected that the Revised Project may generate additional potential indirect benefits to local suppliers of $26.2 million in NPV terms in addition to those generated by approved operations. Indirect benefits to employees located in the Lower Hunter SA3 are expected to be $9.2 million in NPV terms. The Revised Project is estimated to confer a potential net benefit on the Lower Hunter SA3 region of $35.4 million in NPV terms, including direct and indirect benefits.

Sensitivity Analysis

As outlined in **Appendix P**, a sensitivity analysis was undertaken consistent with the Guidelines. The sensitivity analysis shows that the estimated potential net benefits remain positive after testing all key assumptions underpinning the analysis.

The lower bound, or worst-case, estimate of net benefits, which takes the most pessimistic assumptions around prices, capital expenditure, operational expenditure and worker and supplier benefits, yields an estimated potential net benefit of $30.4 million in NPV terms. The upper bound, or best-case, estimate based on optimistic assumptions is $38 million in NPV terms.

6.15 Hazard, Risk and Bushfire

The SEARs required an assessment of hazards including bushfire risk. A preliminary risk screening has been completed for the Revised Project in accordance with the *State Environmental Planning Policy 33 – Hazardous and Offensive Development* (SEPP 33) (DoP, 1992) and *Applying SEPP 33* (DoP, 2011). Should a preliminary risk screening determine that the Revised Project is a 'potentially hazardous industry' under SEPP 33, the preparation of a Preliminary Hazard Analysis (PHA) is required.

The preliminary risk screening involves the identification and assessment of the storage of specific dangerous goods classes that have the potential for significant off-site effects. If, at the proposed location, and in the presence of controls, the risk level exceeds the acceptable criteria for impacts on the surrounding land use, the development is classified as a 'hazardous' and/or 'offensive' industry as appropriate and may not be permissible within certain land zones in NSW.

A 'hazardous industry' under SEPP 33 is one which, when all locational, technical, operational and organisational safeguards are employed, continues to pose a significant risk. An 'offensive industry' is one which, even when controls are used, has emissions which result in a significant level of offence e.g. odour or noise emissions. A proposal cannot be considered either hazardous or offensive until it is firstly identified as 'potentially hazardous' or 'potentially offensive' and subjected to the assessment requirements of SEPP 33.

A proposed development may also be potentially hazardous if the number of traffic movements for the transport of hazardous materials exceeds the annual or weekly criteria outlined in *Table 2 of Applying SEPP 33* (DoP, 2011). If these thresholds are exceeded a route evaluation study is likely to be required.

6.15.1 Preliminary Risk Screening

Preliminary risk screening is undertaken to determine if a PHA is required. The preliminary risk screening compares hazardous material storage quantities for the Revised Project that have the potential to create off site impacts, as well as transport quantities and frequency, with the screening thresholds in SEPP 33. If any of the screening thresholds are determined to be exceeded, the proposed development should be considered potentially hazardous and SEPP 33 will apply (DoP, 2011).

Table 6.56 provides a list of the hazardous materials to be stored at the quarry, dangerous goods class of the material, storage quantity and the respective SEPP 33 screening threshold.

All hazardous materials listed in **Table 6.56** will be stored within the Project Area at the locations shown in **Figure 6.33**.

Table 6.56 further demonstrates that none of the hazardous materials to be stored within the Project Area are above SEPP 33 screening thresholds. As such, a PHA is not required to be undertaken for the Revised Project.

Table 6.56 Hazardous Material Inventory

Material	Storage Type/Location	ADG Code[1] Class (PG)	Estimated Project Storage Capacity (kg)	Screening Threshold (kg)	Trigger SEPP 33
Aggregate Precoat	Above Ground Tank/Infrastructure Area	3 (III)	27,000	30,000,000[2]	No
Unleaded Petrol	Packages/Maintenance and Servicing Area	3 (II)	200		

Material	Storage Type/Location	ADG Code[1] Class (PG)	Estimated Project Storage Capacity (kg)	Screening Threshold (kg)	Trigger SEPP 33
Diesel	Above ground tank/Infrastructure Area	C1	17,000	-[3]	NA
Oils	Packages/Hydrocarbon Storage Container	C2	3,000	-[3]	NA
Aerosols	Packages/Maintenance and Servicing Area	2.1	50	100	No
LPG	Cylinders/Maintenance and Servicing Area	2.1	100	10,000	No
Acetylene	Cylinders/Maintenance and Servicing Area	2.1	31	200[4]	No
Paint and Solvents	Packages/Maintenance and Servicing Area	3 (II)	50	500	No
Sulphuric Acid	Above ground IBC/Dam 1, Dam 3, and Water Treatment Chemicals Container (Infrastructure Area)	8	3,840 (3 x 1,280)	25,000	No

1. ADG Code – Australian Dangerous Goods Code
2. Threshold quantity for storage located 100 m from the site boundary
3. No SEPP 33 quantity screening thresholds for these materials
4. Threshold quantity for storage located 15 m from the site boundary

Table 6.57 presents the SEPP 33 transportation screening thresholds. If the quantity of hazardous material to be transported is greater than the minimum threshold quantity and the frequency of transport movements is greater than the annual or peak weekly thresholds (refer to **Table 6.57**), a transport route evaluation may be required.

The number of transport movements associated with the Revised Project, for Class 3 (II), Class 3 (III), Class 2.1 and Class 8 materials will not exceed either the annual or peak weekly screening thresholds. The maximum delivery quantity of Class 3 (II), Class 2.1 and Class 8 materials for the Revised Project will not exceed the screening thresholds. As such, a transport route evaluation study is not considered to be required.

Table 6.57 Transportation Screening Threshold

Material	ADG Code[1] Class (PG)	Bulk or Package	Estimated Project Vehicle Movements		Maximum Project Transport Quantity (T)	Vehicle Movement Screening Threshold		Minimum Threshold Quantity (T)
			Cumulative Annual	Peak Weekly		Annual Threshold	Weekly Threshold	
Aggregate Precoat	3 (III)	Bulk	12	1	20	>1,000	>60	10
Paint and Solvents	3 (II)	Package	<750	<45	<10	>750	>45	10
LPG, Acetylene, Aerosols	2.1	Package	<500	<30	<5	>500	>30	5
Sulphuric Acid	8	Bulk	<500	<30	<2	>500	>30	2

1. ADG Code – Australian Dangerous Goods Code

6.15.2 Storage of Flammable and Combustible Liquids

All flammable and combustible liquids for the Revised Project will be stored in accordance with the requirements of AS1940 - 2017 The storage and handling of flammable and combustible liquids).

Where flammable liquids and combustible liquids are stored in close proximity, the total inventory is to be assessed as the most hazardous substance, e.g. if diesel tanks (combustible liquid) were located an inadequate distance from the Aggregate Precoat (flammable liquid) the diesel fuel would need to be assessed as a flammable liquid. The storage layout (refer to **Figure 6.33**) shows that the bulk flammable liquids (Aggregate Precoat) and combustible liquids (diesel) are separated by an adequate distance (>7.5 m) in separate bunds, in accordance with Section 5.7 of AS1940. Therefore, the flammable and combustible liquids may be considered separately in the risk screening.

The locations for flammable and combustible liquids storages meet the requirements of AS1940 for separation from the quarry boundary and onsite protected places. To meet the fire protection requirements of AS1940 the Aggregate Precoat storage will require a 10 L/s hydrant system and at least two fire extinguishers (one being foam and the other may be powder). The diesel storage is required to be equipped with a 10 L/s hydrant system and at least one powder type fire extinguishers.



Image Source: Google Earth (Aug 2018)
Data Source: Daracon (2020)

0 25 50 100m
1:2 500

Legend

- Site Boundary
- Diesel Fuel Storage
- Unleaded Fuel and Secondary Oil / Grease Storage
- Precoat Oil Storage
- Acid, Flocculent and Coagulant Storage
- Acetylene Storage

FIGURE 6.33

Storage of Hazardous Materials

File Name (A4): R01/3957_033.dgn
20201119 12.17

6.15.3 Bushfire Hazard

This section provides an updated bushfire assessment in accordance with the *Planning for Bushfire Projection 2019* (PBP, 2019), including a description of existing bushfire management at the quarry, an assessment of potential bushfire hazards applicable to the Project Area and the proposed bushfire management for the Revised Project.

Vegetated land surrounds the Project Area to the north, east and west. Land adjoining the southern end of the Project Area is predominately cleared agricultural land with rural residential properties. The Project Area is identified as bushfire prone land by DSC Bushfire Prone Land Map (DSC 2020) (refer to **Figure 6.34**).

The most significant potential bushfire threat to the Project Area is from the north, north-east and east of the quarry, the adjoining land supports forest/woodland vegetation and a potentially significant fuel load capable of sustaining and spreading bushfire. Areas of forest/woodland vegetation within the Project Area, and to the west of the Project Area also represent a potential linkage between vegetated areas within and adjoining the Project Area, with the potential to support the spread of bushfire.

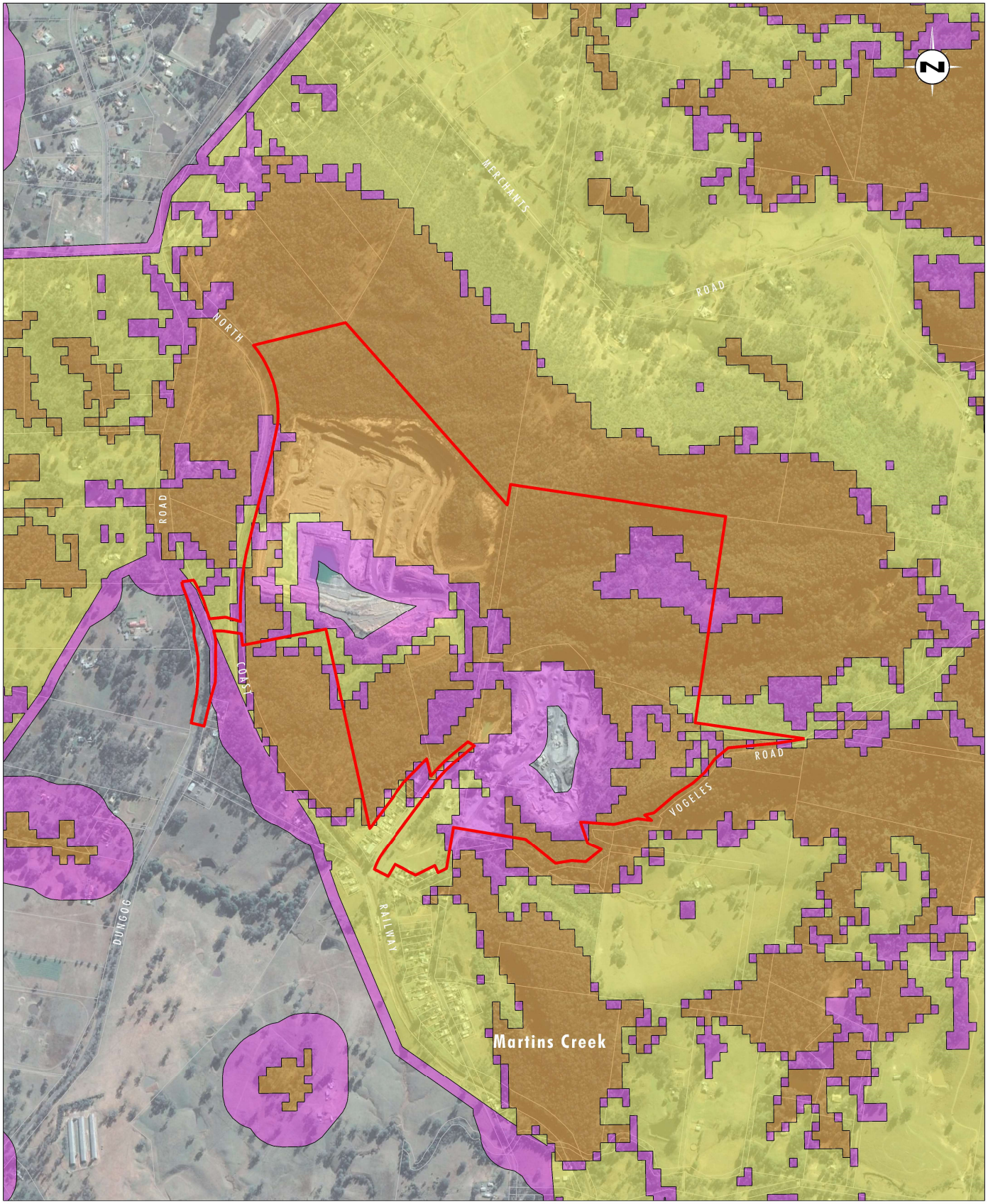


Image Source: Google Earth (2018)
Data Source: Daracon (2020), NSW Rural Fire Service (2016)

0 250 500 750m
1:15 000

Legend

- Project Area
- Vegetation Buffer
- Category 1
- Category 2

FIGURE 6.34

Dungog Council
Bushfire Prone Map

6.15.4 Bushfire Assessment

The existing infrastructure including site offices, amenities building and workshops will continue to be utilised as part of the Revised Project. This infrastructure is located within the existing processing area at the south-eastern end of the Project Area which is predominately cleared and adjoins cleared land beyond the southern boundary. This area of the quarry is maintained and will continue to be maintained with a >10 m buffer to provide a defendable space to reduce fuel loads and appropriate asset protection zones (APZ).

The quarry is adequately accessible with direct access from Station Street at the southern end of the quarry and Vogeles Road, providing emergency exit from the Project Area for all staff and access for firefighting. A second and new direct assess is proposed as part of the Revised Project to provide additional emergency exit from the quarry site. Additionally, internal haul roads provide all weather access across the quarry site. Access across the Project Area will continue to be assessed and maintained as the Revised Project progresses.

Resources for firefighting, such as adequate water supply and fire extinguishers, are permanently maintained and will continue to be implemented and maintained for the life of the Revised Project.

Spills and handling of hazardous materials pose a potential risk of being an ignition source. The IFMP includes appropriate responses to the control and management of these hazards. Operational work instructions in relation to bushfire will also continue to be implemented for all aspects of the operations that are considered high risk. The operational work instructions are included in the Safe Work Method Statements (SWMS), inform toolbox communications and staff training. These procedures will continue to be implemented for the life of the Revised Project.

The emergency response procedure detailed in the Integrated Facility Management Plan (IFMP) specifies the responsibility for fire management and the monitoring, review and reporting of incidents. The closest RFS Fire Control Centre is located in Maitland with the local RFS located in Martins Creek and Paterson. The local RFS would be the primary response with backup response from Maitland. Should the Revised Project be approved the emergency response procedure would be reviewed and updated in accordance with the relevant requirements under PBP 2019 and in consideration of the relevant aspects of the Revised Project.

With the ongoing review of the emergency response procedure and the continued implementation of bushfire protection measures in consultation with the RFS as operations progress, it is considered that bushfire risk associated with the Revised Project can continue to be appropriately managed in an effective manner.

6.15.5 Bushfire Management

The current IFMP for the quarry includes appropriate procedures in relation to responding to fire emergencies. The bushfire emergency response seeks to limit impact to infrastructure and risk of injury to personnel and the community.

Existing bushfire management measures implemented at the quarry include:

- fire extinguishers fixed to all machinery
- appropriate access to water sources and use of water carts for firefighting purposes
- appropriate access maintained at all times
- infrastructure areas including offices maintained to reduce fuel loads

- emergency response procedure.

The Bushfire Emergency Response Procedure as part of the IFMP will be reviewed and updated to consider the relevant aspects of the Revised Project with an ongoing commitment to review and revise the procedure if necessary, as the Revised Project progresses.

6.15.6 Environmental and Safety Management

Daracon has a number of environmental and safety management system documents relevant to the storage and handling of hazardous materials including the EMP, a Pollution Incident Response Management Plan (PIRMP), Environmental Inspection Report checklist, Incident Reporting and Investigation procedure and the quarry Safety Management Plan. These documents are updated on a regular basis and applied as required to ensure:

- hazardous materials are managed on site to minimise the risk of harm to people and the environment
- that all foreseeable emergency events involving hazardous materials are considered and adequate site-specific systems are put in place to ensure site personnel and equipment are ready and able to deal with an emergency.

6.16 Waste Management

Daracon is committed to the management of waste streams in accordance with the principles of the waste hierarchy, where emphasis is placed upon reduce, reuse, recycle prior to disposal of its wastes.

The NSW Waste Avoidance and Recovery Strategy 2014-21 (EPA, 2014) provides a framework for waste management over the next seven years, aligning with the NSW Government's waste reforms in NSW 2021: A Plan to Make NSW Number One. The Strategy identifies the following waste avoidance and resource recovery goals:

- avoid and reduce waste generation
- increase recycling
- divert more waste from landfill
- manage problem wastes better
- reduce litter
- reduce illegal dumping.

6.16.1 Predicted Waste Streams

Under the Waste Classification Guidelines – Part 1: Classification of waste (EPA, 2014), waste can be classified into 6 different classes based on risks to the environment and human health. These are:

- special waste
- liquid waste
- hazardous waste
- restricted solid waste

- general solid waste (putrescible)
- general solid waste (non-putrescible).

6.16.1.1 Construction

A number of construction activities are likely to generate inert waste such as concrete, steel and other heavy construction material including:

- the construction of the new access road and bridge crossing from Dungog Road
- intersection upgrades at Dungog and Gresford Road and the King and Duke Street
- extension of rail siding
- improvements to the water management system
- construction of additional noise mitigation works including a new noise barrier and acoustic treatment of processing infrastructure.

Inert waste materials generated by these activities will be recycled where practicable or disposed of at an appropriate facility, with some inert wastes (e.g. clean concrete waste) to be disposed of in appropriate locations in on-site pit voids. Any excavated material generated during construction will be re-used on site.

Other waste that may be generated during the construction phase of the Revised Project will include office, domestic and ablution waste, as well as a small amount of waste associated with general maintenance and workshop activities.

Construction wastes will be separated and recycled where possible and facilities will be provided for general wastes generated by construction staff. Any construction waste that cannot be recycled will be collected by an appropriately licensed contractor and disposed of at an appropriately licensed facility.

6.16.1.2 Operation

Once the quarry is fully operational, the Revised Project will not generate significant quantities of waste. The main streams associated with the operation of the quarry will include:

- general solid waste (putrescibles), associated with food waste and waste from litter bins from employees
- general solid waste (non-putrescible), associated with recyclable products such as glass, paper and cardboard
- hazardous waste, associated with waste generated from workshop and equipment maintenance activities, such as oils, lubricants, hydrocarbons, paints, rags, gloves, machinery components and empty drums.

These wastes will be recycled where practicable and otherwise disposed of via a licensed landfill facility.

6.16.2 Mitigation and Management Measures

To manage waste generated by the Revised Project, Daracon will review and update the existing waste minimisation and recycling measures in the IFMP to consider the construction and operational phases of the Revised Project.

The following management measures would be implemented as part of the Revised Project:

- Waste streams will be managed in accordance with the principles of the waste hierarchy, with emphasis on reduce, reuse, recycle prior to disposal of its wastes.
- General waste generated by the quarry personnel during operation of the Revised Project will be accommodated through the existing waste collection service for the quarry or via a licensed contractor for disposal/recycling at an appropriate waste management facility.

6.17 Visual Amenity

A comprehensive Landscape and Visual Impact Assessment (LVIA) for the Original Project was prepared by Moir Landscape Architects (Moir), in accordance with the SEARs and DSC's relevant guidelines. The SEARs required an assessment of the likely visual impacts of the development on private landowners in the vicinity of the development and key vantage points in the public domain, paying particular attention to the creation of any new landforms (noise bunds and embankments, as well as new stockpile areas).

The LVIA involved field work undertaken in February 2015, a systematic evaluation of the visual environment pertaining to the site and a quantitative assessment of the visual impacts through digital terrain modelling, view shed analysis and survey accurate photomontages depicting the Original Project and mitigation measures. Further discussion regarding the outcomes of the LVIA is provided in **Section 6.17.2**.

During the exhibition of the 2016 EIS, visual amenity was raised as a concern by some of the local community stakeholders (refer to **Section 5.1**), particularly the visibility of the proposed noise wall along Station Street and cleared and denuded land associated with the extraction in the new resource areas towards the east. As further discussed in **Section 6.17.3**, the Revised Project no longer includes the proposed noise wall and does not propose further expansion of extraction areas to the east. There are other components of the Revised Project that may have visibility from key viewpoint locations, and these are discussed and assessed in **Section 6.17.3**.

Further visual analysis was undertaken by Umwelt as part of the ADA process to reconfirm the findings of the LVIA (Moir, 2016) and assess any potential changes to the visual impacts of the Revised Project. The methodology used in this analysis and its outcomes are provided in **Sections 6.17.4** and **6.17.5** respectively.

6.17.1 Existing Landscape Setting and Visual Amenity

The quarry has been operating for over 100 years and has formed part of the existing landscape character over this period. The quarry is in a predominantly rural setting, on the south-west facing slope of a densely vegetated ridgeline that runs to the south of Merchants Road.

Directly south to the quarry is the village of Martins Creek, with a small number of residential lots along Station Street, Cory Street, Douglas Street and Grace Avenue. The quarry is located within proximity to several residential lots, particularly those in Station Street and Cory Street. There is a primary school and church located on Cook Street, to the south of the town. Views of the quarry are largely screened from residences in Martins Creek due to vegetation and topographical relief.

To the west, the quarry is bounded by the North Coast Railway line, with large areas of undeveloped, densely vegetated land along the north and eastern boundaries of the quarry associated with the ridgeline. The rural landscape to the north-west and south-south has been largely cleared of vegetation to allow for rural residential properties and grazing activities, with pockets of scattered remnant vegetation remaining.

The cleared land and remnant vegetation surrounding the Project Area is considered to provide views of moderate to high scenic quality. The varying scenic quality of the area is generally dependent on elevation and surrounding land uses.

Views from the elevated Vacy community located to the north-west would generally be considered of high scenic quality. Views from these properties to the south are generally characterised by the undulating terrain with distant views of densely vegetated areas, including Mount Johnstone. Closer views are predominantly characterised by cleared grazing land. Views to the east and south east, towards the quarry, are generally shielded due to topography.

The rural-residential area of Paterson south west of the quarry generally has moderate scenic quality. These areas have lower elevations and views are generally restricted to surrounding properties with some filtered views of surrounding undulating hills. Long distant views are generally restricted due to topography and existing vegetation.

Views of the existing quarry are available from the west, particularly from residential properties in Station Street directly adjacent the quarry, but also further afield along Gresford Road where there are clearings in roadside vegetation. The views along Gresford Road are limited and in context with the existing landscape character. Some rural residences located on cleared, slightly sloping land associated with the foothills of Mount Johnstone, approximately 2 km from the quarry, generally have expansive views to the east across the landscape towards the quarry.

6.17.2 Summary of Previous Assessment Outcomes

The key findings of the LVIA for the Original Project were:

- The quarry is generally concealed to the north, east and south by prominent vegetated ridges. The highest visual impact is therefore to the west, where views to the quarry are possible. Particularly, this includes:
    - motorists and residences associated with Gresford Road
    - rural residences located on cleared, slightly sloping land associated with the foothills of Mount Johnstone with expansive views to the east across the landscape towards the quarry.
- There are limited opportunities to view the quarry from areas within Martins Creek village due to the undulating topography and vegetation. Foreground vegetation and rises in topography screen views from residences associated with Station Street and Cory Street.
- The new access road off Dungog Road would appear in keeping with the existing access roads and driveways already existent off Dungog Road.
- Viewpoints to the west already experiencing views onto the existing quarry operations will experience increased views as the proposed expansion of quarrying towards the east develops. Due to the progressive nature of the development, this visual change would occur overtime. The highest visual impact is likely to be felt as vegetation is removed to accommodate the proposed extraction and quarry operations.
- The proposed noise wall along the eastern side of Station Street is likely to have a low to moderate visual impact on residences within close proximity due to its relatively large scale. Overtime, as proposed screen planting establishes, it is likely the visual impact would be reduced.

In summary, the LVIA for the Original Project concluded that:

- The existing quarry has been an element in the landscape for the past 100 years and forms an element in the existing landscape character. The progressive nature of the development will allow the proposed changes to occur gradually and there is an opportunity to rehabilitate the landscape concurrently.
- When implemented with appropriate environmental management and employment of suitable mitigation measures, the future development associated with the proposed expansion could be undertaken with minimal visual impact on the surrounding environment whilst retaining the core landscape character and values.

6.17.3 Project Design Changes and Visibility of the Project

As discussed in **Section 1.6**, one of the key design changes of the Revised Project is the reduced disturbance footprint to the east of the quarry (Lot 21 DP 773220). Based on the findings of the LVIA for the Original Project (refer to **Section 6.17.2**), it is expected that the visual impact of the Revised Project would be considerably reduced as a result of this design change. This was confirmed by the outcomes of the updated analysis undertaken for the Revised Project, as discussed in **Section 6.17.4**.

Further, the Revised Project does not include a noise wall along Station Street and there would be no visual impact in this regard.

Other components of the Revised Project that may have visibility from key viewpoint locations include:

- construction of the new main access road and intersection off Dungog Road
- construction of additional noise mitigation walls along the internal haul route and the rail siding, of approximately 4 m in height
- continued extraction within the West Pit and expanding extraction within the existing Processing Area (proposed East Pit)
- emplacement and stockpiling of overburden associated with minor landform changes including additional noise bunds ranging between 4 - 8 m in height
- product stockpiling within the southern Stockpile Area, with ballast stockpiles of up to 8 m in height
- continued use of night lighting at the Processing Area
- progressive rehabilitation which may be associated with views of mobile plant and equipment and regenerating vegetation.

A combination of these activities will occur throughout the life of the Revised Project as quarrying in the West Pit progresses and the overburden emplacement areas progressively achieve their final landform and are rehabilitated.

6.17.4 Viewpoints and Updated Assessment Methodology

A radial topographic analysis technique was used to identify areas potentially visible from the Project Area, based on ground topography alone (no allowance was made for existing vegetation). The radial analysis was further used to confirm the visibility of the Revised Project from the 16 viewpoint locations identified and assessed in the LVIA (Moir, 2016) for the Original Project. The radial analysis was completed using the Revised Project's Year 25 landform as this was considered to be representative of the worst-case for viewing locations.

The following viewpoint locations, shown on **Figure 6.35**, were chosen from the analysis for more detailed transect analysis:

- **VP1** – Station Street, Martins Creek – looking north east along Station Street, towards the quarry.
- **VP2** – View Street, Vacy – looking south east along View Street with surrounding rural residential properties towards the quarry.
- **VP3** – Corner of Dungog Rd and Merchants Rd – looking south east towards the quarry.
- **VP4** – Corner of Dungog and Hors Crossing Rd – directly adjacent the railway corridor, looking generally south towards the quarry.
- **VP5** – Dungog Road (near 281 Dungog Road)– looking directly west from Dungog Road towards the quarry.
- **VP 6** – Martins Creek Tennis Court – looking north towards the quarry, adjacent to single storey residential dwellings associated with Cory Street.
- **VP7** – Vogeles Road, Martins Creek – looking north directly into the quarry from a dominant bend on Vogeles Road.
- **VP8** – Douglas Voge Road – looking north west from a highpoint in the road verge along Douglas Voge Road.
- **VP10** – Cory Street – looking north from Cory Street, adjacent to the rail siding within the town of Martins Creek.
- **VP12** – Dungog Road – looking north east from Dungog Road approximately 500 m south from the intersection with Grace Avenue.
- **VP13** – Gresford Road (near 598 Gresford Road) – looking west from Gresford Road, approximately 1.3 km north from the intersection with Dungog Road
- **VP14** – Gresford Road - looking north east from Gresford Road, approximately 1km north from the intersection of Dungog Road
- **VP15** – Gresford Road – view north east from Gresford Road
- **VP16** – Gresford Road - view north east towards the site from the entry to 288 Dungog Road, approximately 3.2km north west of Paterson town centre.

A transect analysis was completed based on the topographic model of the existing landform and the Revised Project's Year 25 landform, taking into account existing vegetation. View lines from the identified assessment points were used to illustrate the extent of visibility of the Revised Project (refer to **Figure 6.36**).

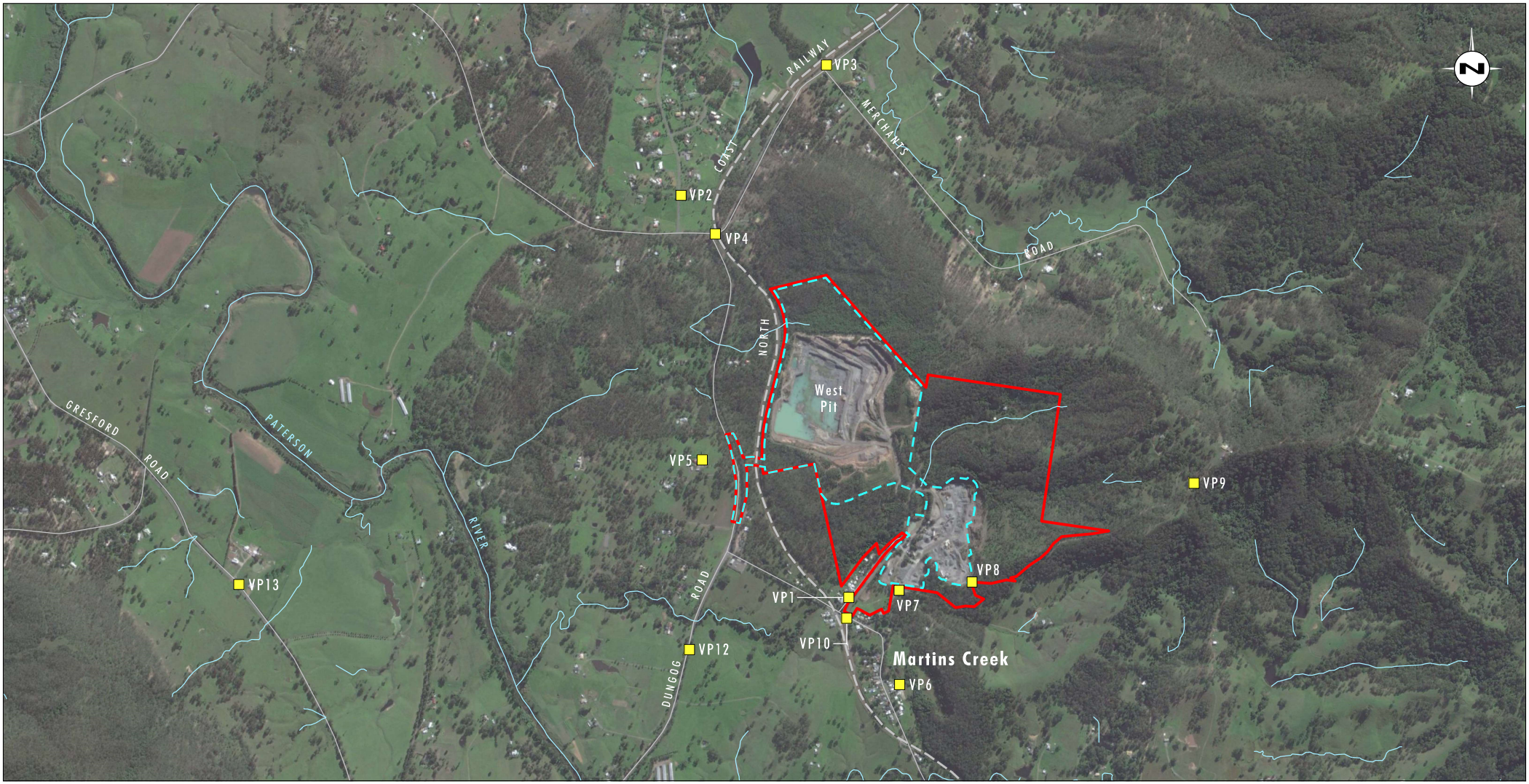


Image Source: Google Earth (Apr 2017)

0 0.25 0.5 1.0km
1:25 000

Legend

- Project Area
- Proposed Disturbance Area
- Viewpoint Location

FIGURE 6.35

Visual Location Points

File Name (A4): R01/3957_234.dgn
20210526 10.00

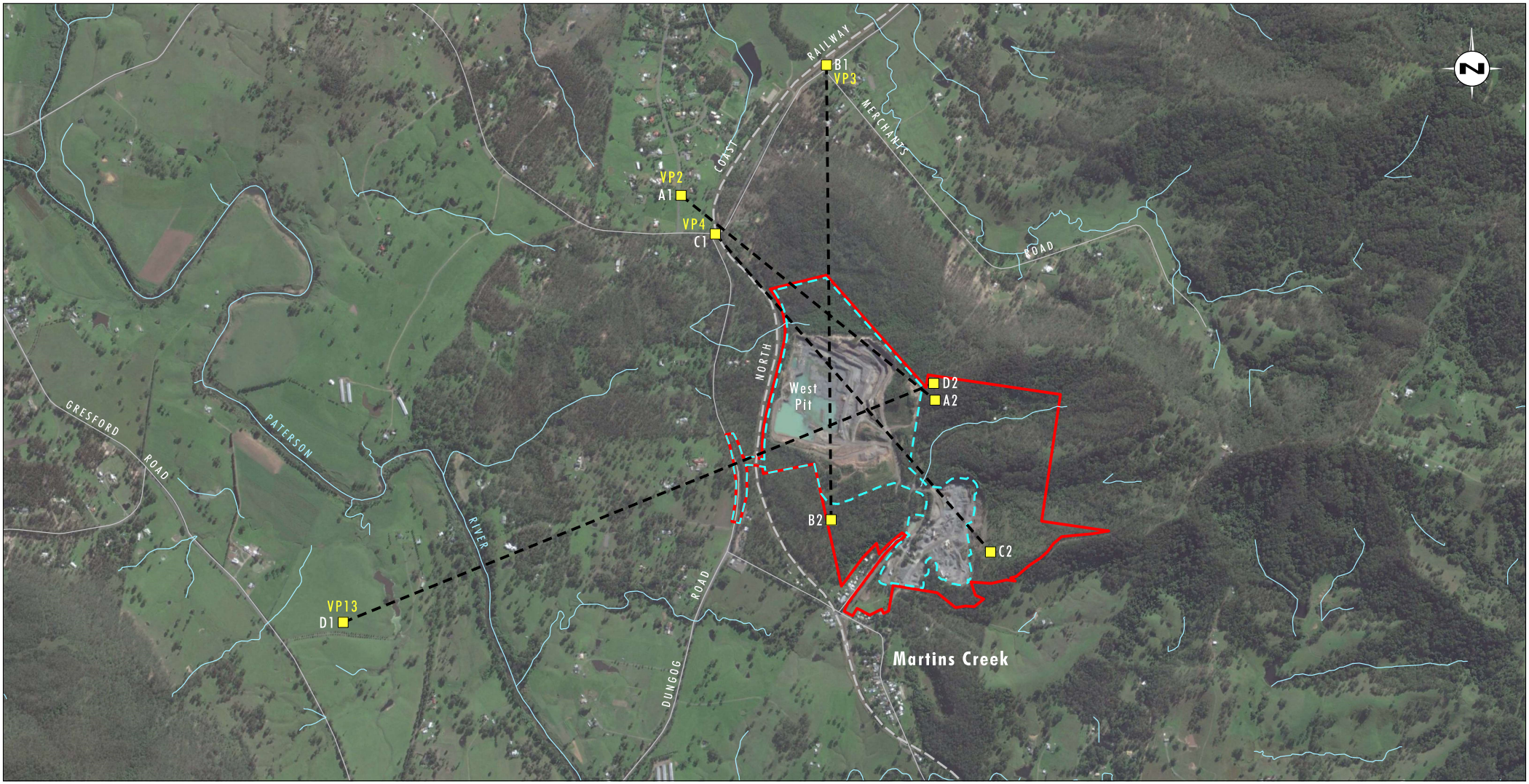


Image Source: Google Earth (Apr 2017)

0 0.25 0.5 1.0km
1:25 000

Legend

- Project Area
- Proposed Disturbance Area
- Transect Locations

FIGURE 6.36

Transect Locations

6.17.5 Assessment of Impacts

The updated visual analysis confirmed the findings of the VLIA for the Original Project, that is that views of the quarry are limited to the west, from residential properties along Station Street and from elevated locations along Gresford Road (refer to **Figure 6.37**). These views are typically filtered by vegetation or undulating topography.

The primary visual impact of the Revised Project is likely to be exposed or filtered views of the proposed new extraction area from elevated locations to the west, on Gresford Road. These locations currently have limited views of the existing extraction area in the West Pit (refer to **Figure 6.37**). Due to the progressive nature of the development, it is likely the visual change of the expansion would occur overtime and remain limited.

Construction of additional noise control bunds is proposed to occur during the first two years of the Revised Project, following project approval. Residents in proximity to the quarry, including Station Street, may have views of the proposed bunds. These bunds will be located within the limits of existing or proposed disturbance. Views of the bunds may shield other views of the quarry and would not be inconsistent with the existing quarry landscape.

The new access road off Dungog Road would be a new feature with visibility from road users and private residences in the vicinity. The new access road will be in keeping with the existing road infrastructure and is not expected to have a significant impact on the visual amenity of road users or private residences in the vicinity.

Minimal lighting is required during the evening and night time periods due to restricted activities after 6pm. The existing topography and vegetation potential impacts from lighting. All lights are currently positioned to direct towards work areas and away from residences.

Lighting will continue to be kept to a minimum, directed away from surrounding residences and will be maintained in accordance with the relevant Australian Standard (AS4282 (INT) 1995 – Control of Obtrusive Effects of Outdoor Lighting). Lighting associated with the rail line is fixed and is required for night loading for safety purposes.

6.17.6 Visual Mitigation and Management Measures

Daracon will implement the following measures to minimise the visual impact of the Revised Project:

- progressive rehabilitation to reduce the duration of visible soil exposure, including the use of temporary rehabilitation as appropriate
- all vegetated areas outside of the proposed disturbance footprint would be retained and preserved
- all outdoor lighting will be installed and operated in accordance with AS4282 including measures such as directing lighting downwards towards work areas and not toward private residences and roads, and where appropriate, using shields to limit the emission of light off site.

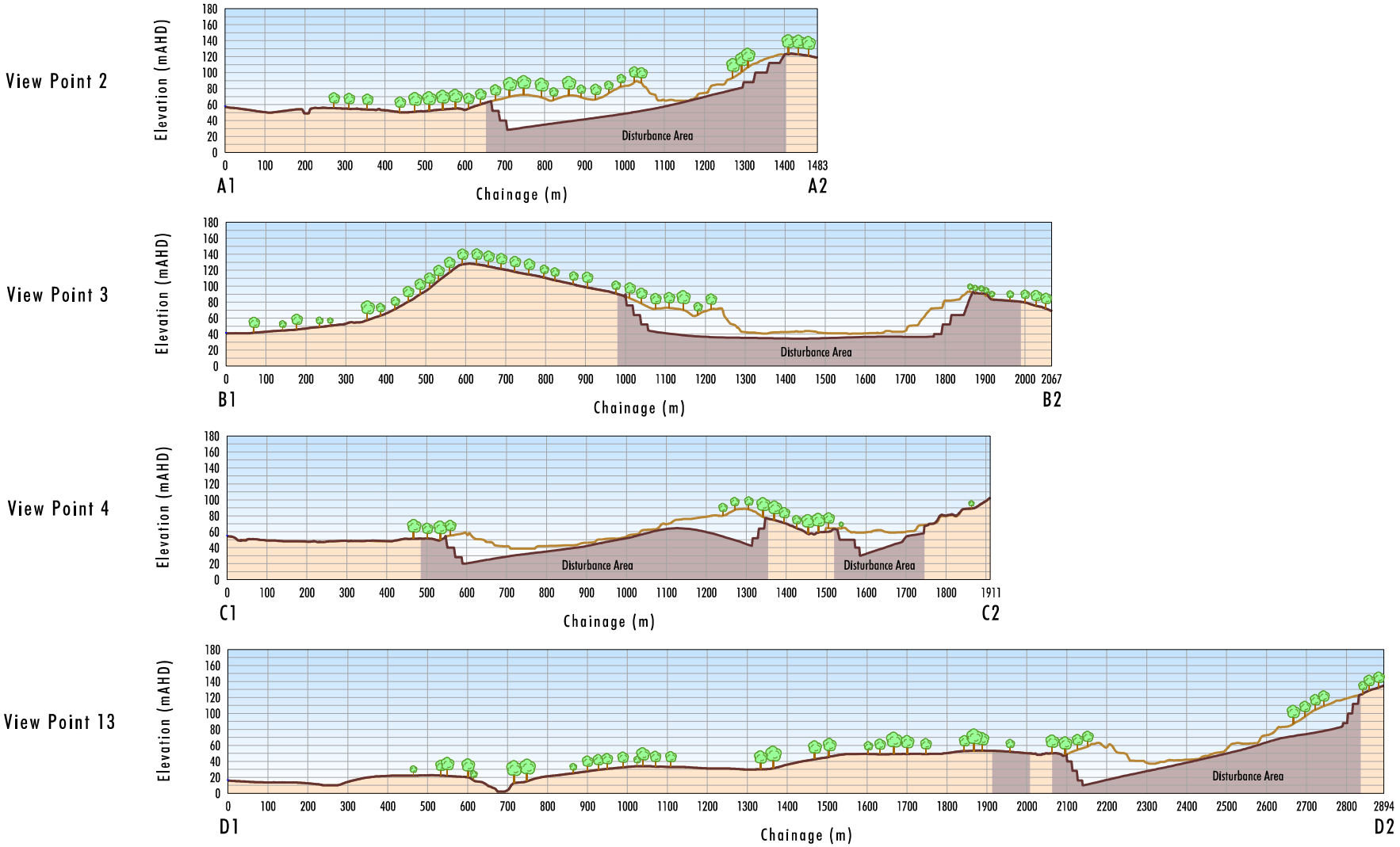


FIGURE 6.37

Visual Transects

6.18 Public Health and Safety

As outlined in **Sections 5.1** and **5.4**, several community and interest group submissions raised public health and safety as a key concern. In addition, the SEARs (dated 4 August 2016) identified that the EIS should include an assessment of the likely risks to public safety, paying particular attention to potential bushfire risks, blasting impacts and the handling and use of any dangerous goods. Risk associated with dangerous goods and bushfire risks are assessed in **Section 6.15**.

The focus of this section is to outline the process undertaken to identify and assess potential impacts on public safety, including human health, detail the key assessment findings in relation to these issues and identify where these issues are addressed in further detail within this ADA.

A risk screening based assessment approach to identifying potential adverse impacts on public safety, including health, was utilised during the updated environmental assessment and throughout preparation of the ADA. The detailed assessment of each potential risk has been undertaken in accordance with relevant legislation and guidelines, and by appropriately qualified specialists. Where relevant, potential risks to public safety or human health have been assessed against accepted safety or health based assessment criteria established by the NSW Government. Where relevant criteria are predicted to be met or where NSW Government policy stipulates mitigation measures that are to be implemented (e.g. imposition of voluntary acquisition clauses in any development consent granted), no further detailed health risk assessment was determined to be required. This screening type of evaluation of public safety and health risks using published guidelines was undertaken considering the tiered assessment approach outlined in *Environmental Health Risk Assessment – Guidelines for Assessing Human Health Risks from Environmental Hazards* (enHealth 2012).

The identified risks to public safety, including health and a summary of the key assessment findings relevant to the identified risk is provided in **Table 6.58**.

Table 6.58 Identified Risks to Public Safety and Associated Assessment Findings

Issue Identification	Description of Risk to Public Safety or Health	Relevant Assessment	Summary of Key Findings
Contaminated Land	Health related risks from human exposure to contaminated land	**Section 6.2**	As discussed in **Section 6.2.3**, the Project Area does not contain any areas of known contamination that may cause a significant risk of harm to human health or the environment. As with all activities that involve earthworks and quarrying, activities carried out as part of the Revised Project have the potential to cause localised contamination if not properly managed. Consistent with the recent approach at the existing quarry, controls will be put in place to manage this risk as part of the Revised Project including appropriate chemical handling and storage procedures, appropriate waste management systems, spill and emergency response procedures and equipment, and regular inspection and reporting processes. The management of contamination risks as part of the Revised Project is discussed further in **Section 6.15** and the management of waste is discussed further in **Section 6.16**.
Road Safety	Safety of other road users including loss of life	**Section 6.3** **Appendix C**	A key objective of the Revised Project has been to reduce traffic and transport impacts associated with the operation of the quarry, especially relating to road safety. In this regard, the TIA (refer to **Section 6.3.4.2**) showed that traffic movements associated with the Revised Project will represent a small increase over the existing flows along the Primary Haul Route and that principal intersections would continue to operate at current capacity. Road improvement works (refer to **Section 2.8.2**) are proposed as part of the Revised Project to address existing road safety concerns along the Primary Haul Route. A range of additional traffic management and mitigation measures (outlined in **Section 6.3.5**) are proposed to mitigate any potential road safety impacts associated with the Revised Project.
	Safety of public transport users, pedestrians and cyclists including loss of life	**Section 6.3** **Appendix C**	As noted above, a number of project design changes have been implemented as part of the Revised Project to reduce road safety impacts. Most notably, the Revised Project will no longer require truck movements on Saturday, Sunday or public holidays, thereby reducing the risk to cyclists mostly riding out on the roads over weekends. It is however noted that the recent operations did not result in any road safety concerns with bus companies, and there has been no recorded incidents involving pedestrians, cyclists or Daracon operated vehicles, including contract drivers. In light of the above, the Revised Project is not expected to adversely impact on public transport, or the safety of pedestrians and cyclists using the primary haul route.
Noise	Human exposure to noise during construction	**Section 6.4** **Appendix D**	It is predicted that up to 64 properties could experience noise levels above the construction noise management level of 45 dB(A) for short periods of time during the construction of the new access road into the quarry from Dungog Road, under noise enhancing weather conditions. It is further possible the construction of the new access road could also occur outside recommended standard

<table>
<tr><th>Issue Identification</th><th>Description of Risk to Public Safety or Health</th><th>Relevant Assessment</th><th>Summary of Key Findings</th></tr>
<tr><td></td><td></td><td></td><td>hours during the construction of the bridge over the North Coast Railway Line. This could occur when the construction activities include track possession from ARTC of the North Coast Railway Line.
In addition, it is predicted 31 properties could experience noise levels above the construction management noise level of 45 dB(A) during the construction of noise mitigation measure in and around the East Pit Processing plant area. These construction activities would be during recommended standard hours. The potential for exceedance of the noise levels at private properties can be reduced through the implementation of management strategies discussed in Section 6.4.6.1.</td></tr>
<tr><td></td><td>Human exposure to acute and cumulative impact of noise during operation</td><td>Section 6.4
Appendix D</td><td>Predicted operational noise levels are expected to exceed PNTL set in accordance with the NfPI at a number of surrounding residences. Following the implementation of reasonable and feasible noise mitigation measures, for the residences where the PNTL are predicted to be exceeded, the NIA found that there would be some exceedances as outlined below.
<table>
<tr><th rowspan="2">Impacts at private residences</th><th colspan="2">Day-time</th><th colspan="2">Shoulder</th><th>Evening</th><th>Night</th></tr>
<tr><th>Year 2 With Rail Loading</th><th>Years 6, 10, 15 and 20</th><th>Years 2</th><th>Years 6, 10, 15 and 20</th><th>Years 6, 10, 15 and 20</th><th>Years 6, 10, 15 and 20</th></tr>
<tr><td>Negligible</td><td>29</td><td>16</td><td>1</td><td>3</td><td>5</td><td>16</td></tr>
<tr><td>Marginal</td><td>15</td><td>11</td><td>3</td><td>2</td><td>2</td><td>3</td></tr>
<tr><td>Moderate</td><td>12</td><td>1</td><td>2</td><td>-</td><td>1</td><td>-</td></tr>
<tr><td>Significant</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>3</td></tr>
</table>
Following DPIE's Voluntary Land Acquisition and Mitigation Policy (2018), the significant and moderately impacted residences will form part of an active noise management zone where proactive noise management will be used to guide operations to minimise the potential impacts of the Revised Project. This private residence will also be offered receiver-based noise mitigation measures such as double glazing, insulation and/or air conditioning to minimise the potential effects of noise impacts from the Revised Project.
Worst case road traffic noise levels, both with and without quarry trucks, have been calculated for all road traffic noise receivers. The NIA show that baseline/existing road traffic noise levels exceed the RNP criteria for some receivers. The addition of quarry trucks did not cause an exceedance of RNP criteria where it was not already calculated to exceed with baseline traffic levels. For all road traffic noise receivers assessed, it is predicted that the addition of quarry trucks will result in minor</td></tr>
</table>

Issue Identification	Description of Risk to Public Safety or Health	Relevant Assessment	Summary of Key Findings
			increases to noise levels i.e. less than 2 dB(A). The RNP states that noise level increases of up to 2 dB(A) are considered barely perceptible to the average person.
	Human exposure to low frequency noise causing annoyance	**Section 6.4** **Appendix D**	Predictive noise modelling and monitoring confirms that low frequency noise modifying factor adjustments are not required for the Revised Project as low frequency noise has not been identified as resulting in more annoyance than would normally occur from the level of noise generated. Predicted low frequency noise levels are not expected to increase as a result of the proposed operations within the quarry relative to the recent operations.
	Sleep disturbance from transient noises often with tonal characteristics	**Section 6.4** **Appendix D**	The NIA found that night-time noise levels will not exceed sleep disturbance noise goals at any residential receivers.
Air Quality	Human exposure to particulates (PM_{10} and $PM_{2.5}$)	**Section 6.5** **Appendix E**	Air modelling results indicate there would be a negligible change in the cumulative maximum 24-hour and annual average PM_{10} and $PM_{2.5}$ concentrations as a result of the Revised Project with compliance with the air quality criteria predicted at all receivers. The assumed background maximum 24-hour average $PM_{2.5}$ concentration at Singleton (34µg/m³), already exceeds the criterion of 25µg/m³. The ambient concentrations of $PM_{2.5}$ within the Martins Creek area is therefore likely to be lower than Singleton. The assessment found that PM_{10} and $PM_{2.5}$ concentrations as a result of the Revised Project are unlikely to lead to any adverse air quality impacts.
	Human exposure to NO_2 from blasting	**Section 6.5** **Appendix E**	Modelling showed that under worst-case meteorological conditions, the Revised Project would not result in any exceedance of the EPA's criterion of 246µg/m³ at any off-site location (as identified by the 180 µg/m³ contour for incremental contribution and assumed background level of 66µg/m³). The assessment therefore concluded that with the proposed blasting management measures in place, fume generated by blasting is not expected to exceed the air quality criteria or result in any adverse air quality impacts.
	Human exposure to diesel emissions, i.e. Carbon monoxide (CO) and Nitrogen dioxide (NO_2)	**Section 6.5** **Appendix E**	As noted in **Section 6.5.5.4**, modelling of diesel exhausts emissions concentrations (including CO and NO_2) associated with both operational activities and road transport indicate compliance with the relevant criteria at all sensitive receivers. Exhaust emissions from operational activities as well as road transport are therefore unlikely to lead to adverse air quality impacts.
	Human exposure to crystalline silica	**Section 6.5** **Appendix E**	Modelling and monitoring results show that the estimated annual average respirable crystalline silica concentration at the Quarry because of the Revised Project would not exceed the relevant

Issue Identification	Description of Risk to Public Safety or Health	Relevant Assessment	Summary of Key Findings
			criteria of 3.0 µg/m^3. The Revised Project is therefore not expected to cause adverse air quality impacts with respect to crystalline silica.
Blasting	Direct and indirect health risks associated with blasting including risk to life, air quality impacts and noise impacts	**Sections 6.5** & **6.7** **Appendix E** & **Appendix G**	Blast fume emissions were assessed as part of the air quality impact assessment (as discussed in **Section 6.5.5.2**). The results show that even under worst-case meteorological conditions applying conservative assumptions, concentrations at the nearest sensitive receiver (R1) are well below (less than 20 µg/m^3) the EPA's criteria of 246 µg/m^3. Ground vibration and blast overpressure levels can be managed to meet relevant blast emission criteria at all sensitive receiver locations through appropriate blast design and the implementation of appropriate control measures. Risks to public safety associated with flyrock will be managed via continued implementation of blasting controls to minimise flyrock. Due to the substantial distances to residential receivers the issue of flyrock impact on the adjacent residential receivers is considered to be fully managed and the potential risks are considered negligible.
Water Contamination	Contamination of groundwater and health risks associated with human exposure	**Section 6.8** **Appendix H**	As discussed in **Section 6.8.4**, the risk of groundwater contamination through operational activities (including blasting and equipment operation) is considered very low due to the low hydraulic conductivity of the geology. All dangerous goods and potential pollutants would be stored in bunded containers or areas to prevent spillage and possible seepage to the groundwater. All refuelling activities will occur in areas with adequate bunding and/or provision for immediate clean-up of spills. All chemicals will be transported, handled and stored in accordance with relevant Australian Standards. These controls represent standard practice and a legislated requirement at quarry sites for preventing the contamination of the groundwater regime. Effective spill prevention and clean-up would further safeguard against the accumulation of contaminants which could seep to the underlying groundwater. The groundwater assessment has not predicted any impacts to groundwater quality as a result of the Revised Project and therefore there is negligible risk of contamination of groundwater such that human health impacts could occur.
	Contamination of surface water and health risks associated with human exposure	**Section 6.9** **Appendix I**	The surface water assessment found that historically the controlled discharge water quality results demonstrate that the quarry consistently meets the discharge criteria for EPL 1378. While controlled discharge volumes and frequencies are predicted to increase by 29% and 52% respectively, the maximum of uncontrolled discharges (typically having higher TSS concentrations) is expected to decrease. Discharge water quality associated with the Revised Project is expected to

Issue Identification	Description of Risk to Public Safety or Health	Relevant Assessment	Summary of Key Findings
			continue to meet the EPL 1378 criteria as the same water treatment processes and controlled discharge management practises will continue to be implemented.
	Contamination of drinking water and health risks associated with human exposure	**Sections 6.8** & **6.9** **Appendix H** & **Appendix I**	As discussed above, the Revised Project is not predicted to result in adverse impacts on downstream water quality and therefore there is negligible risk of contamination of surface waters such that human health impacts could occur.
Social	Health risks associated with impact to the social wellbeing of the community including social equity issues such as employment, impacts to access and amenity	**Section 6.13** **Appendix O**	The SIA engagement process found that there was the perception in the local community that the health and wellbeing of proximal landholders was being impacted by the Revised Project in a number of different ways, including as a result of the physical environment (safe water, clean air, safe houses) and psychosocial factors e.g. stress and anxiety. The aspects relating to water and air are discussed above. Potential impacts to social amenity as a result of traffic and truck movements, are perceived by stakeholders to impact on their way of life, their health and well-being, and their access to and use of surroundings. Whilst stress and frustration alone do not constitute mental illness, they affect quality of life, and for individuals with an existing vulnerability to mental health issues, are added stressors. Regular sleep disturbance is also known to affect health. The SIA indicates that it is likely that the Revised Project is contributing to mental health issues for some residents and landholders in the locality. It is anticipated that the project design changes and associated proposed mitigation measures discussed in **Section 6.13** with respect to continued ongoing engagement and targeted information provision should the Revised Project be approved, may result in some relief from that stress being felt; however it is also acknowledged that it will take some time for community confidence in the management of project impacts to be demonstrated and a sense of trust in Daracon's ability to manage and monitor these effectively and that community concerns may persist regardless of the Revised Project's compliance and how impacts are experienced.
Dangerous Goods	Health risks associated with the storage, handling and disposal of dangerous goods	**Section 6.15**	All hazardous materials will be stored within the Project Area at the locations shown in **Figure 6.33**. None of the hazardous materials to be stored within the Project Area are above SEPP 33 screening thresholds. Furthermore, all flammable and combustible liquids for the Revised Project are stored in accordance with the requirements of *AS1940 – 2017 The storage and handling of flammable and combustible liquids* (AS1940). The environmental and safety management system relevant to the storage and handling of hazardous materials will be updated on a regular basis and applied as required to ensure hazardous

Issue Identification	Description of Risk to Public Safety or Health	Relevant Assessment	Summary of Key Findings
			materials are managed on site to minimise the risk of harm to people and the environment; and that all foreseeable emergency events involving hazardous materials are considered and adequate site-specific systems are put in place to ensure site personnel and equipment are ready and able to deal with an emergency. With the effective implementation of the environmental and safety management system, the level of risk to surrounding land users is tolerable.
Bushfire	Direct and indirect health risks associated with bushfire including risk to life	**Section 6.15**	Existing bushfire management measures include: • Fire extinguishers fixed to all machinery • Appropriate access to water sources and use of water carts for firefighting purposes • Appropriate access maintained at all times • Infrastructure areas including offices maintained to reduce fuel loads; and • Emergency response procedure. The closest RFS Fire Control Centre is in Maitland with the local RFS located in Martins Creek and Paterson. The operational areas within the quarry site will be maintained with a >10m buffer to provide a defendable space to reduce fuel loads and appropriate asset protection zones (APZ). Access via Station Street and Vogeles Road is adequate with direct access to and from the quarry providing emergency exit from the quarry for all staff and access for firefighting. A new site access is proposed as part of the Revised Project to provide additional emergency exit from the quarry site. Additionally, internal haul roads provide all weather access across the quarry site. Access across the Project Area will continue to be assessed and maintained as the Revised Project progresses. The emergency response procedures as part of the IFMP for the quarry would be reviewed and updated in accordance with the relevant requirements under PBP 2019 and in consideration of the relevant aspects of the Revised Project. With these measures in place, the risk to human health and life associated with bushfire is considered low.
Waste	Health risks associated with the handling and disposal of waste including hazardous waste	**Section 6.16**	The management of waste streams at the quarry will be in accordance with the principles of the waste hierarchy, where emphasis is placed upon reduce, reuse, recycle prior to disposal of its wastes.

Issue Identification	Description of Risk to Public Safety or Health	Relevant Assessment	Summary of Key Findings
			Hazardous wastes will include those generated from workshop and equipment maintenance activities, such as oils, lubricants, hydrocarbons and paints. These wastes will be recycled where practicable and otherwise disposed of via a licensed landfill facility. Most wastes that cannot be reused or recycled will be transported off site by licensed waste management contractors. All licensed waste management contractors are required to have appropriate controls in place to manage risks in accordance with NSW Government guidelines. With these controls in place and considering the nature of hazardous wastes associated with the Revised Project, the risk to human health associated with waste is expected to be low.

6.19 Rehabilitation and Final Landform

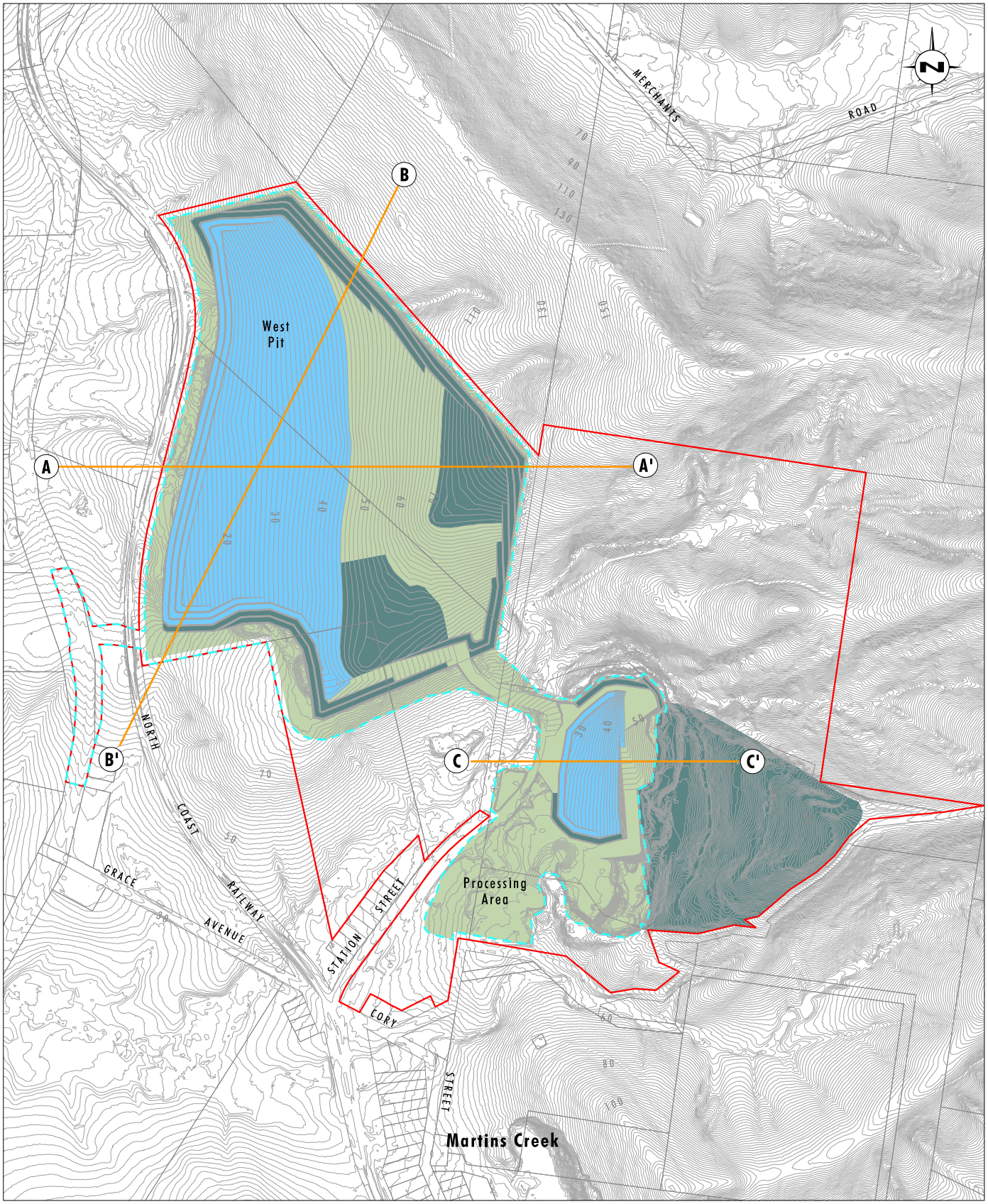
Daracon is committed to the effective rehabilitation and closure of the quarry at the cessation of operations. The overarching principles which apply to the rehabilitation and closure of the Revised Project is the development of a safe, stable and non-polluting landform. This will be achieved through managing quarry assets, operations and rehabilitation on a progressive basis to work towards the final rehabilitation and closure of the quarry.

Rehabilitation at the quarry will consider the existing and future quarry areas to build on existing rehabilitation undertaken and to address long term rehabilitation of quarried and disturbed areas. Key aspects associated with rehabilitation include rehabilitation of the quarry benches and available areas within and surrounding the quarry pit with two final voids to remain at the quarry.

Rehabilitation will occur progressively within the quarry pit and benches as operations progress however, the exact timing of rehabilitation works will be dependent upon on the rate of resource extraction in each area and the final height of each bench. Additionally, any areas surrounding the active extraction and processing facilities, where quarrying is not proposed, will be subject to progressive rehabilitation once it is identified that areas will not be required for ongoing operations (refer to **Section 6.19.8.1**). Indicative rehabilitation staging for the Project is shown in **Figure 2.4** to **Figure 2.9**.

Whilst a conceptual quarry closure plan will be outlined within the BRMP, a detailed Quarry Closure Plan will be developed approximately three years prior to cessation of quarrying activities. The Quarry Closure Plan will describe the proposed operational and progressive rehabilitation procedures for the remainder of the quarry life and following quarry closure. Several final land use options are available for the quarry. Currently, final land use is focused on promoting the rural landscape by establishing native grassland or exotic pastures in low lying areas whilst focusing on the re-introduction of pockets of woodland species across the benches consistent with endemic vegetation types (refer to **Figure 6.38**). As detailed in **Section 6.19.4**, the final land use will be subject to further investigation during the development of the detailed Quarry Closure Plan three years prior to the cessation of quarrying activities.

A description of the strategies that will be used to rehabilitate the areas disturbed by quarrying operations are provided in the sections below. Daracon will consult with relevant stakeholders, including DSC and the CCC, regarding the suitability of the proposed final use as part of the detailed Quarry Closure Plan.



Data Source: Daracon (2020)
Note: Contour Interval 1m

0 100 250 500m
1:10 000

Legend

- Project Area
- Proposed Disturbance Area
- Rehabilitation Area - Native and Pasture Grass
- Rehabilitation Area - Native and Pasture Grass with Pockets of Woodland Species
- Pit Void Lake
- Cross Section

FIGURE 6.38

Conceptual Final Landform

6.19.1 Rehabilitation Principles and Objectives

6.19.1.1 Strategic Framework for Quarry Closure

In accordance with SEARs for the Project, rehabilitation is proposed to be undertaken incorporating relevant principles of *The Strategic Framework for Mine Closure (ANZMEC & MCA 2000)* (SFMC).

The SFMC provides a framework of six key objectives which are to be considered as part of a closure plan.

These objectives have been adopted for the Project to achieve an integrated approach to rehabilitation and closure planning and are provided in **Table 6.59**, along with the relevant section where they are addressed.

Table 6.59 Key Objectives from the Strategic Framework for Mine Closure

Key Objectives	Relevant Section of Document
To enable all stakeholders to have their interests considered during the closure process.	**Section 6.19.1.2**
To ensure the process of closure occurs in an orderly, cost-effective and timely manner.	**Section 6.19.8** and **6.19.11**
To ensure that the cost of closure is adequately represented in company accounts and that the community is not left with a liability.	**Section 6.19.11**
To ensure there is clear accountability and adequate resources for the implementation of the closure plan.	**Section 6.19.10**
To establish a set of indicators which will demonstrate the successful completion of the closure process.	**Section 6.19.6** and **6.19.7**
To reach a point where the company has met agreed completion criteria to the satisfaction of the responsible authority.	**Section 6.19.9** and **6.19.10**

Each of these objectives will be reviewed throughout the life of the Revised Project and will be informed by various external factors based on stakeholder feedback and regulatory requirements which may be applicable at the time of closure. If necessary, rehabilitation objectives will be refined to align with post closure land use goals.

6.19.1.2 Stakeholder Consultation

As discussed in **Section 1.6**, Daracon has considered Agency and community feedback in the submissions on the EIS for the Original Project and subsequent consultation and undertaken detailed quarry planning and design activities to optimise use of the existing resource and minimise environmental and community impacts. This includes a reduction in the proposed quarry approval term from 30 - 25 years and a reduction in the project disturbance footprint. Accordingly, refinements have been made to the quarry stage plans (**Figure 2.4** to **Figure 2.9**) and the conceptual final landform (refer to **Figure 6.39**).

Key processes which provide for transparency and stakeholder feedback in relation to ongoing rehabilitation progress and closure planning include but are not limited to:

- periodic review and revision of the quarry BRMP
- submission of annual reporting documents outlining progressive rehabilitation work
- CCC

- ongoing meetings with agency and community stakeholders
- development of a conceptual and subsequently a detailed closure plan.

6.19.2 Strategic Guidance

6.19.2.1 Dungog Local Environmental Plan

Opportunities for the quarry during rehabilitation and post closure have been developed in consideration of the objectives of the Dungog LEP. As noted in **Section 4.2.2.1**, the majority of land parcels that make up the quarry are zoned as RU1 - Primary Production. A small portion of Lot 1 DP 1006375 is listed as RE1 – Public Recreation however, the Project does not propose to disturb this parcel of land.

The objectives of RU1 zone are outlined below:

- to encourage sustainable primary industry production by maintaining and enhancing the natural resource base
- to encourage diversity in primary industry enterprises and systems appropriate for the area
- to minimise the fragmentation and alienation of resource lands
- to minimise conflict between land uses within this zone and land uses within adjoining zones.
- to provide for recreational and tourist activities that are compatible with the agricultural, environmental and conservation value of the land
- to promote the rural amenity and scenic landscape values of the area and prevent the silhouetting of unsympathetic development on ridgelines.

In consideration of the Dungog LEP, rehabilitation at the quarry will focus on promoting the rural landscape by establishing native grassland or exotic pastures in low lying areas whilst focusing on the re-introduction of pockets of woodland species across the benches consistent with endemic vegetation types. The conceptual final landform is presented in **Figure 6.39**.

Any amendments that may occur to the Dungog LEP during the life of the Project and opportunities for other complimentary final land uses, will be evaluated as part of an ongoing revision to the quarry's post closure planning process, including the development of the detailed Quarry Closure Plan.

6.19.2.2 Hunter Regional Plan 2036

As discussed in **Section 4.2.5.2**, the Hunter REP aims to guide the NSW Government's land use planning priorities for the Hunter over the next 20 years by providing an overarching framework for more detailed land use plans, development proposals and infrastructure funding decisions.

This rehabilitation strategy aligns to the following 'directions' in the Hunter REP:

- Direction 11 is aimed at recognising the need to manage the ongoing use of natural mineral resources and develop land use plans that respond to the lifecycle of the extractive resource area to provide stakeholders with certainty around the long term use and productive value of the land.
- Direction 15 notes the importance of monitoring and managing impacts of existing land uses, and in the future those associated with the region's growth will be essential to protect the quality and security of the region's water supplies.

Direction 11 is relevant as it relates to the benefit of the Project through the development of economic extractive resources. Direction 15 is addressed through the range of management, mitigation and monitoring measures committed to for the Revised Project refer to **Section 8.0**.

The investigation of alternative, high economic value and employment generating land uses for the quarry post operations as part of the closure planning processes is also consistent with Direction 15 and is further discussed in **Section 6.19.4**.

6.19.3 Rehabilitation Processes and Performance

The total surface area available for rehabilitation at any one point in time will be limited due to the nature of extractive operations at the quarry, the progressive vertical expansion of the active quarry pit and stepped development of benches.

As operations progress and material is extracted to the quarry design depth, areas such as quarry benches will become available for rehabilitation.

The pit floor and ancillary areas will generally not become available for rehabilitation until active operations have fully exhausted resources in that area and ancillary areas for processing, stockpiling and laydown activities are not required.

As a result, rehabilitation activities to date have largely been focused around the fringes of the active quarry area as shown in **Figure 2.4**. The existing rehabilitation process is designed around revegetating disturbed land surfaces which have been shaped and topsoiled to create a grassed, stable soil surface on batter slopes to prevent soil erosion and is discussed further in **Section 6.19.3.1**.

Rehabilitation at the quarry has been undertaken in various forms to date including:

- reshaping and revegetation of overburden and spoil material
- rehabilitation (topsoil spreading and re-seeding) of shaped areas on part of the southern boundary of the West Pit (Lots 5 and 6) and west of the East Pit (Lot 1) (refer to **Figure 2.4**) that were quarried many years ago, prior to Daracon leasing of the quarry
- passive regeneration within areas of existing vegetation where adequate canopy seed sources are available.

6.19.3.1 Rehabilitation Practices

Rehabilitation of part of previously quarried areas on Lot 1 (refer to **Figure 2.4** and **Plate 6.1**) occurred during 1990's whilst Lot 5 and Lot 6 previous temporary rehabilitation works were completed by Daracon during 2015. Areas of existing temporary rehabilitation in Lots 5 and 6 are proposed to be quarried as illustrated in **Figure 2.4** to **Figure 2.9**.

Rehabilitation works undertaken on Lots 5 and 6 to date have involved reworking quarry benches to batter gradients, grading and ripping batters to ensure stability whilst optimising the retention of soil moisture to support and promote vegetation growth. Planting works completed by Daracon have involved a mix of hydro-mulch, hand and aerial seeding using a mix of local province species endemic to the region to establish vegetation cover.

Irrigation, weed management and other minor maintenance activities have most recently been undertaken in these areas to promote vegetative groundcover and minimise soil erosion and weed invasion.

Rehabilitation activities undertaken within Lot 1 (refer to **Plate 6.1**) has included the establishment of groundcover and planting of some mid-storey and canopy species.

Further infill planting is proposed to be undertaken in Lot 1 within Year 1 of the Project to increase mid-storey and canopy species diversity in this area.

The program for additional planting, including species listing and composition will be detailed within the BRMP to be developed for the Revised Project.



Plate 6.1 Active Management (Infill Planting of Tree Species) Proposed – Lot 1

© Umwelt, 2020

6.19.3.2 Proposed Quarry Rehabilitation

Rehabilitation practices proposed for the Revised Project will be based on existing rehabilitation management practices employed across the quarry. These practices will be detailed in the BRMP. These measures are designed to build on the existing rehabilitation techniques and to achieve the rehabilitation principles and objectives that will progress the quarry towards the intended final land use.

The rehabilitation strategy, including rehabilitation management measures proposed for the quarry are discussed further in **Section 6.19.8.3**.

6.19.4 Proposed Final Land Use

The selected final land use will focus on promoting the rural landscape by establishing native grassland or exotic pastures in low lying areas whilst focusing on the re-introduction of pockets of woodland species across the benches consistent with endemic vegetation types (refer to **Figure 6.39**). However, this will be subject to further investigation during the development of a detailed Quarry Closure Plan three years prior to the cessation of quarrying activities. Alternate final land use options include but are not limited to:

- livestock and grazing uses
- utilisation of the voids as a water supply for relevant proximate land uses
- recreational use
- commercial enterprise/agri-business.

Alternate options, including the incorporation and ongoing utilisation of existing infrastructure and assets proposed as part of the Revised Project will be reviewed as part of the detailed Quarry Closure Plan, subject to the relevant regional and local economic development considerations and relevant development approval and regulatory requirements applicable at the time.

With regards to the conceptual post closure land use, existing infrastructure and assets proposed as part of the Revised Project, may have the opportunity to be retained during post closure for alternate land uses.

Existing infrastructure utilised onsite includes electricity connections to the NSW power grid, water storage components, hardstand processing areas and connectivity to road and rail infrastructure. In consideration of these infrastructure components, there is potential to identify alternate strategic post closure land uses for the Project Area.

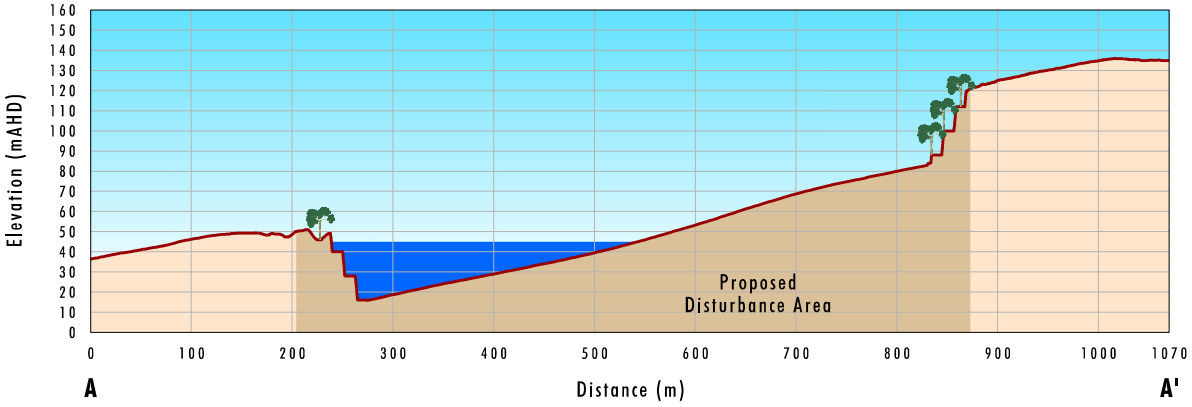
6.19.5 Conceptual Final Landform

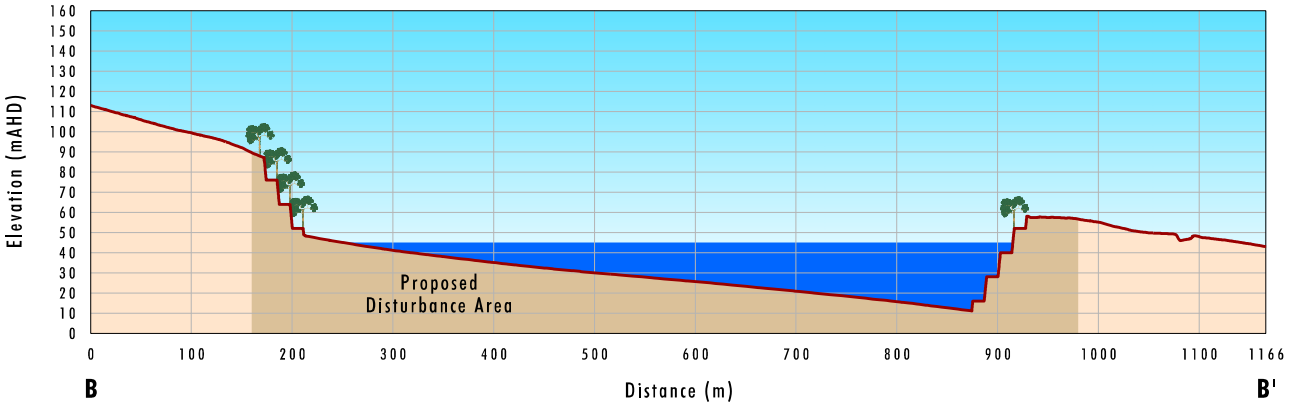
The final landform will primarily consist of vertical batter face slopes, horizontal benches, flat or gently sloping quarry floor areas, pit void lakes and water areas retained for sediment control and hydrological balance purposes to achieve the intended final land use (refer to **Section 6.19.4**). As illustrated in **Figure 6.38**, two water storages, the West Pit Lake and East Pit Lake will remain within the Project Area.

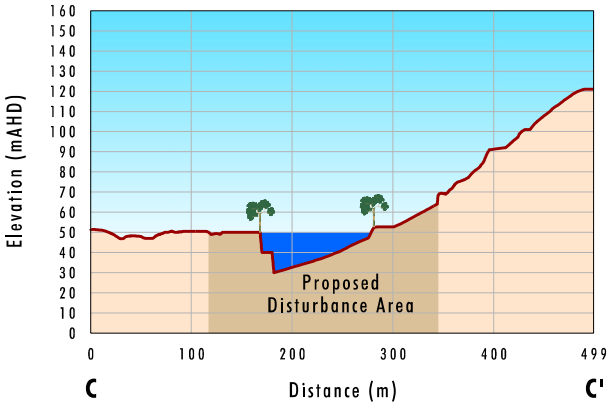
The following operational aspects will be implemented to assist in achieving the conceptual final landform:

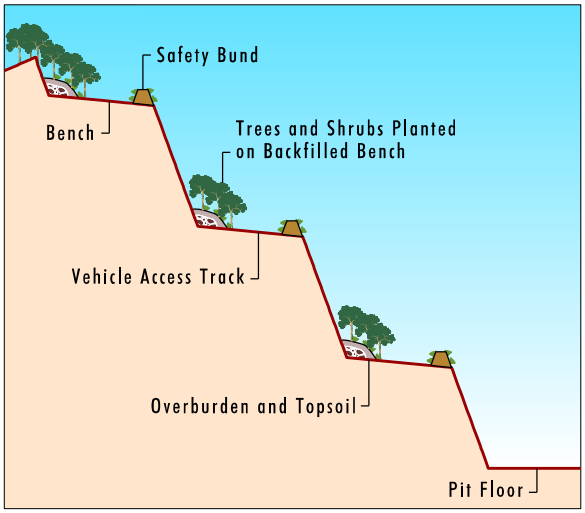
- all rehabilitation activities and ongoing management will be detailed in accordance with a site BRMP to be developed in consultation with regulatory authorities
- the BRMP will include TARPs to respond to any unexpected events or unforeseen impacts relating to rehabilitation
- rehabilitation processes will be implemented based on the existing rehabilitation management measures
- ongoing monitoring of rehabilitation will be undertaken annually to track rehabilitation performance against rehabilitation objectives.

The primary rehabilitation objective of the quarry is to create a stable final landform with an acceptable post-quarrying land use. The conceptual final landform has been designed to maintain consistency with the local area and align with the intended post quarrying land use for the quarry. Typical cross-sections of the final landform are shown in **Figure 6.39**.









Typical Bench Section

Legend

- Final Landform
- Rehabilitated Vegetation
- Water Level
- Grass
- Safety Bund
- Overburden
- Rockfill Toe Drain

0 50 100 200m
Vertical Scale

0 100 200 400m
Horizontal Scale

Note: Vertical Exaggeration 1:2

FIGURE 6.39

Final Landform Cross Sections

6.19.6 Rehabilitation Objectives

Planning for rehabilitation has taken into consideration a number of factors for site opportunities, constraints and existing strategic land use objectives.

The overall objectives for the post closure land use design for the Project include:

- provide opportunities for mixed native vegetation and future agricultural activities such as grazing
- not preclude other potential post closure land use activities should they be determined viable following investigation during the Detailed Closure Plan development.

Rehabilitation objectives for the Project are summarised in **Table 6.60**.

Table 6.60 Rehabilitation Objectives

Feature	Objective
Site (as a whole)	Safe, stable and non-polluting Minimise visual impacts of final landform as far as is reasonable and feasible
Surface Infrastructure	To be decommissioned and removed, unless relevant regulatory agencies approve as part of Detailed Closure Plan process
Benched Quarry Walls	Landscaped and revegetated utilising native tree and understorey species
Quarry Pit Floors	Landscaped and revegetated utilising native flora species and pasture species, above the anticipated final pit void water levels
Rehabilitation and other vegetated land	Restore ecosystem function, including maintaining or establishing self-sustaining ecosystems comprised of: Native endemic species; and A landform generally consistent with Figure 6.38
Community	Ensure public safety Minimise adverse socio-economic effects associated with closure

6.19.7 Preliminary Rehabilitation performance and Completion Criteria

Preliminary completion criteria will be utilised to demonstrate achievement of rehabilitation objectives and performance standards and are outlined in **Table 6.61**.

The preliminary closure criteria will be reviewed and revised throughout the life of the Revised Project via the BRMP. The rehabilitation criteria will be refined throughout the life of the operations to consider the results and performance of rehabilitation monitoring programs and any stakeholder feedback.

Table 6.61 Preliminary Closure and Rehabilitation Completion Criteria

Aspect	Preliminary Completion Criteria
Decommissioning	All infrastructure that does not have a potential post-quarrying land use will be removed.
	Removal of all services which do not have a potential future use associated with the post-quarrying land use (power, water, communications).
	All demolition work has been carried out in accordance with AS2601-2001: The Demolition of Structures or its latest version.

Aspect	Preliminary Completion Criteria
	Appropriate security measures have been implemented to minimise the potential for unauthorised access during the period that the quarry is transitioned to the intended final land use.
Landform	No significant erosion is present that would constitute a safety hazard or compromise the capability of supporting the final land use.
	Contour banks are stable and there is no evidence of overtopping or significant scouring as a result of runoff.
	Surface is free of any hazardous materials.
	Monitoring verifies there are no gully or tunnel erosion features, or rill erosion >200mm deep.
	Landform survey verifies constructed landform is generally in accordance with the approved landform design, including heights detailed in the relevant approval documentation.
	Rehabilitated areas are designed to be free draining (for areas not forming part of the catchment areas of final voids).
Soil	Topsoil or a suitable alternative has been spread uniformly over the rehabilitation surface.
Water	Runoff water quality from the quarry does not pose a material threat to downstream water quality.
Native Vegetation	Revegetation areas contain flora species assemblages characteristic of the desired native vegetation communities.
	Second generation tree seedlings are present or likely to be, based on monitoring in comparable older rehabilitation sites (i.e. evidence of fruiting of native species observed).
	More than 75 % of trees are healthy and growing as indicated by Rehabilitation Monitoring.
	There is no significant weed infestation such that weeds do not comprise a significant proportion of species in any stratum.

6.19.8 Rehabilitation Strategy

A progressive approach to rehabilitation will be implemented by Daracon to ensure that completed areas are progressively shaped and vegetated to produce a landform that is safe, stable and non-polluting to the natural environment.

6.19.8.1 Progressive Rehabilitation

Although there is limited area available within the active quarry areas, as soon as practicable progressive rehabilitation will be undertaken by Daracon to ensure that completed areas are stabilised to achieve the intended final land use for the quarry.

Daracon have identified areas around the periphery of the active quarrying areas in the West Pit that are available in the short to medium term for progressive rehabilitation (refer to **Figure 2.4** to **Figure 2.9**) and the bench on the northern side of the rail siding extension in the East Pit (refer to **Figure 2.4**). These areas will be rehabilitated using the methodologies detailed in **Section 6.19.8.3**.

Rehabilitation maintenance activities will also be undertaken where required. The conceptual staging of rehabilitation for the Revised Project is shown in **Figure 2.4** to **Figure 2.9**. Whilst this will occur on a progressive basis, timing of rehabilitation will ultimately be dependent on the rate of resource extraction in each area and the final levels of the quarry floor.

As noted within **Figure 2.4**, Daracon will also undertake temporary rehabilitation works within the active extraction area in the West Pit following the exhaustion of recoverable material. Temporary rehabilitation works will be undertaken to minimise potential for windblown dust until pit lake levels begin to fill post closure.

The final pit lake water balance modelling (refer **Section 6.9.6**) concluded that the West Pit lake will begin to spill at approximately 45 mAHD after approximately 22 years following closure, and that the East Pit lake will begin to spill at approximately 50 mAHD after approximately 8 years after closure. As there will be no ongoing ground disturbance within the final landform, runoff to the final voids will be from upstream undisturbed catchments and rehabilitated disturbed areas and hard rock surfaces. As such, final void water quality is expected to be similar to that of runoff from the surrounding catchment.

6.19.8.2 Active Management Area – Lot 1

An active rehabilitation management program is proposed to be undertaken within the existing rehabilitation area of Lot 1. This management program will include an infill and supplementary planting program to ensure rehabilitation works will be consistent with the quarry's revised rehabilitation objectives and completion criteria as proposed for the Revised Project. The active rehabilitation management program will commence in Year 1 of the Revised Project and will be further detailed within the quarry BRMP. Infill planting to be undertaken in Lot 1 will provide that density of tree species in the rehabilitation is consistent with analogue sites to be established as part of the BRMP.

6.19.8.3 Rehabilitation Management Measures

The methodology for the completion of rehabilitation at the quarry will be included in a BRMP. The following section details the specific management measures to be implemented so that key commitments in the Rehabilitation Strategy are achieved.

6.19.8.4 Topsoil Management

Topsoil material for rehabilitation will be sourced from soil stored on-site which has been stockpiled as part of the initial clearing and soil removal process. Prior to each topsoil stripping campaign, Daracon will also undertake a sampling program to determine suitable stripping depths and characterise soil type. Topsoil stripping activities for any ground disturbance works will be closely monitored to ensure only the top layer of topsoil or suitable subsoils will be taken for later reuse, nominally this will be the top 100-150mm.

The BRMP will include a topsoil balance to identify if imported material e.g. Certified VENM, ENM or other approved organic material will be required for restoration and revegetation purposes at the quarry. Where practicable, this will also include the incorporation of mulched vegetation into the topsoil to promote onsite growth medium availability.

Prior to use for rehabilitation purposes, topsoil material will be analysed at a NATA registered laboratory to determine the application requirements for any soil ameliorants, if necessary.

Topsoil management techniques will be implemented to maintain the quality of topsoil for subsequent use in rehabilitation. These techniques include:

- during stripping activities, topsoil and logs will be pushed to areas adjacent to disturbance and stockpiled for later use in rehabilitation

- topsoil and subsoil will be stripped using appropriate equipment to the appropriate depths
- topsoil stockpiles will be placed in proximity to the canopy of existing vegetation across the quarry which will act as a viable seed source
- topsoil stockpiles are to be located away from traffic areas and at an appropriate distance from watercourses
- stockpiles to be kept longer than three months will be sown with a suitable cover crop to prevent minimise soil erosion and the invasion of weed species
- weed growth will be monitored and subsequently controlled if necessary
- appropriate sediment controls will be installed around topsoil stockpiles
- following land shaping works, stockpiled soil and resources from pre-stripping activities will be spread over shaped areas and stockpiled logs scattered over the area for habitat enhancement purposes. These areas will then be seeded and/or direct planted.

6.19.8.5 Habitat Enhancement

The salvage of hollow bearing trees, hollow logs, and fallen timber will be undertaken, where practical, during the vegetation clearing process. These resources will be stockpiled adjacent to the disturbance area along with topsoil stockpiles with both being spread across the shaped landform once complete. The relocation of these habitat resources into post-quarrying rehabilitation areas is aimed at increasing habitat complexity, in order to make them more habitable for native species.

6.19.8.6 Supplementary Planting

The requirement for supplementary planting is to be determined by the results of rehabilitation monitoring (refer to **Section 6.19.8.3**). Where monitoring indicates that preliminary seeding and rehabilitation is not tracking towards rehabilitation objectives and conceptual rehabilitation and closure criteria proposed within the quarry BRMP, supplementary and infill planting is to be undertaken to ensure the desired cover for the target vegetation type is achieved and further promote the success of long term and sustainable final land form. The methods and planting densities are to be determined by a suitable qualified ecologist as part of the monitoring programme outlined in **Section 6.19.8.3** and will be further detailed within the quarry BRMP.

6.19.8.7 Weed and Pest Management

The requirement for weed and pest management will be determined by the results of rehabilitation monitoring. Where monitoring identifies areas for weed spraying and pest management, these areas will be included on the weed and pest management program for the quarry. The weed and pest management program will be detailed in the quarry BRMP.

6.19.9 Rehabilitation Monitoring and Maintenance

Ongoing monitoring and maintenance of rehabilitation and comparison with analogue sites will be incorporated into a BRMP. The rehabilitation monitoring program will be developed to assess performance against the rehabilitation objectives and completion criteria throughout the life of the Revised Project. The key objectives of rehabilitation monitoring will be to:

- include regular inspections of the rehabilitated areas

- undertake monitoring of rehabilitation to assess the progression of these areas towards the rehabilitation objectives for the quarry. Monitoring frequency will be identified in the BRMP
- inform the timely implementation of TARPS which cover unexpected deviations from the expected successional pathways in regeneration and rehabilitation areas.

Dependent upon the outcomes of the rehabilitation monitoring as outlined above, the scope of post closure rehabilitation care and maintenance activities may include the following:

- weed and feral animal control
- erosion and sediment control works
- re-seeding of rehabilitation areas that may have failed
- maintenance fertilising
- repair of fence lines, access tracks and other general related land management activities.

The scope of the rehabilitation monitoring program will be detailed within the BRMP. The rehabilitation monitoring program will define the record keeping requirements for the rehabilitation program, include inspection requirements at defined intervals after the initial rehabilitation is undertaken and include an annual rehabilitation monitoring program, which will be linked to TARPS contained within the quarry BRMP.

6.19.10 Conceptual and Detailed Quarry Closure Plans

Specific responsibilities and appropriate resources for the implementation of rehabilitation and quarry closure planning will be detailed within the BRMP. The allocation of responsibilities will promote the integration of rehabilitation and quarry closure.

Further, closure planning and investigation of final land use opportunities will be undertaken during the development of a detailed Quarry Closure Plan three years prior to the cessation of quarrying activities.

6.19.10.1 Closure and Decommissioning Works

At the end of the proposed operational life at the quarry, Daracon proposes to decommission all onsite infrastructure and associated facilities not required for a post closure land use as part of the closure process. Closure monitoring and maintenance works will continue after quarry closure activities are complete until it can be demonstrated that all relevant completion criteria have been achieved (refer to **Section 6.19.7**).

As identified in **Section 6.19.1**, ongoing dialogue with relevant stakeholders is a key objective of the quarry rehabilitation and closure planning process. Whilst a conceptual long-term closure and decommissioning strategy will be included within the BRMP, Daracon will revise the BRMP to consider detailed closure requirements within three years of closure.

6.19.11 Rehabilitation Security Mechanisms

There are a range of mechanisms which are utilised to provide financial security to ensure that rehabilitation is undertaken at the quarry in accordance with the requirements of the Development Consent.

Contemporary requirements include the establishment of a rehabilitation bond, which is a security deposit required to be established by Daracon to provide funds that are available for the completion of rehabilitation at the quarry. In the event that rehabilitation undertaken by Daracon does not meet the requirements of the NSW Government, the NSW Government can draw upon the security deposit to undertake rehabilitation works on behalf of Daracon.

Daracon will establish a security bond or utilise an alternate NSW Government approved mechanism to establish a security bond to provide that appropriate funds are available for the rehabilitation of the quarry.

7.0 Matters of National Environmental Significance

As discussed in **Section 4.1.1**, on 21 July 2019 the Original Project was determined to be a Controlled Action which requires approval under the EPBC Act from the Commonwealth Minister for the Environment due to its potential impact on the following MNES:

- Slaty Red Gum (*Eucalyptus glaucina*) – Vulnerable
- Koala (*Phascolarctos cinereus*) combined populations of Qld, NSW and the ACT – Vulnerable
- Regent Honeyeater (*Anthochaera phrygia*) – Critically Endangered
- Swift Parrot (*Lathamus discolour*) – Critically Endangered
- Spot-tailed Quoll (*Dasyurus maculatus maculatus*) SE mainland population – Endangered
- the Hunter Estuary Wetlands Ramsar site.

Detailed assessments have been undertaken as part of the updated environmental assessment to assess the Revised Project's potential impacts on these MNES. The following section provides a summary of the key MNES assessment findings in relation to Attachment 2 of the SEARs which outlines DAWE's assessment requirements. The following summary should be read in conjunction with:

- the Surface Water Assessment (refer to **Appendix I**) and **Section 6.9** of this report which discusses surface water impacts
- the Groundwater Impact Assessment (refer to **Appendix H** and **Section 6.8** of this report which discusses groundwater impacts
- the Biodiversity Assessment Report (BAR) (refer to **Appendix J**) and **Section 6.10** of this report which discusses biodiversity impacts and the Assessment of Biodiversity MNES Impacts.

For ease of response to the DAWE assessment requirements, this section uses the terminology 'action' and 'Revised Project' interchangeably.

7.1 DAWE Assessment Requirements

A checklist of DAWE's assessment requirements as outlined in Attachment 3 of the SEARs and where they have been addressed in this EIS is outlined in **Table 7.1**.

Table 7.1 DAWE Assessment Requirements and Response

Requirement	Response and Section Where Addressed
The proponent must undertake an assessment of all the protected matters that may be impacted by the development under the controlling provision identified in paragraph 1. A list of protected matters that are considered likely to be significantly impacted is provided at Attachment A to these Guidelines. Note that this may not be a complete list and it is the responsibility of the proponent to ensure any protected matters under this controlling provision, likely to be	All relevant matters have been considered and assessed in the ADA including consideration of all potential controlling provisions (refer to **Section 4.1.1**). To inform this assessment a protected matters database search was undertaken. Key technical studies completed include:

Requirement	Response and Section Where Addressed
significantly impacted, are assessed for the Commonwealth decision-maker's consideration	• groundwater assessment (**Appendix H**) • surface water assessment (**Appendix I**) • biodiversity assessment (**Appendix J**).
General Requirements	
The precise location and description of all works to be undertaken (including associated offsite works and infrastructure), structures to be built or elements of the action that may have impacts on matters of national environmental significance (MNES).	Refer to **Section 3.0** which provides a detailed description for the action.
How the works are to be undertaken and design parameters for those aspects of the structures or elements of the action that may have relevant impacts on MNES.	Refer to **Section 3.0** which provides a detailed description for the action.
An assessment of the relevant impacts of the action on Ramsar wetlands and threatened species and communities; including: a description and detailed assessment of the nature and extent of the likely direct, indirect and consequential impacts, including short term and long term relevant impacts a statement whether any relevant impacts are likely to be known, unpredictable or irreversible; analysis of the significance of the relevant impacts any technical data and other information used or needed to make a detailed assessment of the relevant impacts a comparative description of the impacts of alternatives, if any, on the threatened species and communities.	Detailed assessment of the impacts of the action on the Ramsar wetland and the threatened species and communities have been completed. For water impacts refer to the groundwater assessment in **Appendix H**, as summarised in **Section 6.8** and the surface water assessment in **Appendix I**, as summarised in **Section 6.9**. For biodiversity impacts refer to the biodiversity MNES assessment in Section 8 of **Appendix J**.
Information on proposed avoidance and mitigation measures to manage the relevant impacts of the action including: a description of the proposed avoidance and mitigation measures to deal with the relevant impacts of the action assessment of the expected or predicted effectiveness of the mitigation measures the cost of the mitigation measures a description of the outcomes that the avoidance and mitigation measures will achieve a description of the offsets proposed to address the residual adverse significant impacts and how these offsets will be established.	Refer to **Section 7.1.1** .
Key Issues - Ramsar	
Identify and describe the location, extent and ecological characteristics and values of the Wetland of International Importance identified at Attachment A that is likely to be impacted by all stages of the proposed development.	Refer to the biodiversity MNES assessment in Section 8 of **Appendix J**.
The assessment of impacts should include information on: areas of wetland being destroyed or substantially modified substantial and measurable changes to the hydrological regime of the wetlands, for example a substantial change to the volume, timing, duration or frequency of ground and surface water flows to and within the wetland	A detailed assessment of the impacts of the action on the Ramsar wetland has been completed. For water impacts refer to the groundwater assessment in **Appendix H**, as summarised in **Section 6.8** and the surface water assessment in **Appendix I**, as summarised in **Section 6.9**.

Requirement	Response and Section Where Addressed
the habitat or lifecycle of native species, including invertebrate fauna and fish species, dependent upon the wetland that are at risk of being affected substantial and measurable change in water quality of the wetlands, for example a substantial change in the level of salinity, pollutants, nutrients or temperature that may adversely impact on biodiversity, ecological integrity and social amenity or human health invasive species that may be harmful to the ecological character of the wetlands, if introduced or spread as a result of the development description of any mitigation and management measures proposed to protect or enhance the elements of the impacted ecological character of the Wetland of International Importance.	For biodiversity impacts refer to the biodiversity MNES assessment in **Appendix J**. For a consolidated list of the proposed mitigation and management measures for the action refer to **Section 8.0** of this report.
Key Issues - Biodiversity	
Identification of each EPBC Act listed threatened species and community likely to be significantly impacted by the development. Provide evidence why other EPBC Act listed threatened species and communities likely to be located in the project area or in the vicinity will not be significantly impacted. in accordance with the *Matters of National Environmental Significance - Significant Impact Guidelines 1.1 Environment Protection and Biodiversity Conservation Act 1999 (Significant Impact Guidelines).*	Summary provided below in **Section 7.1.3** Further detail is provided in **Appendix J** – Biodiversity Assessment Report.
For each of the relevant EPBC Act listed threatened species and communities likely to be significantly impacted by the development the assessment must provide a separate: description of the habitat and habits (including identification and mapping of suitable breeding habitat, suitable foraging habitat, important populations and habitat critical for survival), with consideration of, and reference to, any relevant Commonwealth guidelines and policy statements including listing advice, conservation advice and recovery plans, threat abatement plans and wildlife conservation plans details of the scope, timing and methodology for studies or surveys used and how they are consistent with (or justification for divergence from) published Australian Government guidelines and policy statements description of the impacts of the action having regard to the full national extent of the species or community's range.	Summary provided below in **Section 7.1.3** Further detail is provided in **Appendix J** – Biodiversity Assessment Report.
For each of the relevant EPBC Act listed threatened species and communities likely to be significantly impacted by the development the assessment must provide a separate: identification of significant residual adverse impacts likely to occur after the proposed activities to avoid and mitigate all impacts are taken into account details of how the current published NSW Framework for Biodiversity Assessment (FBA) has been applied in accordance with the objects of the EPBC Act to offset significant residual adverse impacts	Summary provided below in **Section 7.1.3** Further detail is provided in **Appendix J** – Biodiversity Assessment Report.

Requirement	Response and Section Where Addressed
details of the offset package to compensate for significant residual impacts including details of the credit profiles required to offset the development in accordance with the FBA and/or mapping and descriptions of the extent and condition of the relevant habitat and/or threatened communities occurring on proposed offset sites.	
Any significant residual impacts not addressed by the FBA may need to be addressed in accordance with the *Environment Protection and Biodiversity Conservation Act 1999 Environmental Offset Policy*.	Refer to **Section 7.1.3**.
Environmental Record of person proposing to take the action	
The information provided must include details of any proceedings under a Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources against the person proposing to take the action; and for an action for which a person has applied for a permit, the person making the application.	Refer to **Section 7.1.4.**
If the person proposing to take the action is a corporation, details of the corporation's environmental policy and planning framework must also be included.	Refer to **Section 7.1.4**.

7.1.1 Avoidance and Mitigation Responses

7.1.1.1 Avoidance Measures

Daracon undertook a thorough redesign of the proposed quarry plan through further project feasibility investigations, detailed quarry design refinements and proposed additional mitigation and management measures guide the design of the Revised Project. Alternative quarrying options were considered in order to minimise the environmental impacts associated with the Revised Project whilst maximising the economic resource recovery. Throughout this process, the key biodiversity values of the area were thoroughly understood due to a long history of biodiversity assessment at the quarry and were considered to guide the design of the Revised Project.

Key elements of the Revised Project have been designed to ameliorate the impacts on significant biodiversity features, such as threatened species, endangered populations, TECs and their habitats and to minimise impacts on water. The approach was to avoid biodiversity impacts where practicable and maximise use of existing disturbed areas. It is noted that avoidance can be challenging for resource projects as by necessity the resource extraction occurs where the resource is and this limits the ability to 'move' an impact, whereas there is more ability to relocate infrastructure or other project components.

Biodiversity and water resource studies were undertaken as part of the updated environmental assessment and to assist Daracon to refine the design of the Revised Project and propose additional effective mitigation and management measures. These design decisions reduced the overall impact of the Revised Project on matters of biodiversity significance. The majority of the Project Area comprises existing disturbed areas, such as the existing extraction area in the West Pit, the processing area and internal haul roads as well as some heavily modified vegetation immediately surrounding the disturbed areas. The proposed disturbance footprint of the Revised Project largely avoids the highest quality remnant forest and woodland occurring on the eastern part of the Project Area.

The design changes implemented for the Revised Project (as outlined in **Section 1.6**) that ameliorated the impacts of the Revised Project on significant biodiversity features have resulted in the following:

- a reduction in disturbance of native vegetation - approximately 15.3 ha of undisturbed vegetation in the former East Pit (Lot 21 DP 773220) is no longer proposed to be disturbed as part of this application
- avoidance of impacts on three groupings of scrub turpentine (*Rhodamnia rubescens*) trees.

With regard to surface water impacts, a further key avoidance measure is the exclusion of the proposed expansion of quarrying activities into new undisturbed areas to the east. As a direct result, the Revised Project will no longer intercept a third order stream to the reduction in the proposed disturbance footprint.

7.1.1.2 Mitigation Measures

A discussion of biodiversity mitigation measures, their effectiveness and statutory basis related to biodiversity is provided in **Appendix J**.

With regard to water mitigation measures, refer to **Section 6.8.5** for the proposed groundwater measures and **Section 6.9.8** for the surface water measures. Many of the measures proposed for the Revised Project are in place for the historic and existing operations and have therefore been approved for implementation by NSW Government agencies and have been subject to ongoing monitoring and audits and shown to be effective. There is a statutory and policy basis for a number of these controls including:

- Water take is in accordance with the provisions of the WM Act and Daracon hold all applicable licenses. These licenses have sufficient allocations to provide for all take associated with the Revised Project. The licensing scheme in NSW includes provision for environmental flows with all licensed water take designed to be sustainable as determined by NSW Government water allocations.
- Water discharges are managed in accordance with the EPL and the quarry's WMS (which includes flocculation, coagulation and pH correction). Improvements to the WMS are proposed as part of the Revised Project.
- Erosion and sediment controls are designed and operated in accordance with the 'Blue Book' (Landcom, 2004 and DECCW, 2008) which is the relevant guideline for the design of such controls in NSW.
- Groundwater bores in NSW are required to be licensed.
- All controls committed to in this ADA by Daracon will be required to be implemented by development consent conditions. These conditions will be enforceable and will be subject to periodic independent audit to ensure they are implemented and will also be subject to periodic compliance assessments by NSW Government compliance officers.
- Daracon has committed to and will be required by a condition of consent to prepare a SWMP for the Revised Project. This plan will build on the existing WMS in place for the current quarry and will be regularly reviewed and updated to ensure that all assumption and commitments nominated are implemented and remain appropriate to ensure that off-site impacts are minimised. The Plan will need to be prepared in consultation with relevant NSW Government agencies and approved for implementation by DPIE. Compliance with the plan will be assessed by regular independent audits and through periodic compliance assessments by NSW Government compliance officers.

7.1.1.3 Cost of Mitigation Measures

In regard to the cost of the mitigation measures, these costs have been included within the operating costs of the Revised Project. This includes the costs of all proposed water management structures, mitigation measures, monitoring and rehabilitation costs.

7.1.1.4 Outline of Environmental Management Plan for the Revised Project

Daracon has an existing EMS and a government approved IFMP that have been prepared to guide the environmental management of the existing operations. This plan is available on Daracon's website and with relevance to MNES include:

- Stormwater Management Sub-Plan, including an Erosion and Sediment Control Plan
- Dewatering and Water Treatment Sub-Plan
- Pollution Incident Response Management Sub-Plan.

As part of implementing the Revised Project, Daracon has committed to update each of these management plans and implement them. The plans will outline the management, mitigation and monitoring measures to be implemented as part of the Revised Project. In addition, Daracon has committed to prepare the following plans should the Revised Project be approved:

- SWMP
- BRMP.

All of the above plans will be required by development consent conditions to be prepared in consultation with relevant government agencies and to be approved by DPIE prior to implementation. Compliance with the plans will be assessed by regular independent audits and through periodic compliance assessments by NSW Government compliance officers.

7.1.2 Key Issues – Ramsar

An assessment of potential impacts on the Ramsar site as they relate to water quality is provided in the surface water assessment (refer **Section 6.9** and **Appendix I**) with an assessment of potential biological values provided in the biodiversity assessment (refer to **Section 6.10** and **Appendix J**). The assessments focussed on the potential direct and indirect effects of changes in water quality and flows in relation to MNES. In summary, the assessment process found:

- No groundwater impacts are predicted that are likely to impact on the Hunter Wetland Estuary Ramsar site. Groundwater monitoring results since 2015 showed that the inflow of groundwater through faults in the latite has not impacted on local groundwater levels and the risk of groundwater contamination through operational activities (including blasting and equipment operation) is considered very low due to the low hydraulic conductivity of the geology. No other groundwater user, including GDEs, or aquifer is likely to be affected by the Revised Project. Annual seepage is predicted to be minimal and well below the allocation provided by the proponents existing water licence. The estimated impacts do not exceed the Level 1 minimal impact considerations for less productive aquifers outlined in the AIP.

- No surface water impacts are predicted that are likely to impact on the Hunter Wetland Estuary Ramsar site. All runoff captured within the quarry would continue to be treated through the quarry WMS prior to discharge to ensure the water quality criteria of the EPL continues to be met. Although there would be an increase in the capture of upslope catchment runoff associated with the Revised Project, it is not expected that daily discharge rates would increase. This finding is based on the water balance model showing that on average the majority (at least 75%) of the additional captured runoff is returned via controlled discharges to the downstream environment. Furthermore, the quarry water treatment processes and controlled discharge management practises have demonstrated to achieve EPL water quality criteria at historical discharge rates. As a result, the impacts on flows to downstream water users are expected to be negligible with respect to flows in the Paterson River.

- The Revised Project is not predicted to result in any significant impact on the Hunter Estuary Wetlands or its associated riparian vegetation. The wetland is located between approximately 30 km and 60 km down-stream of the Revised Project. The Revised Project will not result in any disturbance or modification of the Hunter Estuary Wetlands nor will there be any substantial change to the hydrological regime of the wetlands. No ecological characters of the Hunter Estuary Wetlands are likely to be impacted. Potential water quality and water flow impacts will be managed and mitigated in accordance with the recommendations for managing water quality and flows provided in the surface water impact assessment. it is therefore concluded that there would be no adverse impacts on the riparian vegetation or aquatic ecosystems of Hunter Estuary Wetlands as a result of the Revised Project.

7.1.3 Key Issues – Biodiversity

The impacts of the action on biodiversity MNES were assessed in detail as part of the biodiversity assessment provided in **Appendix J**. The biodiversity MNES assessment specifically addresses the questions posed by DAWE in **Table 7.1** above. In addition, the detailed biodiversity assessment was completed in accordance with the NSW Policy (the FBA) and the key findings of the assessment are summarised in **Section 6.10**.

With regard to Daracon's approach to the design and planning of the Revised Project potential biodiversity impacts have been recognised and thoroughly considered throughout the project planning process and as described further in **Section 7.1.1** through the principles of avoid, mitigate and offset have been considered and addressed.

As demonstrated in **Section 6.10**, the biodiversity offset requirement for the Revised Project is completely satisfied by the proposed offset strategy. A core component of the proposed biodiversity offset strategy is strategically located local offsets that will offset the biodiversity values impacted by the Revised Project in perpetuity.

The land-based biodiversity offsets will be secured under Stewardship Agreements, in consultation with the BCD.

7.1.4 Environmental Record of Person Proposing to take the Action

The following statement of environmental record has been provided by Daracon.

Buttai Gravel Pty Ltd operates under the Daracon Group of businesses with an assured record of responsible environmental management and an independently certified environmental management system. The Integrated Daracon (Environmental) Management System (DMS) is certified to the requirements of ISO 14001:2015 Environmental Management Systems comprising activities, products and services associated

with quarrying and supply of construction materials for the purpose of meeting internal and external business supply demands.

Buttai Gravel Pty Ltd is not subject to any past or present proceedings under Commonwealth or State law for protection of the environment or conservation and sustainable use of natural resources. Buttai Gravel acknowledges the recent decisions handed down by the LEC and the Court of Appeal confirming that operations at the quarry had not, in the past, complied with planning approvals under the NSW Environmental Planning and Assessment Act 1979. Neither Buttai Gravel nor the lessee were prosecuted for offences against the Environmental Planning and Assessment Act 1979. The proceedings were brought in the Court's civil jurisdiction, seeking declarations and orders restraining the operations at the quarry. The judgements show the complicated history of Martins Creek Quarry and a misunderstanding by Buttai Gravel (and the lessee) of the extent of development consents and existing use rights for the quarrying and processing operations.

During the stay of the Court orders, the quarry was operated in accordance with an Interim Environmental Management Plan (IEMP). No issues were raised by Council or other authorities about Buttai Gravel's environmental performance or compliance with the IEMP during this time.

Since the Court of Appeal decision became effective, Buttai Gravel has amended its operations to ensure compliance with the orders of the Court and the findings of the Court of Appeal. These changes have included ensuring that the main product produced at the quarry is railway ballast and reducing road transport so that not more than 30% of the product per annum is transported by road. Buttai Gravel has worked with Council to confirm that its operations are carried out within the parameters determined by the Courts.

In taking this action, Buttai Gravel is complying with the existing planning approvals applying to the quarry, and the conditions and requirements of those approvals, as clarified by the Courts.

All work undertaken by Buttai Gravel Pty Ltd is completed in accordance with the Daracon Group Environmental Policy and DMS.

Buttai Gravel Pty Ltd has a DMS (EMS) that covers the processes and activities that have the potential to impact the environment; including mitigation and management measures proposed as part of the action. The DMS (EMS) ensures compliance with NSW Environment Protection and Biodiversity Conservation obligations, including conditions of the Environment Protection Licence that applies to the premises.

The action, therefore, will be undertaken, monitored and measured in accordance with the Buttai Gravel DMS (EMS) which covers processes and activities that have the potential to impact on the environment and ensures compliance with Environment Protection and Biodiversity Conservation obligations. The DMS (EMS) responsibilities includes appropriate resource allocation to ensure compliance costs are appropriately budgeted and assessed as part of the overall business case for the development.

This ensures that the costs of proposed management measures and offsets is considered in the budget approvals and ensures compliance is appropriately funded and resourced.

8.0 Summary of Environmental Mitigation and Management Measures

The SEARs for the Original Project required that a consolidated summary of all the proposed environmental management and monitoring measures, highlighting all of the commitments included in the assessment be provided. If development consent for the Revised Project is granted, Daracon will commit to the environmental management and monitoring measures outlined below.

8.1 Summary of Management Measures

8.1.1 Hours of Operation

- Quarry operations from 7.00 am to 6.00 pm Monday to Saturday, with the exception of road haulage of quarry product which will only occur Monday to Friday. No evening or night-time operation and no operation on Sundays or public holidays.
- Between 6.00 pm and 7.00 pm, up to ten unladen Daracon trucks will return to the quarry for loading and parking at the quarry overnight, in readiness for departure from 7.00 am the following morning. (In the case of trucks loaded on Friday between 6.00 pm and 7.00 pm, departure will be no earlier than 7.00 am Monday morning).
- Blasting of quarry material will be undertaken between 11.00 am and 3.00 pm on Monday to Friday, with no blasting on Saturday, Sunday or public holidays.
- Necessary maintenance activities and/or environmental management controls, including vehicles/trucks moving in and out of the quarry for maintenance purposes as required will be undertaken 24 hours seven days per week.
- Construction activities for the new access road will be conducted 7.00am to 6.00pm Monday to Saturday. Rail bridge and associated works over the Northern Railway Line may be undertaken 24 hours per day, seven days a week to suit rail shutdown periods.
- Rail loading and transportation may occur 24 hours per day, seven days a week.

8.1.2 Hours of Transportation and Truck Movements

- Road haulage of quarry product between 7.00 am to 6.00 pm, Monday to Friday. No road haulage of quarry product on Saturday, Sunday or public holidays.
- Use of Haul Route 1 as the primary haul route being Martins Creek Quarry via Station Street, Grace Avenue, Dungog Road, Gresford Road, Tocal Road, Paterson Road, Flat Road, Pitnacree Road, Melbourne Street, New England Highway.
- A maximum of 140 loaded product trucks per day for 50 days per year, otherwise 100 loaded product trucks per day, with a peak of:
    - 20 laden trucks per hour (40 movements), Monday to Friday between 7.00am and 3.00pm
    - 15 laden trucks per hour (30 movements), Monday to Friday between 3.00pm and 6.00pm
- No quarry trucks through Paterson prior to 6.45 am Monday to Friday.

- Haulage may be limited as required around days when there is extra traffic in Paterson due to community events, e.g. Tocal Field Days, car show events, Baptist Church events and funerals.
- No haulage between 24 December and 1 January, inclusive.

8.1.3 Environmental Management Plans

- Daracon will prepare a CEMP prior to the commencement of construction that identifies the environmental and social management controls to be implemented during the construction phase. Daracon will implement the CEMP.
- Prior to the commencement of quarrying operations, Daracon will update the existing IFMP to detail the environmental management measures and any monitoring requirements for the Revised Project into an EMP. The EMP will include details of all the management and monitoring commitments, as well as detailing the timing and responsible person.

8.1.4 Social and Economic

- Daracon commit to re-establishing and operating a CCC in accordance with the DPIE C*ommunity Consultative Committee Guidelines: State Significant Project (2016)*. In accordance with the guidelines, the Committee will comprise an independent chair and appropriate representation from Daracon, DSC and the local community.
- Daracon will develop and implement a SIMP for the Revised Project in consultation with DSC, the CCC, affected communities (including Martins Creek and Paterson) and other interested stakeholders (to the greatest extent practicable). The SIMP will:
    - identify negative social impacts resulting from the development both locally and regionally
    - specify adaptive management and mitigation measures to avoid, minimise, and/or mitigate negative social impacts
    - identify opportunities to secure and enhance positive social impacts of the development, including opportunities to:
        - assist in maintaining community services and facilities
        - improve the way of life, wellbeing, and social cohesion within the local community
    - include a program to monitor, review, and report on the effectiveness of these measures, including:
        - identifying representative parameters or indicators to be monitored, how and when data is to be collected, and who is responsible for collecting it
        - ongoing analysis of social risks
        - undertaking additional research, if necessary, to reduce uncertainties
    - include a Stakeholder Engagement Plan to guide the evaluation and implementation of social impact management and mitigation measures.
- Daracon will update and implement the existing quarry complaints response and management program as part of the Revised Project.

- Daracon will implement a dedicated Martins Creek Quarry Community Investment Program that strategically focuses the allocation of contributions and donations and allows the company to work with the local community to effectively manage the negative impacts of the operation and to enhance any potential benefits of the quarry.
- Daracon will implement a local employment and procurement policy.
- Daracon will implement a revised Community Engagement Program that seeks to monitor ongoing community and stakeholder concerns and evaluate the success of management and mitigation measures. It will also target stakeholder identified engagement and information preferences.

8.1.5 Traffic and Transport

- Daracon commit to constructing a new access road on Dungog Road to allow heavy vehicle access via Dungog Road directly onto the quarry. Detailed concept design for the new access road and new intersection on Dungog Road will be prepared in consultation with DSC and ARTC. The proposed main access, including the bridge over the rail line, will be designed, and constructed in accordance with Austroads, TfNSW and ARTC standards as applicable.
- Daracon will prepare and implement a CTMP in consultation with DSC. This will be prepared in accordance with RMS Traffic Control at Work Sites manual and will include TCPs to control traffic through and in/out of the construction site.
- Daracon will also prepare and implement a Traffic Management Plan in consultation with TfNSW, DSC and MCC, should the Revised Project be approved. The Traffic Management Plan will include:
    - the haulage route and traffic types to be used for the Revised Project
    - the measures to be implemented to:
        - ensure compliance with the traffic operating conditions committed to by Daracon
        - minimise traffic safety issues and disruption to local road users, including minimising potential for conflict with school buses
        - minimise the transmission of dust and tracking of material onto the surface of public roads from vehicles exiting the quarry
        - confirm truck speed limits through Paterson, Bolwarra, Vacy and Martins Creek
        - participate in transport management investigations initiated by DSC or MCC
    - include the Driver Code of Conduct.
- Daracon commit to the continued implementation of existing operational traffic controls and a review and update of these controls for the Revised Project, including:
    - continued rigorous assessment and pre-qualification process prior to the engagement of any transport subcontractors, including thorough review of subcontractor's relevant management processes and procedures to ensure compliance with the HVNL and associated CoR
    - all drivers attending the quarry are required to sign and adhere to the Driver Code of Conduct. The Drivers Code of Conduct will:
        - be reviewed and updated annually and as the need arises

- require drivers to report any substantial road pavement irregularities along the haul route, with these reports being passed on councils for attention
- reinforce truck speed limits, including:
  - 40 km/hr through Paterson, Bolwarra and Vacy
  - 20 - 25 km/hr at the intersection of King and Duke Street, Paterson
  - 20 km/hr on Station Street, Martins Creek

- Daracon will undertake regular audits of transport subcontractors to ensure compliance with the HVNL and CoR.
- Daracon will conduct regular monitoring, spot checks and observation of driver behaviour.
- Daracon will investigate all complaints and potential breaches of Daracon's Traffic and Transport policies and procedure to the fullest extent possible and initiate disciplinary action as required.
- Daracon will install a Camera Monitoring Station at the King and Duke Street Intersection to enable identification of trucks through Patterson to quickly resolve complaints associated with trucks.
- Daracon will continue planning to expand rail markets and gain access to rail unloading capacity, in order to enable greater transportation of product by rail.
- If Daracon is called upon to assist in providing quarry material in response to an emergency event it will; advise the community, DSC and the EPA, at the soonest possible opportunity, in accordance with any emergency response plan enacted by the relevant State or National authority.
- Explore additional opportunities to further monitor driver conduct and truck convoying, as suggested by the community, including fleet management technologies as they become available and GPS monitoring for non-Daracon vehicles.
- Daracon commit to plan quarry activities, and revise haulage as required, around days when there is extra traffic in Paterson due to a funeral.

8.1.6 Noise

- Daracon commit to the preparation and implementation of a CNMP in accordance with the requirements of the ICNG. The CNMP would outline the standard reasonable and feasible mitigation measures required to reduce the noise impact from construction activities. Where standard mitigation measures have been implemented and the noise levels still exceed the noise management levels, the following additional mitigation measures can be adopted:
  - Notification letterbox drop or equivalent to provide advanced warning of works detailing work activities, times over which these will occur, impacts and mitigation measures.
  - Specific notifications to identified stakeholders to provide additional information when relevant and informative to more highly affected receivers than covered in general letterbox drops.
  - Phone calls and individual briefings detailing relevant information made to identified/affected stakeholders providing tailored advice and to provide the opportunity for stakeholders to comment on the proposed work and specific needs.

- Individual briefings to inform stakeholders about the impacts of high noise activities and mitigation measures that will be implemented, with the opportunity to comment on the project. Where the resident cannot be met with individually then an alternative form of engagement should be used.
- Respite offers should be considered where there are high noise-generating activities near receivers.
- Verification measurement to check noise levels and follow up reasonable complaints.

- Daracon commit to the review and update of the existing NMP. The NMP will detail the monitoring and management controls to be implemented to manage noise impacts associated with the Revised Project including ongoing implementation of the proactive and reactive management protocols in response to noise trigger levels defined in the plan.

- Daracon commit to the implementation of the following physical noise controls as part of the Revised Project to assist in managing noise emissions from the quarry:
  - noise barrier adjacent to the primary dump hopper and part of the internal haul road between the West Pit and East Pit
  - noise barrier adjacent to the primary crusher
  - noise attenuation of the primary surge bin
  - 8-m noise barrier around the southern boundary of the existing East Pit processing plant area to overlap an augmented landform adjacent the existing wheel wash bay
  - new cladding of the secondary screen and crusher building including a mass layer for the roof, northern, southern and western walls. Additionally, cladding of the existing open areas at the base of the building for the northern, western and southern facades.
  - attenuated replacement of the tertiary crusher and tertiary surge bin
  - 3-m noise barrier around the southern boundary of the Southern Stockpile Area
  - installation of a fence between the western boundary of the Southern Stockpile Area and adjacent rail siding.

- Daracon commit to implement both proactive and reactive noise control strategies informed by real-time noise and meteorological monitoring systems. The proactive noise management approach will include:
  - implementation of a system to provide environmental personnel with a daily forecast of expected conditions in the vicinity of the operation, particularly with regard to the potential for noise enhancing meteorological conditions
  - using noise forecasts for daily operational planning
  - modifying the planned quarrying activities, as appropriate, to minimise or avoid the potential noise impacts including but not limited to:
    - to enable the continued progression of the quarry area topsoil and overburden will be stripped using a bulldozer and excavator on a campaign basis
    - machines working on the higher, more exposed benches in the West Pit will be relocated during periods of noise-enhancing meteorological conditions

- quarrying activity on the higher benches to be scheduled for times when the dominant prevailing weather conditions do not enhance the noise propagation towards the receivers to the west and north of the West Pit. Quarrying activity on the higher benches to be prioritised when the appropriate conditions occur

- reducing the number of machines operating in the Wet Pit, moving a specific machine into a location that is acoustically shielded so that other machines can continue to operate, or the complete shut down of the West Pit

- managing the West Pit activities to compliment the truck movements on the access road through Lot 5 to Dungog Road. During periods of high truck movement and weather conditions that enhance the noise propagation, this may include shutting down some or all activities within the West Pit

- re-scheduling drilling in exposed locations for periods when the weather conditions do not enhance the noise impacts.

- Daracon commit to implement reasonable and feasible receiver-based noise mitigation measures which may include measures such as double glazing, insulation or air conditioning for relevant residences in to meet the requirements of the VLAMP (refer to **Section 6.4.2**) and any relevant development consent conditions, based on monitoring results and upon written request of the landowners.

- Daracon commit to expand the noise monitoring network for the Revised Project by installing two new real-time noise monitors and five new attended monitoring locations as part of the updated noise monitoring network.

8.1.7 Air Quality

- Daracon commit to the continued implementation of the current air quality monitoring consisting of four dust deposition gauges, one high volume air sampler (HVAS) and one meteorological station. Daracon will continue to publish the air quality monitoring data on the Daracon website.

- Daracon commit to effectively manage the air quality impacts associated with the Revised Project by implementing a range of dust management measures for the key dust generating activities, including:

  - all trucks travelling between the pits and ROM stockpiles, or between ROM stockpiles and crushers, will be restricted to clearly marked haul routes

  - a water truck will be operated to reduce dust lift-off from internal roads and stockpile areas.

  - all vehicles travelling on internal unsealed roads will be limited to a speed appropriate for the conditions and safety, i.e. less than 20 km/hr

  - the location and scale of activities which generate dust emissions will be modified and limited during periods of dry and windy weather

  - mobile crushing will cease to be undertaken within the pit areas. Water sprays will be applied at transfer points on mobile crushing undertaken within the processing area

  - the following components of the fixed plant will have cladding applied (as outlined in **Section 6.4.6**):

    - screen two and three

    - tertiary crusher and hopper

    - primary screen and secondary crusher building

- primary crusher
- surge bin

- water will be applied to stockpiles and hardstand surfaces to prevent dust lift-off
- establishment of a new bitumen sealed quarry access road up to the wheel wash
- all trucks leaving the quarry will make use of the wheel wash facility to limit dust tracking onto the public road network
- trucks entering and leaving the quarry that are carrying loads will be covered at all times, except during loading and unloading.

8.1.8 Blasting

- Daracon will implement the appropriate blast management controls necessary to meet the relevant criteria for private residential receivers, heritage items and infrastructure.
- Daracon will continue to manage blasting practices for the Revised Project within a reduced blasting window. That is, between the hours of 11.00 am and 3.00 pm Monday to Friday, with no blasts being fired on weekends or public holidays.
- Daracon will continue to undertake blasting for the Revised Project in accordance with a detailed blast design process that considers operational, geological and environmental constraints, with the design and size of each blast determined to meet these constraints and meet blasting criteria.
- Daracon will develop a Blast Management Plan in consultation with the EPA, should the Revised Project be approved. The Blast Management Plan will:
  - describe the measure that will be implemented to:
    - ensure compliance with the blasting criteria and operating conditions
    - avoid blasting during unfavourable climatic conditions
  - detail the monitoring program for evaluating and reporting on compliance with the relevant conditions
  - include a protocol for identifying any blast-related exceedance, incident or non-compliance and for notifying DPIE and relevant stakeholders of these events
  - include public notification procedures to enable members of the public, particularly surrounding residents, to get up-to-date information on the proposed blasting schedule
  - include a protocol for investigating and responding to blast-related complaints.
- Daracon commit to independent blast monitoring to be undertaken for three blasts within the first year of the Revised Project by an independent qualified person, and in consultation with the EPA. Daracon will consult with the Martins Creek CCC and/or representative of DSC in relation the monitoring times and locations.
- Daracon will continue to implement the existing blast monitoring regime at three locations, as established under EPL 1378, and will review and update the blast monitoring as required to cover the sensitive receivers located in the vicinity of the Project Area.

- Daracon will continue to consult with residents via letter box drops to inform them of the blast time the following day as well as an SMS or email on the day of the blast notifying neighbours of the time of day the blast is to occur.

8.1.9 Greenhouse Gas and Energy

- Daracon will implement reasonable and feasible energy management controls as part of the Revised Project, including:
    - investigating and considering the use of alternative fuels such as Biodiesel, CNG or Hydrogen where practicable
    - considering fuel efficient equipment as new equipment is purchased
    - energy efficiency will be an important selection criterion when purchasing new equipment. The existing tertiary crusher will be replaced with new plant which is more efficient
    - designing blasting strategies to improve extraction efficiency
    - limiting the length of material haulage routes
    - optimising ramp gradients for fuel efficiency
    - maximising haul truck payloads
    - maintenance of roads to improve vehicle efficiency
    - optimising the number of haul trucks on site to eliminate queuing and minimise idle time. Loaders will be selected to load in the most efficient time.

8.1.10 Water Resources

- Daracon will prepare and implement a comprehensive WMP in consultation with DPIE Water, should the Revised Project be approved. The WMP will include a:
    - Site Water Balance that:
        - includes details of:
            - sources and security of water supply
            - water use and management on the site
            - any off-site discharges or water transfers
            - reporting procedures, including the annual preparation of a site water balance
        - minimises clean and potable water use on the site
    - Surface Water Management Plan, that includes:
        - baseline data on surface water flows and water quality
        - surface water impact assessment criteria, including trigger levels for investigating any potentially adverse impacts, and surface water management performance measures
        - a detailed description of the surface water management system on the site, including the:
            - clean water diversion system

- erosion and sediment controls
- dirty water management system
- water storages

- a program to monitor and report on:
  - any surface water discharges
  - the effectiveness of the water management system
  - surface water flows and quality in watercourses and/or waterbodies that could potentially be impacted by the development
- a protocol for identifying and investigating any exceedances of the surface water impact assessment criteria and for notifying DPIE and relevant stakeholders of these events

- Groundwater Management Plan, that includes:
  - baseline data of groundwater levels, yield and quality for groundwater resources potentially impacted by the Revised Project
  - a description of the groundwater management system
  - groundwater performance criteria, including trigger levels for investigating any potentially adverse groundwater impacts
  - a groundwater monitoring program
  - a protocol for identifying and investigating any exceedances of the groundwater performance criteria and for notifying DPIE and relevant stakeholders of these events.

- Daracon will continue to implement the existing groundwater monitoring network and monitoring regime consisting of seven bores, each fitted with a continuously recording datalogger, to be monitored with the dataloggers and data downloaded every six months. As the extraction area extends, relevant bores will be decommissioned and replaced beyond the extent of the quarry. In addition, as the future quarrying may extend below the local water table, additional monitoring downgradient of MW01 will be undertaken, to detect and quantify potential drawdown.
- Surface water quality monitoring at sites upstream and downstream of the quarry will be continued to enable the development of site-specific water quality trigger values in accordance with ANZG 2018.
- All runoff captured within the quarry will continue to be treated through the WMS (which includes flocculation, coagulation and pH correction) prior to discharge to ensure the water quality criteria of the EPL continues to be met.
- ESCs will continue to be implemented in accordance with Landcom's Managing Urban Stormwater Volume 1 (Landcom, 2004) and Volume 2E Mines and Quarries (DECC, 2008) (the Blue Book) during stripping/development of new extraction areas or any other ground disturbing activities.
- In the event of water source restrictions, Daracon will limit production to ensure environmental controls, i.e. dust suppression, are maintained as a priority with the available water supply.

- A potable water usage reduction strategy will be included in the revised WMP following approval and a program for implementation of water savings measures developed within 12 months of commencement of operations. Ongoing potable water usage reduction performance will be reported as part of the Annual Review process.
- Potable water from the amenities water reticulation system will be sampled on a biannual basis and analysed to ensure the water meets the requirements of the ADWG (National Health and Medical Research Council, 2011). The amenities water supply tank will be inspected monthly for any potential contamination with organics or other materials.

8.1.11 Biodiversity

- Daracon will prepare and implement a BRMP in consultation with BCD and DSC, should the Revised Project be approved. The BRMP will:
    - describe the short, medium, and long-term measures to be undertaken to:
        - implement the BOS, including how impacted species under the EPBC Act would be suitably offset
        - retain and manage the remnant vegetation and fauna habitat on the site
        - ensure compliance with the rehabilitation objectives
    - include detailed performance and completion criteria for evaluating the performance of the rehabilitation of the site, including triggers for remedial action, where these performance or completion criteria are not met
    - include a detailed description of the measures to be implemented on the site to:
        - minimise impacts on fauna, including undertaking pre-clearance surveys
        - supervision of clearing works to be undertaken by a qualified and experienced ecologist
        - manage potential indirect impacts on threatened plant and animal species
        - minimise the amount of clearing within the approved disturbance area where reasonable and feasible
        - protect vegetation and fauna habitat outside the approved disturbance area
        - control weeds and feral pests, with consideration of actions identified in relevant threat abatement plans
        - control erosion
        - control unrestricted access
        - progressively rehabilitate the site and minimise disturbance areas
    - include a seasonally-based program to monitor and report on the effectiveness of the above measures, progress against the detailed performance and completion criteria, and any progressive improvements that could be implemented to improve biodiversity outcomes

- monitor and report on the impacts of the development on groundwater dependent ecosystems and riparian vegetation, and identify trigger levels for the remediation of any material impacts to these ecosystems
- identify the potential risks to the successful implementation of the final rehabilitation, and include a description of the contingency measures to be implemented to mitigate against these risks
- include details of who would be responsible for monitoring, reviewing, and implementing the plan.

- Daracon is committed to delivering a BOS that appropriately compensates for the unavoidable loss of ecological values as a result of the Revised Project. The BOS will be further developed in consultation with the BCD and DPIE and based on the credits required to be retired to offset the impacts of the Revised Project as specified in the BAR and the offset options available under the BC Act:
  - land based offsets (determined in accordance with the BAR and the offset rules in the BC Regulation) through the establishment of new Stewardship Sites
  - purchasing credits from the market, and/or
  - paying into the Biodiversity Conservation Fund.

8.1.12 Aboriginal Cultural Heritage

- Within 12 months of an approval, an ACHMP will be prepared for the quarry in consultation with Heritage NSW and RAPs, should the Revised Project be approved. The ACHMP will describe the measures to:
  - ensure all workers receive suitable Aboriginal cultural heritage inductions prior to carrying out any activities which may cause impacts to Aboriginal objects or Aboriginal places
  - protect, monitor and/or manage identified Aboriginal objects
  - protect Aboriginal objects located outside the disturbance area from impacts of the development
  - manage the discovery of human remains and any new Aboriginal objects or Aboriginal places, including detailed provisions for burials, over the life of the development.
- RAPs will be consulted and further survey completed, to inform any further mitigation measures required as part of the final design and construction process for the new access road, prior to the commencement of clearing of land (initial ground works).
- In the unlikely event that suspected human remains are encountered during construction, all work in the area that may cause further impact, must cease immediately and:
  - the location, including a 20 m curtilage, should be secured using barrier fencing to avoid further harm
  - the NSW Police must be contacted immediately
  - no further action is to be undertaken until the NSW Police provide written notification to Daracon
  - if the skeletal remains are identified as Aboriginal, Daracon or their agent must notify the Heritage NSW, RAPs and cease works in the area.

8.1.13 Historic Heritage

- Daracon commit to contribute to road maintenance costs associated with truck haulage and these funds will enable DSC to ensure road conditions within Paterson are appropriately maintained (refer to **Section 8.1.18**).
- Insertion of a requirement in the Driver Code of Conduct to report any substantial road pavement irregularities in Paterson, with these reports being passed on the DSC for attention.
- Directions to be given to drivers alerting them of any identified road irregularities to enable them to minimise speeds where these occur when driving through Paterson.
- All kerb and other road infrastructure will be reinstated following the proposed works within the Paterson Village HCA to replicate that removed to allow for the King and Duke Street intersection works.
- In the unlikely event that unexpected historic (non-Aboriginal) archaeological remains are discovered during works associated with the Revised Project they will be managed in accordance with the existing process for management of unknown heritage sites/items as detailed within the existing IFMP which will be included in the EMP.

8.1.14 Visual

- Progressive rehabilitation to reduce the duration of visible soil exposure, including the use of temporary rehabilitation as appropriate.
- All vegetated areas outside of the proposed disturbance footprint would be retained and preserved.
- All outdoor lighting will be installed and operated in accordance with AS4282 (INT) 1995 – Control of the Obtrusive Effects of Outdoor Lighting, including measures such as directing lighting downwards towards work areas and not toward private residences and roads, and where appropriate, using shields to limit the emission of light off site.

8.1.15 Waste

- Daracon will update the existing waste minimisation and recycling measures in the EMP and implement it for the Revised Project.
- Waste streams will be managed in accordance with the principles of the waste hierarchy, with emphasis on reduce, reuse, recycle prior to disposal of its wastes.
- General waste generated by the quarry personnel during operation of the Revised Project will be accommodated through the existing waste collection service for the quarry or via a licensed contractor for disposal/recycling at an appropriate waste management facility.

8.1.16 Hazard, Risk and Bushfire

- Daracon will review and update the Pollution Incident Response Management Plan (PIRMP), Environmental Inspection Report checklist, Incident Reporting and Investigation procedure and the quarry Safety Management Plan. These documents will be updated in relation to the Revised Project to ensure:

- hazardous materials are managed on site to minimise the risk of harm to people and the environment
- that all foreseeable emergency events involving hazardous materials are considered and adequate site-specific systems are put in place to ensure site personnel and equipment are ready and able to deal with an emergency.

- No explosives will be stored on site, with all explosives brought onto the quarry site as needed and loaded directly into the drill hole.
- Diesel tanks and refuelling systems will be designed and maintained in accordance with relevant Australian Standards and codes.
- Surface drainage systems will be designed and maintained to prevent spills or runoff from hazardous materials storage areas entering surrounding land/waterways.
- Dangerous goods will be stored in dangerous goods compliant stores (in accordance with relevant Australian Standards) with appropriate segregation of incompatible dangerous goods.
- Daracon will review and update the Bushfire Emergency Response Procedure to consider the relevant aspects of the Revised Project with an ongoing commitment to review and revise the procedure if necessary, as the Revised Project progresses.

8.1.17 Rehabilitation and Closure

8.1.17.1 Progressive Rehabilitation

- Daracon will prepare a BRMP to guide rehabilitation management practices across the quarry (as discussed in **Section 8.1.12**).
- Daracon will implement a natural landform approach to the design and development of the final landform, outside of the final void areas. The final landform will be designed to:
  - be safe, stable and non-polluting
  - incorporate natural landform design features (i.e. micro relief)
  - incorporate drainage lines consistent with topography and natural drainage where reasonable and feasible
  - sustain the intended land use for the post-quarrying domains
  - minimise the visual impacts of the development
  - be in keeping with the natural terrain features of the area.
- Daracon will progressively rehabilitate disturbed areas over the life of the Revised Project, that is, as soon as reasonably practicable following disturbance. All reasonable steps will be taken to minimise the total area exposed at any time.
- Daracon will use interim stabilisation and temporary re-vegetation strategies when areas prone to dust generation, soil erosion and weed incursion cannot be permanently rehabilitated.
- Prior to use for rehabilitation purposes, topsoil material will be analysed at a NATA registered laboratory to determine the application requirements for any soil ameliorants, if necessary.

- Topsoil management techniques will be implemented to maintain the quality of topsoil for subsequent use in rehabilitation.

8.1.17.2 Quarry Closure

- A Conceptual Closure Plan will be developed as part of the implementation of the Revised Project and will be incorporated into the BRMP. The Conceptual Closure Plan will be developed in consideration of the approach outlined in this ADA, subject to requirements of the Revised Project approval conditions.
- Daracon commit to continue to investigate potentially feasible final void options during the life of the Revised Project as part of preparing a detailed final landform and final void strategy for the Revised Project.
- A detailed quarry closure plan will commence at least three years prior to the anticipated quarry closure date (e.g. cessation of quarrying) with the closure plan being finalised at least two years prior to this date.
- A Final Void Management Plan will be developed and included in the Final Closure Plan.

8.1.17.3 Final Land Use

- Daracon commit to further investigating supplementary post quarrying land uses, including potential uses for the final voids, as part of developing the detailed closure plan for the quarry.
- Daracon will prepare a Final Land Use Strategy for the quarry as part of the Quarry Closure plan.

8.1.18 Voluntary Planning Agreement

- Should the Revised Project be approved, Daracon will make relevant financial and/or in-kind contributions to both DSC and MCC in the form of a Voluntary Planning Agreement (VPA), in accordance with Section 7.11 of the EP&A Act.
- As part of the VPA, Daracon will contribute towards road maintenance and pavement upgrades for impacts on the road pavement resulting from the transport of product from the Revised Project, should the Revised Project be approved.

9.0 Conclusion

This section provides a conclusion of the updated environmental assessment and associated technical studies for the Revised Project, summarising the key environmental, social and economic impacts of the Revised Project and the suitability of the quarry, to assist the consent authority to determine whether or not the Revised Project is in the public interest.

9.1 Environmental, Social and Economic Impacts

The environmental, social and economic impacts of the Revised Project have been identified and subject to a detailed environmental assessment based on:

- assessment of the quarry characteristics (existing environment)
- historical/actual knowledge and data from previous and recent operations and surrounds
- focused consultation with relevant government agencies
- extensive engagement with local community and other stakeholders
- environmental and social risk analysis
- application of the principles of Ecologically Sustainable Development (ESD), including the precautionary principle, intergenerational equity, conservation of biological diversity and valuation and pricing of resources
- expert technical assessment.

The key issues identified were subject to comprehensive specialist assessment to identify and assess the potential impacts of the Revised Project on the existing environment and community. The results of these assessments are detailed in **Section 6.0**.

The detailed impact assessment undertaken for the Revised Project concludes that with the implementation of feasible and reasonable mitigation measures, the proposal can proceed within acceptable environmental standards. This is largely driven by the project design changes outlined in **Section 1.6**, in particular the reduced extraction limits and the revised operational hours and truck movements. Furthermore, the impacts of the Revised Project have been kept to a minimum through:

- obtaining a detailed understanding of the issues and impacts by extensive scientific evaluation and stakeholder engagement
- a thorough assessment of project alternatives based on consideration of maximum resource recovery efficiency developed from detailed geological exploration, engineering design and detailed analysis of potential environmental and community impacts
- active engagement with stakeholders, including the neighbouring community, to identify key concerns and issues early in the Revised Project design process
- project parameters for the Revised Project have been designed around the mitigation of potential amenity impacts, particularly traffic, noise and air quality impacts, as these are recognised as key stakeholder concerns

- commitment to proactive and appropriate strategies to avoid, minimise, mitigate, offset or manage a range of potential environmental impacts (refer to **Section 6.0** and **8.0**).

9.2 Suitability of the Site

The quarry has a long-established history in the region, with quarrying having been undertaken since the early 1900s. The quarry was originally developed for the purpose of providing materials for the construction and maintenance of the North Coast Railway. Materials for other purposes have also been produced from the high quality rock source including aggregates, ballast, manufactured sand and rock. The quarry is surrounded largely by agricultural and rural residential land uses. The quarry has coexisted with these neighbouring land uses over an extended period with a degree of impact on the social amenity of these surrounding land uses. Key elements of the Revised Project have been designed to minimise impacts on the surrounding land uses and proximal communities, which included substantial noise mitigation works to reduce noise impacts on surrounding residents and controls on the speed and timing of trucks entering and leaving the site.

The development of a quarry operation and associated infrastructure is limited, by its nature, to the location of the resource and suitable markets. For the quarry, the resource proposed to be extracted is located within or adjacent to an existing quarry operation, on land that is currently primarily used for quarrying purposes.

The additional disturbance area is relatively minor, in the context of the previous operations. The additional disturbance area generally consists of land with lower land capability which is within an area that has been historically used for quarrying. In terms of land use, it would be reasonable to determine that quarrying is the preferred land use for the site. Post quarrying, the area will be rehabilitated and whilst the post quarrying land use is proposed as native vegetation, that land would be capable of being used for other purposes.

The additional disturbance area currently has a range of biodiversity values and these values will be impacted by the Revised Project, however, Daracon is committed to developing an offset strategy that fully offsets these impacts in accordance with government policy and which will contribute to and improve conservation outcomes in the local area and region.

The predominant existing land use for the broader Project Area is quarrying, with the Revised Project consistent with this existing land use. The Revised Project is located in an area historically characterised by quarrying with the existing operation well-established. Some of the key objectives for the Revised Project are to maximise extraction of remaining resources from the existing quarry, maximise the use of previously disturbed areas, maximise use of existing infrastructure and further development of existing environmental and social mitigation and management strategies to mitigate and manage the predicted impacts associated with the Revised Project, thereby limiting potential for conflicts with other land uses.

From a quarrying perspective, the Revised Project is a logical continuation of the existing quarry into adjacent resources. From a land use perspective, as a continuation of an existing approved land use, it is considered that while some impacts are predicted, with the application of the management and mitigation measures committed to by Daracon, these impacts can be managed to a level that can coexist with surrounding land uses.

Daracon has engaged with stakeholders including the local community, to seek to understand the key concerns and issues associated with the Revised Project and to assist with managing these issues through appropriate project design and application of management, mitigation and offset measures.

9.3 Ecologically Sustainable Development

Ecologically Sustainable Development (ESD) is one of a number of objectives of the EP&A Act. ESD requires the integration of economic and environmental considerations in decision making processes.

To justify the Revised Project with regard to the principles of ESD, the benefits of the Revised Project in an environmental and socio-economic context should outweigh any negative impacts. The principles of ESD encompass the following:

- the precautionary principle
- intergenerational equity
- conservation of biological diversity
- valuation and pricing of resources.

These principles are discussed further in **Sections 9.3.1** to **9.3.4**.

Essentially, ESD requires that current and future generations should live in an environment that is of the same or improved quality than the one that is inherited.

9.3.1 The Precautionary Principle

The EP&A Regulation defines the precautionary principle as:

> *'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 principle, 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.*

In order to achieve a level of scientific certainty in relation to the potential impacts associated with the Revised Project, this ADA has undertaken an extensive evaluation of all the key components of the Revised Project. Detailed assessment of all key issues and necessary management procedures has been conducted and is comprehensively documented in this ADA.

The assessment process has involved a detailed study of the existing environment (refer to **Section 6.0**), and the use of engineering and scientific modelling to assess and determine potential impacts as a result of the Revised Project. These models have been calibrated using data gathered from the previous quarrying operation (e.g. noise, air, water and blast monitoring data) to ensure the models are robust and appropriately characterise the Revised Project, allowing the impacts to be predicted and evaluated. To this end, there has been careful evaluation to avoid, where possible, irreversible damage to the environment.

The decision-making process for the design, impact assessment and development of management processes has been transparent in the following respects:

1. Government authorities, landholders potentially affected by the Revised Project, the local community, the Aboriginal community and other stakeholders were extensively consulted during the preparation of the updated environmental assessment (refer to **Section 6.0**). This enabled comment and discussion regarding potential environmental impacts and proposed environmental management procedures.

2. The community has been comprehensively engaged throughout the design and assessment of the Revised Project through a range of mechanisms including face to face meetings, presentations, collaborative assessment forums and community newsletters to inform the Revised Project design and proposed management of key issues (refer to **Section 6.0**), which provided stakeholders with both information and the opportunity to influence the Revised Project outcomes.

3. Daracon will update and implement the existing comprehensive Environmental Management Plan (EMP) for the Revised Project. Through implementation of the EMP, Daracon will seek to implement best practice management. The Revised Project will incorporate the practices implemented and demonstrated to be effective at the recent approved operations. The EMP will incorporate the additional controls committed to in **Section 8.0** of this report.

4. The updated environmental assessment has been undertaken on the basis of the best available scientific information about the Project Area and has been informed by site specific survey, monitoring, modelling and environmental and social assessment. Where uncertainty in the data used for the assessment has been identified, a conservative worst-case analysis has been undertaken and/or sensitivity analysis undertaken to assess a range of potential impact scenarios. Contingency measures have also been identified to manage areas of identified uncertainty. Extensive management and mitigation measures will be implemented, including monitoring programs to measure predicted against actual impacts of the Revised Project (refer to **Section 8.0**), so that contingency measures, if required, can be implemented in a timely and pro-active manner. As noted earlier the recent operations and the management practices implemented provide a high degree of confidence in both impact predictions and the need for and the likely success of proposed management and mitigation measures.

9.3.2 Intergenerational Equity

Intergenerational equity is based on the principle that the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations. It requires that the needs and requirements of today's generations do not compromise the needs and requirements of future generations in terms of health, biodiversity and productivity.

The objectives of the Revised Project are outlined in **Section 2.1** and in terms of intergenerational equity they include:

- provision of a long-term secure supply of hard rock construction material, including rail ballast, to the local and regional market
- economic recovery of hard rock material within the quarry licenced areas held by Daracon, maximising operational efficiencies within the quarry site whilst aiming to minimise environmental and social amenity impacts
- minimising social amenity, traffic and transport, noise, dust and visual impacts on the surrounding community over the life of the proposed quarry operations
- flexibility and contingency to adapt to future market and specification requirements
- flexibility and contingency for unplanned events (excessive rainfall, geological variation, changes to bench or slope stability, etc)
- enhancement and ongoing relationships with the local community through development of effective communication channels and ongoing involvement in the form of employment and community contributions

- contribute to the local, regional and State economies through capital expenditure, employment and economic supply of construction materials.

The Revised Project further includes a range of environmental and social management and control measures in relation to traffic and transport, noise, air quality, cultural heritage values and community sustainability (refer to **Section 8.0**). These measures will mitigate and offset the predicted impacts of the Revised Project and maintain the health, diversity and productivity of the environment for future generations. Furthermore, the Revised Project is projected to generate significant economic benefits for both the State and local region which is expected to contribute to the wealth of both current and future generations. The Revised Project will also make a significant contribution to maintaining services in the community through the direct and flow on effects of employee and operational expenditure and through development contributions in accordance with the EP&A Act.

9.3.3 Conservation of Biological Diversity

The EP&A Regulation identifies that the principle of conservation of biological diversity and ecological integrity should be a fundamental consideration in the decision-making process. The conservation of biological diversity refers to the maintenance of species richness, ecosystem diversity and health and the links and processes between them. All environmental components, ecosystems and habitat values potentially affected by the Revised Project are described in **Section 6.10** and **Appendix J**.

NSW Government policy requires the biodiversity impacts of a project to be quantified and offset on a no let loss basis. The impacts of the Revised Project have been quantified and the biodiversity offset strategy will be developed having regard to the NSW and Commonwealth offsetting objectives.

The biodiversity offsets for the Revised Project will be delivered in consultation with DPIE, BCD and the Biodiversity Conservation Trust (BCT). A formal credit equivalency assessment will be undertaken should the Revised Project be approved, which will require an application to have the FBA credit requirement converted to BAM credits through an Assessment of Reasonable Equivalence. The following credit retirement options are available to satisfy the offset requirements for the Revised Project under the BOS:

- securing (purchasing) credits from the establishment of Biodiversity Stewardship Site(s) (and subsequent retirement of credits) or by retiring credits from already established Stewardship Sites, in accordance the offset rules documented in section 6.3 and 6.4 of the BC Regulation
- funding a Biodiversity Conservation Action in accordance with section 6.2 of the BC Regulation, and/or
- paying into to the Biodiversity Conservation Fund (BCF).

Daracon are committed to implementing a comprehensive BOS for the Revised Project. Daracon have identified five potential offset sites, located directly adjacent to the Project Area which were found to support suitable PCTs and threatened species habitat required for the Revised Project.

The credits required to offset the impacts of the Revised Project will be determined by a formal assessment of reasonable equivalence of biodiversity credits made by DPIE, which is only available following project approval.

The actual amount of credits to be generated at the proposed land based candidate biodiversity sites will be determined as part of a future formal biodiversity stewardship application and agreement. Any residual credit obligations not offset through land based credits at the candidate biodiversity offset sites will be met through additional land based biodiversity offsets established as biodiversity stewardship sites, purchase of credits from the market associated with existing biodiversity offset stewardship sites or through payment to the BCT.

9.3.4 Valuation and Pricing of Resources

In response to ongoing community and agency concerns regarding the potential adverse impacts associated with the Original Project (refer to **Section 1.5**), the Revised Project incorporates key project design changes and additional mitigation and management measures to minimise the environmental and social amenity impacts associated with the Revised Project. This involves a significant reduction of the proposed extraction limits (**Section 1.6.1**), revision of the operational hours (**Section 1.6.2**) and truck movements (**Section 1.6.3**). To this end, the Revised Project is considered to strike an appropriate balance between maximising resource recovery within the environmental and community constraints of the quarry.

The goal of improved valuation of natural capital has been included in Agenda 21 of Australia's Intergovernmental Agreement on the Environment. The principle has been defined in the EP&A Regulation as:

> *'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 placed to maximise benefits or minimise costs to develop their own solutions and responses to environmental problems'*

Project considerations have included the costs of management measures to minimise potential environmental and social impacts. There will also be additional costs associated with establishing and managing ecological offsets to reduce the magnitude of ecological impacts. In many cases, operational efficiencies are also associated with improved environmental outcomes. For example, efficient haul routes reduce total noise and dust emissions and diesel use (with associated greenhouse gas and particulate emission reductions). The Revised Project also optimises the valuation and pricing of the resources with minimal impact by optimising use of the existing infrastructure and equipment.

9.4 Conclusion

As outlined in **Section 9.3**, the Revised Project has been assessed against the principles of ESD as required by the EP&A Act. This assessment has indicated that the Revised Project is consistent with the principles of ESD.

The SIA has identified that the key negative social impacts predicted include impacts relating to social amenity (as a result of traffic related impacts); changes to sense of community and community cohesion and culture. In addition to these impacts, stakeholders have raised concerns relating to noise, personal safety, livelihoods and health and wellbeing impacts. Positive impacts of relevance include potential economic benefits to the region and State through employment, procurement and business opportunities. The Revised Project will also lead to a secured availability of construction materials for markets across NSW.

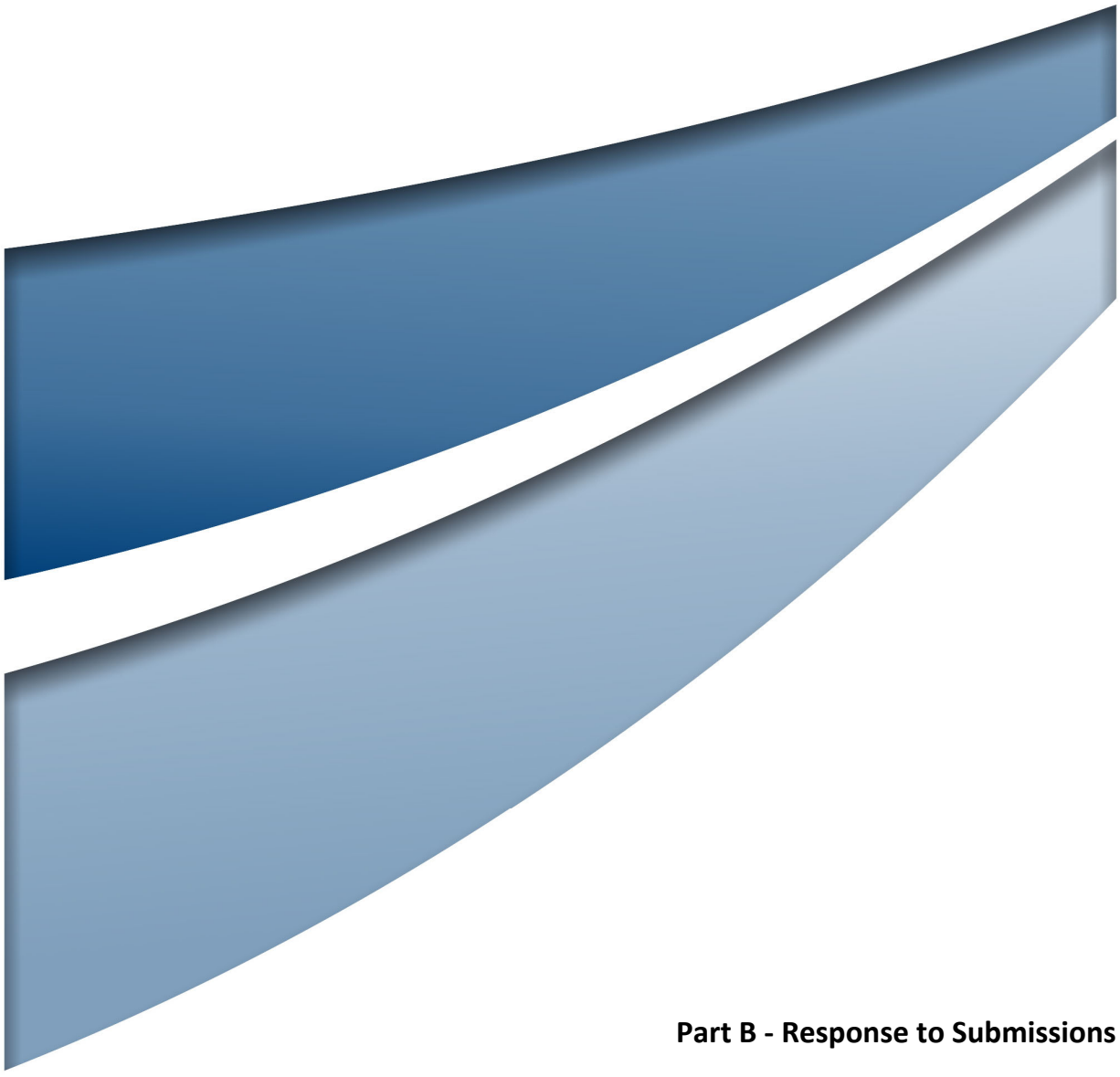
As has been highlighted in the SIA, project development brings benefits and costs that are not always evenly distributed across individuals and stakeholder groups and as a result, where social impacts are predicted it is the role of a SIA to outline how such impacts can or cannot be managed.

Given Daracon's approach of reviewing the Revised Project design to minimise impacts, the social impacts of the Revised Project have been minimised where possible through project design and the proposed management and enhancement approaches.

The Economic Assessment (refer to **Appendix P**) describes a range of positive benefits from the Revised Project that will result at a local, regional and State level. These benefits include:

- continued employment of approximately 22 full time equivalent employees
- the Revised Project is estimated to provide a net benefit of $58 million to NSW, in NPV terms
- the Revised Project is estimated to generate $11.5 million in NPV terms for Australia, of which $3.7 million is attributed to NSW
- the Revised Project is estimated to generate $1.5 million in royalties, payroll tax and Council rates in NPV terms
- the Revised Project is estimated to provide a net producer surplus attributed to NSW of $13.5 million in NPV terms.

On this basis, it would be reasonable to consider that with the implementation of the management, mitigation and offset measures proposed by Daracon, the Revised Project will result in a net benefit to the NSW community.



Part B - Response to Submissions

10.0 Background

Part B of this report provides a response to the submissions received during the exhibition period of the EIS (Monteath & Powys, 2016) in late 2016.

Daracon and its technical specialists have considered the submissions from the government agencies, interest groups and community members and a response is provided to each of the issues in the following sections.

In addition, Daracon have undertaken a thorough review of the Original Project to redesign key operational parameters in order to reduce environmental and social impacts. In particular, Daracon have committed to further reduce the extraction limits, operational hours and truck movements (the Revised Project), as further detailed in **Section 2.0**.

An updated environmental assessment, including revised and updated technical studies, have been commissioned to evaluate the key project changes, provide requested additional information and adequately address the assessment requirements (as detailed in **Section 6.0**).

11.0 Submission Analysis

11.1 Breakdown of Submissions

The Original Project was placed on public exhibition from 13 October to 24 November 2016. During the public exhibition period 887 submissions were made on the Original Project. This included 14 government agency submissions and 873 community, interest group or organisation submissions.

Table 11.1 provides a breakdown of the submissions received for the Original Project.

Table 11.1 Breakdown of Submissions

Category	Number of Submissions
Agency (State/Public Authority)	11
Council	3
Community and Interest Groups	7
Organisations	81
Members of the public	785
Total	**887**

Appendix Q provides the Register of Submitters.

11.1.1 Agency Submissions

As outlined in **Table 11.1**, 11 agency submissions and 3 council submissions were received, which included:

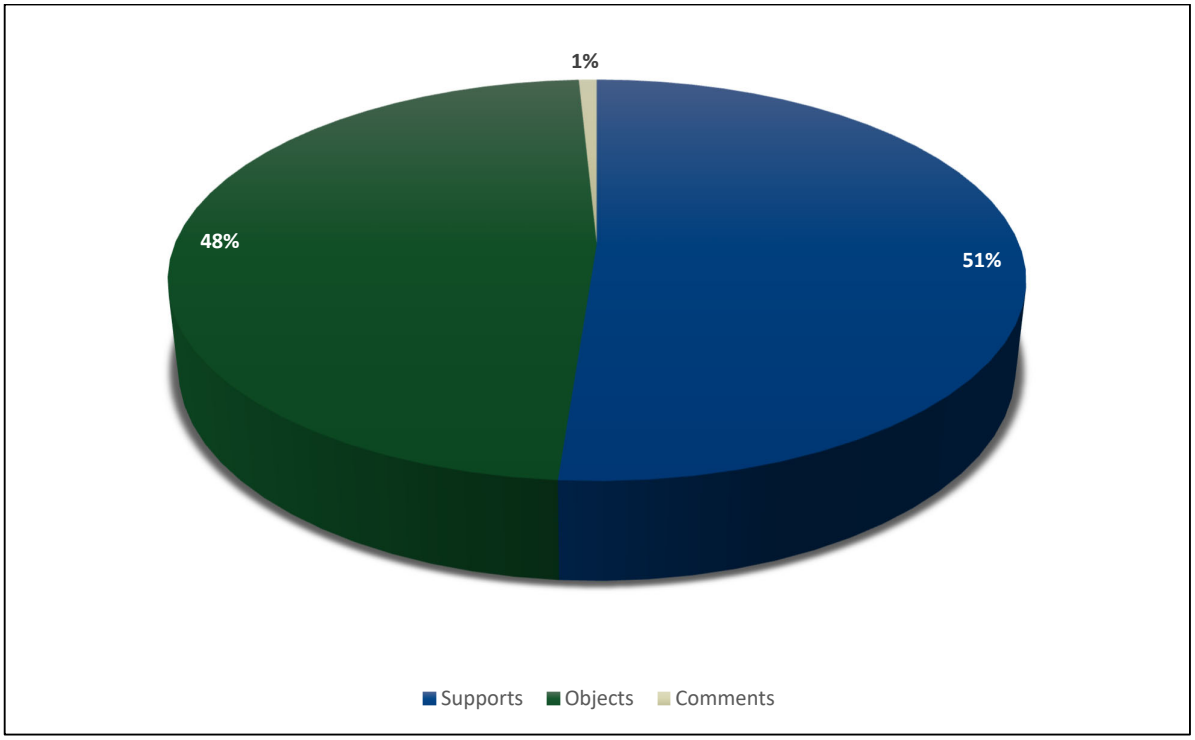
- DPIE
- the then Office of Environment and Heritage (OEH) – now Biodiversity Conservation Division (BCD)
- the then OEH – Heritage Division – now Heritage NSW
- the then Department of Industry - Division of Resources and Geoscience (DRG) – now MEG
- NSW Environment Protection Authority (EPA)
- the then Department of Primary Industries (DPI), now DPIE
- Hunter New England Local Health District
- Transport for NSW (TfNSW)
- Roads and Maritime Service (RMS)
- NSW Rural Fire Service (RFS)
- Australian Rail Track Corporation (ARTC)
- DSC
- MCC

- Port Stephens Council (PSC).

DSC objected to the Original Project and ARTC supported the Original Project. All other agencies did not identify whether they opposed or supported the Original Project, however, several agencies made submissions seeking further clarification regarding aspects of the assessment of the Original Project. These submissions are discussed further is **Section 12.0**.

11.1.2 Community and Interest Groups

Of the 873 submissions from community members, interest groups and organisations, a total of 419 (48 %) were objections, 447 (51 %) were in support and seven (7) (7 %) provided comment (refer to **Graph 11.1**).



Graph 11.1 Percentage of Supporting and Objecting Community and Interest Group Submissions

The breakdown of the 873 submissions received from community, interest group and organisations are provided in **Table 11.2**.

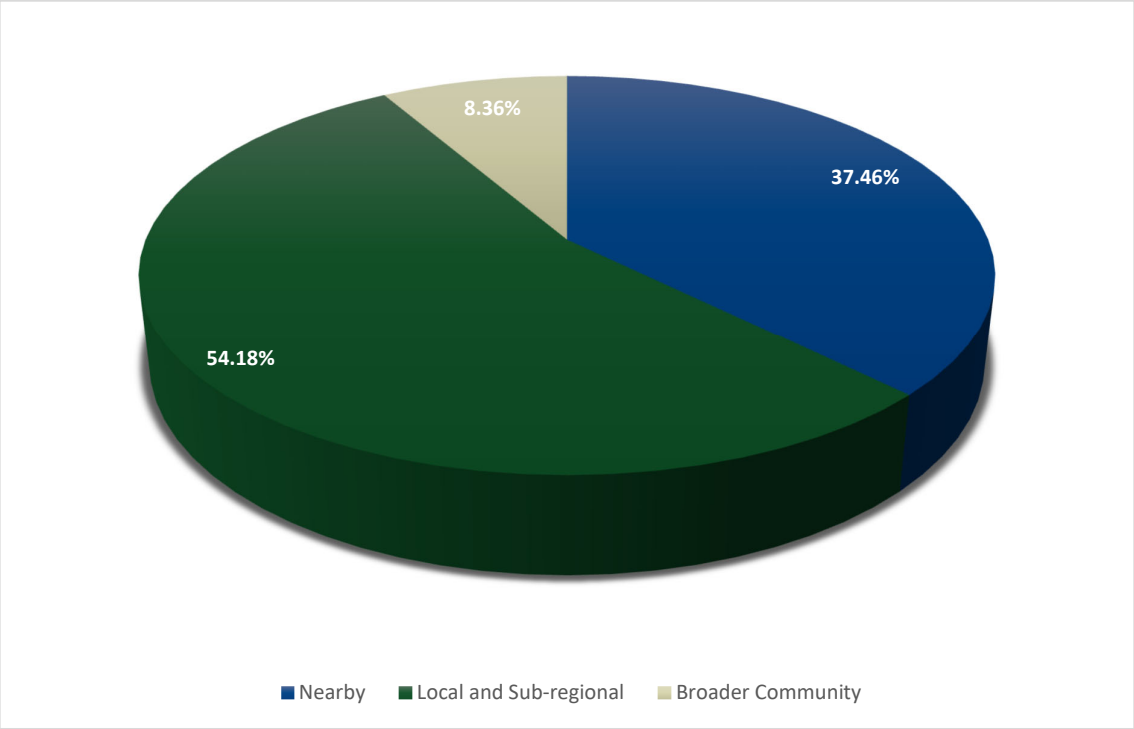
Table 11.2 Breakdown of Community and Interest Group Submissions

Group	Objections	Supports	Comments
Community	408 (46.4 %)	373 (42.7 %)	4 (0.5 %)
Interest Groups	7 (0.8 %)	0 (0 %)	0 (0 %)
Organisations	4 (0.5%)	74 (8.5 %)	3 (0.3 %)
TOTAL	**419 (48 %)**	**447 (51 %)**	**7 (1 %)**

The submissions were analysed based on proximity to the Project Area to determine the level of interest in the Original Project. The three categories include:

- nearby, being residences within approximately 5 km from the quarry and/or proximate to the haulage route including the suburbs of Martins Creek, Vacy, Hilldale, Paterson, Duns Creek, Tocal, Mindaribba, Woodville, Bolwarra Heights and Bolwarra (refer to **Graph 11.2**)
- local and sub-regional area, being between approximately 5 and 100 km
- broader community, being approximately 100 km or greater from the Project Area.

Of the community, interest group and organisation submissions received (including objections, supporting and comment), 327 (37.46 %) were received from the nearby area, 473 (54.18 %) from the local and sub-regional area and 73 (8.36 %) from the broader community (refer to **Graph 11.2**).

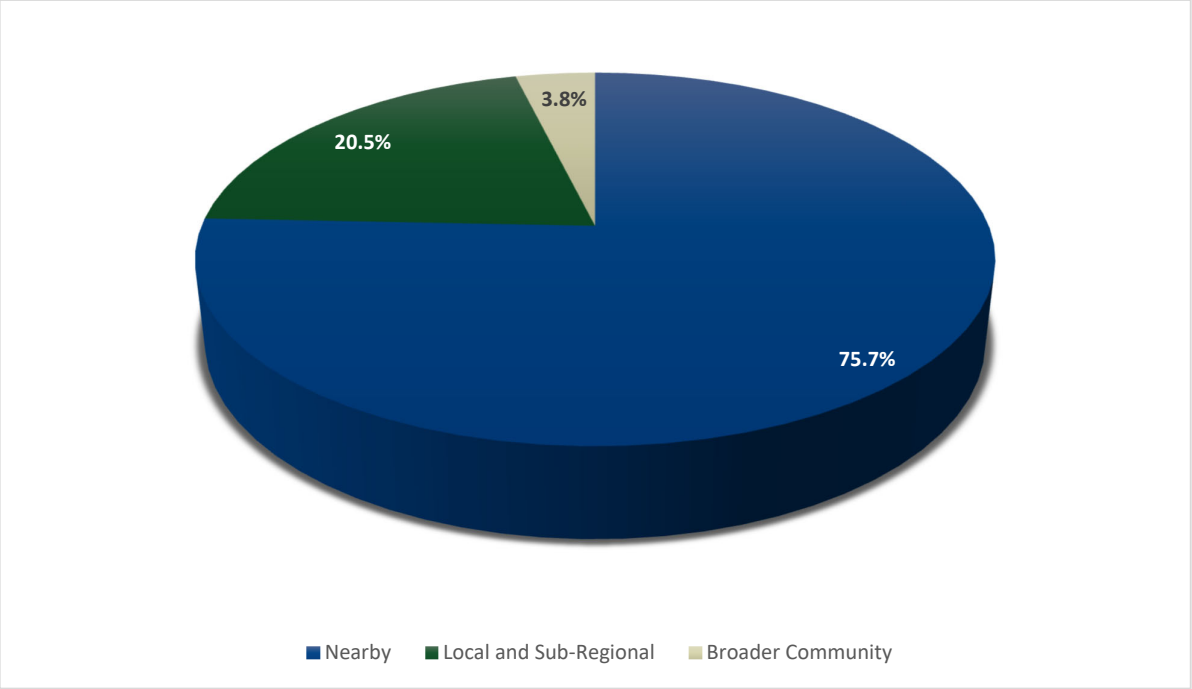


Graph 11.2 Percentage of Community and Interest Group Submissions by Area

Of the 415 objections, 15 submissions are considered form letters, being a standardised letter covering the same matters.

11.1.2.1 Objecting Submissions

As outlined above, a total of 419 submissions objected the Original Project, including 408 community members, 7 interest groups and 4 organisations. Based on the analysis, 317 (75.7 %) of objections were received from the nearby area (within approximately 5 km or proximate to the haulage route), 86 (20.5 %) from the local and sub-regional area (between approximately 5 km and 100 km) and 16 (3.8 %) from the broader community (approximately 100 km) (refer to **Graph 11.3**).

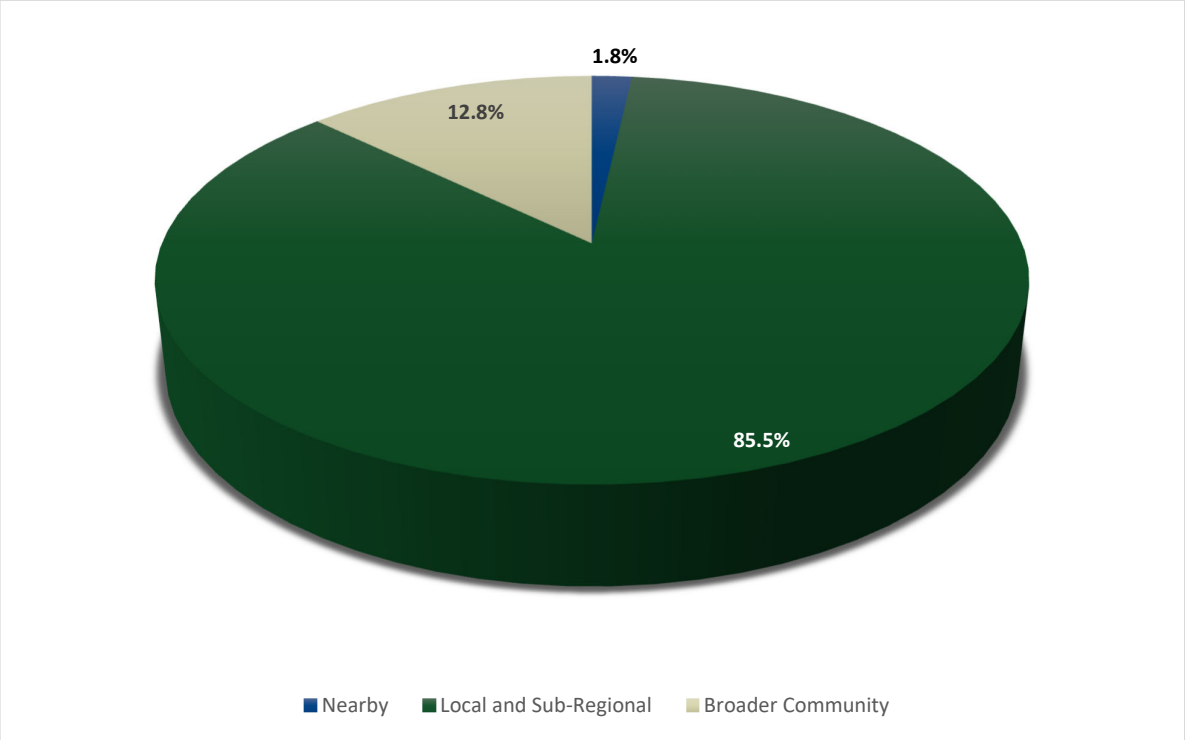


Graph 11.3 Percentage of Objecting Community and Interest Group Submissions by Area

Of the 317 objections to the Original Project from nearby areas, 310 (97.8 %) were from community members, 3 (0.9 %) were from interest groups and 4 (1.3 %) were from organisations.

11.1.2.2 Supporting Submissions

A total of 454 submissions were received that support the Original Project, including 384 community members and 70 interest groups. Based on the analysis, 8 (1.8 %) supporting submissions were received from the nearby area (within approximately 5 km and proximate to the haulage route), 388 (85.5 %) from the local and sub-regional area (between approximately 5 and 100 km) and 58 (12.8 %) from the broader community (approximately 100 km) (refer to **Graph 11.4**).



Graph 11.4 Percentage of Supporting Community and Interest Group Submissions by Area

Of the 447 supporting community submissions received on the Original Project, there were approximately 384 that stated a connection to Daracon either as an employee, family member of an employee or business connection.

11.2 Categorisation of Issues

A content analysis was undertaken on all community submissions to understand the key issues raised by the community in relation to the Original Project. Objections, supporting submissions or comment on the Original Project were analysed separately, as the themes within the submissions were distinct. The submission summary is provided in **Appendix R** with a summary provided below.

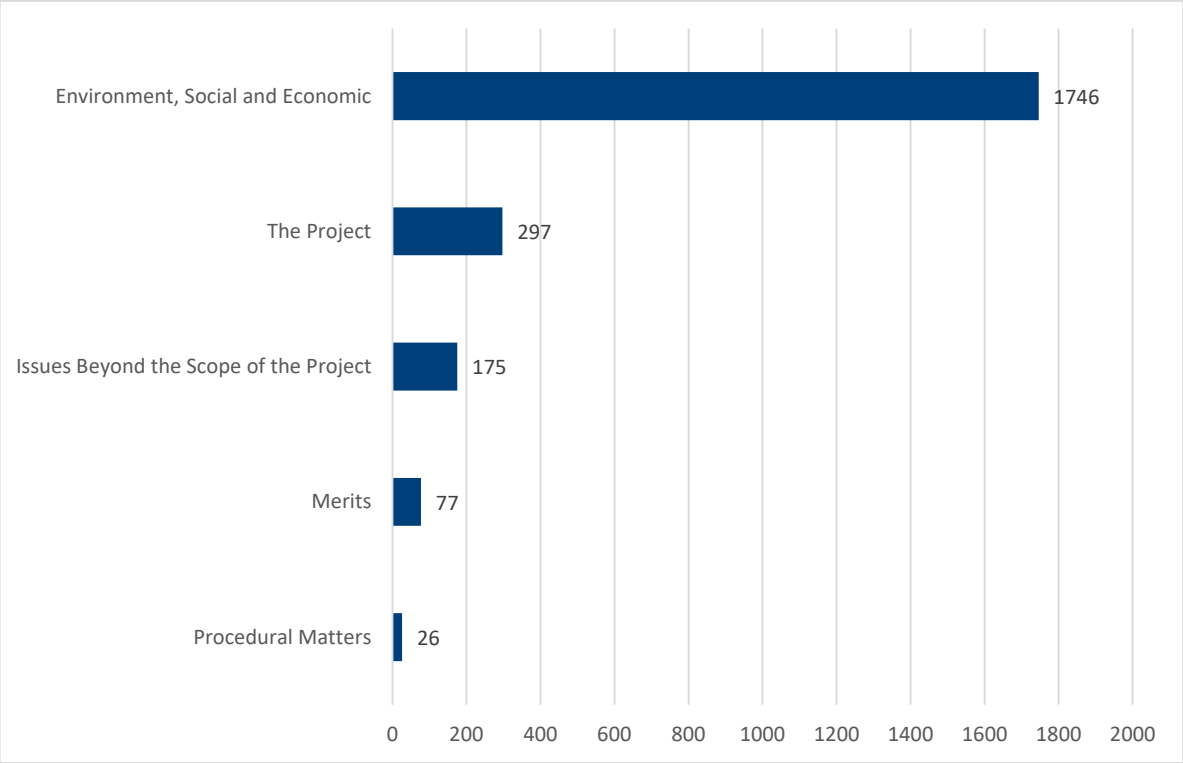
Issues have been categorised into the following broad groups:

- environmental, social and economic impacts of the Original Project
- the Project
- the merits of the Original Project
- procedural matters
- issues beyond the scope of the Original Project or not relevant to the Original Project (e.g. broader policy issues).

These broad issues categories were then divided into themes and sub-themes where relevant in order to provide greater definition of the issues raised. Further details of the categorisation of issues are provided in the following sections.

11.2.1 Objecting Submissions

Environmental, social and economic impacts of the Original Project were the most frequently raised category of issues in the 419 objecting submissions received (refer to **Graph 11.5**). Issues with the Original Project were the second most frequently raised category of issues, followed by issues beyond the scope of the Original Project, merits of the Original Project, and procedural matters. It should be noted that many submissions raised multiple issues categories and multiple themes and sub-themes within each issue category. The totals presented in the following tables and graphs have been tallied at the sub-theme level as identified in **Appendix R**.



Graph 11.5 Categorisation of Objecting Submissions

As outlined in **Section 11.1.2** , 317 (75.7 %) objections were received from the nearby area (within approximately 5 km and proximate to the haulage route), 86 (20.5 %) from the local and sub-regional area (between approximately 5 and 100 km) and 16 (3.8 %) from the broader community (approximately 100 km) (refer to **Graph 11.3**). When the objections were analysed in relation to location, there was a similar proportion of issues by category for each of the areas (refer to **Table 11.3**).

Table 11.3 Categorisation of Issues by Area

Locality	Category				
	Environmental, Social and Economic Impacts of the Project	The Project	Issues Beyond the Scope of the Project	Merits of the Project	Procedural Matters
Nearby Area (within 5 km and proximate to haulage route)	75.0% (1366)	12.8% (234)	7.9% (144)	1.0% (18)	3.3% (60)

Locality	Category				
	Environmental, Social and Economic Impacts of the Project	The Project	Issues Beyond the Scope of the Project	Merits of the Project	Procedural Matters
Local and Sub-Regional area (5 to 100 km)	77.0% (341)	12.4% (55)	6.3% (28)	0.5% (2)	3.8% (17)
Broader Community (100 km)	69.6% (39)	14.3% (8)	5.4% (3)	8.9% (5)	1.8% (1)

Environmental, Social and Economic Issues

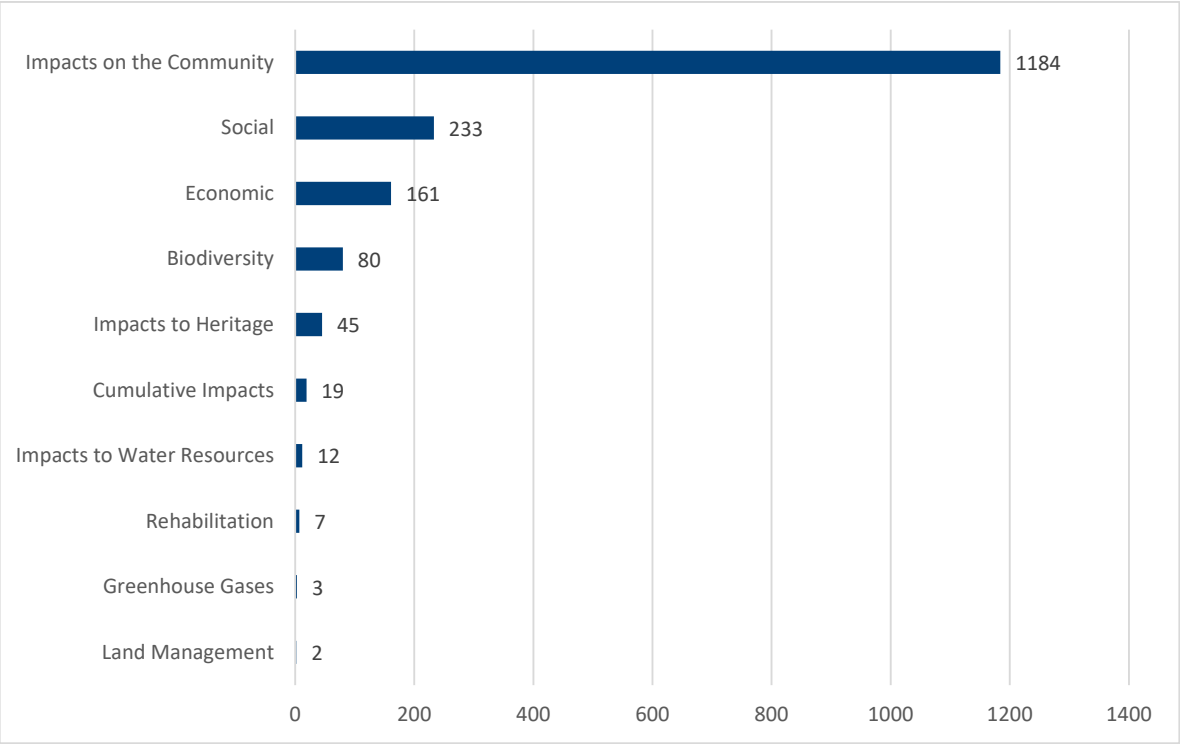
There were 10 key themes to the environmental, social and economic issues raised in the objecting submissions, including:

- impacts on the community
- social
- economic
- biodiversity
- impacts to heritage
- cumulative impacts
- impacts to water resources
- rehabilitation
- greenhouse gases
- land management.

The most frequently raised theme was impacts on the community (refer to **Graph 11.6**). The key concerns raised in relation to impacts on the community included the following sub-categories:

- traffic and transport (373 submissions)
- public health and safety (291 submissions)
- noise (257 submissions)
- air quality (160 submissions)
- blasting and vibration (160 submissions)
- visual (15 submissions).

Social impacts were the second most frequently raised theme (refer to **Graph 11.6**), with concerns centred around the loss of social amenity (227 submissions).



Graph 11.6 Environmental, Social and Economic Issues Themes

Responses to objections raised in relation to Environment, Social and Economic Issues are addressed in **Section 14.1**.

The Original Project

The key theme raised in objecting submissions in relation to the Original Project was associated with consideration of project design and alternatives. A total of 297 objecting submissions from community, interest groups and organisations raised issues relating to the project design of the Original Project.

Responses to objections raised in relation to the Project are addressed in **Section 14.2**.

Issues Beyond the Scope of the Project

This category includes broader policy issues or issues that are not directly related to the merits of the Original Project. The main theme raised under this category was in relation to whether Daracon are considered fit and proper in relation to existing and proposed operations. The key sub-themes were:

- the current operations and management, including compliance with the existing development consent (110 submissions)
- Daracon's reputation in the community and social licence to operate (40 submissions)
- court proceedings relating to Martins Creek Quarry that were being undertaken at the time of the Original Project application (15)
- complaints processes for the existing operations (10).

Responses to objections raised in relation to Issues Beyond the Scope of the Project are addressed in **Section 14.3**.

Merits of the Project

13 submissions raised concerns about the justification of the Original Project, while 12 submissions were received that stated a general objection to the Original Project however stated no specific issues or reasons for the objection. These submissions were classified as objections on the merits of the project.

Responses to objections raised in relation to the Merits of the Project are addressed in **Section 14.4**.

Procedural Matters

The key issue raised in relation to procedural matters was the need for Daracon to pay community contributions or the lack of contributions paid in the past (32 submissions). Other issues raised included:

- unsatisfactory community consultation by Daracon in relation to the Original Project (20 submissions)
- the NSW Government planning process (13 submissions)
- adequacy of assessments completed for the Original Project (13 submissions).

Responses to objections raised in relation to Procedural Matters are addressed in **Section 14.5**.

12.0 Agency Submissions

Government agencies make submissions relating to their areas of responsibility and typically relate to technical matters as well as matters the agency considers require consideration by the consent authority or to be addressed by conditions should development consent be granted.

The following section responds to the specific matters raised by each agency submission. The issues raised in the agency submissions are identified in the following sections in text boxes, with a response provided following each text box.

12.1 Department of Planning

12.1.1 Existing Development

The Department notes the EIS has adopted the 2014/15 annual production of around 900,000 tonnes per annum (tpa) for the purposes of assessing the proposed increase up to 1.5 Million tonnes per annum (Mtpa). This means that impact assessments have been undertaken for a proposed increase of around 600,000 tpa (eg. Table 2-7 in the Traffic Impact Assessment).

The Department has received submissions from the community that raise concern with this approach, particularly in the context of the current proceedings brought by Dungog Shire Council (Council) in the Land and Environment Court of NSW. These submitters are concerned that the use of 2014/15 annual production data may not accurately characterise the existing consent limits that apply to the quarry operation.

More specifically, Council in its submission on the EIS outlines a significantly smaller scale operation, which involves a maximum extraction rate of 300,000 tpa from Lot 5 DP242210, a processing limit of up to 449,000 tpa on Lot 1 DP 1006375 and a maximum of 30% (or around 80,000 tpa) allowed to be transported by road, with the remainder dispatched by rail. Council also disputes the use of processing equipment, existing use rights, land clearing and stockpiling described in the EIS (sections 2.5 – 2.9 inclusive and Appendix B).

The Department notes and accepts that the EIS provides an assessment of a proposed increase of 600,000 tpa. However, in light of the uncertainty around the existing consent limits, the Department considers that additional impact assessments, which consider the environmental effects of a proposed increase in extraction of 900,000tpa and 1.2 Mtpa and corresponding increases in processing, stockpiling and dispatch are necessary in order to ensure a robust and reliable assessment and an approval which can withstand legal and other scrutiny. Please provide a comprehensive assessment of noise, dust, traffic and all other key impacts based on expansion of approved production by increments of both 900,000 tpa and 1.2 Mtpa.

As outlined in **Section 1.4**, in 2015 DSC brought action in the LEC against the lessee and the proponent for breach of the EP&A Act. DSC claimed that operations at the quarry were contrary to the 1991 development consent. The LEC made declarations and orders restraining the respondents from carrying out certain activities at the quarry. The LEC decision was appealed by the proponent to the Court of Appeal. The Court of Appeal did not make the same orders as the LEC but did find that some operations at the quarry were not authorised by the 1991 development consent. The effect of the Court of Appeal judgment was that the quarry operations be restricted to the Approved Development activities, comprising:

a) winning material primarily for railway ballast

b) extraction only from Lot 5 DP 242210 (no extraction from Lot 6 DP 242210)

c) total processing on that part of Lot 1 DP 1006375 that formerly comprised Lot 2 DP 524511 of no more than 449,000 tpa

d) not greatly more than 30% of total production transported by road per annum

(e) total production limited by the terms of the EPL to 500,000 tpa.

Since 24 September 2019, the quarry has operated within the parameters deemed as approved by the Court of Appeal.

The issues raised by DPIE have now been determined by the Courts. **Section 1.4** sets out the confirmed extent of approved operations, considered for the assessment of the Revised Project described in the ADA report.

Since the change to quarry operations, Daracon have considered community input and have completed further project feasibility investigations, changes to the proposed quarry and product haulage configuration, and proposed additional mitigation measures. With the agreement of DPIE as the delegate for the IPC, Daracon is submitting an amended development application, supported by the ADA Report (Part A of this document).

The updated environmental assessment, supported by a full suite of updated technical studies, has been commissioned to re-evaluate all components of the Revised Project. The court judgement did not provide clarity on the approval status of all elements of the quarry operation, but where available and applicable updated assessment of the Revised Project has been assessed against the existing consent limits to ascertain the incremental impacts of the Revised Project.

12.1.2 Consultation

The Department's Social Impact Assessment (SIA) specialist has reviewed the EIS, including the Stakeholder Consultation Issues Report (SCIR) (Appendix E) and the Social and Economic Assessment (Appendix O). The Department's SIA specialist has identified significant shortcomings with the Social Impact Assessment (SIA) and the consultation undertaken to date. This is consistent with feedback from the community during the Department's consultation meetings that consultation undertaken during preparation of the EIS did not result in the community's issues and concerns being addressed or resolved.

The Department requests that a revised SIA is submitted as part of the RTS which, at a minimum:

a) Includes a comprehensive stakeholder identification or map with particular emphasis on potentially vulnerable groups;

b) researches, analyses and qualitatively describe first-hand views (ie opinions, concerns and aspirations) of community members regarding the proposal;

c) investigates and documents the views of other interested parties regarding the proposal;

d) considers and assesses the different ways in which the project might affect various groups in the community, with particular attention to distributive equity and hard-to-reach community members;

e) conducts a thorough assessment of potential social impacts, directly informed by insights gained through community engagement;

f) considers the potential significance of these impacts, in terms of:

i) duration – when the impact will occur and over what period;

ii) extent – in terms of both geography and number of people potentially affected;

iii) severity – the intensity of the potential impact on different groups;

iv) sensitivity – the social value placed on the impact by different groups, and their capacity to adapt to change; and

v) level of concern/interest – the degree to which the impact is viewed as significant by different groups in the community (based on outcomes from engagement);

g) proposes how positive impacts might be secured or enhanced;

h) proposes responses to significant negative impacts (avoid, minimise or, lastly, mitigate); and

i) provides a comprehensive monitoring plan for social impacts, including appropriate responses for unanticipated impacts.

The Department considers that a further program of consultation and engagement with the community is necessary to inform the revised SIA. Such a program should be designed and carried out by an appropriately qualified and experienced person/s or organisation.

As a mechanism to support and inform a revised SIA, the SCIR (Appendix E) requires further work including:

a) prioritisation and identification of significance of issues to determine the importance of each issue to different parts of the community;

b) a discussion of whether the Applicant's responses to issues actually address the concerns (eg does restricting in-pit quarrying operations to between 6am and 6pm Monday to Saturday address community concerns around noise from this activity?);

c) identifying the relationships between the issues raised and the parts of, or groups in, the community to whom they relate; and

d) shifting the focus of engagement so that, as well as informing people of the Applicant's operational intentions, there is genuine, inclusive engagement around impacts on the social fabric and intangible dimensions of the community.

Additionally, the SCIR includes a description of proposed mitigation and management measures that are not discussed in relevant impact assessment reports elsewhere in the EIS (eg. relating to road noise mitigation measures, on-site truck parking and consultation with residents in View Street). The Department requests that any description of mitigation and management measures is properly considered in relevant impact assessments and clearly outlined in a consolidated section of the RTS.

An updated SIA (refer to **Appendix O**) has been completed for the Revised Project (refer to **Section 6.13**) in line with the requirements of the Social Impact Assessment Guideline for State Significant Mining, Petroleum Production and Extractive Industry Development (DPE 2017). The comments provided above by DPIE on the Original Project have been addressed in the SIA. Table 1.2 of the SIA outlines the sections of the SIA where each of the above comments have been addressed (refer to **Appendix O**).

A comprehensive stakeholder engagement strategy was developed as part of the preparation of the SIA to guide stakeholder engagement activities during the environmental assessment process for the Revised Project. This strategy was informed by a detailed review and analysis of submissions made during the public exhibition of the EIS, as set out in **Sections 5.2** and **11.2**.

The outcomes of the stakeholder engagement strategy have informed various aspects of the Revised Project and the updated environmental assessment including the updated SIA (refer to **Section 6.13** and **Appendix O**). A summary of the process of additional stakeholder engagement is outlined in **Section 5.2**, and further discussion of the key issues raised during the stakeholder engagement is provided in **Section 6.13**.

12.1.3 Traffic and Transport

The figures in the Engineering and Transport Assessment (Appendix J) appear to indicate proposed road intersection works would occur on privately-owned land. The Department requests revised figures of all proposed road intersection works that include the clear identification of property boundaries and privately-owned land. The consent of the relevant landowner must be provided for all parcels of land on which works are proposed to occur, including any privately-owned land and relevant Road Authorities (i.e. the relevant Council, or RMS).

The Original Project included conceptual designs for the proposed road intersection works. Further design work has been completed since that time, and the proposed road intersection and bridge approach upgrades proposed as part of the Revised Project (as discussed in detail in Sections 2.7 and 2.8), have been designed to suit the relevant road corridors and do not occur on any privately owned land. The proposed road works would therefore not impact on any private property.

As outlined in **Section 5.3**, extensive consultation has been undertaken with the relevant road authorities (TfNSW and DSC) for the concept design of the proposed intersection and bridge approach upgrades. The concept designs have been prepared with reference to the relevant road design standards and incorporate the requirements of the relevant road authorities.

The Department is not satisfied that the EIS and TIA have proposed an acceptable road intersection upgrade in the village of Paterson. Specifically, the Department is not satisfied that a traffic engineering solution, such as physical separation, achieves an acceptable balanced outcome that considers the community's current use of the town centre, desire to preserve village amenity and heritage values and availability of on-street parking. The Department requests that careful and detailed consideration is given to avoiding traffic impacts to Paterson or alternatively the development of solutions that achieve a more reasonable outcome and considers the community's views on access and use of the village of Paterson.

In response to DPIE's concerns, additional refinements of potential alternatives for modifications to the King Street and Duke Street intersection upgrade have been undertaken as part of the redesign of the Revised Project.

As outlined in **Section 5.2**, extensive consultation has been undertaken since the exhibition of the EIS with DSC regarding a number of potential viable options for this intersection, in addition to extensive community engagement via the CAFs to assist with identifying a preferred design option for this intersection. The CAFs have been invited group discussion sessions with notices sent to all those that had previously indicated an interest in being involved in engagement activities, including relevant Paterson business owners, with expressions of interest in participating in engagement activities sought via a number of mechanisms. This included consultation with businesses in Paterson and service providers in Paterson, Tocal, Vacy and Bolwarra.

Two traffic and transport CAFs were held during July 2019 to present and discuss the outcomes of the traffic impact study with the community and to seek further input from the community on the proposed roads and traffic management options and design concepts.

The community were overwhelmingly focused on the reduction of truck movements through Paterson Village, and were unable to provide any preference in relation to the proposed conceptual intersection designs for the King and Duke Street intersections, other than not wanting raised separation of the lanes.

That said, the community identified concerns with the proposed loss of car parking spaces in Paterson and also safety concerns when parking and exiting their cars within Paterson. However, most of the community felt that pedestrian crossings are generally not needed. The loss of car parking spaces was a result of some intersection modifications/road works that were identified as being required through the traffic impact assessment.

As illustrated on **Figure 2.16**, the updated design allows for the relocation of the existing driveway on the north side of the intersection slightly west, to improve the space allocation for parking on either side of the intersection and improve carparking capacity along the northern kerb line. Therefore, there is no longer any loss of on-street parking. In addition, the proposed upgrade will allow for a refresh of the dividing line marking through the intersection to delineate and separate opposing traffic movements.

In addition, Daracon have also committed to speed limit of 20 to 25km/hr around the King and Duke Street intersection in Paterson to further improve safety and intersection performance without the need for additional intersection upgrade.

The EIS concludes that "the existing road networks would be likely to manage traffic flows associated with the proposal, given that the hourly rate of truck movements will not increase compared to existing peak operations (i.e. 40 outbound laden trucks per hour in the mornings)".

The Department considers further information is required to support this statement, including:

a) monthly sales (production) data from the past three years;

b) the highest daily volume of trucks dispatched in each month of these years; and

c) the highest hourly dispatches each month of these years.

Detailed analysis of historic records of weighbridge data has been taken into account in the revised TIA in **Appendix C**, and the NIA in **Appendix D**.

As outlined in previous sections, Daracon have committed to substantial changes to both volumes and hours of truck movements. A maximum of 20 laden trucks per hour (40 truck movements per hour) between 7.00 am and 3.00 pm, and 15 laden trucks per hour (30 movements per hour) between 3.00 pm and 6.00 pm are now proposed as part of the ADA.

The Department requests the following clarification and/or additional information relating to the TIA:

a) a description of the proposed staging of construction works for the new haul road, including identification of interim mitigation and management measures that would be implemented while the quarry is operating and prior to the completion of this work (eg. temporary reductions in truck movements, limits on production, or other arrangements such as upgrading Station Street and Grace Avenue).

Approval is sought to commence construction in a phased approach to allow the quarry the flexibility to continue operations while construction is underway. The construction of the proposed new access road, including the new intersection and rail bridge, will require the longest duration and be subject to additional design and approvals processes.

As noted in **Section 2.7.2**, it is estimated that the construction program will be completed within 50 weeks of obtaining these approvals, and by the end of Year 4 once the Revised Project has been approved.

The Revised Project represents further limitations in terms of truck movements and road haulage of quarry product, which negate the need for interim mitigation and management measures such as temporary reduction in truck movements, limits on production or other arrangements.

As part of ongoing VPA discussions, Daracon will consult with DSC in regard to potential upgrades to Station Street and Grace Avenue, such as an asphalt overlay in Station Street to improve the road surface.

b) SIDRA modelling of all major intersections on proposed haul routes (these have been identified in section 2.4.1 of the TIA) and a description of any measures that would be implemented to minimise or mitigate traffic impacts, if necessary.

The updated TIA for the Revised Project used the intersection capacity analysis program Sidra to model all major intersections on the proposed haul route (Primary Haul Route), as further detailed in **Section 6.3**. These major intersections included:

- Dungog Road/Gresford Road
- Paterson Road/Tocal Road
- Paterson Road/Flat Road
- Pitnacree Road/Melbourne Street/Lawes Street
- Melbourne Street/New England Highway.

A description of the traffic and transport mitigation measures are provided in **Section 6.3.5**.

c) an amended TIA that considers those unquantified truck movements associated with deliveries of fuel, parts, pre-coat and other chemical additives, blending products such as fly ash and any other service or delivery vehicles likely to access the site (eg. the NIA indicates regular delivery of consumables to supply the pug mill each morning of operation however this has not been quantified in the TIA, or elsewhere in the EIS).

As requested by DPIE, ancillary truck movements associated with deliveries of fuels, pre-coat and additives have been considered in the updated TIA as part of the proposed maximum truck movements for the Revised Project (refer to **Section 6.3**). These movements have been considered in the traffic modelling of the TIA. Other service and delivery vehicles are ad hoc and not regular, as such they have not been included in the truck movements. These movements will be minor in nature.

d) an impact assessment that includes a road safety appraisal of the proposed new driveway access to Dungog Road.

As part of the Revised Project, a new site access road is proposed that will allow for direct vehicle access between the quarry and Dungog Road, to the north of Grace Avenue (refer to **Section 2.7.2**).

This proposed new access involves a bridge crossing over the North Coast rail line. Once this new access has been constructed, all heavy vehicle movements will be via this new access. The existing access on Station Street will remain as per the current layout and will be maintained as a secondary access for emergency or unplanned disruptions only.

The new access has been considered in the updated TIA for the Revised Project (refer to **Section 6.3**). The traffic assessment found that delays for the through traffic movements on Dungog Road would be minimal and any delay for exiting traffic would result in a queue located within the quarry. Further, the proposed intersection design has been refined by Lindsay Dynan and DSC has been consulted in relation to the updated intersection design. Refer to **Section 5.4** for a summary of ongoing consultation with DSC in this regard. Further discussion on road safety matters is provided in **Section 6.3**.

e) a description of the measures that would be implemented to avoid or minimise haul trucks exceeding the speed limit on parts of the proposed haul routes (as reported in the TIA).

Section 6.3 outlines all traffic management and mitigation measures proposed as part of the Revised Project.

As part of the ongoing management of the trucks associated with the quarry all drivers will be instructed to adhere to the requirements of the Drivers Code of Conduct which includes drivers to adhere to the posted speed limits.

Daracon commit to review and update the Driver Code of Conduct annually and as the need arises, as well as undertaking regular audits of transport subcontractors to ensure compliance with the HVNL and associated CoR (refer to **Section 6.3.5**). A process will be documented with the road authority to monitor truck speeds along the haul route with appropriate action taken with drivers who exceed the posted speed limit.

f) a description of the measures that would be implemented to monitor and demonstrate that haul trucks do not travel through Lorn, as proposed.

Lorn is not part of the primary haul route and would only be used for local deliveries as necessary. The approved primary haul route and associated road network will be communicated to drivers through Daracon's Code of Conduct, which is currently available on Daracon's website (www.daracon.com.au).

Daracon trucks are fitted with GPS monitoring and the majority of subcontractor trucks also have GPS monitoring. These records are investigated as required in response to an incident or complaint. While there are trucks which do not have GPS monitoring, all vehicles are still subject to the requirements of the Driver Code of Conduct.

Daracon commits to explore additional opportunities to further monitor driver conduct and truck convoying, as suggested by the community, including fleet management technologies as they become available and GPS monitoring for non-Daracon vehicles.

g) clarification of the hours of operation during which haul trucks travel to (first arrival) and depart from (final load) the site (the TIA indicates an 8 hour day, but states under section 4.4.1 that this actually occurs over 10 hours between 5 am and 5 pm, each day).

In response to community and agency concern, the proposed hours of operation, and specifically trucking hours, have been updated as part of the Revised Project (refer to **Section 2.6**).

Road haulage of quarry product will be limited between 7.00 am and 6.00 pm, Monday to Friday, with no haulage on Saturday, Sunday or public holidays. In addition to this, no quarry trucks will be traveling through Paterson prior to 6.45 am Monday to Friday.

Daracon is also applying for product loading of up to 10 Daracon-owned trucks (not contractor trucks) between 6.00 pm and 7.00 pm, Monday to Friday, with these trucks remaining parked at the quarry overnight for morning departure from 7.00 am. In the case of trucks loaded on Friday evening, departure will be no earlier than 7.00 am Monday morning.

h) provide further justification for the method used to quantify the proposed additional 488 truck movements as accurately reflecting the existing approved level of trucks that may be dispatched from the site (refer section 4.4.1 in the TIA); and

The Revised Project no longer proposes an additional 488 truck movements. Daracon recognise that traffic and transport issues are of key concern to the community, in particular with regards to the volume of truck movements, transportation hours, and road capacity. Consequently, Daracon have undertaken a thorough review of the Original Project to redesign key operational parameters in order to reduce environmental and social amenity impacts, in particular in relation to traffic and transport.

In response to community concern, Daracon have committed to the following revised operational parameters as part of the redesign of the conceptual quarry plan for the Revised Project:

- reduction in tonnes transported by road to 500,000 tpa
- reduction in peak trucks per hour to:
    - 20 loaded vehicles per hour (40 movements per hour) between 7.00 am and 3.00 pm
    - 15 loaded vehicles per hour (30 movements per hour) between 3.00 pm and 6.00 pm
- road haulage of quarry product to occur 7.00 am to 6.00 pm Monday to Friday, with no haulage of quarry product on Saturday, Sunday, public holidays or between 24 December and 1 January, inclusive
- no trucks through Paterson prior to 6.45 am Monday to Friday
- removal of Haul Route 2 as a primary haul route (now proposed only to service local jobs as required).

i) provide a cumulative impact assessment of the proposed volume of truck movements as they relate to existing approved and proposed truck movements from the Brandy Hill Quarry.

The updated TIA includes an assessment of cumulative traffic impact of other proposed developments in the area, which includes the now approved expansion of the Brandy Hill Quarry (refer to **Section 6.3.3.1**).

In addition, the existing truck movements associated with the Brandy Hill Quarry were included in the background traffic counts. The TIA allows for a maximum of 15 truck movements per hour from the extension of Brandy Hill Quarry along the Maitland route between Tocal Road and Flat Road (SECA, 2021). This is based on the following:

- Brandy Hill Expansion Project's consent allowing for up to 60 truck movements per hour (at peak) for the entire project
- up to 25% of the Brandy Hill Expansion Project's traffic to utilise a secondary haulage route via Clarence Town Road towards Maitland, as assessed in the Brandy Hill Expansion Project's TIA (Intersect Traffic, 2016) under the worst case scenario; this route coincides with a section of the Revised Project's primary haul route, along Paterson Road (between Tocal Road and Flat Road).

The Department requests clarification and additional information in relation to the use of rail transport, including:

a) revised analysis of the viability of using rail transport to dispatch material via a stockpile site in light of Daracon's current ownership of the Ardglen Quarry, which also has an existing rail siding; and

b) identify the particular circumstances under which the rail siding and transport would increase (ie the circumstances required to make this viable focussing on the current primary market, being the Newcastle and Hunter regions).

Daracon acknowledges the strong sentiment to increase the use of rail as a means for transport of quarry product and is committed to working toward this. Daracon recognise that traffic and transport issues were a very significant issue for the Original Project, based on both submissions on the Original EIS and subsequent feedback during stakeholder engagement.

To further reduce the impacts associated with transport of quarry product via road and still maintain an economically viable project, Daracon have committed to increase the amount of quarry product transported by rail. Daracon are planning to expand rail markets and gain access to rail unloading capacity, in order to enable greater transportation of product by rail to service the Sydney market.

Currently, the quarry is constrained by available train paths on the network and train loading hours which limits movements to one train per day. To alleviate some these constraints Daracon is seeking approval to load trains 24 hours per day and to construct an extension of the existing rail spur within the East Pit, to enable the loading of trains.

The proposed changes to the rail spur will enable the full range of quarry products produced by the quarry, not just rail ballast, to be loaded onto trains. A rail dispatch rate of 600,000 tonnes per annum equates to six to eight trains per week depending on train length.

Ardglen Quarry, located approximately 110 km northwest of Martins Creek, services different markets to Martins Creek Quarry. At approximately 360 km from Sydney, the Ardglen Quarry is over 150 km further away than the new rail served quarries in the Southern Highlands, which are also competing for market share. Ardglen's potential market opportunities remain in the Liverpool Ranges, Gunnedah and Tamworth areas as well as future ARTC construction projects such as Inland Rail.

There are currently no plans for product from Ardglen Quarry to service the Hunter or Sydney markets.

12.1.4 Air Quality

The Environment Protection Authority (EPA) has raised a number of issues with respect to the Air Quality Impact Assessment (AQIA) in Appendix F of the EIS, including that it has not been undertaken in accordance with the Approved Methods for the Modelling and Assessment of Air Pollutants in NSW (Approved Methods). The Department also has specific comments on the AQIA, including:

a) Assessment of different stages of the project

The AQIA does not include a plan, or reference to other parts of the EIS to identify the scale or stage of the proposal that has been assessed. Rather, the AQIA predicts emissions in a single scenario that assumes all activities would occur concurrently and in the same location on the site. The Department does not consider this sufficiently represents the proposed staging of the quarry, particularly activities in new extraction areas, the operation of mobile plant in different locations and the use of the new haul road to Dungog Road. It is also unclear whether the AQIA has considered the proposed relocation of part of the existing stockpile areas in the southern part of the site. Accordingly, the Department requests the revised AQIA provides an assessment of predicted emissions from each key stage of the development to potentially affected receivers. From this, the Department would expect the identification of additional receivers, for example, those residences located on Merchants Road, which would be closer to extraction activities as the quarry expands into new extraction areas.

A comprehensive and updated AQIA has been undertaken for the Revised Project in accordance with the Approved Methods (EPA 2016) (refer to **Appendix E**). The AQIA provides an assessment of the predicted emissions from each key stage of the Revised Project and the impact on all potentially affected receivers (refer to **Section 6.5**).

b) Consideration of past monitoring results

The AQIA reports that the dust monitor at location DG3 has recorded continual exceedances of between 1 and 7.9 g/m2/month) compared to the deposited dust criterion of 4 g/m2/month in the Approved Methods. The AQIA states that these exceedances, which in some cases are almost double the relevant criterion is the result of dust from nearby cattle paddocks rather than from the existing quarry operation. In the Department's view, this explanation seems unlikely.

The Department notes this justification was also not accepted by the EPA in 2014 as part of the quarry's request to vary its Environment Protection Licence (EPL) to remove this monitoring location. The EPA refused this licence variation and recommended that Buttai Gravel Pty Ltd investigate the source of the exceedances.

The Department considers that without the results of this investigation, it is unable to support the justification that nearby cattle paddocks are the cause of the exceedances, particularly considering the predominant winds at the site are from the west and north-west (as identified in section 7.1 of the AQIA).

The Department requests that the revised AQIA consider the results of the investigation, if undertaken, or investigate the source of the exceedances reported at DG3. The Department further requests that dust monitoring results from locations DG5 and DG6 (which are not included in the EIS) as well as more recent data from DG3 are included and discussed in the revised AQIA.

Background air quality has been established to allow for the potential impact of the Revised Project to be assessed against the air quality criteria nominated in **Section 6.5.2**. In establishing the background concentration of the particulate matter and gaseous pollutants, the contribution to existing air quality of the operating quarry has been considered. The following sources of data have been used to establish background air quality:

- Five deposited dust gauges located on and surrounding the quarry (refer to **Figure 6.7**). Data has been collected from DG1 to DG3 since 2013, and from DG4 since 2015. In 2017, DG3 was moved slightly south west (labelled 'DG3' on **Figure 6.7**), with a new dust deposition gauge installed in Vacy in 2019 (labelled 'Vacy' on **Figure 6.7**).

- Two temporary dust deposition gauges (DG 5 and DG 6) located on the southern boundary of the quarry processing area and to the east of the processing area. These gauges were installed by Daracon to monitor dust deposition closer to the quarry processing area.

- A HVAS located adjacent to the Quarry meteorological station on Station Street, Martins Creek (refer to **Figure 6.7**). The HVAS has collected PM_{10} data every 6 days since 2013.

- OEH air quality monitoring station located at Singleton (approximately 40 km west of the quarry). $PM_{2.5}$ and NO_2 are both monitored at this location. It is noted that another OEH monitoring station is located at Beresfield approximately 30 km to the south of the quarry. The Singleton location has been identified by Jacobs (2020) as more representative of the Martins Creek setting as Singleton has a lower population density and the monitor is situated in a rural residential area that has closer environmental characteristics to Martins Creek.

Section 6.5.3 provides a brief discussion of the results of monitoring of each of the key air pollutants and summary of the established background concentrations.

c) Assessment of potentially affected receivers along proposed haulage routes

The EIS and AQIA state that "Due to the proximity of residences in the villages of Paterson and Bolwarra to the main road proposed to be used as a haulage route, the likely impacts of dust from truck movements have also been considered in the AQIA". Neither the EIS nor AQIA identify these potentially affected receivers, or present predicted emission levels. The Department requests the revised AQIA include this impact assessment.

The potential for air quality impacts due to road transport along Haul Route 1 has been examined in the revised AQIA by using the RMS air quality screening tool known as "Tool for Roadside Air Quality" (TRAQ) (refer to **Section 6.5**). Results from TRAQ were compared to the EPA assessment criteria in order to determine the potential for impacts.

Emissions from wheel-generated dust are predicted to remain well below the nominated EPA criteria and are therefore unlikely to lead to any adverse air quality impacts.

d) Emissions discount applied to noise walls as wind breaks

The AQIA states that a 30% reduction in PM10 and TSP emissions has been applied on the basis that the proposed noise walls designed to mitigate noise emissions from the quarry would also mitigate dust emissions. The Department requests a more detailed justification in support of this factor that includes consideration of the predominant wind conditions at the quarry and results from dust monitors at locations DG3, DG5 and DG6 (see b) above).

The updated AQIA has not applied emissions discount to noise walls as wind breaks (refer to **Section 6.5**).

e) Dust dispersion contour maps

Revised dust dispersion contour maps are requested based on the additional impact assessments requested in a) above (ie for each stage of the development). In addition, it is requested that these revised maps are provided at a higher resolution to enable identification of potentially affected receivers and monitoring locations.

Contour figures for all modelled years are provided in **Section 6.5** and **Appendix E**.

f) Assessment against the NSW Voluntary Land Acquisition and Mitigation Policy (VLAMP)

The AQIA has not identified, or assessed, two vacant parcels of land, being 438 Dungog Road and 10 Vogels Road. It is requested these vacant land parcels are assessed in accordance with the VLAMP in the revised AQIA.

The VLAMP (2018) includes the NSW Government's policy for voluntary mitigation and land acquisition to address dust (particulate matter) impacts from State significant mining, petroleum and extractive industry developments. VLAMP (2018) brings the air quality criteria in line with the NEPM standards and EPA criteria.

Voluntary acquisition rights may apply where, even with best practice management, the development contributes to exceedances of the criteria at any residence or workplace on privately owned land, or on more than 25% of any privately-owned land where there is an existing dwelling or where a dwelling could be built under existing planning controls.

Jacobs has assessed the potential air emissions from the Revised Project at these land parcels against the updated VLAMP (2018), with the modelling results shown in **Table 12.1** below.

Table 12.1 Model Predictions at 438 Dungog Road and 10 Vogeles Road

Receiver ID	Mitigation Criteria	Background	Cumulative		
			Year 2	Year 10	Year 20
Predicted maximum 24-hour average PM10 concentrations (µg/m^3)					
10 Vogeles Road	50	34	28	26	42
438 Dungog Road	50	34	33	34	37
Predicted annual average PM10 concentrations (µg/m^3)					
10 Vogeles Road	25	13	12	12	15
438 Dungog Road	25	13	13	13	13
Predicted maximum 24-hour average PM2.5 concentrations (µg/m^3)					
10 Vogeles Road	25	14	13	12	15
438 Dungog Road	25	14	14	14	15
Predicted annual average PM2.5 concentrations (µg/m^3)					
10 Vogeles Road	8	5.5	5.3	5.2	5.7
438 Dungog Road	8	5.5	5.5	5.5	5.6
Predicted annual average TSP concentrations (µg/m^3)					
10 Vogeles Road	90	33	32	31	35
438 Dungog Road	90	33	33	33	33
Predicted annual average dust deposition concentrations (g/m^2/month)					
10 Vogeles Road	4	2.4	2.3	2.3	2.6
438 Dungog Road	4	2.4	2.4	2.4	2.5

Based on the results, there are no predicted exceedances of the VLAMP mitigation and acquisition criteria at these two properties for all particulate matter classifications (PM_{10}, $PM_{2.5}$, TSP and dust deposition).

g) Review and revise Table 10 in AQIA

It is requested that the calculation error in Table 10 is corrected in the revised AQIA. It appears that the predicted incremental emissions have been subtracted from the background level but should have been added to generate the cumulative predicted emission.

A revised AQIA has been prepared and presents an updated approach to the assessment of potential air quality emissions. **Section 6.5** and **Appendix E** provide further detail regarding the assessment methodology and approach.

12.1.5 Noise

In addition to the EPA's submission, which raises several issues in respect of the Noise Impact Assessment (NIA) (Appendix I), the Department requests clarification and further information on the following matters:

a) a description of all treatments proposed to be implemented to minimise noise from processing plant and the timing of implementing these treatments;

As outlined in **Part A**, a comprehensive, updated NIA has been prepared for the Revised Project. Acoustic treatments of the processing plant proposed as part of the Revised Project including expected timing of implementation of these, are detailed in **Section 6.4** and **Appendix D**.

b) clarify that the rail noise assessment has considered the use of longer trains, as identified in the Department's SEARs, to make rail transport viable (as opposed to shorter ballast trains);

The NIA considers rail transportation, including the use of longer trains (refer to **Section 6.5**).

ARTC have historically managed the 30 to 35 rail-ballast trains that frequent the quarry each year. The 330 m long, 22 wagon trains account for approximately 32,000 t of rail-ballast dispatched by train per annum.

The proposed changes to the rail spur will enable the full range of quarry products produced by the Revised Project, not just rail-ballast, to be loaded onto trains. It is anticipated the ARTC demand for rail-ballast will remain relatively constant at an average of 32,000 tpa. To achieve the balance of the projected 600,000 t of product dispatched by train per annum (approximately 562,000 tpa) the site would need to be frequented by between 330 x 400-m long trains per annum to 220 x 600-m long trains per annum.

A rail dispatch rate of 600,000 tpa equates to 6 to 8 trains per week depending on train length.

c) a more detailed discussion of measures that may be applied to minimise, or mitigate noise emissions (eg construction of temporary noise bunds to shield potentially affected receivers from stripping activities);

The updated NIA has undertaken a comprehensive analysis of all reasonable and feasible noise mitigation measures and details suite of proposed management, mitigation and monitoring measures for the Revised Project for both the construction and operational phases. A summary of the proposed management and mitigation measures is provided in **Section 6.4.6**.

d) provide an impact assessment of sleep disturbance levels on potentially affected receivers, including predicted levels taking into consideration the different stages of the proposed development;

Noise sources that could lead to sleep disturbance are typically transient noises and often have tonal characteristics. No rock excavation or processing activities will occur during the evening or night-time period. Activities that could lead to sleep disturbance include:

- train by-pass event on the spur line opposite the receivers in Station Street
- loading of rail wagons using front end loaders
- reversing beepers on the front-end loaders used to load the rail wagons.

ENM's Single Point Calculation feature was used to determine noise levels at the nearest residential receiver locations under calm and noise enhancing meteorological conditions. The predicted $L_{A1,1minute}$ noise levels associated with activities that could result in sleep disturbance are presented in the NIA (refer to **Appendix D**). Results show that night time noise levels will not exceed sleep disturbance noise goals at any residential receivers.

The assessment of the predicted construction noise levels against the construction noise management levels was then undertaken in accordance with the ICNG (DECC 2009). It is predicted that up to 64 properties could experience $L_{Aeq,15minute}$ construction noise management levels above 45 dB(A) during the construction of the new access road into the quarry from Dungog Road. This assessment is based on the worst-case conditions. It is possible that construction of the new access road could also occur outside recommended standard hours during the construction of the bridge over the North Coast Railway Line. This could occur when the construction activities include track possession from ARTC of the North Coast Railway Line.

It is predicted 31 properties could experience $L_{Aeq,15minute}$ construction noise management levels above 45 dB(A) during the construction of noise mitigation measures in and around the East Pit processing plant area. These construction activities would be during recommended standard hours and would not occur during the evening or night periods.

e) provide a revised road noise impact assessment, which considers trucks travelling through Paterson and Bolwarra (and any other affected urban areas) from before 5:30 am (based on the identification in the NIA that consumables are supplied to the pug mill from this time);

As outlined in **Part A**, to reduce traffic impacts, including traffic noise, associated with the operation of the quarry, Daracon have committed to the following revised operational parameters as part of the redesign of the conceptual quarry plan for the Revised Project:

- road haulage of quarry product to occur 7.00 am to 6.00 pm Monday to Friday, with no haulage of quarry product on Saturday, Sunday or public holidays
- no trucks through Paterson prior to 6.45am Monday to Friday
- removal of Haul Route 2 as a primary haul route (now proposed only to service local jobs as required).

Ancillary truck movements (associated with deliveries of fuels, pre-coat and additive delivery vehicles likely to access the quarry) have been considered in the updated NIA as part of the proposed maximum truck movements for the Revised Project.

The revised noise impact assessment considered road noise predictions for numerous locations that represent the nearest rural residences and urban areas along the proposed primary haul route. These locations include:

- Dungog Road, between Grace Avenue and Gresford Road

- Gresford Road, between Dungog Road and Paterson Township (Tocal Road)
- Tocal Road, between Paterson township and Bolwarra Heights
- Paterson Road, between Bolwarra Heights and Flat Road
- Flat Road/Glenarvon Road/Pitnacree Road.

f) clarify the statement "The quarry generally remains inaudible at all other receivers" in section 6.4.2 in relation to which receivers, under what operating conditions/stages and in noise assessment periods;

A revised NIA has been prepared for the Revised Project. The predicted noise impacts associated with the Revised Project are provided in **Appendix D** and summarised in **Section 6.4**.

The revised NIA has been prepared in accordance with the SEARs for the Original Project and the project noise criteria have been developed with consideration to the NPfI.

g) revise predictions in section 6.5.1.2 to reflect noise levels from current approved truck volumes and then assess the incremental road noise impact from the proposed additional truck volumes (see above);

The revised NIA assesses road and rail noise impacts associated with the Revised Project. Road traffic noise levels with and without quarry trucks have been calculated for the road traffic noise receivers along the proposed primary haul route (refer to **Section 6.4**).

The results show that existing road traffic noise levels exceed the RNP criteria for some receivers due to existing traffic rates without the quarry trucks present. The addition of quarry trucks does not result in an exceedance of the RNP criteria where it was not already calculated to exceed with baseline traffic levels. Where the RNP criteria are already exceeded the predicted increase in road traffic noise due to the quarry trucks is predicted to be less than 2 dB. The RNP states that noise level increases of up to 2 dB are considered barely perceptible to the average person.

h) revise noise contour drawings to provide finer resolution that enables identification of receivers and existing and proposed monitoring locations and with an improved legend;

i) provide additional noise contour drawings to reflect all stages of the proposed development (eg. there is no noise contour drawing that depicts noise levels from stripping and extraction in the northern part of Lot 6 and associated emissions to receivers and vacant land to the north).

j) Table 14 in the Acoustic Report does not include haul trucks, which based on the proposed volumes during peak hours, are expected to contribute to noise generated at the site.

Noise contours for each of the meteorological conditions modelled are presented in **Appendix D** for the operating stages modelled, being Years 2, 6, 10, 15 and 20. Noise contours are presented as amalgamated outer-envelopes for each of the 5 operating stages modelled in **Section 6.4**.

The NIA seeks to characterise the existing quarry as a legacy noise source. However, the past and existing operation of the quarry within its development consent is disputed by Council. The Department is, at this time, not satisfied that the EIS provides sufficient evidence to justify that existing operations are consistent with extant development consents (see 1 above). Accordingly, this justification for not considering further measures to avoid, minimise and mitigate significant exceedances to project specific noise levels (PSNLs) determined in accordance with the NSW Industrial Noise Policy is not accepted. Please provide a revised assessment that considers further measures to avoid, minimise and mitigation noise impacts.

As requested by DPIE, an updated NIA has been prepared in accordance with the SEARs for the Original Project, the NPfI and the VLAMP.

The first step in the application of the NPfI involves determining the project noise trigger levels for the development. Project noise trigger levels are based on the project intrusiveness noise level and project amenity noise level for a particular location as defined by the NPfI.

The project intrusiveness noise level protects against significant changes in noise levels and is established by reference to existing background noise levels. The project amenity noise level is set based on the approved use of the land and is designed to manage cumulative noise impacts from industry thereby protecting the amenity for particular land uses.

In residential, rural and semi-rural areas such as that surrounding the quarry, background noise levels are typically low. However, the project amenity noise levels are a function of the approved land use and independent of the existing acoustic environment. Generally speaking, in an area such as surrounds of the quarry the intrusiveness noise levels are usually lower than the project amenity noise level as defined by the NPfI.

The Revised Project is a change to an existing operation and Section 6 of the NPfI provides the process for identifying project noise trigger levels for upgrades or expansion of an existing industrial site:

For an industry that has been in operation for more than 10 years and existing site operations exceed the project amenity noise level, the project amenity noise level may be adopted as the project noise trigger level to assess existing, and existing plus proposed site operations.

The noise levels from the existing approved operations are presented in the NIA. These are based on a combination of noise modelling and attended monitoring of operations identified as being covered by the existing approvals for the site.

As product haulage along Station Street and Grace Avenue occurs on public roads, the noise impacts associated with this haulage has not been considered as part of the noise impacts from existing operational noise (but is taken into account in the assessment of existing traffic noise). Train movements on the rail siding associated with the loading of rail wagons are included as an industrial noise source in the assessment of the existing approved operations.

Noise generated at the quarry is actively managed through the implementation of a performance-based, adaptive management approach that has been focused on implementing appropriate operational controls and management strategies to proactively manage potential noise impacts. This noise management includes the design and operation of quarrying activities, the implementation of a range of operational controls and also implementation of mitigation measures at surrounding receivers (refer to **Section 6.4**).

Through the development of the conceptual quarry plan, a range of iterative noise modelling processes have been undertaken, designed to identify noise controls that can be implemented. This process was undertaken to inform the operational constraints to the Revised Project that may be required for each quarry stage to meet noise criteria, and involved:

- optimisation of pit geometry and sequencing to enable placement of quarrying equipment lower in the landscape (thus in more shielded locations) during adverse meteorological conditions
- redesign of the East Pit (processing plant area) to incorporate a noise bund and walls and the extension of the rail spur to move loading operations further from receivers
- detailed review of production planning and sequencing to enable the incorporation of required operational controls (such as slow-down in quarry progression, provision of lower shielded areas and, where required, selective equipment shutdowns) during periods of adverse weather conditions.

In addition to the design controls above, Daracon are committed to the continued implementation of reasonable and feasible physical noise control measures (including noise bunds, barriers, and attenuation of processing equipment) and operational noise controls for the life of the Revised Project (refer to **Section 6.4.6**). These controls have been factored into the noise model for the Revised Project in order to demonstrate the proposed quarrying operations can meet the project noise trigger levels.

The NIA states "…secondary haulage routes such as Butterwick Road were not identified as being potentially significantly affected by changes in the proposed quarry operations". Provide justification in support of this statement that considers the revised incremental assessment following response to 1 above.

Daracon recognise that traffic and transport issues are a key issue for the Revised Project, based on both submissions on the Original EIS and subsequent feedback during stakeholder engagement. Daracon will now not seek approval for Haul Route 2 from the intersection of Tocal Road and Paterson Road, as a primary haul route. Haul Route 2 will only be used to service local projects on, or directly accessed from, the route. It will not be used as a primary haul route.

Appendix I of the EIS includes drawings for the proposed noise wall on the western side of the rail siding at the quarry. The Department requests drawings of all proposed noise walls and/or bunds prepared to scale, with dimensions to Australian Height Datum AHD and identifying any relevant nearby features eg. privately-owned properties and residences.

Conceptual designs of physical noise control measures, including noise bunds, barriers, and attenuation of processing equipment, are shown on **Figure 6.3**. The detailed design of physical noise barriers will be undertaken after approval.

12.1.6 Blasting

Provide predicted blast levels for potentially affected receivers based on the different stages of the quarry extraction plan.

A detailed BIA has been prepared for the Revised Project and is presented in **Appendix G**. The blast modelling was undertaken for representative quarry years and considered blast design parameters and the closest privately-owned residences to assess the potential air overpressure and vibration generation from blasting. **Section 6.7** provides predicted blast levels for potentially affected receivers for the different stages of the Revised Project.

The BIA showed that potential impacts associated with blasting activities can be managed so that the relevant blast criteria are met at all private residences, by undertaking blasting in accordance with a detailed design process that considers operational, geological and environmental constraints for each blast.

12.1.7 Historic Heritage

The Department requests a historic heritage assessment of the listed items and conservation areas located on the proposed haul routes (ie Paterson, Morpeth and any other relevant location) by a suitably qualified and experienced professional/s. The historic heritage assessment should consider the:

a) potential vibration impacts (if any) of the proposed number and frequency of trucks on the structural integrity of listed heritage items;

b) potential impacts to significance of the conservation area as a result of the number and frequency of trucks travelling through a conservation area; and

c) the impacts of proposed intersection upgrade works on the curtilage and significance of listed items and any conservation areas.

As discussed in **Section 6.11**, a HIS (refer to **Appendix K**) was undertaken by Umwelt's qualified historic heritage consultant, to consider the potential heritage impacts associated with the Revised Project's proposed haul route (i.e. Haul Route 1).

Based on the findings of the HIA, it is considered unlikely that the proposed intersection works within the Paterson HCA will result in any adverse visual or physical impacts to the heritage significance of this HCA or individually listed heritage items. In addition, there are no identified impacts to the listed Gostwyck Bridge as a result of the proposed bridge approach works.

Daracon committed to a range of mitigation measures outlined in **Section 6.10.4** aimed at mitigating and preventing any impacts on heritage values (including minor cosmetic damage) to be associated with quarry truck movements. These include, amongst others, reduced truck speeds through the town of Paterson and a road maintenance contribution to DSC. As noted in **Section 6.11.3.3**, the combination of these specific measures is consistent with the recommendations in the NSW Department of Environment and Conservation 2006 Guideline Assessing Vibration: a technical guideline (Vibration Guidelines) in reducing vibration impacts.

No physical works associated with the Revised Project will occur in the Bolwarra HCA.

12.1.8 Water Resources

The Department requests the following additional information is provided as part of the RTS:

a) justification as to why a set of three water samples is considered sufficient to fully and accurately determine surface water quality conditions, or provision of a more comprehensive sampling regime;

In January 2019, Daracon commenced the implementation of a more comprehensive water quality monitoring program. Additional water quality data was collected as part of the updated SWIA (refer to **Appendix I**) for the Revised Project as summarised in **Section 6.7.2**.

b) provide an assessment of the frequency, scale and potential water quality impacts of planned and unplanned water discharges from the site;

An assessment of water discharges has been undertaken as part of the updated SWIA (refer to **Section 6.7** and **Appendix I**). The updated SWIA indicates that historically the controlled discharge water quality results demonstrate that the quarry consistently meets the discharge criteria for EPL 1378. While controlled discharge volumes and frequencies are predicted to increase with the Revised Project, the discharge water quality is expected to continue to meet the EPL 1378 criteria as:

- the same water treatment processes and controlled discharge management practises will continue to be implemented
- it is not proposed to increase the daily discharge rates and the quarry water treatment processes and controlled discharge management practises have been demonstrated to achieve EPL water quality criteria at historical discharge rates.

Furthermore, it is predicted that the maximum volume of uncontrolled discharges will decrease slightly which will have a positive impact on downstream water quality.

c) justification as to how the limited groundwater monitoring data (three events at four locations) is sufficient to fully and adequately characterise existing groundwater conditions, provision of a more comprehensive sampling regime.

As outlined in **Section 6.8**, additional data have been collected, including continual monitoring using level loggers, and data from three additional groundwater sites installed in 2018 to expand the groundwater monitoring network.

For further detail on the current groundwater monitoring network at the quarry are provided in **Appendix I** and **Section 6.8**.

12.1.9 Rehabilitation

Provide conceptual rehabilitation plan/s that identify the anticipated staged rehabilitation of the site having regard to the staged quarry expansion plans.

Daracon is committed to the effective rehabilitation and closure of the quarry at the cessation of operations. The overarching principles which apply to the rehabilitation and closure of the Revised Project is the development of a safe, stable and non-polluting landform. This will be achieved through managing quarry assets, operations and rehabilitation on a progressive basis to work towards the final rehabilitation and closure of the quarry.

Rehabilitation will occur progressively within the quarry pit and benches as operations progress however, the exact timing of rehabilitation works will be dependent upon on the rate of resource extraction in each area and the final height of each bench. Additionally, any areas surrounding the active extraction and processing facilities, where quarrying is not proposed, will be subject to progressive rehabilitation once it is identified that areas will not be required for ongoing operations (refer to **Section 6.19**). Indicative rehabilitation staging for the Revised Project is shown in **Figure 2.4** to **Figure 2.9**.

12.1.10 State Environmental Planning Policy 33 – Hazardous and Offensive Development

Further information is required to demonstrate that storage of substances on site would not exceed the screening threshold under SEPP 33, including:

a) a drawing that identifies the location of all substances to be stored in the proposed quarry footprint (ie. The footprint after the stockpiles are relocated behind the noise wall); and

b) if substances are proposed to be stored within the same bunded areas, a further assessment under SEPP 33, including a preliminary hazard analysis if screening thresholds are triggered.

In response to DPIE's comments, a preliminary risk screening has been completed for the Revised Project in accordance with SEPP 33 – Hazardous and Offensive Development (DoP, 1992) and Applying SEPP 33 (DoP, 2011) (refer to **Section 6.15**).

The preliminary risk screening demonstrated that none of the hazardous materials to be stored within the Project Area are above SEPP 33 screening thresholds. Additionally, the number of transport movements associated with the Revised Project, for Class 3 (II), Class 3 (III), Class 2.1 and Class 8 materials will not exceed either the annual or peak weekly screening thresholds. The maximum delivery quantity of Class 3 (II), Class 2.1 and Class 8 materials for the Revised Project will not exceed the screening thresholds. As such, a transport route evaluation study is not considered to be required.

The location of all substances to be stored within the Project Area are shown on **Figure 6.33**. The locations for flammable and combustible liquids storages meet the requirements of AS1940 for separation from the quarry boundary and onsite protected places.

12.1.11 State Environmental Planning Policy 55 – Remediation of Land

The EIS identifies potential contamination of land due to leaks from the existing diesel storage bund. Further information is required to demonstrate:

a) how the land affected by this potential contamination would be made suitable in its contaminated state (or would be suitable, after remediation) for the proposal; and

b) the mitigation and management measures that would be put in place in the event that the railway is used more frequently

The localised contamination associated with the refuelling facility located within the quarry processing area, will be remediated as part of the process of planned relocation of that facility, to meet current standards.

As with all activities that involve earthworks and quarrying, activities carried out as part of the Revised Project have the potential to cause localised contamination if not properly managed. Consistent with the recent approach at the quarry, controls will be put in place to manage this risk as part of the Revised Project including appropriate chemical handling and storage procedures, appropriate waste management systems, spill and emergency response procedures and equipment, and regular inspection and reporting processes. The management of contamination risks as part of the Revised Project is discussed further in **Section 6.14** and the management of waste is discussed further in **Section 6.15**.

12.1.12 Other Matters

Resolve inconsistencies in the EIS, which include, for example:

a) the EIS main report identifies 29.6 ha of Koala habitat impacted by the proposal, however the BAR states the extent of this impact is lower at 21.61 ha;

b) the TIA describes the current production at the quarry to be 900,000 tpa while the SMEC report states this is 906,500 tpa; and

c) hours of operation of truck arrivals in the TIA and NIA are different.

Since the change to quarry operations, Daracon have considered community input and have completed further project feasibility investigations, detailed quarry design refinements and proposed additional mitigation measures. With the agreement of the Planning Secretary, Daracon is submitting an amended development application, supported by the ADA Report (**Part A** of this document).

Part A of this report includes an updated BAR, TIA and NIA. The above inconsistencies in the EIS for the Original Project have been updated as part of the Revised Project and are provided in a consistent manner throughout the ADA and the applicable specialist reports.

Revise and update the quarry staging plans, if required, due to revisions to the project and/or recommendations of various impact assessment reports. It is requested these plans are provided as separate documents (i.e. not embedded in a report) with appropriate drawing annotations.

The conceptual Quarry stage plans and associated infrastructure for the Revised Project are shown on **Figure 2.4** to **Figure 2.9**.

Daracon will also provide the relevant figures separately to DPIE directly, as requested.

The timing of specific mitigation measures is uncertain (e.g. completion of new haul road, construction of noise walls and relocation of stockpile areas) and the EIS is unclear as to what measures, if any would be implemented in the interim to manage impacts until these works have been completed/installed (for example, the NIA indicates the rail siding noise wall would only be constructed if and when an increase in rail transport becomes viable). It is requested that the timing of these mitigation measures and any interim measures are clearly outlined in the RTS in the form of commitments.

Approval is sought to commence construction in a phased approach to allow the quarry the flexibility to continue operations while construction is underway. Section 2.9 provides details regarding the proposed phasing of construction activities.

Project refinements provide further limitations which will negate the need for interim mitigation and management measures such as temporary reduction in truck movements, limits on production or other arrangements.

Relevant management and mitigation measures are discussed in **Part A** and summarised in **Section 8.0**.

12.2 Department of Primary Industries

12.2.1 Soils

In the treatment of topsoil the proponent should develop a program based on the identification of an analogue site (undisturbed soil on adjacent land). The proponent should apply treatments to achieve a pre-development status for parameters including; soil pH, aggregate size, organic matter, depth of topsoil and nutrient status.

As outlined in **Section 6.19.8.4**, topsoil material for rehabilitation will be sourced from soil stored on-site which has been stockpiled as part of the initial clearing and soil removal process. Prior to each topsoil stripping campaign, Daracon will also undertake a sampling program to determine suitable stripping depths and characterise soil type. Topsoil stripping activities for any ground disturbance works will be closely monitored to ensure only the top layer of topsoil or suitable subsoils will be taken for later reuse, nominally this will be the top 100 to 150 mm.

Prior to use for rehabilitation purposes, topsoil material will be analysed at a NATA registered laboratory to determine the application requirements for any soil ameliorants, if necessary. Topsoil management techniques will be implemented to maintain the quality of topsoil for subsequent use in rehabilitation.

12.2.2 Traffic and Transport

The road extending north from Station Street, Martins Creek must be closed and acquired by the Proponent prior to the Proponent undertaking any works on this land.

The road extending north from Station Street is a paper road separating the West Pit and the Processing Area and proposed East Pit. As discussed in **Section 2.3**, part of this road is owned by DSC and part is owned by the Crown.

Related to the Revised Project's proposed access arrangements is the proposed closure of this paper road. Applications have been made to Crown Lands and DSC in respect of closing the road. DSC has agreed in principle to entering into the relevant commercial agreement with the quarry landowner in relation to closing the road for public access, and allowing haulage across the road, subject to project approval.

12.2.3 Water Resources

The proponent should provide further detail on:

- **Current water holding in the western pit void.**
- **Clean and dirty water diversions around the pits.**
- **Change in catchment area in the final landform.**

A comprehensive SWIA was undertaken to investigate the potential impact of the Revised Project on surface water resources. A summary of the key findings of the SWIA is presented in **Section 6.9**, with the full report provided in **Appendix I**. The SWIA includes:

- the existing and proposed water management system, including any diversions
- changes in the catchment area.

The proponent should investigate purchase of an additional 2 shares in the New England Fold Belt Coast Groundwater Source.

Based on the predicted groundwater take for the Revised Project, Daracon holds sufficient licences in the New England Fold Belt Groundwater Source (refer to **Section 6.8**).

A Dam on a 3rd order stream (Dam 4) does not satisfy DPI Water's criteria for exemption from requiring a Water Access Licence (WAL). As such a WAL may be required for Dam 4. To assist DPI Water in providing advice on this matter the following information is requested:

- **Justification for the proposed location of Dam 4. Clarification as to whether this is a 'clean' water dam, as it is represented in the water balance and further detail on any reuse of this water.**
- **Detail on the separation of clean and dirty water diversions.**
- **Clarification regarding whether Dam 3 is a 'clean' water dam, due to clean catchment references in the water balance and further detail on any reuse of this water.**

As noted in **Section 6.9.7**, the Revised Project will no longer intercept a third order stream. There is also no longer the need for Dam 4 as part of the updated WMS. Existing and proposed separation of clean and dirty water diversion, as well as details with regards to Dam 3, are described in **Sections 6.9.3** and **6.9.4**.

The proponent will be required to offset 217 ML of additional loss of catchment area in the Paterson/Allyn Rivers Water Source resulting from the proposed expansion through the attainment of Water Access License shares equal to the loss.

DPIE Water nominated the licensable volume to be 217 ML based on the assessment of catchment surface water loss presented in the original Water Quality Impact Assessment (WQIA) (JM Environments, 2016) supporting the Original Project. The Original Project resulted in the interception of a second and third order stream to the east of the West Pit which would have resulted in runoff from approximately 106 ha of additional upslope undisturbed catchment entering the quarry WMS. The Revised Project avoids the interception of these streams and significantly reduces the clean catchment intercepted by the expansion relative to that assessed in the EIS for the Original Project.

An assessment of the licensable surface water take associated with operational phase and post-mining phase of the Revised Project can be found in **Section 6.9**. The assessment indicates that there is no surface water licensing requirement during the operational phase and an ongoing licensing requirement of 9.8 ML/year in the post-mining phase once the proposed final voids reach spill level. Further monitoring (inventories, usage and discharges) and groundwater modelling will be undertaken as part of closure planning to inform the final void recovery model and refine the ongoing surface water licencing estimate.

The proponent should provide further detail of proposed diversion design and impacts downstream on ecological and geomorphic function as a result of water course diversions. All watercourse diversions and other works on waterfront land should be designed and undertaken in accordance with DPI Water Guidelines on Controlled Activities.

As discussed in **Section 6.9**, three primary catchments of the WMS direct capture and manage water runoff within the Project Area as follows:

- **Dam 1** - Runoff from the Processing Area and undisturbed upslope catchment is diverted to Dam 1 with discharge from LDP 6, as required. Dam 1 has a capacity of 13 ML.
- **Dam 2** - Runoff from the administration offices, stockpiles and undisturbed upslope catchment is diverted to Dam 2 with offsite discharge via LDP 7. Dam 2 has a capacity of 0.9 ML.
- **Dam 3** - Runoff from east of the West Pit, rainfall runoff of the West Pit and groundwater inflows are diverted to Dam 3 with offsite discharge via LDP 8. A diversion bank located along the northern edge of the West Pit prevents in-flow of surface runoff from the upslope undisturbed catchment to the WMS.

Steep terrain prevents the construction of a diversion bank to the east of the West Pit and as a result there is some mixing of clean and dirty water. Dam 3 has a capacity in excess of 400ML, however, as the retention of large quantities of water may impede extractive operations, water is periodically discharged via LDP 8.

The WMS will be modified over the life of the Revised Project to incorporate additional upslope catchments associated with the extended open cut pit catchments, an additional pit sump in the East Pit and associated pumps and pipes (refer to **Section 6.9**).

Daracon has investigated options to divert the streams to be intercepted around the proposed West Pit, however the steepness of the terrain precludes the construction of diversion drains. As a result, clean and dirty water will not be separated, similar to existing operations. The capacity of Dam 2 will be increased to comply with Blue Book Volume 2E requirements.

Runoff captured in the new East Pit sump will be transferred to Dam 1 or Dam 3 for reuse, or treatment of the proposed Year 25 WMS and off-site discharge (as required) in accordance with EPL 1378.

The proposed WMS will continue to meet the water quality values in accordance with the WQOs and criteria of EPL during discharge. The proposed WMS will be documented in the quarry's WMP.

The proponent should develop a Water Management Plan in consultation with DPI Water. The Plan should include:

- **Prescriptive Trigger Action Response Plans for impacts on surrounding surface and groundwater users. These should include make good provisions.**
- **Make good provisions to ensure downstream water users are not impacted by the project.**

Daracon commits to develop a WMP for the Revised Project, should it be approved, in consultation with DPIE Water. The WMP will include TARPs for impacts on surface water and groundwater resources.

- **A groundwater monitoring plan for the monitoring and management of groundwater associated with the quarrying activities, as outlined in section 8.6 of the EIS and section 7.6.6 of Appendix 6. Groundwater monitoring sites should include water level loggers for continuous monitoring. This is important to obtain information for the first 4 years to inform if quarterly downloads of water level information, as proposed, are appropriate.**

As outlined above, Daracon commits to develop a WMP for the Revised Project, should it be approved. The WMP will identify the ongoing groundwater monitoring and reporting requirements for the Revised Project.

Subject to the requirements of the conditions of consent, the WMP will include:

- programs of all monitoring, both surface water and groundwater, that is carried out at the quarry
- details of the site water balance, which estimates the groundwater pit inflows and the rainfall runoff that accumulates in the voids
- processes for ongoing review of monitoring data against the water balance and the impact predictions in the GIA
- development of TARPs.

As outlined in **Section 6.8**, the groundwater monitoring network for the Revised Project currently comprises seven bores with continuous monitoring of groundwater levels at 6 hourly intervals (refer to **Figure 6.17**). Groundwater levels are downloaded twice a year. Manual groundwater level dips and groundwater quality sampling is undertaken annually.

The surface water monitoring plan should include monitoring of downstream flow and water quality.

As outlined in **Section 6.9**, water quality monitoring at sites upstream and downstream of the quarry would be continued to enable the development of site-specific water quality trigger values in accordance with ANZG 2018. The site-specific trigger values will be used to initiate investigation in the event of any deviations in receiving water quality from the normal water quality range.

The proponent should develop an Erosion and Sediment Control Plan in consultation with DPI Water.

ESCs included in the quarry's SWMCP (refer to Appendix 1 of the SWIA, in **Appendix I**) will continue to be implemented in accordance with the Blue Book during stripping/development of new extraction areas or any other ground disturbing activities.

As outlined in **Section 6.9.8**, the ESCs would be identified and regularly reviewed and updated as part of the quarry WMP.

The proponent must ensure that it has sufficient water for all stages of the development, and if necessary, adjust the scale of operations on site to match its available water supply.

The water balance modelling results showed that the Revised Project will result in an increase in the capture of upslope catchment runoff in the quarry WMS, however, on average the majority (at least 75%) of the additional captured runoff would be returned via controlled discharges to the downstream environment (refer to **Section 6.9.5**). The water balance study further determined that water deficits experienced in dry years for all modelled scenarios can be adequately supplied with water imported from the HWC reticulated supply. Nonetheless, Daracon is committed to implementing following measures as part of the Revised Project in order to utilise water sufficiently for all stages of the development:

- investigate opportunities to increase the quantity of captured runoff reused for operational demands to offset potable water imports
- limit production in the event of water source restrictions to ensure environmental controls, i.e. dust suppression, are maintained as a priority with the available water supply.

12.2.4 Final Land Use

A final land use must be detailed for the site at the end of life of the quarry. Rehabilitation of the site must lead to best practice use of land for the identified final use.

As noted in **Section 6.19**, Daracon is committed to the effective rehabilitation and closure of the quarry at the cessation of operations. This will be achieved through progressive rehabilitation and managing quarry operations, as outlined in **Section 6.19.5**, to work towards the final rehabilitation and closure of the site. The selected final land use will focus on promoting the rural landscape by establishing native grassland or exotic pastures in low lying areas whilst focusing on the re-introduction of pockets of woodland species across the benches consistent with endemic vegetation types. The final land use will be subject to further investigation during the development of a detailed Quarry Closure Plan 3 years prior to the cessation of quarrying activities.

12.3 Environmental Protection Authority

12.3.1 Air Quality

Further information is required regarding the following aspects of the Air Quality Impact Assessment - Martins Creek Quarry Extension (JM Environments, September 2016):

- **emissions estimation;**
- **the choice of year used for the modelling;**
- **validation of meteorological modelling;**
- **generation of land-use data;**
- **terrain data used for the modelling;**
- **configuration of meteorology for dispersion modelling;**
- **cumulative impacts assessed against 24-hour impact assessment criteria; and**
- **assessment of TSP impacts.**

REFER TO: ATTACHMENT A

EPA's review of the AQIA has identified that the AQIA has not followed guidance provided in the 'Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales' (Approved Methods) and has determined that the following information is needed:

Clear identification of all potential sources of emissions to the air associated with the proposal and clearly articulated estimation for those sources deemed significant with justification for any sources excluded from emission estimation.

Details on the calculations used to estimate emissions from the identified significant sources.

At least one year of meteorology data that has been shown to be suitably representative of weather conditions at the site based on comparison to at least five years of meteorological data. The chosen data must reflect the range of conditions occurring at the site, conditions leading to the greatest impacts, and conservatively represent the frequency of poor dispersion conditions.

The AQIA needs to demonstrate that the chosen meteorology model performed acceptably by comparing model output to corresponding observations that have not been used in the modelling. Comparison should use at least once set of observations as close to the proposal as possible.

Land-use description with a resolution commensurate to that of the modelling scale (100 metres).

Clear description of the approach to generating land-use description, including correspondence between any categories independently derived and those used in the model.

Meteorological modelling using terrain data with a resolution commensurate to that of the modelling scale.

Clarification regarding the source of the meteorology used to initialise the meteorology module (CALMET) of the dispersion model (CALPUFF).

Assessment of cumulative impacts against 24-hour criteria must use 24-hour data for background and follow the guidance set out in Section 5.1.1 of the Approved Methods.

Include the impact assessment criteria for TSP in Table 5.

Amend/vary the incorrect background concentration used in section 10.5 and amend interpretation of results.

A revised AQIA has been undertaken for the Revised Project in accordance with the Approved Methods (EPA 2016) (refer to **Appendix E**). The AQIA provides all the relevant details including an updated, comprehensive assessment of the predicted emissions from each key stage of the Revised Project and the impact on potentially affected receivers (refer to **Section 6.5.4**).

12.3.2 Blasting and Vibration

As the blasting report is dated November 2015 and given the period of time since that report was completed, and the EIS was lodged there have been a substantial number of blasts since 17 August 2015 that should have been included in a revised assessment. This would provide a more thorough review of blasting activities at the site over the previous years.

An updated BIA has been prepared for the Revised Project (refer to **Appendix G**). The updated BIA has reviewed over 6.5 years of monitoring data for the period 1 March 2013 to 19 August 2019, comprising 158 blasts. In addition, the EPA undertook an independent monitoring audit involving 13 separate blasts from the quarry during 29 March to 27 August 2018 at a location in View Street, Vacy. The findings of the BIA have been summarised in **Section 6.7**.

12.3.3 Water Resources

Following review of the Water Quality Impact Assessment - Martin Creek Quarry Extension Project (JM Environments, September 2016), the EPA's key issues in relation to surface water are:

- **Further detail on the management, operation and dewatering of dams within the site;**
- **Additional information on the chemical flocculants for use as a water treatment control; and**
- **Clarification of the maximum pump out rates applicable for the site.**

An updated SWIA has been prepared for the Revised Project (refer to **Appendix I**). **Sections 6.9.3** and **6.9.4** provide an overview of the existing and proposed WMS at the quarry, including details on dam management, water treatment and pump rates.

12.3.4 Noise

Based on the information provided in the EIS, specifically the issues with the noise assessment discussed above and at Attachment B, the EPA is currently unable to accurately predict the potential impact the proposed varied hours may have on neighbouring receptors. Once the noise impact assessment matters raised in this letter have been addressed or resolved the EPA should be in a position to provide advice on the potential impacts from the extended hours of operation sought in the proposal.

The EPA's primary area of concern relates to the degree to which noise levels predicted for various activity scenarios in the Acoustic Assessment exceeds the project specific noise levels derived in the assessment.

Many of the predicted noise levels from the various activity scenarios are significantly higher than both the PSNLs and the proposed alternative license noise limits.

The proponent needs to provide a clear set of tables showing predicted noise levels at each receiver together with the applicable noise criteria, clearly highlighting any exceedances. This information needs to be provided for EPA to develop noise license limits.

A comprehensive, updated NIA has been undertaken for the Revised Project in accordance with the NPfI (refer to **Appendix D**). The updated NIA addresses the EPA's comments.

12.3.5 Hours of Operation

The proposed amended hours of operations are a substantial variation to the currently allowed hours, with certain operations being proposed into the early morning, evening and night periods. Most notably, the quarrying operations in the western portion of the site would be permitted to commence earlier and go later than the currently allowed hours.

In response to ongoing community and government agency concerns, Daracon has committed to reducing the hours of operation for the Revised Project (refer to **Section 2.6**).

Daracon is seeking approval for the following operating hours:

- Quarry operations from 7.00 am to 6.00 pm Monday to Saturday, with the exception of road haulage of quarry product which will only occur Monday to Friday.
- Between 6.00 pm and 7.00 pm, provision for up to 10 unladen Daracon trucks to return to the quarry for loading and parking at the quarry overnight, in readiness for departure from 7.00 am the following morning. (In the case of trucks loaded on Friday between 6.00 pm and 7.00 pm, departure will be no earlier than 7.00 am Monday morning).
- As an additional mitigation measure, blasting of quarry material will only occur between 11.00 am and 3.00 pm on Monday to Friday, with no blasting on Saturdays.
- No evening or night operation and no operation on Sundays or public holidays, apart from the following activities which may occur 24 hours seven days per week:
    - rail loading and transportation
    - necessary maintenance activities and/or environmental management controls, including vehicles/trucks moving in and out of the quarry for maintenance purposes as required.

12.4 Office of Environment and Heritage

12.4.1 Biodiversity

The Biodiversity Assessment Report provided as part of the EIS has been determined by OEH as non-compliant with the FBA guidelines. OEH contacted the Department of Planning and Environment (DPE) and requested additional information with respect to the BAR. Partly addressed in November 2016 (Conacher Consulting). OEH still of the opinion that information is missing and some data appeared to contradict what is stated in the BAR.

The BAR appended to the EIS is non-compliant for the following reasons:

A full set of all the completed plot and transect field sheets has not been provided. However, completed floristic plot data sheets was not provided. Without this data OEH is unable to conclude that the correct PCTs were used and whether that data has been entered into the credit calculator correctly. OEH questions how the PCTs were determined. OEH questions the overall credit calculations given the veracity of the data used cannot be checked. The guidelines clearly state this information must be provided and to date, despite two requests, it is still outstanding.

An updated BAR has been prepared by Conacher Consulting which supersedes the 2016 BAR provided as part of the EIS for the Original Project. The updated report has been prepared to provide additional information requested in the government agency submissions and to provide an updated assessment of the Revised Project parameters.

A list of flora species observed during surveys is provided in Appendix 1 of the BAR (refer to **Appendix J**) and plot and transect field data sheets are provided in Appendix 2 of the BAR (refer to **Appendix J**).

The way the plot data has been presented in MS Excel format is confusing (i.e. difficult to read), as species have been duplicated and information about strata is unclear. There appear to be obvious errors in the data. OEH encountered discrepancies between the MS Excel spreadsheet and the field transect/plot sheets Conacher Consulting have provided (November 2016), particularly with respect to species richness, based on randomly checking a couple of plots. Clearly there appear to be errors which could have bearing on the credit calculations and overall biodiversity credits being generated. Note: OEH has not assessed whether or not the PCTs are correct as this cannot occur until the field plot sheets are made available and they are verified during a site inspection.

In response to BCD's comments, the data has been corrected in the updated BAR and is provided in **Appendix J**.

In light of the above concerns regarding the veracity of the data, OEH has requested a field inspection, which is a typical process in the assessment of FBA/BBAM. OEH will expect that the accredited assessor (Mr Jacob Manners - Biobanking Assessor Accreditation No 0132) is present during the site inspect to answer any specific queries. OEH requested a site inspect during the exhibition phase of the EIS but to date this request has remained unanswered.

BCD will be provided with an updated BAR, including a BOS as part of the ADA and RTS. BCD was contacted on 2 July 2018 to discuss their preferred timing for the site inspection. BCD indicated that BCD would prefer to have the site inspection after BCD have had adequate time to review the updated data. The requested site inspection will be arranged following lodgement of this ADA and RTS.

OEH notes that the methodology utilised to determine the threatened Eucalyptus glaucina is not consistent with OEH guidelines (i.e. Threatened Flora Guidelines, OEH 2016) and provided estimation rather than an accurate count. OEH recommends that the EIS employ specific counts in accordance with the Threatened Flora guidelines across all known areas and potential habitat on site.

The updated BAR notes that the field surveys and abundance estimates for Eucalyptus glaucina were completed in accordance with the requirements of the NSW Guide to Surveying Threatened Plants (NSW OEH 2016). Specifically, the guideline identifies that:

> *'Where the unit of measure is abundance, the number of individuals can be counted, or sampling and extrapolation may need to provide an estimate of abundance.*
>
> *Small groups of individuals (<50 plants) can be counted with reasonable confidence. However, larger populations (>50 plants or >0.1 hectare area of occupancy) can't be counted without noticeable error (Cropper 1993, Keith 2000). In this case it is best to extrapolate the density by sampling over the area of occupancy. Samples can be stratified according to areas of differing density, and counts made within quadrats'.*

The extent of E. glaucina within the site falls within the category of >50 plants over an area of >0.1 ha. In accordance with NSW OEH (2016), the quadrat-extrapolation method utilised by Conacher Consulting (2020) is identified as the best method for assessing the likely impacts to this species for the Revised Project.

The distribution of this species was further refined during 10 m spaced belt transect searches completed in accordance with the NSW Guide to Surveying Threatened Plants (NSW OEH 2016). The locations of these searches are also mapped in Figure 4.1a of the BAR (refer to **Appendix J**). A detailed description of the methods utilised to determine the presence of is provided in **Appendix J**.

Threatened flora targeted searches locations are not shown (except for Eucalyptus glaucina). Plus it is unclear whether or not OEH (2016) survey guidelines for threatened flora have been used - which requires appropriately belted transects. This will need to be clarified and potentially redone if the incorrect was utilised, particularly if the site was under sampled utilising 'random meanders'.

Details with regards to the threatened flora targeted searches and the survey locations are provided in the updated BAR (refer to **Appendix J**). The surveys included a 10 m spaced belt transect search for all threatened flora species in accordance with the NSW Guide to Surveying Threatened Plants (NSW OEH 2016). The locations of the targeted searches are mapped in **Appendix J**.

No apparent assessment or inclusion of indirect impacts of the proposal.

The updated BAR includes an assessment of indirect impacts. A summary is provided in **Section 6.10**.

Digital shape files for all maps and corresponding data has not been provided.

The digital shape files for all maps and corresponding data will be provided directly to BCD.

OEH notes the EIS does not contain a complete BOS. OEH understands that DPE have provided approval for the proponent to provide this document during the 'Response to Submissions' phase. OEH requires the BOS to determine whether the type of vegetation/habitats being conserved.

Daracon is committed to delivering a BOS that appropriately compensates for the unavoidable loss of ecological values as a result of the Revised Project. The BOS will be further developed in consultation with the BCD and DPIE and based on the credits required to be retired to offset the impacts of the Revised Project as specified in the BAR and the offset options available under the BC Act.

As outlined in **Section 6.10.7**, Daracon has committed to the preparation of a BOMP as part of the implementation of the Revised Project, in accordance with the requirements of BAM (NSW OEH 2016). The BRMP will include management actions and activities proposed for the biodiversity offset sites as identified in the BOS.

12.4.2 Water Resources

Upon review of the flooding/floodplain management component of the EIS, OEH notes that the proposal will intercept first, second and third order streams which will impact on availability of water for downstream users. The Department of Primary Industries Water should provide advice in relation to this issue.

A response to DPIE Water has been provided in **Section 12.2**.

12.5 Heritage Council of New South Wales

12.5.1 Non-Aboriginal Heritage

The Historical Heritage Assessment recommends the following mitigation measures:

- **The proposed extraction works at Martins Creek Quarry overlaps with the heritage curtilage of the locally significant 'Martins Creek railway buildings and quarry'. However, no modification to the rail line or quarry infrastructure is proposed and there would be no impact on the item's heritage significance. No further heritage assessment of the item is therefore required prior to the commencement of extraction works.**
- **In the unlikely event that historical archaeological relics were to be discovered during ground disturbance, work in the immediate area would need to cease and a suitably qualified archaeologist be engaged to assess the condition, extent and likely significance of the remains. If the relics were identified to be of Local or State heritage significance, OEH would need to be notified in accordance with s.146 of the Heritage Act and further discussions with OEH and DP&E held regarding future management of the item.**

The Heritage Division recommends that these mitigation measures be included as conditions of consent for the Martin's Creek Quarry Extension Project.

The Revised Project proposes an extension to the rail spur to facilitate longer trains to transport more quarry product. The rail spur will be extended by approximately 360 m and is planned to be constructed by the end of Year 4 of the Revised Project. There are no other works proposed to the rail line.

No further heritage assessment is proposed. Daracon commit to the above mitigation measure for historic heritage (refer to **Section 6.10**).

12.6 Roads and Maritime Services (now Transport for NSW (TfNSW)

12.6.1 Traffic and Transport

Roads and Maritime provides the following components to assist the Department of Planning and Environment in the determination of the development proposal:

- **Proposed access to the Quarry**
- **Proposed new access from the quarry which will include a new bridge over the railway line and new road intersection at Dungog Road.**
- **The Proposed CHR intersection does not comply with the Austroads Guide to Road Design. The length of the proposed CHR is 100m which is insufficient. The proposed lateral movement length for the CHR of 95m is insufficient. The sign posted speed is 100km/h and according to Roads and Maritime Supplement to Austroads Guide to Road Design Part 3: Geometric Design Version 2.0 the design speed is 110km/h.**
- **There does not appear to be any provision for a left turn lane into the proposed access road.**
- **There does not appear to be any provision for an acceleration lane for the left turn lane out of the proposed access road.**
- **The design does not provide information to determine if safe intersection sight distance for all movements at the intersection, and approach sight distance to the intersection from the access road approach has been achieved.**
- **Turning paths should be shown for the appropriate design vehicles on all movements as supplementary information to the drawings.**
- **The intersection design should clearly identify and consider the location of existing property access points adjacent to the proposed intersection.**
- **The proposed intersection treatment will result in either (or both) the northbound and southbound travel lane being shifted closer to roadside hazards such as trees and property fence. The design should have consideration for the application of clear zones in accordance with Austroads Guidelines.**
- **There is an existing open table drain on both side of the carriageway at various locations that may be impacted with the proposed work. Details of the open drain and a drainage provisions should be considered in the design.**
- **The consent authority should consider requesting additional design details to allow for the proper assessment of the strategic design.**
- **Refer to RMS CADD Manual Section 3.5 Road Design Part 8.1 Strategic Drawings. Alignment plans, longitudinal sections, typical cross sections, and preliminary cross sections are required.**

In response to comments from TfNSW, the proposed new site access off Dungog Road have been re-designed in accordance with Austroads Guidelines standards. As part of the Revised Project, a new site access road is proposed that will allow for direct vehicle access between the quarry and Dungog Road, to the north of Grace Avenue. This proposed new access involves a bridge crossing over the North Coast rail line. Once this new access has been constructed, all heavy vehicle movements will be via this new access. The existing access on Station Street will remain as per the current layout and will be maintained as a secondary access for emergency or unplanned disruptions only.

More specifically, the proposed new site access would involve:

- constructing a diverge taper and left turn lane from Dungog Road into Main Site Access road (AUL intersection)
- road widening on both sides of Dungog Road to accommodate a channelised right turn intersection (CHR) from Dungog Road into Main Site Access road and associated line marking and delineation

- for vehicles exiting Main Site Access road, providing storage for 1 design vehicle turning right onto Dungog Road (northbound) and new acceleration lane on Dungog Road (southbound)
- removing the existing redundant line marking on Dungog Road
- modification of existing property accesses on western side of Dungog Road
- providing new safety barriers and drainage infrastructure.

The new access road will also require the construction of a new intersection on Dungog Road (refer to **Figure 2.11**). The new intersection will be designed and constructed in accordance with Austroads Standards and in consultation with Dungog Shire Council and will allow for a sheltered right turn lane on Dungog Road to enable the new access to operate in a safe and appropriate manner.

The revised design has been assessed in the updated TIA (refer to **Section 6.3**).

Proposed Haulage Route(s)

- **The TIA outlines the proposed haulage routes:**
  - **Martins Creek Quarry - Grace Avenue - Dungog Road - Gresford Road - Tocal Road - Paterson Road - Flat Road (Route 1)**
  - **Martins Creek Quarry - Grace Avenue - Dungog Road - Gresford Road - Butterwick Road - Clarence Town Road - Brandy Hill Drive - Seaham Road (Route 2)**
  - **Martins Creek Quarry - Grace Avenue - Dungog Road - Gresford Road - local Road - Paterson Road - Belmore Road (Route 3)**
- **The TIA states that the proposed future expansion of the quarry will require the majority of traffic to use Route 1 and Route 2.**

State Road Network

- **The TIA has undertaken an intersection analysis using SIDRA for intersections where the haulage route meets the state road network at Pitnacree Road/Melbourne Street and Melbourne Street/New England Highway (Route 1).**
- **The TIA has not carried out any analysis of state road intersections as part of Route 2 and Route 3.**

Roads and Maritime considers that the TIA should provide intersection analysis of all intersections which impact on the classified state road network.

The Revised Project is seeking approval to haul product trucks along one primary haulage route (Haul Road 1) as described in **Section 2.8.1** and shown on **Figure 2.11**. Route 2 and 3 are no longer proposed as primary haul routes, although other local roads may be used as required to service local projects accessed from those local roads, on a campaign basis.

Gostwyck Bridge

- **Gostwyck Bridge is a steel truss bridge under the care and control of Roads and Maritime.**
- **Roads and Maritime is not aware of any discussions with the traffic consultant as noted in Section 2.4.2 of the TIA. The proponent should provide evidence of any discussions with Roads and Maritime regarding the proposal and the heritage listed bridge as noted in the Traffic Impact Assessment.**
- **The documentation provided in the EIS does not address the impact of additional truck movements on the bridge structure.**
- **Roads and Maritime considers that the bridge in its current form will be adversely affected by the increased level of traffic and high frequency of truck movements proposed.**
- **Gostwyck Bridge currently operates as a single lane bridge with give way provision. Roads and Maritime considers with increased traffic volumes that a dual lane two-way bridge would be required at this location to comply with current design guides.**

Extensive consultation has been undertaken with TfNSW with regards to the Gostwyck Bridge following the submissions phase (refer to **Section 5.0**).

As part of the consultation process with TfNSW, Daracon commissioned FBE to assess the potential impact of truck movements across the Gostwyck Bridge as a result of the Revised Project and to provide an analysis of strategic options further future maintenance, upgrade works or replacement of the bridge.

Investigations by FBE, including load testing and structural assessment, have found the steel truss span operating as a one lane bridge is capable of supporting vehicle loads up to 68 t B-Doubles. The bridge has also been found to have a remaining fatigue life well in excess of 90 years under current and proposed usage and in excess of 100 years for BD68 vehicles.

Intersection upgrades

The proposed road upgrades should be referred to Dungog Shire Council for comment as Council is responsible for all roads on the regional road network.

Since the exhibition of the EIS for the Original Project, extensive consultation has been undertaken with DSC as part of the preparation of the ADA (refer to **Section 5.3**) and the TIA (refer to **Appendix C**). DSC has been specifically consulted in respect of the proposed road upgrades, as discussed in **Section 5.3**.

The consent authority should consider requesting concept plans for the proposed upgrades in accordance with the Austroads Guide to Road Design and based on detailed survey which clearly shows property boundaries to ensure that the proposed upgrades can be accommodated within the road reserve.

Concept plans for the proposed road upgrades are shown in **Figure 2.10** to **Figure 2.17**.

- **The sign posted speed is 50km/h on King Street and according to Roads and Maritime Supplement to Austroads Guide to Road Design Part 3: Geometric Design Version 2.0 the design speed is 60km/h.**
- **Turning paths should be shown for the appropriate design vehicles on all movements as supplementary information to the drawings.**
- **The proposed physical separation (pedestrian refuge) on King Street should consider any necessary property adjustments to allow for the swept path of the design vehicle in consultation with Council to determine the minimum verge width for footpath, sign posting, and utilities.**
- **The design for the proposed physical separation (pedestrian refuge) on King Street should clearly identify and consider the location of existing property access points.**
- **Council should consider the impact on street parking along King Street and Duke Street as a result of the proposed physical separation, as shown in Fig 8 of the Engineering & Transport Report by Accor Consultants.**

The updated design for the King and Duke Street intersection (shown in **Figure 2.16**) allows for the relocation of the existing driveway on the north side of the intersection slightly west, to improve the space allocation for parking on either side of the intersection and improve carparking capacity along the northern kerb line. As a result, there is no impact on street parking. Furthermore, the proposed design can be accommodated within the current road corridor and therefore no property adjustments are required (refer to **Figure 2.16**). Consideration has been given to the location of existing property access points within the updated design.

The design no longer proposes a physical separation (pedestrian refuge), but instead proposes a refresh of the dividing line marking through the intersection to delineate and separate opposing traffic movements. Turning paths are shown on **Figure 2.16** for appropriate design vehicles on all movements.

- **The proposed CHR intersection does not comply with the Austroads Guide to Road Design. The length of the proposed CHR is 100m which is insufficient.**
- **The sign posted speed is 110km/h on Gresford Road and according to Roads and Maritime Supplement to Austroads Guide to Road Design Part 3: Geometric Design Version 2.0 the design speed is 110km/h.**
- **The proposed intersection treatment will result in either (or both) the northbound and southbound travel lane being shifted closer to roadside hazards such as trees and property fence. The design should have consideration for the application of clear zones in accordance with Austroads Guidelines.**
- **There is an existing open table drain on both side of the Gresford Rd carriageway at various locations that may be impacted with the proposed work. Details of the open drain and a drainage provisions should be considered in the design.**
- **The consent authority should consider requesting additional design details to allow for the proper assessment of the strategic design.**
- **Refer to RMS CADD Manual Section 3.5 Road Design Part 8.1 Strategic Drawings. Alignment plans, longitudinal sections, typical cross sections, and preliminary cross sections are required.**

Since the exhibition of the EIS in 2016, Lindsay Dynan has been commissioned to amend the proposed Gresford Road and Dungog Road intersection design to address the above issues raised in TfNSW's submission (refer to **Section 2.7**). The amended design has been prepared in consultation with DSC.

Daracon have adopted a formation requested by DSC for the full length of the works, with deceleration/acceleration lanes remaining 3 m wide.

Roads and Maritime requests that the SIDRA files are provided for review and assessment.

The SIDRA files will be provided to TfNSW, as requested.

12.7 Department of Industry – Resources and Energy

12.7.1 Geological Resources

The geological resource volume/quantity has been demonstrated in the EIS; however the resource quality assessments are referenced but not provided. The bolded sections below should be provided to demonstrate the product's suitability to the intended uses, as specified in DRE/GSNSW SEARs.

- **Appendix B: Business and Extraction Report, Appendix A - Qualtest Material Engineering Properties**
- **Appendix M Part 1: VGT Geological Assessment Sept 2015, Appendix B - Petrographic Assessment**

GSNSW has no issues regarding resource utilisation or land use compatibility, however the omitted resource quality assessments should be included in the EIS or provided to DRE separately and noted in the EIS.

The updated geological assessment is provided in **Appendix B** of this report.

The Business and Extraction Report, Appendix A - Qualtest Material Engineering Properties will be provided separately to MEG by Daracon.

12.8 Hunter New England Health

12.8.1 Community Consultation

There is some sensitivity in the community associated with this development proposal, thus, your community consultation should continue up to and if approved, during the ongoing operation of the development.

Additional community consultation has been undertaken following the exhibition of the EIS for the Original Project. This included the development and implementation of a comprehensive stakeholder engagement strategy as part of the preparation of the SIA to guide stakeholder engagement activities during the environmental assessment process for the Revised Project. This strategy was informed by a detailed review and analysis of submissions made during the public exhibition of the EIS.

The outcomes of the stakeholder engagement strategy have informed various aspects of the Revised Project and the updated environmental assessment including the updated SIA (refer to **Section 6.13** and **Appendix O**). A summary of the process of additional stakeholder engagement is outlined in **Section 5.3**, and further discussion of the key issues raised during the stakeholder engagement is provided in **Section 6.13**.

12.8.2 Health

When assessing health risks, both incremental changes in exposure from existing background pollutant levels and the cumulative impacts of specific and existing pollutant levels should be addressed at the location of receptors. Exposure should be assessed at the location of the most affected receptors.

A public health and safety assessment has been prepared for the Revised Project (refer to **Section 6.18**).

12.8.3 Air Quality

The proponent should demonstrate that the mitigation measures implemented throughout their operation of the project will result in no increase in the net $PM_{2.5}$ to the air-shed impacting on the surrounding population.

The results of the revised AQIA show that with the implementation of the mitigation and management measures, the Revised Project would not cause adverse air quality impacts on surrounding receivers or the local air shed (refer to **Section 6.5**). Specifically, very little change in $PM_{2.5}$ concentrations is expected beyond the Project Area boundary due to the Revised Project, with no exceedances of the EPA criteria predicted at any of the sensitive receiver locations.

In addition, it should be noted on 15 December 2015, the National Environment Protection Council (NEPC) agreed to vary the National Environment Protection (Ambient Air Quality) Measure (NEPM). The amending instrument took effect on 4 February 2016.

The updated AQIA for the Revised Project adopts the air quality assessment criteria recommended by the EPA and specified in the Approved Methods (EPA 2016) (refer to **Section 6.3**). These criteria are consistent with the national standards set by the NEPC under the NEPM for Ambient Air Quality (NEPC 2016).

12.8.4 Noise

The EIS advises that the applicant proposes to operate the project including quarrying and processing operations between 0430 hrs to 2000 hrs Monday to Saturday and train loading 24 hrs per day, 7 days per week.

The EIS review of noise monitoring data for the existing operations have highlighted concerns with excessive emissions associated with the extraction activities at the quarry floor, primary and secondary crushing operations, operational truck movements within the quarry area and rail loading.

As outlined in **Section 2.6**, Daracon has committed to reducing the hours of operation for the Revised Project in a response to community and government agency concerns.

An updated NIA has been undertaken for the Revised Project, considering the updated hours of operation (refer to **Section 6.4**).

Noise generated by truck movements through local communities is an issue to residents. The EIS has outlined mitigation and management measures to address the impact from these noise emitters.

In response to community and government concerns, Daracon has committed to project changes to reduce the predicted noise impacts associated with product transportation from the Revised Project, including the reduction of road transportation (refer to **Section 2.8**).

Revised product transport arrangements for the Revised Project, include:

- reduced peak daily laden trucks of 140 per day (280 movements) for 50 days per year, otherwise 100 laden trucks per day (100 movements). The peak hourly truck movements will consist of:
    - 20 laden trucks per hour (40 movements) between 7.00 am and 3.00 pm, Monday to Friday
    - 15 laden trucks per hour (30 movements) between 3.00 pm and 6.00 pm, Monday to Friday
- no trucks through Paterson Village before 6.45 am
- increased quarry product transported by rail

- removal of Haul Route 2 as a primary haul route (now proposed only to service local jobs as required).

As outlined in **Section 6.4**, the updated NIA for the Revised Project has indicated that baseline/existing road traffic noise levels exceed the RNP criteria for some receivers due to existing traffic rates without the quarry trucks present. The addition of quarry trucks does not result in an exceedance of the RNP criteria where it was not already calculated to exceed with baseline traffic levels. Where the RNP criteria are already exceeded the predicted increase in road traffic noise due to the quarry trucks is predicted to be less than 2 dB. The RNP states that noise level increases of up to 2 dB(A) are considered barely perceptible to the average person.

The NIA indicates a 9 to 13 dB reduction in the road traffic noise levels for properties in Station Street, the northern end of Cory Street and Grace Avenue once the new access road is constructed and the quarry trucks no longer access the quarry via Station Street.

In respect to the above mitigation measures there are many issues that need to be continuously evaluated and managed to control noise emissions. The approval needs to demonstrate that the proposed mitigation and management measures on the existing and predicted noise impacts are satisfactory and ensure compliance with all the regulatory criteria.

The identification and assessment of operational controls and reasonable and feasible noise controls have been considered throughout the Revised Project design process and incorporated into detailed noise modelling.

Daracon commits to review and update the existing NMP and then implement the updated plan for the Revised Project. The NMP will detail the monitoring and management controls to be implemented to manage noise impacts associated with the Revised Project including ongoing implementation of the proactive and reactive management protocols in response to noise trigger levels defined in the plan. The revisions to the NMP will focus on the changes relevant to the Revised Project with the existing noise management processes identified in the approved NMP being applied to the Revised Project where relevant and remaining valid for activities and areas outside the quarry boundary.

Daracon will implement both proactive and reactive noise control strategies informed by real-time noise and meteorological monitoring systems (refer to **Section 6.4.2**).

12.8.5 Water Resources

The EIS does not address the source, retention and treatment of water to be used by the project for potable purposes. The assessment, management and monitoring of potable water needs to be addressed in a Drinking Water Management Plan and included as part of the EIS.

Potable water is discussed in the updated SWIA (refer to **Section 6.9**). Water for amenities purposes supplied via a tank connected to the Hunter Water potable water supply and gravity fed to the amenity buildings.

Amenities wastewater is collected in a tank and periodically removed from site by a licensed contractor.

There is minimal information in the EIS on surface water associated with the proposal. The collection, retention, treatment, use and off-site discharge of surface water needs to be adequately assessed. The offsite discharge and its implications on the receiving environment need to be evaluated and continuously monitored.

An updated SWIA has been prepared for the Revised Project (refer to **Appendix I**). The updated SWIA includes a description of the proposed WMS for the Revised Project and an assessment of discharges (refer to **Section 6.9**).

The type of operations undertaken on this site has an inherent risk to any ground water reserves in and around the site. There needs to be further assessment, management and monitoring of any ground water associated with this proposal.

A comprehensive GIA has been undertaken for the Revised Project and is provided in **Appendix H** and discussed in **Section 6.8**. The GIA demonstrates that the Revised Project is unlikely to impact groundwater reserves in and around the Project Area.

Daracon have committed to the preparation of a WMP for the Revised Project which will identify the ongoing groundwater monitoring and reporting requirements. The WMP will be prepared in consultation with relevant government agencies and ongoing monitoring and management will be undertaken in accordance with the approved plan. Additional groundwater management and mitigation measures are outlined in **Section 6.8**.

Any approval needs to ensure that the EIS has a comprehensive Water Management Plan addressing all aspects of assessment, management and continuous monitoring of potable, surface and ground water associated with this proposal.

Should the Revised Project be approved, a comprehensive WMP, including a Surface Water Management Plan and Groundwater Management Plan, will be prepared to guide the overall management of water. The WMP will be developed in consultation with DPIE Water, including a full outline of the surface water and groundwater monitoring program, and development of TARPs.

12.9 New South Wales Rural Fire Service

12.9.1 Bushfire

The NSW RFS has reviewed the information provided and provides the following recommended conditions:

- **New buildings shall be constructed of non-combustible materials and be provided with ember protection. This shall be achieved by enclosing all openings (excluding roof tile spaces) or covering openings with a non-corrosive metal screen mesh with a maximum aperture of 2mm. Where applicable, this includes any sub floor areas, openable windows, vents, weepholes and eaves. External doors are to be fitted with draft excluders.**
- **Provision of an on-site mobile water pump and tanker fitted with firefighting hose connections.**
- **Access should be consistent with the requirements of property access roads shall comply with section 4.1.3 (2) of Planning for Bush Fire Protection 2006.**
- **Arrangements for emergency and evacuation are to comply with section 4.2.7 of Planning for Bush Fire Protection 2006.**
- **Sufficient setbacks managed as an inner protection area (IPA) as outlined within section 4.1.3 and Appendix 5 of Planning for Bush Fire Protection 2006 and the NSW RFS's document Standards for asset protection zones should be provided around the administration buildings.**
- **Activities which may lead to ignition of bushfire hazards e.g. blasting or refuelling of equipment, should be deferred or have a plan of management for these functions on Total Fire Ban (TOBAN) days. A fire permit shall be obtained from the NSW RFS for any activities where required.**
- **Any proposed vegetation remediation should be done in such a way as to ensure it will not result in an increased bush fire management and maintenance risk to adjoining land holders.**

An updated bushfire assessment in accordance with the Planning for Bushfire Projection 2019 (PBP, 2019) was prepared for the Revised Project (refer to **Section 6.14**).

The current Integrated Facility Management Plan (IFMP) for the quarry includes appropriate procedures in relation to responding to fire emergencies. The bushfire emergency response seeks to limit impact to infrastructure and risk of injury to personnel and the community.

Existing bushfire management measures implemented at the quarry include:

- fire extinguishers fixed to all machinery
- appropriate access to water sources and use of water carts for firefighting purposes
- appropriate access maintained at all times
- infrastructure areas including offices maintained to reduce fuel loads
- emergency response procedure.

The Bushfire Emergency Response Procedure as part of the IFMP will be reviewed and updated to consider the relevant aspects of the Revised Project with an ongoing commitment to review and revise the procedure if necessary, as the Revised Project progresses.

12.10 Dungog Shire Council

12.10.1 Traffic and Transport

The EIS acknowledges that at this time the application includes a road which is part Council owned road and part Crown Road. The applicant has indicated they propose to acquire the road prior to determination of the application and if this is not possible to obtain owners consent. This road reserve is fundamental to the new access arrangements proposed in the EIS as a means to mitigate the current and increased impacts proposed from the quarry expansion. Unless ownership of this road reserve is secured or owners consent obtained then DPE has no means of determining the application in its current form.

As discussed in **Section 2.3**, there is a narrow strip of land which is a paper road separating the western and eastern sides of the quarry Project Area. Part of this paper road is owned by DSC and part is owned by Crown Land (refer to **Figure 2.1**). An internal haul road between the West Pit and the East Pit traverses the Council-owned portion of the paper road. DSC have provided in principle agreement to establish an appropriate commercial arrangement to enable use of this section of road, and to close it from public access.

Condition 6 of the 1991 Consent prohibited the beneficiary of the Consent from permitting the transport of more than 30% of the quarry product by road. At present, almost 1,000,000 tonnes are being transported by road in contravention of this condition (more than 30% of the annual product of 265,000 tonnes per annum).

As discussed in **Section 1.4**, in 2015 DSC brought action in the LEC against the lessee and the proponent for a breach of the EP&A Act. DSC claimed that operations at the quarry were contrary to the 1991 development consent.

As a consequence of those proceedings and subsequent appeal proceedings, the quarry operations were restricted to the Approved Development activities, comprising:

a) winning material primarily for railway ballast

b) extraction only from Lot 5 DP 242210 (no extraction from Lot 6 DP 242210)

c) total processing on that part of Lot 1 DP 1006375 that formerly comprised Lot 2 DP 524511 of no more than 449,000 tpa

d) not greatly more than 30% of total production transported by road per annum

(e) total production limited by the terms of the EPL to 500,000 tpa.

Since 24 September 2019, the quarry has operated within the parameters deemed as approved by the Court of Appeal. Those parameters have been used as a baseline for the assessment of the proposed operation.

As part of the Revised Project, approval is being sought to transport up to a maximum of 500,000 tpa of quarry product by road and up to 600,000 tpa via the existing rail network. Further details are provided in **Section 2.0**.

Once the baseline increase from actual approved production levels is determined, traffic and transport components of the EIS and associated reports will then need to be reassessed to determine potential impacts between the approved production levels and the new proposed production levels.

All components of the Revised Project have been re-evaluated against the baseline or approved development (refer to **Section 1.4**). **Part A** provides updated assessments for the Revised Project.

Other critical issues that either have not been addressed, not fully addressed, not agreed to by the writer of this report (Manager Infrastructure and Assets) or that require further information include:

- **Increased deterioration of Council's Road Networks - up to 84% of all Class 9 Heavy Vehicles on Dungog Road south of the quarry will be generated by this development;**
- **Reduction in current pavement design lives;**
- **Increases in pavement rehabilitation costs due to increased traffic loadings;**
- **Insufficient detail and apparent underestimation of costs for Capital Works at intersections as identified by the applicant;**
- **Lack of information with respect to calculation of haul road contributions and inadequate haul road contributions;**
- **Several sections of the haul route (including Maitland Road in Paterson and Gresford Road) have extremely poor surface conditions which will require immediate rehabilitation/reconstruction;**
- **Increased use of Over-Dimension Haul Route has not been identified within the reports;**

A Pavement Condition Analysis was undertaken by SMEC (2021) as part of the updated environmental assessment for the Revised Project. The findings of this analysis are summarised in **Section 6.3.3** with the full report provided in **Appendix L**.

The Pavement Condition Analysis found that the Maitland roads tend to be in better condition and have stronger pavements as compared to Dungog. As a result of the modelling, it was predicted that the addition of the extra truck traffic would result in additional road maintenance requirements for the haul routes over the next 25 years (SMEC 2021).

Should the Revised Project be approved, it is expected that Daracon will be required to make annual financial contributions to DSC in the form of a VPA, in accordance with section 7.11 of the EP&A Act.

Road access and safety

Inadequate responses to a number of road access and safety concerns including:

- **Grace Avenue/Station Street/Rail Crossing - This intersection has been identified by both Council and the ARTC as requiring safety upgrades. Lack of available funding from both parties is the only reason works have not been undertaken. Whilst this intersection and crossing is projected to be abandoned within two (2) years as far as being part of the identified haul route is concerned, no consideration is given to interim measures.**

During the early phase of the Revised Project, all vehicle access will be via the existing access on Station Street. Whilst the current layout of the Station Street/Grace Avenue intersection does not comply with current Austroads Guidelines, it has operated as a single vehicle access to the quarry for the majority of the life of the quarry and has allowed for safe and appropriate two-way traffic movements (with no recorded accidents at this location). Existing controls for the level crossing will continue to advise vehicle drivers of approaching trains which improves road safety. Visibility at this location allows drivers in trucks exiting the quarry to safely determine suitable gaps in the through traffic movements along Grace Avenue to exit Station Street. Whilst the posted speed limit is 50 km/h in this location, the road alignment in this location encourages drivers to travel below this limit.

As part of the Revised Project, a new site access road is proposed that will allow for direct vehicle access between the quarry and Dungog Road, to the north of Grace Avenue. This proposed new access will involve a new intersection off Dungog Road and bridge crossing over the North Coast rail line (as shown on Figure 2.10). Subject to ARTC and DSC approvals for the rail bridge and intersection construction, respectively, it is expected that the new access road will be constructed and operational by the end of Year 4.

Once the new access has been constructed, all heavy vehicle movements will be via this new access. The existing access on Station Street will remain as per the current layout and will be maintained as a secondary access for emergency or unplanned disruptions only.

As part of ongoing VPA discussions, Daracon will consult with DSC in regard to potential upgrades to Station Street and Grace Avenue, such as an asphalt overlay of Station Street to improve the road surface.

- **Paterson Rail Crossing - Congestion on the northern side of the crossing is already problematic with respect to the blind crest on the approach to the crossing. The need for advanced warning for a closed rail crossing has not been adequately addressed.**

Network constraints limit the number and timing of train movements that can service the quarry. These constraints currently limit the existing approved operations in terms of daily train movements and the time of train movements. The Revised Project will not have a significant impact on the number of times the rail crossing is closed.

The updated TIA indicates that the sight distance to the level crossing is in accordance with RMS/ARTC requirements and there are no recorded accidents in this location associated with lack of visibility (refer to **Appendix C**).

- **Gostwyck Bridge Single Lane - Whilst the RMS have identified that the bridge can meet load standards, the alignment and lack of sight distance for traffic to "Give Way" is an ongoing concern**

In order to raise driver awareness and improve road safety along the Gostwyck Bridge approach, it is proposed that the bridge approach be upgraded through curves on the bridge approach being incorporated in the realignment of Dungog Road, including new line marking and Vehicle Activated Signage alerting drivers approaching the bridge to reduce speed, as outlined in **Section 2.8.2**.

- **Pavement Widths - Some sections of the identified haul routes have insufficient pavement widths for the design traffic loadings. Rehabilitation costs identified within the reports do not allow for required width increases.**
- **Clear Zones - There is insufficient shoulder widths and clear zones on considerable lengths of the identified haul routes. Rehabilitation costs identified within the reports do not allow for required shoulder increases or clear zone creation.**
- **Overtaking Areas - Whilst the reports identify the lack of suitable overtaking areas, no consideration is made to provide such.**

The updated TIA includes an assessment of the road network along the length of the Primary Haul Route, as discussed in **Section 6.3**. It is noted that pavement widths and shoulders is an existing road safety issue along the haul route, regardless of the Revised Project.

Should the Revised Project be approved, it is expected that Daracon will be required to make annual financial contributions to DSC and MCC, which will be put towards the maintenance of roads used for haulage of quarry products.

- **Flood Free Access - The main haul route through Paterson has three (3) identified areas where flooding occurs. Alternate flood free access or quarry processes in times of flood have not been addressed**
- **The Traffic Impact Assessment also fails to take into consideration the issue of the major haul route being flood prone in at least three (3) separate locations within the Dungog LGA. Alternate flood free access needs to be considered as part of this process.**

Due the market driven nature of quarry operations, variations in daily traffic flows are necessarily created by market demands. Daily flows will vary due to market demands as well as weather conditions. The primary influencing factor on the traffic flows generated by the Revised Project is created by the demands of the end market.

Should there be flood conditions, it is likely that the quarry operations will be restricted, as to the market demand. Except to supply material for emergency government flood rectification works, there would be no haulage in the event of flood condition. In these circumstances, Daracon would consult with the relevant authority to manage the process.

Review of Traffic Impact Assessment (Seca Solutions, August 2016) identified the following issues:

- **The report fails to adequately address all road safety concerns identified by Council**
- **Some statements and assumptions are erroneous with respect to Council's position regarding current and proposed works for the proposed haul routes**

The TIA has been updated to address road safety issues more extensively (refer to **Section 6.3** and **Appendix C**). Daracon has been undertaking ongoing consultation with DSC in relation to the Revised Project.

The report identifies that typically there are expected to be 40 outbound trucks from the site per hour for the first three or more hours due to operational limitations within the quarry. These peak times conflict with morning peak times for commuter traffic and school buses.

A key objective of the Revised Project has been to reduce traffic and transport related impacts associated with the operation of the quarry to address ongoing concerns from the community and government agencies. This has included:

- reduction in tonnes transported by road to 500,000 tpa
- reduction in peak trucks per hour to:
    - 20 loaded vehicles (40 movements) between 7.00 am and 3.00 pm
    - 15 loaded vehicles (30 movements) between 3.00 pm and 6.00 pm
- road haulage hours from the site reduced to 7.00 am to 6.00 pm, Monday to Friday
- no road haulage of quarry product on Saturday, Sunday, public holidays or between 24 December and 1 January, inclusive
- no trucks through Paterson prior to 6.45 am Monday to Friday.

The revised TIA is provided in **Appendix C** and a summary provided in **Section 6.3**.

The current report identifies tube counters being installed in the week beginning 17th July 2015 over a minimum period of 7 days, however:

- **This is a very small period to be extrapolating annual figures from;**
- **There are some relatively small inconsistencies between the Seca figures obtained and Council data. Council data is, however, 12 months older than the Seca data but was taken over a two month period;**

Additional traffic surveys were undertaken during April and May 2018 and February 2020 as part of the revised TIA process. The survey details and results are provided in **Section 6.3** and **Appendix C**.

There is no traffic data for Station Street nor Grace Avenue.

The updated TIA includes traffic data for Station Street and Grace Avenue (refer to **Appendix C**).

The report identifies a number of safety concerns which have not been adequately addressed. These include:

- **Sight distance may be an issue at the proposed intersection of the internal haul route with Dungog Road;**
- **Station Street/Grace Avenue intersection conflict with rail crossing - The report identifies (p24) that the "ARTC has prepared plan for upgrade but no timeframe for works". This is contradicted later in the report (p52) which states that "the railway crossing on Grace Avenue has been reviewed by ARTC and they have no plans to upgrade this crossing". As Council nor ARTC did not have any funds allocated for the works, the project was not undertaken.**
- **One-way bridge operation on Dungog Road at Gostwyck Bridge - Council's issue is not with the capacity of the bridge (which is the RMS concern) but the lack of sight distance to the north and the increased potential for road accidents as a result of increased heavy vehicle movements.**
- **Bus Routes and Associated Facilities - The report identifies that there are local school bus routes in operation along the haul route but "there are no bus stops within the general locality of the subject site".**

The TIA has been updated to address road safety issues more extensively (refer to **Section 6.3** and **Appendix C**) and to provide further clarification.

As part of the Revised Project, a new site access road is proposed that will allow for direct vehicle access between the quarry and Dungog Road, to the north of Grace Avenue. This proposed new access involves a bridge crossing over the North Coast rail line. Once this new access has been constructed, all heavy vehicle movements will be via this new access.

The new access road will require the construction of a new intersection on Dungog Road (refer to **Figure 2.10**). The new intersection will be designed and constructed in accordance with Austroads Standards plus in consultation with DSC and will allow for a sheltered right turn lane on Dungog Road to enable the new access to operate in a safe and appropriate manner. Daracon will continue to consult with ARTC and DSC on the final design and approvals for the proposed upgrades.

In relation to Gostwyck Bridge, Daracon proposes a number of measures to improve safety, including:

- realign Dungog Road, incorporating a series of curves to raise driver awareness and associated new line marking
- install Vehicle Activated Signage alerting drivers approaching the bridge to reduce speed
- relocate existing hazard signage
- remove redundant signage
- modify existing property accesses as required on either side of Dungog Road.

The TIA acknowledges that there are no set down or pick up area on Station Street. A drop off area is available for the Martins Creek train station. Other informal bus stops are located at various locations along the haul route to serve the school bus runs.

On-street Parking Provision - The report does not consider the loss of on-street parking within the Paterson Business Area as a result of the proposed intersection modification works at King and Duke Street.

Based on agency and community concern, an updated design for the works at King and Duke Streets allows for the relocation of the existing driveway on the north side of the intersection slightly west, to improve the space allocation for parking on either side of the intersection and improve carparking capacity along the northern kerb line. There is no longer any loss of on-street parking.

Only limited reference is made to the haulage of over-dimension vehicles along MR301 and MR101. These include over width and overmass vehicles which cannot access via Gostwyck Bridge.

Daracon may on occasion need larger vehicles, including low loader floats for moving heavy machinery on and off site as required. Over size and/or over mass vehicles may be required infrequently and would be subject to separate specific permits from TfNSW and DSC.

Visibility to the right for drivers exiting Station Street is impacted upon by the vertical alignment of the road over the rail crossing. The report then states that the visibility has been assessed as greater than 100 m in both directions. This may be based on "the raised seating position for drivers of trucks" which should not be considered under the standards.

The updated TIA addressed sight distances more extensively (refer to **Appendix C**). In particular, the TIA noted that although visibility to the right for drivers exiting Station Street is impacted upon by the vertical alignment of the road over the level crossing, there remains adequate distance for drivers to determine a suitable gap for exiting Station Street.

For the posted speed limit of 50 km/h the sight distance requirement measured in accordance with Austroads Guides for a driver exiting Station Street is 80 m. This distance has been assessed on site and exceeds 100 m in both directions. It is noted that whilst the posted speed limit is 50 km/h in this location, the actual vehicle speeds are lower due to the interaction with the at-grade train level crossing to the immediate west of the intersection.

No reference is made to the lack of sight distance on the northern side of the Paterson level crossing nor the conflict that may occur due to queueing vehicles.

The updated TIA indicates that the sight distance to the level crossing is in accordance with RMS/ARTC requirements and there are no recorded accidents in this location associated with lack of visibility (refer to **Appendix C**).

Prince Street/Duke Street Intersection - The poor road alignment (horizontal and vertical) and narrow pavement widths have not been addressed.

Key intersections along the primary haul road for inclusion in the TIA were nominated and confirmed in consultation with the RMS. The Prince Street/Duke Street intersection was not nominated by RMS.

This intersection is constrained by 3rd party land on all sides which restricts options for upgrading this intersection. The condition of the road surface has been separately identified and Daracon's contribution to road maintenance will be resolved as part of the VPA process with DSC.

Level crossings in Martins Creek and Paterson are referred to as only causing minor traffic delays as "there is a limited train service in this location". The rail crossings service 5 local commuter trains (10 movements), 6 XPT services (6 movements) and numerous coal and freight services.

The timetable for trains has been included in the TIA (refer to **Appendix C**) and confirm daily numbers for trains on this line. These trains are controlled by ARTC. The proposed maximum of 20 trucks per hour will not create any significant increase in traffic delays at these crossings.

The report identifies the use of 10-15kt per annum of flyash. On average, 12,500t of flyash is imported to the site per annum. Based on 32.5t per load, this would generate a further 385 laden and 385 unladen truck movements per annum. Therefore, based on Dungog Shire Council data from 2014, there would be significant increases in heavy vehicles on the various haul roads south of Martins Creek Quarry, as well as effects on traffic volumes. (REFER TO: Table on pg. 11 of Dungog Shire Council Submission)

Ancillary truck movements associated with deliveries of fuels, pre-coat and additives likely to access the quarry have been considered in the updated TIA as part of the proposed maximum truck movements for the Revised Project. These movements have been considered in the traffic modelling of the TIA (refer to **Appendix C**).

Based on several data sets and assumptions, there are indications of actual increases in Class 9 and above vehicles as a result of the Martins Creek Quarry Operations. Council would contend that the basis for the increase being founded on the "current" production of 900,000 tonnes is highly contentious and not agreed to by Council. (REFER TO: Table on pg. 12 of Dungog Shire Council Response)

In response to agency and community concern, Daracon have committed to the following revised operational parameters as part of the redesign of the conceptual quarry plan for the Revised Project:

- reduction in tonnes transported by road to 500,000 tpa
- reduction in peak trucks per hour to:
    - 20 loaded vehicles (40 movements) between 7.00 am and 3.00 pm
    - 15 loaded vehicles (30 movements) between 3.00 pm and 6.00 pm

- road haulage of quarry product to occur 7.00 am to 6.00 pm Monday to Friday, with no haulage of quarry product on Saturday, Sunday, public holidays or between 24 December and 1 January, inclusive
- no trucks through Paterson prior to 6.45am Monday to Friday
- removal of Haul Route 2 as a primary haul route (now proposed only to service local jobs as required).

An updated TIA was completed for the Revised Project (refer to **Section 6.3**).

Martins Creek Quarry - Report on Engineering & Transport (Acor Consultants, May 2016) identifies that "a new development site access to Dungog Road is proposed to be constructed within 2 years" but also states that "upgrade of the Station Street/Grace Avenue intersection and associated upgrade of the rail crossing will (therefore) not be required". The report does not identify how the increased haulage traffic and intersection/rail crossing issues will be addressed during this 2 year period.

The report lists considerably more issues that have been identified by Dungog Shire Council than were addressed in the previous Seca Solution Report.

As part of the Revised Project, the new site access road is proposed to allow for direct vehicle access between the quarry and Dungog Road, to the north of Grace Avenue. Once this new access has been constructed, all heavy vehicle movements will be via this new access. The existing access on Station Street will remain as per the current layout and will be maintained as a secondary access for emergency or unplanned disruptions only.

In the interim the existing access will continue to operate, noting that the proposed truck movements are significantly lower than those during the period in which DSC provided this response. It is noted that whilst the current layout of the intersection of Station Street and Grace Avenue does not comply with current Austroads Guidelines, the existing access has operated as the single vehicle access to the quarry for the majority of the life of the quarry and allows for safe and appropriate two-way traffic movements.

Analysis of Future Pavement Maintenance Requirements Resulting From a Proposed Increase in Quarry Truck Traffic (SMEC Australia, November 2015) determined:

- **There is insufficient evidence within the report to either quantify or justify the predictions as regards 25 year funding requirements for both current and predicted traffic;**
- **There are assumptions being made with respect to pavement material qualities, geotechnical issues, etc;**
- **The report does not give consideration to extra works required for pavement widening for increased pavement life and traffic safety;**
- **Due to the report being based on maintaining "road pavements at their current condition level" for the next 25 years there is no consideration made for service level increases or improvements that would be expected to pavement conditions;**
- **The projected annual funding increase of $36,135 ($2,737/km or $0.07/tonne carried) does not adequately address the overall effect of Class 9 Heavy vehicles on the haul route as a result of the full Martins Creek Quarry Operations.**

As outlined above, a Pavement Condition Analysis was undertaken by SMEC (2021) as part of the updated environmental assessment for the Revised Project. The findings of this analysis are summarised in **Section 6.3.3** with the full report provided in **Appendix L**.

The Pavement Condition Analysis found that the Maitland roads tend to be in better condition and have stronger pavements as compared to Dungog. As a result of the modelling, it was predicted that the addition of the extra truck traffic would result in additional road maintenance requirements for the haul routes over the next 25 years (SMEC 2021).

Should the Revised Project be approved, it is expected that Daracon will be required to make annual financial contributions to DSC in the form of a VPA, in accordance with Section 7.11 of the EP&A Act.

Following review of the Budget Estimate Report for: Proposed Capital Expenditure Works - Martins Creek Quarry (Vasey Consulting, May 2016), the works identified for the Gresford Road & Dungog Road Intersection do not meet the required standards for:

- **Overall Design - Length of through lane not to standard.**
- **Tapers - Length of Tapers on through lane not to standard.**
- **Shoulders - Existing pavement does not have sufficient width for shoulder requirements.**
- **Acceleration Lane - The length of the acceleration lane for southbound vehicles out of Dungog Road is not to standard.**
- **Deceleration Lane - The length of the deceleration lane for left turn vehicles out of Gresford Road is not to standard.**
- **There is possible conflict with Telecommunications and Property Boundaries which would only be identified at the full design stage. The above costs do not make any allowances for such conflicts.**

As part of the Revised Project, it has been recognised that the intersection of Gresford Road for drivers turning right into Dungog Road will be upgraded to provide a sheltered right turn lane on Gresford Road. The design of the proposed upgrades has been prepared in consultation with DSC. The design and construction of this upgrade will be agreed with DSC with the design prepared in accordance with Austroads Guidelines. This will ensure that there are minimal impacts upon road safety in this location.

The works identified for the King Street/Duke Street Paterson- Intersection Median Works raise the following issues:

- **Property Acquisition - No allowance made for Property Acquisition requirements identified on the plan. There may also be heritage issues.**

The King and Duke Street intersection upgrade works will be restricted to the current road reserve and would not impact on any private property.

- **Pavement - Inconsistent pavement type has been identified in the proposal. The existing road is deep lift asphalt, whilst the design has allowed for a flexible pavement design.**

All pavement designs and materials will be signed off by DSC prior to works commencing.

- **Pedestrian/truck movement conflicts - The increased speed capacity of the intersection for heavy vehicle movements poses a conflict with the high pedestrian area.**
- **On-Street Parking - Loss of approximately seven (7) on-street car parking spaces in the Paterson Business Area. *This equates to 50% of available parking in this particular area*.**

Daracon have committed to reducing truck speeds through Paterson to 40km/hr, with further reduction to 20 to 25km/hr around the King and Duke Street intersection.

Furthermore, as discussed in **Section 2.8.2** and illustrated on **Figure 2.16**, the updated design for the King and Duke Street intersection upgrade allows for the relocation of the existing driveway on the north side of the intersection slightly west, to improve the space allocation for parking on either side of the intersection and improve carparking capacity along the northern kerb line. Therefore, there is no longer any loss of on-street parking.

The works identified for the Martins Creek Rail Bridge & Associated Works does not fully identify the works proposed. The estimates provided by Vasey Consulting raise the following possible issue:

- **Sight Distance - Whilst actual location is not able to be determined accurately off the above plan, sight distance to the north may be sub-standard at the proposed location for an 80km/hr zone.**

A review of the existing road network along the primary haul route has highlighted that parts of the current road network layout do not conform with Austroads standards. This includes the one-way bridge operation at Gostwyck Bridge on Dungog Road.

To maintain and improve the capacity, efficiency and safety of the road network used by the Revised Project, Daracon propose to upgrade the approach to Gostwyck Bridge. The upgrade would include:

- realignment of Dungog Road, incorporating a series of curves to raise driver awareness and associated new line marking
- installation of Vehicle Activated Signage alerting drivers approaching the bridge to reduce speed
- relocation of existing hazard signage
- removal of redundant signage
- modification of existing property accesses as required on either side of Dungog Road.

Daracon have consulted with TfNSW and DSC on the options for approaches to Gostwyck Bridge. Daracon will continue to consult with TfNSW and DSC on the final design and approvals for the proposed upgrades.

12.10.2 Air Quality

The Air Quality Assessment Report does not assess the impacts of road dust or diesel emissions on the residents of Paterson or Bolwarra (and other residential communities adjacent to transport routes).

Council would respectfully request that the impacts of road 6 of 58 dust (property aesthetics) and diesel omissions generated by the transport of quarry products along the various transport routes be addressed as requested in the SEARS by a number of the government agencies.

Emissions from diesel exhausts associated with off-road vehicles and quarry plant and equipment have been assessed as part of the AQIA (refer to **Section 6.5**). As discussed in **Section 2.4**, the Revised Project proposes to largely use the existing equipment fleet that is already in place at the Quarry. The most significant emissions from diesel exhausts are products of combustion including carbon monoxide (CO), NO_2 and particulate matter (PM_{10} including $PM_{2.5}$). The NO_2 and PM_{10} (including $PM_{2.5}$) have been considered as part of the AQIA.

As outlined in **Section 6.5.5.3**, modelling of the potential NO_2 concentrations associated with diesel use as part of the Revised Project indicates a maximum 1-hour average concentration at the nearest sensitive receiver (R1) of approximately 20 µg/m^3 or less. With the addition of maximum background levels of 66 µg/m^3, the predicted levels readily comply with the criteria of 246 µg/m^3.

Predicted annual average NO_2 concentrations at the nearest sensitive receiver (R1) are approximately 10 µg/m^3 or less. With the addition of background levels of 16 µg/m^3, the predicted levels comply with the EPA criteria of 62 µg/m^3. All other surrounding private receivers are more distant and are predicted to have lower levels than those predicted at the nearest residence.

Diesel exhaust emissions associated with operational activities (quarry plant and equipment) and off site road transportation (truck movements for quarry sales) are predicted to remain well below the nominated criteria and are therefore unlikely to lead to any adverse air quality impacts. Similarly, monitoring and modelling suggest that the Revised Project is not expected to cause adverse air quality impacts with respect to crystalline silica.

12.10.3 Water Quality

As the discharge of waste waters is controlled under an EPL, the EPA is the responsible authority and it would be expected that the EPA would critically assess the Water Quality report.

Refer to **Section 12.3** for a summary of the EPA submission on the Original Project and response.

12.10.4 Voluntary Planning Agreement

The EIS makes reference to two other matters including a proposed Voluntary Planning Agreement for road assets and an internal policy and Code of Conduct for drivers (including sub-contractors). However no detail is available at this stage.

DPE has advised that they no longer favour Draft Voluntary Planning Agreements as a result Council has been required to prepare an amendment to their existing Section 94 Plan to insert an appropriate heavy haulage contribution rate.

Should the Revised Project be approved, it is expected that Daracon will be required to make annual financial contributions to both DSC and MSC in the form of a VPA, in accordance with section 7.11 of the EP&A Act.

With regards to the Code of Conduct for drivers, please refer to Daracon's Martins Creek Quarry website (www.daracon.com.au) for a copy of the policy.

12.10.5 Noise

The concept of the application for the proposed expansion is based upon noise levels that already give rise to significant exceedances of appropriate noise criteria (due to the unlawful operations), upon which then the applicant seeks to create a further increase under EPA policies based upon the existing excessive noise.

No contemplation or consideration has been given to what the noise levels would be if the quarry was operating in accordance with the 1991 Development consent and related EIS (that stated full compliance with the general background + 5 dB(A) limit at residential receivers).

- **General issues and discrepancies in noise level data, criterion, and identification of noise contribution (see pages 4-10).**
- **Not all relevant aspects of the proposed expansion project for the Martins Creek Quarry have been identified- there is a lack of acoustic information with respect to the approved development.**
- **The Expansion EIS acoustic assessment identifies that currently there is a significant acoustic impact occurring in Martins Creek, of which there is now a proposal to provide an alternative road to address that impact which should have occurred as a result of the unapproved intensification of the quarry.**

An updated NIA has been completed for the Revised Project (refer to **Section 6.4**). The updated NIA has been prepared in accordance with the SEARs and the NPfI. The NPfI (NSW EPA, 2017) replaced the NSW INP (NSW EPA, 2000) in October 2017.

The NIA provides a comprehensive and updated assessment of potential noise impacts from all relevant noise sources associated with the Revised Project. The project noise trigger levels have been developed in accordance with the NPfI.

12.10.6 Environmental Management

The overarching document (EMP) was last reviewed on 8th January 2016, with some of the sub plans not having been reviewed for many years. There has been other work completed and submitted with the EIS which has proposed various actions or plans in relation to environmental management of the site - these are not referenced in the EMP.

Noted. Since the exhibition of the EIS, the EMP has been replaced with an approved IFMP.

Should the Revised Project be approved, Daracon have committed to a number of specific environmental management plans to manage the operations. The development of environmental management plans will be governed by the development consent and would supersede previous EMPs.

12.10.7 Geology

It is worth noting in section 1.2 Previous Geological Assessments the report references the following Exploration Programs 1968, 1984 and 2006. VGT Pty Ltd have either not been provided with the results of the Geological investigations undertaken by C. L. Adamson in December 1979 and which was referenced as Appendix 3 to the EIS prepared by D.P. James in July 1990 for the proposed Railway Ballast Quarry or they have determined not to include them for whatever reason. VGT have plotted the location and outcome of the respective bore holes from each previous investigation.

It is Councils view that the omission of the December 1979 investigation results is deliberate. This report and its contents form the basis of a number of Points of Claim in the Class 4 proceedings- primarily that no Development consent has been granted for extraction of material on Lot 6 DP 242210.

A geologists report has been tabled with Dungog Shire Council which disputes the reserve tonnages claimed in the EIS document. Council requests that the geotechnical assessment be checked by a suitably qualified independent professional with experience in reserves assessment.

In response to agency and community submissions, an amended Geological Assessment has been prepared for the Revised Project (refer to **Appendix B**). The amended assessment includes a review of the 1979 investigations by C. L. Adamson.

The resource modelling undertaken identifies that the proposed quarry area contains up to 22.4 Mt of high quality saleable latite resource, with some minor amounts of other lower value products (refer to **Appendix B**).

12.10.8 Historic Heritage

The assessment is considered deficient in that the development proposes physical works and increased truck movements through the Historical village of Paterson which is an adopted Heritage Conservation Area under Dungog LEP 2014. There are a number of specifically listed heritage items of local significance in King and Duke Streets and there has been no consideration given as to the potential impact the development may have on the historical significance of the village or the individual listed Heritage items.

In response to DSC's submission, a HIS has been prepared to assess the potential heritage impacts associated with the Revised Project's primary haulage route (refer to **Section 6.11**), in particular:

- potential vibration impacts (if any) of the proposed number and frequency of trucks on the structural integrity of listed heritage items
- potential impacts to the significance of the conservation area as a result of the number and frequency of trucks travelling through a conservation area
- the impacts of proposed intersection and bridge approach upgrade works on the curtilage and significance of listed items and any conservation areas.

A detailed visual inspection of the Paterson HCA was undertaken. The works proposed at the King and Duke Street intersection are at-grade, or close to at-grade, meaning that they will not be readily visible within general views to or within the HCA or individually listed heritage items. As existing kerbs, gutters and footpaths are contemporary, their re-alignment and reconstruction in a like-for-like manner will not result in any adverse visual impacts to the existing aesthetic significance or general visual presentation of the HCA or listed heritage items located therein.

All physical works will be undertaken in association with contemporary fabric of no identified heritage significance. Footpaths, kerbs, gutters and road surfaces within the HCA are all contemporary, and none are identified as significant elements within the statement of significance prepared for the HCA.

The HIS concluded that it is unlikely that the proposed intersection works within the Paterson HCA will result in any adverse visual or physical impacts to the heritage significance of this HCA or individually listed heritage items. In addition, there are no identified impacts to the listed Gostwyck Bridge as a result of the proposed bridge approach works.

The implementation of mitigation measures outlined in **Section 6.11.4** is expected to prevent any impacts on heritage values (including minor cosmetic damage) associated with quarry truck movements.

12.10.9 Aboriginal Cultural Heritage

This report notes that two previously identified Items 38-4-0218 and 38-4-2014 no longer exist. This is reflective of the damage that has occurred to the environment as a result of the quarry operators operating outside the terms of their existing approvals.

An ACHAR was prepared in support of the EIS (Monteath & Powys, 2016) prepared for the Original Project by Niche, in consultation with the RAPs and Knowledge Holder groups to assess the Aboriginal cultural heritage values of the Project Area and surrounds (refer to **Section 6.12**).

A search of the AHIMS database identified three Aboriginal objects within the original proposed extraction area (refer to **Section 6.12**), namely item 38-4-0214 comprising an isolated artefact, items 38-4-0217 and 38-4-0218 both comprising one scarred tree.

Item 38-4-0214 could not be found during the field survey and due to the loss of topsoil at the site at the listed location, it was determined that the site has low archaeological potential.

Item 38-4-0218 could not be located during the field survey and it was concluded that it no longer exists. A Site Impact Recording Form was submitted to Heritage NSW and the AHIMS register has since been amended to identify the site as 'destroyed'. The recorded location of AHIMS ID #38-4-0218 is outside of the existing and proposed quarry extension and consequently it is very unlikely that the scar tree was impacted by the quarry operations. The ACHAR concluded that the site Martins Creek 6 (AHINS ID #38-4-0218) identified as a scarred tree could not be relocated and may have been destroyed by natural causes or other impacts not associated with the quarry.

During the field survey conducted for as part of the ACHAR, Item 38-4-0217 was located and determined not to be a culturally modified tree, and hence not an Aboriginal object under the NPW Act.

12.10.10 Social

The Social and Economic Assessment report has been developed concentrating on regional influences and ignoring the local consequences and lacks detailed analysis of the social and economic impacts on the local community.

A comprehensive SIA and Economic Impact Assessment have been undertaken for the Revised Project, refer to **Sections 6.13** and **6.14** respectively. The SIA and Economic Impact Assessment have been prepared in accordance with relevant guidelines and considers relevant local impacts.

12.10.11 Existing Approvals

The impacted area used for the calculation of offsets does not include the cleared lands and rehabilitation areas of the existing operation (Page 37 of Biodiversity Assessment report), whereas the EIS states that one of the purposes of the proposal is to consolidate existing operations where the consent requirements by their own admission is unclear.

Council contends that no development consent exists for the quarrying activities undertaken on Lot 6 DP244210 and this is a Point of claim in the current action in the Land and Environment Court.

The Council disputes that the current operations are being conducted lawfully in accordance with the consents and to this intent has commenced Class 4 proceedings in the Land and Environment Court seeking declarations and restraining orders against the current operators to control and limit the current operations taking place on the site.

The baseline for the actual quantum of the expansion and the resultant environmental impacts can only realistically be identified once the Class 4 matter is determined and the lawful extraction rate and the terms/conditions governing the existing operations are established.

REFER TO: 'FIGURE 1 - COUNCIL'S SUMMONS' & 'FIGURE 2 - COUNCIL'S POINTS OF CLAIMS' which sets out Council's contentions in relation to the current operations of the quarry.

REFER TO:' ANNEXURE A' which provides information about extraction tonnages as at the relevant dates provided by Railcorp previously when they were seeking acknowledgement of existing land use rights.

REFER TO: FIGURE 2 - COUNCIL'S POINTS OF CLAIMS

In Councils Points of Claim there is dispute over the lawfulness of the following substantial activities occurring on site presently these include:-

- **Pre-coated sealing aggregates production**
- **Manufactured and Modified Road base production utilising the Pugmill**
- **Washed Coarse Manufactured Sand.**

Should these activities be determined to be unlawful then more information will be required outlining the nature of those processes and greater consideration will have to be given to the environmental consequences of each processing activity.

Regarding quarry expansion, the applicant claims that "the previous approvals over the site permitted that clearing of the undisturbed areas on Lots 5 &6 DP242210 (within the West Pit)" Council contends that this statement is incorrect the previous approvals only permitted clearing within the area defined in the 1991 EIS. The only clearing permitted on Lot 6 DP242210 was for a haul road.

The Council disputes the "Summary of Existing Operations and Approvals for Martins Creek Quarry" contained in Appendix 'B' of the EIS and without being exhaustive disputes the following:

- **that Lot 1 DP1006375 and Lot 1 DP204377 have continuing use rights to be used either for quarrying purposes or for screening, crushing, stockpiling and processing of quarried material.**
- **that the Consent for use of Lot 6 DP244210 does not permit the extraction of extractive material (quarry products) from the land but only permits the use of that land for a haul road in the location shown in Plan 2 in the 1991 EIS accompanying that Application.**

Council further contends that the 1991 EIS did not contain any assessment of the likely impacts on the environment of quarry activities now being carried out on Lot 6 and did not identify any measures to mitigate the likely impacts on the environment.

Council further contends that the Consent was for an "extractive industry being a quarry winning materially primarily for railway ballast".

Council further contends that the use of Lot 6 for the extraction of extractive material is unlawful.

Council further contends that the 1991 EIS is incorporated into the 1991 Consent by necessary implication and as the EIS proposes environmental safeguards those environmental safeguards are incorporated into the Consent and include the following, which have been breached:

- **Only a total 10 hectares was proposed for the quarry, with only 5 hectares being occupied by the actual quarry and 5 hectares by the haul road.**
- **Railway ballast is not the primary product produced on lot 5 & 6 but only constitutes a secondary non-main product and is therefore in contravention of the Consent.**
- **At present, approximately 90% to 95% of the extracted product is delivered by road, whereas the EIS proposed that no more than 30% of the extracted product would be delivered by road and the current operation is in contravention of the Consent.**
- **The EIS proposed that the majority of the quarry product would be delivered by rail, whereas the majority of the quarry product is being delivered by road contrary to the Consent.**
- **The EIS proposed that no more than 80,000 tonnes of quarry product per annum would be transported by road, whereas at present approximately 900,000 tonnes of quarry product is being transported by road contrary to the EIS.**
- **EIS proposed that the amount of quarry product that would be extracted would be in the region of 300,000 tonnes, whereas at present over 900,000 tonnes is being extracted contrary to the provisions of the EIS and the consent.**
- **The EIS proposed that the transportation of the quarry product would involve an average of 24 truck movements a day where at present truck movements exceed on average 220 a day and at peak times up to 582 truck movements per day.**

Condition 1 of the 1991 Consent required the development to be conducted in such a manner as not to interfere with the amenity of the neighbourhood in respect of noise, vibration, smell, dust, waste water, waste product or otherwise.

The current transportation arrangements and other arrangements and the excessive extraction and transportation of quarry product is interfering with the amenity of the neighbourhood (as is admitted by the proponent in the 2016 EIS) in respect of noise, dust, vibration, traffic congestion and traffic danger.

- **Council contends that there is a pug mill on Lot 1 DP204377, which has not been approved by the Council and is therefore unlawful.**
- **Council contends that the manufacturing sand processing plant and associated facility have been erected on Lot 5 or been installed and used on Lot 5 DP242210, for which no consent has ever been granted.**
- **Council contends that on that part of Lot 1 DP1006375 (that did not comprise the former Lot 2 DP524511) is being used to store and stockpile aggregate of various sizes for which no consent has ever been granted.**
- **Council contends that Lot 1 DP1006375 has a precoat plant installed on it for which no development consent exists.**
- **Council contends that the Environment Protection Licence held by the Second Respondent, being EPL 1378 dated 2 April 2007 is invalid.**

In relation to Lot 42 DP815628, Council contends that this Consent expired on 31 October 2006. No such extension has been granted and any extraction taking place/or proposed on Lot 42 is unlawful.

In relation to alleged consent on Lot 6 DP244210 (DA171/95/5) Council contends that this development never commenced and accordingly the Consent has expired and no Consent exists for the installation or use of any crushing plant or associated infrastructure on Lot 6.

In relation to Lot 1 DP1006375 Council contends that this consent was for the operation of a fixed tertiary crushing equipment and was limited to the amount of material crushed on that part of former Lot 2 DP 524511 as is now incorporated into 5 of 58 Lot 1 DP1006375 as at 17 September 1999. Council contends that this limitation does not permit the crushing of approximately 1,000,000 tonnes as is currently occurring.

As outlined in **Section 1.4**, in 2015 DSC brought action in the LEC against the lessee and the proponent for a breach of the EP&A Act. DSC claimed that operations at quarry were contrary to the 1991 development consent.

The LEC made declarations and orders restraining the respondents from carrying out certain activities at the quarry. The LEC decision was appealed by the proponent to the Court of Appeal. The Court of Appeal did not make the same orders as the LEC, but did find that some operations at the quarry were not authorised by the 1991 development consent. The effect of the Court of Appeal judgment was that the Quarry operations be restricted to the Approved Development activities, comprising:

a) winning material primarily for railway ballast

b) extraction only from Lot 5 DP 242210 (no extraction from Lot 6 DP 242210)

c) total processing on that part of Lot 1 DP 1006375 that formerly comprised Lot 2 DP 524511 of no more than 449,000 tpa

d) not greatly more than 30% of total production transported by road per annum

(e) total production limited by the terms of the EPL to 500,000 tpa.

Since 24 September 2019, the Quarry has operated within the parameters deemed as approved by the Court of Appeal.

The issues raised by DSC about the existing operations have now been determined by the Courts. **Section 1.4** sets out the confirmed extent of approved operations, which has been used as a baseline for the assessment of the proposed operation described in the ADA Report.

Daracon have considered community input and have completed further project feasibility investigations, detailed quarry design refinements and proposed additional mitigation measures. With the agreement of the Planning Secretary, Daracon is submitting an amended development application, supported by the ADA Report (**Part A** of this document).

12.10.12 Other Matters

In the Departments consideration of the current SSD application it is suggested that it may be beneficial to review the Draft Environmental Reports prepared for the previous Part 3A application on behalf of Railcorp in 2007. This application was never subsequently lodged as it was determined that the environmental impacts would be too significant. Council is willing to provide this information under separate cover due to the size of the files.

Noted. This is a matter for DPIE to consider.

Council is of the view that the extended operating hours has the potential to increase the negative impacts already being experienced in the Martins Creek and Paterson Communities. This issue will be expanded upon by Council's noise consultant in the supplementary report.

In response to ongoing community and government agency concerns, Daracon has committed to reduce the hours of operation for the Revised Project, as outlined in **Section 2.6**.

Daracon is seeking approval for the following operating hours:

- Quarry operations from 7.00 am to 6.00 pm Monday to Saturday, with the exception of road haulage of quarry product which will only occur Monday to Friday.
- Between 6.00 pm and 7.00 pm, provision for up to ten unladen Daracon trucks to return to the quarry for loading and parking at the quarry overnight, in readiness for departure from 7.00 am the following morning. (In the case of trucks loaded on Friday between 6.00 pm and 7.00 pm, departure will be no earlier than 7.00 am Monday morning).
- As an additional mitigation measure, blasting of quarry material will only occur between 11.00 am and 3.00 pm on Monday to Friday, with no blasting on Saturdays.
- No evening or night operation and no operation on Sundays or public holidays, apart from the following activities which may occur 24 hours seven days per week:
    - rail loading and transportation
    - necessary maintenance activities and/or environmental management controls, including vehicles/trucks moving in and out of the quarry for maintenance purposes as required.

12.11 Maitland City Council

12.11.1 Traffic and Transport

To mitigate the impacts of heavy vehicle road transport through the Maitland LGA, Council requests:

- **The quarry operator prepares a Transport Management Plan in consultation with Maitland City Council to minimise the traffic impact on residents located along designated access routes to the quarry.**
- **The heavy vehicle operator use retail services where possible, and should be required to undertake project cost evaluations for use of rail transport associated with major projects above a specified dollar value.**
- **Travel conditions such as limiting travel speed by agreement with local Council's where issues are raised through government agencies associated with school traffic, child care & aged care centres etc, along identified access routes.**
- **Limit heavy vehicle volumes to specific periods of the day to minimise impact on residents and road traffic service levels.**
- **Heavy vehicle operators that provide services to the quarry maintain their vehicle fleet on a regular basis, and the use of compression braking not be used in the Paterson & Tocal Road residential areas.**
- **Encourage the quarry to use Performance Based Standards (PBS) heavy vehicles with routes for these vehicles approved through the National Heavy Vehicle Regulator.**
- **Heavy vehicles are permitted to operate at PBS Level 1 General Mass Limits (GML) up to but not exceeding 50.0 tonnes Gross Combination Mass along Belmore Road Lorn and Paterson Road Largs, subject to posted local restrictions.**
- **The quarry operator/heavy vehicle operators are to comply with the requirements of Roads & Maritime Services.**

Following detailed analysis of Agency and community feedback on the EIS and subsequent stakeholder engagement, Daracon committed to a number of key project design changes and additional mitigation and management measures to minimise the project's environmental and social amenity impacts. This included reductions in proposed extraction limits, changes to quarry operating hours, reduced road transportation volumes and increased rail transportation (refer to **Part A** of this report).

As outlined in **Section 8.0**, should the Revised Project be approved, Daracon will implement a range of additional controls to mitigate and manage traffic and transport related impacts associated with the Revised Project. Daracon commits to review and update the Driver Code of Conduct to incorporate any relevant and new requirements as an outcome of the updated environmental assessment for the Revised Project, should it be approved. In addition, the Driver Code of Conduct will be reviewed and updated annually and as the need arises. Daracon also commits to reinforce the requirements of the Driver Code of Conduct with all organisations and drivers attending the quarry through regular communication and consultation.

- **Limit heavy vehicle travel speed during early hours through built area of Bolwarra/Bolwarra Heights and Lorn.**

The Revised Project is seeking approval to haul product trucks along one primary haulage route (Haul Road 1) as described in **Section 2.8.1** and shown on **Figure 2.11**. The primary haulage route (Haul Road 1) for the Revised Project will be via Flat Road and Melbourne Street to connect with the New England Highway, thus removing most trucks from the routes via Lorn and Brandy Hill which have been historically used for the quarry site.

In addition, Daracon has revised its proposed operating hours (as discussed in **Section 2.6**). Daracon has committed to reducing the hours of operation for the Revised Project in a response to community and government agency concerns. Road haulage of quarry product leaving the quarry will be limited between 7.00 am and 6.00 pm, Monday to Friday, with no haulage on Saturday, Sunday or public holidays. In addition to this, no quarry trucks will be traveling through Paterson prior to 6.45 am Monday to Friday.

Daracon is also applying for product loading of up to 10 Daracon-owned trucks (not contractor trucks) between 6.00 pm and 7.00 pm, Monday to Friday, with these trucks remaining parked at the Quarry overnight for morning departure from 7.00 am. In the case of trucks loaded on Friday evening, departure will be no earlier than 7.00 am Monday morning.

Those major projects likely to result in the quarry operating at high output volumes should be candidates for consideration of transporting material by rail. Where the quarry is operating near/at peak demand, then projects should consider the environmental cost and also undertake a project cost evaluation to determine the viability of moving material by rail.

In light of the potential impacts associated with traffic noise and congestion generated by the expanded quarry operation proposed, consideration should be given to increased rail haulage to limit the number of trucks on the local road along the haul route.

Daracon recognise that traffic and transport issues are the most significant issue for the Original Project, based on both submissions on the Original EIS and subsequent feedback during stakeholder engagement.

To further reduce the impacts associated with transport of quarry product via road and still maintain an economically viable project, Daracon have committed to increase the amount of quarry product transported by rail. Daracon are planning to expand rail markets and gain access to rail unloading capacity, in order to enable greater transportation of product by rail to service the Sydney market.

Local transport by rail, even for major projects, is not considered viable at this time. Project planning is not currently influenced by quarry operators and customers generally prefer road delivery. Rail delivery for major projects may become viable if all government bodies support project planning and consideration is given as part of the feasibility process.

Currently, the quarry is constrained by available train paths on the network and train loading hours which limits movements to one train per day. To alleviate some these constraints Daracon is seeking approval to load trains 24 hours per day and to construct an extension of the existing rail spur within the East Pit, to enable the loading of trains.

The proposed changes to the rail spur will enable the full range of quarry products produced by the quarry, not just rail ballast, to be loaded onto trains. A rail dispatch rate of 600,000 tpa equates to 6 to 8 trains per week depending on train length. This is likely to consist of 5 to 8 trains managed by Daracon (via a freight rail leasing company).

As a result of the increase to rail transportation, Daracon has committed to a reduction in peak hourly truck volumes. The Revised Project is now seeking approval for 20 laden trucks per hour (40 movements) between 7.00 am and 3.00 pm, and 15 laden trucks per hour (30 movements) between 3.00 pm and 6.00 pm.

Council considers the following potential impacts to result from the proposed extension project:

- **Residents complained about truck noise and road safety that stemmed from this project. The five areas of contention were:**
  - **the volume of trucks;**
  - **the early morning start and the continuing of noise throughout the day;**
  - **the truck noise created by the pavement condition;**
  - **noise from empty trucks; and**
  - **road safety in built up areas.**

Daracon recognise that public safety related to traffic and transport impacts is of key concern to the community. A key objective of the Revised Project has been to reduce traffic and transport related impacts associated with the operation of the quarry to further address concerns from the community and government agencies. This has included:

- reduction in tonnes transported by road to 500,000 tpa
- reduction in peak trucks per hour to:
  - 20 loaded vehicles (40 movements) between 7.00 am and 3.00 pm
  - 15 loaded vehicles (30 movements) between 3.00 pm and 6.00 pm
- road haulage of quarry product to occur 7.00 am to 6.00 pm Monday to Friday, with no haulage of product on Saturday, Sunday, public holidays or between 24 December and 1 January, inclusive
- no trucks through Paterson prior to 6.45 am Monday to Friday.

In addition, the Revised Project will utilise one haulage route (Haul Route 1) via Flat Road and Melbourne Street to connect with the New England Highway, thus removing most trucks from the routes via Lorn and Brandy Hill which have been historically used for the quarry.

The Revised Project is not expected to have any adverse impacts on the safety of the road network or other road users (refer to **Section 6.3**). As discussed above, while there will be an increase in traffic movements due to the Revised Project, this will represent a small increase over the existing flows along the primary haul route and through key intersections.

In response to community and government concerns, Daracon has committed to project changes to reduce the predicted noise impacts associated with product transportation from the Revised Project, including the reduction of road transportation (refer to **Section 2.8**).

As outlined in **Section 6.4** the updated NIA for the Revised Project has indicated that baseline/existing road traffic noise levels exceed the RNP criteria for some receivers due to existing traffic rates without the quarry trucks present. The addition of quarry trucks does not result in an exceedance of the RNP criteria where it was not already calculated to exceed with baseline traffic levels. Where the RNP criteria are already exceeded the predicted increase in road traffic noise due to the quarry trucks is predicted to be less than 2 dB. The RNP states that noise level increases of up to 2 dB(A) are considered barely perceptible to the average person.

The addition of quarry trucks will increase the road traffic noise levels at all the sensitive receivers assessed, however the maximum traffic generation scenario modelled will not increase the road traffic noise levels at any sensitive receiver by more than 2 dB and therefore meet the relevant RNP criteria for new developments.

- **The issue with truck volume noise is when the quarry has a contract to supply material to a project. The contract is driven by a timeline ... at peak capacity these volumes affect residents along the route by nearly 3.5 times as many trucks**

As discussed above, Daracon has committed to address concerns from the community and government agencies in relation to road transportation. This has included:

- reduction in tonnes transported by road to 500,000 tpa
- reduction in peak trucks per hour to:
    - 20 loaded vehicles (40 movements) between 7.00 am and 3.00 pm
    - 15 loaded vehicles (30 movements) between 3.00 pm and 6.00 pm
- road haulage of quarry product to occur 7.00 am to 6.00 pm Monday to Friday, with no haulage of product on Saturday, Sunday or public holidays.

- **The Acoustic Assessment fails to provide details of the location and offset of the monitors from houses. This was nominated as 'Section 5.5.8 however there is no Section 5.5.8 in the Report.**

An updated NIA has been completed for the Revised Project (refer to **Appendix D**), including an assessment of road noise associated with transportation of product from the quarry.

- **Information has not been provided on the existing haulage route.**

The Revised Project is seeking approval to haul product on the road network via the Primary Haulage Route 1 (described in **Table 2.6** and **Figure 2.13**). Other local roads may be used as required to service local projects on a campaign basis.

- **Three noise monitors were placed in Paterson, and one at Bolwarra Heights. Readings in Paterson were adjacent to businesses and houses, which appear inconsistent when compared to monitor readings in Bolwarra Heights, adjacent to rural residential housing. Without details it is difficult to assess the impact on the Maitland residents and indeed if the monitoring is representative of the impact of noise levels for residents in Bolwarra Heights.**

Two noise loggers were deployed as part of the NIA, one in Paterson and one on Gresford Road to the north of Paterson. There were four traffic counts undertaken as part of the TIA. The noise logging was undertaken at the same time as traffic counts to validate the noise modelling of the traffic noise.

As outlined in the NIA, receivers along the proposed road haul route were selected to assess the impact of proposed truck movements generated by the Revised Project. The nearest residential receivers in each speed limit area in each of the five zones were included in the assessment. Sensitive receivers, as defined in the RNP, were also identified along the route and included in this assessment. The location of loggers installed to measure road traffic noise levels were also assessed as receivers, to validate the modelling methodology.

- **Monitoring should be carried out again at locations that are representative of the typical environment on this road where noise would likely to be an issue.**

An updated NIA has been completed for the Revised Project (refer to **Appendix D**), including an assessment of road noise associated with transportation of product from the quarry.

- **Buttai Gravel have recently instigated a self-imposed reduction in operating hours due to complaints received about noise and truck volumes. This resulted in delayed entry of trucks into the township, which reduced flow-on complaints from most of the residents regarding the start time.**

Noted.

- **The EIS indicates that this will continue as an internal policy and code of conduct for drivers, however Council has not seen any document details.**

The Code of Conduct for divers is currently available on Daracon's website on the quarry website (www.daracon.com.au).

- **Council requests that**
  - **the vehicles be maintained on a regular basis to reduce engine and exhaust noise;**
  - **use of compression braking not be used on Paterson and Bolwarra Heights residential roads (60kph and less speed zones)**

Daracon has committed to a number of mitigation and management measures in relation to traffic and transport (refer to **Section 8.0**), including the regular maintenance of vehicles and reinforcement of truck speed limits, including:

- 40 km/hr through Paterson, Bolwarra and Vacy
- 20-25 km/hr at the intersection of King and Duke Streets Paterson
- 20 km/hr on Station Street, Martins Creek.

Daracon commit to review and update the Driver Code of Conduct annually and as the need arises. All drivers attending the quarry are required to sign and adhere to the Driver Code of Conduct, a copy of which is available on the quarry page of Daracon website at: https://daracon.com.au/storage/app/media/Enviro%20and%20Quarries%20Documents/Martins%20Creek/Martins-Creek-Code-of-Conduct.pdf.

- **There is some concern over the resulting hourly volume and its implications on the queuing of commuter traffic at the intersection of Pitnacree Road and Melbourne Street, East Maitland.**
- **The stacking of trucks will have an impact on Council roads and their ability to move off will have an impact on normal traffic flows. This needs to be investigated and assessed during normal truck movements, movements at maximum extraction and at peak hour haulage rate to determine the stacking of trucks and their impact on queuing at these traffic signals.**

As part of the Revised Project, the hourly transport rate has been reduced to a maximum of 20 laden trucks per hour to the quarry (worst case).

The updated TIA indicates that the traffic movements associated with the Revised Project will have an acceptable impact upon the overall operation of the signalised intersections of Pitnacree Road/Melbourne Street/Lawes Street and Melbourne Street/New England Highway. Whilst these intersections are predicted to suffer from increasing delays, this would be due to the continual traffic growth along the New England Highway in this location rather than a direct impact of the Revised Project (refer to **Section 6.3**).

Traffic flows associated with the Revised Project represent a small increase over the existing flows through the Melbourne Street/New England Highway intersection. In the AM peak between 8.15 am and 9.15 am

the total flows were 4,451 and the quarry traffic represents an increase of 0.89% over these flows. In the PM peak between 4.30 pm and 5.30 pm, the quarry traffic generated through the intersection represents a 1. 09% increase.

In light of the potential impacts associated with traffic noise and congestion generated by the expanded quarry operation proposed, consideration should be given to increased rail haulage to limit the number of trucks on the local road along the haul route.

As outlined above, Daracon recognise that traffic and transport issues are the most significant issue for the Original Project. As a result, to further reduce the impacts associated with transport of quarry product via road and still maintain an economically viable project, Daracon have committed to increase the amount of quarry product transported by rail.

As a result of the increase to rail transportation, Daracon has committed to a reduction in peak hourly truck volumes. The Revised Project is now seeking approval for:

- 20 laden trucks per hour (40 movements) between 7.00 am and 3.00 pm
- 15 laden trucks per hour (30 movements) between 3.00 pm and 6.00 pm.

12.11.2 Noise

The number of complaints regarding noise from existing road pavement has been reduced by the resurfacing and reconstruction of the pavement wearing course by Council. This will need to be strictly monitored to maintain the current pavement noise levels and may require more regular resurfacing treatments, should the pavement deteriorate, and noise levels increase.

Noted.

Daracon commit to the continued improvement of the Driver Code of Conduct and will add a requirement to the Code of Conduct calling for drivers to report any substantial road pavement irregularities along the haul route, with these reports being passed on to MCC for attention.

Daracon has also committed to making road maintenance contributions to MCC and DSC, should the Revised Project be approved.

Council, with a suitable contribution from Buttai Gravel, should be able to provide a reasonable road surface over the life of the quarry to reduce road pavement noise. This however is subject to negotiation of an acceptable Voluntary Planning Agreement, of which little detail has yet been forthcoming.

Should the Revised Project be approved, it is expected that Daracon will be required to make annual financial contributions to both DSC and MCC in the form of a VPA, in accordance with section 7.11 of the EP&A Act.

Daracon will continue consultation with MCC in relation to an appropriate VPA.

The road pavement improvements should improve noise generated by empty trailers, however vehicle maintenance should also be extended to the trailer, bogey and tailgate to possibly be fitted with dampeners to reduce noise.

TfNSW have minimum rules for trucks. Daracon has committed to continue the rigorous assessment and pre-qualification process prior to the engagement of any transport subcontractors. This includes a thorough

review of the subcontractor's relevant management processes and procedures to ensure compliance with the HVNL and the associated CoR requirements.

12.11.3 Voluntary Planning Agreement

The maintenance value determined by Council is through the current Extractive Industries Contribution Plan. By applying this methodology $56,000 per annum would be an appropriate contribution to maintenance works of Council roads rather than the sum of $2,189 per annum proposed by Buttai Quarries.

Maitland City Council seeks a road maintenance contribution of $56, 732 per annum, indexed annually, associated with the heavy vehicle traffic generated by the quarry.

Should the Revised Project be approved, it is expected that Daracon will be required to make annual financial contributions to both DSC and MCC in the form of a VPA, in accordance with section 7.11 of the EP&A Act.

Daracon will continue consultation with MCC in relation to an appropriate VPA.

12.12 Port Stephens Council

It should be noted that with removal of proposed Haul Route 2 from the primary haul route, there is now no major interaction of the Project with the Port Stephens LGA. Nevertheless, a response has been provided to the issues raised by Port Stephens Council on the Original EIS.

12.12.1 Biodiversity

The haulage route proposed in Port Stephens has high environmental values and thus environmental constraints, including:

- **Butterwick Road in particular contains important vegetation including remnant and rehabilitated Spotted Gum Ironbark Forest, an Endangered Ecological Community, Callistemon linearefolius, a threatened species and tree species representing habitat for koalas and other threatened fauna species.**
- **Butterwick Road has been targeted for internally and externally funded environmental projects including compensatory rehabilitation by Council and is a key component of a wider multi council regional project to conserve and improve road corridor EECs.**
- **The Martins Creek Quarry EIS must address all potential impacts as a result of its operation. If road upgrades are likely to be required as a result of the increased truck movements, potential impacts to roadside EEC and environmental attributes need to be considered in the EIS as impacts related to the development proposal.**
- **Consideration also appears to have not been given to the haulage route through Port Stephens Local Government Area and the effect of State Environmental Planning Policy 44 - Koala Habitat Protection.**

The Revised Project is seeking approval to haul product trucks on the road network on Primary Haulage Route 1 (as described in **Table 2.6** and **Figure 2.13**). There will be a need for quarry sales trucks to occasionally access other local road for local projects via Butterwick Road, but these would be the exception. Consequently, the Revised Project involves road intersections upgrades and bridge approach upgrades along the primary haul route only.

The updated BAR (refer to **Appendix J**) has assessed all direct and indirect impacts associated with the Revised Project, including the impacts from the proposed road upgrades (refer to **Section 6.8.5**).

The BAR included a koala habitat assessment (refer to **Appendix J**).

12.12.2 Traffic and Transport

Council raises the following issues:

- **The assessment has identified the lack of shoulder width on Butterwick Road as being one of the main safety concerns on the proposed haulage routes. The assessment notes that the width of Butterwick Road does not comply with current design standards but dismisses these concerns because there have been no recorded crashes involving haulage trucks from the quarry. Although the Blackspot funding during the 2015-2016 year has allowed the Council to improve an 800m section of Butterwick Road, there remains approximately 1400m length of road at the northern end of Butterwick Road that still does not meet required standards.**
- **The existing road pavement is deteriorating at a rate which is considered the normal lifecycle. Additional trucking traffic on the road would reduce the lifespan of the existing road pavement. The proposed trucking movements will increase the ESA by a factor of seven. This indicates the Butterwick Road pavement will deteriorate within a number of years. This rate of deterioration will result in any maintenance works failing and hence the need for a full upgrade to the pavement to withstand the proposed ESAs. Full scoping has not yet been determined, however the anticipated cost to upgrade the Road is in the vicinity of $12 million.**
- **The safety concerns regarding the lack of a right-turn bay at the intersection of Brandy Hill Drive and Clarence Town Road upgrade has been linked to the proposed expansion of the Brandy Hill Quarry. Council is of the opinion that the right hand turn will only affect Martins Creek Quarry and not Brandy Hill Quarry. Council will require this intersection to be upgraded to allow a right turn.**
- **Section 4.5.1 of the Section 94 Development Contributions Plan identifies the need for Council to seek contributions from developments that generate significant truck movements. These funds would be expended on road upgrades, repairs and ongoing maintenance to roads affected by the haulage route. • Based on unacceptable amounts of truck movements in 2015 (in excess of 1,000 per day) generated from Martins Creek Quarry and Brandy Hill Quarry, Council seeks to cap a limit on the truck movements.**

The Revised Project is seeking approval to haul product trucks on the road network on Primary Haulage Route 1 (described in **Section 2.8**). The Revised Project no longer proposed a primary haul route through the Port Stephens LGA.

Primary haulage route 1 accesses the quarry via Station Street, Grace Avenue, Dungog Road, Gresford Road, Tocal Road, Paterson Road, Flat Road, Pitnacree Road, Melbourne Street and the New England Highway. Butterwick Road and Brandy Hill Drive are not within the Primary Haulage Route 1 for the Revised Project.

An updated TIA has been completed for the Revised Project and is summarised in **Section 6.3**.

Council notes that the report does not consider the effects of the Mining SEPP 2007, Part 3, sub paragraph 16 in relation to (1)(b) the proposed haulage route within Port Stephens LGA.

Section 16 1(a) of the Extractive Industries SEPP states:

> *(1) Before granting consent for development for the purposes of mining or extractive industry that involves the transport of materials, the consent authority must consider whether or not the consent should be issued subject to conditions that do any one or more of the following—*
>
> *…*
>
> *(b) limit or preclude truck movements, in connection with the development, that occur on roads in residential areas or on roads near to schools, …*

It is noted that this is consideration for the consent authority. The Extractive Industries SEPP has been considered as part of the ADA, refer to **Section 4.2.3**. As outlined in Part A, to reduce traffic impacts associated with the operation of the Quarry, Daracon have committed to the following revised operational parameters as part of the redesign of the conceptual quarry plan for the Revised Project:

- reduction in tonnes transported by road to 500,000 tpa
- reduction in peak trucks per hour to:
    - 20 loaded vehicles per hour (40 movements) between 7.00 am and 3.00 pm
    - 15 loaded vehicles per hour (30 movements) between 3.00 pm and 6.00 pm
- road haulage of quarry product to occur 7.00 am to 6.00 pm Monday to Friday, with no haulage of quarry product on Saturday, Sunday or public holidays
- no trucks through Paterson prior to 6.45 am Monday to Friday
- removal of Haul Route 2 as a primary haul route (now proposed only to service local jobs as required).

The Revised Project no longer proposed a primary haul route through the Port Stephens LGA.

12.12.3 Noise

Council considers the dispatch of road transportation from 5:30 am to 7:00 pm excessive.

In response to ongoing community and government agency concerns, Daracon has committed to reduce the hours of operation for the Revised Project (as outlined in **Section 2.6**). The Revised Project seeks to allow product transportation via road from 7.00 am to 6.00 pm Monday to Friday only.

Council requests that the Department consider limiting of the use of compression braking for haulage trucks in residential and rural areas, particularly along Paterson Road, Butterwick Road and Brandy Hill Drive.

The Revised Project is seeking approval to haul product trucks on the road network on Primary Haulage Route 1 (described in **Section 2.8**). Primary Haulage Route 1 accesses the quarry via Station Street, Grace Avenue, Dungog Road, Gresford Road, Tocal Road, Paterson Road, Flat Road, Pitnacree Road, Melbourne Street and the New England Highway. Butterwick Road and Brandy Hill Drive are not within the Primary Haulage Route 1 for the Revised Project.

Daracon has committed to explore additional opportunities to further monitor driver conduct and truck convoying, as suggested by the community. **Section 6.11.4** provides relevant traffic management and mitigation measures proposed as part of the Revised Project.

The EIS advises that the quarry has an internal policy and code of conduct for their drivers however a copy of these documents was not supplied in the EIS for review.

The code of conduct for drivers is available on Daracon's website, refer to the quarry website (www.daracon.com.au) for a copy of the policy.

12.12.4 Council Contributions

With the increase of potential risks to public safety have been raised particularly through Butterwick Road & Brandy Hill Drive due to a lack of bus pick up and drop off areas for school children and an increase of truck movements. Council asks that a contribution towards the construction of the pathway be made to assist the residents of Brandy Hill Drive. Given the heightened risk for public safety for walking and driveway access, Council will consider an application for the reduction of speed limits along these roads.

As noted above, the Revised Project is seeking approval to haul product trucks on the road network on Primary Haulage Route 1 (described in **Section 2.8**). Other local roads may be used as required to service local projects on a campaign basis.

Primary Haulage Route 1 accesses the Quarry via Station Street, Grace Avenue, Dungog Road, Gresford Road, Tocal Road, Paterson Road, Flat Road, Pitnacree Road, Melbourne Street and the New England Highway.

The Revised Project does not include a primary haulage route through Butterwick Road and Brandy Hill Drive.

12.12.5 Voluntary Planning Agreement

The EIS discusses a proposed Voluntary Planning Agreement however Council has not received information in relation to a proposed VPA. Such items that Council would consider in a VPA would be the upgrade of roads, pathways, bus stops and a road haulage levy for the maintenance of the proposed haulage route.

The primary haul route for the Revised Project would not pass through Port Stephens LGA. A VPA with Port Stephens Council is no longer relevant for the Revised Project.

12.12.6 Other Matters

The EIS does not include the impact of the "likely interactions between the development and any other existing, approved or proposed extractive industry development in the vicinity of the site (such as the Brandy Hill Quarry)" as stated in the Secretary's Environmental Assessment Requirements. Accordingly Council has been unable to satisfactorily assess the overall impact on the environment, communities and Council owned lands.

HCM operates the Brandy Hill hard rock quarry located approximately 12 km to the south of the quarry. The Brandy Hill Expansion Project was approved on 16 July 2020. The Revised Project considers the Brandy Hill quarry as part of all relevant assessments. Cumulative impacts have been assessed as part of each technical assessment and are presented throughout **Section 6.0**.

Council is of the opinion that the EIS does not comply with the requirements of the Environmental Planning and Assessment Regulation 2000 and therefore the application cannot be accurately assessed until such time as Brandy Hill Quarry provides the relevant information to determine such effects.

Part A of this report presents the Amended Development Application which has been prepared in accordance with the EP&A Act, including Schedule 2 of the Environmental Planning and Assessment Regulation 2000. **Section 4.0** provides a summary of relevant planning considerations for the Revised Project.

13.0 Interest Group Submissions

As outlined in **Section 5.2**, a total of seven submissions were received from interest groups. A response to the issues raised in these submissions is included in the following sections grouped by theme.

13.1 Martins Creek Quarry Action Group

13.1.1 Court Proceedings

MCQAG request Department of Planning's assessment of this proposal to be deferred until the Court has ruled on this matter to enable:

a) the community, proponent and decision makers alike to know that the lawful current consents are prior to their consolidation and

b) baseline data within the EIS to be correctly reflected within a revised EIS prior to a decision on the Proposal being made

MCQAG request the Minister to require to proponent to revise the EIS to record baseline data, such that the existing impacts are document to be no greater than those approved via the 1991 consent issued by Dungog Shire Council

As noted in **Section 1.4**, the Court of Appeal judgment was delivered on 20 June 2019 and a stay of orders of 3 months was granted. The effect of the Court of Appeal judgment was that quarry operations be restricted to:

- winning material primarily for railway ballast
- extraction only from Lot 5 DP 242210 (no extraction from Lot 6 DP 242210)
- total processing on that part of Lot 1 DP 1006375 that formerly comprised Lot 2 DP 524511 of no more than 449,000 tpa
- not greatly more than 30% of total production transported by road per annum
- total production limited by the terms of the EPL to 500,000 tpa.

Since 24 September 2019 the quarry has been operated in accordance with the parameters of the Court of Appeal decision as set out above.

The Martins Creek Quarry Action Group requests that any new consent issued in this planning process limit operating hours to 7am to 5pm Monday to Friday in accordance with the DSC 1991 consent to ameliorate existing community impacts.

In response to ongoing community and government agency concerns, Daracon has committed to reduce the hours of operation for the Revised Project (as outlined in **Section 2.6**). Road haulage of quarry product will be limited between 7.00 am and 6.00 pm, Monday to Friday, with no haulage on Saturday, Sunday, public holidays or between 24 December and 1 January. In addition, no quarry trucks will be traveling through Paterson prior to 6.45 am Monday to Friday.

Daracon is also applying for product loading of up to 10 Daracon-owned trucks (not contractor trucks) between 6.00 pm and 7.00 pm, Monday to Friday, with these trucks remaining parked at the quarry overnight for morning departure from 7.00 am. In the case of trucks loaded on Friday evening, departure will be no earlier than 7.00 am Monday morning.

Additional traffic controls committed to by Daracon as part of the Revised Project, are outlined in **Section 8.0**.

13.1.2 Land Use

The EIS gives little consideration to the Dungog Shire Local Environmental Plan 2014 (LEP). The planning for the Dungog Shire and the areas of Martins Creek, Vacy and Paterson are embodied within this LEP. Section 79C of the EP&A Act requires consideration to be given to relevant planning instruments and we are of the understanding the LEP is one such instrument. Clause 3.2 (2) of the LEP states that the consent authority must have regard to the objectives of development in a zone when determining a development application in respect of land within the zone. The proposal is inconsistent with a number of objectives of RU1 Primary Production to which the land is zoned.

Section 4.2 provides a comprehensive description of relevant NSW planning instruments that have been considered in the preparation of the Amended Development Application for the Revised Project. The matters for consideration by the consent authority as set out in section 4.15 (previously section 79C) of the EP&A Act and **Table 4.3** outlines where they have been addressed in the Amended Development Application.

The majority of the Project Area is zoned RU1 Primary Production under the provisions of the Dungog Shire LEP (refer to **Figure 1.4**). Under the provision of the LEP, extractive industries are permissible with development consent in RU1 Primary Production. A small section of land within Lot 1 DP 204377, located towards the southern extent of the Project Area, is zoned RE1 – Public Recreation. This area does not form part of the quarry's operations. It is also outside of the proposed disturbance area and will therefore not be impacted by the Revised Project. As the development is permissible with consent, the Minister (or delegate) can approve the carrying out of the Revised Project.

The objectives of the RU1 Primary Production zone in the Dungog Shire LEP are:

- to encourage sustainable primary industry production by maintaining and enhancing the natural resource base
- to encourage diversity in primary industry enterprises and systems appropriate for the area
- to minimise the fragmentation and alienation of resource lands
- to minimise conflict between land uses within this zone and land uses within adjoining zones
- to provide for recreational and tourist activities that are compatible with the agricultural, environmental and conservation value of the land
- to promote the rural amenity and scenic landscape values of the area and prevent the silhouetting of unsympathetic development on ridgelines.

The Revised Project is considered to be consistent with these principles, as the quarry is an economically productive industry and is not likely to impact any rural and agricultural uses in the locality.

As discussed in **Section 6.2**, there are no agricultural areas would be removed from production or agricultural use as a result of the Revised Project.

The proposed final land use (refer to **Section 6.19.4**) is focused on promoting the rural landscape by establishing native grassland or exotic pastures in low lying areas whilst focusing on the re-introduction of pockets of woodland species across the benches consistent with endemic vegetation types.

It is also noted that the Revised Project is within an area which has been subject to quarrying since the early 1910s, with this quarrying activity coexisting with neighbouring land uses for over 100 years. The Revised Project seeks to maximise resource recovery from an existing operational quarry, limiting the potential for conflicts with other land uses.

The land upon which the development will impact on via the proposed haulage routes and via offsite impacts form industrial noise, blasting and dust are zoned R5 Large Lot Residential and RU5 Village, the proposal is inconsistent with a number of the objectives within the above land zoning. MCQAG request the Minister to consider the appropriateness of the impacts (past, present and future) having regard to the LEP.

As outlined in **Part A** of this report, Daracon has made significant changes to the Revised Project in response to community concerns. This has included reducing road transportation volumes and peak hourly truck movements and refined operational hours which lessen impacts along the haulage route.

As outlined in the relevant assessments:

- it is predicted that the addition of quarry trucks will result in minor increases to noise levels. Where the RNP criteria are already exceeded the predicted increase in road traffic noise due to the quarry trucks is predicted to be less than 2 dB. The RNP states that noise level increases of up to 2 dB(A) are considered barely perceptible to the average person
- air emissions from transport are predicted to remain well below the nominated EPA criteria and are therefore unlikely to lead to any adverse air quality impacts
- that ground vibration and blast overpressure levels can be managed to meet relevant blast emission criteria at all sensitive receiver locations through appropriate blast design and the implementation of appropriate control measures.

The Revised Project is therefore not considered to be inconsistent with the objectives of the R5 or RU5 zonings.

13.1.3 Air Quality

The Air Quality Impact Assessment understates release from processing equipment and fails to assess the impacts of in pit crushing operations using mobile plant. MCQAG requests the Minister to require the proponent to assess the impacts of mobile crushing plant on air quality predictions and provide technical justification for the release of dust in the manner shown in photos. We request the Minister to require the proponent to address and remedy the out-dated Lot 1 processing dust control measures that are currently in place.

A comprehensive assessment of potential air quality impacts of the Revised Project has been prepared for the Revised Project (refer to **Section 6.5**). This assessment has been in prepared in accordance with the EPA's Approved Methods of the Modelling and Assessment of Air Pollutants in NSW (EPA, 2016) and the SEARs (dated 4 August 2016). The assessment also considers the matters raised by government agencies in respect to air following the exhibition of the 2016 EIS.

As outlined in **Section 2.5.2**, no approval is sought for in-pit mobile crushing in the West Pit. Some mobile crushing and screening may occur in the Processing Area on a campaign basis to suit operational needs. Towards the end of the quarry life when the quarrying extends further in the East Pit, all processing of quarry product will occur using mobile crushing and screening equipment. The revised AQIA addresses the proposed use of mobile equipment (refer to **Section 6.5**).

As discussed in **Section 6.5.6**, a range of air quality monitoring and management measures have been incorporated into the Revised Project design, and these include:

- ongoing monitoring via the four deposition dust gauges, one high volume air sampler and one meteorological station
- all trucks travelling between the pits and crushing area will be restricted to clearly marked haul routes
- a water truck will be operated to reduce dust lift-off from internal roads and stockpile areas. The frequency of watering will increase during periods of extended dry weather and/or high winds.
- all vehicles travelling on internal unsealed roads will be limited to a speed appropriate for the conditions and safety, i.e. less than 20 km/hr
- the location and scale of activities which generate dust emissions will be modified and limited during periods of dry and windy weather
- mobile crushing will cease to be undertaken within the pit areas. Water sprays will be applied at transfer points on mobile crushing undertaken within the processing area.
- the following components of the fixed plant will have cladding applied (as outlined in **Section 6.4.6**):
    - screen two and three
    - tertiary crusher and hopper
    - primary screen and secondary crusher building
    - primary crusher
    - surge bin.
- water will be applied to stockpiles and hardstand surfaces to prevent dust lift-off where applicable
- establishment of a new bitumen sealed quarry access road up to the wheel wash
- all trucks leaving the quarry will make use of the wheel wash facility to limit dust tracking onto the public road network
- trucks entering and leaving the quarry that are carrying loads will be covered at all times, except during loading and unloading.

MCQAG submit grave concerns in regard to the air emission from the site currently and refer to lab testing of Martins Creek Quarry ballast showing free silica contact is ~14%. This level of silica content poses significant occupational health and safety concerns both to workers and to impacted residents. MCQAG request the Minister to impose conditions in any new consent that:

a. require improved air quality monitoring by replacement of existing depositional gauges with Taper Element Oscillating Microbalance (TEOM) monitors with data being made publicly available in real time and
b. require that fully enclosed processing facilities and improved dust suppression measures be mandated commensurate with modern processing facilities located within urban areas.

The revised AQIA assesses potential impacts of crystalline silica from the Revised Project (refer to **Section 6.5**).

Typically, the Andesite rock source at the quarry has a crystalline silica content of between 8 to 15% based on petrographic analysis. Dust from quarrying activities such as crushing may therefore contain free silica.

As outlined in the revised AQIA, only the crystalline forms are known to be fibrogenic (that is, dust which causes an increase of scar tissue after deposition in the gas exchange region of the lung) and only the respirable particles, being those which are capable of reaching the gas exchange region of the lungs, are considered in determining health effects of crystalline silica.

In response to community concerns, Daracon conducted ambient monitoring of respirable crystalline silica at the quarry on 14 June 2019 in order to inform further assessment of potential impacts from the Revised Project. This monitoring involved the installation of a monitor located on the site boundary and positioned downwind of the quarry activities on a day representative of normal operations.

As outlined in **Section 6.5**, the assessment found that the estimated maximum annual average respirable crystalline silica concentration at the site boundary is 2 µg/m^3, a result which is below the 3 µg/m^3 criterion noted by the Victorian EPA. Concentrations further from the site boundary, including at sensitive receptors, will be lower than 2 µg/m^3. There is no current NSW EPA assessment criteria for respirable crystalline silica.

MCQAG note the exclusion of receptors on the Western side of Dungog Road, Paterson Valley Estate, Martins Creek Village and Merchant Road residents who all fall within the affected area of Martins Creek Quarry operations. MCQAG request the Minister require the proponent to incorporate all sensitive receptors listed above within a revised Air Quality Impact Assessment.

A comprehensive review of land ownership and receiver locations was undertaken as part of the revised AQIA process. The privately owned residential receivers that could potentially be affected by air emissions from the Revised Project are shown in **Figure 6.7** and discussed in **Section 6.5**. These include private properties on the western side of Dungog Road, Paterson Valley Estate in Vacy, Martins Creek Village and Merchant Road.

The Air Quality Impact Assessment makes reference in section 5.2 to dust impacts from trucks in Paterson and Bolwarra but fails to assess the air quality impacts to residents (some of whom who live only metres from the haulage route) due to diesel emissions at the proposed scale of operations. MCQAG request the Minister require the proponent to assess the impacts of diesel emissions and air quality along the haulage route.

A revised AQIA was prepared for the Revised Project which includes an assessment of road dust and diesel emissions from trucks travelling on public roads along the primary haul route.

As outlined in **Section 6.3.5**, the Revised Project will meet relevant criteria for both road transport and diesel emissions.

The emission inventory table 8 of the Air Quality Impact Assessment, and MCQAG assume the modelling itself has incorrectly excluded vegetation removal and top soil clearing, mobile crushing plant, pug mill processing, rail loading and site rehabilitation works. The inventory table also makes reference to only 12 trucks used to transport product to market. MCQAG ask the Minister to require the proponent to incorporate mobile crushing plant, pug mill processing, rail loading, vegetation clearing and site rehabilitation works and actual proposed truck numbers per hour within an updated revision of the Air Quality Impact Assessment.

A revised AQIA was prepared for the Revised Project which includes consideration of all potential dust generating quarry activities (refer to **Appendix E**). The most significant emission to air from the Revised Project will be dust (particulate matter) due to material handling, material transport, processing, wind erosion, and blasting. Estimates of these emissions are required by the dispersion model. As outlined in the AQIA, total dust emissions have been estimated by analysing the material handling schedule, equipment listing and quarry plans and identifying the location and intensity of dust generating activities.

Dust emission inventories have been developed for each of the modelled scenarios, namely:

- "Previous Operations" – this scenario was developed in order to estimate the contribution of the Quarry to local air quality in 2015 with production assumed to be in the order of 900ktpa.
- Year 2, Year 10 and Year 20 – this scenario represents proposed future operations, and assuming maximum production at 1.1. Mtpa. These scenarios cover a range of machinery locations and quarry extents, therefore addressing the potential worst case operating scenarios.

It is noted that the main intent of the inventories is to capture the most significant emission sources that may affect off-site air quality. Not every source will be captured, however, the contribution of emissions from sources not identified will be captured in the assumed background levels and these data have been considered for predicted contributions from the Revised Project. The emission estimates also include particulate emissions associated with fuel combustion (predominately diesel) by on-site machinery.

The Air Quality Impact Assessment is silent on any proposed changes to location of the wheel wash-down bay proposed with the change in quarry access road. The Engineering Assessment eludes to the change in wheel wash-down location. MCQAG request the Minister require the proponent to clarify all proposed improvement to air quality mitigation measures (including relocation of wash down facilities) within the EIS and or Air Quality Impact Assessment.

As outlined in **Section 2.7.2**, a new site access road is proposed that will allow for direct vehicle access between the quarry and Dungog Road, to the north of Grace Avenue. The proposed new access road will be sealed up to a new vehicle wheel wash bay (refer to **Figure 2.10**) and regularly maintained by Daracon throughout the life of the Revised Project. The wheel wash will be constructed on the outbound truck path for dust suppression and to reduce tracking of material onto public roads.

The existing access road and wheel wash will be utilised until the new access has been constructed.

Part A of this report and the revised AQIA outline all project details for the Revised Project, including air quality mitigation measures proposed.

13.1.4 Noise

RECOMMENDATION: Either the background noise survey needs to be repeated for Noise Assessment Group (NAG) 3 at a location that is not affected by existing quarry noise, or a conservative minimum PSNL of 35 LAeq, 15min must be adopted for this area.

RECOMMENDATION: The NIA should specify exactly where each traffic noise monitor was located and whether distance and façade corrections are required and have been applied to measured data.

The NIA should report the number of quarry trucks and measured noise levels in each of the two noise survey periods, allowing an estimate of the effect of quarry trucks on measured noise levels.

The measured traffic noise levels must exclude existing quarry truck noise to present a correct baseline, either by identifying and removing noise from each quarry truck pass by event or by other appropriate means such as careful correlation with weighbridge records.

RECOMMENDATION: The PSNL at NAG3 should be recalculated based on the correct background noise levels determined in the absence of existing quarry noise. The NIA should correct the flawed logic related to the effect of existing quarry noise levels on the amenity criteria derived in Table 8.

The alternative noise criteria listed in Section 5.7.2 and Table 11 of the NIA must be either deleted or properly justified.

RECOMMENDATION: The NIA should clarify the sleep disturbance criteria in relation to NAG 1, including the higher proposed criterion only applying during train loading at night and the lower and more conservative criterion of 45 LAmax applying to all NAG 1 receptors at other times.

RECOMMENDATION: The NIA should present the source sound power levels in octave bands and properly determine the need for a low frequency correction to the predicted received noise levels.

RECOMMENDATION: Adjust traffic noise criteria based on correct baseline traffic noise levels. Include night traffic noise criteria in Table 12 and assess noise from traffic before 7 am to the night criteria, rather than dismissing the period from before 5 am to 7 am as a shoulder period. Add traffic related sleep disturbance criteria to the NIA.

RECOMMENDATION: DP&E should consider whether legacy noise issues exist, and the extent of any issues, considering the currently unresolved question of existing quarry production levels compared to the current consent and the relatively recent nature of high operating and traffic noise levels. This question must be resolved in order to place predicted noise levels in their correct context.

RECOMMENDATION: The NIA should present clear figures showing the exact location, width and extent of proposed noise barriers and other data regarding height and/or RL for each barrier or section of barrier, for each assessed scenario or stage. The NIA should properly assess construction noise levels as specifically required by the SEARs. As the NIA correctly states that the construction noise policy does not apply to extractive industries, construction noise levels require assessment to the INP noise criteria.

RECOMMENDATION: The NIA should present clear figures and/or tables showing the exact location of modelled noise sources and haul routes, sound power levels for each source or route in octave bands and other data sufficient to reproduce the noise contours, for each assessed scenario or stage. Details regarding all proposed operational noise control measures, perhaps in the form of a noise management plan and/or statement of commitments are required to ensure the NIA reflects the proposed quarry management strategy and to demonstrate that practical management measures will achieve the stated noise levels and are technically and economically feasible.

RECOMMENDATION: The NIA should present octave or 1/3 octave sound power data for each modelled source and ensure all modelled sound power levels are realistic and achievable by actual plant and equipment operating or proposed to operate within the quarry. If the listed sound power levels result from on-site noise measurements as claimed in the NIA, then the on-site noise measurements should be repeated using the correct procedure with plant and equipment operating in a more representative manner. The tables of sound power levels in the NIA and appendices should be corrected to be consistent with the actual operating sources and the noise model input files. Detailed engineering drawings of proposed acoustic treatments are required to justify proposed noise reductions in the order of 45 dBA from some sources such as the primary crusher building, as such reductions are likely to be very difficult to achieve and can certainly not be achieved by installing steel cladding or other common industrial building materials. The drawings should include details regarding personnel and equipment access, acoustically controlled ventilation, vibration isolation and other aspects of the design required to achieve such significant noise reductions. The NIA should also describe management measures, such as keeping doors and any windows closed and maintenance of silencers and other important acoustic elements, to ensure the design noise reductions are achieved and maintained over the long term.

RECOMMENDATION: The NIA should present a proper assessment of weather conditions in the area according to the INP including winds in all time periods, temperature inversions and drainage flows.

The noise model results should be updated to reflect the revised weather conditions (and other important parameters such as source sound power levels discussed in this report).

RECOMMENDATION: The NIA author(s) should be required to make all requested files available in a timely manner, although the time to do this has now passed. DP&E staff should consider commissioning an independent review and confirmation of the noise model inputs given the significant issues with various input data described above and the high residual noise impacts predicted in the NIA compared to INP criteria at some receptors.

RECOMMENDATION: The NIA should ideally present 1/3 octave predicted noise levels to demonstrate quarry noise will not be tonal as defined in the INP. This should specifically include reverse alarms fitted to mobile machines which are not currently mentioned or assessed in the NIA.

The NIA must predict noise levels in octave bands or at least predict both dBC and dBA levels at all receptors to determine the need for the low frequency modifying factor required by the INP.

RECOMMENDATION: The NIA should show recalculated noise contours after correcting the sources etc as described above, then ensure the contour colours match the legend colours or label the contours with the dBA values to resolve ambiguous noise levels.

RECOMMENDATION: The NIS should be revised to show correct baseline traffic noise levels in the absence of existing quarry traffic. The NIS should recalculate noise levels at receptors with and without proposed quarry traffic to indicate the correct increase in traffic noise levels due to the quarry, particularly for comparison with the 'relative increase' traffic noise criteria.

The NIS should assess traffic related sleep disturbance to various representative receptors along the haul routes.

The NIS should consider traffic noise levels from all proposed routes, not just through Paterson and Bolwarra, including cumulative traffic noise levels for routes common to Brandy Hill Quarry traffic.

The NIS should comprehensively consider mitigation measures including truck transport times, the proportion of product despatched by rail, any alternative transport routes and other measures to show all feasible and reasonable mitigation measures have been applied to the project.

RECOMMENDATION: The NIS should more clearly justify the proposed 24 hour rail loading and associated significant noise impacts to nearby residents in the more sensitive night period, ideally including guaranteed reductions in truck numbers on local and regional roads to reduce impacts on the community as a whole, or at least to avoid an increase in noise impacts as currently proposed.

The NIA should assess construction noise associated with the proposed rail siding noise wall, and associated with the proposed extension of the rail siding, to nearest residences as specifically required by the SEARs.

In addition to the peer review recommendations, MCQAG also notes that the EPA Road Noise Policy requires Noise Impact Assessments to consider noise impacts to places of worship and public open spaces. MCQAG note two operational churches (St Pauls Anglican Church and Bolwarra Uniting Church) and three public open spaces (John Tucker Park, Kings Park and Bolwarra Heights Scenic Lookout) are located along the haulage route. In accordance with the Road Noise Policy, MCQAG request the Minister require the proponent to complete noise impact assessments on the above listed places of worship and public open spaces.

MCQAG comments in relation to the NIA for the Original Project are noted. As outlined in **Part A** of this report, Daracon have made significant changes to the Original Project in response to community and government concerns.

An updated NIA has been completed for the Revised Project (refer to **Section 6.4**). The updated NIA has been prepared in accordance with the SEARs and the NPfI. The NPfI (NSW EPA, 2017) replaced the NSW INP (NSW EPA, 2000) in October 2017. Transitional arrangements for the implementation of the NPfI state that:

> *…Where SEARs were issued before the release of the new policy, and have not been modified, the assessment requirements referenced in the SEARs will apply for a period of two (2) years from the date of issue of the SEARs consistent with the provisions in the Environmental Planning and Assessment Regulation 2000, Schedule 2, Part 2, 3 (7).*

The SEARs for the Original Project make reference to the INP, however, in accordance with the transitional arrangements, and with consideration to the date of issue of the SEARs (4 August 2016), the provisions of the NPfI have been applied to the updated NIA. Accordingly, the project noise criteria have been developed with consideration to the NPfI.

The assessment has also considered road and rail traffic impacts associated with Revised Project as well as the noise impacts from construction activities in accordance with the NPfI, the NSW Road Noise Policy (DECCW, 2011) (RNP), the Rail Infrastructure Noise Guideline (RING) (NSW EPA, 2013) and the Interim Construction Noise Guideline (ICNG) (DECC, 2009).

It should be noted that some of the concerns raised relate to specific details within the previous noise assessment undertaken as part of the EIS for the Original Project (RCA Acoustics, 2016). The revised NIA has been undertaken as a new, standalone assessment of the Revised Project, and therefore a number of the comments raised are not applicable to the new NIA.

13.1.5 Blasting and Vibration

RECOMMENDATION: The proponent should be required to further investigate blasting issues to resolve the community's concerns, either by commissioning independent blast monitoring to confirm vibration and overpressure levels and/or by commissioning independent investigations into geotechnical and structural issues for a number of the apparently worst affected residences.

MCQAG note in the last two public meetings blasting impacts include shaking of crockery, cracking of walls and brick work, disturbance to horses and other pets and even the reported shaking off of a toilet cistern from a bathroom wall. The blasting impacts due to the intensity variability also result in un-nerving anxiety imposed upon neighbouring residents who must wait throughout the day for quarry silence as pit operations are halted and then brace themselves, their pets and their households for the blast. Will it be big or a small one?

The experiences of residents to do not correlate to the published blast monitoring data that indicates compliance with relevant criteria. Section 3 of J0232-01-R1 Acoustic Review within the Bridges Noise Impact Assessment Peer Review includes commentary and recommendations in regards to blasting impacts. MCQAG request the Minister require the proponent to implement the recommendations outlined in the Acoustic Review in regards to blasting.

In 2018, the EPA conducted an independent audit of blast monitoring by Daracon, which included monitoring of 13 separate blasts from the quarry during 29 March 2018 to 27 August 2018 in View Street Vacy. The EPA audit outcomes were provided to Daracon in December 2018 and found that:

- the blasts all occurred between 10.00 am and 2.00 pm Monday to Friday, in accordance with Daracon's EPL which requires blasting between 9.00 am and 3.00 pm Monday to Friday
- the blast levels recorded were broadly consistent in magnitude with blast data reported by Daracon over the previous 24 months
- the highest recorded ground vibration was 2mm/s, compared to the EPL limit of 10mm/s
- the highest recorded overpressure was 109 dBL, compared to the EPL limit of 120 dBL
- all measured data collected by both the EPA and Daracon complied with the EPL limits by some margin
- monitors are set to 'trigger' at predetermined levels. Some of the blasts did not trigger one or the other of the monitors. This occurred mostly when vibration or overpressure was low compared to the limits
- there was reasonable correlation between EPA and Daracon values measured for both vibration and overpressure
- based on the data collected during the audit, the EPA considered that Daracon's vibration and overpressure monitoring undertaken during the EPA's review period was appropriate for complying with the conditions of the EPL
- there were no breaches of the EPL limits or conditions.

Notwithstanding, Daracon commit to independent blast monitoring for three blasts in the first year of the Revised Project, and every five years thereafter. The monitoring will be undertaken by an independent, qualified person with blast monitoring times and locations suggested to be nominated by the Martins Creek CCC, or a representative of DSC.

For blast damage criteria for residential structures AS2187.2-2006 refers to other available standards such as British Standard BS 7385-2:1993 and American (USBM) RI8507. The blast damage criteria are dependent on the frequency and structure type, and range from 15 mm/s at 4 Hz, 20 mm/s at 15 Hz, increasing to 50 mm/s at 40 Hz.

The lowest transient vibration value for cosmetic damage is estimated at 15 mm/s at 4 Hz. The cited range is well above the blast emission criteria for human comfort (5 mm/s and 10 mm/s). It therefore follows that when vibration limits for human comfort are imposed, compliance with blast damage criteria for residential structures will be achieved.

Based on the ongoing compliance with the blasting emission criteria for human comfort, the potential is very low that blasting at the quarry is the primary cause of the property damage. Nevertheless, in response to residents' feedback following the Air and Blasting CAF, Daracon committed to commission a suitably qualified, experienced and independent person to undertake a structural and vibration assessment of one representative property in View Street, Vacy. The commitment was also made that if the assessment confirms any structural damage caused by blasting from the quarry, Daracon will liaise with relevant specialists and the community to investigate and implement a broader structural monitoring program in relation to blast impacts from the quarry.

With the permission of the property owner, the structural and vibration assessment was undertaken at 24 View Street, Vacy, during a quarry blast on 26 June 2019, within three months of Daracon's commitment. The assessment was conducted by a qualified structural engineer, generally in accordance with AS 4349.0-2007 and sections 4 and 5 of the Royal Institute of Chartered Surveyors Guidance Note 63/2010 where applicable.

The results of the assessment were reported back to the owner of the property and are summarised below:

- Vibration monitoring at 24 View Street, Vacy during the blast measured the peak particle velocity at a magnitude of 10 to 20 times lower than the levels likely to cause damage to residential properties.
- The structure response, including assessment for resonance, revealed that during the blast the dwelling was subject to deflections 20 times lower than the levels likely to cause damage to residential properties.
- The dilapidation inspection revealed that the cause of the existing cracking and damage is settlement and typical thermal/moisture driven movements in the building material and soil foundations.
- Due to the representative selection of the property, and its proximity to the quarry, the assessment concluded that it is unlikely that any other residential buildings located in View Street Vacy have been damaged due to the blasting operations at the quarry.

RECOMMENDATION: The proponent should ensure existing blast monitoring procedures are appropriate and ensure adequate training of monitoring personnel to avoid potentially incorrect monitoring results.

Daracon engages specialist contractors to undertake the blast monitoring for the quarry. Specialist contractors have appropriate qualifications, skills and knowledge to enable competent application of procedures and work methods for both undertaking the blasting, monitoring the blasts and reporting the results.

RECOMMENDATION: The proponent should measure existing ground vibration levels produced by heavy vehicles travelling on public roads, particularly at the closest and worst affected residences, to determine compliance with criteria and likely future compliance. In the event of existing and/or predicted future non-compliance with criteria, the EIS should propose mitigation measures.

Vibration impacts generally only arise when a heavy vehicle hits a pothole, speed bump or other irregularity at speed and the energy from the impact is then transferred through the ground to adjoining buildings.

A review of the Vibration Guidelines and academic studies (see for example Basekar et al, 2015) indicate that vibration impacts from trucks under any conditions on bitumen roads is unlikely to cause structure damage to buildings but can have cosmetic effects in extreme cases. The key factor in determining vibration impacts is irregular road surfaces (e.g. cobbles, corrugations or potholes) and the speed of the vehicle (see for example Crispino 2001).

Consistent with the findings of academic studies, the Vibration Guidelines recommend:

> *Mitigation techniques could therefore include the restriction of use of heavy vehicles on particular roads, limiting speed and reducing the occurrence of surface irregularities such as potholes and speed humps.*

Daracon will include a requirement in the Driver Code of Conduct a requirement to report any substantial road pavement irregularities in Paterson, with these reports being passed on the DSC for attention. Directions will also be given to drivers alerting them of any identified road irregularities to enable them to minimise speeds where these occur when driving through Paterson. It is noted that these instructions are also consistent with good operating practice as it reduces wear and tear on vehicles and improves vehicle safety and driver comfort.

Daracon have also committed to reducing truck speeds through Paterson to 40km/hr, with further reduction to 20 to 25km/hr around the King and Duke Street intersection. The combination of reduced truck speeds and appropriate road maintenance is consistent with the recommendations in the Vibration Guidelines.

In addition, Daracon will contribute towards road maintenance and pavement upgrades for impacts on the road pavement resulting from the transport of product from the Revised Project, should the Revised Project be approved, as part of the VPA.

13.1.6 Geology and Soils

We have attached a peer review of the Geology and Blast Vibration Assessment (GVA). The review was performed by a technical expert. It identifies a number of factual inaccuracies in regards to the assessment of geology and blasting impacts on Paterson Valley Estate Vacy. The review also includes an independent calculation of the Proponents claimed reserves the results of which indicate that the resource size has been grossly over stated within the EIS.

We request the Minister to request the Division of Resource and Energy or other NSW Government nominated expert to perform an independent estimate of the reserves to verify the Proponent's claims. Should the reserves be found to be erroneous we request that the Minister require the Proponent to provide an amended EIS that incorporates these revised resource figures and that these are taken in to account in regards to ecologically sustainable development principles.

A peer review of the Geology Assessment completed for the Original Project EIS was undertaken by Graham Holt BSc (Hons), MEng Sci. F AusIMM on behalf of the Martins Creek Quarry Action Group in 2016 (Holt, 2016) which highlighted two key issues regarding the Blasting and Vibration Assessment and the Geological Assessment. The peer review raises concerns over the methodology used to determine the reserves of quarry material left at the quarry and the geological linkage between the quarry and the surrounding residents.

The concerns over the geological linkage between the quarry and the surrounding residents was raised from the conclusion of the Geology and Blasting Vibration Assessment, where the report concluded that the "Geological assessment showed that there was no direct geological linkage between the quarry and residents, which may create a direct pathway for ground vibration". The peer review of the assessment outlined that the type of rock does not matter and that blast vibration will travel through all rocks regardless of the lithology and the fact that the closer and bigger the blast, the bigger the ground vibrations. The peer review also noted that a shrink swell test indicates a moderate level of cracking during shrinkage, and on the basis of one test this really is an inconclusive statement. The peer review also raised concerns regarding the methodology used to determine the reserves of rock left at the quarry. The assessment for the Original Project noted that the remaining geological reserves of the quarry was calculated at 14.1 Mm^3 (38.07 Mt) of latite; however the peer review disputes this claim by undertaking a manual method to determine the volume of an irregular body as set out in the Field Geologists' Manual

published by the Australian Institute of Mining and Metallurgy, Monograph 9, Edition 3. The peer review determined that the latite resource was 14 Mt across the site; with the west pit containing 10.6 Mt of potentially quarryable rock while the east pit area contains 3.4 Mt.

In response to the Holt (2016) peer review regarding the geological linkage of the quarry and surrounding residential areas, the linkage between the stratums examined in the EIS for the Original Project refers to the fact the vibrations between the same rock unit are more likely to transmit vibrations that those of differing rock units. Vibrations within the same competent unit and along strike are most likely to produce the highest vibrations, as opposed to across strike or between other units.

A review of the methodology used in the peer review was undertaken. Three-dimensional (3D) computer modelling packages, such as 12D, uses points to create triangles which in turn creates surfaces of existing terrain and proposed final surfaces. The two surfaces are then intersected to calculate volumes with greater accuracy across the whole geological deposit. The methodology to determine the reserves at the quarry involved the use of 12D modelling software which included the 4 parallel cross-sections from the northern most pit extraction area at 200 m apart. The 5th parallel cross section was placed approximately 176 m away from the fourth cross section in order to keep within the extraction boundaries.

The review of the Holt (2016) methodology found that the available latite resource at the quarry is considerably different. The data presented in the **Table 13.1** and **Table 13.2** do not replace the volume presented in the Original EIS, but they demonstrate the difference in results using the2D cross section types or resource assessment methodology, and by using a 3D model, in this case 12D.

Table 13.1 Holt (2016) Interpretation Using Areas from Peer Review

Cross section No.	Area (m²)	Distance (m)	Volume (m³)	Tonnes
1	6,280	200	1,256,000	3,278,160
2	8,820	200	1,764,000	4,604,040
3	3,875	200	775,000	2,022,750
4	8,550	200	1,710,000	4,463,100
5	0	200	0	0
East Pit 4	1,830	50	91,500	238,815
East Pit 5	4,180	50	209,000	545,490
East Pit 6	7,090	50	354,500	925,245
Total			**6,160,000**	**16,077,600**

Table 13.2 Quantities Using Holt (2016) Method with Areas from the 12D Model

Cross section No.	Area (m²)	Distance (m)	Volume (m³)	Tonnes
A	8,620	200	1,724,000	4,499,640
B	9,920	200	1,984,000	5,178,240
C	10,640	200	2,128,000	5,554,080
D	18,415	200	3,193,520	8,335,090
E	14,970	176	2,634,720	6,876,620
East Pit 4	Not assessed	Not assessed	Not assessed	Not assessed
East Pit 5	Not assessed	Not assessed	Not assessed	Not assessed
East Pit 6	Not assessed	Not assessed	Not assessed	Not assessed
		Total	**11,664,240**	**30,443,670**

The review of Holt (2016) has shown that the 2D cross section technique adopted to calculate the total volumes for the quarry can produce significantly varying results, the variable floor and upper surface topography cannot be replicated using 7 cross sections over a 65 ha resource envelope. The 2D resource methodology is not supported for assessments given the current 3D technologies available.

With respect to blasting, as noted in the GVA referred to in the response above, Bridges Acoustics undertook independent monitoring of a blast event on 17 November 2016 at a residence in Wayaka Close Martins Creek. Based on a comparison of the results reported by the proponent and those independently obtained, it was found that "these results are consistent indicating the published blast monitoring results are reliable at least for this blast and presumably for all other blasts."

An updated geological assessment has been prepared for the Revised Project (refer to **Section 6.2** and **Appendix B**).

In response to the proponents suggestion throughout various sections of the EIS that the MCQ andesite resource is of significance to the Hunter region and the state. We have attached within Appendix 3 Hunter Region Quarried Material Supply Capacity a map showing hard rock resources within the state. We submit that from the map and data it can be demonstrated that there is other hard rock resources in the region and that there is existing supply capacity within the Hunter construction aggregate market and that 800 Daracon staff and contractors prospects of employment are not solely dependent on the expansion of MCQ as seems to be inferred by the proponent.

The quarry supplies and delivers high quality material and products for use in concrete, asphalt and general civil construction, including products to meet the specifications of RMS, ARTC and Sydney Trains. The quarry provides a diverse range of products that are more extensive than what is typically supplied within the hard rock quarrying industry.

Most other quarries target materials into a particular market sector. This is a critical and particular point of difference between the quarry and other hard rock quarry producers, signifying the significance of what the quarry provides to the Hunter region and the State.

As discussed in **Section 3.2**, hard rock quarries, particularly those that are suitable for high strength concrete and asphalt applications, are limited in NSW. This situation is not dissimilar in the Hunter Region. The Lower Hunter Region is supplied by five hard rock quarries considered to have the capacity to service the demand placed by the construction industry with high strength aggregates to produce concrete/asphalt and high-quality base and subbase materials for RMS applications. These being:

- Daracon/Buttai Gravel, Martins Creek
- Boral Quarry, Seaham
- Hanson Quarry, Brandy Hill
- Hunter Quarry, Karuah
- Quarry Products Newcastle, Allandale.

Seaham and Brandy Hill quarries belong to vertically integrated major companies predominantly supplying their own company requirements. Karuah and Allandale quarries and service the general Lower Hunter and Newcastle markets. Additionally, there is a conglomerate quarry being Teralba Quarry (Metromix/Hanson Heidelberg/Holcim Lafarge). Whilst not providing direct competition, there is indirect competition from some minor roadbase and engineering fill material quarry sources and sand quarry sources that provide unbound roadbases and sand market competition.

When assessing the importance of the quarry resource within the market it is important to note that significant customers include business with their own individual sources of either hard rock quarry products, conglomerate quarry products or sand quarry products (including Boral, Hanson, Holcim, Metromix, Redicrete).

Demand for products from the quarry will be driven by a combination of:

- infrastructure development – State or Federal spending on roads, rail, ports, schools, housing, hospitals, etc.
- private investment – commercial development, industrial development and residential construction.

As outlined in **Section 3.3.1**, the forecasted growth within the Hunter Region and the Government's commitment to upgrading infrastructure, will increase market need for hard rock quarry products in the region, to service the demand for building and construction materials. Whilst the quarry is critical to the ongoing development and growth of the Hunter area, it is anticipated that it will have a significant place in the State market due to the potential utilisation of the rail siding and limited hard rock quarries in NSW locations that are forecast to have major road and rail infrastructure upgrades completed.

Further details on the strategic need and justification for the Revised Project is provided in **Section 3.0**.

We request the Minister to obtain independent advice on the Hunter construction material market to determine the resource significance to the region and the state. Should the Minister's advice confirm its criticality we request the Minister to require through consent conditions appropriate capital investment and funding in order for the resource to be extracted in an ecologically sustainable and socially acceptable manner.

Daracon will assist DPIE with any review into the Hunter construction material market undertaken.

Should the Revised Project be approved, it is expected that Daracon will be required to make annual financial contributions to both DSC and MCC in the form of a VPA, in accordance with section 7.11 of the EP&A Act.

13.1.7 Traffic

The EIS and Traffic Impact Assessment omit any estimates on ... construction vehicles, no estimate on daily vehicular access that would relate to re-fuelling, supply of pug mill product, supply of bitumen pre coat, maintenance vehicles nor are there any estimates on heavy haulage/permit load movements proposed to occur to and from the facility. We request the Minister require the proponent to update the TIA to incorporate estimated daily vehicle movements of all vehicles planned to access the proposed development.

As described in **Section 2.9**, construction activities are planned to occur at different times over the first five years following commencement of the Revised Project. Each of the construction activities will occur over different durations and may not all occur simultaneously. In general, construction traffic is expected to be minimal as the majority of the proposed works will be located within the quarry site.

A comprehensive TIA has been prepared to assess the road traffic impacts of the Revised Project (refer to **Section 6.3**), including an assessment of construction traffic (refer to **Section 6.3.4.1**). Estimates for construction related traffic movements to and from the quarry have been assessed and the daily ancillary vehicular movements (including delivery of materials, re-fuelling, etc.) associated with the Revised Project are included in the proposed maximum truck movements.

Overall, construction related traffic is not considered likely to result in any significant impact on the local road network.

As with other impact assessments the TIA has incorporated background (existing) conditions that include existing heavy vehicle traffic from the site within data. We request the Minister require background traffic data to exclude effects of the current disputed illegal operations and to consider the traffic impacts associated with increasing heavy haulage from the site from the 1991 approved 24 truck movements per day to the proposed 80 truck movements per hour as outlined in the Proposal.

Traffic analysis undertaken in the updated TIA assessed three operational scenarios, being:

- no quarry truck movements
- IEMP - 20 laden trucks per hour/90 laden per day (180 movements)
- proposed - 20 laden trucks per hour/140 laden trucks per day (280 movements) (as the worst case).

A summary of the TIA is provided in **Section 6.3**. The updated TIA indicates that the proposed annual output of the quarry for which approval is being sought will have an acceptable impact upon the road network that forms the haul route between the New England Highway and the Project Area.

No assessment or commentary is made within the TIA or the EIS main body in regards amenity impacts or to the environmental capacity of the proposed haulage route. According to the RMS Guide to Traffic Generating Development, environmental capacity is determined by traffic volume, traffic composition, in particular the proportion of heavy vehicles, vehicle speed, road reserve and carriageway width, number of traffic lanes, gradient, road surface condition, distance from road carriageway to property boundary, nature of intervening surfaces, setback of building from property boundary and the type and design of building. We request the Minister require the proponent to incorporate amenity impacts and environmental capacity within a revised TIA that take in to consideration the elements listed above from the RMS Guide particularly in relation to Paterson Village, Martins Creek Village, Butterwick Rd, Brandy Hill and Bolwarra Heights.

The updated TIA has been undertaken in accordance with relevant guidelines, primarily the Austroads Guidelines and the "RTA Guide to Traffic Generating Developments" published by the RMS.

Relevant amenity impacts associated with proposed traffic volumes have been assessed in other assessments, where required including:

- noise (refer to **Section 6.4**)
- air quality (refer to **Section 6.5**)
- social amenity (refer to **Section 6.13**).

The TIA traffic safety audit results are in our opinion deficient and have omitted a number of significant safety issues. We request the Minister require the proponent to address the safety issues listed below in a revised TIA;

The proposed new exit on to Dungog Road lacks adequate lines of sight for both entering and exiting vehicles and omits a sheltered accelerating lane for northbound heavy vehicles exiting the proposed facility. The proposed new exit makes no safety provisions for existing residential driveways located on the western side of Dungog Rd opposite the proposed new entrance road.

The updated TIA provides an updated road safety analysis which is summarised in **Section 6.3**.

The TIA indicates there is an existing road safety concern relating to the layout of the road network in a number of locations which are not directly related to the existing activities of the quarry. The safety issues are due to the existing road system being built to historic rather than current Austroads design standards.

Since the exhibition of the EIS in 2016, Lindsay Dynan has been commissioned to amend upgrade designs to take into account Ausroads design criteria that covers safety provisions.

No detailed consideration has been given in regard to the adequacy and safety issues of Gostwyck Bridge. In spite of TIA commentary that the RMS approve its current use, we note that the south-bound approach to this one-way bridge is on a blind corner and requires MCQ heavy vehicles to radio their approach. MCQAG considers this one-way bridge to be a significant safety hazard. The TIA makes no assessment of traffic safety to non-quarry vehicles (who do not monitor UHF channels) in regard to the approach to the bridge. It is MCQAG view that this bridge is totally inadequate for both the current scale of operation and future proposed expansion parameters.

As noted in **Section 6.3**, an assessment of the Gostwyck Bridge and the potential impact of increased truck movements over the bridge has been undertaken by FBE.

In order to raise driver awareness and improve road safety along the Gostwyck bridge approach, it is proposed that as part of the Revised Project the bridge approach be upgraded through a series of curves being incorporated in the realignment of Dungog Road, including new line marking and Vehicle Activated Signage alerting drivers approaching the bridge to reduce speed.

The proposed intersection upgrades at the Dungog-Gresford Roads appear to be deficient. There is limited sheltered turning lane length (60m) which will result in class 9 vehicles unacceptably occupying the north bound Gresford Rd lane during periods of South bound peak traffic as they wait to turn on to Dungog Road.

In response to community and agency concern, Daracon has amended the intersection design for Dungog / Gresford Road to lengthen the right turn storage lane, and as a result three semi-trailers would be readily accommodated within this lane.

No consideration has been provided to the safety issues generated by traffic entering King Street from Church Street. Vehicles entering King St from Church St are required to enter with a reduced sight line to the north. This turn is utilized by local residents but also by road users accessing and egressing from Paterson Primary School, Paterson Historical Rail Society, St Columbas Catholic Church, Paterson Court House and Paterson sports ground area. Conversely the South bound right hand turn from King Street in to Church Street has no sheltered turning lane. The safety issues relating to this intersection have not been addressed or considered in the current TIA.

As discussed in **Section 6.3**, key intersections along the primary haul road for inclusion in the TIA were nominated and confirmed in consultation with the RMS. The King Street/Church Street intersection was not nominated by RMS.

Notwithstanding, the TIA indicates that the visibility to the north for drivers exiting Church Street is appropriate for the posted speed limit (50 km/h). The road corridor in this location does not allow for any widening to allow for a sheltered right turn lane on King Street. Discussion with the road authority has not raised any safety concerns for traffic at this intersection.

Paterson Village according to Austroad Guidelines is an activity centre. No consideration has been given within the TIA or EIS body as to the impacts of this activity centre by the proposed development. No consideration has been made as to the impacts to pedestrians or parking in regards to the proposed magnitude of haulage. It is MCQAG view that the impacts to this activity centre both at the current scale of operation and future proposed expansion parameters is totally unacceptable and an alternate route that avoids this activity centre should be proposed by the proponent as part of a revised TIA.

The updated TIA has been prepared in accordance with relevant guidelines (refer to **Section 6.3**).

There is no economically viable route for traffic associated with the quarry to bypass the village of Paterson. Consideration has been given to pedestrian and vehicle safety and upgrades are proposed in the centre of Paterson at King and Duke Street to improve road safety for all users.

As outlined in **Section 5.3**, extensive consultation has been undertaken since the exhibition of the EIS in relation to the King and Duke Street intersection in Paterson. Potential viable options for the intersection have been discussed with DSC, in addition to extensive community engagement via the CAFs to assist with identifying a preferred design option for this intersection. The CAFs have been invited group discussion sessions with notices sent to all those that had previously indicated an interest in being involved in engagement activities, including relevant Paterson business owners, with expressions of interest in participating in engagement activities sought via a number of mechanisms. This included consultation with businesses in Paterson and service providers in Paterson, Tocal, Vacy and Bolwarra.

Two Traffic and Transport CAFs were held during July 2019 to present and discuss the outcomes of the traffic impact study with the community and to seek further input from the community on the proposed roads and traffic management options and design concepts.

The community identified concerns with the proposed loss of car parking spaces in Paterson and also safety concerns when parking and exiting their cars within Paterson. However, most of the community felt that pedestrian crossings are generally not needed. The loss of car parking spaces was a result of some intersection modifications/road works that were identified as being required through the traffic impact assessment.

As illustrated on **Figure 2.16**, the updated design allows for the relocation of the existing driveway on the north side of the intersection slightly west, to improve the space allocation for parking on either side of the intersection and improve carparking capacity along the northern kerb line. Therefore, there is no longer any loss of on-street parking. In addition, the upgrade will allow for a refresh of the dividing line marking through the intersection to delineate and separate opposing traffic movements.

Tocal homestead entrance, no consideration has been made for other road users safety at the proposed magnitude of haulage (80 truck movements per hour) having regard to the significant numbers of vehicles that enter and exit the Tocal homestead. There are no proposed sheltered turning bays.

As discussed in **Section 6.3**, traffic data along the primary haul route associated with the haulage of material has been collected at mid-block locations as well as at the key intersections impacted upon by the quarry. The data showed that the section of the haul route along Tocal Road, to be impacted upon by the Revised Project, would continue to carry traffic flows well within its capacity.

As previously identified the Revised Project proposes a reduction in peak trucks per hour to:

- 20 loaded vehicles per hour (40 movements) between 7.00 am and 3.00 pm
- 15 loaded vehicles per hour (30 movements) between 3.00 pm and 6.00 pm.

The provision of a sheltered right turn lane at Tocal Homestead entrance is not a matter for consideration for the Revised Project. The road authority has not raised any concerns over this existing access point.

Tocal Road intersections with Lang Drive, Maitland Vale Road, Moore Road and Wesley Street; no consideration has been given within the TIA for sheltered turning lanes for the entry and egress of these above listed streets at the proposed magnitude of haulage. It is evident from heavy vehicle tyre marks that emergency braking is used in these areas as north bound right turning vehicles turn off Tocal Road.

As noted earlier, key intersections along the primary haul road for inclusion in the TIA were nominated and confirmed in consultation with the RMS. None of the above-mentioned intersections along Tocal Road were nominated by RMS for inclusion in the TIA.

As discussed in **Section 6.3**, the traffic analysis included mid-block traffic counts along Tocal Road (near Lemon Grove Road) to analyse the capacity of the road based on peak hour traffic volumes and model the traffic flow as a result of the Revised Project. A summary of the mid-block traffic volumes along the haulage route during the morning and afternoon peak hours for each of the identified scenarios, with the subsequent LoS under the RMS Guide, identified in the TIA.

Based on the traffic analysis, the assessment concluded that there would be no change in the mid-clock capacity of Tocal Road as a result of the traffic movements associated with the Revised Project.

The intersection of Tocal Road and Paterson Road (turn off to Largs), this lane is deficient at current flows for the safe merging of traffic. This intersection poses an unacceptable safety conditions based on the proposed magnitude of haulage. An upgraded intersection should be incorporated into a revised TIA.

The Tillys Childcare centre directly accesses Tocal Road. The access point is located on a sweeping bend. No assessment has been made in regards to the safe entry and egress of vehicles accessing this facility. This driveway access and the proposed magnitude of haulage poses unacceptable safety risks to road users based on the propose trucking rates.

The TIA demonstrated that with the Revised Project's proposed traffic movements the intersection of Paterson Road/Tocal Road will continue to provide a very high standard of operation with the results yielding an overall Level of Service (LoS) A on each approach with minimal delays and congestion (refer to **Section 6.3**).

The LoS of A is defined by the RMS Guide to Traffic Generating Developments as good operation and is the highest level of service for intersection operation. As such, the heavy vehicles associated with the quarry have an acceptable impact upon the operation of this intersection.

A number of road upgrades have been considered in consultation with the relevant road authority. These are identified and assessed in **Sections 6.2** and **6.3**.

The access to the Tillys Childcare Centre has been designed in accordance with Austroads requirements (in 2016) and satisfied the required of the road authority. This access allows for left in and left out movements only to ensure safe entry and exit movements are provided.

The intersection of Paterson Road and Bolwarra Road. The TIA provides no assessment of the safety issues presented by the proposed scale of haulage in regards to this intersection. We note that this intersection is the primary access point for Bolwarra Heights Public School. There are significant numbers of vehicles utilizing this intersection, there are currently no sheltered turning bays provided at this intersection. This intersection and the proposed magnitude of haulage pose unacceptable safety risks to road users.

As discussed in **Section 6.3**), the TIA undertook an analysis of all the key intersections along the primary haul road as nominated and confirmed in consultation with the RMS. The Paterson Road/Bolwarra Road intersection was not one of the intersections nominated by RMS for detailed analysis.

The intersection of Paterson Road and Bolwarra Road allows for a BAR type intersection control with shoulder widening to allow for a vehicle to pass a vehicle propped waiting to turn right. The road authority have not identified any safety concerns at this location. The road authority monitor accident data for any specific issues and have not identified this intersection as a safety concern.

The traffic analysis however, included mid-block traffic counts along Paterson Road (near Victoria Road) to analyse the capacity of the road based on peak hour traffic volumes and model the traffic flow as a result of the Revised Project. A summary of the mid-block traffic volumes along the haulage route during the morning and afternoon peak hours for each of the identified scenarios are provided in the TIA, with the subsequent LoS under the RMS Guide.

Based on the traffic analysis, the assessment concluded that there would be no change in the mid-clock capacity of Paterson Road as a result of the traffic movements associated with the Revised Project.

The TIA provides no assessment of the adequacy of Dunmore Bridge located to the south of Paterson. The bridge pavement width measures approximately 5.94 m wide. The bridge has no lane markings and due to its limited pavement width is in effect a single lane bridge. Traffic entering from Tocal Road east bound to cross the bridge are required to wait in sheltered turning bays until west bound traffic exits the bridge. Traffic holding in the south bound Tocal Rd sheltered turning bay then generates a blind spot for east bound traffic users attempting to exit the bridge off Paterson Road on to Tocal Road. These issues are only further magnified with heavy vehicle movements.

Dunmore Bridge is not on the primary haul route for the Revised Project. The Revised Project traffic movements are not anticipated to impact the Dunmore Bridge.

Paterson Road pavement widths and shoulders are identified as not being in accordance with Austroad Guidelines. No assessment of this has been made within the current TIA.

The updated TIA includes an assessment of the road network along the length of the Primary Haul Route, as discussed in **Section 6.3**. It is noted that the Paterson Road pavement widths and shoulders is an existing road safety issue along the haul route.

Should the Revised Project be approved, it is expected that Daracon will be required to make annual financial contributions to DSC and MCC, which will be put towards the maintenance of roads used for haulage of quarry products.

The 3 way intersection of Paterson Road, Duns Creek Road and Butterwick Road has been omitted from the TIA. It is apparent that pavement widths, lanes and the intersection configuration is completely inadequate for the current and proposed future haulage parameters. The intersection currently requires both north-bound and south-bound heavy vehicles to swing in to oncoming traffic in order to transit the intersection. No consideration has been made for the safety issues nor adequacy of this intersection for road users.

The intersection of Paterson Road, Duns Creek and Butterwick Road is not located along the primary haul route for the Revised Project.

Pavement conditions presented in these photos along various sections of the proposed haulage route are completely inadequate. No clear proposal is made within the EIS for remediation or upgrading of these and other deficient areas of pavement along the haulage routes.

The Pavement Condition Analysis indicates that the addition of the extra truck traffic would result in additional road maintenance requirements for the haul routes over the next 25 years (SMEC 2021).

Should the Revised Project be approved, it is expected Daracon will be required to make annual financial contributions to DSC and MCC, which will be put towards the maintenance of roads used for haulage of quarry products.

The TIA and the EIS body have failed to document the current school bus pickup/drop off locations along the proposed haulage route. Furthermore the TIA fails to assess the likely safety impacts to other road users and pedestrians in the context of school bus pickups and drop offs. MCQAG notes that multiple school bus pick up areas are un marked and informal and require buses to double park at driveways and on road side verges for school children to enter and egress buses.

Consultation with key bus service operators within the vicinity of Martins Creek were undertaken as part of the updated TIA to inform the review of public transport facilities. **Section 6.3** provides a description of the existing bus transport services and pick up/drop off locations along the primary haulage route.

No proper consideration has been given within the TIA or EIS body to the need to improve both cyclist and pedestrian access and safety along the proposed haul route based on the proposed magnitude of operations.

Through the consultation process, additional issues raised have included safety for pedestrians, cyclists and the public.

The TIA assessed potential safety issues for pedestrians. It is considered that the Revised Project will continue to have an acceptable impact upon pedestrian safety, with no recorded incidents involving pedestrians or Daracon operated vehicles, including contract drivers.

The TIA outlines that the rural location together with distances from Maitland and other major centres discourages casual cycling. The area does appeal to cycling enthusiasts, who typically ride in this area on a weekend, when the quarry will not be hauling materials. As such, it is considered that the operational on-going quarrying activities are unlikely to impact upon cycling within the locality.

The EIS body, TIA and Heavy Vehicle Market Route Assessment all fail to give proper consideration and assessment of alternate haulage routes. Engineering Transport Assessment presents a tabulation of site access options but also provides no further details on haulage route alternate options. There is no consideration made for traffic route bypasses of Paterson, Butterwick, Brandy Hill or Bolwarra, no consideration for assessment and use of Clarence Town/Seaham Roads route via Dungog Road which we understand will add only ~20min of transport time per load to reach the Hexham/Pacific Highway interchange but presents itself as a viable means of distributing off site haulage impacts. We request the Minister require the proponent to perform additional assessment justification as to the feasibility of alternate haulage route options.

The Revised Project is seeking approval to haul product trucks along one primary haulage route (Haul Road 1) as described in **Section 2.8.1** and shown on **Figure 2.13**.

Previously proposed haul routes are no longer considered as part of the Revised Project, although other local roads may be used as required to service local project on a campaign basis.

The Engineering Transport Assessment makes reference to a "Traffic and Access Assessment", March 2016 prepared by SECA Solution reference 8. No such document can be found in the EIS nor can the cross referencing of this document on discussion on impacts of queuing traffic at the Gresford Road Paterson rail crossing and proposed road widening of Butterwick Road. We request the Minister require the proponent to issue the document Traffic and Access Assessment", March 2016 in a revised issue of the EIS.

The updated TIA is provided in full in **Appendix C**.

The proposal has failed to adequately assess the option of transport of product from MCQ via rail. The proponent has also failed to assess the option to transport product to a secondary processing and staging location via road using dedicated (controlled) haulage transport. MCQAG understands there are multiple rail off loading facilities (also known as Regional Distribution Centres) utilized for the rail transport and nodal distribution of construction aggregates within NSW. According to the Holcim Rooty Hill Regional Distribution Centre Environmental Assessment Report October 2005; The use of rail and the corresponding reduction in truck kilometres travelled has significant socio-economic and environmental benefits. Rail transportation provides safety and cost benefits to the community. Austroads and Bureau of Transport Economics data indicates the following comparative accidents rates (ACIL 2001) (ACIL Consulting 2001. Rail in Sustainable Transport – A Report to the Rail Group of the Standing Committee on Transport).

Daracon recognise that traffic and transport issues are the most significant issue for the Original Project, based on both submissions on the Original EIS and subsequent feedback during stakeholder engagement.

To further reduce the impacts associated with transport of quarry product via road and still maintain an economically viable project, Daracon have committed to increase the amount of quarry product transported by rail. Daracon are planning to expand rail markets and gain access to rail unloading capacity, in order to enable greater transportation of product by rail to service the Sydney market.

Currently, the quarry is constrained by available train paths on the network and train loading hours which limits movements to one train per day. To alleviate some these constraints Daracon is seeking approval to load trains 24 hours per day and to construct an extension of the existing rail spur within the East Pit, to enable the loading of trains.

The proposed changes to the rail spur will enable the full range of quarry products produced by the quarry, not just rail ballast, to be loaded onto trains. A rail dispatch rate of 600,000 tpa equates to 6 to 8 trains per week depending on train length.

As a result of the increase to rail transportation, Daracon has committed to a reduction in peak hourly truck volumes. The Revised Project is now seeking approval for 20 laden trucks per hour (40 movements) between 7.00 am and 3.00 pm, and 15 laden trucks per hour (30 movements) between 3.00 pm and 6.00 pm.

MCQAG notes that MCQ facilities include an existing rail loading facility. Asides from the Rail Logistics Report analysis which confirms rail transport of product into local and regional markets is possible, the EIS provides no consideration or detail into rail options analyses. The EIS body and the SEO make no assessment of the likely environmental costs and benefits to the local communities between rail and road transport, nor is there any assessment into the cost and benefits of greenhouse gas air emissions and life of project road pavement up keep when comparing road versus rail transport options.

A rail options analysis has been undertaken for the Revised Project and is summarised in **Section 6.3**.

Environmental costs and benefits to the local communities, including cost and benefits of greenhouse gas air emissions and life of project road pavement upkeep have been considered in the CBA of the economic impact assessment, as summarised in **Section 6.14**.

13.1.8 Social Impact Assessment

The proponents Social Impact Assessment (SIA) fails to address social impact assessment objectives. The IAIA SIA Guidelines are quoted however key SIA factors outlined in the guidance documentation are not addressed in any comprehensive way. From a social perspective, the development and application of good SIA practice is essential to facilitate meaningful and respectful community and stakeholder engagement, to support better decision making by proponents and government and develop more appropriate project outcomes. This SIA is severely lacking in this regard.

The document is not considered a SIA but a community profile providing pages and pages of 2011 census data (now significantly outdated) and a review of local plans, many of which are also out of date. The profile data provided is also merely descriptive and provides no analysis of how the characteristics of the communities affected by the Project may be influenced by the project against specific social baseline indicators.

The SIA does not include an adequate stakeholder analysis and identification and description of the different stakeholders and stakeholder groups in the assessment area that may be affected by the Project.

Outputs in the consultation section should be more fully integrated in the SIA for the project, particularly with relevance to key stakeholder and community issues. It appears that the community themselves have undertaken a community survey in the absence of appropriate consultation and engagement methods undertaken by the proponent as part of the SIA and broader project. Social impact assessment deficient.

A comprehensive SIA should outline the key issues of concern associated with the proposed development across different stakeholder groups – the assessment shows no demonstration of engaging with specific stakeholder groups and community residents to identify their issues of concern and relevance in the assessment and how such issues may vary across different stakeholder groups.

We request the Minister require the proponent to revise its SIA in line with the comments listed above and to incorporate results and outcomes from meaningful consultation into a more appropriate Proposal outcome.

An updated SIA (refer to **Appendix O**) has been completed for the Revised Project (refer **Section 6.13**) in line with the requirements of the Social Impact Assessment Guideline for State Significant Mining, Petroleum Production and Extractive Industry Development (DPE 2017). In addition, the SIA was completed in accordance with the SEARs for the Original Project and in response to the DPIE's request for additional information.

A comprehensive stakeholder engagement strategy was developed as part of the preparation of the SIA to guide stakeholder engagement activities during the environmental assessment process for the Revised Project. This strategy was informed by a detailed review and analysis of submissions made during the public exhibition of the EIS (as set out in **Section 5.2**).

The outcomes of the stakeholder engagement strategy have informed various aspects of the Revised Project and the updated environmental assessment including the updated SIA (refer to **Section 6.13** and **Appendix O**). A summary of the process of additional stakeholder engagement is outlined in **Section 5.3**, and further discussion of the key issues raised during the stakeholder engagement is provided in **Section 6.13.4**.

Social impacts can be many and varied and include the following impact categories. The assessment deals superficially with only a few of the categories below largely population change (associated with the project workforce) and the impact on service and infrastructure provision. Community perceptions of environmental impact are also not addressed with the reader referred to the environmental assessment – resident perceptions of environmental impacts on social amenity and quality of life should be assessed. Furthermore, there is no consideration of how the Project impacts on local or regional cultural assets such as sense of place, customs and values).

As outlined above, a comprehensive SIA has been prepared for the Revised Project. One of the key objectives of the updated SIA was to assess community perceptions of environmental impacts on social amenity and quality of life (refer to **Section 6.13**). In addition, the SIA assessed how the Revised Project would impact on local and regional cultural assets such as sense of place and values (refer to **Section 6.13**).

The proposed development, as described in the EIS fails to take account of the social, environmental and cultural structure of Martins Creek, Vacy, Paterson, Bolwarra Heights, Butterwick and Brandy Hill areas. While recognising that Paterson and the Martins Creek quarry have satisfactorily co-existed for nearly 100 years and the quarry being principally a source of hard rock railway ballast, the intensity of the current proposal, if approved, will compromise and destroy the social amenity described above.

The social, environmental and cultural structure of the local communities (i.e. Martins Creek, Vacy, Paterson, Bolwarra Heights) have been considered in the updated environmental assessment and the associated technical studies, as outlined in **Section 6.13**.

The Proponent has failed to consult with the wider community and local businesses and has not addressed the requirement in the SEAR'S to examine social amenity and propose a strategy for its protection. We request that the Minister require the proponent to assess all likely impacts and all aspects of amenity that the impacted community so value. We request the Minister to consider the impacts on amenity of the Proposal be included as relevant matters within the decision-making process.

As noted in **Section 5.3**, additional community consultation with the wider community and local businesses has been undertaken following the exhibition of the EIS. This included the development and implementation of a comprehensive stakeholder engagement strategy as part of the preparation of the SIA to guide stakeholder engagement activities during the environmental assessment process for the Revised Project. This strategy was informed by a detailed review and analysis of submissions made during the public exhibition of the EIS (as set out in **Section 5.2**).

The outcomes of the stakeholder engagement strategy have informed various aspects of the Revised Project and the updated environmental assessment including the updated SIA (refer to **Section 6.13** and **Appendix O**). A summary of the process of additional stakeholder engagement is outlined in **Section 5.3**, and further discussion of the key issues raised during the stakeholder engagement is provided in **Section 6.13**.

The MCQ Proposal has the potential to significantly change the characteristics of the village as a weekend tourist destination, particularly if trucks are allowed to transport product from the quarry to the market through the town on Saturday. The Proposal also has the significant potential to impact upon the rural amenity and driving pleasure of the horse shoe scenic drive.

The Revised Project does not propose road haulage of quarry product on Saturday.

As part of the Proposal, the proponent proposes to undertake road works in the main street to widen a corner which would significantly impact traffic patterns and local businesses on the main street. Furthermore accommodation houses such as the CBC Café and the Post Office B&B would be significantly affected given their main street location and subsequent impacts of traffic volume and noise.

The proposed intersection upgrade in Paterson will not involve any widening works. The proposed intersection works will be accommodated within the current road corridor.

A key objective of the Revised Project has been to reduce traffic and transport related impacts associated with the operation of the Quarry to further address concerns from the community and government agencies. This has included:

- reduction in tonnes transported by road to 500,000 tpa
- reduction in peak trucks per hour to:
    - 20 loaded vehicles per hour (40 movements) between 7.00 am and 3.00 pm
    - 15 loaded vehicles per hour (30 movements) between 3.00 pm and 6.00 pm
- road haulage of Quarry product to occur 7.00 am to 6.00 pm Monday to Friday, with no haulage of product on Saturday, Sunday or public holidays
- no trucks through Paterson prior to 6.45 am Monday to Friday.

In addition, Daracon committed to a range of traffic controls to be implemented specifically in the village of Paterson, including:

- Include a requirement in the Driver Code of Conduct to report any substantial road pavement irregularities in Paterson, with these reports being passed on the DSC for attention.
- Reinforce the truck speed limit of 40km/hr through Paterson and include a requirement in the Driver Code of Conduct for a speed limit of 20 to 25km/hr at the King and Duke Street intersection in Paterson.
- Plan quarry activities, and revise haulage as required, around days when there is extra traffic in Paterson due to a funeral.

To date, the quarry and village community have co-existed given the previous size and scale of past quarry operations. However, the significant scale of the current proposal would result in more severe social impacts, resulting in impacts on local tourism and local businesses.

The Revised Project presents a reduced scale of the Original Project.

Consultation with businesses for the SIA, particularly those within Paterson, centred on concerns regarding the impact of the Revised Project on their business operations and livelihoods. Consulted community members felt that the Revised Project and associated trucks were causing decline of business in Paterson due to noise, increased safety issues, decreased ability to walk around village and issues with parking. These impacts were seen to cause a reduction in the amenity of the village and deterring people from shopping in Paterson.

With regards to historical rates of product extraction and tonnages transported from the quarry, the proposed road transportation limit of 500,000 tpa returns road haulage volumes to a level that is not inconsistent with road haulage volumes occurring prior to Daracon securing its licence in 2012 (refer to **Figure 2.13**). **Figure 2.13** illustrates that road transportation volumes proposed for the Revised Project are less than those previously transported by RailCorp, particularly through the period of 2003/04 to 2010/11.

With respect to tourism impacts specifically, an analysis of visitor reviews posted on Tripadvisor from 2012 to 2020 indicates a small number of comments noting customer dissatisfaction with their stay specifically due to truck traffic within Paterson, however these appear to be evenly interspersed with guests either commenting favourably on their experience or for those making a negative review, also noting other noise sources (such as trains) and other reasons for dissatisfaction with their stay.

While not to detract from the importance and potential impact of complaints to a business, the examination of historical customer reviews has indicated that the majority of the reviews published on TripAdvisor positively rating their experience – 19 out of 32 reviews rated as excellent with the large majority of these made prior to reduced operations at the quarry in September 2019.

As outlined in the SIA, Daracon have attempted to respond to community concerns in relation to potential impacts on local tourism and local businesses through project design changes and mitigation measures (refer to **Appendix O**).

No local tourist or hospitality businesses have been consulted as part of the Social impact assessment for the Project. Furthermore no tourism impacts have been identified as of concern to local residents or assessed within the current EIS. We request that the Minister require the proponent to assess the impacts to tourism both local and regional and to hospitality businesses who operate along the proposed haulage route based on the proposed operational scale.

As noted in **Section 5.3**, a range of local tourist and hospitality businesses have been consulted as part of the SIA and community engagement strategy for the Revised Project.

Local and regional tourism impacts associated with the Revised Project are assessed in **Section 6.13**.

13.1.9 Ecological Sustainable Development (ESD)

We note that the Proponent has failed to reference or address in any detail the principles of ecological sustainable development (ESD) throughout the EIS. There is no reference to the precautionary principles, no inclusion of environmental factors in valuations and no detailed discussion on intergenerational equity.

We request that the Minister require the proponent to provide more detail on how the Proposal incorporates the ESD principals and ask that the precautionary principals be applied to the assessment decision making process considering the impacts to amenity.

An assessment of the Revised Project against the principles of ESD, including a discussion on the precautionary principles, intergenerational equity, conservation of biological diversity, valuation and pricing of resources is provided in **Section 9.1**.

13.1.10 Biodiversity

The biodiversity assessment does not comply with Commonwealth survey requirements. The ecology report notes that the area supports habitat for the green and golden bell frog, however, the survey effort does not meet the obligations under the Commonwealth Department of Environment survey guidelines. It is MCQAG's understanding that for the green and golden bell frog a minimum 4 nights survey is required (they did three). Surveys are required to be performed only after receiving more than 50mm of rain in a consecutive 7 day period. In September 2015, according to Paterson BOM records there was not enough rain during that period to qualify. We request that the Minister require the proponent to repeat the green and golden bell frog survey and incorporate these findings within a revised ecology report.

An updated BAR was completed for the Revised Project in accordance with the Guidelines for preparing Assessment Documentation relevant to the Environment Protection and Biodiversity Conservation Act 1999 provided by DAWE (refer to **Section 6.10**).

The Threatened Species Profile Database identifies that surveys for the green and golden bell frog can be undertaken between August to March. Surveys for this species were targeted to the watercourses and dams present and included surveys during summer after periods of rain. The watercourses present within the Project Area were found to be generally dry with only very minor ephemeral pools of water present following heavy rain events. Details of the targeted surveys completed for this species are provided in **Appendix J**. This species was not observed within the Project Area during targeted surveys.

13.1.11 Groundwater

MCQAG notes that groundwater flow contours were developed but are not presented within the Water Quality Impact Assessment (WQIA). It would be useful to present contours to visualise groundwater flow directions and the extent to which the quarry is a sink for the water in the fractured rock aquifer as the quarry is a sink then more monitoring bores would be useful to gain a better appreciation of the extent of seepage/drainage to the quarry. We request the Minister require the proponent to include groundwater flow contours in a revised WQIA prior to making a decision on the Proposal.

A comprehensive GIA has been undertaken for the Revised Project with the outcomes of the assessment summarised in **Section 6.8** and the full report provided in **Appendix H**. Groundwater level contours that have been updated using the most recent data are shown in **Figure 6.19** of this report.

It is noted that the current site is not conceptualised as a sink, but as an intermittent flow-through feature. This is outlined in Section 5.8 of the GIA (refer to **Appendix H**).

Refer to **Section 6.8.5** regarding the addition of bores to the groundwater monitoring network.

Under Sec 7.6.2 of the WQIA quoted groundwater flow velocities of 57m/year (unless it is in the immediate area surrounding the quarry) are unusually high for local recharged water that is brackish water quality. More monitoring bores at a greater distance would provide better evidence of the regional groundwater gradient and flow directions. We request the Minister to require the proponent in any new consent to be required to install monitoring bore holes at a greater distance to better provide evidence of gradients and flows.

A new hydraulic assessment has been undertaken and is discussed in the GIA (refer to **Appendix H**). The GIA notes that current gradients are 0.03 to 0.07, which are in the normal range (AGE, 2021).

The existing groundwater monitoring network at the quarry currently provides an appropriate level of understanding of the groundwater conditions at the site and prediction of any potential impacts associated with the Revised Project. Some of the monitoring sites will be affected at different proposed quarry stages of the Revised Project (MW07 will be removed in stage 2, MW04 removed in stage 5, and MW05 may be disturbed in Stage 6). Timely replacement of these monitoring sites prior to removal is required to provide an appropriate monitoring network.

Under Sec 7.6.5 of the WQIA, the project is quickly assessed under some of the criteria in the Aquifer Interference Policy (AIP). As quarrying is a substantial AI activity, a more thorough assessment should be carried out to address water table, water pressure and water quality criteria as required for fractured rock aquifers and less production groundwater sources (see p23/24 of the AIP for further details) We request the Minister require the proponent to perform a more thorough assessment in accordance with the details described above and include in a revised WQIA prior to making a decision on the Proposal.

An assessment of the groundwater impacts of the Revised Project was undertaken in accordance with the NSW AIP (refer to **Section 6.8**). It is considered that the GIA has been undertaken in a manner that satisfies the AIP.

Based on the AIP criteria, the groundwater source for the Quarry has been defined as less productive. The GIA indicates:

- the extended extraction area is upslope of the current pit and hence there would be no additional effect on the recharge zone for the aquifer
- there are no known Culturally Significant Sites or high priority GDEs located within the proposed extension area according to the North Coast Fold Belt Coast Groundwater Source Rules Summary Sheet

- nearby significant aquifers (i.e. the Paterson River alluvium) are over 1.2 km from quarry
- the elevation of the ignimbrite and meta-sandstone aquifer is greater than that of the Paterson River alluvium. Therefore, the alluvium cannot be drained by drawdown at the quarry
- there are no known water supply works located within the relevant aquifer at the quarry in areas where the Revised Project is predicted to influence the water table.

Section 7.6.6 of the WQIA suggests that up to 8 exploration holes would be used for groundwater monitoring. These should be properly constructed monitoring bores and be operational ASAP so that current baseline conditions (WLs and WQ) can be better assessed – at least one site should be equipped with a data logger collecting continuous WL data and for this data to be made publicly available with other project related environmental data. We request the Minister require the proponent to include the above requirements within any new consent.

As outlined in **Section 6.8**, following the exhibition of the 2016 EIS, additional data have been collected, including continual monitoring using level loggers, and data from three additional groundwater sites installed in 2018 to expand the monitoring network.

Bores are each equipped with data loggers for continuous monitoring of groundwater levels at six hourly intervals. Groundwater levels are downloaded and reviewed quarterly, and manual dip levels are taken annually. Drilling, construction and development of the monitoring bores conformed to the Minimum Construction Requirements for Water Bores in Australia (2012). For further detail on the current groundwater monitoring network at the quarry refer to the GIA provided in **Appendix H**.

Results from the monitoring program will be included in the Annual Review which will be made publicly available on the Daracon website.

13.2 Hunter Environment Lobby

13.2.1 Public Health and Wellbeing

The activity is comprehensive as an industrial site activity and when country populations are impacted on by this noise, dust and blasting we will see increasing health problems in the nearby communities, including Martins Creek, Paterson and Vacy.

As outlined in **Part A** of this report, the Revised Project is within an area which has been subject to quarrying since the early 1910s, with this quarrying activity coexisting with neighbouring land uses for over 100 years.

Detailed noise, air quality and blasting assessments have been undertaken for the Revised Project (refer to **Sections 6.4**, **6.5** and **6.7**). A comprehensive SIA has also been undertaken for the Revised Project to assess the potential social impacts which is summarised in **Section 6.13**.

13.2.2 Traffic and Transport

Added to these impacts on the local population are the impacts on all the populations which live along the many roads that are being used to transport the product to its final destination. These impacts are massive on property holders and on the infrastructure of roads and bridges in that long haulage journey.

In response to community concerns, Daracon is now seeking approval to haul product on the road network via primary Haulage Route 1 (refer to **Section 1.6**). Previously proposed Haul Route 2 and 3 are no longer proposed as primary haul routes. Other local roads may be used as required to service local projects on a campaign basis.

The Revised Project also result in:

- reduction in tonnes transported by road to 500,000 tpa
- reduction in peak trucks per hour to:
    - 20 loaded vehicles per hour (40 movements) between 7.00 am and 3.00 pm
    - 15 loaded vehicles per hour (30 movements) between 3.00 pm and 6.00 pm
- road haulage of quarry product to occur 7.00 am to 6.00 pm Monday to Friday, with no haulage of quarry product on Saturday, Sunday or public holidays
- no trucks through Paterson prior to 6.45 am Monday to Friday.

Relevant assessments have been undertaken to assess the Revised Project, as presented in **Part A** of this report.

13.2.3 Rail Haulage

Hunter Environment Lobby sees no reason why rail transport of the materials cannot be utilised to a greater extent. In fact this would solve many of the impacts that neighbours and local people, plus urban dwellers in the many years where these trucks are transporting materials.

Hunter Environment Lobby makes the comment that it favours the communities to have this material to be hauled by rail, the infrastructure, which is right at the quarry head, and it is also a Greenhouse friendly way to transport materials. The original quarry was developed because of the proximity to rail – we see no reason to abandon that commitment, if it is not profitable to transport by rail then the project needs to re-look at its bottom line.

Daracon acknowledges the strong sentiment to increase the use of rail as a means for transport of quarry product and is committed to working toward this. Daracon recognise that traffic and transport issues are the most significant issue for the Original Project, based on both submissions on the Original Project EIS and subsequent feedback during stakeholder engagement.

To further reduce the impacts associated with transport of quarry product via road and still maintain an economically viable project, Daracon have committed to increase the amount of quarry product transported by rail. Daracon are planning to expand rail markets and gain access to rail unloading capacity, in order to enable greater transportation of product by rail to service the Sydney market.

Currently, the quarry is constrained by available train paths on the network and train loading hours which limits movements to one train per day. To alleviate some these constraints Daracon is seeking approval to load trains 24 hours per day and to construct an extension of the existing rail spur within the East Pit, to enable the loading of trains.

The proposed changes to the rail spur will enable the full range of quarry products produced by the quarry, not just rail ballast, to be loaded onto trains. A rail dispatch rate of 600,000 tpa equates to 6 to 8 trains per week depending on train length.

As a result of the increase to rail transportation, Daracon has committed to a reduction in peak hourly truck volumes. The Revised Project is now seeking approval for:

- 20 loaded vehicles per hour (40 movements) between 7.00 am and 3.00 pm
- 15 loaded vehicles per hour (30 movements) between 3.00 pm and 6.00 pm.

13.2.4 Biodiversity

The Hunter Environment Lobby's main focus in all its submissions for mining projects has been that of biodiversity, both flora and fauna. It is with that lens we examine the EIS in its request to clear and destroy 37ha of existing vegetation.

The Biodiversity Assessment Report prepared by Conacher consulting Pty Ltd contains the results of the search of the Protected Matters Tool (AGDE 2016) for EPBC Act listed threatened and migratory species recorded within 10km of the site. HEL asks is that a considerable effort on behalf of the company? 10km is not a substantial distance when considering these threatened and vulnerable species, whose habitat has been impacted on considerably by other mining practices, especially coal.

The migratory fauna species, Rufous Fantail and Black-faced Monarch were observed on the site during surveys conducted. No threatened ecological communities listed under the EPBC Act were observed on the site during surveys, which could mean the survey were inadequate.

Our main point of course is the any further destruction of habitat of threatened and vulnerable species must be taken into consideration with the thousands of hectares of vegetation that has been removed in the interests of private coal companies, mostly overseas owned. That means a considerable cumulative impact.

Daracon have undertaken further detailed resource quantification and quarry plan design work to optimise future operations and minimise environmental and community impacts. As a result, the proposed additional disturbance area for the Revised Project has been by approximately 15.3 ha of undisturbed vegetation in the former East Pit (Lot 21 DP 773220) that is no longer proposed to be disturbed as part of this application.

An updated biodiversity assessment has been prepared for the Revised Project (refer to **Section 6.10**). As part of the updated assessment, a protected matters search has been undertaken for nationally listed threatened species and ecological communities within 5 km of the Project Area. The assessment has identified that the nationally listed Grey-headed Flying-fox (Pteropus poliocephalus) was observed during surveys and the following other nationally listed entities have potential to occur within the site:

- Large-eared Pied Bat (Chalinolobus dwyeri)
- Greater Glider (Petauroides volans).

The updated BAR provides an assessment in accordance with the EP&BC Act Policy Statement 1.1 Significant Impact Guidelines (AGDoE 2013).

13.2.5 Air Quality

Added to the cumulative loss of precious habitat for vulnerable species, we see many impacts on communities in the Lower Hunter, of noise and dust in particular. As you know, the Department of Health made a recommendation some years ago that there be no more mines open in the Hunter, unless as equivalent one was closed. The recommendation was made because of the addition of particulates into the air which is breathed by population in the Hunter, and in fact over 3,000 people die earlier than expected in the Hunter because of the air quality issues.

As discussed in **Section 6.5**, the NSW Government has set criteria for PM_{10} and $PM_{2.5}$ that are intended to protect human health. The assessment findings against these criteria are outlined in **Appendix E**.

The modelling indicates that there will be very little change in contribution from the Revised Project beyond the Project Area boundary, for all particulate matter classifications (PM_{10}, $PM_{2.5}$, TSP and dust deposition), with no exceedances of the EPA criteria at any of the sensitive receiver locations.

13.3 Voice of Wallalong and Woodville

13.3.1 Traffic and Transport

The EIS for the Project does not adequately or sufficiently address the interactions issue, considers it to be background and consequently not satisfy the SEARs. There is a clear failure to address the interactions and cumulative impact of the heavy quarry vehicles using the roads. How can there be mitigation measures for quarry traffic when there has been no detailed input as to the cumulative interactions of the traffic generated by the quarry and the Brandy Hill Quarry?

The point here is that the daily laden truck numbers out of the site determined by the Traffic Impact Assessment are 168 while the EIS stipulates a reduction (?) to 215, in response to strong community feedback.

Daracon will not seek approval for Haul Route 2 from the intersection of Tocal Road and Paterson Road, as a primary haul route. Haul Route 2 will only be used to service local projects on or directly accessed from the route. It will not be used as a primary haul route. Similarly, other local roads may be used as required to service local projects on a campaign basis.

An updated TIA has been prepared for the Revised Project (refer to **Section 6.3**). The updated TIA includes an assessment of cumulative traffic impact of other proposed developments in the area, which includes the now approved expansion of the Brandy Hill Quarry (refer to **Section 6.3**). In addition, the existing truck movements associated with the Brandy Hill Quarry were included in the background traffic counts.

13.3.2 Rail Haulage

The EIS merely accepts the recommendation in general terms without firm commitment to increasing the transport of its products by rail to really mitigate the severe effects of road transport. The question begged is "should the community suffer because of the drive for cost cutting and greater profit"?

Daracon recognise that traffic and transport issues are the most significant issue for the Original Project, based on both submissions on the Original EIS and subsequent feedback during stakeholder engagement.

To further reduce the impacts associated with transport of quarry product via road and still maintain an economically viable project, Daracon have committed to increase the amount of quarry product transported by rail. Daracon are planning to expand rail markets and gain access to rail unloading capacity, in order to enable greater transportation of product by rail to service the Sydney market.

Currently, the Quarry is constrained by available train paths on the network and train loading hours which limits movements to one train per day. To alleviate some these constraints Daracon is seeking approval to load trains 24 hours per day and to construct an extension of the existing rail spur within the East Pit, to enable the loading of trains.

The proposed changes to the rail spur will enable the full range of quarry products produced by the quarry, not just rail ballast, to be loaded onto trains. A rail dispatch rate of 600,000 tpa equates to 6 to 8 trains per week depending on train length. This is likely to consist of 5 to 7 trains managed by Daracon (via a freight rail leasing company) and one ARTC rail ballast train per week.

As a result of the increase to rail transportation, Daracon has committed to a reduction in peak hourly truck volumes. The Revised Project is now seeking approval for 20 laden trucks per hour (40 movements) between 7.00 am and 3.00 pm, and 15 laden trucks per hour (30 movements) between 3.00 pm and 6.00 pm.

13.3.3 Social Impact Assessment

The Social and Economic Impact Assessment attached to the EIS promotes employment opportunities, limited though they are, and ignore the social impact in the locality (s79C (1)(b) EP&A Act).

An updated SIA has been prepared for the Revised Project and provides a comprehensive assessment of localised social impacts (refer to **Section 6.13** and **Appendix O**).

13.3.4 Noise

Noise has been a big factor in reducing the time people spend outside their homes and gardening has become unpleasant at times. Trucks are starting to head to Martins Creek much earlier in the morning so they can start loading and leave the quarry again by 6.00am. Local residents along Brandy Hill Drive are beginning to complain about being woken by noisy trucks from as early as 5.30am. Shift workers complain about lack of sleep due to truck noise during the day. Sleep deprivation is a serious issue and must be addressed as such.

As outlined in **Section 2.6**, Daracon has committed to reducing the hours of operation for the Revised Project in a response to community and government agency concerns. Road haulage of quarry product will be limited between 7.00 am and 6.00 pm, Monday to Friday, with no haulage on Saturday, Sunday, public holidays or between 24 December and 1 January. In addition to this, no quarry trucks will be traveling through Paterson prior to 6.45 am Monday to Friday.

Daracon is also applying for product loading of up to 10 Daracon-owned trucks (not contractor trucks) between 6.00 pm and 7.00 pm, Monday to Friday, with these trucks remaining parked at the quarry overnight for morning departure from 7.00 am. In the case of trucks loaded on Friday evening, departure will be no earlier than 7.00 am Monday morning.

An updated NIA has been undertaken for the Revised Project, considering the updated hours of operation and trucking movements (refer to **Section 6.4**).

13.3.5 Voluntary Planning Agreement

At the Martins Creek CCC meeting 24.06.15 Daracon promised to exhibit a draft Voluntary Planning Agreement at the same time as the EIS, detailing works in kind, contributions or a tangible community asset that would be made available. This promise also repeated at meeting 22.07.15. No VPA surfaced as far as we are aware. We make wo points on this matter; while we understand that there is no common formula for road maintenance levies, in this case it must be significantly higher than standard due to the poor state of the existing roads, to date, the quarry has NOT paid any levy to any of the three councils! As a consequence, the councils have not been able to maintain, let alone construct, the local roads to a standard suitable for high volumes for heavy trucks.

Under the IEMP agreed with DSC in February 2019, Daracon contributed $0.795 per tonne of product transported by road for the purpose of the maintenance or repair of the public roads comprising the haul routes within the Dungog Shire local government area from the quarry. The contributions were paid on a monthly basis, calculated by reference to weighbridge records, which were required to be provided to DSC upon request.

For the period January to September 2019 (when operation of the IEMP and the quarry ceased), Daracon contributed in excess of $250,000 to DSC in accordance with the agreed requirements of the IEMP. Prior to the IEMP, there was no planning tool in place for Daracon to make contributions to road maintenance.

Should the Revised Project be approved, it is expected that Daracon will be required to make annual financial contributions to both DSC and MCC in the form of a VPA, in accordance with section 7.11 of the EP&A Act. While Daracon is not responsible for how contributions are used by Council, it is anticipated that contributions would be put towards the maintenance of roads used for haulage of quarry products. The VPA has not been finalised at the time of preparation of this report and is subject of ongoing consultation.

The land holding of the proponent appears to be the way of sublease, and given the terms of the tenure by which the proponent holds possession of the quarry lands any rehabilitation of the lands after the end of production may be futile, given the inability of the enforcing body to enter the lands to effect remediation and rehabilitation.

As outlined in **Section 6.19**, Daracon is committed to the effective rehabilitation and closure of the quarry at the cessation of operations. This will be achieved through progressive rehabilitation and managing quarry operations to work towards the final rehabilitation and closure of the site. Closure monitoring and maintenance works will continue after quarry closure activities are complete until it can be demonstrated that all relevant completion criteria have been achieved (refer to **Section 6.19**).

There are a range of mechanisms which are utilised to provide financial security to ensure that rehabilitation is undertaken at the quarry in accordance with the requirements of a development consent. Contemporary requirements, including the establishment of a rehabilitation bond, which is a security deposit required to be established by the proponent to provide funds that are available for the completion of rehabilitation at the site, is one of these mechanisms.

In the event that rehabilitation undertaken by the proponent does not meet the requirements of the NSW Government, the NSW Government can draw upon the security deposit to undertake rehabilitation works on behalf of the proponent.

Daracon will establish a security bond or utilise an alternate NSW Government approved mechanism to establish a security bond to provide that appropriate funds are available for the rehabilitation of the site.

13.4 Bolwarra Heights Community Group

13.4.1 Traffic and Transport

Pedestrian and vehicle safety - The section of Tocal Road between Maitland Vale Road and Paterson Road was originally built as a minor access road to local farms form Maitland Vale through to Lambs Valley, now it is the main road to Paterson and Dungog areas, it is a narrow and congested and NOT suitable for fully laden 50tonne double quarry trucks at a rate of 80 movements per hour. It is very narrow with no shoulders to avoid potential accidents, power poles and one side has a pedestrian footpath with NO room for error with the pedestrians walking within one metre of these large trucks doing 60kmph.

Road safety issues have been raised by various government agencies (refer **Section 11.0**). The updated TIA provides an updated road safety analysis which is summarised in **Section 6.3**.

The TIA indicates there is an existing road safety concern relating to the layout of the road network in a number of locations which are not directly related to the existing activities of the quarry. The safety issues are due to the existing road system being built to historic rather than current Austroads design standards.

The TIA assessed potential safety issues for pedestrians. It is considered that the Revised Project will continue to have an acceptable impact upon pedestrian safety, with no recorded incidents involving pedestrians or Daracon operated vehicles, including contract drivers.

The vast majority of trucks that haul to and from their quarry are non Daracon trucks (contractors or private trucks). Daracon (David Mingay) has openly admitted and the company has proven they have NO CONTROL over the non Daracon trucks which regularly do not conform with Daracon's road use policies in the way of speed reductions, engine breaking and general poor/noisy condition of the trucks. Any expansion of the quarry will see the amount of non Daracon trucks and their associated problems increase dramatically and Daracon will still have no control.

As part of the Revised Project, Daracon has committed to a range of additional management and monitoring measures that would apply to all subcontractor trucks transporting product material from the Quarry. This includes a Code of Conduct for trucks transporting product from the quarry (refer to **Section 6.3**).

In addition, Daracon commits to continue the rigorous assessment and pre-qualification process prior to the engagement of any transport subcontractors. This includes a thorough review of the subcontractor's relevant management processes and procedures to ensure compliance with the HVNL and the associated CoR requirements.

13.4.2 Noise

Local NOISE at our homes. This section of road is a tree lined previously quite part of the community to live, that is why we moved here, with the illegal increase of trucks in 2014-2015 as mentioned above the noise was unbearable for all with empty quarry trucks rattling through as early as 4.30am and going well into the evening each day. This proposed increase will see at least 50% more truck movements that in 2014-2015, it is totally unacceptable that we and other residents should endure this just to allow one company to enjoy healthier profits. NB: the EIS states that all areas surveyed, the Tocal Road area will be MOST AFFECTED by the proposed increase (69dba).

The comments in relation to potential noise impacts from product transportation by road associated with the Original Project are noted. In response to community and government concerns, Daracon has committed to project changes to reduce the predicted noise impacts associated with product transportation from the Revised Project, including the reduction of road transportation (refer to **Section 2.8**).

Revised product transport arrangements for the Revised Project, include:

- reduced peak daily laden trucks of 140 per day (280 movements) for 50 days per year, otherwise 100 per day (200 movements), with a peak of:
    - 20 loaded vehicles per hour (40 movements) between 7.00 am and 3.00 pm
    - 15 loaded vehicles per hour (30 movements) between 3.00 pm and 6.00 pm
- no trucks through Paterson Village before 6.45 am
- increased quarry product transported by rail
- removal of Haul Route 2 as a primary haul route (now proposed only to service local jobs as required).

As outlined in **Section 6.4**, the updated NIA for the Revised Project has indicated that baseline/existing road traffic noise levels exceed the RNP criteria for some receivers due to existing traffic rates without the quarry trucks present. The addition of quarry trucks does not result in an exceedance of the RNP criteria where it was not already calculated to exceed with baseline traffic levels. Where the RNP criteria are already exceeded the predicted increase in road traffic noise due to the quarry trucks is predicted to be less than 2 dB. The RNP states that noise level increases of up to 2 dB(A) are considered barely perceptible to the average person.

The addition of quarry trucks will increase the road traffic noise levels at all the sensitive receivers assessed, however the maximum traffic generation scenario modelled will not increase the road traffic noise levels at any sensitive receiver by more than 2 dB and therefore meet the relevant RNP criteria for new developments.

13.4.3 Hours of Operation

The EXTENDED HOURS asked for will mean that Daracon, contractor and private quarry trucks will be on our roads form before the quarry opens to after it closes, this in our area will mean FROM 4.30am till 8.00pm continually for 6 days a week. This is totally UNACCPETABLE.

In response to ongoing community and government agency concerns, Daracon has committed to reduce the hours of operation for the Revised Project (as outlined in **Section 2.6**). Road haulage of quarry product will be limited between 7.00 am and 6.00 pm, Monday to Friday, with no haulage on Saturday, Sunday, public holidays or between 24 December and 1 January. In addition to this, no quarry trucks will be traveling through Paterson prior to 6.45 am Monday to Friday.

Daracon is also applying for product loading of up to 10 Daracon-owned trucks (not contractor trucks) between 6.00 pm and 7.00 pm, Monday to Friday, with these trucks remaining parked at the quarry overnight for morning departure from 7.00 am. In the case of trucks loaded on Friday evening, departure will be no earlier than 7.00 am Monday morning.

13.4.4 Community Consultation

The CONSULTATION process of the EIS was a farce. We and other concerned groups attended the scheduled meetings, but it was only one way communication, we were not allowed to give input or query the expansion plans. All it did was allow Daracon to cite in the EIS that they consulted with the communities. It was a complete waste of time for what we concerned residents required.

The community concerns in relation to the consultation undertaken during the Original Project EIS phase are noted.

In response to community submissions and feedback, additional community consultation has been undertaken following the exhibition of the EIS for the Original Project. A comprehensive stakeholder engagement strategy has been developed and implemented as part of the preparation of the updated SIA to guide stakeholder engagement activities during the environmental assessment process for the Revised Project. This strategy was informed by a detailed review and analysis of submissions made during the public exhibition of the EIS (refer to **Section 11.0**).

Engagement with the community and other key stakeholders has been an ongoing and important part of the Revised Project. The stakeholder engagement strategy has aimed to:

- inform and seek feedback from stakeholders during the design and development of the Revised Project
- identify key issues to inform the updated assessment of the Revised Project

- seek feedback from stakeholders to identify and refine proposed mitigation measures to seek to further minimise environmental and community impacts.

The outcomes of the stakeholder engagement strategy have informed various aspects of the Revised Project and the updated environmental assessment including the updated SIA (refer to **Section 6.13** and **Appendix O**).

A summary of the process of additional stakeholder engagement is outlined in **Section 5.2**, and further discussion of the key issues raised during the stakeholder engagement is provided in **Section 6.13**.

13.4.5 Cumulative Impacts

The EIS has not taken into account future house communities' vehicle loading or the COMBINED TUCK loads for both Martins Creek and nearby Brandy Hill quarries into consideration. Trucks from both quarries meet at the intersection of Tocal Road and Paterson Road which now makes this tight intersection very hazardous for all users. The vast increase in trucks proposed by the Martins Creek quarry expansions would see this intersection and the roads south extremely congested and dangerous.

An updated TIA has been prepared for the Revised Project (refer to **Section 6.3**). The updated TIA includes an assessment of cumulative impacts.

From the updated TIA completed for the Revised Project, it has been assessed that the proposed annual output of the quarry for which approval is being sought will have an acceptable impact upon the road network that forms the haul route between the New England Highway and the site.

13.4.6 Biodiversity

We strongly believe the ENVIRONMENT around the Martins Creek quarry will be severely affected by the clearing of an additional 37 hectares of native forest. Endangered species have been identified in this area, what right has Daracon to take the native environment away just to increase profits for some company or persons? Our local roads have seen a vast increase in traffic over the last few years with many native animals being hit and killed by road uses including possums, lizards, snakes and kangaroos, any increase in truck movements will only exasperate this problem.

Daracon's approach to the design and planning of the Revised Project has considered potential biodiversity impacts. Whilst Daracon has strived to minimise impacts on biodiversity through the design process, not all impact could be avoided by the proposed design and a detailed assessment of the impacts was undertaken of the Revised Project. A comprehensive BAR was completed for the Revised Project in accordance with the SEARs and to provide additional information requested in the government agency submissions and to provide an updated assessment of the revised project parameters. A summary of the key findings of the BAR is provided in **Section 6.10**.

As outlined in **Section 1.6.5**, Daracon have undertaken further detailed resource quantification and quarry plan design work to optimise future operations and minimise environmental and community impacts. As a result, the proposed additional disturbance area for the Revised Project has reduced from 82.8 to 66 ha, a reduction of 16.8 ha. This reduction includes avoiding approximately 15.3 ha of undisturbed vegetation in the former East Pit (Lot 21 DP 773220) that is no longer proposed to be disturbed as part of this application.

Daracon is committed to delivering a biodiversity offset strategy that appropriately compensates for the unavoidable loss of ecological values as a result of the Revised Project. The BOS will be further developed in consultation with the BCD and DPIE and based on the credits required to be retired to offset the impacts of the Revised Project as specified in the BAR and the offset options available under the BC Act.

As outlined in **Section 6.10.7**, Daracon has committed to the preparation of a BRMP as part of the implementation of the Revised Project, in accordance with the requirements of Biodiversity Assessment Method (NSW OEH 2016). The BRMP will include management actions and activities proposed for the biodiversity offset sites as identified in the BOS.

13.4.7 Voluntary Planning Agreement

It has been stated that the quarry does not pay the State Government any royalties for the tonnage of product that is extracted from the quarry. It is also understood that the ongoing major repairs to Tocal Road is funded by our taxes, this is not acceptable.

Under the IEMP agreed with DSC in February 2019, Daracon contributed $0.795 per tonne of product transported by road for the purpose of the maintenance or repair of the public roads comprising the haul routes within the Dungog Shire LGA from the quarry. The contributions were paid on a monthly basis, calculated by reference to weighbridge records, which were required to be provided to DSC upon request.

For the period January to September 2019 (when operation of the IEMP and the quarry ceased), Daracon contributed in excess of $250,000 to DSC in accordance with the agreed requirements of the IEMP. Prior to the IEMP, there was no planning tool in place for Daracon to make contributions to road maintenance.

Should the Revised Project be approved, it is expected that Daracon will be required to make annual financial contributions to both DSC and MCC in the form of a VPA, in accordance with section 7.11 of the EP&A Act. While Daracon is not responsible for how contributions are used by Council, it is anticipated that contributions would be put towards the maintenance of roads used for haulage of quarry products.

13.5 Morpeth Heritage Conservation Group

13.5.1 Traffic and Transport

Transporting the product - This should be using the existing railway. The trucks accessing this quarry are destroying roads, village amenity and people's lives. Coal mines are required to transport their coal by rail the same should apply to this quarry. There is a solution – rail – and it should be used.

Daracon recognise that traffic and transport issues are the most significant issue for the Original Project, based on both submissions on the Original EIS and subsequent feedback during stakeholder engagement.

To further reduce the impacts associated with transport of quarry product via road and still maintain an economically viable project, Daracon have committed to increase the amount of quarry product transported by rail. Daracon are planning to expand rail markets and gain access to rail unloading capacity, in order to enable greater transportation of product by rail to service the Sydney market.

Currently, the quarry is constrained by available train paths on the network and train loading hours which limits movements to one train per day. To alleviate some these constraints Daracon is seeking approval to load trains 24 hours per day and to construct an extension of the existing rail spur within the East Pit, to enable the loading of trains.

The proposed changes to the rail spur will enable the full range of quarry products produced by the quarry, not just rail ballast, to be loaded onto trains. A rail dispatch rate of 600,000 tpa equates to 6 to 8 trains per week depending on train length.

As a result of the increase to rail transportation, Daracon has committed to a reduction in peak hourly truck volumes. The Revised Project is now seeking approval for:

- 20 loaded vehicles per hour (40 movements) between 7.00 am and 3.00 pm
- 15 loaded vehicles per hour (30 movements) between 3.00 pm and 6.00 pm.

Offsite Processing - It was suggested at the community meeting that the option for off-site processing should be considered.

Offsite processing was considered but deemed unfeasible due to transport costs contributing substantially to the delivered cost of quarry product. The double handling and additional transportation costs associated with trucking the quarry material to an off-site processing facility and then transporting the product to specific jobs sites would increase the price of the quarry product such it is uncompetitive in the market.

As outlined in **Part A** of this report, Daracon has made significant changes to the project to address community and government concerns.

Heavy Goods Route - There was a strong community opposition to trucks being routed through local villages at the public meeting held at Paterson. The current route is being replaced by one which avoids the Maitland suburb of Lorn and transfers the route to the New England Highway via Melbourne Street, East Maitland. Melbourne Street is already a bottleneck in peak hours. The traffic banks up back past the roundabout near the old gaol. The addition of many trucks, which also travel during peak hour, will create additional strain on the access to the New England Highway to the detriment of Maitland and Morpeth residents. Maitland Council should be consulted regarding this proposal.

Extensive consultation has been undertaken with MCC in respect of the primary haul route and proposed traffic movements associated with the Revised Project (refer to **Section 5.3**).

A review of the Melbourne Street/New England Highway intersection layout as part of the TIA showed that the current capacity of the intersection is constrained, due to established development on each corner together with requirements for turning lanes, footpaths and cycling facilities. There is limited scope for any upgrades at this intersection to increase the capacity, other than changes to timings of the traffic signal operation. These traffic signals are vehicle actuated i.e. detect queues and delays and will actively respond to vehicle demands/queues and as such provide the maximum capacity available at this location. The operation of these traffic signals is monitored by the RMS and refined as appropriate.

Based on the traffic analysis, delays and queuing at the Melbourne Street/New England Highway increase slightly, compared with the existing traffic conditions, the overall level of service remains at E in the AM peak with the average delay increasing from 56.5 seconds to 61.1. In the PM peak, the level of service changes from D to E with the delays increasing from 52.5 to 59.2 seconds.

GPS Tracking of Trucks - With modern technology it is possible to track individual trucks. Conditions should be applied to provide regular reporting on truck movements, routes and driver performance this information should be regularly made available to the community for comment and action.

Daracon trucks are fitted with GPS monitoring and the majority of subcontractor trucks also have GPS monitoring. These records are investigated as required in response to an incident or complaint. While there are trucks which do not have GPS monitoring, all vehicles are still subject to the requirements of the Driver Code of Conduct.

Daracon has committed to explore additional opportunities to further monitor driver conduct and truck convoying, as suggested by the community, including fleet management technologies as they become available and suitable and GPS monitoring for non-Daracon vehicles. Refer to **Section 6.3** for all the traffic management and mitigation measures as part of the Revised Project.

13.5.2 Blasting

Currently this occurs without warning and causes damage to property and distress to those living within a large radius of the quarry. It should be conditioned that those impacted should be given advance notice of blasting. Coal mines in the Hunter Valley already do this.

Daracon have a procedure for notifying the community with options for being notified of scheduled blasting activities by email, SMS or post. This procedure is available on Daracon's website at: https://daracon.com.au/storage/app/media/Enviro%20and%20Quarries%20Documents/Martins%20Creek/MCK%20Blast%20Notification%20Procedure.pdf.

The community can register to be notified about blasts via the 'contact us' page on Daracon's website https://daracon.com.au/services/quarries. Notification of all blasts are provided by email, SMS or email and SMS, depending on the selected preference. Daracon's blasting contractor also undertakes a letterbox drop one to two days prior to each blast for those residents who have requested this method of communication.

13.5.3 Cumulative Impacts

There are other quarries in the area and the cumulative impacts need to be addressed.

Revised assessments have been undertaken for the Revised Project which assess cumulative impacts where relevant. Cumulative assessments include potential interactions with Brandy Hill Quarry which has subsequently been approved.

Cumulative impacts in regard to key aspects have been considered and assessed in each of the specialist studies, as presented in **Section 6.0**, as relevant.

13.6 Paterson Progress Association

13.6.1 Existing Operations

The proponent uses base levels of operation to support their "modest" expansion which are disputed by the community and Dungog Council (DSC). Hence the current court proceedings in play between DSC and the proponent.

As you can no doubt appreciate, until the legitimate base levels of operation are established (300T/450T/750T/950T), it is not feasible to measure the direct impact of an increase to 1.5mT/annum. This means many of the comparisons used in the current EIS are meaningless.

Whilst the quarry has been in existence for a long time, the proponent has failed to establish the necessity for its continued operation. There are several hard rock quarries in the Hunter region much closer to main highways, that can operate with much less impact on their local communities. We have also had sight of a report questioning the claimed resource levels, estimating 14mT versus the claimed 38mT.

As noted in **Section 1.4**, the Court of Appeal judgment was delivered on 20 June 2019 and a stay of orders of 3 months was granted. The effect of the Court of Appeal judgment was that quarry operations be restricted to:

- winning material primarily for railway ballast
- extraction only from Lot 5 DP 242210 (no extraction from Lot 6 DP 242210)
- total processing on that part of Lot 1 DP 1006375 that formerly comprised Lot 2 DP 524511 of no more than 449,000 tpa
- not greatly more than 30% of that total production transported by road per annum
- total production limited by the terms of the EPL to 500,000 tpa.

Since 24 September 2019, the quarry has operated within the parameters deemed as approved by the Court of Appeal. **Section 1.4** sets out the confirmed extent of approved operations, which has been used as a baseline for the assessment of the proposed operation described in the ADA Report.

In response to the public and government agency concerns, Daracon have undertaken a thorough review of the Original Project to redesign key operational parameters in order to reduce environmental and social impacts. In particular, Daracon have committed to reduce the extraction limits, operational hours and truck movements (the Revised Project), as further detailed in **Section 2.0**. An updated environmental assessment, including revised and updated technical studies, have been commissioned to evaluate the key project changes, provide requested additional information and comprehensively address the assessment requirements (as detailed in **Section 6.0**).

If it is assumed DSC and ARTC had reached compromise in there 2009 out of court settlement on a production cap and a levy per tonne, then clearly the proponent on acquiring these "existing use rights" has chosen to ignore them. 4 years of levy alone would mean DSC should have received $1.3m since 2012 towards road upgrades and maintenance.

Daracon advise that when it took over the operation of the quarry there was consultation with DSC on the road maintenance levy, and DSC advised that it would not continue with the previous agreement that was in place with RailCorp. Subsequently, Daracon and their representatives sought to consult with DSC on this matter, and DSC maintained the view that it was inappropriate to liaise on an appropriate road maintenance levy, prior to any resolution of the LEC hearings.

In February 2019, in accordance with the IEMP established under the Court processes, DSC agreed to Daracon contributing $0.795 per tonne of product transported by road for the purpose of the maintenance or repair of the public roads comprising the haul routes within the Dungog Shire LGA from the quarry. The contributions were paid on a monthly basis, calculated by reference to weighbridge records, which were required to be provided to DSC upon request.

For the period January to September 2019 (when operation of the IEMP and the quarry ceased), Daracon contributed in excess of $250,000 to DSC in accordance with the agreed requirements of the IEMP. Prior to the IEMP, there was no planning tool in place for Daracon to make contributions to road maintenance.

13.6.2 Social

The current and proposed truck numbers and operating hours have unacceptable social and environmental impacts upon our village and the immediate surrounds.

For the community of Paterson and its immediate surrounds, the crux of this issue is truck numbers and flow rates. The issues include:

Operating hours and sleep disruption due to truck noise. Currently we are subjected to a 6 days per week 5.45 a.m. "alarm" call from convoys of quarry trucks making their way to MCQ. The proponent proposes to bring this forward by at least 30 minutes to 5.15 a.m. This "time limit" is part of a voluntary code and is completely un-enforceable. It is not unusual to witness trucks quarry trucks parked south of the village currently, well before 5.45a.m., to avoid the "curfew", meaning they have travelled through other impacted communities much earlier. The proponent's dismissal of the impact of these trucks during this shoulder period (prior to 7.00am according to RMS), is insulting to the residents who have to endure this daily assault to their senses.

During the peak period of Feb-Apr 2014, we regularly experienced up to 60 truck movements per hour. Needless to say this was not a steady flow of one per minute, but resulted in convoys of trucks and flow rates in excess of 7-8/minute. The proponent says they will "limit" truck dispatches to 40 loaded per hour meaning (in their own words), this could result in 80-90 trucks per hour passing through our village. This is a rate 50% higher than the rates which provoked community outrage in 2014. Where was this community concern noted in the current EIS?

Following review and consideration of the EIS submissions, Daracon amended key operational parameters of the Original Project in order to reduce environmental and social amenity impacts associated with transportation of quarry product, extraction of material and ongoing operation of the quarry. This involved a revision of the proposed extraction limits, hours of operation as well as truck movements and volumes.

In response to ongoing community and government agency concerns, Daracon has committed to reduce the hours of operation for the Revised Project (as outlined in **Section 2.6**). Road haulage of quarry product will be limited between 7.00 am and 6.00 pm, Monday to Friday, with no haulage on Saturday, Sunday, public holidays or between 24 December and 1 January. In addition to this, no quarry trucks will be traveling through Paterson prior to 6.45 am Monday to Friday.

Daracon is also applying for product loading of up to 10 Daracon-owned trucks (not contractor trucks) between 6.00 pm and 7.00 pm, Monday to Friday, with these trucks remaining parked at the quarry overnight for morning departure from 7.00 am. In the case of trucks loaded on Friday evening, departure will be no earlier than 7.00 am Monday morning.

The Revised Project proposes to transport up to 600,000 tpa of product via rail based on community and agency comments. As a result of the increase to rail transportation, Daracon has committed to a reduction in peak hourly truck volumes. The Revised Project is now seeking approval for 20 laden trucks per hour (40 movements) between 7.00 am and 3.00 pm, and 15 laden trucks per hour (30 movements) between 3.00 pm and 6.00 pm.

Impact on local business. Paterson is thriving community serviced by a number of local businesses which cater to locals and tourists alike. They employ considerably more local people than the quarry and are the lifeblood of our community. Enduring up to 90 quarry trucks per hour, 6 days a week is not conducive to business.

A key objective of the Revised Project has been to reduce traffic and transport related impacts associated with the operation of the quarry to further address concerns from the community and government agencies. This has included:

- reduction in tonnes transported by road to 500,000 tpa

- reduction in peak trucks per hour to:
    - 20 loaded vehicles per hour (40 movements) between 7.00 am and 3.00 pm
    - 15 loaded vehicles per hour (30 movements) between 3.00 pm and 6.00 pm
- road haulage of Quarry product to occur 7.00 am to 6.00 pm Monday to Friday, with no haulage of product on Saturday, Sunday, public holidays or between 24 December and 1 January
- no trucks through Paterson prior to 6.45 am Monday to Friday.

In addition, Daracon committed to a range of traffic controls to be implemented specifically in the village of Paterson, including:

- Include a requirement in the Driver Code of Conduct to report any substantial road pavement irregularities in Paterson, with these reports being passed on the DSC for attention.
- Reinforce the truck speed limit of 40 km/hr through Paterson and include a requirement in the Driver Code of Conduct for a speed limit of 20 to 25 km/hr at the King and Duke Street intersection in Paterson.
- Plan quarry activities, and revise haulage as required around days when there is extra traffic in Paterson due to community events, e.g. Tocal Field Days, car show events, Baptist Church events and funerals.

The proposed "upgrade" to the Duke St/King St junction will have serious negative consequences for the village.

Removes access and parking from several key businesses in the village namely the Post Office, Service Station and Country Café.

As outlined in **Section 5.0**, extensive consultation has been undertaken since the exhibition of the EIS with DSC regarding a number of potential viable options for this intersection, in addition to extensive community engagement via the CAFs to assist with identifying a preferred design option for this intersection. This included consultation with businesses in Paterson and service providers in Paterson, Tocal, Vacy and Bolwarra.

The community identified concerns with the proposed loss of car parking spaces in Paterson and also safety concerns when parking and exiting their cars within Paterson. However, most of the community felt that pedestrian crossings are generally not needed. The loss of car parking spaces was a result of some intersection modifications/road works that were identified as being required through the traffic impact assessment.

As illustrated on **Figure 2.16**, the updated design allows for the relocation of the existing driveway on the north side of the intersection slightly west, to improve the space allocation for parking on either side of the intersection and improve carparking capacity along the northern kerb line. Therefore, there is no longer any loss of on-street parking.

In addition, the proposed intersection works will be at-grade, or close to at-grade, meaning that they will not be readily visible within general views to or within Paterson. As existing kerbs, gutters and footpaths are contemporary, their re-alignment and reconstruction in a like-for-like manner will not result in any adverse visual impacts to the existing aesthetic significance or general visual presentation of the locality. All physical works will be undertaken in association with contemporary fabric of no identified heritage significance.

The Hexham project period of intense operations was imposed on the community with no notice and there was a lack of any contrition when the community pointed out to the proponent this was totally unacceptable.

The Dept mandated Community Consultative Committee meetings during preparation of the EIS which the proponent organised. During these meetings the community groups made very clear that truck numbers were the major concern to the residents of Paterson and surrounds (confirmed by a professionally organised and privately funded community survey). Asked at one meeting if they would in fact run 600 trucks per day through the village again, the answer was "Yes". The EIS proposes truck flow rates 50% higher than they achieved at peak in 2014, clearly ignoring community concerns will have a detrimental visual impact on the village.

Following review and consideration of the EIS submissions, Daracon have undertaken to amend key operational parameters of the Original Project in order to further reduce environmental and social amenity impacts associated with transportation of quarry product, extraction of material and ongoing operation of the quarry. This involved a revision of the proposed extraction limits, hours of operation as well as truck movements and volumes.

Extensive stakeholder engagement was undertaken throughout 2018 and 2019 as part of the updated environmental assessment for the ADA and RTS. Following this process, Daracon considered the feedback provided, in particular from the local community, and have made additional amendments to the Revised Project parameters, including further reductions in the amount of quarry product transported by road, peak truck movements, and operational hours.

13.6.3 Historic Heritage

Impact on heritage. No attempt has been made to assess the impact of vibration on the many heritage listed properties which line the haul route through Paterson. Many of the owners reported cracking/subsidence during the 2014 period. These heritage listed properties form a large part of the character of our village and preserving them is expensive will have a detrimental visual impact on the village

A HIS was been prepared to assess the potential heritage impacts associated with the Revised Project's primary haulage route, in particular:

- potential vibration impacts (if any) of the proposed number and frequency of trucks on the structural integrity of listed heritage items
- potential impacts to the significance of the conservation area as a result of the number and frequency of trucks travelling through a conservation area
- the impacts of proposed intersection and bridge approach upgrade works on the curtilage and significance of listed items and any conservation areas.

Vibration impacts generally only arise when a heavy vehicle hits a pothole, speed bump or other irregularity at speed and the energy from the impact is then transferred through the ground to adjoining buildings. As outlined in **Section 6.11**, the areas where truck movements associated with the Revised Project are in proximity to heritage buildings is the Paterson HCA. The road surface within the Paterson HCA is a bitumen pavement and, when properly maintained, does not contain irregulates that would induce significant vibration impacts. A review of the Vibration Guidelines and academic studies indicate that vibration impacts from trucks under any conditions on bitumen roads is unlikely to cause structure damage to heritage buildings but can have cosmetic effects in extreme cases.

Since the Original Project, Daracon have committed to reduced truck numbers per hour and a speed limit for trucks driving through the King and Duke Street intersection, in Paterson.

As outlined in **Section 6.11.4**, Daracon have committed to a number mitigation measures to reduce potential impacts to heritage items from the Revised Project, including:

- contributing to road maintenance costs associated with truck haulage to enable DSC to ensure road conditions within Paterson are appropriately maintained
- insertion of a requirement in the Driver Code of Conduct to report any substantial road pavement irregularities in Paterson, with these reports being passed on the DSC for attention
- directions to be given to drivers alerting them of any identified road irregularities to enable them to minimise speeds where these occur when driving through Paterson
- reducing truck speeds through Paterson to 40km/hr, with further reduction to 20-25km/hr around the King and Duke Street intersection
- all kerb and other road infrastructure to be reinstated following the proposed works within the Paterson Village HCA to replicate that removed to allow for the King and Duke Street intersection works.

The HIS concluded that it is unlikely that the proposed intersection works within the Paterson HCA will result in any adverse visual or physical impacts to the heritage significance of this HCA or individually listed heritage items.

13.6.4 Health and Safety

Dust & diesel fumes. Diesel fumes are a well-recognised source of carcinogenic particulate matter. During previous peak flow rates, haul route residents noted a black grime appearing throughout their properties and could frequently smell diesel fumes both outside and inside their properties. Daracon's air quality consultant dismissed these concerns with a flippant "close your windows and buy an air conditioner" comment at one CCC meeting. Again the EIS makes no effort to address this genuine concern.

Emissions from diesel exhausts associated with off-road vehicles and quarry plant and equipment have been assessed as part of the AQIA (refer to **Section 6.5**). As discussed in **Section 2.4**, the Revised Project proposes to largely use the existing equipment fleet that is already in place at the quarry. The most significant emissions from diesel exhausts are products of combustion including CO, NO_2 and particulate matter (PM_{10} including $PM_{2.5}$). The NO_2 and PM_{10} (including $PM_{2.5}$) have been considered as part of the AQIA.

As outlined in **Section 6.5.5.3**, modelling of the potential NO_2 concentrations associated with diesel use as part of the Revised Project indicates a maximum 1-hour average concentration at the nearest sensitive receiver (R1) of approximately 20 µg/m^3 or less. With the addition of maximum background levels of 66 µg/m^3, the predicted levels readily comply with the criteria of 246 µg/m^3.

Predicted annual average NO_2 concentrations at the nearest sensitive receiver (R1) are approximately 10 µg/m^3 or less. With the addition of background levels of 16 µg/m^3, the predicted levels comply with the EPA criteria of 62 µg/m^3. All other surrounding private receivers are more distant and are predicted to have lower levels than those predicted at the nearest residence.

Diesel exhaust emissions associated with operational activities (quarry plant and equipment) and off site road transportation (truck movements for quarry sales) are predicted to remain well below the nominated criteria and are therefore unlikely to lead to any adverse air quality impacts. Similarly, monitoring and modelling suggest that the Revised Project is not expected to cause adverse air quality impacts with respect to crystalline silica.

Much of the product transported for construction purposes has been mixed with other materials e.g. lime, fly ash, asphalt etc. This is being transported in open trucks loosely covered. The health impacts of dust from these materials has not been assessed anywhere in the EIS.

Rock falling from moving trucks was an issue especially during peak flow periods. Many residents reported windscreens being cracked and the author had personal experience of a melon sized rock falling from a truck outside his residence.

Trucks entering and leaving the quarry that are carrying loads will be covered at all times, except during loading and unloading.

The AQIA for the Revised Project has assessed air quality impacts from road transportation (refer to **Section 6.5**). Emissions are predicted to remain well below the nominated EPA criteria and are therefore unlikely to lead to any adverse air quality impacts.

13.6.5 Traffic and Transport

Road safety issues. Quarry truck combinations are typically approx. 20m in length and laden are approximately 48-50T. Our village is approximately one kilometre in length. It is not unusual to have 10-14 quarry truck within the confines of our village at any one time. Spaced at 10m this means 30-40% of our village can be dominated by these vehicles during peak flow rates.

As outlined in **Section 13.6.1**, Daracon has sought to reduce traffic and transport related impacts associated with the operation of the quarry to address concerns from the community. This has included reduction in peak trucks per hour to 20 loaded vehicles per hour (40 movements) between 7.00 am and 3.00 pm, and 15 loaded vehicles per hour (30 movements) between 3.00 pm and 6.00 pm.

In addition, Daracon committed to a range of traffic controls to be implemented specifically in the village of Paterson, including reinforcing the truck speed limit of 40km/hr through Paterson and include a requirement in the Driver Code of Conduct for a speed limit of 20 to25 km/hr at the King and Duke Street intersection in Paterson.

Impact on road safety as a result of the Revised Project is further discussed in **Section 6.3**.

There are no defined pull-offs for buses either within the village or even more worryingly on Gresford Road, north of the village, where buses have to stop within the 80- 100kph limit. Actual and predicted peak flow rates coincide with school pick up times.

Consultation with key bus service operators within the vicinity of Martins Creek were undertaken as part of the updated TIA to inform the review of public transport facilities. **Section 6.3** provides a description of the existing bus transport services and pick up/drop off locations along the primary haulage route.

There are few footpaths in Paterson adding to the dangers to children and elderly residents especially walking around the village. We note the EIS deems it unnecessary to make provision for either pedestrians or cyclists as there is "little demand". Could it be a case of chicken and egg here? Our elderly residents and new drivers are intimidated by trucks even where their drivers demonstrate exemplary behaviour which is not always the case. Voluntary codes policed by the proponent do not necessarily control third party owned vehicles.

A review of existing pedestrian amenities along the majority of the primary haul route and been undertaken as part of the updated TIA, including and assessment of pedestrian and cyclist safety (refer to **Section 6.3**). The TIA considered that the Revised Project will continue to have an acceptable impact upon pedestrian and cyclist safety, with no recorded incidents involving pedestrians, cyclists or Daracon operated vehicles, including contract drivers.

The proposed "upgrade" to the Duke St/King St junction … will make crossing the road for pedestrians more difficult than currently

Daracon have considered the feedback from the community and have completed further extensive consultation with the DSC and the Paterson community regarding a number of potential viable options for this intersection, to assist with identifying a preferred design option for this intersection. This included consultation with businesses in Paterson and service providers in Paterson, Tocal, Vacy and Bolwarra.

As shown on **Figure 2.16**, the updated design for the King and Duke Street intersection allows for the relocation of the existing driveway on the north side of the intersection slightly west, to improve the space allocation for parking on either side of the intersection and improve carparking capacity along the northern kerb line. Therefore, there is no longer any loss of on-street parking. In addition, the upgrade will allow for a refresh of the dividing line marking through the intersection to delineate and separate opposing traffic movements.

13.7 Brandy Hill and Seaham Action

13.7.1 Consent History

DSC is taking Daracon to court over non-compliance with the existing consent. Daracon is using "current" operations as the baseline for seeking further expansion of tonnage and operating hours. Surely the court case must be resolved to determine existing consents before your department can rule on this project. And surely an injunction must be placed on Daracon to cease or curtail its operations until both are resolved.

As noted in **Section 1.4**, in 2015 DSC brought action in the LEC against the lessee and the proponent for a breach of the EP&A Act. DSC claimed that operations at the quarry were contrary to the 1991 development consent.

The LEC made declarations and orders restraining the respondents from carrying out certain activities at the quarry. The LEC decision was appealed by the proponent to the Court of Appeal. The Court of Appeal did not make the same orders as the LEC, but did find that some operations at the quarry were not authorised by the 1991 development consent. The effect of the Court of Appeal judgment was that the quarry operations be restricted to the Approved Development activities, comprising:

a) winning material primarily for railway ballast

b) extraction only from Lot 5 DP 242210 (no extraction from Lot 6 DP 242210)

c) total processing on that part of Lot 1 DP 1006375 that formerly comprised Lot 2 DP 524511 of no more than 449,000 tpa

d) not greatly more than 30% of total production transported by road per annum

e) (total production limited by the terms of the EPL to 500,000 tpa.

On 24 September 2019, the quarry was placed into limited operations within the parameters deemed as approved by the Court of Appeal.

Since the change to quarry operations, Daracon have considered community input and have completed further project feasibility investigations, detailed quarry design refinements and proposed additional mitigation measures. With the agreement of DPIE as a delegate of the IPC, Daracon is submitting an amended development application, supported by the ADA Report (**Part A** of this document).

13.7.2 Traffic and Transport

The EIS completely ignores any detriment to amenity, health, wellbeing and existing employment within the affected communities, and also ignores any cumulative impact from other quarry developments. It offers no mitigation measures, other than intersection "improvements" that would speed the flow of their trucks, but would cripple Paterson and destroy incomes and lifestyles along truck routes.

Haul route 2 in the MCQ EIS (the EIS) specifies Clarence Town Road, Brandy Hill Drive and Seaham Road, which are main access roads for our residents and traffic passing through our community. At times, depending on MCQ contracts, the majority of MCQ's output has and would use this route, in conjunction with 100% of Brandy Hill Quarry's output. The EIS claims that on average 25.1% of MCQ output would use this route, which to put in context, is another 25.1% on top of Hanson's proposal, and is a 54% increase over Hanson's current licenced output. These are very big increases and neither quarry has been prepared to quantify or address the cumulative impact of these increases, particularly on the amenity, safety and health of residents or other road users.

In addition to the expected volumes of truck traffic, the proposed earlier starting time of 5:30am for dispatch from MCQ, which is about 30 minutes by road from our community, will result in full trucks travelling through our community from 6am, and worse, empty trucks travelling toward MCQ from before 5am!

The proposed barriers and median strips at the main intersection in Paterson may address some issues, but will create more problems than they solve. The street is just not wide enough to accommodate the proposed number of trucks, while providing parking for the elderly and others outside the post office, takeaway shop and B&B/café. Access to the petrol station will also be blocked. The proposed barriers appear to preclude long loads such as low loaders, B-Doubles and over length special vehicles, which travel through the village, and there is no reasonable detour or bypass. Why else would the quarry trucks use this route?

As outlined in **Section 6.3**, to reduce traffic impacts associated with the operation of the quarry, Daracon have committed to the following revised operational parameters as part of the redesign of the conceptual quarry plan for the Revised Project:

- reduction in tonnes transported by road to 500,000 tpa
- reduction in peak trucks per hour to:
    - 20 loaded vehicles per hour (40 movements) between 7.00 am and 3.00 pm
    - 15 loaded vehicles per hour (30 movements) between 3.00 pm and 6.00 pm
- road haulage of quarry product to occur 7.00 am to 6.00 pm Monday to Friday, with no haulage of quarry product on Saturday, Sunday, public holidays or between 24 December and 1 January
- no trucks through Paterson prior to 6.45 am Monday to Friday
- removal of Haul Route 2 as a primary haul route (now proposed only to service local jobs as required).

An updated TIA has been completed for the Revised Project which includes an assessment of cumulative traffic impacts.

A redesign of the King and Duke Street intersection in Paterson has been undertaken in consultation with the community and local businesses owners. The proposed upgrade of this intersection is detailed in **Section 2.8.2.**

Amenity and wellbeing impacts associated with the Revised Project have been considered in the SIA (refer to **Section 6.13**).

Everyone is angry that worse than this could become the norm if the expansion is approved. Daracon have not paid any levy to any of the three councils, so the chopped up roads have had to be patched using council funds and grants of taxpayer money.

Previous extraction limits for both quarries were increased with the licences issued by the respective councils. PSC had the wherewithal to include a road maintenance levy, but due to the lack of community consultation and council foresight, no levy was imposed to mitigate the loss of amenity for pedestrians and cyclists or to improve the safety of bus stops in the affected community. Dungog council did levy ARTC for road haulage, but Daracon have not been paying any levy to any of the three councils. Any future consent for these quarry expansions is an opportunity to rectify these past shortcomings.

Under the IEMP agreed with DSC in February 2019, Daracon was contributing $0.795 per tonne of product transported by road "for the purpose of the maintenance or repair of the public roads comprising the two haul routes within the Dungog Shire LGA from the quarry" (IEMP, 2019). The contributions were paid on a monthly basis, calculated by reference to weighbridge records, which were required to be provided to DSC upon request.

For the period January to September 2019 (when operation of the IEMP and the quarry ceased), Daracon contributed in excess of $250,000 to DSC in accordance with the agreed requirements of the IEMP. Prior to the IEMP, there was no planning tool in place for Daracon to make contributions to road maintenance.

Should the Revised Project be approved, it is expected that Daracon will be required to make annual financial contributions to both DSC and MCC in the form of a VPA, in accordance with section 7.11 of the EP&A Act. While Daracon is not responsible for how contributions are used by Council, it is anticipated that contributions would be put towards the maintenance of roads used for haulage of quarry products.

False, Misleading and Omitted Information in the EIS - The report is either about different roads from the ones we use, or the consultant employed used "rose coloured glasses" and data filters. The suitability of the road pavement, the width of shoulders and suitability of bridges and intersections is grossly overstated, and focused solely on improving the flow of their trucks.

An updated TIA has been undertaken for the Revised Project, and the key outcomes of the assessment have been summarised in **Section 6.3**.

The TIA has been undertaken in accordance with SEARs for the Original Project (dated 4 August 2016), the Austroads Guide to Traffic Management and the Guide to Traffic Generating Developments published by the RMS. The TIA undertaken for the Revised Project comprised the following:

- characterisation of existing traffic conditions through review of the historic and recent operations of the quarry and traffic count data as available
- undertaking intersection surveys during weekday AM and PM peak periods on 8 and 10 May 2018 along the primary haul route to establish current traffic volumes. Specifically, this involved counts at the following intersections:
    - Dungog Road / Gresford Road
    - Paterson Road / Tocal Road
    - Paterson Road / Flat Road
    - Pitnacree Road / Melbourne Street / Lawes Street
    - Melbourne Street / New England Highway

- undertaking automatic tube traffic counts during April 2018 along key roads on the primary haul route to establish current traffic volumes. Specifically, this involved collecting traffic data over a 24-hour period for a three-week duration on the following roads:
    - Dungog Road, midway between Grace Ave and Gresford Road
    - Gresford Road, north of Paterson
    - Tocal Road, midway between Paterson and Bolwarra Heights
    - Paterson Road, between Bolwarra Heights and Flat Road
    - Flat Road midway between Paterson Road and Melbourne Street
- undertaking additional automatic tube traffic counts for the week beginning 17 February 2020, to the north of Church Street in Paterson, when there were no activities occurring at the quarry
- traffic modelling and intersection analysis using Sidra modelling software and an assessment of traffic impacts and any required management measures.

There is also no mention of a number of intersections where trucks cannot stay within their lane/side of the road, forcing other traffic to stop or use the shoulder.

The T-intersection right-angle turn from Tocal Rd onto Paterson Rd and onto the old iron Paterson River bridge which is barely wide enough for cars to pass and is only wide enough for one truck.

The right angle T-intersection into Duns Ck Rd.

The right angle T-Intersection into Butterwick Rd.

Relevant roads and intersections have been assessed in the revised TIA (refer to **Section 6.3**). As outlined above, Haul Route 2 has been removed as a primary haul route. As such, a number of roads listed in the submission are no longer located on the primary haul route proposed for the Revised Project.

The TIA seems to understate the number of trucks bringing materials to MCQ, carrying:

- **Fly ash**
- **Cement**
- **Lime**
- **Asphalt**

Given the Daracon claim that 85% of the product shipped is blended with the materials above, the number of incoming trucks is understated, which means that the number of total truck movements is also understated.

There is no offer to build soundproof screens/fences (as often seen along highways) beside residential houses that are within metres of haul route roadways.

Daily ancillary vehicular movements including delivery of fly ash, cement, lime and pre-coat associated with the Revised Project are included in the proposed maximum truck movements (refer to **Section 6.3**). These movements have been considered in the traffic modelling of the TIA.

The updated NIA for the Revised Project assessed noise impacts from road transportation (refer to **Section 6.4)**. The addition of quarry trucks will increase the road traffic noise levels at all the sensitive receivers assessed, however the maximum traffic generation scenario modelled will not increase the road traffic noise levels at any sensitive receiver by more than 2 dB and therefore meet the relevant RNP criteria for new developments.

There is no firm offer of a VPA to fund road, bridge and intersection improvements and maintenance.

Should the Revised Project be approved, it is expected that Daracon will be required to make annual financial contributions to both DSC and MCC in the form of a VPA, in accordance with section 7.11 of the EP&A Act. While Daracon is not responsible for how contributions are used by Council, it is anticipated that contributions would be put towards the maintenance of roads used for haulage of quarry products.

As outlined in **Section 6.3**, Daracon has committed to upgrading intersections and the Gostwyck Bridge approach as part of the Revised Project.

13.7.3 Cumulative Impacts

The absence of any analysis or mitigation measures for the cumulative impact of trucks from two quarry expansions using the haul routes shows no respect for your Department let alone residents. Maitland City Council (MCC) concerns about MCQ trucks queuing at the Melbourne St lights will be multiplied when Brandy Hill contracts direct up to all their output along that route also used by the majority of MCQ trucks.

Revised assessments have been undertaken for the Revised Project which assess cumulative impacts where relevant. Cumulative assessments include potential interactions with Brandy Hill Quarry which has subsequently been approved.

Cumulative impacts in regard to key aspects have been considered and assessed in each of the specialist studies, as presented in **Section 6.0**, as relevant.

13.7.4 Health and Safety

The health and wellbeing of residents living along the haulage corridors must be considered a serious issue and is not addressed in the EIS. It has been widely documented that constant road noise is a contributing factor to anxiety, stress, depression, high blood pressure and other cardio-vascular conditions. Aggression has been attributed to sleep deprivation for shift workers and those who are impacted by noise during their normal night time sleep hours.

The increased disruption of sleep and rest times will be grave, when it is considered that our roads are otherwise very quiet from 7pm and 7am.

As outlined in **Part A** of this report, Daracon has made significant changes to the Revised Project in response to community concerns. This has included reducing road transportation volumes and peak hourly truck movements and refined operational hours which lessen impacts along the haulage route.

As outlined in the relevant assessments, the Revised Project will:

- it is predicted that the addition of quarry trucks will result in minor increases to noise levels i.e. less than 1 dB(A). The RNP states that noise level increases of up to 2 dB(A) are considered barely perceptible to the average person
- night time noise levels will not exceed sleep disturbance noise goals at any residential receivers
- air emissions from transport are predicted to remain well below the nominated EPA criteria and are therefore unlikely to lead to any adverse air quality impacts.

Relevant revised assessments are provided in **Section 6.0**.

14.0 Community Submissions

As outlined in **Section 11.0**, a total of 785 individual community submissions were received relating to the Original Project. A response to the issues raised in these submissions is included in the following sections grouped by theme.

Several of the community submissions received were similar or had consistent themes. Where this is the case, the theme of the concern has been provided in bold in the text boxes below with some examples of specific quotes from the submissions provided in normal type to assist the reader. Specific issues, that is, where an issue was raised only once have also been addressed.

14.1 Environment, Social and Economics

14.1.1 Traffic and Transport

Issues relating to traffic and transport were raised in 367 community submissions.

Adequacy of road network

'…some trucks currently wait at Tocal from 5:30am others don't care what they do and proceed through, a 5:30am start will see trucks passing through the village from 5:00am possibly earlier. This will see driver fatigue increase with drivers awake at 3:30am & working from say 4:00am and driving until the last load at 7:00pm arriving home after 8:00pm over 6 days per week, an accident waiting to happen with fatal consequences.' (174312)

Daracon recognise that traffic and transport issues are of key concern to the community, in particular with regards to the volume of truck movements, transportation hours, and road capacity. Consequently, Daracon have undertaken a thorough review of the Original Project to redesign key operational parameters in order to reduce environmental and social amenity impacts, in particular in relation to traffic and transport.

In response to community concern, Daracon have committed to the following revised operational parameters as part of the redesign of the conceptual quarry plan for the Revised Project:

- reduction in tonnes transported by road to 500,000 tpa
- reduction in peak trucks per hour to:
    - 20 loaded vehicles per hour (40 movements) between 7.00 am and 3.00 pm
    - 15 loaded vehicles per hour (30 movements) between 3.00 pm and 6.00 pm
- road haulage of quarry product to occur 7.00 am to 6.00 pm Monday to Friday, with no haulage of quarry product on Saturday, Sunday, public holidays or between 24 December and 1 January
- no trucks through Paterson prior to 6.45 am Monday to Friday
- removal of Haul Route 2 as a primary haul route (now proposed only to service local jobs as required).

An updated TIA was completed for the Revised Project (refer to **Section 6.3**). The TIA indicates that while there will be an overall increase in traffic along the primary haul route due to the Revised Project, the proposed annual output of the quarry for which approval is being sought will have an acceptable impact upon the road network that forms the haul route between the New England Highway and the site. The assessment above shows that the road has adequate capacity and is currently operating within acceptable guidelines provided by the RTA Guide to Traffic Generating Developments.

Additionally, the TIA found that the traffic movements associated with the Revised Project will have an acceptable impact upon the overall operation of the principal intersections along the primary haul route. Whilst the two signalised intersections are predicted to suffer from increasing delays, this would be due to the continual traffic growth along the New England Highway in this location rather than a direct impact of the Revised Project.

Quarry traffic causing road damage

'The increase of truck movements will cause major road degradation as many roads are not local and not built for such intense heavy vehicle Traffic daily.' (169586)

'Paterson already experiences major road damage from the existing amount of trucks passing through the town and doubling the existing Traffic will worsen the state of the roads.' (169737)

Submissions indicate that existing pavement condition surrounding the quarry, including haul routes, is of concern to the local community.

As outlined in **Section 6.3**, a pavement assessment was undertaken to assess the current condition of the haul route. The Pavement Condition Analysis found that the Maitland roads tend to be in better condition and have stronger pavements as compared to Dungog. As a result of the modelling, it was predicted that the addition of the extra truck traffic would result in additional road maintenance requirements for the haul routes over the next 25 years (SMEC 2021).

As outlined above, Daracon have committed to reducing traffic movements associated with the Revised Project in response to community concerns. Daracon have also committed to a number mitigation measures to reduce potential impacts from the Revised Project, including contributing to road maintenance costs associated with truck haulage to enable Dungog Council to ensure road conditions are appropriately maintained.

Quarry traffic causing damage to residences

'My house also shudders when trucks round the corner and the double brick walls are showing signs of cracking up.' (170284)

'… vibration caused by truck movements will adversely affect residents health and buildings will continue to suffer vibration related damage.' (169384)

'The constant pounding of the trucks on the road has affected our house so badly we have had to have it jacked up and repaired' (169959)

An assessment of truck movements on heritage buildings was undertaken in the Paterson HCA (refer to **Section 6.11.3.3**). The assessment indicated that vibration impacts generally only arise when a heavy vehicle hits a pothole, speed bump or other irregularity at speed and the energy from the impact is then transferred through the ground to adjoining buildings.

The NSW Department of Environment and Conservation 2006 Guideline "Assessing Vibration: a technical guideline" (Vibration Guidelines) includes guidance for the assessment of vibration impacts. It includes the following observation:

The most severe vibrations associated with road traffic result from heavy vehicles with stiff suspensions moving rapidly along roads with irregular surfaces.

The proposed haulage route is already host to heavy vehicle traffic associated with the existing Quarry operations, as well as general non-quarry related heavy vehicle traffic.

In response to community and government concerns, Daracon has committed to project changes to reduce the predicted impacts associated with product transportation from the Revised Project, including the reduction of road transportation (refer to **Section 2.8**). Revised product transport arrangements for the Revised Project, include:

- reduced peak daily laden trucks of 140 per day (280 movements) for 50 days per year, otherwise 100 per day (200 movements) with a peak of:
    - 20 loaded vehicles per hour (40 movements) between 7.00 am and 3.00 pm
    - 15 loaded vehicles per hour (30 movements) between 3.00 pm and 6.00 pm
- no trucks through Paterson Village before 6.45 am
- increased quarry product transported by rail
- removal of Haul Route 2 as a primary haul route (now proposed only to service local jobs as required).

Daracon have committed to a number mitigation measures to reduce potential impacts from the Revised Project, including contributing to road maintenance costs associated with truck haulage to enable Dungog Council to ensure road conditions are appropriately maintained.

Furthermore, Daracon has committed to:

- insertion of a requirement in the Driver Code of Conduct to report any substantial road pavement irregularities in Paterson, with these reports being passed on the Dungog Council for attention
- directions to be given to drivers alerting them of any identified road irregularities to enable them to minimise speeds where these occur when driving through Paterson.

14.1.2 Public Health and Safety

Issues relating to public health and safety were raised in 284 community submissions.

Health impacts associated with noise

'There are shift workers in our house - the noise impacts our sleep/living patterns - it affects our health.' (170625)

'The noise of the quarry already affects our family causing stress and fear of our home and lifestyle being changed or lost by the quarry proposal as well as loss of value to the property the proposal will cause.' (174392)

'I was suffering cancer of the immune system and was advised by my doctors that increased stress levels would significantly hinder my recovery. The constant noise from truck traffic already causes increased stress and an extension of operations would increase this even more.' (173653)

'The noise of continual trucks makes living inside & outside our home impossible for us." (174004)

'So the noise from these trucks will be relentless with our only respite being one day per week. Not good for anyone's physical or mental health and will lead to fatigue which is a major contributing cause to injuries and death on New South Wales roads.' (174280)

As outlined above, Daracon have made substantial changes in response to community feedback in relation to noise impacts associated with the Original Project, both in terms of on-site operations and for product transportation.

Detail of the updated noise assessment in relation to all phases of on-site operations is provided in **Section 6.4**.

Noise sources that could lead to sleep disturbance are typically transient noises and often have tonal characteristics. No rock excavation or processing activities will occur during the evening or night-time period. Activities that could lead to sleep disturbance include:

- train by-pass event on the spur line opposite the receivers in Station Street
- loading of rail wagons using front end loaders
- reversing beepers on the front-end loaders used to load the rail wagons.

The NIA results show that night time noise levels will not exceed sleep disturbance noise goals at any residential receivers.

As outlined in **Section 6.4**, the modelling results indicate that baseline/existing road traffic noise levels without the quarry trucks present exceed the NSW Road Noise Policy (RNP) (DECCW, 2011) criteria for some receivers due to existing traffic rates and proximity to the road.

The addition of quarry trucks at the capped maximum of 140 laden trucks per day (280 movements) and the capped maximum of 20 laden trucks per hour only results in an exceedance of the RNP Criteria at one receiver where it was not already calculated to exceed the criteria with the baseline traffic levels. Where the RNP criteria are already exceeded, or is predicted to be exceeded, the predicted increase in road traffic noise due to the quarry trucks is predicted to be less than 2 dB. The RNP states that noise level increases of up to 2 dB are considered barely perceptible to the average person.

The modelled scenarios with the addition of quarry trucks at the capped maximum of 140 laden trucks per day (plus the return trip) and the capped maximum of 20 laden trucks per hour represent worst-case traffic conditions. During usual operating conditions, road noise impacts would be lower than the levels predicted for the maximum operating scenarios.

Daracon will continue to manage operations to achieve the approved operations noise limits throughout the life of the Revised Project through the continued implementation of an adaptive management approach, focused on implementing appropriate operational controls and management strategies to minimise noise impacts. The approach will vary during different quarry stages and weather conditions and will also consider evolving technology and associated equipment noise levels. Daracon has committed to the implementation of controls as outlined in **Section 6.4.6** over the life of the Revised Project as will be detailed as part of a revised NMP.

The VLAMP provides guidance on the approach to managing noise impacts in excess of the target PNTLs. Daracon will continue to consult with potentially impacted residents regarding management of noise associated with the Revised Project in accordance with the requirements of the VLAMP.

Health impacts associated with air quality

'My husband suffers with asthma and as a result of the quarry extending this would increase dust around the home and external parameters causing increased asthma attacks and medical cost.' (170082)

'We have been here for 14 years and I have developed asthma from the dust and dust levels in our house are excessive.' (170137)

'... the volume of dust is unbearable and uncontrollable. Both of my children have chronic nose bleeds weekly. After seeking medical treatment I was told that it is caused by an infection in the nose from the dust particles.' (170656)

'… both of my grandchildren have serious health issues attributed to the ongoing dust problem.' (170654)

'Diesel combustion exhaust is a source of atmospheric soot and fine particles, which is a component of the air pollution implicated in human cancer, heart and lung damage, and mental functioning.' (174402)

'Diesel emissions are a carcinogen and affect people's health. Residents are concerned about air pollution impacts…'(173823)

As discussed in the AQIA (refer to **Section 6.5**), PM_{10} and $PM_{2.5}$ are the components of air borne particulate matter which are relevant to human health impacts. The NSW Government has set criteria for PM10 and PM2.5 that are intended to protect human health. The assessment findings against these criteria are outlined below and in **Section 6.5**.

Based on the air modelling results, it is predicted that the contribution as a result of the Revised Project to the cumulative maximum 24 hour average and annual average PM_{10} concentrations would be negligible with compliance with the EPA cumulative air quality criteria of 50µg/m³ and 25µg/m³, respectively, at all surrounding private residences (refer to **Section 6.5.5.1**). The annual average PM_{10} concentrations with the Revised Project are expected to be similar than the annual average PM_{10} concentrations under the recent quarry operations, which was in the order of 13µg/m³, as measured by the high volume air sampler located off Station Street, at Martins Creek.

Regarding diesel emissions, the AQIA modelling results showed that the diesel exhaust emission concentrations (including CO and NO_2) associated with the operational activities as well as road transport of quarry product would comply with the relevant criteria at all sensitive receivers. Exhaust emissions from operational activities and road transport are therefore unlikely to lead to adverse air quality impacts.

As noted above, Daracon is aware that air quality is an important issue for the community and has committed to a range of emission controls to be incorporated into the design of the Revised Project to further minimise air quality impacts:

- watering of unsealed access roads
- water sprays for drilling activities
- cladding and water sprays on the primary and secondary plant
- cladding of the tertiary crusher and hopper
- cladding of the screening plant
- water sprays on product stockpiles.

Additional air quality monitoring, management and mitigation measures proposed as part of the Revised Project are outlined in **Section 6.5.6**.

Public safety associated with product transportation

'As a daily pedestrian on Dungog Rd. & Grace Av. my safety is threatened now, however with increased truck movements it will be near fatal. NONE OF THESE TRUCKS OBSERVE THE 30 METRE DISTANCE BETWEEN THEM which is law.' (170811)

'…the proposed extra Traffic (i.e trucks) that will be traveling on the proposed route really causes serious safety concerns for myself and my children that travel that road, the main road traveling through Paterson is too small for heavy haulage Traffic as well as the state of the road itself, the main corner where the post office is in Paterson has had one incident and many more near misses that I have heard about and I think it's only a matter of time before someone gets injured or possibly killed due to the trucks now…'(170474)

'80 trucks an hour thundering past residential homes and on the narrow roads in the area is a hazard and will lead to major problems for the families in the area. Safety of children, old people, dog walkers etc is also going to be at risk.' (170340)

'The current Traffic level is already proving to be unsafe with the speed and volume of heavy vehicles moving through the built up community, passing by a school and retail shops and residential homes.' (171245)

Daracon recognise that public safety related to traffic and transport impacts is of key concern to the community. A key objective of the Revised Project has been to reduce traffic and transport related impacts associated with the operation of the quarry to further address concerns from the community and government agencies. This has included:

- reduction in tonnes transported by road to 500,000 tpa
- reduction in peak trucks per hour to:
    - 20 loaded vehicles per hour (40 movements) between 7.00 am and 3.00 pm
    - 15 loaded vehicles per hour (30 movements) between 3.00 pm and 6.00 pm
- road haulage of quarry product to occur 7.00 am to 6.00 pm Monday to Friday, with no haulage of product on Saturday, Sunday, public holidays or between 24 December and 1 January
- no trucks through Paterson prior to 6.45 am Monday to Friday.

In addition, the Revised Project will utilise one haulage route (Haul Route 1) via Flat Road and Melbourne Street to connect with the New England Highway, thus removing most trucks from the routes via Lorn and Brandy Hill which have been historically used for the quarry.

The length of the major haulage route for the quarry operations has been reviewed under the guidelines for the preparation of Road Safety Audits published by Austroads. As outlined in the TIA, TfNSW has also provided accident data along the full length of the haul route over the 5 year period between July 2013 and June 2018, which provides details on the accident types as well as the type of vehicles involved.

Since Daracon commenced operating the quarry in December 2012 there have been no reportable accidents recorded and/or reported to Daracon along this route nor the other historical main haulage route associated with trucks working for the quarry. From the accident data, the following points are made:

- the vast majority of the accidents involved light vehicles and light trucks only, which excludes the size/type of vehicle associated with haulage of quarry material
- speed and fatigue were determined as contributing factors in over 30% of the accidents along the route
- the majority of accidents in urban areas along the haulage route involved rear end accidents, turning traffic and at the approach to intersections. These are typically created at driveways and intersections where there are no sheltered right turn lanes, to protect traffic waiting to turn right off the road

- the most frequent crash type involved vehicles going off road, with this being the most common accident type in rural locations

- one fatal accident was recorded along the route involving a driver going off road on a bend. Speeding and fatigue were identified as contributing factors for this accident.

The road safety review undertaken along the length of the major haulage route identified a number of safety concerns with the existing layout of intersections and roads. The TIA found that these are existing safety issues on the existing road network where there is non-compliance with current Austroads Guidelines design standards rather than being directly related to the haulage vehicles associated with the Revised Project.

The Revised Project is not expected to have any adverse impacts on the safety of the road network or other road users. As discussed above, while there will be an increase in traffic movements due to the Revised Project, this will represent a small increase over the existing flows along the primary haul route and through key intersections.

Road improvement works are proposed as part of the Revised Project to alleviate existing road safety concerns and improve traffic flow. These will be designed in consultation with the relevant road authorities and in accordance with Austroads Guidelines. The proposed road works (detailed in **Section 2.8.2**) will provide the following benefits to be experienced with the Revised Project:

- New main site access – A new access to the quarry on Dungog Road will remove all quarry related trucks from Station Street and Grace Street and the existing access will only be used by light vehicles in an emergency event.

- Gresford/Dungog Road intersection – Will provide a sheltered right turn lane on Gresford Road to improve road safety, by reducing or eliminating the potential for rear end type accidents. The upgrade will direct all through traffic to steer to the left of any vehicle waiting to turn right at this location. This upgrade is in line with RMS policy (RMS 2017) which no longer permits Rural Type AUR intersection controls and requires a Rural CHR type intersection. The upgrade will further extend the acceleration lane improving road safety.

- King and Duke Street intersection - Upgrade the 90-degree bend in Paterson with a refresh of the diving line marking through the intersection to delineate and separate opposing traffic. The upgrade will allow for the relocation of the driveway on the north side of the intersection to improve space allocation for on street parking.

- Gostwyck Bridge approach upgrade - The upgrade will allow for the realignment of Dungog Road by incorporating a series of curves to raise driver awareness and associated new line marking, as well as Vehicle Activated Signage (VAS) alerting drivers approaching the bridge to reduce speed.

In addition, Daracon commit to implement a range of traffic controls (as outlined in **Section 6.3.5**) to further mitigate any potential road safety impact to be associated with trucks from the Revised Project.

14.1.3 Noise

Issues relating to noise were raised in 253 community submissions.

Increased noise levels from quarrying operations

'… noise coming from the quarry now is bad, if production increases it will force us to move' (170759)

'Noise in the village will increase exponentially causing annoyance and possibly health problems to locals.' (174258)

'Despite this distance noise from the quarry operation has become increasingly obvious. In particular blasting, dumping of rock into equipment and on some days the constant hum of machinery. The limited acoustic wall (designed for residents of Station St only) proposed will do nothing to alleviate this.' (174097)

'… we can often hear the noise of the processing (a constant rumble of varying volume, or the crashing sound of large rocks tumbling – we assume this is what it is, or the noise & vibration of the blasting).' (174137)

'There are days when there is continuous noise from the crushers and other machinery…" (174457)

In response to community and government concerns, Daracon has committed to project changes to reduce the predicted noise impacts associated with quarrying activities from the Revised Project, including the refinement of operational hours (refer to **Section 2.6**).

Under the Revised Project, the following changes have been committed to:

- Quarry operations from 7.00 am to 6.00 pm Monday to Saturday, with the exception of road haulage of quarry product which will only occur Monday to Friday.
- As an additional mitigation measure, blasting of quarry material will only occur between 11.00 am and 3.00 pm on Monday to Friday, with no blasting on Saturdays.
- No evening or night operation and no operation on Sundays or public holidays, apart from the following activities which may occur 24 hours seven days per week:
    - rail loading and transportation
    - necessary maintenance activities and/or environmental management controls, including vehicles/trucks moving in and out of the site for maintenance purposes as required.

As outlined in Section 6.4, the updated Noise Impact Assessment for the Revised Project has indicated that there will be predicted exceedances (refer to **Section 6.4**).

Daracon will continue to manage operations to achieve the approved operations noise limits throughout the life of the Revised Project through the continued implementation of an adaptive management approach, focused on implementing appropriate operational controls and management strategies to minimise noise impacts. The approach will vary during different quarry stages and weather conditions and will also consider evolving technology and associated equipment noise levels. Daracon has committed to the implementation of controls as outlined in **Section 6.4.6** over the life of the Revised Project as will be detailed as part of a revised NMP.

The VLAMP provides guidance on the approach to managing noise impacts in excess of the target PNTLs. Daracon will continue to consult with potentially impacted residents regarding management of noise associated with the Revised Project in accordance with the requirements of the VLAMP.

Noise impacts from road transportation

'There are already too many trucks on this road without adding more, thus adding more noise …'(170829)

'The constant noise from truck traffic already causes increased stress and an extension of operations would 'increase this even more.' (173653)

'Given the proposed early hours of operation, the noise report does not adequately address the proposed significant increase in heavy vehicle movements in early morning hours that will have a significantly greater impact.' (173800)

'… the noise of the empty trucks rolling passed our place from 5.30 6 days a week will be unbearable.' (170111)

'Although we don't live directly on Brandy Hill Drive, we wake early each morning to the noise of quarry trucks bouncing along the potholes.' (170500)

'The noise from the trucks often wakes me and my family early in the morning. To give an example of the severity of the noise from the trucks we often have mistaken the sound of the trucks for a rumble of thunder. The quarry might not be open until 7am but trucks are presently moving through Paterson before 6am.' (174145)

'The constant grinding, heavy truck movement within the quarry makes it unpleasant to spend time outside in my garden and many visitors ask and comment on the noise.' (174408)

'Truck movements are loud and obtrusive, and can be heard some distance away particularly as they come through the township.' (174550)

'We have even had people who have been booked in for two nights leave after one because of the noise.' (174696)

The comments in relation to potential noise impacts from product transportation by road associated with the Original Project are noted. In response to community and government concerns, Daracon has committed to project changes to reduce the predicted noise impacts associated with product transportation from the Revised Project, including the reduction of road transportation (refer to **Section 2.8**).

Revised product transport arrangements for the Revised Project, include:

- reduced peak daily laden trucks of 140 per day (280 movements) for 50 days per year, otherwise 100 per day (200 movements) with a peak of:
    - 20 laden trucks per hour (40 movements) between 7.00 am to 3.00 pm, Monday to Friday
    - 15 laden trucks per hour (30 movements) between 3.00 pm and 6.00 pm, Monday to Friday
- no trucks through Paterson Village before 6.45 am
- increased quarry product transported by rail
- removal of Haul Route 2 as a primary haul route (now proposed only to service local jobs as required).

As outlined in **Section 6.4**, the updated Noise Impact Assessment for the Revised Project has indicated that baseline/existing road traffic noise levels exceed the RNP criteria for some receivers due to existing traffic rates without the quarry trucks present. The addition of quarry trucks does not result in an exceedance of the RNP criteria where it was not already calculated to exceed with baseline traffic levels. Where the RNP criteria are already exceeded the predicted increase in road traffic noise due to the quarry trucks is predicted to be less than 2 dB. The RNP states that noise level increases of up to 2 dB(A) are considered barely perceptible to the average person.

The addition of quarry trucks will increase the road traffic noise levels at all the sensitive receivers assessed, however the maximum traffic generation scenario modelled will not increase the road traffic noise levels at any sensitive receiver by more than 2 dB and therefore meet the relevant RNP criteria for new developments.

14.1.4 Blasting and Vibration

Issues relating to blasting and vibration were raised in 86 community submissions.

Vibration impacts associated with blasting activities

'The rock blasting is also something that compares to an earthquake. We experience a large warning siren before a huge blast that shakes the ground and the windows in our home. Pictures on the walls have fallen down! We now have significant cracks in the interior and external bricks of our home.' (173676)

'I have lost precious items of china falling from cupboard after blasting. Each time there is a blast the glass ware rattles in the cupboard & I have watched a crack in our ceiling travel during the blast.' (170759)

'Regular blasting impacts on our house with cracking to cornices etc and the subsequent shift and movement in the ceiling.' (170625)

'The blasting noise and shock waves that follow with the blast sucking the air away and then once it explodes the glass windows literally move and shake.' (174698)

'… shock waves from the blasting of blue metal rock, which requires extra force to break metal open is horrendous. We feel the shockwaves before we hear rumbling of the blast. We have major cracking on our exterior & interior walls on our home. Our concrete inside & outside our house has major cracks. We have doors & windows that won't open properly. When the blasting happens our house shakes & rattles, it sounds and feels like a mini earthquake.' (174004)

A comprehensive assessment of potential blasting and vibration impacts of the Revised Project has been undertaken and summarised in **Section 6.7**.

The results of the BIA indicate that ground vibration and blast overpressure levels can be managed to meet relevant blast emission criteria at all sensitive receiver locations through appropriate blast design and the implementation of appropriate control measures. Each blast will be designed to comply with the relevant criteria and the design practice at Daracon incorporates a factor of safety to provide for unexpected conditions (that is, blasts are designed to result in impacts below the limit, not on the limit).

As outlined in **Section 6.7**, Daracon has a demonstrated track record of managing blasting impacts from its quarrying operations with no exceedances of the relevant ground vibration criteria at the private residences, and one result above 115 dBL (but less than 120 dBL) at the Gully Monitor (located at 336 Dungog Road) over a 6.5 year period, extending from 1 March 2013 to 19 August 2019 (consisting of 158 blasts). In addition, the EPA undertook an independent monitoring audit involving 13 separate blasts from the quarry during 29 March to 27 August 2018 at a location in View Street, Vacy. Based on the data collected during the audit, the EPA considered that Daracon's vibration and overpressure monitoring undertaken was appropriate for complying with the conditions of the EPL with no breaches of the EPL limits or conditions.

Additionally, in response to community concerns in relation to property damage resulting from blasting activities, Daracon commissioned an independent inspection, monitoring and reporting relating to blast vibrations from the quarry at a residence in Vacy during 2019. The peak particle velocity of the measured blast was measured at a magnitude of 10 to 20 times lower than the levels likely to cause damage to residential properties. The assessment indicated that the residence had not been damaged due to blasting operations at the quarry.

Noise impacts associated with blasting

'Previously the blasting resembled a faraway explosion, it has now become so intense that the ferocity of the blast led me to believe an earthquake was rumbling up the road...' (171785)

'The noise from the blasting is extremely loud, often causing distress to my wife.' (170217)

In response to community feedback, Daracon have committed to voluntarily reduce the permissible window for blasting, and only undertaking blasting at the quarry between the hours of 11.00 am and 3.00 pm Monday to Friday, inclusive. No blasts will be fired on weekends or public holidays.

To provide further certainty around the timing of blasts, Daracon have a procedure for notifying the community with options for being notified of scheduled blasting activities by email, SMS or post. This procedure is available on Daracon's website at: https://daracon.com.au/storage/app/media/Enviro%20and%20Quarries%20Documents/Martins%20Creek/MCK%20Blast%20Notification%20Procedure.pdf.

If the Revised Project is approved, blasting activities will continue to be undertaken in accordance with the existing Blast Management Plan, which will be updated as required. All blasting undertaken as part of the Revised Project will continue to be managed to meet relevant blasting criteria.

14.1.5 Social Amenity

Issues relating to social impacts were raised in 222 community submissions.

Impacts on social amenity:

"Many families have relocated to the rural NSW areas for a quieter and safer life for their families and the proposed Quarry Expansion is certainly not in the best interest of the community nor its people." (172038)

"I have lived at the above address for almost 10 years now and in this time I watched the quarry grow to a place now where it is destroying the lives of people in the community." (173676)

"…they cannot compensate for the loss of sense of place entailed in the desolation of a whole rural village and the quality of lives people living along the trucking route." (174049)

'Sitting outside the cafe with a coffee is a joke. Trucks rattling past every couple of seconds make it hard to communicate' (173909)

'our house has experienced cracks in the walls due to truck movements, plus the noise interferes with our peaceful enjoyment of the property' (174418)

'This submission will disadvantage surrounding local businesses including the shop, bed and breakfast and post office as the road would experience heavy truck Traffic with fewer safe on road parking options, and restrict quick safe access to these businesses.' (174080)

'We moved to the Brandy Hill area some years ago in an attempt to gain a more relaxed rural lifestyle. Unfortunately we underestimated the impact of truck movements from both Martins Creek and Brandy Hill Quarries. It is part of our daily life to contend with and be affected by the large number of truck movements already present. We regularly compete on the roads with large trucks (with dog trailers) thundering past while entering or traveling along Brandy Hill Drive; a huge safety concern.' (170500)

Sense of Community

"Again, the quarry as it SHOULD be is an asset to the community in terms of local jobs and assets, but the expansion is terrifying, in terms of safety, impacts on property values and the destruction of an area that has been so highly prized for community spirit, closeness, safety for children" (170621)

In response to the public and government agency concerns, Daracon have undertaken a thorough review of the Original Project to redesign key operational parameters in order to reduce environmental and social impacts. In particular, Daracon have committed to reduce the extraction limits, operational hours and truck movements (the Revised Project), as further detailed in **Section 2.0**. An updated environmental assessment, including revised and updated technical studies, have been commissioned to evaluate the key project changes, provide requested additional information and comprehensively address the assessment requirements (as detailed in **Section 6.0**).

A comprehensive SIA was prepared for the Revised Project and a summary is provided in **Section 6.13**. As has been highlighted in the SIA, project development brings benefits and costs that are not always evenly distributed across individuals and stakeholder groups and as a result, where social impacts are predicted it is the role of a SIA to outline how such impacts can or cannot be managed.

In addition to the project refinements, a number of mitigation and enhancement strategies are proposed to address potential social impacts relating to the Revised Project, where possible (refer to **Section 6.13** and **Appendix O**).

14.1.6 Air Quality

Issues relating to air quality were raised in 157 community submissions.

Air emissions from quarry operations

'I cannot open the doors and windows in my house as the dust infiltrates the inside 24 hours a day.' (170656)

'… more trucks and traffic mean more dust and the expansion means more air pollution' (172614)

'We can very rarely hang washing on the line or open the windows to our home as the dust levels are so high.' (173676) "The Project's impacts would exacerbate the loss of sense of place, and materially and adversely change the sense of community….." (174049)

A comprehensive assessment of potential air quality impacts of the Revised Project has been prepared with a summary provided in **Section 6.5**. The Revised Project will result in emissions to air from a variety of activities, as identified and discussed in **Section 6.5.1**. These emissions will mainly comprise particulate matter (PM) in the form of deposited dust, total suspended particles (TSP) which includes particulate matter with equivalent aerodynamic diameter of 10 microns or less (PM_{10}) and 2.5 microns or less ($PM_{2.5}$) from general quarrying activities, fume (oxides of Nitrogen (NO_x)) from blasting and minor emissions from machinery exhausts (PM, NO_x and CO).

The design and planning of the Revised Project has closely considered air quality impacts and incorporated air quality mitigation and management measures into the Revised Project design. Key measures included in the Revised Project design that have minimised air quality emissions include:

- reduction of the overall disturbance footprint by approximately 16.8 ha through optimisation of the proposed extraction within the West Pit and therefore reducing the area of operations that could generate dust
- reduced operational hours which would imply that the running of processing equipment, stockpiling and transportation of material will be reduced and thereby reduce the amount of dust generated by the operation of the Revised Project
- limiting the number of haulage routes (where feasible), thus minimising transport routes and associated dust generation and diesel emissions
- progressive rehabilitation of disturbed areas to reduce wind generated dust where feasible

- ongoing implementation of the air quality management practices of the previous operations at the quarry (e.g. through a high level of active dust control).

Daracon is aware that air quality is an important issue for the community and has committed to a range of emission controls to be incorporated into the design of the Revised Project to further minimise air quality impacts:

- watering of unsealed access roads
- water sprays for drilling activities
- enclosure and water sprays on the primary and secondary plant
- enclosure of the tertiary crusher and hopper
- enclosure of the screening plant
- water sprays on product stockpiles.

Additional air quality monitoring, management and mitigation measures proposed as part of the Revised Project are outlined in **Section 6.5.6**.

The AQIA predicted that there would be very little change in contribution for all particulate matter classifications (PM_{10}, $PM_{2.5}$, TSP and dust deposition) beyond the Project Area boundary as a result of the Revised Project, with no exceedances of the EPA criteria at any of the sensitive receiver locations. The assessment further showed that emissions from blasting and associated fume are not expected to result in any adverse air quality impacts, based on model predictions which show compliance with EPA criteria.

Based on the results of the AQIA, with the implementation of the proposed management measures nominated in **Section 6.5.6**, it is concluded that the Revised Project would not cause adverse air quality impacts on surrounding receivers or the local air shed.

Dust impacts from blasting activities

'I believe that the blasting technique used by Daracon sends microparticles into the atmosphere to be inhaled by those in the path of the plume. Plumes of dust are visible immediately after blasting, but it is what I contend is "microdust" that is my main concern.' (169901)

'The dust is already a problem to my health, with increased blasting this will further impact on my health.' (170811)

'In terms of how the quarries current activities have affected me, my friends in local communities and my family it has been … decreased air quality during blasting.' (173680)

Particulate matter emissions from blasting have been modelled as part of the updated AQIA for the Revised Project (refer to **Section 6.5**). The results show that even under worst-case meteorological conditions applying conservative assumptions, predicted concentrations of NO_2 at the nearest sensitive receiver (R1) are less than 20 µg/m^3. This is well below the maximum background levels (66 µg/m^3 from **Table 6.29**) and demonstrate compliance with the EPA's 246 µg/m^3 criteria.

Notwithstanding, the community's concern regarding blasting are noted and Daracon have undertaken to reduce the current permissible window for blasting to between the hours of 11.00 am and 3.00 pm Monday to Friday inclusive, with no blasts being fired on weekends or public holidays. In addition, a range of dust suppression measures and blasting controls will be implemented as part of the Revised Project, as outlined in **Sections 6.5.6** and **6.7.3**. Amongst others, these would include:

- water to be applied during drilling

- blasts to be scheduled to avoid higher wind conditions, especially when winds from the south or south-east prevail
- independent blast monitoring would be undertaken for three blasts within the first year of the Revised Project by an independent qualified person, and in consultation with the EPA.

Diesel Emissions

'… the air particles in the fumes from the trucks are a health hazard to all that inhale them.' (174463)

'Diesel fumes from the B-Double trucks grinding up-hill fully loaded fall thick over my home … Although trucks loads are covered fine dust escapes from the loads and finds its way into my home.' (173666)

'Both my husband and I spend many hours working in our extensive garden and in doing so realise we may already be breathing in polluted air,-namely the sooty particles generated by diesel fumes from passing trucks' (174101)

'I have major concerns about the increase that 80 trucks per hour using Brandy Hill Drive for transport would have on gaseous and particulate pollutants levels…'(174402)

Emissions from diesel exhausts associated with off-road vehicles and quarry plant and equipment have been assessed as part of the AQIA (refer to **Section 6.5**). As discussed in **Section 2.4**, the Revised Project proposes to largely use the existing equipment fleet that is already in place at the Quarry. The most significant emissions from diesel exhausts are products of combustion including CO, NO_2 and particulate matter (PM_{10} including $PM_{2.5}$). The NO_2 and PM10 (including $PM_{2.5}$) have been considered as part of the AQIA.

As outlined in **Section 6.5.5.3**, modelling of the potential NO2 concentrations associated with diesel use as part of the Revised Project indicates a maximum 1-hour average concentration at the nearest sensitive receiver (R1) of approximately 20 µg/m^3 or less. With the addition of maximum background levels of 66 µg/m^3, the predicted levels readily comply with the criteria of 246 µg/m^3.

Predicted annual average NO_2 concentrations at the nearest sensitive receiver (R1) are approximately 10 µg/m^3 or less. With the addition of background levels of 16 µg/m^3, the predicted levels comply with the EPA criteria of 62 µg/m^3. All other surrounding private receivers are more distant and are predicted to have lower levels than those predicted at the nearest residence.

Diesel exhaust emissions associated with operational activities (quarry plant and equipment) and off site road transportation (truck movements for quarry sales) are predicted to remain well below the nominated criteria and are therefore unlikely to lead to any adverse air quality impacts. Similarly, monitoring and modelling suggest that the Revised Project is not expected to cause adverse air quality impacts with respect to crystalline silica

14.1.7 Biodiversity

Issues relating to biodiversity were raised in 77 community submissions.

Impacts on biodiversity:

'The company is seeking to extract 1.5 million tonnes of hard rock material a year. This means the destruction of 37 hectares of natural bushland and the possible loss of koala habitat ….' (173823)

'Clearing of native vegetation, further exposing the residents and livestock to more dust and also impact on the native animals which would be displaced.' (174523)

'WILDLIFE HABITAT. Koalas in particular have been sighted in this area & in close proximity to the quarry. Daracon continue to clear habitat.' (170562)

'Fauna such a brush-tailed phascogales which I believe are listed a Vulnerable, and live in the area, will be impacted adversely by the expansion of the quarry.' (170621)

'As a wildlife ambassador this expansion will also see a loss of EPBC listed threatened species habitat and corridors which is unacceptable.' (173780)

Daracon's approach to the design and planning of the Revised Project has considered potential biodiversity impacts. Whilst Daracon has strived to minimise impacts on biodiversity through the design process, not all impact could be avoided by the proposed design and a detailed assessment of the impacts was undertaken of the Revised Project. A comprehensive BAR was completed for the Revised Project in accordance with the SEARs and to provide additional information requested in the government agency submissions and to provide an updated assessment of the revised project parameters. A summary of the key findings of the BAR is provided in **Section 6.10**.

As outlined in **Section 1.6.5**, Daracon have undertaken further detailed resource quantification and quarry plan design work to optimise future operations and minimise environmental and community impacts. As a result, the proposed additional disturbance area for the Revised Project has reduced from 82.8 to 66 ha, a reduction of 16.8 ha. This includes avoiding approximately 15.3 ha of undisturbed vegetation in the former East Pit (Lot 21 DP 773220) which is no longer proposed to be disturbed as part of this application.

Daracon is committed to delivering a biodiversity offset strategy that appropriately compensates for the unavoidable loss of ecological values as a result of the Revised Project. The BOS will be further developed in consultation with the BCD and DPIE and based on the credits required to be retired to offset the impacts of the Revised Project as specified in the BAR and the offset options available under the BC Act.

As outlined in **Section 6.10.7**, Daracon has committed to the preparation of a BOMP as part of the implementation of the Revised Project, in accordance with the requirements of BAM (NSW OEH 2016). The BRMP will include management actions and activities proposed for the biodiversity offset sites as identified in the BOS.

14.1.8 Water Resources

Issues relating to water resources were raised in 13 community submissions.

Impacts to surface water

'We have noticed a dramatic increase in silt levels (evidenced in the gradual filling in of a dam) and a white substance coating the edges of the creek. Whilst these creeks mainly run during wet weather, we have noticed that the volume of water has increased significantly as the quarry has grown.' (174121)

'Daracon purchased the lease and are now ... polluting our creek and water supply (Paterson River).' (174212)

'We have noticed when the creek has water there can be a white milky look to it and when it dries up, there is a white deposit left on the rocks.' (174214)

A comprehensive assessment of the potential surface water impacts of the Revised Project has been undertaken and is summarised in **Section 6.9**.

Daracon have an existing WMS in place at the quarry to contain potentially contaminated water for reuse or treat (if required) to achieve water quality discharge criteria prior to release at the licenced discharge points (LDPs). Water is reused at the quarry for haul road dust suppression and some demands at the Processing Plant. Where possible, clean water is directed around disturbed areas, however, in some areas clean and dirty water have not been separated, as this is impractical due to the steep terrain upslope of the quarry.

Daracon expanded the existing water quality monitoring program in January 2019. A network of monitoring sites both upstream and downstream of the Quarry are sampled for physico-chemical parameters and nutrients on a regular basis in accordance with Daracon's surface water quality monitoring programme. Additional water quality data have been collected and analysed as part of the updated SWIA (refer to **Section 6.9**) for the Revised Project.

As outlined in **Section 6.9.7.1**, historically, the controlled discharge water quality results demonstrate that the quarry consistently meets the discharge criteria for EPL 1378. While controlled discharge volumes and frequencies are predicted to increase with the Revised Project, the discharge water quality is expected to continue to meet the EPL 1378 criteria as:

- the same water treatment processes and controlled discharge management practises will continue to be implemented
- it is not proposed to increase the daily discharge rates and the site water treatment processes and controlled discharge management practises have been demonstrated to achieve EPL water quality criteria at historical discharge rates.

The SWIA completed for the Revised Project indicates that impacts on downstream water quality and availability associated with the Revised Project are expected to be negligible.

The WMS will be modified over the life of the Revised Project to incorporate additional upslope catchments associated with the extended open cut pit catchments, an additional pit sump in the East Pit and associated pumps and pipes. The proposed WMS will continue to meet the water quality values in accordance with the WQOs and criteria of EPL during discharge (refer to **Section 6.9.4.1**). The proposed WMS will be documented in the quarry's WMP, should the Revised Project be approved.

The EPA have investigated reports of 'milky blue grey' water in 2017. The EPA concluded that the data suggests that all sampling undertaken relating to the discharge was in accordance with the requirements of the EPL, specifically that all water limits from condition L2.4 and water monitoring requirements in condition M2.2 were met during discharge.

Groundwater

"… my concerns are for the long term effects of blasting and the potential for there to be a shift in water courses, water tables and general hydrology." (174111)

A comprehensive assessment of potential groundwater impacts of the Revised Project has been undertaken and is summarised in **Section 6.8**.

The GIA indicates that the Revised Project is unlikely to have any significant impact on the groundwater system outside the Quarry. As outlined in **Section 6.8**, the GIA indicates:

- probable estimates of seepage rates range from 5.7 ML/yr to 22.4 ML/yr per year across the Revised Project stages. Daracon currently holds an allocation to extract 33 ML of groundwater per year therefore, the purchase of any additional water allocation is not required
- the drawdown is expected to be minimal due to the estimates of seepage being similar to water table recharge
- no impacts to the Paterson River alluvium are predicted as a result of the Revised Project
- no impacts on registered bores are expected from the Revised Project and the beneficial water quality use category will not be affected.

An assessment of the Revised Project against the AIP minimal impact considerations for less productive aquifers was completed. The analysis indicated that none of the minimal impact criteria would be exceeded (refer to **Section 6.8**).

Should the Revised Project be approved, Daracon will prepare a WMP for the quarry in consultation with DPIE-Water. As part of the preparation of the WMP will review the groundwater monitoring program and consider additional monitoring locations.

14.1.9 Heritage

Issues relating to Historic Heritage and Aboriginal Archaeology and Cultural Heritage were raised in 44 community submissions.

Aboriginal Heritage Impacts

'The company is seeking to extract 1.5 million tonnes of hard rock material a year. This means the destruction … of Aboriginal sites.' (173823)

An ACHA was undertaken for the Original Project by Niche with a summary provided in **Section 6.12**. The ACHA was prepared in accordance with relevant guidelines and policies, including:

- The Burra Charter: The Australia ICOMOS Charter for Places of Cultural Significance (Australia ICOMOS, 2013
- NPW Act
- National Parks and Wildlife Regulations 2009
- Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales (DECCW, 2010b) (hereafter referred to as 'the Code of Practice')
- Guide to investigating, assessing and reporting Aboriginal cultural heritage in NSW (Office of Environment and Heritage [OEH], 2011a).

An assessment of the potential impact of the proposed works indicates that one site, Martins Creek 2 (AHIMS ID#38-4-0214), will be directly and totally harmed by the proposed activities.

Niche conclude that the area has low potential to contain Aboriginal archaeological or cultural heritage sites. Similarly, the ACHA indicates that the Project Area does not have potential to yield information that would contribute to a further understanding of the cultural or natural history of the local area and/or region and/or state.

Notwithstanding, Daracon has committed to the preparation of an Aboriginal Cultural Heritage Management Plan for the quarry, should the Revised Project be approved.

Historic Heritage Impacts

'The main concern I have is the damage to my property due to vibration caused by a high volume of big dump trucks passing close by. My house is almost 200 years old, one of the oldest building in the area. It is listed in the Dungog Councils Local Environmental Plan as a building of historical significance." (170413)

'Large trucks are ruining the heritage significance of the village of Morpeth.' (174584)

'Paterson is a small village with a number of buildings listed as of Heritage Interest and these buildings are being affected by the heavy trucks passing through 6 days a week. Some of these buildings are recording cracks and destabilisation now without extra trucks passing through.' (170729)

A HIS was been prepared to assess the potential heritage impacts associated with the Revised Project's primary haulage route, in particular:

- potential vibration impacts (if any) of the proposed number and frequency of trucks on the structural integrity of listed heritage items
- potential impacts to the significance of the conservation area as a result of the number and frequency of trucks travelling through a conservation area
- the impacts of proposed intersection and bridge approach upgrade works on the curtilage and significance of listed items and any conservation areas.

Vibration impacts generally only arise when a heavy vehicle hits a pothole, speed bump or other irregularity at speed and the energy from the impact is then transferred through the ground to adjoining buildings. As outlined in **Section 6.11.3.3**, the areas where truck movements associated with the Revised Project are in proximity to heritage buildings is the Paterson HCA. The road surface within the Paterson HCA is a bitumen pavement and, when properly maintained, does not contain irregulates that would induce significant vibration impacts. A review of the Vibration Guidelines and academic studies (see for example Basekar et al, 2015) indicate that vibration impacts from trucks under any conditions on bitumen roads is unlikely to cause structure damage to heritage buildings but can have cosmetic effects in extreme cases.

Since the Original Project, Daracon have committed to reduced truck numbers per hour and a speed limit for trucks driving through the King and Duke Street intersection, in Paterson.

As outlined in **Section 6.11.4**, Daracon have committed to a number mitigation measures to reduce potential impacts to heritage items from the Revised Project, including:

- contributing to road maintenance costs associated with truck haulage to enable DSC to ensure road conditions within Paterson are appropriately maintained
- insertion of a requirement in the Driver Code of Conduct to report any substantial road pavement irregularities in Paterson, with these reports being passed on the DSC for attention
- directions to be given to drivers alerting them of any identified road irregularities to enable them to minimise speeds where these occur when driving through Paterson

- reducing truck speeds through Paterson to 40km/hr, with further reduction to 20 to 25km/hr around the King and Duke Street intersection

- all kerb and other road infrastructure to be reinstated following the proposed works within the Paterson Village HCA to replicate that removed to allow for the King and Duke Street intersection works.

The HIS concluded that it is unlikely that the proposed intersection works within the Paterson HCA will result in any adverse visual or physical impacts to the heritage significance of this HCA or individually listed heritage items. In addition, there are no identified impacts to the listed Gostwyck Bridge as a result of the proposed bridge approach works. The implementation of mitigation measures is expected to prevent any impacts on heritage values (including minor cosmetic damage) associated with quarry truck movements.

The HHA prepared for the Original Project addressed all non-haulage route components of the Original Project.

14.1.10 Greenhouse Gas

Issues relating to Greenhouse Gases were raised in 3 community submissions.

'The environmental impact of transport is significant because it is a major user of energy, and burns most of the world's petroleum. This creates air pollution, including nitrous oxides and particulates, and is a significant contributor to global warming through emission of carbon dioxide, for sector. By subsector, road transport is the largest contributor to global warming." (173719)

As discussed in **Section 6.6**, an updated GHGEA was completed for the Revised Project.

The Revised Project is expected to generate up to approximately 39,000 t CO_2-e of Scope 1 emissions over the life of the quarry. On an annual basis, the Revised Project could generate up to approximately 1,600 t CO_2-e Scope 1 emissions per annum.

The GHGEA indicated that the Revised Project's annual emissions are well below National Greenhouse Gas and Energy Act reporting thresholds (25,000 t CO_2-e) and Safeguard Mechanism thresholds (100,000 t CO_2-e). The Scope 1 emission intensity of the Revised Project is similar to other hard rock quarries approved for operation in NSW.

Over the life of the quarry, the Revised Project can also be associated with up to approximately 33,000 t CO_2-e and 162,000 t CO_2-e of Scope 2 and 3 emissions respectively. The Revised Project does not generate a large demand for electricity, and the majority of Scope 3 emissions are associated with product transport. Approximately 78% of total Scope 1 and 3 emissions are associated with product transport.

To put the Revised Project's emissions into perspective, during operation, the Revised Project will contribute approximately 0.0000030 % to global emissions per annum (based on its projected Scope 1 emissions).

The Revised Project will mitigate greenhouse gas emissions through ongoing energy efficiency initiatives and optimising productivity.

Daracon is committed to the effective maintenance of equipment to ensure that they operate effectively and that diesel combustion emissions and greenhouse gas emissions associated with the Revised Project are minimised. This includes:

- servicing all machinery in accordance with maintenance contracts and adopting original equipment manufacturer recommendations for maintenance

- targeting the maintenance to ensure equipment remains fit for purpose over its whole life cycle
- review opportunities for improvement in diesel use and energy efficiency when purchasing or replacing equipment at the quarry.

14.1.11 Visual Amenity

Issues relating to visual amenity were raised in 15 community submissions.

Visual Impacts

'The visual impact of the proposed noise wall will significantly affect the visual amenity of the town…'(174147)

'The visual impact of the cleared and denuded land will leave scar that will take 50-100 years to repair. The shire is unique because development has been controlled to retain the vista of wilderness.' (174596)

'… the noise and visual pollution will be appalling and significantly adversely impact the village life.' (174510)

An assessment of the potential visual impacts of the Revised Project has been undertaken and a summary provided in **Section 6.17**. Visual amenity was raised as an issue of concern to local community stakeholders (refer to **Section 14.1.11**), particularly in regard to the visibility of the (then) proposed noise wall along Station Street and cleared and denuded land associated with the extraction in the new resource areas towards the east.

The Revised Project does not include the construction of the noise wall along Station Street and no longer proposes any quarrying activities into new resource areas towards the east. However, as outlined in **Section 6.17**, key aspects of the Revised Project that may have the potential to result in visual impacts include:

- continued extraction within the West Pit and expanding extraction within the proposed East Pit
- emplacement and stockpiling of overburden associated with minor landform changes including additional noise bunds ranging between 4 and 8 m in height
- product stockpiling within the southern Stockpile Area, with ballast stockpiles of to 8 m in height
- additional noise mitigation walls along the internal haul route and the rail siding, of approximately 4 m in height
- construction of a new main access road and intersection off Dungog Road
- continued use of night lighting at the Processing Area
- progressive rehabilitation which may be associated with views of mobile plant and equipment and regenerating vegetation.

The updated visual analysis confirmed the findings of the VLIA for the Original Project, that is that views of the quarry are limited to the west, from residential properties along Station Street and from elevated locations along Gresford Road (refer to **Section 6.17**). These views are typically filtered by vegetation or undulating topography.

The new access road off Dungog Road would be a new feature with visibility from road users and private residences in the vicinity. The new access road will be in keeping with the existing road infrastructure and is not expected to have a significant impact on the visual amenity of road users or private residences in the vicinity.

14.1.12 Rehabilitation and Land Use

Issues relating to land management were raised in 7 community submissions.

Land use

'Mining companies consistently demonstrate that while they are happy to mine the land, once it becomes non-profitable they do not help rebuild the land they have destroyed, ensure that no further damage will impact on surrounding land, and do not utilise the area to perhaps build renewable energy source equipment.' (169737)

'Totally unacceptable land use proposal.' (173688)

As discussed in **Section 9.2**, the Project Area is located in an area with a long history of quarrying, with the Project Area itself subject to over 100 years of quarrying activity.

The quarry was originally developed for the purpose of providing materials for the construction and maintenance of the North Coast Railway. Materials for other purposes have also been produced from the high quality rock source including aggregates, ballast, manufactured sand and rock. The quarry has provided substantial economic benefit to the local and State economies and produced products that have contributed to development across the State.

Existing land uses and land use planning forms a constraint to quarry development. The development of a quarry and associated infrastructure is limited, by its nature, to the location of the resource. The Revised Project seeks to maximise resource recovery from an existing operational quarry, limiting the potential for conflicts with other land uses.

The quarry is surrounded primarily by agricultural and rural residential land uses. The quarry has coexisted with these neighbouring land uses over an extended period with a degree of impact on the social amenity of these surrounding land uses. Daracon have engaged with stakeholders as part of the assessment of the Revised Project to understand the key concerns and issues associated with the Original Project and to assist with managing these issues through appropriate design. Key elements of the Revised Project have been designed to minimise impacts on the surrounding land uses and proximal communities, which included substantial noise mitigation works to reduce noise impacts on surrounding residents and controls on the speed and timing of trucks entering and leaving the site.

As discussed in **Section 6.2**, all of the land required to be disturbed within the Project Area has moderate to severe (LSC Class 4) limitations to agriculture in their present state. It is noted that following rehabilitation the majority of the Project Area would be considered LSC Class 6 with the final void area being LSC Class 8. The current post operations land use for the majority of the Project Area is proposed to be rehabilitated for biodiversity offsets and does not include agricultural uses. However, it is noted theoretically the majority of the post operations landscape (which is considered to be LSC Class 6) could be used for low intensity grazing, which has successfully been demonstrated at other rehabilitated sites in the Hunter Valley.

The Revised Project is within an area which has been subject to quarrying since the early 1910s, with this quarrying activity coexisting with neighbouring land uses for over 100 years. The Revised Project will expand the historic quarrying activities and extraction of quarry material into new resource rich areas within the existing quarry site. The Revised Project is therefore considered to be compatible with existing land use of the quarry and broadly compatible with the surrounding land uses.

Rehabilitation

'How can I be assured rehabilitation will take place on the current operation which looks now like an open cut mine? How will it be rehabilitated and when?' (174095)

'What is meant by a concept plan for site rehabilitation? It is proposed that rehabilitation works will take place over the next 25 years but is there a timeline or any details for this process? It seems that to date there hasn't been any rehabilitation of the quarry site carried out by Daracon (Buttai Gravel Pty Ltd).' (174041)

'Anyone with a knowledge of quarry operations can deduce that virtually no rehabilitation is possible during the active life of the quarry.' (174278)

Daracon is committed to the effective rehabilitation and closure of the quarry at the cessation of operations. As outlined in **Section 6.19.5**, this will be achieved through progressive rehabilitation and managing quarry operations to work towards the final rehabilitation and closure of the site.

Rehabilitation at the site will consider the existing and future quarry areas to build on existing rehabilitation undertaken and to address long term rehabilitation of quarried and disturbed areas. Key aspects associated with rehabilitation of the quarry includes rehabilitation of the quarry benches and available areas surrounding the quarry pit with a final void to remain at the site.

As identified in **Section 6.19**, rehabilitation at the quarry has been undertaken in various forms to date including:

- reshaping and revegetation of overburden and spoil material
- rehabilitation (topsoil spreading and re-seeding) of shaped areas on Lot 1 and Lot 5
- passive regeneration within areas of existing vegetation where adequate canopy seed sources are available.

Future rehabilitation practices will be based on the existing rehabilitation management practices whilst focusing on the need to continue rehabilitation maintenance following the establishment of the early phases of rehabilitation. These measures are designed to build on the existing rehabilitation techniques and to achieve the rehabilitation principles and objectives that will progress the site towards the intended final land use.

Several final land use options are available for the site. The selected final land use will focus on promoting the rural landscape by establishing native grassland or exotic pastures in low lying areas whilst focusing on the re-introduction of pockets of woodland species across the benches consistent with endemic vegetation types (refer to **Figure 6.38**). However, as detailed in **Section 6.19.1.1**, the final land use will be subject to further investigation during the development of detailed Quarry Closure Plan to be prepared three years prior to the cessation of quarrying activities.

The rehabilitation strategy, including rehabilitation management measures proposed for the site are discussed further in **Section 6.19.4**. The conceptual final landform is presented in **Figure 6.38**.

14.1.13 Economics

Issues relating to economic impacts were raised in 501 community submissions, or which 135 related to potential negative economic impacts.

Economic impacts on local tourism and businesses

'Tourism will be impacted over time with less people visiting the region, this will further have an impact on the economy of the region.' (169386)

'…I also believe that a further increase of truck traffic will have a great impact on local tourism. A lot of the money coming into this area is from people visiting to enjoy the peace and quiet and get away from the city traffic.' (173913)

'Having so many truck movements through these small towns will have a devastating effect on the businesses and residents (due to noise, vibration) and just the extreme danger presented by these trucks when turning near the Post Office at Paterson.' (174250)

'the increased truck Traffic through Paterson directly affects not only my business … The noise from the truck Traffic disturbs not only me but also my guests. I have on occasion had guests leave due to the truck noise, or have said they would not return for that reason.' (170284)

'We have already seen a down turn in local businesses trading in goods & services, hospitality, tourism and wedding functions along haul roads, an extension will only make this worse.' (173780)

As outlined in **Part A** of this report, Daracon has committed to a number of key project design changes and additional mitigation and management measures to minimise the project's environmental and social amenity impacts. In terms of improving social amenity within Paterson to limit impacts on tourism, key project changes includes:

- revised product transport arrangements, including:
    - reduced peak daily laden trucks of 140 per day (280 movements) for 50 days per year, otherwise 100 per day (200 movements), with a peak of:
        - 20 laden trucks per hour (40 movements) between 7.00 am and 3.00 pm, Monday to Friday
        - 15 laden trucks per hour (30 movements) between 3.00 pm and 6.00 pm, Monday to Friday
    - no road haulage of quarry product on Saturday
    - no trucks through Paterson Village before 6.45 am
    - increased quarry product transported by rail
- revised operating hours of 7.00 am to 6.00 pm Monday to Saturday, with the exception of road haulage of quarry product which will only occur Monday to Friday, and no evening or night operation, apart from rail loading and transportation and necessary maintenance activities.

Employment:

'The potential job creation due to this expansion will only benefit a very small group of people.' (174374)

'It is hardly correct to make the statement that the flow on effects for jobs in the Hunter is significant if the proposal is not approved.' (174550)

As outlined in **Section 2.10**, the Revised Project will provide for approximately 120 construction jobs and approximately 22 full time equivalent employees when the quarry is operating at full capacity. In addition, contractors will be periodically engaged for various activities.

As outlined in **Section 6.14**, the Revised Project is estimated to provide a potential net benefit to NSW of $58 million in NPV terms. This net benefit is comprised of $19 and $39 million in direct and indirect benefits respectively.

In addition to direct employment, the Revised Project will also result in indirect economic benefits. Supplier benefits are estimated to be $26 million in NPV terms. Benefits to workers are estimated to be $12.8 million in NPV terms over the 25-year lifespan of the quarry.

The LEA considers the costs and benefits of the Revised Project to residents of the Lower Hunter region of NSW. The analysis shows an estimated potential net benefit of $35 million to the region in NPV terms over the life of the Revised Project, well over half of the total benefit estimated to NSW. This is largely driven by benefits to local suppliers, based on information from Daracon that 100% of the inputs to production are supplied from the region. In fact, the net benefit to local suppliers is estimated to be about $26.2 million in NPV terms. There is an estimated additional benefit of $9.2 million in NPV terms to local workers over the life of the Revised Project.

Impacts to property values:

'There will be significant increases in noise, dust and vibration which will render most properties along the proposed "haul routes" uninhabitable and severely impact property values.' (169384)

'Our land values have been affected and our roads, Seaham Road and Brandy Hill Drive have also suffered.' (169643)

'I am also very concerned about the drop in property values in our area because of the trucks.' (173821)

'We are also concerned about devaluation of our property.' (174282)

The site has a long history of quarrying operations, with the quarry being established in 1914 by the NSW Government Railways for the purpose of supplying railway ballast and other quarry materials to both the NSW railway network and Hunter Valley/Newcastle construction projects. The quarry has therefore coexisted with neighbouring land uses over an extended period with a degree of impact on the amenity of residential receivers. Key elements of the Revised Project have been designed to minimise impacts on residential receivers, including:

- reductions in proposed extraction limits
- reductions to road transportation volumes and peak hourly truck movements
- reductions in operating hours.

As outlined in the SIA for the Revised Project, housing prices

- The average sales price in Martins Creek has increased from $376,000 in 2013 to $504,317 in 2020.
- The average sales price in Vacy has increased from $396,231 in 2013 to $613,483 in 2020.
- The average sale price in Paterson has increased from $363,167 in 2013 to $641,605 in 2019 and fell to $572,456 in 2020.

According to housing data reported by real estate analysts Property Value (2020), over the last 12-month period ending April 2020, Bolwarra Heights had the most houses sold with 58, followed by 24 in Bolwarra, 17 in Paterson, 11 in Vacy, and 4 in Martins Creek. Property Value also reported the following figures as of April 2020:

- the highest median sale price was $750,000 in Paterson with an average of 77 days on the market. In the last 12 months there has been a 33.1% median price decrease, which coincided with limited quarry operations
- Vacy had a second highest median sale price with $655,000 and the highest average days on the market of 92 days. Median house price has increased by 21.7% in the last 12 months

- the median sale price in Martins Creek was the lowest of the study communities at $400,000 with an estimated 15.3% increase in median sale price
- sale prices have also increased in Bolwarra by 10.3% according to Property Value (2020). The current median sale price is sitting at $533,000 with an average of 76 days on the market
- Bolwarra Heights had a median sale price with $653,000 and an average of 87 days on the market. Median house prices have increased by 3.4% in the last 12 months.

Due to the low number of sales recorded in 2020 for Vacy, Paterson and Martins Creek average price is heavily influenced by individual property prices.

There are a wide range of factors which affect property values including broader regional market trends. In regard to impacts associated with the Revised Project, the assessments have found that in most surrounding areas there will be minimal changes to impacts.

Given the long history of quarrying in the area and predicted impacts, adverse effects on property values are considered unlikely.

14.1.14 Cumulative Impacts

Issues relating to cumulative impacts were raised in 14 community submissions.

'At no time has MCQ/Daracon approached us with regard to cumulative effect on our community. When we have tried to bring it up at CCC meetings it has been glossed over or totally ignored. The EIS states that they have not had any contact with Hanson therefore do not know what the cumulative effect might be.'

'[In the EIS] The lack of meaningful information of the cumulative effect of the expansion of both Brandy Hill and MC quarries should not be accepted.'

'It is also important to consider the impact of Martins creek and Brandy Hill quarry application to increase their production to 1.5 million tonnes p.a. and extend their operation to 24hrs Mon-Sun will result in even greater devastation to the greater community in this lovely rural community.' (174374)

'Quarry operations throughout the area need to be viewed and considered with regard to their cumulative impacts. Brandy Hill quarry expansion (application #5899) also seeks planning approval to increase production … How many trucks would end up stacked nose to tail as only one or two at a time can progress through a light change.' (174372)

'The EIS shows no sufficient information on this point to assess the cumulative impacts of the road traffic generated by the development with that generated by the Brandy Hill quarry, on the villages named above, with the exception of Paterson.' (174376)

An assessment of cumulative impacts was undertaken in the EIS for the Original Project (Monteath & Powys, 2016). At the time of preparation of the EIS for the Original Project (Monteath & Powys, 2016), details on the Brandy Hill Quarry proposal were limited therefore assumptions were made on available information to inform cumulative assessments.

Revised assessments have been undertaken for the Revised Project which assess cumulative impacts where relevant. Cumulative assessments include potential interactions with Brandy Hill Quarry which has subsequently been approved.

Cumulative impacts in regard to key aspects have been considered and assessed in each of the specialist studies, as presented in **Section 6.0**, as relevant.

14.2 The Project

Issues relating to the Original Project design and justification were raised in 289 community submissions.

Project design:

'It is unthinkable that DARACON with little regard to local communities would increase its extraction and double the number of truck movements it currently has on our roads.' (171785)

'Hours of operations – need to be kept to a limit that allows residents in the area some down time.' (173666)

'We hope rather that better use of the rail service be considered.' (174326)

'80 trucks an hour thundering past residential homes and on the narrow roads in the area is a hazard and will lead to major problems for the families in the area.' (170340)

The EIS for the Original Project was publicly exhibited in late 2016. Following detailed analysis of Agency and community feedback, Daracon committed to key project design changes and additional mitigation and management measures to minimise the Project's environmental and social amenity impacts. This included reductions in proposed extraction limits, quarry operating hours and truck movements.

Following further community engagement and feedback during 2018 and 2019 and the change to the quarry operations in September 2019, Daracon has undertaken further assessment of potential amendments to the Revised Project.

As outlined in **Section 2.2**, the key features of the Revised Project include:

- extraction of up to a maximum of 1.1 Mtpa of quarry product material over 25 years
- revised product transport arrangements, including:
    - reduced peak daily laden trucks of 140 per day (280 movements) for 50 days per year, otherwise 100 per day (200 movements), with a peak of:
        - 20 laden trucks per hour (40 movements) between 7.00 am and 3.00 pm, Monday to Friday
        - 15 laden trucks per hour (30 movements) between 3.00 pm and 6.00 pm, Monday to Friday
    - no trucks through Paterson Village before 6.45 am
    - increased quarry product transported by rail
    - removal of Haul Route 2 as a primary haul route (now proposed only to service local jobs as required)
- revised operating hours of 7.00 am to 6.00 pm Monday to Saturday, with the exception of road haulage of quarry product which will only occur Monday to Friday, and no evening or night operation, apart from rail loading and transportation and necessary maintenance activities
- reduction in the proposed disturbance area, including avoiding approximately 15.3 ha of undisturbed vegetation in the former East Pit (Lot 21 DP 773220)
- construction and use of a new access road and bridge crossing from Dungog Road, over the North Coast rail line, to allow for all heavy vehicle movements via the new access
- improvements at the Dungog Road and Gresford Road intersection and the King Street and Duke Street intersection (within the village of Paterson)

- extension of the rail spur to facilitate longer trains to transport more quarry product
- establishment of noise bunds and noise attenuation of the existing fixed processing plant with further upgrades and replacements to reduce noise and air quality impacts
- progressive rehabilitation of the site.

The key features of the Revised Project are illustrated on **Figure 2.1**. Further to this, the key features of the Revised Project are summarised in **Table 2.1** along with a comparison against the Original Project.

14.3 Issues Beyond the Scope of the Project

Issues relating to the proponent were raised in 165 community submissions.

Need to wait for Court proceedings to be completed:

'Application SSD-146612 not be considered by the DoP&E until the pending court case with Dungog Council is resolved.' (172426)

'…I believe this proposal should not be processed until such time as the current legal proceedings between Daracon (Martins Creek Quarry) and Dungog Shire Council are finalised.' (173829)

'…it appears that Daracon has submitted the development application in order to delay the outcome of DSC's court case" (173873)

'This application should not proceed while there is still an outstanding case to be heard in the Land and Environment court between Dungog Council and Daracon.' (174654)

'I hear by formally request that the Application No SSD -16- 662 be declined until Daracon can legally prove that the current conditions referred to in the application are true and correct.' (174664)

As outlined in **Section 1.4**, in 2015 DSC brought action in the LEC against the lessee and the proponent for a breach of the EP&A Act. DSC claimed that operations at the quarry were contrary to the 1991 development consent. The LEC made declarations and orders restraining the respondents from carrying out certain activities at the quarry. The LEC decision was appealed by the proponent to the Court of Appeal. The Court of Appeal did not make the same orders as the LEC, but did find that some operations at the quarry were not authorised by the 1991 development consent. The effect of the Court of Appeal judgment was that the quarry operations be restricted to the Approved Development activities, comprising:

a) winning material primarily for railway ballast

b) extraction only from Lot 5 DP 242210 (no extraction from Lot 6 DP 242210)

c) total processing on that part of Lot 1 DP 1006375 that formerly comprised Lot 2 DP 524511 of no more than 449,000 tpa

d) not greatly more than 30% of total production transported by road per annum

e) total production limited by the terms of the EPL to 500,000 tpa.

Since 24 September 2019, the quarry has operated within the parameters deemed as approved by the Court of Appeal.

Since the change to quarry operations, Daracon have considered community input and have completed further project feasibility investigations, detailed quarry design refinements and proposed additional mitigation measures. With the agreement of the Planning Secretary, Daracon is submitting an amended development application, supported by the ADA Report (**Part A** of this report).

Daracon's reputation:

'Daracon has proved to be deceptive and not to be trusted because they took on the quarry under certain council conditions and then knowingly started operations by flouting them. Their current operation is illegal and they don't care because profits rank ahead of any environmental and human being concern.' (174668)

'The community has no trust in Daracon or that it will do anything positive for the community' (173873)

'The company does not have social licence and public trust' (173301)

Daracon acknowledge that relationships within the communities around the quarry have been impacted by the previous quarry operations. Daracon is committed to investing time and resources to rebuild trust within the local community. Daracon will continue to consider the local community as part of our decision making processes at the quarry now and in the future. This is demonstrated by the changes made to the project design as a result of the ongoing consultation with the community.

Daracon is committed to open, respectful and effective communication with local communities in all regions in which we operate. This can be clearly demonstrated through numerous examples across the business, including other active quarry operations.

The Revised Project is a key element in building strong relationships moving forward. The complexity of legacy consents under which the quarry was operating for many decades before Daracon took control has led to confusion and frustration for all parties. We acknowledge that in this complex environment, some of our operations were characterised by poor decisions and practices that negatively impacted the local communities, resulting in residual low levels of trust.

The Revised Project seeks to modernise the consent for the quarry operations. Should the Revised Project be approved, the conditions of consent will clearly specify project requirements and obligations for the quarry and its associated operations. As part of the approval conditions, Independent Environmental Audits will be required to evaluate compliance with the consent conditions and assess the environmental management and impact of the development. These audits will be publicly available on the Martins Creek Quarry website.

To improve the relationship with the community and other key stakeholders Daracon has already committed to the implementation of a number of strategies.

In 2020, the company engaged a dedicated Community Liaison Representative with the objective of re-establishing relationships with local landholders and other key stakeholders. It is Daracon's intent that this role will continue should the Revised Project be approved with the Community Liaison Representative to be responsible for the ongoing delivery of a Community Engagement Program that includes mechanisms allowing for the sharing and exchange of information between Daracon and its stakeholders on a regular basis.

Further, Daracon is committed to the development and implementation of a SIMP which will include appropriate monitoring, reporting and review mechanisms and a process for making information regarding ongoing company activities, monitoring results and associated information publicly available in an open and transparent way. While such information has been available in the past, both the SIMP and supporting Community Engagement Program will provide a structure for this to take place.

As a component of the ongoing Community Engagement Program, Daracon has also committed to re-establishing and operating a CCC in accordance with the DPIE's Community Consultative Committee Guidelines: State Significant Projects (2019). Daracon will work with the Independent Chairperson establish the necessary framework to ensure the transparent operation of the CCC to meet its intended objectives.

Daracon is also committed to the implementation of a targeted Community Contributions Program. While investment in the community has been undertaken in the past, activities moving forward will be more strategically directed to investment and sponsorship activities that have a focus on:

- mitigating the direct and indirect impacts of the quarry on the local community
- working collaboratively with key stakeholders to focus on sponsorships and in-kind contributions that target impact areas and enhance local values with a focus on the villages of Martins Creek and village of Paterson, and other localities as relevant
- enhancing positive impacts associated with the presence of the operation in the community, e.g. local employment and procurement
- developing projects and programs that are consistent with community needs, values and aspirations
- contributing to local communities and better targeting investment spend locally.

The existing donations and sponsorship program would see a shift towards assessing applications and distribution of donations to community-led initiatives, with a clear set of criteria for assessment of applications with funding criteria aligning with the areas of focus arising from the SIA and identified community needs. This is to be achieved through the development of a Community Contributions and Sponsorship policy that includes funding criteria and a process to determine priorities. Community investment and sponsorships will only be in strict accordance with this policy.

The establishment of funding criteria will involve key stakeholders therefore it is intended that the development of criteria for this investment will be determined in collaboration with the CCC once formed. Having a dedicated community relations officer to manage the program will ensure local level insight and an understanding of community needs is combined with the company's existing donations management and administration.

Investments made via the Community Contributions and Sponsorship policy will not replace the responsibilities of government and associated spending under the yet to be negotiated VPA.

Current operations and management and history of non-compliance:

'[Daracon's] use of gravel area at the back of our block to have majority of day have several parked trucks there having breaks or waiting for Martins Creek Quarry to open or on the way returning to Martins Creek Quarry for further loading come from 60 kms zone to dirt piece of land to park causing dust and soil, erosion.'(174344)

'… they are not even adhering to the current requirements of the last Environmental Impact statement signed off by local government.' (170494)

'… the trucks do not abide by the time rules, they enter the town at all hours making it very difficult for me and my family to sleep.' (170656)

'…they knowingly operate outside of their current restrictions, knowing full well that this impacts heavily on local communities.' (171785)

Daracon operates under an integrated Quality System which includes an Environmental Management System that is certified by Bureau Veritas to AS/NZS ISO 14001:2015. This management system focuses on protection of the environment, prevention of pollution and sustainability. Daracon operates the quarry in a responsible manner ensuring sustainable development and effective implementation of leading environmental practices is applied to their operational decisions.

Daracon are committed to their operational objectives of preventing pollution, conserving biodiversity and using precautionary practices to minimise ecological impact.

The court proceedings withstanding, Daracon has a good record of environmental performance at the quarry.

Complaints process:

'I have made complaints to the quarry and EPA and nothing has been done.' (169392)

'Unfortunately continued complaints from residents in all affected communities to the EPA, Dracon, Maitland Council, Dungog Council and State Government had no effect on the situation.' (174232)

The quarry has a Complaints Line to which members of the community can call to make complaints with regards to the operations. During January 2014 to April 2020, 106 community complaints were received. The highest number of complaints received relate to impacts on road/road-user safety, followed by vibration (blasting), operational noise (blasting) and blasting (property damage).

All complaints and non-compliances are raised as an incident in accordance with the current IFMP. All incidents are investigated accordingly.

14.4 Merits of the Project

As outlined in **Section 11.2.1**, 13 objections raised concerns about the justification of the Original Project, while 12 submissions were received that stated a general objection to the Original Project however stated no specific issues or reasons for the objection. These submissions were classified as objections on the merits of the project.

An updated evaluation of the merits of the Revised Project is provided in **Section 9.0**.

14.5 Procedural Matters

Issues relating to the planning process were raised in 56 community submissions.

Inadequate community consultation throughout the approval process

'There has been NO consultation from Daracon with the community, NO consultation from government or state members.' (174688)

'… residents beside this proposed access road were not consulted prior to this application being submitted.' (172372)

'We've participated in every meeting regarding this project and taken part in the farcical process of "community consultation" where the main issues could not be discussed with Daracon and all of it for no result.' (174372)

'Daracon have repeatedly failed to properly engage with the communities concerned and have not, in any way at all, addressed valid concerns put forward' (174688)

'Community consultation has been applied as a 'tick the box' process' (173873)

In response to community submissions and feedback, additional community consultation has been undertaken following the exhibition of the EIS for the Original Project. A comprehensive stakeholder engagement strategy has been developed and implemented as part of the preparation of the updated SIA to guide stakeholder engagement activities during the environmental assessment process for the Revised Project. This strategy was informed by a detailed review and analysis of submissions made during the public exhibition of the EIS (refer to **Section 11.0**).

Engagement with the community and other key stakeholders has been an ongoing and important part of the Revised Project. The stakeholder engagement strategy has aimed to:

- inform and seek feedback from stakeholders during the design and development of the Revised Project
- identify key issues to inform the updated assessment of the Revised Project
- seek feedback from stakeholders to identify and refine proposed mitigation measures to seek to further minimise environmental and community impacts.

The outcomes of the stakeholder engagement strategy have informed various aspects of the Revised Project and the updated environmental assessment including the updated SIA (refer to **Section 6.13** and **Appendix O**).

A summary of the process of additional stakeholder engagement is outlined in **Section 5.2**, and further discussion of the key issues raised during the stakeholder engagement is provided in **Section 6.13**.

Planning Process

'In my opinion, the proposals made by Daracon are completely unrealistic and are not based on proper impact studies. They amount to no more than an ambit claim and for this reason alone should be dismissed as fanciful and an insult to proper process.' (174406)

'…the application is fundamentally floored in its assumptions and requests. Daracon is blatantly abusing both the DoP approval system and the judicial system.' (174664)

As discussed previously, there have been many changes to the Original Project, in response to feedback from the community. Further, it is noted that there are a substantial number of legislative instruments in NSW which regulate the environmental impact of development. The primary instrument is the EP&A Act which regulates the planning and environmental assessment and approval process for development in NSW. The application of the EP&A Act and subordinate legislation to the Revised Project is discussed in **Sections 4.2.1** and **4.2.2**. The operation of other environmental legislation in regard to the Revised Project is discussed in **Section 4.2.3** and in **Section 6.0** in relation to specific Revised Project impacts where relevant.

Daracon has followed the approval process as outlined in the EP&A Act, other legislation and as directed by DPIE.

Adequacy of assessment

'The proposal does not include adequate assessment of economic or amenity impact, or any course for redress for loss of property value, property damage, poor health and diminished lifestyle.' (171405)

'To adequately address road safety issues, an independent road safety audit should be conducted on the existing local road networks that will be impacted by the significant increase in heavy vehicles.' (173800)

'I have seen no document in the EIS or attachments from the RMS to confirm that this bridge is adequate for the proposed haulage.' (173851)

Community concerns in relation to the adequacy of assessments for the Original Project are noted.

As outlined in **Section 1.6**, Daracon have considered community input and have completed further project feasibility investigations, detailed quarry design refinements and proposed additional mitigation measures. Revised assessments have been undertaken where relevant to assess the Revised Project. This has included revised assessments for all key aspects (refer to **Section 6.0**). Each assessment has been undertaken in accordance with relevant standards and policies.

Daracon not making contributions

'My biggest gripe would have to be the taxes I pay out of my pay each week that goes to fixing roads mostly caused by continuous movements of trucks along the haul road & the quarry owners don't contribute 1 cent to the repairs in the local area roads.' (170494)

'…That Daracon contribute to public road repairs and upgrades, minimising the burden on tax payers.' (174236)

'It is also understood that the ongoing major repairs to Tocal Rd is funded by our taxes, which is neither fair nor acceptable.' (174232)

As outlined in **Section 12.10**, Daracon contributes $0.795 per tonne of product transported by road for the purpose of the maintenance or repair of the public roads comprising the haul routes within the Dungog Shire LGA from the quarry, in accordance with the IEMP. The contributions are paid on a monthly basis, calculated by reference to weighbridge records, which are required to be provided to DSC upon request.

For the period January to September 2019 (when the quarry was placed on limited operations), Daracon contributed in excess of $250,000 to DSC in accordance with the agreed requirements of the IEMP. Prior to the IEMP, there was no planning tool in place for Daracon to make contributions to road maintenance.

Should the Revised Project be approved, it is expected that Daracon will be required to make annual financial contributions to both DSC and MCC in the form of a VPA, in accordance with section 7.11 of the EP&A Act. While Daracon is not responsible for how contributions are used by Council, it is expected that contributions would be prioritised towards the maintenance of roads used for haulage of quarry products.

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16.0 Abbreviations and Glossary

Table 16.1 Abbreviations

Abbreviation	Definition
µg	micrograms
µm	micrometres
ABL	Assessment background level
ABS	Australian Bureau of Statistics
ACHAR	Aboriginal Cultural Heritage Assessment Report
ADA	Amended Development Application
AHD	Australian Height Datum
AHIMS	Aboriginal Heritage Information Management System
AIP	Aquifer Interference Policy
ANZECC	Australian and New Zealand Environment and Conservation Council
APZ	Asset Protection Zone
AQIA	Air Quality Impact Assessment
ARTC	Australian Rail Track Corporation Ltd
BAR	Biodiversity Assessment Report
BC Act	*Biodiversity Conservation Act 2016 (NSW)*
BCD	NSW Biodiversity Conservation Division
BIA	Blast Impact Assessment
BOS	Biodiversity Offset Strategy
CBA	Cost Benefit Analysis
CCC	Community Consultative Committee
CEEC	Critically Endangered Ecological Community
CIS	Community Information Sheet
CO	Carbon Monoxide
CTMP	Construction Traffic Management Plan
DAWE	Commonwealth Department of Agriculture, the Environment of Water
dB	Decibels
DPIE	NSW Department of Planning, Industry and Environment
DSC	Dungog Shire Council
EC	Electrical Conductivity
EEC	Endangered Ecological Community
EIA	Economic Impact Assessment
EIS	Environmental Impact Statement
EMS	Environmental Management System
ENM	Environmental Noise Model
EP&A Act	*Environmental Planning and Assessment Act 1979 (NSW)*

Abbreviation	Definition
EP&A Regulation	*Environmental Planning and Assessment Regulation 2000 (NSW)*
EPA	Environment Protection Authority of NSW
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth)
EPL	Environment Protection Licence
ESD	Ecologically Sustainable Development
Extractive Industries SEPP	State Environmental Planning Policy (Mining, Petroleum and Extractive Industries 2007
FBA	Framework for Biodiversity Assessment
GDEs	Groundwater Dependent Ecosystems
GHG	Greenhouse gas
GHGEA	Greenhouse Gas and Energy Assessment
GJ	Gigajoule
GWIA	Groundwater Impact Assessment
Ha	Hectares
HIS	Heritage Impact Statement
ICNG	Interim Construction Noise Guidelines
Infrastructure SEPP	State Environmental Planning Policy (Infrastructure) 2007
IPC	Independent Planning Commission
km	kilometres
Koala Habitat SEPP	State Environmental Planning Policy – Koala Habitat Protection
kV	Kilovolt (1000 volts)
LDP	Licensed Discharge Point
LEA	Local Effects Analysis
LEP	Local Environmental Plan
LGA	Local Government Area
LoS	Level of Service
LSC	Land and Soil Capability
m	metres
M	Million
m/s	metres per second
MCC	Maitland City Council
MCQAG	Martins Creek Quarry Action Group
MJ	Megajoules
ML	Megalitre
MLALC	Mindaribba Local Aboriginal Land Council
MNES	Matters of National Environmental Significance
Mt	Million tonnes
Mtpa	Million tonnes per annum
NIA	Noise Impact Assessment

Abbreviation	Definition
NO	Nitric Oxide
NO_2	Nitrogen Dioxide
NO_x	Oxides of Nitrogen
NPfI	Noise Policy for Industry
NPV	Net Present Value
NPW Act	*National Parks and Wildlife Act 1974*
NSW	New South Wales
OEH	Office of Environment and Heritage
PBP	Planning for Bushfire Protection
PCT	Plant Community Type
PEA	Preliminary Environmental Assessment
pH	Potential Hydrogen
PHA	Preliminary Hazard Analysis
PM	Particulate matter
PM_{10}	Particulate matter less than 10 micro metres in diameter
$PM_{2.5}$	Particulate matter less than 2.5 micro metres in diameter
PNTL	Project Noise Trigger Levels
POEO Act	*Protection of the Environment Operations Act 1997*
RAPs	Registered Aboriginal Parties
RBL	Rating Background Level
RFS	Rural Fire Service
RL	Reduced Level
RMS	Roads and Maritime Services
RNP	*NSW Road Noise Policy 2011*
RTS	Response to Submissions
SEARs	Secretary's Environmental Assessment Requirements
SEPP	State Environmental Planning Policy
SEPP 33	State Environmental Planning Policy 33 – Hazardous and Offensive Development
SEPP 55	State Environmental Planning Policy 55 – Remediation of Land
SIA	Social Impact Assessment
SRD SEPP	State Environmental Planning Policy (State and Regional Development)
SSD	State Significant Development
TARP	Trigger Action Response Plan
tCO_{2-e}	Tonnes of CO_2 equivalent
TDS	Total Dissolved Solids
TEC	Threatened Ecological Community
TfNSW	Transport for NSW
TIA	Traffic Impact Assessment
TSP	Total suspended particulate matter, usually in the size range of zero to 50 micrometres

Abbreviation	Definition
TSS	Total Suspended Solids
TIA	Traffic Impact Assessment
Umwelt	Umwelt (Australia) Pty Ltd
VCA	Voluntary Conservation Agreement
VENM/ENM	Virgin Excavated Natural Material/Excavated Natural Material
ENM	Environmental Noise Model
VLAMP	Voluntary Land Acquisition and Mitigation Policy
VPA	Voluntary Planning Agreement
WAL	Water Access Licence
Water Act	*Water Act 1912*
WMP	Water Management Plan
WSP	Water Sharing Plan

Table 16.2 Glossary

Term	Definition
Amended Development Application	The process through which the development application for the proposed Martins Creek Quarry Extension Project is being amended to reduce the scale of impacts and respond to the community and government agency submissions.
Amenity	An agreeable feature, facility or service which makes for a comfortable and pleasant life
Aquifer	A water-bearing rock/sediment formation
Archaeological	Pertaining to the study of culture and description of its remains
Assessment background level	A single-figure background noise level representing each assessment period – day, evening and night (that is, three assessment background levels are determined for each 24 hour period of the monitoring period). It is determined by taking the lowest 10th percentile of the L90 level for each assessment period.
Attenuation	The reduction in magnitude of some variable in a transmission system, for example, the reduction of noise with distance as it travels through air
Catchment Area	The area from which a river or stream receives its water
Conservation	The management of natural resources in a way that will preserve them for the benefit of both present and future generations
Day	The period from 7.00 am to 6.00 pm Monday to Saturday or 8.00 am to 6.00 pm on Sundays and public holidays
Decibels	The units of sound level and noise exposure measurement where a step of 10 dB is a ten-fold increase in intensity or sound energy and actually sounds a little more than twice as loud.
Ecology	The science dealing with the relationships between organisms and their environment
Ecosystem	Organisms of a community together with its non-living components through which energy and matter flow
Electrical Conductivity	The measure of electrical conduction through water or a soil-water suspension generally measured in millisiemens per centimetre or microsiemens per centimetre. An approximate measure of soil or water salinity

Term	Definition
Environment Protection and Biodiversity Conservation Act 1999	Commonwealth legislation that regulates development proposals that have an actual or potential impact on matters of national environmental significance
Environmental Planning and Assessment Act 1979	NSW Government Act to provide for the orderly development of land in NSW
Evening	The period from 6.00 pm to 10.00 pm.
Fauna	All vertebrate animal life of a given time and place
Feasible	Means what is possible and practical in the circumstances
Floodplain	Large flat area of land adjacent to a stream which has been deposited during previous stream flow events and is inundated during times of high flow
Flora	All vascular plant life of a given time and place
Geology	Science relating to the earth, the rocks of which it is composed and the changes it undergoes
Groundwater	Sub-surface water which is within the saturated zone and can supply wells and springs. The upper surface of this saturated zone is called the water table
Habitat	The environment in which a plant or animal lives; often described in terms of geography and climate
In situ	In its original place
Indigenous	Native to, or originating in, a particular region or country
kL (Kilo litre)	One thousand litres
kV (Kilo Volt)	One thousand volts
LA1 Noise Level	The noise level exceeded for one per cent of the time. It is used in assessment of sleep disturbance
LA90 Noise Level	The noise level, measured in dB(A), exceeded for 90% of the time, which is approximately the average of the minimum noise levels. The L90 level is often referred to as the 'background' noise level and is commonly used to determine noise criteria for assessment purposes
LAeq Noise Level	The equivalent continuous noise level, measured in dB(A), during a measurement period
LAMax Noise Level	The maximum noise energy, measured in dB(A), during a measurement period
Land Capability	The ability of a parcel of land to be used in a sustainable manner (that is without permanent damage) for a given land use
Landform	Sections of the earth's surface which have a definable appearance (e.g. cliff, valley, mountain range, plain, etc.)
Mean	The average value of a particular set of numbers
Megalitre (ML)	One million litres
Meteorology	Science dealing with atmospheric phenomena and weather
Mitigate	To lessen in force, intensity or harshness. To moderate in severity
Mitigation	Activities associated with reducing the impacts of the project prior to or during those impacts occurring.
Native	Belonging to the natural flora or fauna in a region
Negligible	Small and unimportant, such as to be not worth considering.
Night	The period between 10.00 am and 7.00 pm
Outcrop	Bedrock exposed at the ground surface

Term	Definition
Particulates	Fine solid particles which remain individually dispersed in gases
pH	Scale used to express acidity and alkalinity. Values range from 0-14 with 7 representing neutrality. Numbers from seven to zero represent increasing acidity whilst 7 to 14 represent increasing alkalinity
Piezometer	A small diameter bore lined with a slotted tube used for determining the standing water level of groundwater
Project Amenity Noise Levels	The project amenity noise level seeks to protect against cumulative noise impacts from industry and maintain amenity for particular land uses. Calculated as the recommended amenity noise level less 5 dB and refers to the day, evening and night periods.
Project Area	The area to which this Amended Development Application applies.
Project Intrusive Noise Levels	The project intrusiveness noise level aims to protect against significant changes in noise levels. Calculated as rated background level plus 5 dB and refers to a 15-minute period.
Project Noise Trigger Levels	Target noise levels for a particular noise-generating facility. They are based on the most stringent of the project intrusiveness noise level or the project amenity noise level.
Proponent	Buttai Gravel Pty Ltd, which is part of the Daracon Group (referred to as Daracon)
Protection of the Environment Operations Act 1997	NSW legislation administered by the EPA that regulates discharges to land, air and water
Radial Analysis	Radial analyses are developed using 3D topographic information and electronic data files relating to the proposed Project to identify what can theoretically be seen from particular vantage points. The radial analysis illustrates what is visible from a height of 1.7 m at that location (i.e. from average eye height)
Rating Background Noise Level	The overall single figure background level representing each assessment period over the whole monitoring period determined by taking the median of the ABLs found for each assessment period.
Reasonable	Reasonable relates to the application of judgement in arriving at a decision, taking into account: mitigation benefits, cost of mitigation versus benefits provided, community views and the nature and extent of potential improvements.
Receiver	A sensitive land use in close proximity to the development that have the potential to experience impacts associated with the development.
Rehabilitation	The process of restoring to a condition of usefulness. In regard to mining, relates to restoration of land from a degraded or mined condition to a stable and vegetated landform
Revegetation	The process of re-establishing vegetation cover
Salinity	A measure of the concentration of dissolved solids in water
Site Specific	Relating to conditions existing at a particular location
Sound Power Level	The total sound energy radiated per unit time measured as 10 times a logarithmic scale, the reference power being 12 picowatts
Topography	Description of all the physical features of an area of land and their relative positions, either in words or by way of a map



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