Brandy Hill Quarry Expansion Project

State Significant Development SSD 5899
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Title: Brandy Hill Quarry Expansion Project

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Cover image: Brandy Hill Quarry Operations (Source: Department of Planning, Industry and Environment, 2018)

Glossary

Abbreviation	Definition
AHD	Australian Height Datum
Amended RTS	Hanson's Amended Response to Submissions report
BCD	Biodiversity and Conservation Division within the Department
Consent	Development Consent
Council	Port Stephens Council
Department	Department of Planning, Industry and Environment
DPIE Water	Water Group within the Department
EIS	Environmental Impact Statement
EPA	Environment Protection Authority
EP&A Act	*Environmental Planning and Assessment Act 1979*
EP&A Regulation	*Environmental Planning and Assessment Regulation 2000*
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
EPI	Environmental Planning Instrument
EPL	Environment Protection Licence
ESD	Ecologically Sustainable Development
LEP	Local Environmental Plan
Minister	Minister for Planning and Public Spaces
MNES	Matters of National Environmental Significance
PM	Particulate Matter
SEARs	Secretary's Environmental Assessment Requirements
Secretary	Planning Secretary of the Department of Planning, Industry and Environment
SEPP	State Environmental Planning Policy
SRD SEPP	*State Environmental Planning Policy (State and Regional Development) 2011*
SSD	State Significant Development

TfNSW	Transport for NSW
VPA	Voluntary Planning Agreement
WSP	Water Sharing Plan

Executive Summary

The Brandy Hill Quarry is an existing hard rock quarry located approximately 10 kilometres north west of Raymond Terrace, in the Port Stephens local government area. The quarry is owned and operated by Hanson Construction Materials Pty Ltd (Hanson) and produces a range of aggregates and other products that are used for construction purposes. The quarry operates under a development consent issued by Port Stephens Council in 1983. The resource extraction approved under the existing development consent, based on the approved disturbance area and extraction depth, is likely to be completed by November 2020.

Proposed Expansion

Hanson is seeking approval to expand and intensify operations at the Brandy Hill Quarry. This proposal, known as the Brandy Hill Quarry Expansion Project (the Project) involves:

- extending the extraction area by approximately 55 hectares (ha), from 19.5 ha to 74.5 ha;
- increasing production from 700,000 tonnes to 1.5 million tonnes per annum;
- extending product transport and operating hours into the evening and night periods;
- constructing and operating a concrete batching and recycling facility; and
- importing solid concrete waste for reprocessing and beneficial reuse.

Strategic Context

Since the quarry's establishment, land surrounding the quarry was subdivided and established as the suburb of Brandy Hill. There are now a significant number of rural residential receivers around the quarry, with over 40 residences within 1 km of the quarry boundary and more than 50 residences located along Brandy Hill Drive.

The quarry produces a range of important aggregate products that are used for construction purposes. There is a high demand for these products as a result of population growth, housing demand and road upgrade projects. The increased demand for hard rock aggregates combined with increased rural residential dwellings surrounding the Brandy Hill Quarry prompts the need for careful and balanced consideration of the compatibility of these land uses.

Statutory Context

The Project is classified as State significant development (SSD) under section 4.36 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) as it is development for the purposes of extractive industry that extracts more than 500,000 tonnes of material per annum from a total resource of more than 5 million tonnes. The Project is also declared to be a 'controlled action' under the *Environment Protection Biodiversity Conservation Act 1999* (EPBC Act) due to its potential impacts on listed threatened species, and has been assessed under the Bilateral Agreement between the Commonwealth and NSW governments.

The consent authority for the Project is the Independent Planning Commission of NSW (the Commission) in accordance with *State Environmental Planning Policy (State and Regional Development) 2011*, because there were more than 50 unique public submissions by way of objections.

Exhibition and Submissions

The Department publicly exhibited the development application and accompanying Environmental Impact Statement (EIS) for the Project from 10 March until 9 April 2017. The Department received 193 submissions including 169 objections from members of the public and special interest groups. Key issues raised in submissions related to the Project's potential amenity and safety impacts associated with the proposed increased trucking intensity and hours of operation. Other issues raised in submissions related to air quality, blasting, health impacts, as well as impacts on biodiversity and property values.

Following the exhibition of the Project and subsequent consultation with government agencies and the community, Hanson amended a number of aspects of the Project, including limiting the proposed hours of product processing and transport. These changes were provided in an Amended Response to Submissions report (Amended RTS) which also included updated assessments to address residual government agency and community concerns.

Assessment

The Department has carried out an assessment of the merits of the Project, having regard to its potential environmental, social and economic impacts, relevant statutory obligations, information provided by Hanson, NSW government agencies and submissions from members of the public and special interest groups. The key issue for the Project, as raised in community submissions, were amenity and road safety impacts associated with the proposed increase in trucking movements, along with the proposal to extend the operating hours of the quarry.

Amenity impacts from increased hours of operation

As described in its Amended RTS, Hanson proposes to undertake secondary and tertiary processing activities 24 hours per day seven days per week, and transport product from the site to construction projects throughout the night (ie between 10:00 pm and 5:00 am) on up to 20 nights per year. This compares to Port Stephens Council's advice that the approved hours of operation for the existing quarry are from 6:00 am to 6:00 pm.

The Department does not support the proposed hours of operation for processing and transport due to adverse impacts on local amenity through the evening and night time periods, noting the extensive rural residential development that has been established around the quarry since it was originally approved in 1983.

The Department has therefore recommended that:

- product transport be limited to the early morning shoulder period to allow early morning product delivery to construction projects from 5:00 am to 7:00 am,
- secondary and tertiary processing be limited to the early evening period Monday to Friday from 6:00 pm to 8:00 pm;
- no activities be undertaken during the late evening / night (8:00 pm to 5:00 am) period; and
- targeted delivery to construction projects that require materials during the night to operate on 20 evenings per calendar year (6:00 pm, to 10 pm).

The Department acknowledges that the recommended restriction on evening processing would reduce the overall annual processing rate at the quarry to around 1.35 Mtpa, rather than the requested 1.5 Mtpa processing rate.

However, the Department's assessment indicates that the crushing activities are a key source of potential amenity impacts on the local community, and Hanson should address this issue by upgrading or replacing secondary and tertiary processing equipment, rather than being allowed to cause additional noise impacts during the evening period using the current equipment.

Road safety

Another key issue for the Project relates to road safety associated with increased trucking movements along Brandy Hill Drive where there are around 50 rural residences. To address these concerns, Hanson has agreed to enter into a Voluntary Planning Agreement (VPA) with Port Stephens Council that includes the construction of six bus bays along Brandy Hill Drive and Seaham Road, and a contribution of $1.5 million towards a shared pathway to be constructed along Brandy Hill Drive.

The Department considers that the implementation of this VPA would mitigate potential safety risks associated with the Project's trucking intensity, particularly during school bus pick up and drop off times along Brandy Hill Drive. Accordingly, the Department has recommended that the construction of the bus bays be completed before Hanson is allowed to increase its existing annual production rate.

Noise, blasting and air emissions

The Project would result in increased noise and dust emissions and increased blasting at the site. However, no exceedances of air quality, ground vibration or airblast overpressure or ground vibration criteria are predicted. The noise impact assessment predicted minor (up to 2dB) exceedances of the project specific noise limits at five receivers. The Department considers that these impacts could be appropriately managed under conditions of consent and has recommended strict operating, management and monitoring procedures to be in place prior to the commencement of the Project.

Water resources

Due to the increased depth of extraction from the currently approved 30 metres (m) Australian Height Datum (AHD) to -78 m AHD, an increase in extraction depth of 108 m, the Project would intercept more groundwater, with an inflow of 642 ML/year predicted towards the end of the quarry life. Due to the increase in the extraction area, additional stormwater runoff would also be captured in the pit requiring treatment in in-pit sediment dams.

To manage excess water and allow quarrying operations to continue, increased controlled discharge of captured water to Deadmans Gully is proposed. These discharges would meet the existing discharge criteria set in the Environment Protection Licence (EPL) for the quarry. The Environment Protection Authority (EPA) did not raise any concerns with the proposed discharge regime and it is considered that these discharges could be managed to avoid adverse impacts on receiving water quality and stream geomorphology. These discharges would continue to be regulated under the EPL for the site.

As a result of the groundwater take, one private bore is predicted to exceed the *NSW Aquifer Interference Policy's* minimal impact consideration (ie drawdown of greater than 2 metres). However, this bore has been identified to be no longer in use.

In addition, due to the depth of extraction, a throughflow pit lake would develop and stabilise after around 160 years after operations have ceased. While there would be an increase in salinity as a result of evaporation from the pit lake, it is predicted that there would be no change in the groundwater beneficial use category in the vicinity of the quarry.

DPIE Water raised no concern regarding the Project's water-related impacts, and the Department considers that subject to the recommended conditions, the risk of adverse impacts on surface water and groundwater resources is low.

Biodiversity

The Department has carefully considered the Project's impacts on biodiversity with around 54 hectares of moderate / high quality native vegetation proposed to be cleared, including habitat for a number of threatened species including the koala. The Department and the Biodiversity Conservation Division (BCD) consider that the proposed biodiversity offsets would adequately compensate for the proposed vegetation clearing and associated impacts on threatened fauna, including Matters of National Environmental Significance (MNES) under the EPBC Act.

The required ecosystem and species credits can be readily obtained on the biodiversity credit market, through existing Biobanking sites located near the Project or payment into the Biodiversity Conservation Fund. Overall, the Department and BCD considers the impacts of the Project on biodiversity, including MNES, are acceptable.

Rehabilitation

The existing development consent allows for a final void to remain in the landform. The Project would increase the size and depth of the remaining void at the site. The Department has recommended contemporary rehabilitation objectives for the site and a requirement for Hanson to progressively rehabilitate completed benches, noting that a large pit lake will develop in the long term and inundate rehabilitated quarry benches. Subject to the recommended conditions, the Department is confident that the Project area could be rehabilitated to achieve sustainable final landform and rehabilitation outcomes.

Other issues

The Department considers that the other impacts associated with the Project, including visual impacts, Aboriginal cultural heritage, historical heritage, waste and hazard management could be effectively managed under the recommended conditions of consent.

Evaluation

The Project would facilitate the ongoing supply of important hard rock aggregates to the construction industry, provide ongoing and additional employment opportunity for up to 31 FTE workers, provide local and regional economic stimulus and local infrastructure development for the Port Stephens LGA through the proposed VPA.

The Department has carefully considered the benefits and impacts of the project, and acknowledges that the land use around the quarry has changed considerably since it commenced in 1983, with significant small lot rural residential development.

As a result of this intensification of rural residences around the quarry, the Department considers that the quarry should continue to remain predominantly a day based operation with some activity allowed

in the early morning shoulder period (5:00 am to 7:00 am) and evening period (6:00 pm to 10:00 pm) to facilitate provision of materials to construction projects. This approach is consistent with the NSW Government's *Noise Policy for Industry* which affords higher day time noise limits to encourage applicants to consider reasonable and feasible options for intensifying day time operations over the more sensitive evening and night periods.

The Department notes that the quarry has nearly exhausted the resource in its approved extraction area and that it is an important source of construction material in the region. The Department has recommended conditions that would allow continued operations with an increase in the annual extraction rate, but would provide additional protection for the amenity of the rural residential receivers around the quarry during the sensitive evening and night periods.

Overall, the Department considers that the benefits of the Project outweigh its residual costs, and is approvable, subject to the recommended conditions.

Contents

1 Introduction

1.1 Background

1.1.1 Hanson Construction Materials Pty Ltd (Hanson) owns and operates the Brandy Hill Quarry, an existing hard rock quarry located on Clarence Town Road, Seaham, in the Hunter region of New South Wales. The quarry produces a range of aggregate products that are used for construction purposes including road base, pre-coated and concrete grade aggregates, manufactured sand, amour rock and fill material.

1.1.2 The quarry is located approximately 15 kilometres (km) northeast of Maitland and 30 km north of Newcastle in the Port Stephens local government area (LGA) (see **Figure 1**).

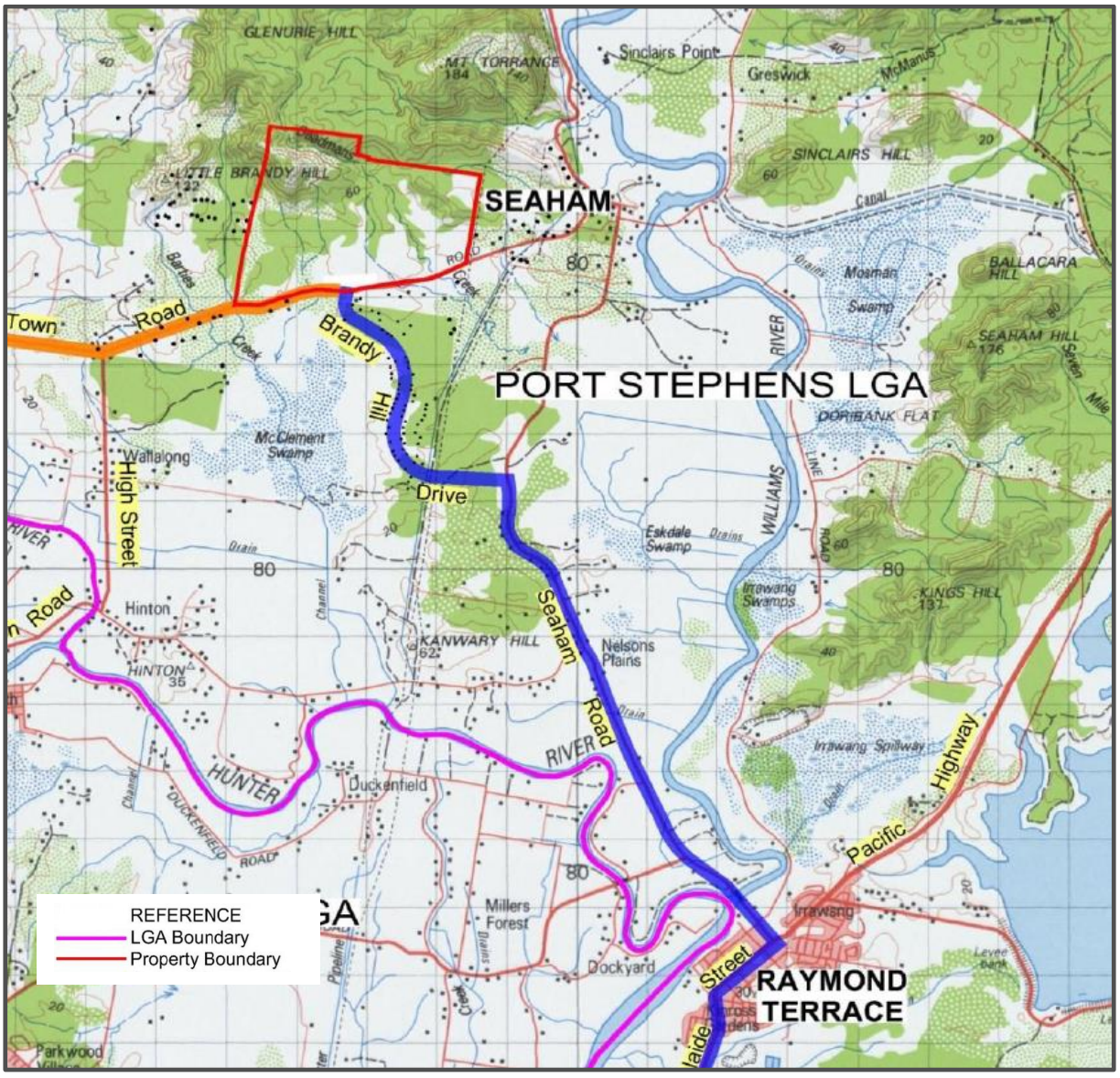

Figure 1 | Location of the Brandy Hill Quarry

1.2 Existing Operations

1.2.1 Brandy Hill Quarry operates under Development Consent 1983/1920 issued by Port Stephens Council (Council) in 1983. Under this consent, extraction is permitted over approximately 19.5 hectares (ha) to a depth of 30 metres (m) AHD. The existing site layout is depicted in **Figure 2**.

Figure 2 | Existing site layout

1.2.2 Operations at the quarry involve the stripping of overburden and extraction of hard rock using drill and blast methods. Extracted material is transported by haul trucks to an on-site processing plant that separates the material into a range of products. Quarry products are distributed to Sydney and Newcastle construction markets via Brandy Hill Drive, Seaham Road and Adelaide Street, Raymond Terrace to the Pacific Highway. The quarry also supplies customers located to the west towards Maitland or east towards Clarence Town and Dungog.

1.2.3 Hanson currently extracts and dispatches up to 700,000 tonnes per annum (tpa) of material from the quarry. This extraction limit is specified in the site's Environment Protection Licence (EPL), issued by the Environment Protection Authority (EPA).

1.2.4 Since the quarry commenced operations, Brandy Hill and its surrounding suburbs have expanded and incorporate a range of residential, agricultural and commercial land uses. There are two quarries located within 15km of the site; Boral Resources' Seaham Quarry and Daracon's Martins Creek Quarry.

2 Project

2.1.1 On 28 February 2017, Hanson lodged a development application and accompanying Environmental Impact Statement (EIS) for the Brandy Hill Quarry Expansion Project (the Project). The Project involves:

- extending the approved extraction area from around 19 ha to 74 ha (55 ha increase), and the approved extraction depth from 30 m AHD to -78 m AHD (108 m increase) to access additional hard rock resource;
- increasing the production limit to 1.5 million tpa;
- carrying out quarrying operations on site for a further 30 years;
- extending the quarry's operating hours, including secondary, tertiary screening, product loading and dispatch to 24 hours per day;
- constructing and operating a concrete batching and recycling facility;
- receiving up to 20,000 tonnes of concrete waste and producing up to 15,000 cubic metres (m^3) of pre-mixed concrete per annum;
- relocating the site office, processing facilities and stockpile areas as quarrying operations progress; and
- progressively rehabilitating the site.

2.1.2 Hanson propose to undertake the Project over five stages. The existing pit would initially be extended west and then south, and extracted to a depth of -8m AHD (Stages 1 and 2). Extraction would then progress along the southern boundary of the site toward the existing processing area to a depth of -38 m AHD (Stage 3). During Stage 4 and 5, the existing processing area would be relocated to the south and the pit would be deepened to a final depth of -78 m AHD. Hanson propose to utilise overburden during Stage 1 to construct an amenity bund wall at the southern edge of the relocated processing area. The proposed site layout and sequence of extraction is shown in **Figures 3 - 5**.

2.1.3 The final landform would consist of a void lake that would gradually fill with water from a combination of groundwater inflows and rainfall. This lake would continue to fill for approximately 160 years before reaching equilibrium, at a level of approximately 25 m AHD (ie approximately 5 metres below the surrounding land). Hanson propose to undertake progressive rehabilitation of upper quarry benches. The proposed final landform is shown in **Figure 5**.

2.1.4 Following the exhibition of the Project and subsequent consultation with government agencies and the community, Hanson amended a number of aspects of the proposal. Key amendments include:

- increasing the disturbance area by approximately 5 ha to account for the proposed amenity bund;
- refining the proposed hours for processing and product transport, including:

reduced hours for construction, blasting, load and haul activities and operation of the primary crusher; product dispatch only to occur during the night period on up to 20 nights per year; and hourly dispatch limits during the early morning, evening and night periods;

- enclosure of all fixed processing equipment and partial enclosure of the mobile crusher from Stage 1;

- early commencement of concrete recycling activities (ie during Stage 1 instead of Stage 4); and
- removing an additional weighbridge.

2.1.5 While the Department is satisfied that some of these amendments would reduce amenity impacts on sensitive receptors, the Department considers that further restrictions on proposed operating hours is required to protect the amenity of the area. The Department's consideration of these issues is provided in **Sections 6.1** and **6.7**.

2.1.6 The Project as proposed by Hanson is summarised in **Table 1** below and described in detail in Hanson's EIS and Amended Response to Submissions (Amended RTS) (see **Appendices B and D**).

Table 1 | Key Aspects of the Brandy Hill Expansion Project

Aspect	Existing consent conditions	Proposed
Total resource	• Approximately 20 million tonnes (Mt)	• 78.1 Mt additional resource
Rate of production	• Not specified, however the site's Environment Protection Licence (EPL) permits production of up to 700,000 tpa of quarry products	• 1.5 Mt per annum of quarry products • 15,000 m^3 of pre-mixed concrete
Imported materials	• Nil	• 20,000 tonnes of concrete waste • Raw materials for concrete production
Quarry life	• Not specified	• 30 years from date of consent
Quarry footprint	• 19.45 ha	• Approximately 79 ha
Depth of extraction	• 30 m AHD	• -78 m AHD
Quarrying methods	• Open cut methods including excavation, drill, blast, load and haul.	• No change
Processing methods	• Rock crushing, screening and washing on site	• No change

Aspect	Existing consent conditions	Proposed

Laden truck dispatch[1]	• Not specified
	Company advised that a peak dispatch of approximately 170 laden trucks per day was recorded in 2013
		• 301 laden between 7:00am – 10:00pm
		• 58 laden between 10:00pm – 7:00am
		• Hourly laden dispatch:
		  ○ 9 laden from 5:00 am to 6:00 am
		  ○ 12 laden from 6:00 to 7:00 am
		  ○ 30 laden per hour from 7:00 to 10:00 pm
		  ○ 5 laden per hour from 10:00 pm to 5:00 am (20 nights per year)

Number of blasts	• Up to 25 blasts per annum	• Up to one blast per week
Transport routes	• Pacific Highway via Brandy Hill Drive, Seaham Road, Adelaide Street and Heatherbrae Roundabout • West on Clarence Town Road toward Maitland or east on Clarence Town Road towards Dungog	• Primary route – Pacific Highway via Brandy Hill Drive, Seaham Road, Adelaide Street and Richardson Road • Secondary Route – New England Highway via Clarence Town Road, Paterson Road, Flat Road and Melbourne Street
Number of employees	• Up to 20 full-time equivalent (FTE) employees	• Up to 31 FTE employees
Equipment and infrastructure	• Processing Plant, including crushers, screens, pre-coat plant and pug mill • Front-end loaders, dump trucks, excavators and water cart • Diesel and electric pumps • Weighbridge • Site office and workshop	• Relocate the existing processing area and facilities, including upgrading the pre-coat plant and other facilities as needed • New infrastructure - concrete batching and recycling plant

[1] One laden dispatch is equal to two truck movements (ie one movement in and one movement out)

Aspect	Existing consent conditions	Proposed
Hours of operation	Quarrying operations • 6:00 am to 6:00 pm[2] Monday to Saturday Blasting • 9:00 am to 5:00 pm Monday to Saturday	Construction • 7:00 am to 6:00 pm Monday to Friday • 7:00 am to 5:00 pm Saturday Extraction activities, concrete batching and recycling, and operation of the primary crusher • 5:00 am to 10:00 pm Monday to Saturday Secondary and tertiary crushing and screening, and maintenance • 24 hours 7 days per week Product loading and dispatch • 5:00 am to 10:00 pm Monday to Saturday • 10:00 pm to 5:00 am on up to 20 nights per calendar year Blasting • 9:00 am to 5:00 pm Monday to Friday

2.1 Project Justification

2.1.7 Hanson argues that the Project is necessary to meet increasing demand from the Sydney, Central Coast and Newcastle construction and industrial markets. The site is well-placed to supply these markets due to its proximity to the Pacific and New England Highways, providing access to major population centres and road networks.

2.1.8 Hanson also argues that the proposed operating and dispatch hours are required to provide flexibility to meet customer demand, particularly for late-night road maintenance projects. Hanson advises that night-time operations would not occur continuously and would be driven by customer demand.

2.1.9 The Project would allow Hanson to expand the existing quarry site, utilising existing infrastructure and equipment, which would be more efficient than developing a new greenfield site. Hanson advises that the Project would result in ongoing employment for its existing workforce of 20 FTE, plus employment for an additional 11 FTE personnel, and have positive flow-on effects to the local and regional communities.

[2] Note: Hanson's EIS contends that the existing Council consent allows operations to occur 24 hours per day, seven days per week. However, Council has advised that it considers the approved hours to be 6:00 am to 6:00 pm.

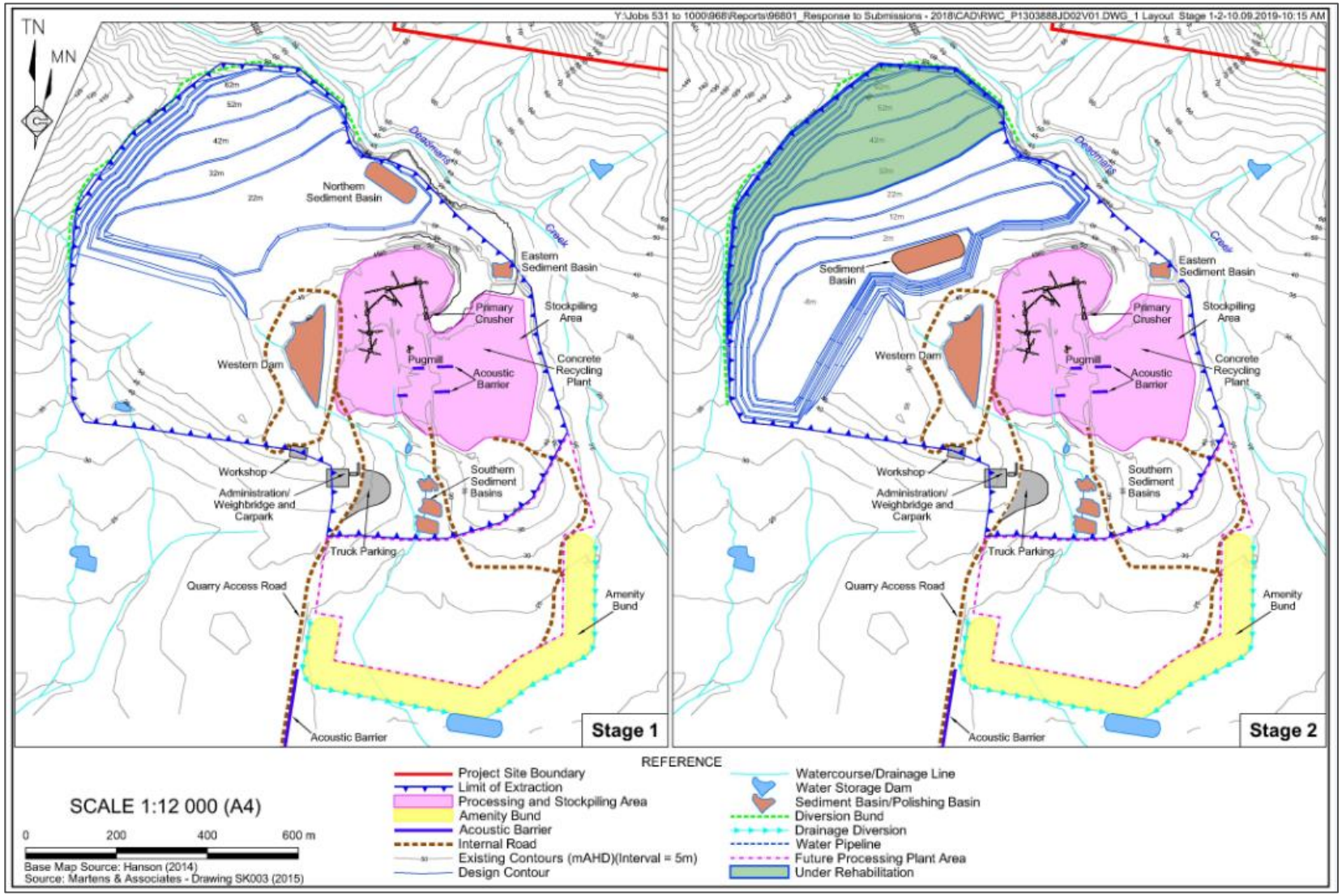

Figure 3 | Proposed Extraction Stages 1 and 2

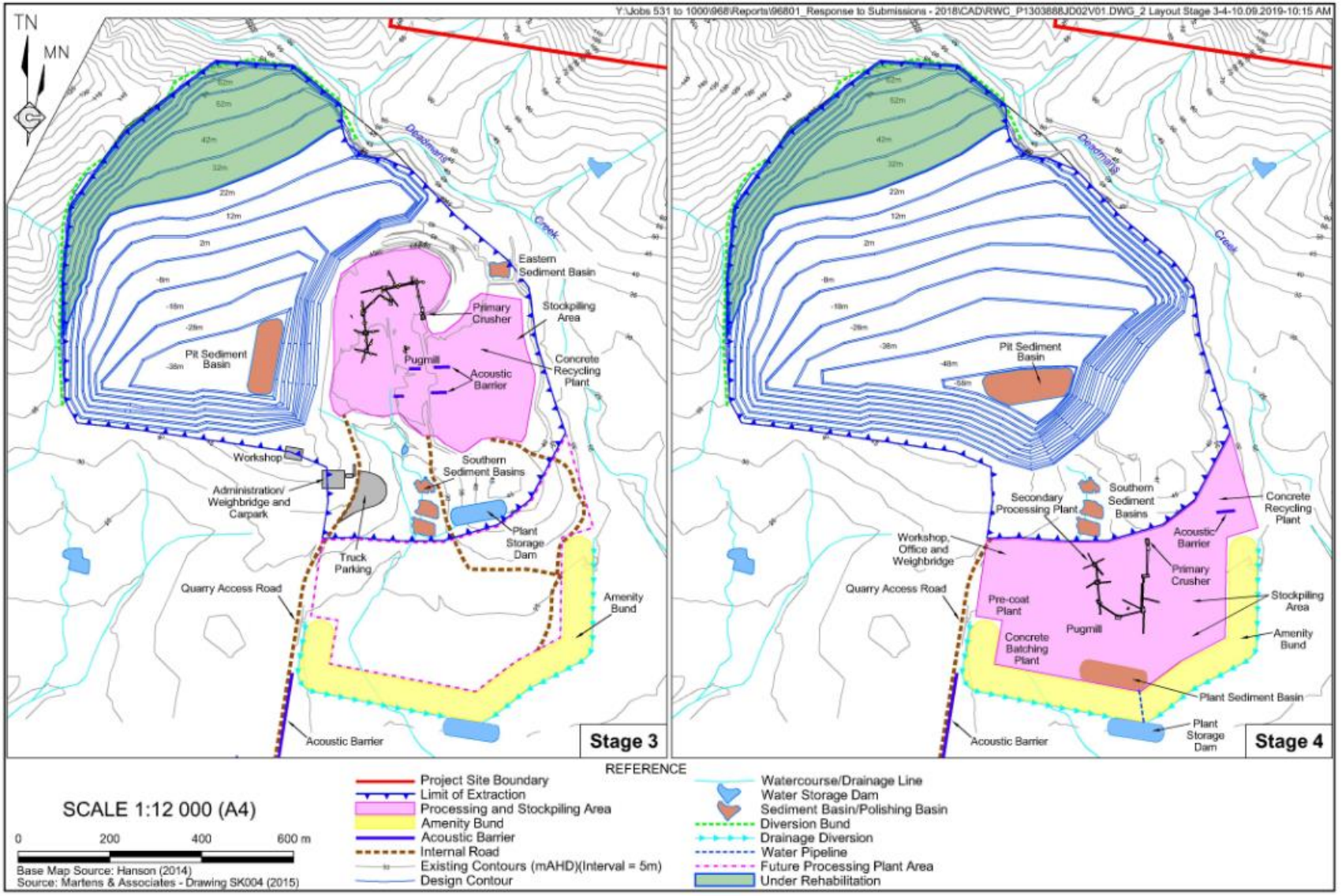

Figure 4 | Proposed Extraction Stages 3 and 4

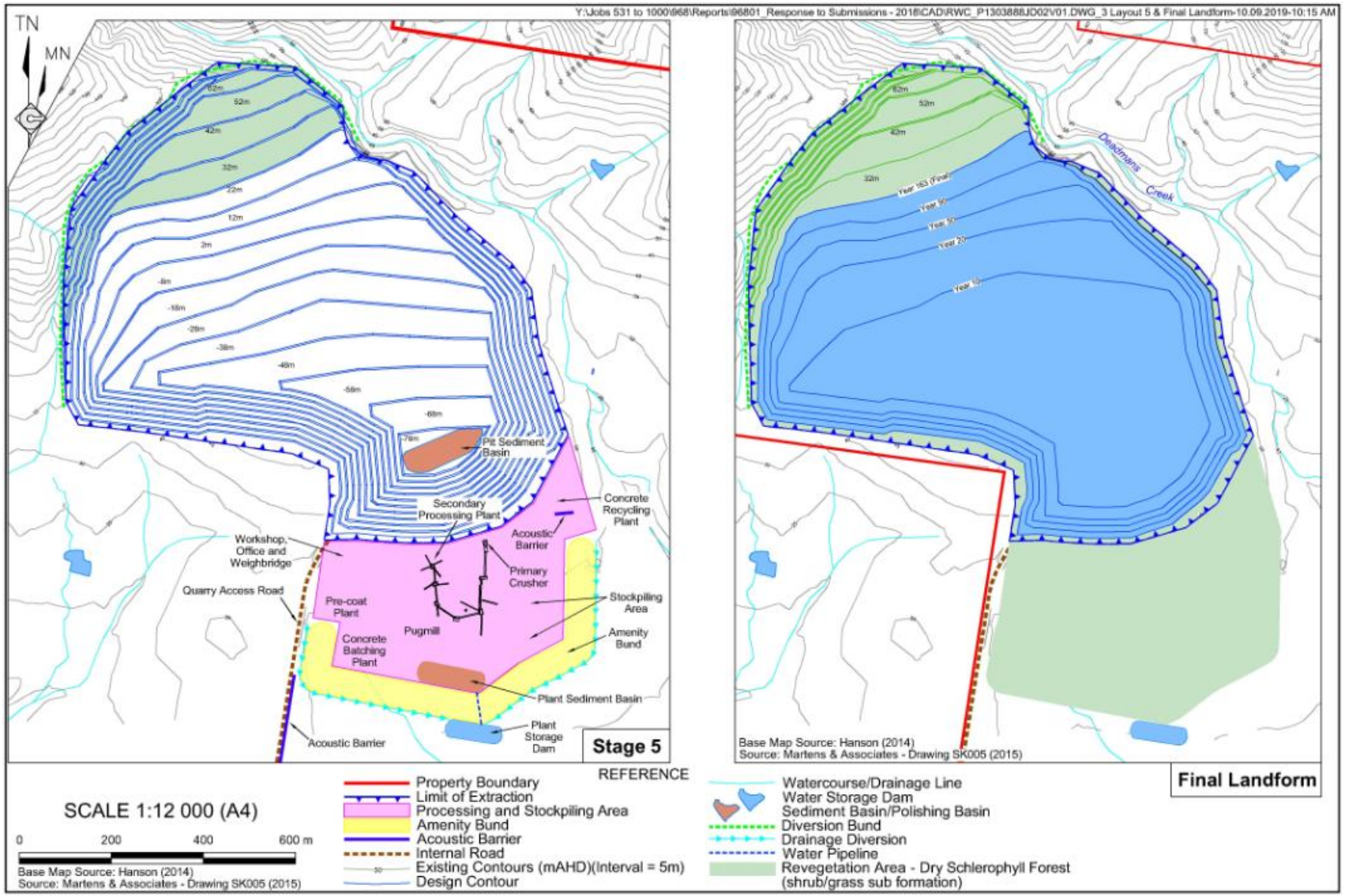

Figure 5 | Proposed Extraction Stage 5 and Final Landform

2.1.10 Hanson also advise that resource extraction approved under the existing development consent, based on the approved disturbance area and extraction depth, is likely to be completed by November 2020. That is, continued operations in the short term is contingent upon the current State significant development application.

2.1.11 Hanson considers that the that environmental impacts associated with the Project can be managed and mitigated to an acceptable level, and that the Project would have positive socio-economic benefits for the local economy and facilitate planned local, regional and state development initiatives.

2.1.12 The Department has carefully considered Hanson's justification for the Project in its evaluation and recommendations to the Commission.

3 Strategic context

3.1.1 The Brandy Hill Quarry was established by Hunter Valley Mining Corporation Pty Ltd in 1983 under a development consent issued by Council. This consent permitted the construction of an access road to the quarry from Seaham Road. Subsequently, land surrounding the quarry's access road was subdivided and established as the suburb of Brandy Hill. The quarry access road was renamed to Brandy Hill Drive and designated as a public road providing a direct route between Brandy Hill and Raymond Terrace. Brandy Hill and its surrounding suburbs have since expanded to predominantly consist of rural residential development (see **Figure 6**).

3.1.2 As shown in **Figure 6**, there are now a significant number of rural residential receivers around the quarry, with over 40 residences within 1 km of the quarry boundary and more than 50 residences located along Brandy Hill Drive.

3.1.3 In 2001, Hanson purchased the quarry and continued its operations. In 2011, a variation was approved to the site's EPL allowing an increase to the annual extraction rate (ie up to 700,000 tpa). This variation was approved on the basis that the Council consent does not specify an extraction limit. Although it should be noted that the original Environmental Impact Statement indicated that extraction would increase to around 400,000 tpa. That is, there has already been an intensification in quarrying activity since Hanson commenced its operations.

3.1.4 The quarry produces a range of important aggregate products that are used for construction purposes, including road base, pre-coated and concrete grade aggregates, manufactured sand, amour rock and fill material. There is a high demand for these products as a result of population growth, housing demand and road network projects. The quarry currently services the Sydney, Central Coast and Newcastle construction and industrial markets, however, demand for materials to service the Sydney construction market is expected to increase due to the small number of hard rock extraction sites remaining in the Greater Sydney Region. Additionally, the *Hunter Regional Plan 2036* identifies an additional 70,000 dwellings needed by 2036 to accommodate predicted population growth.

3.1.5 There are two other quarries within 15 km that supply similar aggregate products, including the Boral Seaham Quarry and the Martins Creek Quarry. Both of these quarries operate under Council development consents and are seeking approval to expand and continue operations. It should be noted that the Martin Creek Quarry has been placed in care and maintenance whilst it seeks approval to continue operations under a State significant development application.

3.1.6 Hanson has advised that production from the quarry fluctuates in response to market demand, which results in peaks and troughs over a typical calendar year. This style of operation is often encountered in the extractive industry where contracts are won for the delivery of material to different types of projects (ie building sites, road upgrade projects and residential subdivisions).

3.1.7 The increased demand for hard rock aggregates combined with increased rural residential dwellings surrounding the Brandy Hill Quarry prompts the need for careful and balanced consideration of these potentially competing land uses.

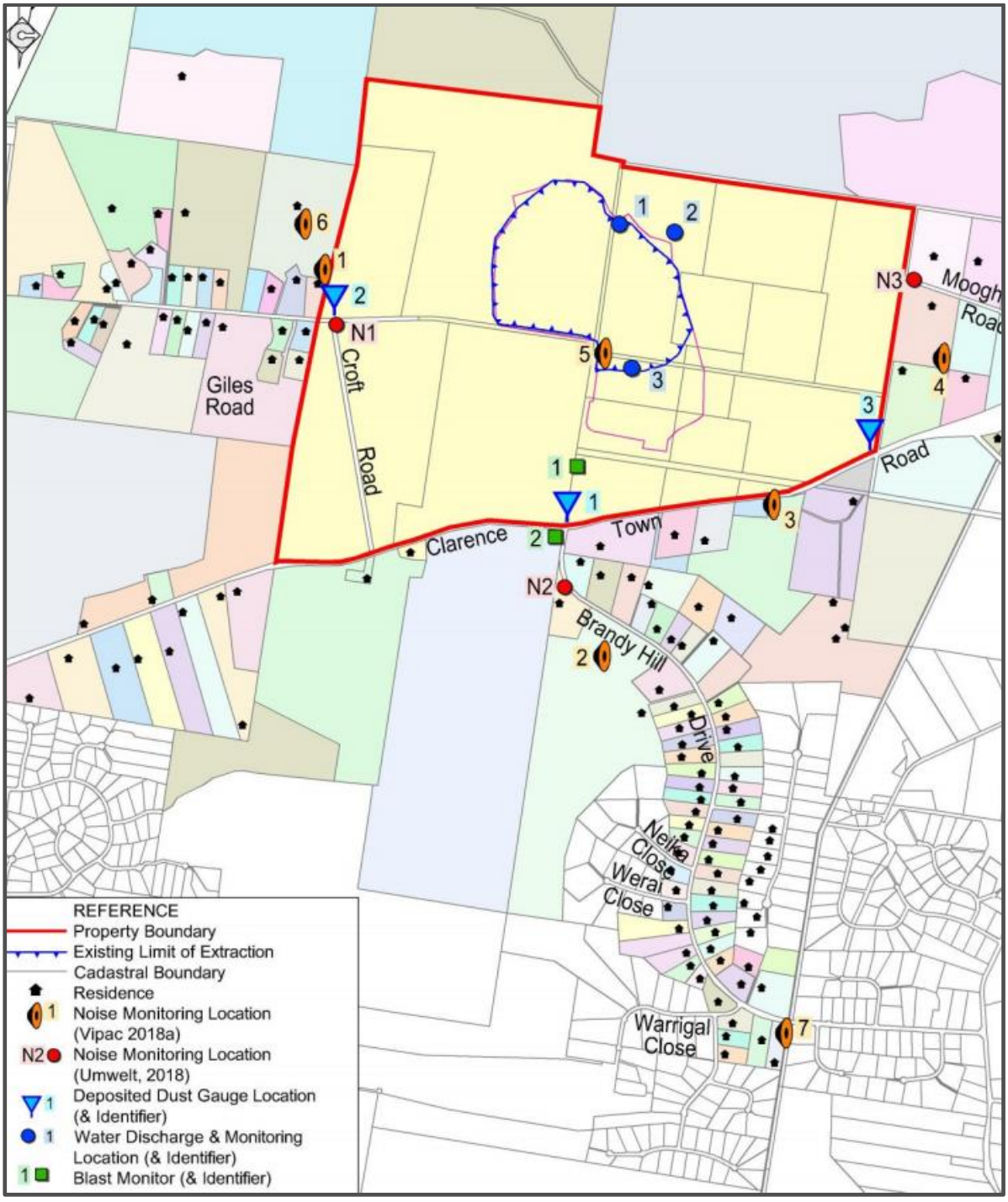

Figure 6 | Residential Development Surrounding the Brandy Hill Quarry

4 Statutory context

4.1.1 In line with the requirements of section 4.15 of the *Environmental Planning and Assessment Act 1979* (EP&A Act), the Department's assessment of the Project has given detailed consideration to a number of statutory requirements. These include the:

- objects found in section 1.3 of the EP&A Act; and
- the matters listed under section 4.15(1) of the EP&A Act, including applicable environmental planning instruments (EPIs) and regulations.

4.1.2 The Department has considered all of these matters in its assessment of the Project and has provided a summary of this consideration below. Further consideration of the objects and other relevant provisions of the EP&A Act and EPIs is found in **Appendix G**.

4.2 State significance

4.2.1 The project is declared to be State Significant Development (SSD) under section 4.36 of the EP&A Act as it meets the criteria in clause 7 of Schedule 1 to *State Environmental Planning Policy (SEPP) (State and Regional Development) 2011* - development for the purposes of extractive industry that extracts more than 500,000 tonnes of material per annum from a total resource of more than 5 million tonnes.

4.2.2 In accordance with section 4.5 of the EP&A Act and clause 8A(1) of *SEPP (State and Regional Development) 2011*, the Independent Planning Commission of NSW (the Commission) is the consent authority and must determine the application.

4.3 Permissibility

4.3.1 The quarry site is zoned RU2 (Rural Landscape) and E3 (Environmental Management) under the *Port Stephens Local Environmental Plan 2013* (Port Stephens LEP). Development for the purpose of extractive industries is permitted with consent in areas zoned RU2 but is prohibited in areas zoned E3. No development is proposed to occur in areas of the site zoned E3.

4.3.2 The Project would also facilitate "resource recovery" and "general industry" land uses through the operation of the concrete recycling facility and the pre-coat and concrete batching plants. Hanson has advised that these land uses are considered ancillary to the dominant land use, and as such, are permitted with consent under the Port Stephens LEP. The Department acknowledges concern from members of the community as to whether the proposed resource recovery and general industry land uses constitute ancillary development to the dominant land use.

4.3.3 However, the Department considers that all components of the Project are permissible with development consent under clause 7(3) and (4) of *State Environmental Planning Policy (Mining, Petroleum & Extractive Industries) 2007* (Mining SEPP).

4.4 Other Approvals

4.4.1 Under section 4.41 of the EP&A Act, a number of approvals are integrated into the SSD approval process, and consequently are not required to be separately obtained for the Project.

4.4.2 The Project would require a variation to the site's Environment Protection Licence (EPL) under the *Protection of the Environment Operations Act 1997*. Under section 4.42 of the EP&A Act, this must be substantially consistent with any development consent granted for the Project.

4.4.3 The Department has consulted with the relevant government authorities responsible for the integrated and other approvals and considered their advice in its assessment of the Project.

4.5 Commonwealth Approvals

4.5.1 On 3 June 2015, a delegate of the Commonwealth Minister for the Environment and Energy determined that the Project is a 'controlled action' under the *Environment Protection Biodiversity Conservation Act 1999* (EPBC Act) due to its potential impacts on Matters of National Environmental Significance (MNES), specifically, listed threatened species and communities (sections 18 & 18A of the EPBC Act).

4.5.2 Under the Bilateral Agreement between the Commonwealth and NSW governments, the Commonwealth has accredited the NSW assessment process under the EP&A Act, to enable a single integrated assessment of the Project. However, the Commonwealth's decision-maker maintains a separate approval role, which will be exercised following the Commission's determination of the development application.

4.5.3 Following clarification of the Commonwealth Department of Agriculture, Water and Environment and Energy's (DAWE, formerly the Department of Environment and Energy) assessment requirements on 3 June 2015, the Department issued revised Secretary's Environmental Assessment Requirements (SEARs, formerly referred to as Director General's Requirements) for the Project to incorporate the Commonwealth's requirements. The Department has assessed the potential impact of the Project on the relevant MNES in accordance with the requirements of the bilateral agreement. This assessment is provided in **Section 6.7** and **Appendix H** of this report.

4.6 Mandatory Matters for Consideration

Objects of the EP&A Act

4.6.1 The objects of the EP&A Act are the underpinning principles for all decision making under the Act. They must be considered by the consent authority when determining a development application under the Act. The Department has assessed the Project against the objects found in section 1.3 of the EP&A Act. **Table 2** summarises how these objects have been considered.

Table 2 | Consideration of the Project against the objects of the EP&A Act

Objects of the EP&A Act (section 1.3)	Consideration
(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 Project would provide ongoing socio-economic benefits to the people of NSW and ongoing employment opportunities for members of the regional community. • The Project would facilitate efficient recovery of an important hard rock resource.

Objects of the EP&A Act (section 1.3)	Consideration
(b) to facilitate ecologically sustainable development by integrating relevant economic, environmental and social considerations in decision-making about environmental planning and assessment;	• The Project can be carried out in a manner that is consistent with the principles of ESD. The Department's assessment has sought to integrate all significant environmental, social and economic considerations. • The Department has further considered the principles of ESD in **Appendix G**.
(c) to promote the orderly and economic use and development of land;	• The Project involves the expansion of an existing operation and can be largely carried out using existing site and transport infrastructure. • The Project involves a permissible land use on the subject site and would facilitate efficient recovery of an important hard rock resource.
(e) to protect the environment, including the conservation of threatened and other species of native animals and plants, ecological communities and their habitats;	• The Department considers that the Project has been designed to minimise potential environmental impacts where practicable, including the incorporation of setbacks from watercourses and the construction of visual and amenity bunds. • The Project would result in the loss of existing vegetation and habitat on the site. However, the Department considers that the proposed offset would maintain biodiversity values in the long-term. • The Department considers that the impacts to threatened species and habitats can be managed and/or mitigated through appropriate conditions that require biodiversity offsets and detailed rehabilitation strategies.
(f) to promote the sustainable management of built and cultural heritage (including Aboriginal cultural heritage);	• The Project would not significantly impact the built or cultural heritage of the locality.
(i) to promote the sharing of the responsibility for environmental planning and assessment between the different levels of government in the State;	• The Department notified and consulted with Council and other NSW government authorities about the Project and considered all responses in its assessment.
(j) to provide increased opportunity for community participation in environmental planning and assessment.	• The Department publicly exhibited the proposal and made the development application and accompanying documents publicly available on its website (see **Section 5**). • The Department participated in a community meeting. • All public submissions have been considered by Hanson and the Department during the assessment process.

Environmental Planning Instruments

4.6.2 The consent authority must take into consideration the provisions of EPIs (including draft instruments), when determining development applications. A number of EPIs apply to the Project, including:

- State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007 (Mining SEPP);
- SEPP (Infrastructure) 2007 (Infrastructure SEPP);
- SEPP (State and Regional Development) 2011;
- SEPP No. 33 – Hazardous and Offensive Development;
- SEPP (Koala Habitat Protection) 2019;
- SEPP No. 55 – Remediation of Land; and
- Port Stephens Local Environment Plan 2013 (Port Stephens LEP).

4.6.3 The Department has considered the Project against the relevant provisions of these instruments (see **Appendix G**). Based on this assessment, the Department considers that the Project can be carried out in a manner that is consistent with the aims, objectives and provisions of these instruments.

4.6.4 *SEPP (Koala Habitat Protection) 2019* came into effect on 1 March 2020, replacing the former *SEPP 44 (Koala Habitat Protection)*. However, the new SEPP does not apply to the Project, in accordance with transitional arrangements. Transitional arrangements also stipulate that a Koala Plan of Management (KPoM) approved under the former SEPP continues to apply. Hanson's Biodiversity Assessment Report has been prepared having regard to Council's KPoM, and the Department has considered the relevant provisions of the former SEPP and KPoM in its assessment of the Project.

5 Engagement

5.1 Department's Engagement

5.1.1 After accepting the EIS for the Project, the Department:

- publicly exhibited the EIS from 10 March 2017 until 9 April 2017, on the Department's website and at:
- NSW Service Centres;
- Council's office; and
- the Nature Conservation Council's office;
- advertised the exhibition in the *Newcastle Herald* and *Port Stephens Examiner* newspapers;
- notified landholders in proximity to the quarry site and haulage route and local special interest groups (including Brandy Hill and Seaham Action Group and Martins Creek Quarry Action Group); and
- notified relevant government agencies, including Council;

5.1.2 Additionally, the Department participated in a community consultation meeting on 22 March 2017, at the Raymond Terrace Bowling Club. At this meeting, the Department provided an overview of the assessment process and received feedback on community's views about the Project.

5.1.3 In response to the exhibition of the Project, the Department received 193 submissions, comprising:

- 11 from public authorities, including Port Stephens and Maitland City Council;
- 174 public and special interest group submissions objecting to or commenting on the Project; and
- 8 public and special interest group submissions in support of the Project.

A summary of the issues raised in submissions is provided below. Full copies of submissions are provided in **Appendix C**

5.2 Response to Submissions

5.2.1 In October 2018, Hanson submitted a Response to Submissions (RTS) (see **Appendix D**) to address the various issues raised in submissions. In response to this document, the Department received 42 additional representations from members of the public (see **Appendix C**). Most of these representations opposed the dispatch of trucks through the night period and associated road and pedestrian safety impacts associated with the increase in truck movements.

5.2.2 The Department and NSW government agencies requested additional information in relation to the Project's air quality, social, biodiversity, noise and traffic impacts. The Department also requested Hanson further consult with Council regarding the terms of the proposed Voluntary Planning Agreement (VPA). Hanson also consulted with the community through its Community Consultative Committee.

5.2.3 On 27 September 2019, Hanson provided an Amended RTS including refinements to the project and updated assessments to address residual Department, agency and community concerns. A copy of the Amended RTS is provided in **Appendix E**.

5.3 Agency Submissions

5.3.1 No government agencies objected to the Project. However, most raised issues or expressed concerns with specific aspects of the Project and/or provided recommendations relating to their administrative and regulatory responsibilities. Following the provision of additional information in the Amended RTS, most government agencies advised the Department that their concerns had been addressed and/or recommended conditions of consent. The following summary provides an overview of the key comments made by government agencies.

5.3.2 The **Environment Protection Authority** (EPA) identified several issues with the Air Quality Impact Assessment (AQIA) provided in the EIS, particularly in relation to modelling assumptions. The EPA also recommended the enclosure of the processing plant prior to Stage 1, to further reduce particulate emissions. Hanson provided a revised AQIA in the Amended RTS and EPA subsequently provided recommended conditions of approval. The Department has considered the air quality impacts of the Project in **Section 6.3**.

5.3.3 EPA identified inconsistencies in the proposed number of truck movements between the Traffic and Noise Impact Assessments in the EIS. EPA also sought clarification on a number of aspects of the noise and blast assessments including L_{max} levels, façade reduction, sleep disturbance, bund mitigation, blasting hours and background noise levels. Hanson provided a revised Noise and Blast Impact assessment in the Amended RTS. EPA subsequently advised that its issues had been largely addressed and considered that it would be able to satisfactorily regulate noise from the quarry via stringent conditions. The Department has considered the noise and blast impacts of the Project in **Section 6.2** and **6.4**.

5.3.4 Lastly, EPA sought clarification on processes associated with concrete waste recycling, contaminated waste and hazardous materials. EPA also requested further information regarding sediment basin design and overflow frequency. The Department has considered the Project's surface water and waste impacts in **Section 6.6 and 6.9**, respectively.

5.3.5 In its initial submission, the Department's **Biodiversity Conservation Division** (BCD, formerly the Office of Environment and Heritage) advised that the Biodiversity Assessment Report (BAR) included in the EIS generally met the requirements of the *BioBanking Assessment Methodology* (BBAM, OEH 2014). However, BCD requested further consideration of habitat connectivity and movements pathways for the Koala, targeted survey and assessment of the *Pterostylis chaetophora* (Tall Rustyhood Orchid) and a number of minor corrections to assumptions used to inform credit calculations.

5.3.6 Hanson submitted additional correspondence relating to the Project's biodiversity impacts, including an assessment of Commonwealth MNES, an amended BAR updated to account for disturbance relating to the proposed amenity bund, and a proposal for a staged biodiversity offset strategy. Subsequently, BCD and the Department requested Hanson provide an updated BAR to address all matters relating to biodiversity, which was included in the Amended RTS.

5.3.7 BCD raised no further issues in relation to the assessment of biodiversity impacts and recommended a number of conditions of consent, including pre-clearance surveys be undertaken for the Rusty Greenhood (in areas proposed for the amenity bund) and two Myrtaceae trees (*Rhodamnia rubescens* and *Rhodomyrtus psidioides*) recently listed under the BC Act. The Department has considered the biodiversity impacts of the Project in **Section 6.7**.

5.3.8 BCD raised no concerns with respect to the Project's impact on Aboriginal cultural heritage and advised that it supported the management measures proposed in the Aboriginal Cultural Heritage Assessment. Lastly, BCD considered that the Project would have no significant impact on flooding.

5.3.9 **Port Stephens Council** (Council) initially raised a number of issues over the Project's potential traffic and social impacts, particularly concerning safety, local road contributions and the provision of local infrastructure.

5.3.10 Council disagreed with Hanson's assertion that the existing development consent permits 24-hour operations and advised that it considered the quarry's existing operating hours to be 6:00 am to 6:00 pm, Monday to Saturday. The Department notes Council's position as the current consent authority for the quarry. Nonetheless, the Department has assessed the Project's proposed hours of operation on its merits having regard to the potential environmental and social impacts. These matters are considered in **Sections 6.1** and **6.2**.

5.3.11 Council requested that the Project's primary haulage route be amended to use the Richardson Road onramp instead of the Heatherbrae Road roundabout to access the Pacific Highway. Council considered that this alternative route would reduce impact on local traffic, and Hanson has agreed to this request.

5.3.12 Council requested additional information on various biodiversity matters including the loss of hollow bearing trees, Koala foraging and movement corridors and impacts on aquatic and groundwater dependent ecosystems.

5.3.13 Following a review of the initial RTS, Council recommended conditions relating to pre-clearance protocol and rehabilitation requirements. The Department has considered the biodiversity and rehabilitation impacts of the proposal in **Sections 6.7** and **6.8**, respectively.

5.3.14 In March 2020, Council and Hanson advised the Department that general terms for a VPA had been agreed. The terms of this agreement address some of the Project's key safety and social impacts, particularly for residents on Brandy Hill Drive. The Department has considered these matters further in **Section 6.1**.

5.3.15 **Maitland City Council** (MCC) raised concern about the Project's potential traffic and road noise impacts in the Maitland LGA, including cumulative traffic impacts with the Martins Creek Quarry Expansion Project. MCC requested that the Project's haulage route and number of vehicle trips be identified, and that Hanson implement a number of monitoring and mitigation measures to minimise impacts on the Maitland LGA.

5.3.16 Subsequently, Hanson met with MCC to discuss potential traffic management strategies. At this time, MCC advised of its preference for quarry trucks to travel along Flat Road and Melbourne Street, rather than Belmore Road through Lorn. Hanson agreed to this alternate route (except if delivering to the local area) and provided additional traffic analysis of intersections along this route.

5.3.17 MCC recommended conditions including the preparation of a Traffic Management Plan and Drivers Code of Conduct, road maintenance contributions and a protocol to investigate road noise complaints. The Department has considered the traffic and road noise impacts of the Project in **Sections 6.1** and **6.2**, respectively.

5.3.18 **NSW Health** raised several concerns over the Project's potential health impacts. NSW Health expressed a preference for the proposal to have no net increase in $PM_{2.5}$ impacts on the surrounding locality and that Hanson should further consider the Project's effects on tank water and nearby properties. Additionally, NSW Health noted that the EIS contained minimal information on wastewater and effluent disposal associated with the Project, and recommended that Hanson review its noise and blasting operations in consultation with the community.

5.3.19 In response to the Amended RTS, NSW Health did not request any additional information but highlighted cumulative exceedances of the 24-hour PM_{10} and annual average $PM_{2.5}$ criteria for a number of properties. NSW Health identified that the National Environment Protection Council has an aim of reducing the annual average and 24-hour $PM_{2.5}$ standards to 7µg/m^3 and 20 µg/m^3 during the life of the Project, and recommended that all reasonable and feasible mitigation measures are undertaken to minimise human exposure to particulate matter. The Department has further considered the air quality impacts of the Project in **Section 6.3**.

5.3.20 **Transport for NSW** (TfNSW, formerly Roads and Maritime Services) requested that the Traffic Impact Statement in the EIS be updated to include analysis of additional intersections along the haulage route, current traffic counts during the peak AM and PM periods and further clarification of the proposed trip distribution. TfNSW advised Council (as the relevant road authority) to consider sight distances in accordance with relevant Austroads Standards.

5.3.21 Hanson provided an updated Traffic Impact Statement in the Amended RTS. TfNSW requested no additional information but recommended that no more than 30 laden trucks are dispatched during the morning and afternoon peak periods. The Department agrees with this recommendation and notes that this limit reflects the dispatch capacity of the site's weighbridge. The Department has considered the traffic impacts of the Project in **Section 6.1.**

5.3.22 The **Department's Water Group** (DPIE Water, formerly the Department of Industry) requested clarification on catchment loss and stream flow impacts in the Williams and Newcastle Water Sources. DPIE Water also advised that Hanson would need to consult with it further regarding existing licensing requirements, and future licensing requirements, should the Project be approved.

5.3.23 DPIE Water also recommended that the existing groundwater monitoring network be expanded and a trigger action response plan be prepared for groundwater users and groundwater dependent ecosystems and that a 30m buffer be maintained from the top of the high bank of Deadmans Creek. The Department has recommended conditions to reflect these recommendations. The Department has considered the surface and groundwater impacts of the proposal in **Section 6.6**.

5.3.24 **NSW Rural Fire Service** (RFS) recommended that the proposal comply with the relevant provisions of *Planning for Bush Fire Protection 2006* and that any proposed vegetation remediation does not create an increased bush fire management and maintenance risk for adjoining landowners. Additionally, RFS recommended that no potentially igniting activities are

undertaken on Total Fire Ban days unless approval has been sought from the NSW RFS District Office. Hanson noted these requirements and agreed to consult with RFS about these matters as required throughout the life of the Project. The Department has recommended conditions to reflect these recommendations.

5.3.25 The **Department of Regional NSW - Mining, Engineering and Geoscience** (MEG) raised no concerns with the proposal and considered that the size and quality of the resource had been adequately assessed. DRG requested that annual production data be provided for the Project.

5.3.26 **Heritage Council NSW** raised no concerns with the proposal but recommended that the procedure for unanticipated historical archaeological sites be included as a condition of consent. Hanson agreed to formalise a procedure for the discovery of unanticipated historical archaeological sites in an Aboriginal Heritage Management Plan.

5.3.27 **Hunter Water Corporation** (HWC) noted that the quarry site is located outside of its drinking water catchment, water supply and sewerage systems. Consequently, HWC had no further comment on the proposal.

5.4 Key Issues - Community and Special Interest Groups

5.4.1 During the exhibition period, the Department received 182 submissions from members of the public and special interest groups, of which, 169 objected to the Project. Nearly all submissions were received from residents surrounding the quarry including Brandy Hill and Seaham or from the region including Bolwarra Heights, Nelson Plains, Paterson, Raymond Terrace and Woodville. Key issues raised in submissions are depicted in **Figure 7** and further summarised below. Full copies of these submissions are provided in **Appendix C**.

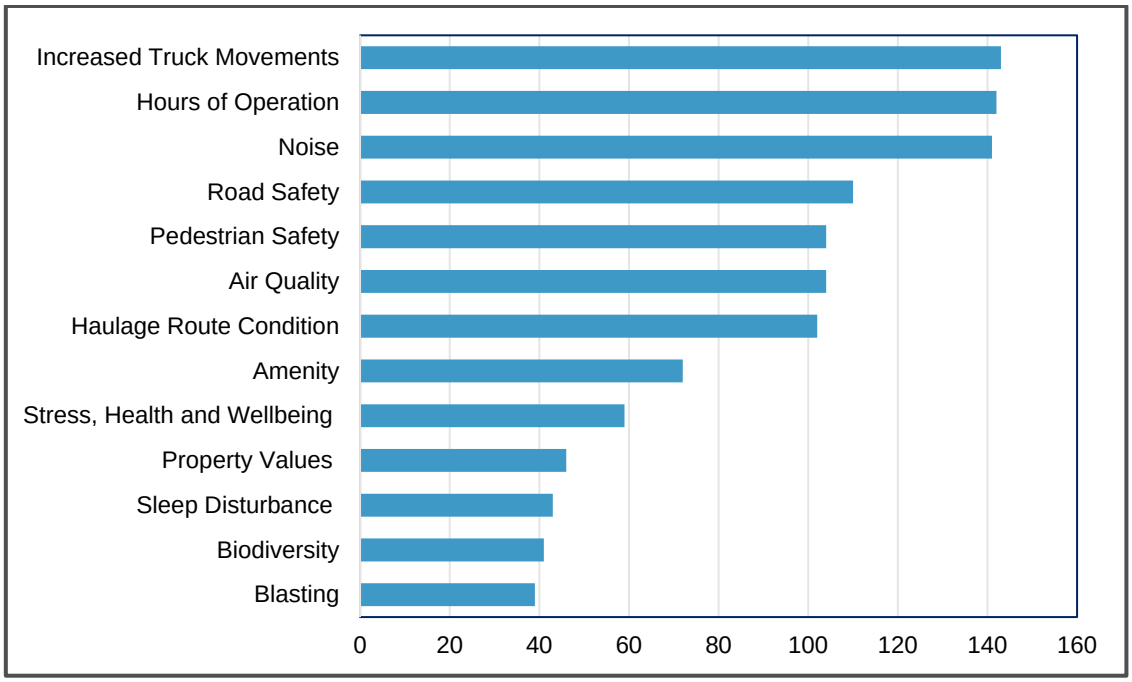

Figure 7 | Issues raised in submissions objecting to the Project

5.4.2 In general, these submissions raised concerns about amenity and safety impacts associated with increased truck movements and 24-hour operations, air quality, blasting and health

impacts from expanded operations, and impacts on biodiversity and property values. Many submitters advised that they did not object to the existing operation of the quarry but were opposed to the increase in the scale of operations proposed for the Project.

Truck Movements, Road and Pedestrian Safety

5.4.3 Nearly all objecting submissions raised concerns about the proposed number of truck movements to and from the site, and the associated road and pedestrian safety risks. Many submitters considered Brandy Hill Drive to be unsuitable for additional truck movements due to its road pavement condition, narrow shoulders and limited sight distance from driveways.

5.4.4 Additionally, Brandy Hill Drive is part of a local school bus route and school children board buses from the roadside. Many submitters expressed concern that the additional truck movements would increase safety risks for motorists, pedestrians and cyclists along the haulage route, particularly during peak periods. The Department has considered the traffic and road safety impacts of the proposal in **Section 6.1** of this report.

Road Noise, Amenity and Hours of Operation

5.4.5 Submitters strongly objected to the Project's proposed 24-hour product dispatch and processing operating hours. Many submitters considered that increased road noise from additional truck movements would disturb sleep and significantly impact the amenity of the area. Some submitters also raised concern with cumulative noise from Martins Creek Quarry trucks and the nearby RAAF base. Many submitters expressed their appreciation of the area's peaceful and rural nature and considered that the Project would detract from these highly valued attributes and potentially impact property values. The Department has considered the noise and other amenity impacts of the proposal in **Section 6** of this report.

Air Quality, Blasting and Health

5.4.6 Many submitters objected to the Project's potential impacts on air quality as a result of increased dust emissions and diesel fumes. Local residents raised concern that increased exposure to these emissions would have adverse health impacts for the community. Residents of Giles Road advised that their properties relied on tank water and raised concern over the Project's potential impacts on drinking water quality.

5.4.7 Some residents advised that were already impacted by existing blasting from the site and that any increase would exacerbate amenity impacts and could result in structural damage to their homes. The Department has considered the air quality and blast impacts of the proposal in **Sections 6.3** and **6.4**, respectively.

Biodiversity

5.4.8 Submitters identified the Project area as home to a diverse range of flora and fauna species and raised concern over the proposed removal of important habitat, particularly for the Koala and native birds. The Department has considered the biodiversity impacts of the proposal in **Section 6.7** of this report.

6 Assessment

6.1.1 The Department has considered the following in its assessment of the Project:

- the development application and accompanying EIS;
- submissions from the public and special interest groups;
- the Amended RTS;
- advice from government agencies;
- applicable EPIs, policies and guidelines; and
- relevant provisions of the EP&A Act, including its objects.

6.1.2 The Department considers the key impacts of the Project relate to traffic and transport, social impacts, noise, air quality, blasting, water, biodiversity and rehabilitation. The Department's consideration of these impacts is provided below, with consideration of other impacts in **Table 14**.

6.1 Traffic and Transport

6.1.1 Most submissions raised concern about the Project's proposed increase in truck movements and transport hours including potential impacts on road safety, amenity and traffic. The Project would result in additional traffic generation along the primary (Transport Route South – Blue) and secondary (Transport Route West – Orange) haulage routes (see **Figure 8**).

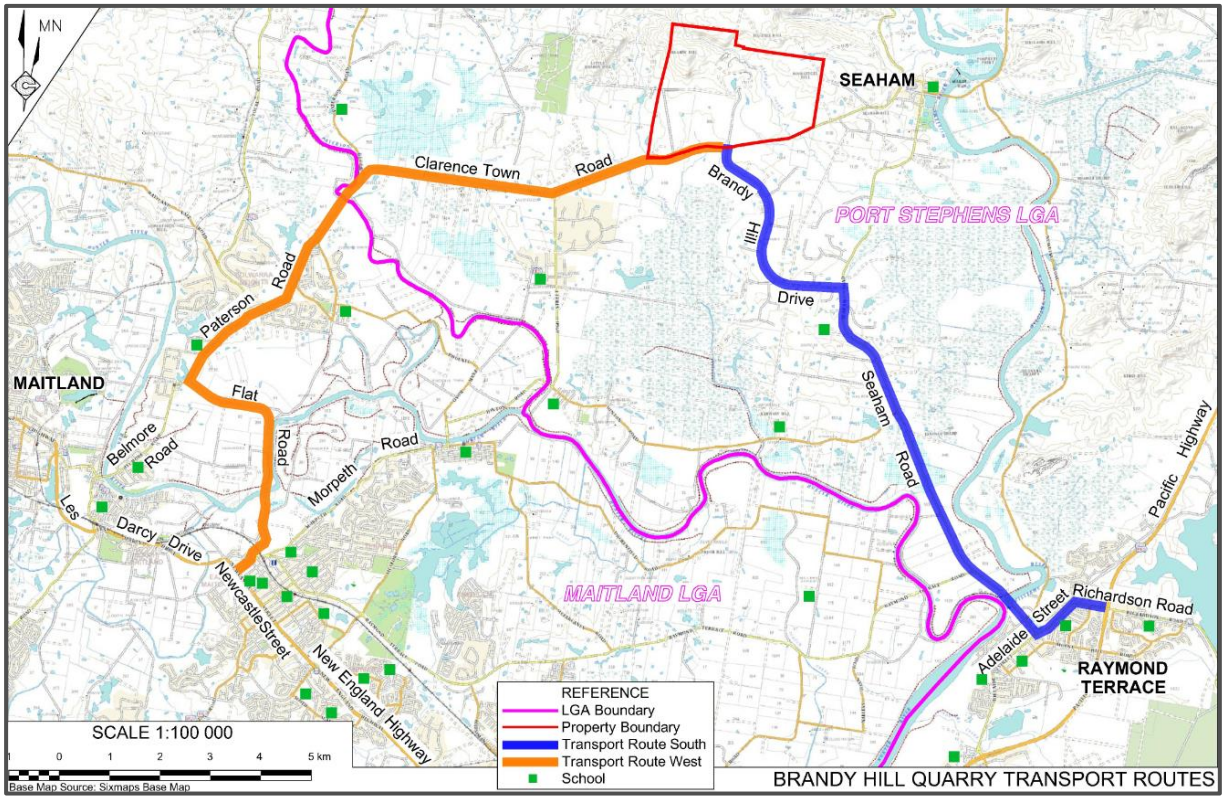

Figure 8 | Project Haulage Routes

6.1.2 Hanson advise that dispatch from the quarry fluctuates and that a peak of 170 laden trucks was recorded in 2013. Hanson is now seeking to dispatch a maximum of 359 laden trucks over a 24-hour period (ie which is more than double of current trucking rates), including:

- 301 laden trucks (602 movements) between 7 am and 10 pm;
- 58 laden trucks (116 movements) between 10 pm and 7 am;

6.1.3 Hanson advise that under normal operations, 75 percent of truck movements would occur along the primary haulage route from the quarry to the Pacific Highway, indicated in **Figure 8** as Transport Route South.

Road Safety

6.1.4 Many local residents raised concern that the proposed increase in daily truck movements would increase safety risks for road users and pedestrians. Brandy Hill Drive is part of a local school bus route and contains areas of narrow shoulders, where a bus is not always able to pull completely off the road.

6.1.5 The Social Impact Assessment (SIA) prepared for the Project indicated that without mitigation, the intensity of truck movements would have a moderate to high level of impact on the local community. The suburb of Brandy Hill is predominantly accessed from Brandy Hill Drive, and the road itself provides direct access to over 50 residential lots (see **Figure 6**). Whilst there are some areas on the road where a school bus can safely pull over, the SIA identified that changing demographics in the area result in the changing need and locations for bus stops along the road. Additionally, the road is over 4 km long and therefore, the safest areas to pull over are not always proximal to school students.

6.1.6 In response to these concerns, Hanson has agreed to implement a VPA with Council including:

- $120,000 towards the construction of bus bays along Brandy Hill Drive, to be provided as an upfront payment of haulage levies required under Council's contributions plan; and
- $1.5 million towards the construction of a shared pathway along Brandy Hill Drive.

6.1.7 Council would design, construct and deliver the bus stops and shared pathway in accordance with its Strategic Asset Management Plan and provide any additional funds to ensure these works are completed.

6.1.8 The Department considers that these measures would significantly mitigate the Project's social impacts and improve safety along Brandy Hill Drive, so long as they are implemented within a reasonable time from the Project's commencement. The Department has recommended that existing product transport volumes (ie 700,000 tpa) are retained until the proposed bus bays are constructed. Hanson has also agreed to provide all contributions towards the shared pathway within two years of the commencement of the Project.

6.1.9 In addition, Hanson propose to implement other road safety mitigation measures including:

- trialing a self-imposed speed limit of 60 km per hour for quarry heavy vehicles travelling on Brandy Hill Drive; and
- implementing a Driver's Code of Conduct, with specific instruction relating to interactions with school buses.

6.1.10 The Department has recommended that these measures form part of a Traffic Management Plan, to be implemented prior to the commencement of the Project. Councils supports these road safety initiatives and subject to the implementation of the VPA and recommended

conditions of consent, the Department considers the road safety impacts of the Project are acceptable.

Road Noise

6.1.11 Hanson initially proposed product transport to occur 24 hours per day, seven days per week. This aspect of the Project was strongly opposed by the community due to potential impacts on local amenity and sleep disturbance. Hanson subsequently revised the proposed product transport hours to:

- 5:00 am to 10:00 pm Monday to Sunday; and
- 10:00 pm to 5:00 am on up to 20 nights per year.

6.1.12 Hanson argues that these hours would provide sufficient flexibility to meet market demand, including road construction projects that require night-time deliveries.

6.1.13 Hanson provided a Noise Impact Assessment (NIA) including road noise impacts prepared in accordance with the *NSW Road Noise Policy* (RNP). **Table 3** provides a comparison of the predicted road noise impacts against the applicable RNP criteria.

Table 3 | Project Road Noise Predictions

Period	Existing Noise Levels (dB(A))	Proposed Truck Dispatch	Predicted Noise Levels (dB(A))	Relative Increase (dB(A))	Applicable Criteria
Day – 7am to 10pm $L_{Aeq(15hour)}$	62.2	301	63.3	1.1	2 dB(A) relative increase
Night – 10 pm to 7 am $L_{Aeq(9hour)}$	52.1	58	54.1	2	55 dB(A)
5am to 6am $L_{Aeq(1hour)}$	59.7	9	61.7	2	2 dB(A) relative increase
6am to 7am $L_{Aeq(1hour)}$	62.2	12	64.2	2	2 dB(A) relative increase

6.1.14 Over the respective periods, it is predicted that the applicable RNP criteria could be achieved, so long as truck haulage is limited to 301 laden dispatch (ie 602 movements) during the day and 58 laden dispatch (ie 116 movements) during the night. These criteria are based over long averaging periods to reflect sub-arterial roads that experience high volumes of traffic over an extended period of time.

6.1.15 Whilst the haulage route is consistent with the RNP's classification of a sub-arterial road, traffic volumes along the haulage route are not consistent across these averaging periods, particularly during the evening and night periods where vehicles movements can reduce to less than 5 movements per hour. On this basis, the Department considers that careful consideration must be given to trucking impacts during these sensitive periods as the

incremental impacts on the amenity of the local community may be higher than would otherwise be the case of a typical sub-arterial road.

6.1.16 The Department accepts the benefit associated with early morning haulage (ie from 5:00 am) to allow timely delivery of material to the construction market. However, with the exception of deliveries to specific night road construction projects, the Department does not consider there is the same broad strategic need for product transport during the evening and night period. The recommended standard hours for construction under *the NSW Interim Construction Noise Guideline* are 7:00 am to 6:00 pm, Monday to Friday, and 8:00 am to 1:00 pm on Saturday. The Department notes that these hours would commonly apply to metropolitan worksites, particularly those in densly populated areas.

6.1.17 The Department notes that the proposed dispatch rate (ie 30 laden trucks per hour or around 330 laden trucks a day) would provide Hanson with sufficient flexibility to achieve its annual production rate of 1.5 Mtpa, even if the Project was restricted to day-time operations only. The Department also notes that the quarry is located in a rural residential setting and that frequent haulage during the evening and night periods would significant impact local amenity. On this basis, the Department considers that the project should predominantly remain a daytime operation.

6.1.18 The Department acknowledges the need for some flexibility to supply night road construction projects. However, the Department considers that the needs of these projects could be met from scheduled dispatches during the evening period (ie up to 10:00pm), as opposed to late at night when most residents would be sleeping. Therefore, the Department has recommended up to five laden dispatches per hour between 6:00 pm and 10:00 pm, on up to 20 weeknights per calendar year.

6.1.19 The Department also acknowledges the need for some early morning trucking in order to facilitate supply of materials to metropolitan construction sites. Hanson has proposed to dispatch up to 9 laden trucks between 5:00 am and 6:00 am and 12 laden trucks between 6:00 am and 7:00 am. This period is still considered ‘night-time’ under the RNP, however, traffic data indicates that a ‘shoulder period’ exists due to increased background traffic volumes during these times.

6.1.20 Based on these dispatch rates, the NIA predicted that noise levels during each of these hours would comply with the applicable RNP criteria (ie a relative increase of no more than 2 dB(A)). The Department notes that noise level increases of 2 dB or less are considered barely perceptible to the average person and therefore considers these impacts to be acceptable.

6.1.21 The Department considers that the recommended dispatch rates would provide Hanson with sufficient flexibility to meet the needs of the construction market whilst preserving the rural/residental amenity of the locality. However, to ensure road noise impacts do not intrude into night period (ie before 5:00 am), the Department has recommended a condition restricting trucks from entering the site prior to 5:00 am and for Hanson to implement management measures to prevent trucks travelling on the haulage route before this time.

Traffic

6.1.22 To assess the Project's potential traffic impacts, Hanson provided a Traffic Impact Analysis (TIA) which was subsequently updated in response to agency submissions. An updated TIA was included in the Amended RTS.

Intersection Impacts

6.1.23 The primary haulage route contains seven key intersections before reaching the Pacific Highway. The secondary haulage contains four key intersections before reaching the New England Highway. **Tables 4** and **5** provide a summary of the predicted performance of seven of these intersections. Intersection modelling was not undertaken for the remaining intersections as the Project would be unlikely to noticeably affect the performance of these intersections. Intersection modelling predicted the average delay and associated Level of Service (LoS) ranking for each intersection. LoS rankings range from A to F, with A indicating minimal delay.

Table 4 | Predicted intersection performance along the primary haulage route

	Existing LoS		With Project 2017		With Project 2024		With Project 2044	
Intersection	**LoS**	**Avg delay**	**LoS**	**Avg delay**	**LoS**	**Avg delay**	**LoS**	**Avg delay**
Clarence Town Road / Brandy Hill Drive[1]	A	5.1	A/B	8.2	A/B	8	A/B	8.6
Brandy Hill Drive / Seaham Road[1]	A	3.8	A	5.0	A	5.1	A	5.5
Seaham Road / Raymond Terrace Road[3]	A/B	8.6	A/B	9.3	F	29.7	F	446
William Bailey Street / Port Stephens Street[2]	A	9.2	A	9.5	A	12.1	F	211
William Bailey Street / Adelaide Street[2]	B	26.8	B	27.7	C	32.9	F	70.6

1 Modelling was based on 60 laden dispatches per hour, based on the EIS's proposal to operate two weighbridges. This aspect of the proposal was subsequently amended to one weighbridge (ie 30 laden dispatches).
2 Intersection to be upgraded under the Kings Hill Urban Release Area S94 Contributions
3 Intersection upgraded since assessment

6.1.24 Modelling indicates that intersection of Seaham Road / Raymond Terrace Road would experience significant deterioration in performance between 2017 and 2024. However, this intersection has since been upgraded from a controlled T-intersection to a roundabout as part of the State government's *Safer Roads Program*. On this basis, TfNSW advised that the impact from the Project on this intersection would be minimal.

6.1.25 The intersections of William Bailey Street / Port Stephens Street and Adelaide Street / William Bailey Street are predicted to operate at an acceptable performance standard until 2024. Performance is then expected to deteriorate to a poor Level of Service (LoS) by 2044. The

TIA advises that this deterioration is attributed to traffic generated from the Kings Hill Urban Release Area (URA) which is expected to provide an additional 3,500 dwellings over the next 25 years. The Project's estimated contribution to the traffic volumes at this time is less than 3.5 percent. Council advised intersections affected by the Kings Hill URA would be considered for upgrade as required, utilising the Council's local development contributions plan.

6.1.26 Modelling undertaken for the intersections of Clarence Town Road / Brandy Hill Drive and Brandy Hill Drive/Seaham Road assumed a maximum dispatch rate of 60 laden trucks per hour (ie 120 truck movements). This assumption was based on Hanson's initial project scope to construct a second weighbridge and loading area on site, which was subsequently removed. The Department notes that even under this very conservative assumption of impacts at the intersections of Clarence Town Road / Brandy Hill Drive and Brandy Hill Drive/Seaham Road, a high LoS is predicted.

Table 5 | Predicted intersection performance along the secondary haulage route

	Existing			Proposed		
Intersection	**LoS**	**Avg delay**	**DoS**	**LoS**	**Avg delay (sec)**	**DoS**
Pintacree Road / Melbourne Street	E	63.2	0.97	E	63.5	0.97
Melbourne Street / New England Highway	E	65.5	0.97	E	68.9	0.99

6.1.27 The intersections of Pintacree Road / Melbourne Street and Melbourne Street / New England Highway experience substantial delays during peak periods. Hanson advised that, under normal operations, approximately 25 percent of truck movements would use the secondary haulage route. However, impacts on these intersections were modelled assuming a worst-case dispatch rate of 30 laden trucks per hour (ie 60 movements). Modelling indicates that average delays to these intersections would increase by less than four seconds, and that there would be no change to the existing LoS.

6.1.28 The Department notes that these intersections are already operating close to capacity. However, the Project's contribution to traffic volumes would be less than 2.5 percent. Additionally, both intersections operate with traffic light control, reducing the risk to other road users. The Department notes that the use of these intersections is Council's preferred route as it would avoid haulage through Lorn and busy areas of Maitland.

6.1.29 The Department also notes that Hanson would be unable to consistently dispatch at the proposed maximum rate without exceeding the proposed annual production limit. For example, if the quarry consistently dispatched 30 laden trucks per hour only during the day period, the annual production limit would be reached in less than 6 months. It is therefore reasonable to conclude that the maximum dispatch rate would be utilised intermittently during peaks of product demand

Cumulative Traffic Impacts

6.1.30 Many submitters raised concern over potential cumulative traffic impacts from the Martins Creek Quarry, located approximately 15 km north-west of the Project. In September 2016, Daracon Quarries lodged a SSD application to expand and increase production at the Martins Creek Quarry (MCQ Expansion Project), including up to 215 laden trucks per day via haulage routes through Maitland to the New England Highway and Brandy Hill Drive to the Pacific Highway. Hanson advised that modelling in the TIA included these potential additional laden loads from the MCQ Expansion Project.

6.1.31 In February 2019, Daracon Quarries advised the Department that it intended to submit an amended development application for the MCQ Expansion Project. Daracon Quarries advised that it no longer sought to distribute product via Brandy Hill Drive and that it would seek a reduced laden dispatch rate to reflect lower production volume. An amended development application has not yet been submitted.

6.1.32 Hanson did not revise its TIA to reflect reduced dispatch from the Martins Creek Quarry, and on this basis, the TIA provides a conservative representation of traffic impacts.

Sight Distances

6.1.33 Based on intersection configuration, the TIA identified two intersections on the haulage routes requiring analysis of safe sight distances, including Clarence Town Road / Brandy Hill Drive and Brandy Hill Drive / Seaham Road.

6.1.34 The TIA advised that available sight distance at the intersection of Brandy Hill Drive / Seaham Road exceeds Austroads sight distance requirements. However, sight distances at the Clarence Town Road / Brandy Hill Drive intersection only just meets the minimum requirement for a 100 km per hour speed zone (ie 215 m). Council and the community raised concern regarding potential safety implications associated with this intersection, particularly as accidents have occurred at and in close proximity to the intersection.

6.1.35 Since this time, the posted speed limit on Clarence Town Road has been reduced to 80 km per hour. As a result, the sight distance is now reduced to 185 m which is sufficient to facilitate vehicles entering the intersection safely.

Contributions

6.1.36 The Project would result in additional heavy vehicle haulage on local roads in two local government areas. Hanson has agreed to pay road maintenance contributions in accordance with the relevant Council contributions plan, which include the *Maitland City Wide Section 94 Contributions Plan 2016* and the *Port Stephens Local Infrastructure Contributions Plan 2020*. Both plans adopt a contribution based on material tonnage and haulage distance on local roads. Hanson has estimated that it would contribute more than $12 million in road maintenance contributions over the life of the Project.

6.1.37 The Department has recommended a condition for Hanson determine contributions to local road maintenance in accordance with these plans or as otherwise agreed by the relevant Council. It should be noted that that Port Stephens Council has agreed for Hanson to provide upfront contributions towards the construction of bus bays along Brandy Hill Drive, as outlined above.

Conclusion

6.1.38 The Department acknowledges the high level of community concern associated with the Project's potential impacts on traffic, safety and amenity. These impacts must be appropriately managed in order to avoid adverse impacts on the local community.

6.1.39 The Department does not support Hanson's proposed hours of product loading and dispatch due to potential adverse impacts on local amenity. The Department has recommended that these activities are restricted during the early morning period and are prohibited during the evening and night, except on 20 evening periods per year for deliveries to night road construction projects. The Department considers that the recommended dispatch rates would provide Hanson with sufficient flexibility to meet the needs of the construction market whilst preserving the rural amenity of the locality.

6.1.40 The proposed VPA would result in important community infrastructure that would improve safety along Brandy Hill Drive. The Department considers that the provision of this infrastructure would significantly mitigate the Project's traffic impacts on this local haulage route.

6.1.41 Overall, the Department considers the Project's potential traffic impacts to be acceptable, subject to the recommended conditions.

6.2 Operational Noise

6.2.1 The NIA included an assessment of operational noise impacts, prepared in accordance with the *Industrial Noise Policy* (INP). On 27 October 2017, the EPA released the *Noise Policy for Industry 2017* (NPfI), which replaces the INP as the relevant NSW Government policy for the management and control of industrial noise sources. However, under transitional arrangements, the INP continues to apply as the relevant NSW Government policy for the Project.

Existing Noise Environment

6.2.2 The noise environment surrounding the quarry is characterised by rural residential and some agricultural activities, as well as traffic noise from Clarence Town Road and Brandy Hill Drive. Winds predominantly come from the northwest during autumn and winter and from the southeast during summer. During spring, wind direction is more evenly distributed.

6.2.3 The NIA identified 19 representative sensitive receiver locations that would potentially be affected by the operational noise of the Project (see **Figure 9**) with background noise levels ranging between 27 and 35 dB(A). Background noise levels during the day period are higher (ie between 30 and 35 dB(A)) due to existing background traffic noise. During the night, background noise levels reduce to 30 dB(A) or below. The site's existing EPL sets noise limits for all receivers, which are:

- 36 dB (A) $L_{Aeq\ (15\ minute)}$ during the day, evening and night periods; and
- 45 dB (A) $L_{A1(1\ minute)}$ during the night period.

6.2.4 Hanson advised that the site has received 45 complaints relating to noise and vibration between 2013 and 2018, with 21 of these occurring in 2018. The Department has also received frequent complaints relating to noise from the site throughout the various assessment

stages of the Project, noting that the Department is not the regulator of the current operations on the site.

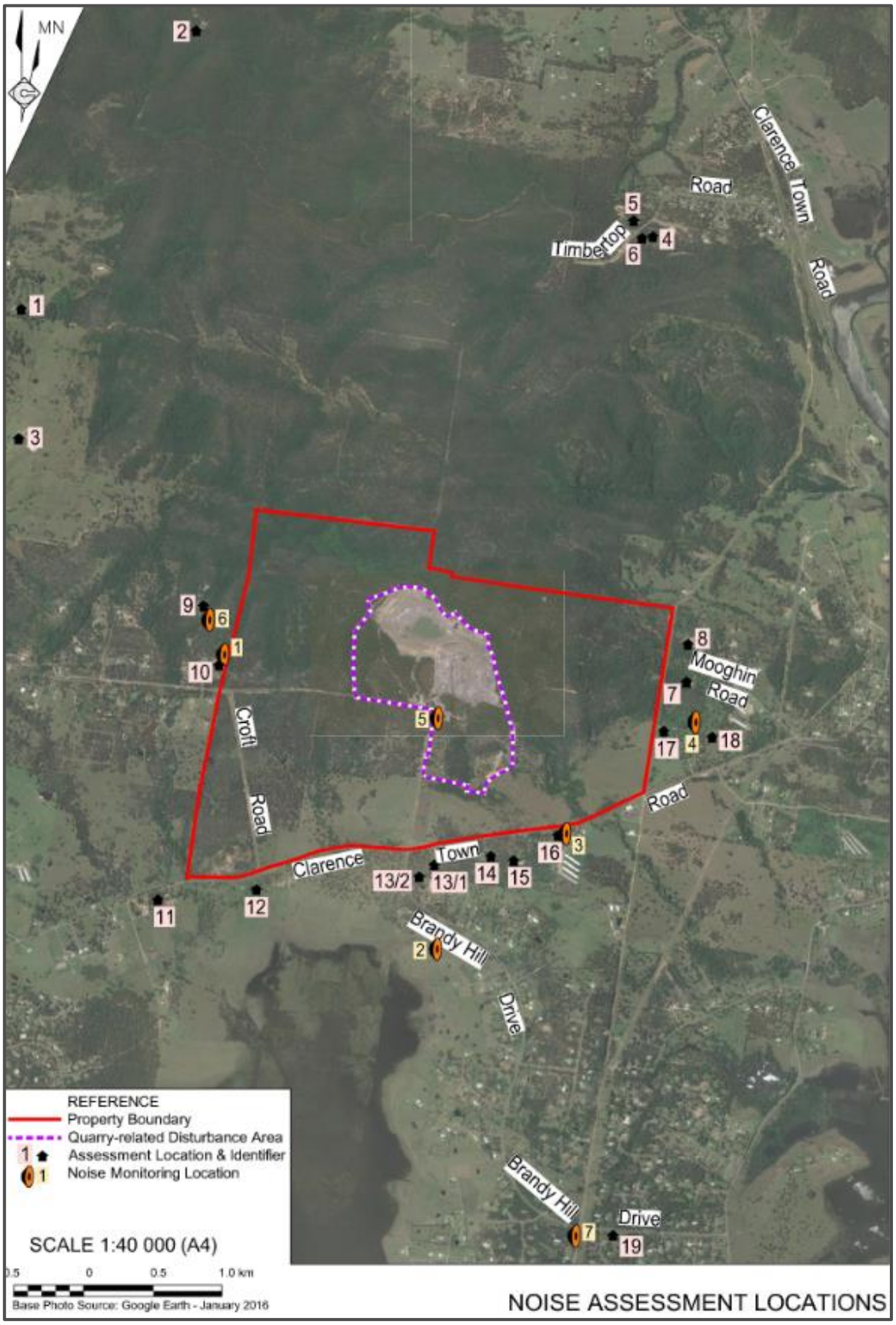

Figure 9 | Location of Representative Sensitive Receivers

Project Specific Noise Levels

6.2.5 Under the INP, Project Specific Noise Levels (PSNLs) are calculated based on the more stringent of a project's intrusiveness criteria (ie background noise environment + 5 dB) or the general amenity criteria (ie noise criteria specific to land use and associated activities). In this case, the Project's PSNL's are based on the intrusiveness criteria, and are summarised in **Table 6** below and the representative receiver locations are shown on **Figure 9**.

Table 6 | Project Specific Noise Levels for Representative Receiver Locations

Receivers	Period	Background (RBL) LA90, 15 minute dB(A)	PSNL LAeq, 15 minute dB(A)	Sleep Disturbance Criteria LA1, 1 minute dB(A)
R1, R2, R3, R9 & R10 (N01 / N06)	Day	30	35	45
	Evening	28*	35	
	Night	27*	35	
R11, R12, R13/1, R13/2, R14, R15, R16 (N03)	Day	32	37	
	Evening	29*	35	
	Night	27*	35	
R4, R5, R6, R7, R8, R17 & R18 (N04)	Day	35	40	
	Evening	32	37	
	Night	30	35	

** Under the INP, where the rating background level is found to be less than 30 dB(A), a minimum RBL of 30 dB(A) is set.*

Predicted Impacts

6.2.6 The NIA modelled the five extraction stages of the Project (see **Figures 3** to **5**), as well as two construction scenarios occurring in:

- Stage 1 – establishing an amenity barrier along the boundary of the proposed extension area; and
- Stage 3 – relocating the fixed crushing plant and additional Stage 4 infrastructure in the area behind the amenity barrier.

6.2.7 Modelling scenarios were based on the worst-case situation which included all major extraction and processing items operating simultaneously at maximum power, and a 3-m/s wind direction from source to all surrounding receivers. The NIA advised that the difference in noise emissions between each stage primarily reflects the varying heights of equipment operating in the quarry pit and the changing location of the fixed processing plant from Stage 4. Modelling scenarios also account for the enclosure all crushers and screens (except Screens 1 and 5 during Stages 1 to 3) and five earthen bunds adjacent to processing equipment and along the southern boundary of the site. It should be noted that Hanson subsequently agreed to enclose all processing equipment, including partial enclosure of mobile crushers.

6.2.8 The NIA predicts that there would be a 1 dB exceedance (38 dB (A)) of the daytime PSNL at Receiver 14 immediately south of thes site, during the Stage 1 construction scenario. No other exceedances of daytime PSNLs are predicted at any receiver over the life of the Project.

6.2.9 Across various stages of the project, five receivers are predicted to experience exceedances of the evening and night PSNLs by 1-2 dB (see **Table 7**). Similarly, four sensitive receivers are predicted to experience a 1-2 dB exceedance of sleep disturbance criteria (ie 45 $L_{A1,\ 1\ minute}$).

6.2.10 It is important to note that these predictions reflect Hanson's proposed hours of operation, including the operation of the primary crusher and load and dispatch activities from 5:00 am and 10:00 pm, and secondary and tertiary crushing 24 hours per day.

6.2.11 The Department notes that the predicted exceedances would not be discernible by most receivers, and would not warrant receiver-based treatment or controls under the Department's *Voluntary Land Acquisition and Mitigation Policy* (VLAMP).

6.2.12 However, while the predicted exceedances are relatively minor, the Department considers that the introduction of an industrial noise source in a sensitive rural residential noise environment during the evening and night period has the potential to significantly impact the amenity of the area. This was a key concern raised in submissions from the local community.

Table 7 | Predicted operational noise exceedances during the evening and night periods

		Stage 1		Stage 2		Stage 3		Stage 4		Stage 5	
Receiver	**Criteria Eve/Night**	**Eve**	**Night**	**Eve**	**Night**	**Eve**	**Night**	**Eve**	**Night**	**Eve**	**Night**
13/1	35 / 35	36 (1)		36 (1)		36 (1)			36 (1)	36 (1)	36 (1)
13/2	35 / 35	36 (1)		36 (1)		36 (1)				36 (1)	
14	35 /35	37 (2)	36 (1)	37 (2)	36 (1)	37 (2)		36 (1)		36 (1)	
16	35 / 35	37 (1)	36 (1)	37 (2)	36 (1)	37 (2)	36 (1)		36 (1)	37 (2)	36 (1)
17	37 / 35								37 (2)		37 (2)

Note: Level of exceedance identified in brackets

Processing Activities

6.2.13 Hanson advised that secondary and tertiary processing has an approxmate 70 perecent production rate compared to the primary crusher and most products require this additional processing in order to refine aggregates to the required size. In order to generate its full range of products and provide sufficient flexibility to meet market demand, Hanson advise that processing would need to be undertaken into the evening and night periods.

6.2.14 In particular, Hanson identified a strong demand for 7 mm aggregate products which yield at approximately 10 percent (ie 33 tonnes per hours) of the secondary and tertiary processing throughout.

6.2.15 The Departments notes that the INP requires reasonable and feasible noise mitigation strategies to be applied where noise impacts exceeding the PSNLs are predicted. This raises the question as to whether secondary and tertiary processing equipment could be upgraded to increase product output during the day period. Hanson has advised that it does not consider upgrading the secondary and tertiary processing equipment to be reasonable or feasible as there is significant cost of undertaking such an upgrade and there would be marginal benefit in terms of product output. However, no further detail was provided to support this conclusion.

6.2.16 Whilst Hanson contend that equipment upgrades would not be reasonable or feasible, the Department considers that extending the quarry's processing hours into these sensitive times on a continual basis as proposed by Hanson would also not be a reasonable outcome for the local community.

6.2.17 The Department also notes that extraction and processing hours for State significant quarries across NSW are generally limited to the day period, with the exception of a small number of sites (ie less than 10). However, most of these sites are located close to major highways.

6.2.18 To facilitate some additional product output, the Department considers secondary and tertiary processing activities may occur up to 8:00 pm on weeknights only. The Department considers that this noise source during the early evening period would not adversely affect the surrounding community, so long as the predicted noise levels are achieved. However, the Department considers that no processing activities should occur after 8:00 pm and through the night.

6.2.19 The Department acknowledges that the recommended restrictions to processing hours would limit the quarry's ability to achieve its maximum production rate. However, with the inclusion of these additional hours in the early evening for processing activities, it is likely that the quarry could reach up to approximately 1.35 Mtpa. The Department notes that this level of production reflects a 90 percent increase on the existing production rate and double the current output of 7 mm aggregate products (ie from approximately 60,000 tones to 135,000 tonnes). Importantly, this level of production would still allow the quarry to provide a steady supply of materials to the construction market.

6.2.20 The Department considers that a production limit of 1.5 Mtpa should be specified in the conditions, which would provide Hanson the opportunity to reach this limit in the future should it decide to upgrade its processing equipment without needing to increase the maximum allowable throughput.

6.2.21 Hanson is also proposing to extend processing hours into the early morning period. The hours between 5:00 am and 7:00 am are classified as the night period under the INP and therefore, night-time PSNLs apply. The Department notes that the existing consent allows quarrying operations (including all processing activities) to commence at 6:00 am and that existing processing infrastructure would continue to be used, with the exception of one additional crusher to be used on a campaign basis for concrete recycling activities.

6.2.22 On this basis, operational noise generated during this hour would be similar to existing noise generated by the quarry, and the Department considers it reasonable to allow quarrying operations to continue to commence at 6:00 am, so long as the recommended noise limits are achieved.

6.2.23 The Department does not consider processing activities should commence any earlier than 6:00 am, and has recommended that the most stringent noise levels under the INP apply between 5:00 am and 6:00 am to allow for product loading and dispatch activities only.

Low Frequency Noise

6.2.24 Whilst the INP continues to apply in all other noise aspects, the transitional arrangement of the NPI require the immediate implementation of *Fact Sheet C*, which reflects a more current understanding of the impact of tonal and low-frequency noise on the community. Fact Sheet C requires modifying factor corrections to be applied to predicted noise levels, in circumstances where:

- the C minus A weighted noise levels are greater than 15 dB; and
- the low-frequency noise spectral limits in Table C2 of *Fact Sheet C* are exceeded.

6.2.25 At most receivers, the C minus A weighted noise levels were predicted to exceed 15 dB. However, the NIA advised that there were no predicted exceedances of the spectral limits in Table C2, and as such no factor corrections are required.

6.2.26 On this basis, the Department considers that the Project would no cause excessive levels of tonality or low frequency noise at nearby private receiver. Nonetheless, the Department has recommended conditions to ensure Hanson undertakes periodic contemporary assessment of low frequency noise as part of its noise monitoring program.

Management and Mitigation

6.2.27 To further mitigate the noise impacts of the Project, Hanson propose to:

- enclose all fixed processing equipment from Stage 1, including partial enclosure of mobile crushers (ie additional enclosures to the above modelling scenarios);
- strategically locate stockpiles and ancillary equipment to limit potential noise impacts;
- implement a comprehensive noise monitoring program, including frequent attended monitoring at representative receivers; and
- modify operations during unfavorable weather conditions.

6.2.28 The Department has recommended that these measures form part of a Noise Management Plan, to be prepared and implemented prior to the commencement of construction.

Conclusion

6.2.29 Overall, the Department considers that noise associated with the Project could be managed through the stringent conditions of consent, including:

- restricted hours of operation, product loading and dispatch: and
- stringent noise operating conditions, including a condition requiring Hanson to modify operations in noise-enhancing weather conditions; and
- a Noise Management Plan, including regular attended noise monitoring.

6.2.30 The EPA did not raise any concerns over the proposed noise predictions and advised that it supported the Department's approach to regulating noise from the quarry. The Department considers that the recommended conditions strike a fair balance between protecting the amenity of the local community and meeting operational demands. Subject to these conditions, the Department considers the noise impacts of the Project are acceptable.

6.3 Air Quality

6.3.1 The EIS included an Air Quality Impact Assessment (AQIA) prepared by Vipac Engineers & Scientists Ltd. However, in response to various technical issues raised by the EPA (see **Section 5.3**), Hanson commissioned a revised AQIA which was included in the Amended RTS.

6.3.2 The Department has based its assessment of air quality impacts (ie particulate matter, blast fumes and respirable crystalline silica) on the information provided in this revised AQIA, with the exception of greenhouse gas emissions, which was addressed in the original EIS AQIA.

Modelling Assumptions

6.3.3 The revised AQIA was prepared in accordance with *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales* (EPA, 2017). Local ambient particulate monitoring data was not available to inform background air quality levels of the Project site. As such, the revised AQIA compared a range of data sources to determine the most representative background dataset to form the basis of dispersion modelling. These sources included the Department's air quality monitoring stations at Beresfield and Wallsend, which are the closest monitoring stations to the site, as well as baseline air quality monitoring data provided for the Rocky Hill Coal Project, which was considered to be a similar rural setting.

6.3.4 The revised AQIA modelled three scenarios considered to be representative of the Project's worst-case impacts (ie Stages 1, 2 and 4) as well as the emissions from the existing operation. Modelling scenarios included the application of some physical mitigation measures, including the regular watering of haul roads and stockpiles and partial enclosure of the transfer conveyor from Stage 4 onwards. It should be noted that not all mitigation measures were modelled including the enclosure of fixed processing equipment.

6.3.5 The revised AQIA predicted both incremental (ie Project alone) and cumulative (ie Project plus background) concentrations of Total Suspended Particles (TSP), PM_{10}, $PM_{2.5}$, deposited dust and blast fumes (ie nitrogen dioxide) at sensitive receivers surrounding the quarry site (see **Figure 10**).

Predicted Impacts

6.3.6 The revised AQIA predicted that the highest particulate matter impacts would be experienced by Receiver 13 immediately south of the site, during Stage 4 of the Project. The predictions are provided in **Table 8** below.

6.3.7 All receivers are predicted to experience minor increases of PM_{10}, $PM_{2.5}$, TSP and deposited dust. However, no exceedances of the air quality criteria specified in *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales* are predicted to occur and no acquisition or mitigation rights are triggered under the VLAMP. It should also be noted that diesel emissions were incorporated into source emissions estimates for TSP, PM_{10} and $PM_{2.5}$ concentrations.

Table 8 | Predicted incremental air quality impacts at Receiver 13 - Stage 4

	PM_{10}		$PM_{2.5}$		TSP	Deposited Dust
Time period	**24-hour average**	**Annual average**	**24-hour average**	**Annual average**	**Annual average**	**Annual Average**
Criteria	50 µg/m^3	25 µg/m^3	25 µg/m^3	8 µg/m^3	90 µg/m^3	4 g/m^2/mth
Existing Operations	11.6	20.8	2.4	7.8	71.4	2.3
Project Stage 4	18.2	22	3	7.9	75.4	2.4

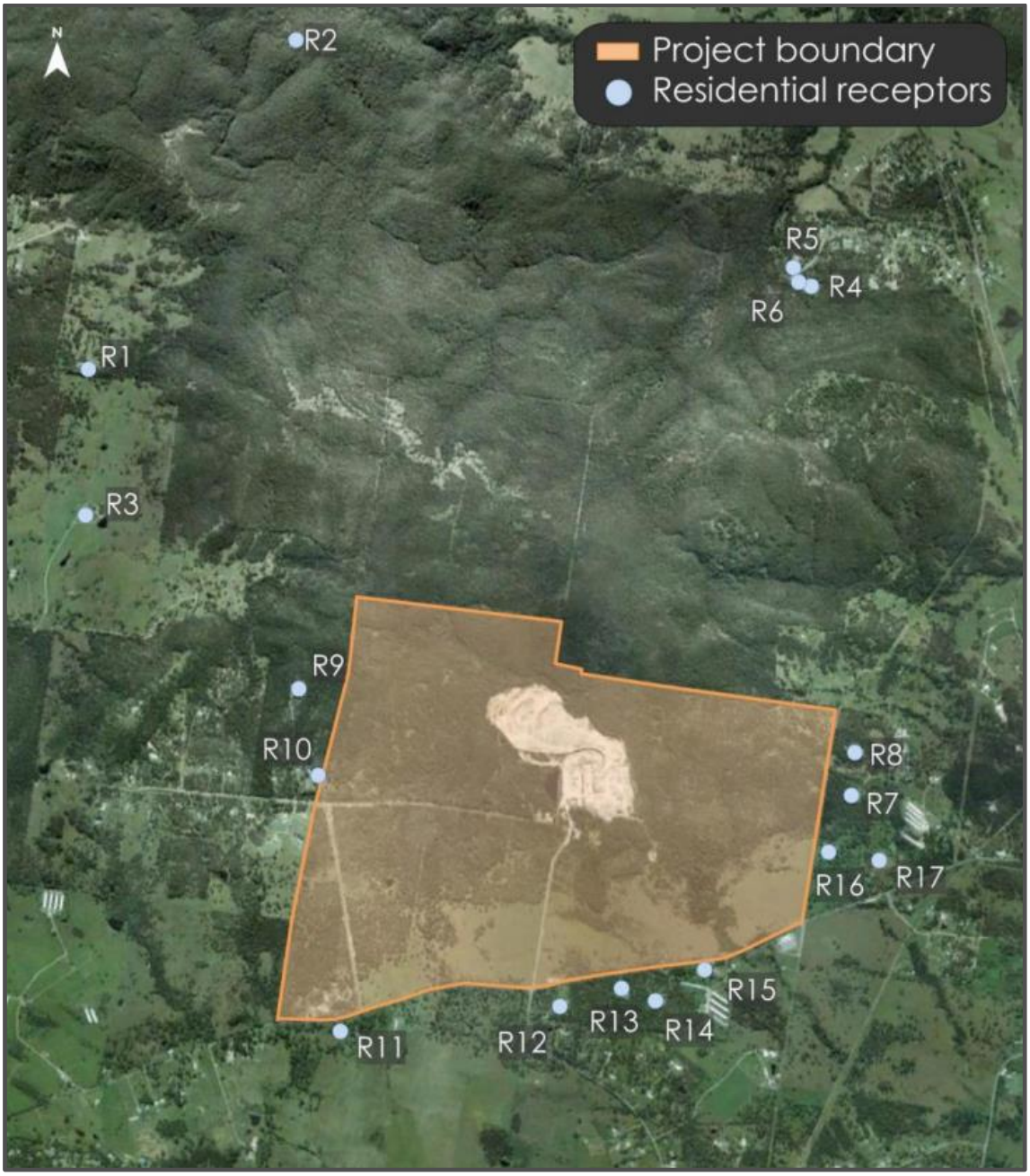

Figure 10 | Location of Representative Sensitive Receivers

6.3.8 As background particulate matter occasionally exceeds the 24-hour PM_{10} and $PM_{2.5}$ criteria, a 'Level 2' assessment was undertaken to predict whether the Project would result in additional days of exceedance at the closest receivers. This assessment combines the highest predicted 24-hour particulate matter concentrations with the highest observed background concentrations using historical meteorological data. No additional days of exceedance are predicted to occur as a result of the Project.

6.3.9 Modelling indicated that blast fumes would mostly disperse within the site boundary and no receiver would experience nitrogen dioxide (NO_2) concentrations above the 1-hour average criterion of 246 µg/m^3. The Department notes that Receivers 9 and 10 would be most affected by blast fumes from the Project, with concentrations of approximately 120 µg/m^3 predicted to be experienced for blasts modelled in Stages 1, 2, and 4. The revised AQIA advised that these predictions reflect blasting during the worst-case hour within the permissible blasting hours (ie 4:00 pm). However, Hanson has advised that in practice, blasting would be scheduled to occur at the least impacting time of day.

6.3.10 Lastly, the revised AQIA advised that the low levels of incremental annual average $PM_{2.5}$ at the most affected receiver (ie 0.6 µg/m^3) indicate that concentrations of respirable crystalline silica associated with the Project would be minimal. The Department notes that the revised AQIA predicts a maximum $PM_{2.5}$ level of 7.9 µg/m^3 at the nearest receiver. However, this includes a background annual average $PM_{2.5}$ level of 7.3 µg/m^3, which would comprise a range of dust sources. The Department notes that even if all incremental $PM_{2.5}$ was comprised of silica from quarrying operations, it would be unlikely that cumulative silicia levels would exceed the Victorian EPA annual average criteria of 3 µg/m^3.

6.3.11 To further mitigate dust impacts, Hanson propose to:

- enclose fixed crushing and screening equipment (ie additional enclosures to the above modelling scenarios);
- partially enclose the mobile crusher used for concrete recycling;
- modify operations during adverse weather conditions;
- implement real-time particulate matter monitoring with internal alert notifications; and
- minimise the extent of exposed surfaces and undertake progressive rehabilitation.

6.3.12 The Department has recommended that these measures form part of an Air Quality Management Plan, to be prepared and implemented prior to the commencement of construction.

6.3.13 The EPA recommended that a daily extraction and processing limit of 5,000 tonnes a day apply at the quarry. The EPA bases this recommendation on assumptions in the air quality modelling that used an average extraction and processing production rate, rather than peak daily production rates. The Department notes that the recommended condition to limit primary production to 12 hours a day would limit the primary crusher to 5,400 tonnes a day, based on a processing rate of 450 tonnes/ hour, which is broadly consistent with EPA's recommendation.

6.3.14 The Department does not consider a further daily tonnage production limit is warranted in this instance and that the recommended conditions provide a comprehensive platform to minimise air quality impacts on sensitive receivers.

Tank Water on Giles Road

6.3.15 A number of residents of Giles Road (in the area of receivers R9 and R10 in Figure 10) advised that their properties are not connected to a town water supply and raised concern about the Project's potential impacts on their tank water quality. In response, Hanson commissioned sampling of water from two properties to determine whether the existing operation is impacting the water quality. The results of these samples indicate that water quality within the tanks is safe to drink.

6.3.16 Hanson noted that NSW Health recommends that all rainwater tanks are fitted with 'first flush' diverters, which work to capture fine particles before they enter the water tank. Hanson advised that this type of device could be funded for applicable residents under its proposed 'Community Enhancement Fund' (see **Section 6.5**).

6.3.17 The AQIA does not predict exceedances of air quality criteria, including dust deposition, at residences along Giles Road, and therefore the Department considers impacts from the quarry on tank water would be acceptable. Nonetheless, the Department supports Hanson's initiative to fund first flush diverters for those currently without these devices.

6.3.18 Additionally, the Department considers that the site's air quality monitoring should be capable of evaluating particulate matter impacts to ensure the regular review of impacts and protection of drinking water supply for residents.

Greenhouse Gases

6.3.19 The Project would result in the generation of greenhouse gases through the use of purchased electricity and combustion of fuels associated with machinery, processing equipment and transportation.

6.3.20 In accordance with the *National Greenhouse Account Factors Workbook* (Department of Environment, 2014), the AQIA estimated that the Project would generate approximately 14,090 tonnes of carbon dioxide (CO_2-e) emissions per annum. Over the life of the Project, it is estimated that the Project would generate around 296,072 tonnes of CO_2-e in Scope 1 emissions, which represents approximately 0.0005 percent of Australia's net greenhouse gas emissions.

6.3.21 Hanson proposes to minimise greenhouse gas emissions by optimising internal haulage distances, applying timer switches on relevant electrical appliances and utilising high efficiency motors for onsite equipment. The Department considers that the greenhouse gas impacts of the proposal are minor and can be managed to acceptable standards. The Department has recommended a condition requiring Hanson to take all reasonable steps to minimise greenhouse emissions associated with the Project.

Conclusion

6.3.22 The Department has carefully considered the potential air quality impacts associated with the Project. Whilst there would be some additional dust generation associated with the increased production rate, no exceedances of the relevant air quality criteria are predicted to occur at any sensitive receiver.

6.3.23 The Department notes that air quality impacts were a key concern raised in submissions for the Project and considers that careful management will be required to minimise potential impacts, particularly during adverse meteorological conditions.

6.3.24 On this basis, the Department has recommended robust and contemporary air quality management conditions, including a requirement to minimise air quality impacts during adverse weather conditions, regular air quality monitoting, and the implementation of an Air Quality Management Plan. Subject to these conditions, the Department considers that the air quality aspects of the Project are acceptable.

6.4 Blasting

6.4.1 A revised Blast Impact Assessment (BIA) was provided in the Amended RTS to assess the Project's potential ground vibration, airblast and overpressure impacts. Sensitive receivers considered in the BIA included privately-owned residences and a nearby poultry farm. The Department has considered the Project's potential blast fume impacts in **Section 5.3**.

Existing Blast Environment

6.4.2 Hanson is currently permitted to undertake blasting between 9:00 am and 5:00 pm Monday to Saturday. Blasting is regulated in accordance with ANZECC Guidelines and the site's EPL which requires:

- ground vibration peak particle velocity (ppv) to not exceed 5 millimeters per second (mm/s) for more than 5 percent of blasts per annum;
- ground vibration ppv to not exceed 10 mm/s at any time;
- airblast overpressure levels to not exceed 115dB Linear Peak (Lin Peak) for more than 5 percent of blasts per annum; and
- airblast overpressure levels to not exceed 120 dB (Lin Peak) at any time.

6.4.3 A review of the quarry's blast monitoring results between 2014 and 2019 indicates no exceedances of the blast criteria. The EPL does not limit the frequency of blasting, however, in practice, Hanson blasts approximately 20-25 times per year (ie less than once a fortnight).

6.4.4 Public submissions raised concern over the proposed increase in frequency of blasting. Some nearby residents considered that the existing magnitude of blasting was causing damage to their homes and raised concern that the Project would increase these impacts.

Predicted Impacts

6.4.5 The BIA predicted maximum airblast overpressure and ground vibration levels at seven sensitive receivers located between 860 m and 1.3 km from the proposed pit boundary (see **Figure 11**). These receivers were representative of privately-owned residences surrounding the site.

6.4.6 Hanson advised that the Project would increase blast frequency to a maximum of one blast per week, with a Maximum Instantaneous Charge (MIC) of no more than 175 kg. The maximum predicted airblast overpressure and ground vibration levels are provided in **Table 9**.

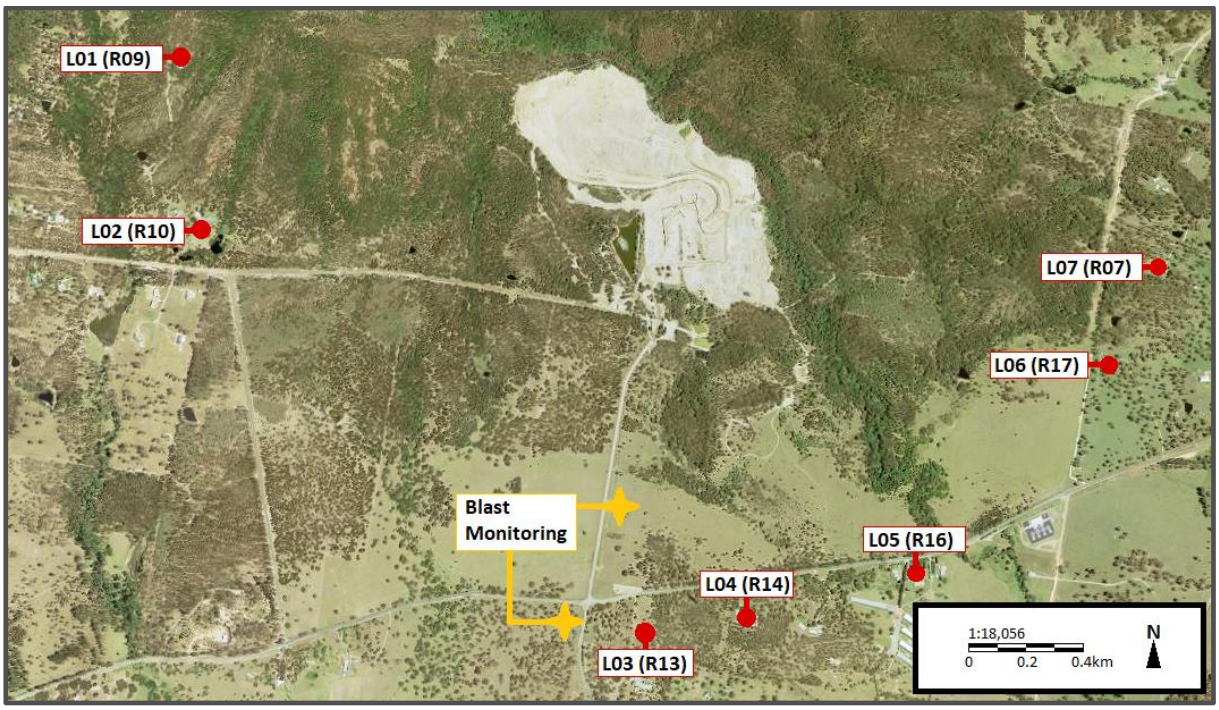

Figure 11 | Location of representative sensitive receivers

Table 9 | Blasting predictions – impacts at nearest receivers

Receiver	Separation distance (m)	Airblast overpressure (dB Lin peak)	Ground vibration (ppv, mm/s)
L01 (R09)	1,110	111	3.3
L02 (R10)	950	113	4.3
L03 (R13)	960	113	4.2
L04 (R14)	860	114	5.0
L05 (R16)	980	112	4.1
L06 (R17)	1,160	110	3.1
L07 (R07)	1,310	109	2.6
Criteria			
95% criteria		115	5
100% criteria		120	10

6.4.7 To mitigate blast impacts, Hanson propose to:

- implement best practice design to minimise blast impacts and achieve compliance with the blast criteria;
- operate a system to notify the community of scheduled blasts; and
- monitor each blast event.

6.4.8 Under the worst-case MIC, the BIA predicts that blasts would comply with the 95 percent criteria for airblast overpressure and ground vibration at all seven locations. The highest levels would be experienced by R14 located to the south of the site, with predictions nearing or equivalent to the 95 percent airblast overpressure and ground vibration criteria. Hanson advises that these predictions are conservative and that most blasts would use a MIC of 145

kg. Under this reduced MIC, airblast overpressure and ground vibration R14 is predicted to be 113 dB Lin Peak and 4.3 ppv mm/s, respectively.

6.4.9 All privately-owned residences would be situated more than 500 m from blasting activities and are therefore unlikely to be impacted by flyrock.

6.4.10 The Department considers that blasting associated with the Project would be unlikely to result in material impacts to nearby privately-owned residences. However, the Department acknowledges concerns raised by proximal residents in relation to current and future blasting at the quarry.

6.4.11 In addition to Hanson's proposed mitigation measures, the Department has recommended strict operating and management conditions to ensure the blast impacts of the Project are managed appropriately. This includes the preparation of a Blast Management Plan, including measures to avoid blasting during unfavourable climatic conditions (ie temperature inversions or prevailing winds). The Department has also recommended a condition allowing landowners to request an independent review of impacts at their property, should they consider the Project to be exceeding the relevant blasting, noise, or air quality criteria.

6.4.12 Overall, the Department considers the blasting impacts of the Project to be acceptable, subject to the recommended conditions.

6.5 Social Impacts

6.5.1 The Project's potential social impacts were a key concern raised in most submissions. In response, Hanson commissioned a Social Impact Assessment (SIA) prepared in accordance with the Department's *Social Impact Assessment Guideline for State Significant Mining, Petroleum Production and Extractive Industry Development*.

6.5.2 Community engagement undertaken for the SIA identified potential impacts on way of life, community, health and wellbeing, property values, and access and use of infrastructure as primary issues of concern. These impacts are predominantly associated with the Project's potential traffic, noise, dust and vibration impacts.

6.5.3 Following the Project's exhibition, Hanson established a Community Consultative Committee (CCC) for the Project which met on five occasions between September 2017 and May 2019. These meetings sought to discuss key aspects of the Project and contributed to the revised scope of the Project, submitted in the Amended RTS.

6.5.4 The Department has sought to integrate its assessment of these social aspects of these impacts in the relevant sections of this report and consider that commitments from Hanson and the Department recommended conditions would mitigate these impacts to an acceptable level. By imposing conditions that would facilitate appropriate management of the Project's amenity impacts in accordance with applicable standards, the Department also considers that adverse impacts on property values would be minimized.

6.5.5 In particular, the Department has recommended:

- reduced operational and road transport hours to protect local amenity, particularly during the evening and night periods;
- retention of the current extraction rate (ie 700,000 tpa) until additional bus bays are constructed on Brandy Hill Drive;

- comprehensive noise, blast and air quality operating and management conditions to minimise these impacts of the Project in accordance with best practice; and
- stringent rehabilitation objectives to facilitate a safe, stable and non-polluting final landform that is integrated with the surrounding natural environment.

6.5.6 Hanson has agreed to contribute $1.5 million towards the construction of a shared pathway along Brandy Hill Drive under a VPA with Council. This contribution would fund approximately 50 percent of the total cost of the pathway with the remainder to be funded by Council and delivered under its Strategic Asset Management Plan. The Department notes that the provision of this pathway would significantly improve pedestrian and cycle access along Brandy Hill Drive.

6.5.7 Additionally, Hanson has committed to establish a Community Sponsorship Policy to provide funding towards local community initiatives. This Policy would support requests for donations for local initiatives and direct funding in consultation with the CCC. Hanson advise that this policy would contribute approximately $0.01 per tonne of material sold.

6.5.8 It should be noted that the Department has received consistent complaints from the local community throughout the assessment of this application, not only in relation to existing amenity impacts, but also regarding the relationship between the company and some members of the community. A lack of trust in the company was identified by the community in submissions and reiterated in community engagement undertaken for the SIA.

6.5.9 The Department considers that overall, the social impacts of the Project can be sufficiently managed to avoid any significant adverse impacts. However, the Department considers that Hanson should continue to engage with the community engagement throughout the duration of the Project in order to improve relationships and provide ongoing information about the quarry and its operations. On this basis, the Department has recommended:

- that Hanson formerly establish and operate the CCC in accordance with the Department's *Community Consultative Committee Guidelines for State Significant Projects*; and
- prepare and implement a formal procedure for managing and responding to complaints, under an Environmental Management Strategy.

6.6 Water Resources

6.6.1 The EIS included an assessment of the Project's potential impacts on surface and groundwater resources, including a Surface Water Impact Assessment (SWIA) and Hydrogeological Impact Assessment (HIA) prepared by Martens & Associates Pty Ltd. The HIA was peer reviewed by Dr Noel Merrick, a leading groundwater modelling expert. The Department considers that the key issues related to water resources include:

- a significant increase in groundwater inflow into the pit due to increasing the extraction depth from the approved 30 m AHD to -78 m AHD, with consequent requirements for management of excess pit water and water licensing, and increased groundwater drawdown around the quarry;
- discharge of water from sediment dams and controlled releases of the excess pit water to downstream waters with potential impacts on receiving water quality and hydrology/ flooding; and
- the formation of a throughflow pit lake in the final rehabilitated landform.

Surface Water

6.6.2 The site is located within the Deadmans Creek and Barties Creek catchment areas. Deadmans Creek is an ephemeral third order stream that flows along the boundary of the site and drains to the Williams River, which flows to the Hunter River. Barties Creek is an ephemeral first order stream that runs through the west of the site and drains directly to the Hunter River.

Existing Water Management System

6.6.3 Hanson operates an existing water management system comprising:

- five sediment basins which capture runoff from disturbed areas; and
- a water storage dam (Western Dam), supplied by captured runoff and diverted clean water runoff.

6.6.4 Water is discharged from the site to Deadmans Creek through three Licensed Discharge Points (LDPs). These LDPs are regulated under the site's EPL, which contains discharge concentration limits for Total Suspended Solids (TSS), pH and oil and grease.

Predicted Impacts

Site Water Balance

6.6.5 Water would be required for product processing, dust suppression, plant maintenance, vehicle/machinery washdown, concrete batching and site amenities. Water supply would be generated from surface water runoff, groundwater inflows and harvested roof water. **Table 10** summarises the predicted site water balance for the Project under extreme dry (95th percentile lowest annual rainfall), average and extreme wet (95th percentile highest annual rainfall) weather conditions.

Table 10 | Predicted site water balance

	Site Water Balance (ML/yr)		
Stage	**Dry**	**Average**	**Wet**
1	-56	181	408
2	140	410	677
3	303	587	879
4	422	792	1,174
5	639	1,031	1,441

6.6.6 The SWIA predicts excess water in every stage of the Project, except Stage 1 under extreme dry conditions, where a deficit of 56 ML is predicted. Surplus water would increase as the Project develops, due to the increase in extraction depth and area, with consequent increases in groundwater and stormwater inflows into the pit. However, these inflows would be captured within in-pit storages with no potential for uncontrolled discharge to receiving waters. The water from the pit would either be transferred to the Western Dam (during Stages 1-3 of the mine) or retained within in-pit sumps during Stages 4-5 for water supply, or discharged to Deadman's Creek as a controlled discharge, subject to meeting the concentrations limits set in the EPL.

6.6.7 The SWIA proposes that controlled discharges would only occur on wet days, to enhance mixing with existing natural flows in the receiving waters. Based on daily rainfall data from 1967 – 2015 at Tocal, the number of wet days per annum under dry (lowest number of days on record), average and wet (highest number of days on record) conditions is 75, 128 and 171 days, respectively. **Table 11** identifies the predicted discharge flow rate if excess water were to be discharged for 24 hours on the number of wet days under the respective weather conditions.

Table 11 | Predicted discharge flow rates on wet days under dry, average and wet conditions

	Discharge Flow (L/s)		
Stage	**Dry**	**Average**	**Wet**
1	0	16.4	27.6
2	21.6	37.2	45.8
3	46.8	53.2	59.5
4	65.1	71.8	79.5
5	98.6	93.5	97.5

6.6.8 The highest discharge to Deadmans Creek of up to 98.6 L/s (8.5 ML/day) could potentially occur during Stage 5. The SWIA analysed this flow against the 1 in 2-year Annual Recurrence Interval (ARI) for Deadmans Creek. The peak discharge represents less than 3% of the bank full discharge flow rate of Deadmans Creek.

6.6.9 The SWIA also conservatively predicted flow rates if the greatest amount of excess water (1,441 ML/yr) was discharged on the lowest number of wet days (75 days). The maximum flow rate under this scenario would be 223 L/s, representing less than 7 percent of the bank full discharge flow rate. On this basis, the SWIA concludes that additional discharge from the Project would be unlikely to result in any geomorphic channel impacts. DPIE Water recommended that the Water Management Plan for the Project include monitoring of stream stability and geomorphic processes, including a Trigger Action Response Plan. The Department has recommended a condition to this effect. BCD advised that it was satisfied that the Project would not cause downstream flooding issues.

6.6.10 The Department notes that there would be sufficient water available for the proposed operations under most climatic conditions. Nonetheless, the Department has recommended the standard condition for extractive industry projects which requires Hanson to adjust the scale of the quarrying operations to match available water supply to ensure adequate environmental protection is achievable at all times (eg water for dust suppression).

Stream Flow/ Hydrology

6.6.11 Over the life of the Project, the Deadmans Creek and Barties Creek catchment areas would be progressively reduced by 43.4 ha and 11.6 ha, representing a 2 and 8 percent decrease in the total catchment areas, respectively.

6.6.12 However, as outlined above, during operations, flows to Deadmans Creek would progressively increase up to 950 ML/year with controlled discharges of the surplus pit water. At the completion of quarrying, discharges would cease and groundwater inflows and runoff would

slowly fill the final void. Overall, catchment flow in Deadmans and Barties Creek would reduce by 81 ML/year and 22 ML/year, respectively.

6.6.13 The SWIA advised that the proposed changes in catchment area and flow rate would have negligible hydrogeological and geomorphic impacts due to:

- the minor extent of reduction in relation to overall catchment size;
- the existing configuration and riparian regimes of the affected tributaries; and
- high existing flow rates in the Hunter and Williams Rivers.

6.6.14 The Department notes that the creek lines that would be affected are ephemeral and accepts that the overall reduction in catchment areas/flow rates would not significantly affect hydrogeological values or geomorphic regimes.

Surface Water Quality

6.6.15 The Project has the potential to impact downstream receiving waters through increased sediment loads, salinity and other pollutants. Hanson propose to manage surface water in a similar manner to the existing operation by capturing dirty water runoff in sediment dams. The Western Dam would continue to be the site's primary water storage during Stages 1 and 2. As extraction progresses into Stage 3, the Western Dam, and its associated clean water diversion, would be removed and all captured water onsite would be recirculated through the various sediment basins and a new water storage dam in the quarry floor.

6.6.16 Discharges from sediment basins located within the surface infrastructure area would be designed and constructed in accordance with *Managing Urban Stormwater Soils and Construction including Volume 2E Mines and Quarries* (the Blue Book). All dams and basins would be designed and constructed in accordance with the Blue Book, based on a 90th percentile 5-day rainfall event. Hanson also propose to transfer water between the various basins and into the storage dam, in order to minimise uncontrolled overflows.

6.6.17 Hanson has advised that it would continue to discharge in accordance with its EPL. Over the life of the Project, salinity of discharges from the site would gradually increase from 937 mg/L to 1,105 mg/L reflecting an increased proportion of groundwater inflow. However, the SWIA advises that this increase would not change the existing use category of downstream waters, and no licensed extraction points have been identified on Deadman's Creek. DPIE Water recommended that Hanson undertake a census, during the preparation of a site Water Management Plan (WMP), to confirm that there are no downstream water users that could be affected by the Project's discharge regime.

6.6.18 Hanson has agreed to implement a WMP for the site that details baseline data of water flows and quality in Deadmans Creek, erosion and sediment control measures, a comprehensive monitoring program and action response triggers. The Department has recommended a condition to this effect.

Surface Water Licensing

6.6.19 Most of the surface water runoff on the quarry site is excluded from the WM Act's licencing provisions as it is dirty water (ie from dams solely for the capture, containment or recirculation of drainage). Additionally, clean water diverted to the Western Dam complies with Harvestable Rights provisions of the *Water Management Act 2000* (WM Act) and does not require any additional licensing under the WM Act. Nonetheless, the Department has recommended a

condition for Hanson to obtain all required water licences for the development, in accordance with the *Water Management Act 2000*.

6.6.2 Groundwater

6.6.20 Groundwater resources at site are regulated under the *Water Sharing Plan for the North Coast Fractured and Porous Rock Groundwater Sources*. Water sharing plans establish the rules for sharing water in a defined water source between the needs of the environment and other users, in accordance with the *Water Management Act 2000*. Under this water sharing plan, the quarry is located within the *New England Fold Belt Coast Groundwater Source* of which approximately 24,000 ML/year[3] is unassigned.

6.6.21 Within a 9 km radius of Brandy Hill Quarry, there are 13 licensed groundwater bores, most of which access the fractured rock groundwater source. Three of these bores are located on site, and the remaining are registered for other uses (ie stock or domestic purposes). The closest private bore is located 2.1 km south east of the site.

6.6.22 Groundwater levels in the fractured rock groundwater source across the site range between 111 m AHD in the northwest and 32 mAHD in the south. The quarry currently experiences some groundwater inflows ranging between 5 and 77 ML/year. Groundwater flow is generally towards the south to south-east, reflecting the site's topography.

6.6.23 The *NSW Aquifer Interference Policy* (AIP) sets out the water licence and impact assessment requirements for aquifer interference activities in NSW with the aim of ensuring that water taken by aquifer interference activities is properly licensed and accounted for in water sharing arrangements.

6.6.24 Monitoring data indicates that groundwater quality across the site is brackish to saline and is of poor quality for potable purposes. Additionally, groundwater yield from licensed bores lies between 0.53 and 2.53 L/s. On this basis, the HIA characterises the groundwater source as having 'low productivity' in accordance with the AIP.

Predicted Impacts

Pit inflows and groundwater drawdown

6.6.25 **Table 12** identifies the proposed depth of extraction for each stage of the Project and the associated groundwater inflows.

Table 12 | Proposed extraction depth by Project stage and associated groundwater inflows

Stage	Timing	Elevation of quarry floor (m AHD)	Groundwater inflows ML/yr
1	Years 1 - 6	22	172
2	Years 7 – 12	-8	315
3	Years 13 – 18	-38	424
4	Years 19 – 24	-58	516
5	Years 25 - 30	-78	642

[3] *New England Fold Belt Coast Groundwater Source – Rules Summary Sheet 10 of 13 (2016)*

6.6.26 The HIA predicts that groundwater inflows into the pit would increase as extraction progresses, reaching a maximum of 642 ML/year during Stage 5. Following completion of quarrying, dewatering of the quarry pit would be discontinued and the void would continue to receive runoff from rainfall and groundwater inflows. The pit lake that would form is predicted to gradually rise for 163 years until it reaches equilibrium at approximately 30 m AHD.

6.6.27 The HIA predicts that two licensed bores would potentially be affected by the Project. One of these (GW51309) would experience drawdown of 0.04 m over the life of the Project. The other (GW078135) would experience drawdown greater than 2 m during Stage 5 of the Project. This level of drawdown would occur during Stage 5 of the Project and continue for 33 years throughout the quarry's rehabilitation period (ie until 2076). A maximum drawdown of 3.5 m is predicted during this period.

6.6.28 A drawdown of 2 m exceeds the AIP's Level 2 minimal impact considerations for 'less productive' groundwater sources. In these circumstances, the AIP requires appropriate studies to demonstrate that the decline will not prevent the long-term viability of the affected water supply, unless make good provisions apply.

6.6.29 Following consultation with the landowner of GW078135, Hanson advised that this bore is no longer in use. Nonetheless, Hanson propose to further consult with this landowner during the preparation of a WMP to determine appropriate monitoring measures and make-good provisions, should they be required.

Final Void

6.6.30 The rehabilitated quarry would result in permanent changes to the regional groundwater table, additional to those approved under current operations.

6.6.31 At the point of equilibrium, the HIA predicts that a 2 m drawdown contour would extend approximately 2.5 km from the pit lake. At this time, inflows would be equivalent to outflows and the pit would act as a flow-through lake.

6.6.32 As a result of the Project, the Williams River would experience maximum baseflow reduction of 7.9 ML/year and permanent reduction at equilibrium conditions of 1.6 ML/year. The HIA advised that this reduction represents approximately 0.002 percent of the flow in the Williams River. The Department considers this reduction to be negligible.

6.6.33 Evaporation from the lake surface would result in increased salinity levels in outflows over time. At equilibrium conditions, outflows would contain salinity levels 33 percent greater than inflows and salinity levels at GW078135 are predicted to increase by 12.6 percent (452 ppm).

6.6.34 The Hunter River would receive the majority of groundwater flow passing through the rehabilitated lake, which would increase salinity levels in the river by 0.004 percent.

6.6.35 Despite these increases in salinity, the Department notes that there would be no change to the existing beneficial use category of the groundwater source in GW078135. There would also be less than a 1 percent increase in salinity in the Hunter River, which meets the minimal impact considerations of the AIP.

Management and Monitoring

6.6.36 Hanson would be required to hold a Water Access Licence (WAL) for the volume of water taken from the *New England Fold Belt Coast Groundwater Source* during each year of

operations, and during subsequent rehabilitation stages. The maximum predicted groundwater inflows which would need to be licensed is 642 ML/year (during Stage 5).

6.6.37 The Department notes that current licensing allocation is less than 80% of the long-term limit for this groundwater source and as such, there is a reasonable prospect for an allocation under this source to be granted. DPIE Water did not raise concerns about sourcing water under this allocation and requested Hanson consult with them further to determine licensing arrangements. The Department has recommended a condition requiring Hanson to obtain any necessary licences under the *Water Management Act 2000*.

6.6.38 DPIE Water raised concern that the HIA did not provide clarity on recharge and groundwater flow paths between aquifers in the study area, creating uncertainty regarding potential impacts to nearby groundwater users and groundwater dependent ecosystems (GDEs). To address these concerns, DPIE Water recommended the development of a WMP, including:

- an expanded monitoring bore network, including an additional bore to monitor drawdown impacts for GW78135 and GW51309;
- a program to regularly update the groundwater model and to compare outputs with predictions of the HIA;
- a Trigger Action Response Plan (TARP) for potential impacts to GDEs, groundwater users, including make good provisions;
- installation of a temporary Class A evaporation pan and rain gauge to inform water balance modelling; and
- installation of automatic water level loggers in all monitoring bores.

6.6.39 The Department considers that the proposed WMP would ensure effective monitoring and management of groundwater resources. However, as the HIA predicts significant drawdown for a licensed bore (GW078135), the Department considers that compensatory water supply provisions should be in place to ensure the Project does not adversely affect the supply of water for this licence holder, should the bore be activated in the future. The Department has recommended a condition to this effect.

Conclusion

6.6.40 The Department notes that the predicted groundwater impacts of the Project are largely unavoidable due to the location of the resource within the hard rock aquifer. However, the predicted impacts would be localised and limited to 'less productive' groundwater sources.

6.6.41 The Department considers that the Project would not lead to significant surface water impacts, beyond those already experienced, subject to the implementation of the mitigation and management measures proposed.

6.6.42 DPIE Water raised no concern over the Project's water-related impacts, subject to the development of a comprehensive water management plan. The Department also notes that Hanson would be required to obtain all necessary licenses under the *Water Management Act 2000*.

6.6.43 Subject to the recommended conditions, the Department considers the risks of impact to surface water and groundwater resources is low and that the Project could be suitably managed through imposing performance measures and strict conditions of consent.

6.7 Biodiversity

6.7.1 The Department has relied on the updated BAR (August 2019) within the Amended RTS to assess the Project's biodiversity impacts. In accordance with the Secretary's Environmental Assessment Requirements (formerly referred to as the Director General's Requirements), the updated BAR was prepared in accordance with the *BioBanking Assessment Methodology (BBAM, OEH* 2014) and the *NSW OEH interim policy on assessing and offsetting biodiversity impacts, State significant development (SSD) and State significant infrastructure (SSI) projects* (NSW Interim Policy, OEH 2011).

6.7.2 These requirements pre-dated the implementation of the *Framework for Biodiversity Assessment* (FBA, OEH 2014) and the *Biodiversity Assessment Methodology* (BAM) of the BC Act. Nonetheless, BCD advised that these approaches are consistent with the FBA and would provide similar outcomes.

6.7.3 The updated BAR focussed on the disturbance area of around 60 ha, including around 54 ha of native vegetation, and 6 ha of cleared areas and water bodies. Native vegetation conforms to six plant community types (PCTs) deemed to be in moderate to good condition (see **Figure 12**).

Matters of National Environmental Significance

6.7.4 The Project has been declared a 'controlled action' under the EPBC Act, due to potential significant impacts on five listed fauna species. These species include the Koala, Grey-headed Flying-fox, Spotted-tail Quoll, Swift Parrot and Regent Honeyeater. In accordance with the *Commonwealth-NSW Bilateral Agreement relating to environmental assessment*, the Department has assessed the Project's impacts on these species (below). Additional assessment of MNES is provided in **Appendix H** of this report and in BCD's assessment of EPBC listed threatened species and communities (**Appendix F**).

Predicted Impacts

Threatened Flora Species and Populations

6.7.5 The updated BAR identified 17 threatened flora species listed under either the BC Act and/or EPBC Act with the potential the occur within the study area. Based on the vegetation present, four species required targeted survey to confirm if present within the proposed disturbance area. No threatened flora species were identified during targeted surveys.

6.7.6 In response to BCD's recommended conditions, Hanson pro-actively undertook additional targeted surveys for Rhodamnia rubescens, Rhodomyrtus psidioides and Rusty Greenhood Orchid (in areas proposed for the amenity bund). No targeted species were identified during these surveys and BCD agreed that no further species credits were required.

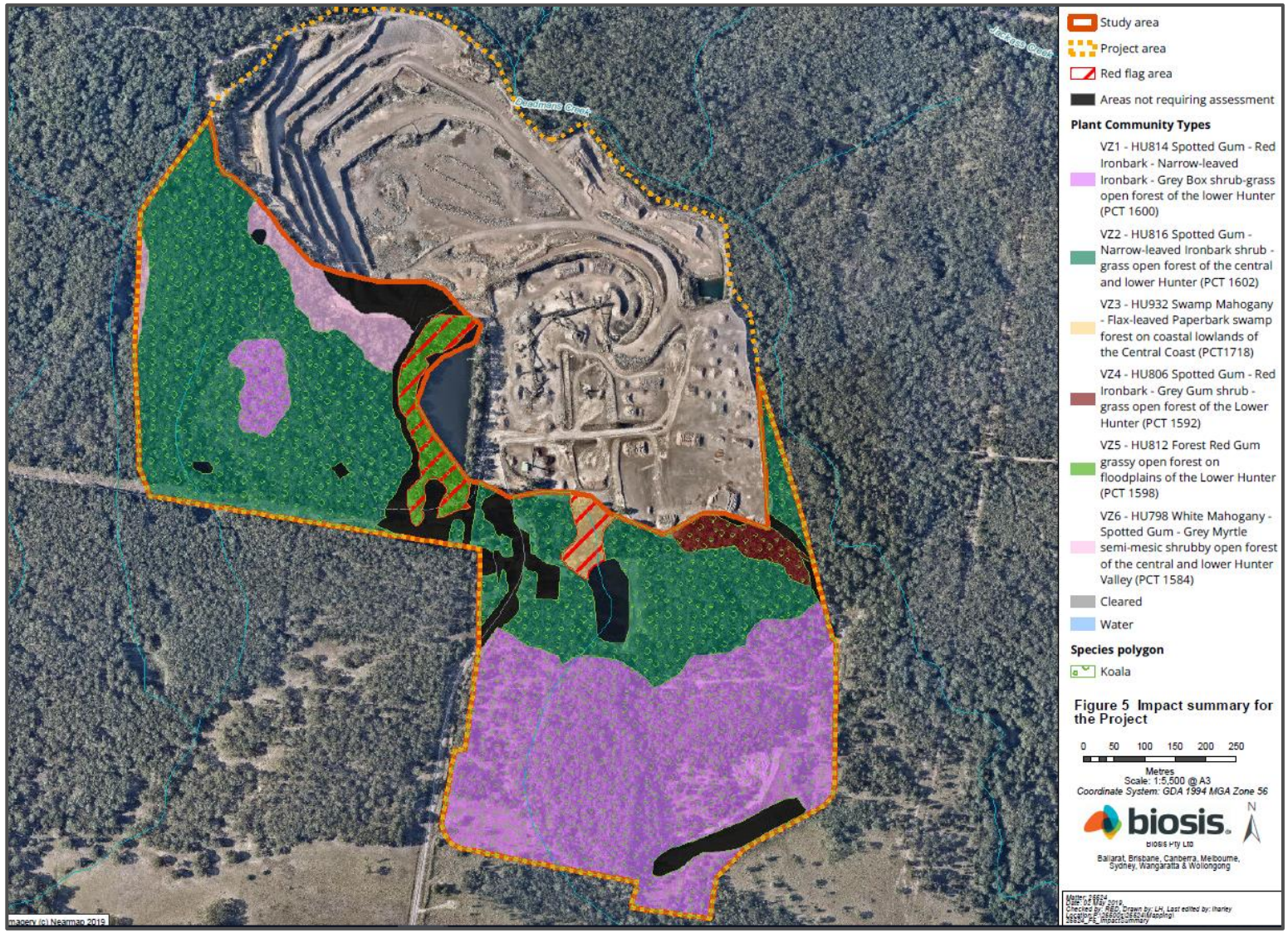

Figure 12 | Vegetation Communities Impacted by the Project

Endangered Ecological Communities

6.7.7 Of the total vegetation to be disturbed, 2.34 ha meets the definition of an Endangered Ecological Community (EEC) under the BC Act, including:

- Swamp Sclerophyll Forest on the Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner Bioregions (0.67 ha); and
- Lower Hunter Valley Dry Rainforest in the Sydney Basin and NSW North Coast Bioregions (1.67 ha).

6.7.8 These EECs are located directly adjacent to the existing disturbance area and in close proximity to the Western Dam and southern sedimentation basins (see 'red flag' areas in **Figure 12**).

6.7.9 The proposed disturbance represents less than 0.02 percent of each of these EECs in the Lower Hunter Central Coast district. Hanson proposes to offset the impacts on these EECs in accordance with the BBAM and NSW Interim Policy (see **Section 6.7.4**). BCD is satisfied with the assessment of biodiversity impacts including the offset liability calculated for these EECs, which is discussed further in Section 5.7.3 below.

Threatened Fauna

6.7.10 Six threatened fauna species listed as vulnerable under the BC Act were recorded during targeted field surveys including the Varied Sittella, Black Falcon, Little Lorikeet, Square-tail Kite, Little Bentwing-bat and Eastern Bentwing-bat. The proposal would remove foraging habitat for these species.

6.7.11 None of these species generate ecosystem or species credits under the BBAM, with the exception of the Varied Sittella and Little Lorikeet. Both of these species are ecosystem credit species, that generate a lower 'TS offset multiplier' than other ecosystem credit species in the disturbance area. This is due to the high availability of other suitable habitat in the locality and the mobile nature of these species. BCD advised that is was satisfied assessment of biodiversity impacts and the calculated ecosystem credit liability.

6.7.12 Hanson has proposed avoidance and mitigation measures to manage potential impacts on arboreal species during clearing activities. The Department has recommended that these management measures form part of a Biodiversity Management Plan.

6.7.13 The Koala and the Grey-headed Flying Fox were recorded during field surveys undertaken for the Project. These species are listed as vulnerable under both the BC Act and the EPBC Act. The Koala is also listed as an endangered population under the BC Act. The Department has further considered the impacts on these species below.

6.7.14 A further 29 BC Act listed fauna species were not recorded within the project study area but were considered to have a medium likelihood of occurrence due to presence of potential habitat. This includes the additional EPBC listed species nominated by DAWE as likely to be impacted by the Project including the Regent Honeyeater, Swift Parrot and Spotted-tail Quoll due to clearing of habitat. In accordance with the requirements of the bilateral agreement, the Department has further considered the impacts on these species in **Appendix H**.

6.7.15 The updated BAR identifies a broad distribution of suitable foraging habitat for these species. Many of these species also conform with ecosystem credit species under the BBAM, and

therefore the calculated credit liability would provide offsets for impacts on this potential habitat.

Koala (Phascolarctos cinereus)

6.7.16 The updated BAR identified that the Project would remove 51.63 ha of Koala habitat. The Koala is listed as a vulnerable species under the EPBC Act and BC Act. Approved Conservation Advice for the Koala identifies loss and fragmentation of habitat, vehicle strike and environmental stressors as key threats to the species. The updated BAR identifies that as a result of these threats the Project is likely to significantly impact Koalas.

6.7.17 During field surveys, individual Koalas were recorded on two separate occasions (August and November 2014) within the proposed disturbance area. There was no evidence of breeding (in the form of females with young) recorded during the survey period, however, Spot Assessment Technique (SAT) surveys indicated that the proposed disturbance area and its immediate surroundings support a low density of Koalas (⩽0.1 Koala per hectare).

6.7.18 Hanson identified that Koala movement likely occurs along a preferred habitat corridor located to the west of the site and along a north-south corridor east of the existing disturbance area. Both corridors are located outside the proposed disturbance area and the BAR concluded that the Project would be unlikely to result in a significant barrier to Koala movement in the wider locality.

6.7.19 Under Council's Comprehensive Koala Plan of Management (CKPoM), the Project area is located in the Western Koala Management Unit (KMU) and contains both 'preferred' and 'marginal' Koala habitat. The proposed disturbance area represents approximately 1 percent of Koala habitat (preferred and marginal) in the Western KMU.

6.7.20 BCD considered that the extent of Koala habitat in the proposed disturbance area may have been over-estimated due to conservative assumptions used in evaluating browse species in each PCT. In its RTS, Hanson advised that the extent of habitat included any vegetation community where:

- the Koala is predicted to occur according to the Threatened Species Profile Database; and
- more than 15 percent of the trees at any SAT location were Koala feed trees listed under Council's CKPoM.

6.7.21 This approach resulted in almost the entire disturbance area being classified as Koala habitat. Hanson advised that this approach was deliberately undertaken to conservatively assess impacts on the Koala, being an important species in the locality.

6.7.22 Hanson has proposed a number of measures to mitigate impacts on the Koala, including:

- undertaking pre-clearance surveys immediately prior to the removal of vegetation;
- commissioning an ecologist to be present during vegetation removal;
- enforcing speed limits on internal haul roads; and
- preparing a Biodiversity Management Plan.

6.7.23 Additionally, Hanson propose to retire 1,342 species credits to offset any residual impacts to the Koala (see **Section 6.7.4**).

6.7.24 Due to the absence of breeding females and the low-density population of Koalas within the Project area, the Department agrees that the updated BAR over-estimates impacts on Koala habitat. The Department notes that the Project could displace individual Koalas whose home-range occurs within the extraction area. However, this is not considered to lead to a significant impact due to the mobilitiy of the species, the sparse populations in the locality and the availability of large areas of suitable habitat within other areas of the site and on surrounding land.

6.7.25 The Department recognises that the purchase of 1,342 Koala species credits fulfils the offset requirements of the NSW Interim Policy and EPBC Act, and would result in a net increase of Koala habitat secured in perpetuity.

6.7.26 Overall, the Department and BCD consider that the Project's impacts on the Koala are acceptable, subject to the recommended management, mitigation and offset requirements.

Grey-headed Flying-fox (Pteropus poliocephalus)

6.7.27 The Project would remove 53.79 ha of suitable foraging habitat for the Grey-headed Flying-fox, which is listed as a vulnerable species under the EPBC Act. Targeted surveys identified one individual during the survey period but no evidence of breeding camps within, or in proximity to, the Project area. However, BCD advised that approximately 23 individuals have previously been recorded within 3.5 km of the Project indicating the presence of the species in the locality.

6.7.28 Key threats to this species include loss of foraging resources around existing camps and decrease in the variety of flowering and fruiting feed trees around existing camps. Although the Project would disturb 53.79 hectares of foraging habitat for the Grey-headed Flying-fox, the BAR concludes that impacts to the species are unlikely to be significant given that:

- there is a large extent of suitable foraging habitat in the locality;
- the species is highly mobile and capable of seeking alternative foraging habitat; and
- no breeding camps were identified on site and the closest camp to the Project area is approximately 12 km away.

6.7.29 On this basis, the updated BAR advised that no species credits are required to be retired. However, ecosystem credits generated from impacts to the associated PCTs would offset the impacts on foraging habitat for this species. BCD agreed with these findings and advised that the correct methodology had been applied to calculate offset liability for this species.

6.7.30 Overall, the Department notes that the Project would not remove habitat critical to the survival of the Grey-headed Flying-fox and considers that the biodiversity offset strategy and the management and mitigation actions required by recommended conditions would result in medium to long-term improvement in the extent and quality of habitat suitable for the species.

Groundwater Dependent Ecosystems

6.7.31 Impacts on Groundwater Dependent Ecosystems (GDE's) were considered in the Hydrogeological Impact Assessment (HIA) in the EIS. The Project area contains a range of terrestrial GDE's that are likely to have a moderate level of groundwater dependence. These include Escarpment Redgum, Ironbark, Moist Foothills Spotted Gum, Rough-barked Apples, Smoothbarked Apple-Sydney Peppermint-Stringybark, South Coast Shrubby Grey Gum and Stringybark-Apple.

6.7.32 The HIA noted that the regional groundwater table at the site is located within low permeability fractured rock, and as such, GDEs on the site are reliant on soil moisture and perched water of the soil/rock interface. On this basis, the HIA concluded that predicted drawdown in the regional groundwater table would be unlikely to affect GDEs.

6.7.33 However, DPIE Water considered that the HIA did not provide clarity on recharge and groundwater flow paths between aquifers on site, creating some uncertainty over potential impacts to GDEs. DPIE Water drew attention to two PCTs (PCT 1598 and PCT 1064) in the study area that may be more reliant on groundwater based on their location within riparian corridors.

6.7.34 Following the establishment of an expanded groundwater monitoring network, DPIE Water recommended the provision of an updated hydrogeological report with explanation and discussion contextualising the sites' hydrogeology relative to the GDEs, as well as a trigger action response plan (TARP) to monitor and respond to any adverse impacts. The Department has recommended these requirements form part of the site's Water Management Plan.

Aquatic Ecosystems

6.7.35 The Project would remove two tributaries of Deadmans and Barties Creeks. Hanson advised that these two tributaries are not subject to consistent groundwater baseflow or spring flow and are not considered to be aquatic habitat. No threatened fish species have previously been recorded or are predicted to occur within the study area, and as such, no targeted aquatic habitat assessment was required.

6.7.36 However, the Project has the potential to alter aquatic in-stream habitat in nearby watercourses, particularly via the disturbance of riparian vegetation and changes in water quality. A visual aquatic habitat assessment (HABSCORE) was undertaken at two locations on Deadmans Creek, adjacent to and downstream of the Project.

6.7.37 Deadmans Creek is a third order stream with ephemeral flows and provides habitat for aquatic species in semi-permanent pools. It is mapped as 'Class 3 – minimal fish habitat' under the *Key Fish Habitat maps: Port Stephens LGA* (DPI 2014b). HABSCORE assessments at the two locations indicated optimal habitat for aquatic flora and fauna.

6.7.38 To mitigate impacts on receiving watercourse, Hanson propose to develop water management actions to control onsite water storages and prevent contaminated discharges to receiving watercourses. Additionally, DoI recommended the Project incorporate a 30-metre buffer between the top of the bank at Deadmans Creek and any areas of disturbance. The Department has recommended a condition to this effect, as well as the preparation of a surface water management plan including regular monitoring of Deadmans Creek as part of the Water Management Plan for the site.

Avoidance and Mitigation Measures

6.7.39 Hanson advised that during initial planning for the Project, the proposed disturbance area was reduced in size from 121 ha to 59.7 ha due to geological constraints and to minimise impacts on biodiversity. Further opportunities to avoid biodiversity impacts are limited due to the location of the resource.

6.7.40 Hanson has committed to mitigate impacts on biodiversity by:

- engaging an ecologist to undertake pre-clearance surveys prior to the removal of any vegetation;
- supervising vegetation clearing by a person suitably qualitied in the capture, management and transport of any displaced fauna;
- implementing a protocol for removing and re-hanging hollow bearing trees;
- maintaining a 30 m buffer between the area of disturbance and Deadmans Creek; and
- implementing appropriate weed and pest management, and erosion and sediment control practices on site.

6.7.41 The Department has recommended a condition requiring Hanson to prepare and implement a Biodiversity Management Plan that incorporates these mitigation measures, as well as other contemporary biodiversity management practices.

Biodiversity Offset Strategy

6.7.42 To offset the residual biodiversity impacts of the Project, Hanson propose to implement a Biodiversity Offset Strategy, including the retirement of 3,096 ecosystem credits for the clearing of native vegetation and associated habitat for threatened flora and fauna habitat, and 1,342 species credits for impacts on Koala habitat, in accordance with the requirements of the BC Act.

6.7.43 Hanson has identified the availability of Tier 1 (ie improve or maintain) offsets for all required credits. Hanson propose to stage the retirement of credits over the life of the Project. The proposed offset stages would correspond to the five stages of extraction and correlate to the biodiversity impacts of each stage. **Table 13** identifies the required amount of credits associated with each PCT, species and offset stage.

6.7.44 Hanson advise that credit retirement would be achieved by purchasing credits off the BioBanking public register, and that the credits identified above reflect available credits at the time of preparing the BAR. Should there be any shortfall in credit availability at the time of purchase, Hanson propose to fulfil its credit obligation via other methods under the BC Act (ie applying credit variation rules, paying into the biodiversity conservation fund or establishing land-based offsets). The Department notes that any deviation from retiring Tier 1 (ie like for like) credits would be subject to the requirements of the Commonwealth EPBC Environmental Offsets Policy, and would be a matter for DAWE to address separately with Hanson if necessary.

6.7.45 The Department considers the proposed staged offset approach to be acceptable, so long as all credits associated with each stage of vegetation removal are retired prior to disturbance. The Department has recommended a condition to this effect, including a note that offsets for MNES must meet Commonwealth offset requirements.

6.7.46 With the commencement of the BC Act on 25 August 2017, the NSW Government released a new Biodiversity Assessment Method which replaces the BBAM used for this Project. As a result, the credit requirements identified above may require conversion to reasonably equivalent biodiversity credits under the BC Act to facilitate retirement under the new legislation. The Department has included a note in the conditions to reflect the policy arrangement. The conversion of credit requirements would not affect the requirement for MNES offsets to be like-for-like.

Table 13 | Proposed biodiversity offset strategy

Credit Type	Area (ha)	Stage 1 (Extraction Stages 1 & 2)	Stage 2 (Extraction Stage 3)	Stage 3 (Extraction Stage 4 & 5)	Credits Required
Ecosystem Credits					
HU814 – Spotted Gum – Red Ironbark – Narrow-leaved Ironbark – Grey Box shrub-grass open forest of the lower Hunter (PCT 1600)	22.26	434	840	7	1,281
HU816 – Spotted Gum – Narrow-leaved Ironbark shrub – grass open forest of the central and lower Hunter (PCT 1602)	25.91	647	440	405	1,492
HU932 – Swamp Mahogany – Flax leaved Paperbark swamp forest on coastal lowlands of the Central Coast* PCT 1718)	0.67	0	0	46	46
HU 806 – Spotted Gum – Red Ironbark – Grey Gum shrub – grass open forest of the Lower Hunter (PCT 1592)	1.12	0	15	48	63
HU812 – Forest Red Gum grassy open forest on floodplains of the Lower Hunter* (PCT1598)	1.67	0	111	0	111
HU798 – White Mahogany – Spotted Gum – Grey Myrtle semi-mesic shrubby open forest of the central and lower Hunter Valley (PCT1584)	2.16	96	7	0	103
Total	53.79	1,177	1,413	506	3,096
Species Credits					
Koala	51.63	488	628	226	1,342

**Vegetation conforms to the definition of an EEC under the BC Act*

Conclusion

6.7.47 The Department considers that the Project has been designed to avoid, mitigate and manage biodiversity impacts where practicable. However, the Project would result in a range of residual impacts on biodiversity, including EECs and threatened fauna species listed under the BC Act and EPBC Act.

6.7.48 The Department has carefully considered these impacts on biodiversity values, and considers that they would be suitably managed, mitigated and/or offset under the recommended

conditions of consent. The Department is confident that the required ecosystem and species credits can be obtained and that the retirement of these credits would sufficiently compensate for residual biodiversity impacts, in accordance with the BC Act. Overall, the Department considers the impacts of the Project on biodiversity, including MNES, are acceptable.

6.8 Rehabilitation

6.8.1 The existing extraction area consists of six unrehabilitated benches and two rehabilitated benches on the uppermost slopes. Under its current operations, Hanson progressively rehabilitates disturbed areas which involves placing stored overburden on completed benches, covering in topsoil and seeding with shrub species.

6.8.2 Several community members raised concern related to the proposed rehabilitation of the quarry, including water quality impacts, groundwater impacts, public safety, rehabilitation objectives, rock bench heights, final void depth, final void use, fauna impacts, erosion and sediment impacts, current rehabilitation data and eco-stability.

6.8.1 Assessment of Impacts

6.8.3 Topography at the site constrains the type of final landform that can be achieved. The approved final landform under the existing consent allows for the rehabilitation of benches above 40 m AHD and a final void for areas below 40 m AHD that would gradually fill with water (see **Figure 13**).

6.8.4 Under the Project, the size and depth of the final void would increase. The void would extend from the northern side of the proposed extraction area (approximately 95 m AHD) to south of the existing processing area (approximately 30 m AHD) and consist of 10 m by 10 m benches. The final void would have a pit floor level -78 m AHD (see **Figure 14**).

6.8.5 The final void would fill with water from rainfall and groundwater seepage to form a slowly developing water storage. It is expected to take 163 years until water in the void reaches the expected equilibrium at approximately 25 m AHD. As depicted in **Figure 15**, the rock bench heights are quite steep and narrow on the south, east and west sides. The upper benches above 30 m AHD would be geotechnically stabilised and graded to ensure free drainage to the sides of the benches.

6.8.6 As the void will take some time to fill, re-vegetation of the rock benches is proposed in the meantime. The Department accepts this approach as an appropriate short to medium-term solution to provide visual amenity, bench stabilisation, erosion and sedimentation control and habitat for flora and fauna. The Department notes that eventually the benches and vegetation below 30 m AHD would be inundated with water.

6.8.7 Hanson advised that the conceptual final land use of the site would be passive biodiversity conservation and water storage. However, the final land use strategy for the site would be evaluated over time, in response to land use preferences of Hanson as the landowner, Council and the local community.

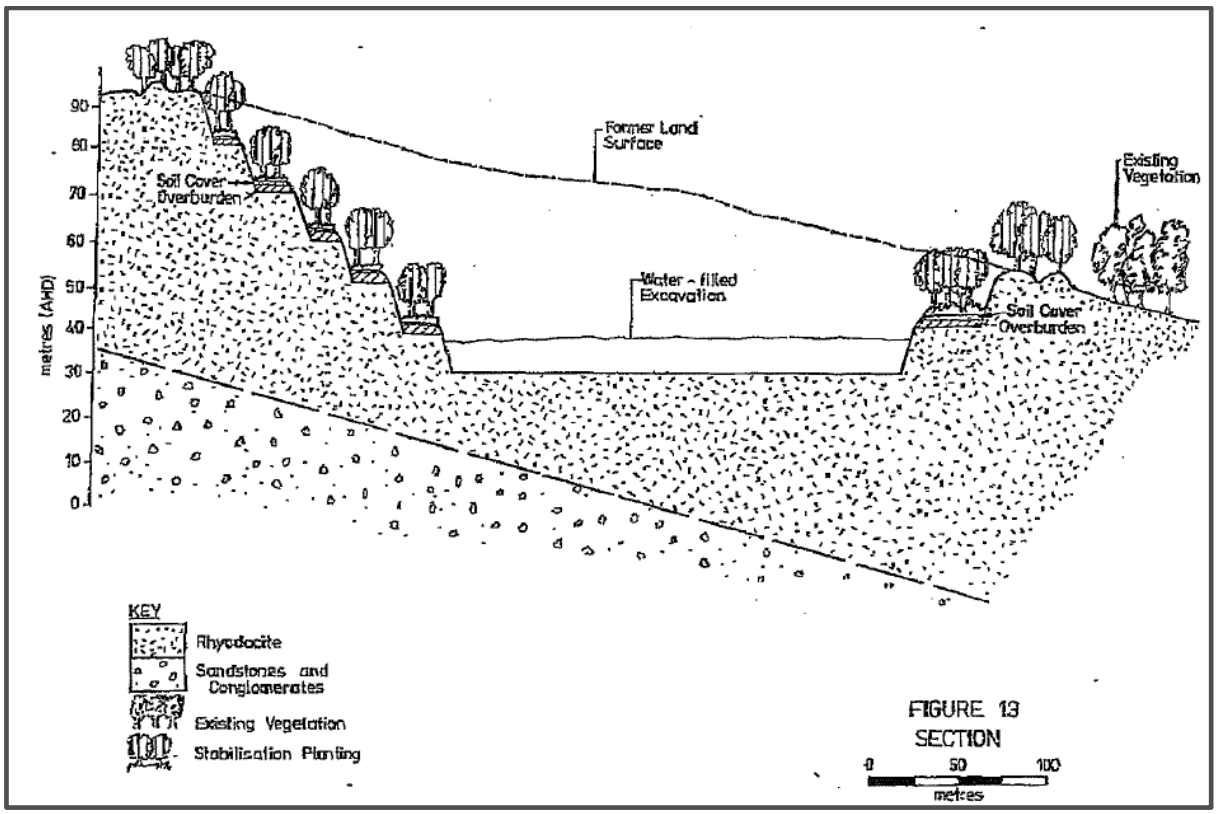

Figure 13 | Existing Final landform under Development Consent 1983/1920

Management and Mitigation

6.8.8 In response to community concerns about the final void, Hanson advised that progressive rehabilitation would be undertaken upon the completion of benches, and that the general objectives of rehabilitation include: ensuring a safe, stable, secure and non-polluting landform, minimising visual impacts and enhancing surrounding biodiversity values.

6.8.9 The Department notes that Hanson's proposed completion criteria, performance indicators and monitoring strategy associated with each objective were qualitative and fairly high level. Fencing of the void is also mentioned in the EIS, however its location, material and height has not been identified. The Department considers that there is room for improvement and elaboration on these measures, and that all short, medium and long-term rehabilitation activities should be appropriately documented and monitored. Council also provided specific recommendations relating to rehabilitation of the site, including Koala feed tree planting, installation of fauna movement structures and onsite speed limits.

6.8.10 The Department has recommended that Hanson prepare Biodiversity and Rehabilitation Management Plan that details specific rehabilitation performance and completion criteria, measures to meet these criteria and a program to monitor, review and report on the effectiveness of these measures. This plan would be prepared in consultation with BCD, DPIE Water and Council and be submitted to the Department for approval prior to the commencement of extraction. The Department notes that this approach is adopted for other large-scale quarries across the State.

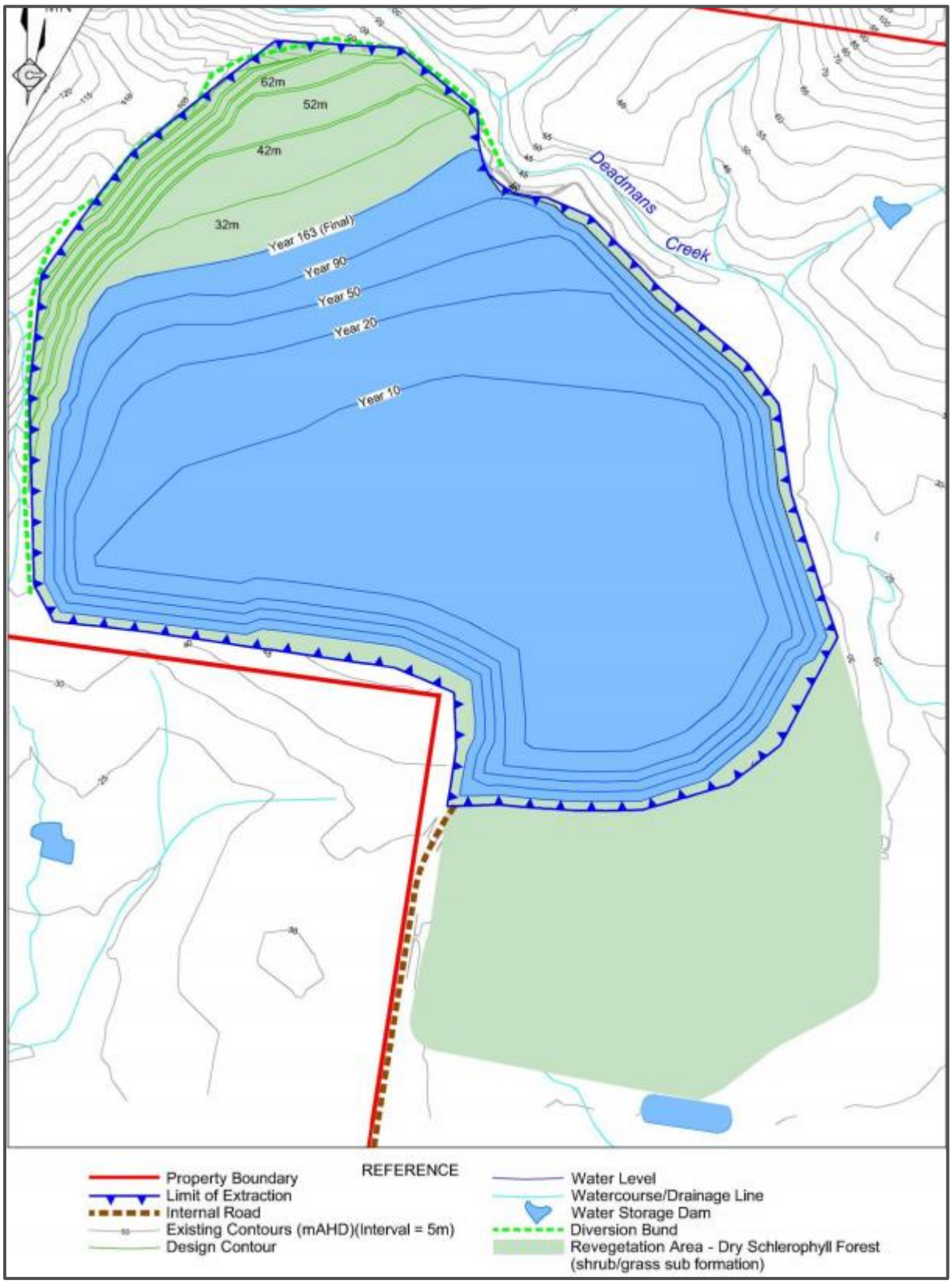

Figure 14 | Final landform

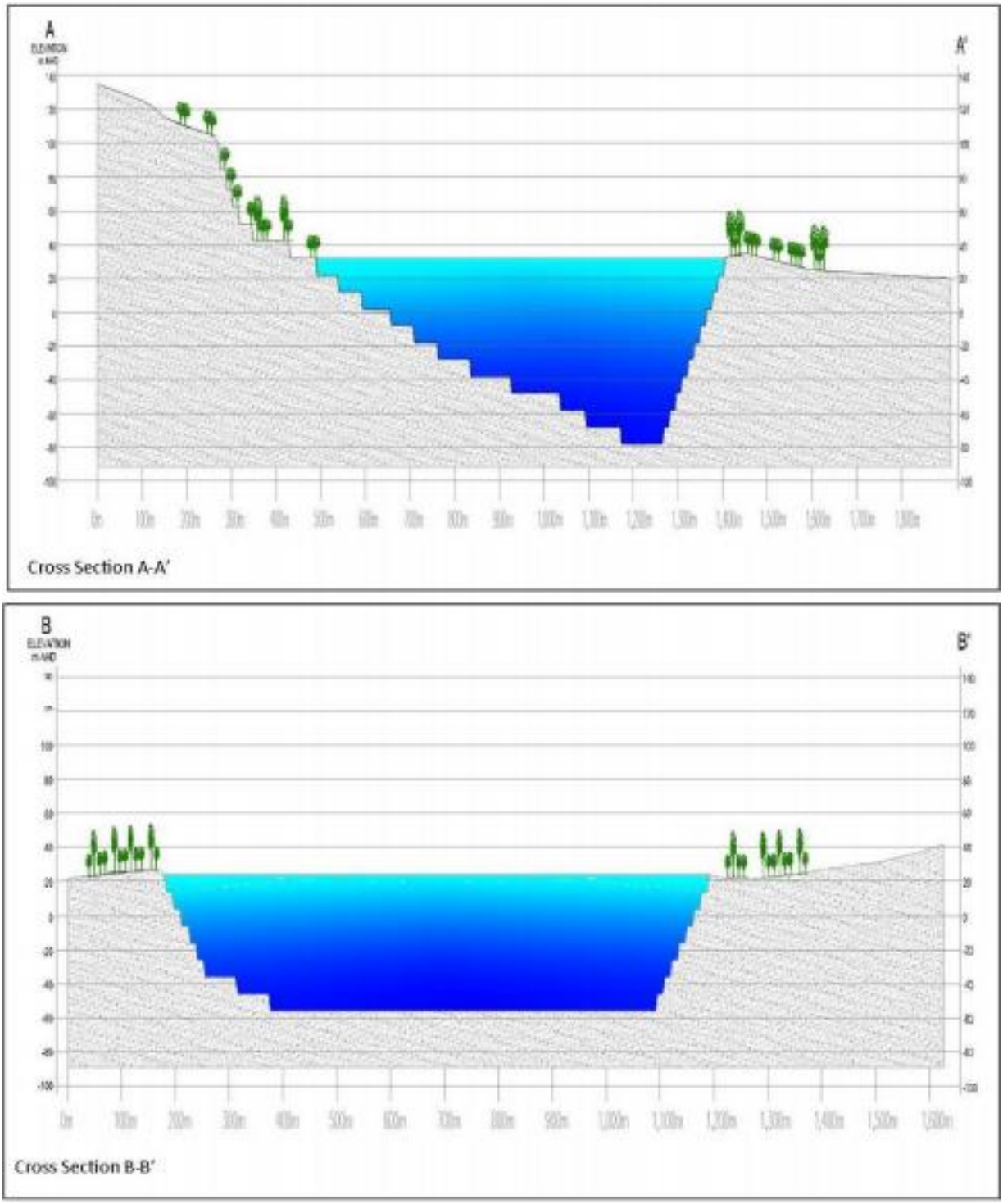

Figure 15 | Final landform water level
Note: Top image is NW to SE, bottom image SW to NE (refer to Applicant's EIS, Appendix 18)

6.8.11 Additionally, the Department has recommended conditions requiring Hanson to lodge a rehabilitation bond with the Department to ensure accumulated and anticipated costs of rehabilitation are available until the rehabilitation completion criteria has been achieved to the satisfaction of the Secretary.

6.8.12 Overall, the Department notes that even if the Project did not proceed a number of changes to the landscape would remain as a result of existing operations, including a final void. The Department recognises that the Project would increase the size and depth of the remaining void, however, subject to the recommended conditions, the Department considers that the Project area could be rehabilitated to achieve sustainable final landform and rehabilitation outcomes.

6.9 Other Issues

6.9.1 The Department considers that the other impacts associated with the Project are likely to be minor. Consideration of these other impacts is provided in **Table 14**, below.

Table 14 | Other Issues

Issue	Findings	Recommended Condition

Visual	• Hanson provided a visual impact assessment (VIA) which considers 12 representative viewing platforms, identifying receivers potentially affected by the project.
	• The VIA assessed visual impacts of Stage 5 of the project and concluded that visual impacts at all identified receivers ranged from very low to moderate.
	• While the natural topography shields views of many receivers, four receivers in the southern area (see Receivers 12, 13/1, 13/2 and 14 in **Figure 9**) are predicted to experience moderate visual impacts. Hanson proposes to mitigate views of the project through:
	  ○ increased planting to enhance screening, as well as replacement of dead trees to enhance vegetation screens; and
	  ○ constructing an 18 - 20 m high vegetated bund to protect receptors to the south.
	• One receiver in the western area (see Receiver 10 in **Figure 9**) would also experience moderate visual impacts. Hanson intends to maintain a vegetation screen between this receiver and the Project.
	• The Department notes that Hanson would progressively rehabilitate the site, which would also reduce the Project's visual impacts.
	• Hanson also proposes to manage lighting by directing lights downwards and away from
		• The Department has recommended conditions requiring Hanson to:
		  ○ minimise the visual impacts of the development; and
		  ○ detail the proposed visual mitigation measures in a Biodiversity and Rehabilitation Management Plan; and
		  ○ integrate the final landform with surrounding natural landforms as far as is reasonable and feasible.

Issue	Findings	Recommended Condition
	vegetation, choosing yellow light and positioning lights to reduce reflection. • Subject to the implementation of the proposed mitigation measures, the Department considers visual impacts of the Project to be acceptable.	
Aboriginal Cultural Heritage	• The EIS included an Aboriginal Cultural Heritage Assessment Report (ACHAR) prepared by Biosis Pty Ltd. • No Aboriginal sites or potential archaeological deposits were identified within or in close proximity to the Project area and it was concluded that there was a low likelihood impacts on Aboriginal cultural heritage. • The ACHAR recommended procedures for if any Aboriginal objects are encountered during the Project and that Hanson should continue to inform Registered Aboriginal Parties about the management of Aboriginal cultural heritage sites within the Project area. • BCD raised no concerns over impacts on Aboriginal cultural heritage and the Department considers potential impacts are low.	• The Department has recommended a condition requiring appropriate procedures to be implemented if unexpected Aboriginal finds are discovered.
Historic Heritage	• A Statement of Heritage Impact was prepared by Biosis Pty Ltd, which concluded that the Project would not impact any local or State listed heritage items. • The Statement of Heritage Impact recommended procedures for if any unexpected relics are encountered during the Project. • Heritage Council recommended these unexpected procedures be adopted as conditions of consent. • The Department considers that the Project's potential impact on historical heritage is low.	• The Department has recommended a condition requiring appropriate procedures to be implemented if unexpected relics are discovered.
Waste	• The Project would generate multiple waste streams, including domestic waste, sewage, oil grease, sediment and concrete washout. • Hanson also propose to receive and process solid concrete waste material which is classified as General Solid Waste (non-putrescible) under EPA's Waste Classification Guidelines. • Hanson advised that: ○ all waste streams would be managed in accordance with its waste management	• The Department has recommended a condition requiring Hanson to: ○ appropriately store, handle and dispose of any waste generated or received on site; ○ receive and manage waste only as permitted under an EPL; and

Issue	Findings	Recommended Condition
	system, which aims to re-use, recycle and reprocess waste in accordance with the *Waste Avoidance and Resource Recovery Act 2001*; ○ it would continue to use its existing effluent and wastewater management system and would undertake any upgrades as requested by EPA; ○ washout of concrete agitators would occur in sealed washout bays and once solidified, washout material would be moved to the concrete recycling area; and ○ stockpiles of concrete waste would be located at least five meters away from hazardous areas, including areas of high velocity water flows such as waterways, paved areas, and driveways. • Some submitters raised concern regarding potential contamination of imported waste material. Hanson advised that waste material would only be imported from Hanson or associated concrete batching plants, and older construction concrete would not be imported to site. • EPA advised that the site's EPL would require a variation to permit the storage and handling of concrete waste material. Hanson noted this requirement. • The Department considers that waste from the Project can be managed with low risk to the environment.	○ detail erosion and sediment control measures in a Surface Water Management Plan.
Hazards	• The Project would involve the storage and use of hazardous materials, including fuel, oils, grease, pre-coating agent, and various gases. • Part of the Project area is also located on bushfire prone land. • To avoid and mitigate contamination risks associated with these substances, Hanson propose to: ○ store hazardous liquid materials in bunded and hard stand areas; ○ undertake regular maintenance, general clean ups, and visual inspections of pre-coat plant areas; and ○ manage any emergencies or spills in accordance with the site's Pollution Incident Response Management Plan and Emergency Site Plan.	• The Department has recommended a condition requiring Hanson to: ○ store, handle and transport dangerous goods in accordance with Australian Standards and *The Australian Dangerous Goods Code*; ○ provide for asset protection in accordance with *Planning for Bushfire Protection 2006*; and ○ ensure that there is suitable equipment to respond to any fires on the site.

Issue	Findings	Recommended Condition
	• Hanson advised it would continue to manage bushfire risk in accordance with *Planning for Bush Fire Protection 2006*, and in consultation with RFS. • The Department considers that the risk of hazards could be managed through existing procedures and conditions of consent.	

Economic	• The Project would facilitate a range of economic benefits, including:
	  ○ continued employment for 20 full time equivalent (FTE) workers;
	  ○ an additional 10 FTE positions during peak production; and
	  ○ indirect employment and flow on effects to local suppliers.
	• However, a key economic benefit of the Project would be the continued supply of construction materials to facilitate infrastructure development in the Sydney, Central Coast and Hunter regions.
		• N/A

7 Evaluation

7.1.1 The Department has carried out an assessment of the merits of the Project, having regard to relevant statutory obligations, all information provided by the Applicant, NSW government agencies, and members of the public and special interest groups.

7.1.2 The Project would facilitate an ongoing supply of important hard rock aggregates to the construction industry, employment for up to 31 FTE workers and local infrastructure for the Port Stephens LGA through a VPA. However, the Project has the potential to adversely impact the surrounding environment without appropriate limitations and management measures in place. As such, the Department considers that the Project is approvable, subject to the recommended conditions of consent.

7.1.3 The Department does not support the proposed hours of operation for processing and transport due to adverse impacts on local amenity through the evening and night time periods, noting the extensive rural residential development that has been established around the quarry since it was originally approved in 1983. The Department has recommended a number of conditions designed to protect local amenity including:

- quarry operating hours to remain predominantly during the day period (ie 6:00 am to 6:00 pm) with the exception of:
  - limited early morning product transport;
  - limited processing (secondary and tertiary screening only) operations till 8:00 pm Monday to Friday; and
  - evening product transport on up to 20 nights per year calendar year;
- a designated primary and secondary haulage route; and
- stringent noise and transport operating and management conditions.

7.1.4 Whilst the recommended operating hours would limit the quarry's ability to achieve a maximum production limit of 1.5 Mtpa, the Department considers that these conditions strike an appropriate balance between meeting the strategic demand for construction materials and protecting the local environment and the amenity of the local community in which the quarry operates.

7.1.5 The Department's assessment indicates that the crushing activities are a key source of potential amenity impacts on the local community, and that processing on the secondary/ tertiary circuit should be restricted to 8:00 pm Monday to Friday, rather than operating through the entire evening/ night period as proposed by Hanson.

7.1.6 Hanson has agreed to enter into a VPA with Council, which would see the delivery of six additional bus bays along Brandy Hill Drive and Seaham Road, and contribute towards the construction of a shared pathway along Brandy Hill Drive. The Department considers that this infrastructure would significantly improve safety and accessibility along Brandy Hill Drive and result in a positive long-term outcome for the local community. This infrastructure would be additional to road maintenance contributions to be paid in accordance with the relevant Council contributions plan.

7.1.7 The Project would result in increased noise and dust emissions and increased blasting at the site. However, no exceedances of air quality, ground vibration or airblast overpressure or ground vibration criteria are predicted. The noise impact assessment predicted minor (up to

2dB) exceedances of the project specific noise limits at 5 receivers. The Department considers that these impacts could be appropriately managed under conditions of consent and has recommended strict operating, management and monitoring procedures to be in place prior to the commencement of the Project.

7.1.8 The Department considers that the Project's impacts on biodiversity, including MNES, are acceptable, subject to the recommended conditions. This includes the retirement of 3,096 ecosystem credits and 1,342 species credits that would result in a net improvement of biodiversity values in the medium to long-term. The Department also considers that the Project's impacts on water resources could be managed to avoid any material environmental impact on the receiving environment and downstream users.

7.1.9 Lastly, the Project would increase the size and depth of the remaining void at the site. The Department notes that topography at the site constrains the type of final landform that can be achieved, however, subject to the recommended conditions, the Department considers that the Project area could be rehabilitated to achieve sustainable final landform and rehabilitation outcomes.

7.1.10 The Department notes that the quarry has nearly exhausted the resource in its approved extraction area and that it is an important source of construction material in the region. The Department has recommended conditions that would allow continued operations with an increase in the annual extraction rate, but would provide additional protection for the amenity of the rural residential receivers around the quarry during the sensitive evening and night periods.

7.1.11 Overall, the Department considers that the benefits of the Project outweigh its residual costs, that the Project is in the public interest and is approvable, subject to the strict conditions of consent.

7.1.12 This assessment report is hereby presented to the Independent Planning Commission to determine the application.

15/5/20

Genevieve Lucas

Team Leader

Resources Assessments

15/5/20

Steve O'Donoghue

Director

Resource Assessments

15/5/20

Mike Young

Executive Director

Energy, Resources and Compliance

Appendices

Appendix A – List of referenced documents

Brandy Hill Quarry Expansion Project – Environmental Impact Statement, Hanson Construction Materials Pty Ltd, February 2017

Brandy Hill Quarry Expansion Project – Response to Submissions, R.W. Corkery & Co Pty Limited, October 2018

Brandy Hill Quarry Expansion Project – Amended Response to Submissions, R.W. Corkery & Co Pty Limited, September 2019

Additional Information

Targeted Survey Letter – R.W. Corkery & Co Pty Limited, November 2019

Targeted Survey – Biosis Pty Ltd, November 2019

Letter of Acceptance – Planning Agreement, 3P Planning Services, March 2020

Letter re: Draft Brandy Hill Quarry Expansion Project Draft Conditions, R.W. Corkery & Co Pty Limited, 28 April 2020

Letter re: Draft Brandy Hill Quarry Expansion Project Draft Conditions, R.W. Corkery & Co Pty Limited, 11 May 2020

Letter re: Draft Brandy Hill Quarry Expansion Project Draft Conditions, Hanson Construction Materials Pty Ltd, 14 May 2020

Appendix B - Environmental Impact Statement

https://www.planningportal.nsw.gov.au/major-projects/project/10056

Appendix C – Submissions and Additional Representations

https://www.planningportal.nsw.gov.au/major-projects/project/10056

Appendix D – Response to Submissions (October 2018)

https://www.planningportal.nsw.gov.au/major-projects/project/10056

Appendix E – Amended Response to Submissions (September 2019) and Additional Information

https://www.planningportal.nsw.gov.au/major-projects/project/10056

Appendix F – BCD Assessment of EPBC Act listed threatened species and communities

https://www.planningportal.nsw.gov.au/major-projects/project/10056

Appendix G - Statutory Considerations

The Department's assessment of the Project has given detailed consideration to the applicable statutory requirements. A summary of these considerations is provided below.

E1 Ecological Sustainable Development

The EP&A Act adopts the definition of ESD found in the *Protection of the Environment Administration Act 1991*, as follows:
"ecological sustainable development requires the effective integration of economic and environmental considerations in decision-making processes. Ecologically sustainable development can be achieved through the implementation of the following principles and programs:

a) the precautionary principle;

b) inter-generational equity;

c) conservation of biological diversity and ecological integrity; and

d) improved valuation, pricing and incentive mechanisms."

The Department has considered the principles and programs of ESD, as follows:

Precautionary Principle

The Department has assessed the Project's threat of serious or irreversible environmental damage and considers that there is sufficient scientific certainty to enable the determination of the application. The Department has carefully considered the information provided by Hanson in support of the Project and has consulted closely with key government agencies to obtain expert advice regarding the Project's potential impacts.

The Project would result in a number of environmental impacts of varying significance. However, the key matters that could cause serious or irreversible environmental damage relate to unmitigated impacts on biodiversity values and impacts on water resources.

The Project footprint is constrained by the location of the hard rock resource, however, it has been designed to avoid impacts as far as practical. Hanson has proposed to implement a Biodiversity and Rehabilitation Management Plan that documents procedures to mitigate impacts the Project's impacts on biodiversity. This plan would include management measures for salvaging hollow bearing trees, minimising impacts on fauna during vegetation clearing, and controlling weeds, pests and erosion. Hanson also propose to retire 3,096 ecosystem credits and 1,342 species credits to offset residual biodiversity impacts.

The Project would need to be operated in accordance with strict conditions of consent, as well as any necessary licences and approvals related to the take, management and discharge of water. The Department has also recommended a condition requiring Hanson to adjust the scale of operations to match available water supply.

The Department considers that the recommended risk-based conditions and performance measures would provide appropriate protection for the environmental and minimise the potential for any serious or irreversible environmental damage.

Intergenerational Equity

The Department acknowledges that diesel fuels and other fossil fuel combustion is a contributor to climate change, which has the potential to impact future generations. However, the Department notes

that the Project's direct energy use and greenhouse gas emissions would constitute a very small contribution towards climate change at both the national and global scale.

Conservation of Biological Diversity and Ecological Integrity

The Project's potential impacts on biodiversity have been a key consideration in the Department's assessment of the Project. As outlined in **Section 6.7**, the Department considers that these impacts can be mitigated and/or offset to achieve beneficial long-term biodiversity outcomes in the region.

Improved Valuation, Pricing and Incentive Mechanisms

Information provided by Hanson in support of the Project (ie the EIS, RTS, Amended RTS and additional information) has sought to identify and quantify the Project's costs and benefits based on its full range of environmental, social and economic impacts. The Department has carefully considered these matters and believes that the Project would geneate a net benefit to NSW and the regional economy.

E2 Environmental Planning Instruments

Under section 4.15 of the EP&A Act, the consent authority is required to consider, amongst other things, the provisions of the relevant EPI's, including any exhibited draft EPIs and development control plans. The Department notes Hanson's consideration of these instruments in its EIS and has undertaken its own consideration of the Project against the applicable provisions of relevant EPI's.

SEPP (Mining, Petroleum Production and Extractive Industry) 2007

Clause 7(3) of the Mining SEPP identifies that extractive industry is permissible with consent on any land where development for the purpose of agriculture or industry may be carried out (with or without development consent). Under the Port Stephens LEP, development for the purpose of extractive industries is permitted with consent in areas zoned RU2.

Clause 7(4) identifies that where extractive industry is being carried out with development consent, the following development may also be carried out:

(a) the processing of extractive material;

(b) the processing of construction and demolition waste or of other material that is to be used as a substitute for extractive material;

(c) facilities for the processing or transport of extractive material; and

(d) concrete works that produce only pre-mixed concrete or bitumen pre-mix or hot-mix.

The Department considers that the Project, including the proposed concrete batching and recycling activities, is permissible with consent under the Mining SEPP, and the IPC may determine the application accordingly.

In addition, Part 3 of the Mining SEPP lists a number of matters that a consent authority must consider before determining an application for consent for development for the purposes of an extractive industry. The Department has considered these matters in its assessment of the Project and has included a summary of these considerations below.

Compatibility with other land uses (clause 12)

The Department's assessment has considered the potential impacts of the Project on other land uses in the area, including nearby residential and agricultural land uses. The Department has considered the potential noise, air quality and visual impacts at nearby private residences, as well as the potential impacts on downstream water users. This consideration has been undertaken in consideration of the

public benefits of the Project and measures to avoid, mitigate and minimise any land use incompatibility.

Overall, the Department considers that, subject to appropriate conditions, including appropriate hours of operation and environmental performance measures, the Project could be managed to minimise any potential land use conflicts and meet the aims, objectives and provisions of clause 12.

Voluntary Land Acquisition and Mitigation Policy (clause 12A)

The Department's assessment has considered the NSW Government's *Voluntary Land Acquisition and Mitigation Policy*. With respect to air quality and noise impacts, this assessment concluded that the Project could be managed to minimise Project-related and amenity impacts at surrounding private properties and does trigger any voluntary mitigation or acquisition rights.

Natural Resource Management and Environmental Management (clause 14)

The Department has recommended a number of conditions aimed at ensuring that the Project is undertaken in an environmentally responsible, including conditions relating to the appropriate management of biodiversity, air quality and water resources.

Resource Recovery (clause 15)

The Department has considered resource recovery in its assessment of the Project, and considers that the Project can be carried out in an efficient manner that optimises resource recovery within environmental constraints. The Department notes that the concrete waste recycling would facilitate the reuse of concrete washout material.

The Department has recommended conditions requiring Hanson to implement reasonable and feasible measures to minimise waste and maximise the salvage and re-use of resources within the disturbance area (including water, top soil and habitat resources).

Transport (clause 16)

After receiving the application for the Project, the Department notified and consulted with the relevant road authorities (TfNSW, Port Stephens and Maitland City Council). The Department has considered the advice from these authorities in its assessment of the Project.

The Department's assessment of the Project's traffic-related impacts is detailed in **Section 6**. Upon the evaluation of potential traffic, road noise and social impacts, the Department has recommended conditions to limit product transport movements during the early morning period and prohibit product transport during the night.

Rehabilitation (clause 17)

Overall, the Department considers that the proposed final landform is acceptable, subject to conditions requiring ongoing management, monitoring and contingency measures. The Department has also recommended a number of conditions requiring Hanson to implement reasonable and feasible measure to minimise waste and maximise the salvage and re-use of resources within the disturbance area (including water, soils and vegetative resources).

SEPP (Infrastructure) 2007 (Infrastructure SEPP)

The Infrastructure SEPP requires the consent authority to notify relevant public authorities about development that may affect public infrastructure or land. The Department notified RMS, Transport for NSW and both Port Stephens and Maitland City Councils, particularly in relation to the Project's proposed traffic generation on the road network. The Department carefully considered the advice from these authorities in its assessment of this application.

SEPP (State and Regional Development) 2011

The project is declared to be SSD under section 4.36 of the EP&A Act as it triggers the criteria in clause 7 of Schedule 1 to *SEPP (State and Regional Development) 2011*, as it is development for the purposes of extractive industry that extracts more than 500,000 tonnes of material per annum from a total resource of more than 5 million tonnes.

In accordance with section 4.5 of the EP&A Act and clause 8A(1) of *SEPP (State and Regional Development) 2011*, the Independent Planning Commission of NSW (IPCN) is the consent authority and must determine the application, as more than 25 public submissions in the nature of objection were received.

SEPP No. 33 – Hazardous and Offensive Development

The EIS has considered the potential hazards and risks associated with the Project, including the storage of hazardous goods, potential for fire and/or explosion and contamination of land, water and air. These hazards and risks would be

SEPP Koala Habitat Protection (2019)

See the Department's consideration in **Sections 4.5** and **6.7**.

SEPP No. 55 – Remediation of Land

The Department considers that the Project area does not have a significant risk of contamination given its historical and current land uses, and that the development is generally consistent with the aims, objectives and provisions of SEPP 55.

Port Stephens Local Environment Plan

The Department has analysed the permissibility of the proposed development under the Port Stephens LEP.

The quarry site is zoned RU2 (Rural Landscape) and E3 (Environmental Management) under the *Port Stephens Local Environmental Plan 2013* (Port Stephens LEP). Development for the purpose of extractive industries is permitted with consent in areas zoned RU2 but is prohibited in areas zoned E3. No development is proposed to occur in areas of the site zoned E3.

Appendix H – Consideration of Matters of National Environmental Significance

In accordance with the Bilateral Agreement between the Commonwealth and NSW Governments, the Department provides the following additional information required by the Commonwealth Minister, in deciding whether or not to approve the proposal under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). This assessment is supplementary to, and should be read in conjunction with the assessment contained within **Section 6.7** of this report and BCD's assessment of EPBC listed species in **Appendix F**.

In its referral decision the Commonwealth determined that the project is a controlled action in that the proposed action is likely to have a significant impact on five listed MNES including the Koala, Grey-headed Flying-fox, Spotted-tail Quoll, Swift Parrot, Regent Honeyeater. Consideration of impacts on the Koala and Grey-headed Flying fox is provided in **Section 6.7**. Consideration of other identified MNES is provided below.

It should be noted that since the referral decision was made, Hanson revised the Project's proposed disturbance footprint to include vegetation clearing associated with an amenity bund proposed to be constructed on the southern boundary of the site. The inclusion of this amenity bund increased the proposed disturbance footprint by approximately 5 ha (ie from 48.62 to 53.79). The Department's assessment of MNES has considered this extended disturbance footprint.

Spotted-tail Quoll (Dasyurus maculatus)

The Spotted-tail Quoll is a marsupial carnivore endemic to eastern Australia and is listed as an endangered species under the EPBC Act. Spotted-tail Quolls are recorded across a range of habitat including open forest, woodland and coastal heath, and use hollow-bearing trees, fallen logs, caves and rock outcrops as den sites.

The Project would remove 53.79 ha of potential foraging habitat and habitat features for this species. Additionally, the Project has the potential to indirectly disrupt foraging patterns, den sites and nocturnal cycles through increased noise, vibration, light, and erosion and sedimentation.

The updated BAR advised that within NSW, there are several populations of the Spotted-tail Quoll that are of particular importance. The closest of these populations is located 20 km north east of the Project area. No Spotted-tail Quolls were recorded during targeted surveys and the BAR concludes that, despite the potential foraging habitat, the species was unlikely to impacted at a national, State or local scale due to the large areas of available habitat in the region. BCD agreed with these findings.

Hanson acknowledged that hollow-bearing trees within the study area could provide potential breeding habitat for this species. Accordingly, Hanson propose to implement a protocol for removing, rehanging, monitoring and maintaining hollows which would be further detailed in a Biodiversity and Rehabilitation Management Plan. Additionally, Hanson propose to offset the residual impacts to this species by retiring ecosystem credits (see **Section 6.7**).

There is no Approved Conservation Advice for this species. However, the National Recovery Plan sets a number of objectives and actions to reduce population decline including securing habitat on private land in perpetuity, maintain and restore habitat corridors and management actions to reduce predation. Hanson's proposed mitigation and offset measures are consistent with these objectives would result in medium to long term improvement in the extent and quality of habitat suitable for the species.

BCD advised that the updated BAR adequately addresses impacts on MNES and the Department agrees that the Project would not result in unacceptable impacts on the Spotted-tailed Quoll, particularly due to the:

- absence of an important population within or in proximity to the site;
- highly mobile nature of the species;
- availability of alternative foraging habitat within the locality; and
- offsetting the removal of habitat through retirement of ecosystem credits.

Swift Parrot (Lathamus discolour) and Regent Honeyeater (Anthochaera phrygia)

The Swift Parrot and Regent Honeyeater are listed as critically endangered species under the EPBC Act. Swift Parrots breed in Tasmania during the summer and migrate north to mainland Australia in winter. They forage in forests and woodland communities throughout coastal and western slope regions. The Regent Honeyeater is endemic to mainland south-eastern Australia and is commonly associated with box-ironbark eucalypt woodland and dry sclerophyll forest.

The Project would remove 53.79 ha of potential foraging habitat for both of these species. Additionally, increased noise, vibration and light pollution on the boundaries of the subject land has the potential to indirectly disturb roosting and feeding behaviour of the species in the area.

Hanson undertook targeted surveys across the Project area during August and November 2014. No sightings of Swift Parrots or Regent Honeyeaters or breeding habitat were recorded within the Project area. However, both species are known to occur within the broader region and have been sighted approximately 5 km from the site.

Loss and degradation of nesting and foraging habitat are identified as key threats in the approved national Conservation Advice and Recovery Plans for these species. Key objectives for the recovery of these species are to prevent and reverse long-term population decline and enhance the condition of habitat to increase carrying capacity.

Whilst the Project would clear potential foraging habitat for these species, the updated BAR advises that the severity of impacts would be minimal as:

- both species have not been recorded in the Project area;
- both species are highly mobile and are capable for seeking alternative foraging habitat in the surrounding locality;
- more extensive areas of suitable foraging habitat exist within the wider locality; and
- the Project would not disturb key populations or important breeding habitat for either species.

BCD advised that the updated BAR adequately addresses impacts on MNES. The Department agrees with these findings and considers that residual impacts to these species would be adequately offset through the retirement of ecosystem credits (see **Section 6.7**). On this basis, the Department considers the Project's impacts on these species are acceptable.

Table G1 below provides a summary of the impacts on MNES and proposed offsetting mechanisms.

Table G1 | *Summary of Impacts and Offset Mechanisms - EPBC Listed Species*

Species	Impact (ha)	Credits[1]	Offsetting Approach
Koala	51.63	1,342 species credits	Staged retirement (three stages) of species credits with retirement of credits prior to commencing each stage. Credits to be retired by: - acquiring like for like BBAM credits available in existing Biobanking Sites; - acquiring and retiring credits in land-based offsets in accordance with the rules of the Biodiversity Offsets Scheme, with conversion of BBAM credits to BAM credits using the reasonably equivalent provisions of the BC Act. - payment into Biodiversity Conservation Fund (BCF) for any residual credits.
Grey-headed Flying Fox **Spotted-tailed Quoll** **Regent Honeyeater** **Swift Parrot**	53.79 ha	3,096 ecosystem credits	Staged retirement (three stages) of ecosystem credits with retirement of credits prior to commencing each stage. Credits to be retired by: - acquiring like for like BBAM credits available in existing Biobanking Sites; - acquiring and retiring like-for-like credits in land-based offsets in accordance with the rules of the Biodiversity Offsets Scheme, with conversion of BBAM credits to BAM credits using the reasonably equivalent provisions of the BC Act. - payment into Biodiversity Conservation Fund (BCF) for any like-for-like residual credits.

Notes

1: Credits determined using the Biobanking Assessment Methodology (BBAM) calculator

G.1 Requirements for Decisions About Threatened Species and Endangered Ecological Communities

In accordance with section 139 of the EPBC Act, in deciding whether or not to approve, for the purposes of section 18 or section 18A of the EPBC Act, the taking of an action and what conditions to attach to such an approval, the Commonwealth Minister must not act inconsistently with certain international environmental obligations, Recovery Plans or Threat Abatement Plans. The Commonwealth Minister must also have regard to relevant Approved Conservation Advice for any of the listed species.

G.1.1 Australia's International Obligations

Australia's obligations under the *Convention on Biological Diversity* (Biodiversity Convention) include the conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilisation of genetic resources, including by appropriate access to genetic resources and by appropriate transfer of relevant technologies, taking into account all rights over those resources and to technologies, and by appropriate funding. The recommendations in the Department's Assessment Report are not inconsistent with the Biodiversity Convention, which promotes environmental impact assessment (such as this process) to avoid and

minimise adverse impacts on biological diversity. The recommended approval requires avoidance, mitigation and management measures, and offsetting for listed threatened species and communities. All information related to the proposed action is required to be publicly available to ensure equitable sharing of information and improved knowledge relating to biodiversity.

Australia's obligations under the *Convention on Conservation of Nature in the South Pacific* (Apia Convention) include encouraging the creation of protected areas which together with existing protected areas will safeguard representative samples of the natural ecosystems occurring therein (particular attention being given to endangered species), as well as superlative scenery, striking geological formations and regions. Additional obligations include signatories using their best endeavours to protect such fauna and flora (special attention being given to migratory species) so as to safeguard them from unwise exploitation and other threats that may lead to their extinction. While the Apia Convention was suspended with effect from 13 September 2006, Australia's obligations under the Convention have been taken into consideration. The recommendations are not inconsistent with the Convention, which has the general aim of conservation of biodiversity.

The *Convention on International Trade in Endangered Species of Wild Fauna and Flora* (CITES) is an international agreement between governments which seeks to ensure that international trade in specimens of wild animals and plants does not threaten their survival. The recommendations are not inconsistent with CITES as the proposed action does not involve international trade in specimens of wild animals or plants.

G.1.2 Recovery Plans and Approved Conservation Advices

Approved Conservation Advice (including listing advice) for *Phascolarctos cinereus*

Approved Conservation Advice for the Koala was adopted in April 2012. The Advice identifies key threats to the species as loss and fragmentation of habitat, vehicle strike, disease, and predation by dogs.

The Advice also identified a number of priority management actions for the species, some of which include implementing protocols to prevent loss of important habitat, populations or connectivity options, mitigating vehicle strike where development occurs, monitoring progress of recovery and management actions and investigating formal conservation arrangements on private land.

The Project would disturb approximately 53 ha of Koala habitat. However, it has been concluded that the removal of this habitat would have minimal impact on the Koala population and would not affect connectivity within the region. The Department has recommended that mitigation and recovery measures are implemented via a Biodiversity and Rehabilitation Management Plan, including measures to mitigate vehicle strikes and rehabilitate the site with Koala tree species.

Additionally, Hanson would be required to retire species credits to offset the loss of Koala habitat, which would result in conservation of Koala habitat in perpetuity.

On this basis, the Department considers the Project would not be inconsistent with the Approved Conservation Advice.

National Recovery Plan and Approved Conservation Advice for the Regent Honeyeater

The National Recovery Plan for the Regent Honeyeater was adopted in April 2016, as a revision of the 1999-2003 Recovery Plan. It advises that a major cause of long-term decline of the species is clearing and fragmentation of foraging habitat. The objectives of this plan are to:

- reverse the long-term population trend of decline and increase the numbers of Regent Honeyeaters to a level where there is a viable, wild breeding population, even in poor breeding years; and
- enhance the condition of habitat across Regent Honeyeaters that maximises survival and reproductive success, and provides refugee during periods of extreme environmental fluctuation.

The Conservation Advice for the Regent Honeyeater was approved by the Commonwealth Minister on 25 June 2015. The Advice includes information on the distribution, biology, and threats to the species' decline. Key conversation and management actions listed in this advice are to:

- improve the extent and quality of regent honeyeater habitat;
- bolster the wild population with captive-bred birds until the wild population becomes self sustaining; and
- maintain and increase community awareness, understanding and involvement in the recovery program.

The Project would remove approximately 53 ha of potential foraging for this species. However, the Project would not disturb key populations or important breeding habitat for this species and proposed offset strategy would result in protection of foraging habitat for this species in perpetuity. On this basis, the Department considers the Project would not be inconsistent with the National Recovery Plan and Approved Conservation Advice for this species.

National Recovery Plan and Approved Conservation Advice for the Swift Parrot

The National Recovery Plan for the Swift Parrot was adopted in February 2012. The Recovery Plan provides information on habitat requirements, ecology, distribution, conservation status, key threats, management issues, research and monitoring, captive breeding and translocation, and community education. The objectives of the plan are to:

- prevent further decline of the Swift Parrot population; and
- achieve a demonstratable sustained improvement in the quality and quantity of Swift Parrot habitat to increase carrying capacity.

The Conservation Advice for the Swift Parrot was approved by the Commonwealth Minister on 5 May 2016 and identifies the main threats as loss/alteration of habitat and predation from Sugar Gliders. The primary conservation action for the species is to prevent further habitat destruction in high quality nesting and breeding habitat. The Advice also identifies a number of priority actions that could be implemented to support the recovery of the species, which include:

- installing nest boxes suitable for swift parrots in areas of low sugar glider predation to enhance breeding success; and
- encourage and support the protection, conservation management and restoration of swift parrot nesting and foraging habitat through agreements with landowners, incentive programs and community projects.

The Project would remove approximately 53 ha of potential foraging habitat for this species. The Department considers that the Project has been designed to minimise the impacts on the Swift Parrot to the greatest extent practicable, and that the residual impacts would be suitably offset in accordance with the NSW Interim Policy. The Department notes that the proposed offset strategy would result in protection of foraging habitat for this species in perpetuity. The Department has also recommended conditions requiring the installation of nest boxes and other fauna habitat features within other areas of the Project site.

Subject to these recommendations, the Department considers that the Project would not be inconsistent with the Recovery Plan and Conservation Advice.

National Recovery Plan for the Spotted-tailed Quoll

A National Recovery Plan for the Spotted-tailed Quoll was adopted in 2016. The Recovery Plan provides information on species distribution, habitat, conservation status, threats, recovery objectives and actions necessary to ensure long-term survival of the species.

The Advice identifies that major threats to the species are habitat loss, modification and fragmentation; timber harvesting; poison baiting; competition and predation from introduced carnivores; deliberate killing; road mortality; bushfire and prescribed burning, poisoning by Cane Toads; and climate change. The strategy for recovery focuses on reducing the impact of threatening processes to stop the decline in distribution and abundance.

The Department has considered the objectives and actions of the Recovery Plan, particularly Action 3.2 – Maintain and restore habitat corridors on unprotected freehold land. The Project would remove approximately 53 ha of potential foraging habitat for this species. However, no species were recorded during targeted surveys and the Department considers that the species is unlikely to be impacted at a national, State or local scale due to the large areas of available habitat in the region. The proposed offset strategy would result in the protection of foraging habitat for this species in perpetuity and the Department has recommended the rehanging of hollow bearing trees in other areas of the site to support potential breeding habitat.

Subject to these recommendations, the Department considers that the Project would not be inconsistent with the Recovery Plan for this species.

Grey-headed Flying-fox

There is no approved Conservation Advice or adopted Recovery Plan for the Grey-headed Flying-fox.

G.1.3 Threat Abatement Plans

The Department has considered the approved Threat Abatement Plans (TAPs) under the EPBC Act, available at http://www.environment.gov.au/biodiversity/threatened/threat-abatement-plans/approved, along with any current draft revisions to these plans. The relevant TAPs are set out below.

Threat abatement plans for competition and land degradation by rabbits (relevant to Regent Honeyeater), predation by the European Red Fox (relevant to Spotted-tailed Quoll) and predation by feral cats (relevant to Spotted-tailed Quoll and Swift Parrot)

Rabbits have direct impacts on native flora and fauna, including from grazing on native vegetation, preventing regeneration and competing with native fauna for habitat and food. Rabbits can also have indirect and secondary effects on the predation of native fauna, for instance by supporting populations of introduced predators or by denuding vegetation and thereby exposing fauna species to increased predation. The ecology of rabbits, including digging and browsing habits, leads to a loss of vegetation cover and consequent slope instability and soil erosion, which further degrades fauna habitat.

The European red fox and feral cats are significant predators in Australia that interact with native fauna in various ways, including predation, competition for resources and transmission of disease.

In relation to the threat abatement plans for competition and land degradation by rabbits and predation by the European Red Fox and feral cats, it is possible that the proposed action may:

- facilitate the spread, or lead to a higher abundance of foxes and feral cats (and other unmanaged or feral fauna) through the clearance and modification of habitat; and
- increase the amount of disturbed and modified habitats, which rabbits tend to colonise, and lead to an increase in rabbit populations.

The Department has included measures for the control of feral animals under the recommended Biodiversity and Rehabilitation Management Plan for the Project, including specific requirements for the Applicant to consider the actions identified in relevant TAPs. With these measures in place, the Department is satisfied that approval of the action would not be inconsistent with the TAPs for competition and land degradation by rabbits and for predation by the European Red Fox and feral cats.

G.2 Additional EPBC Act Considerations

Table G2 contains the additional mandatory considerations, factors to be taken into account and factors to have regard to under the Act, additional to those already discussed, which the Commonwealth Minister must consider in determining the proposed action.

Table G2 | Additional Considerations for the Commonwealth Minister under the EPBC Act

EPBC Act section	Consideration	Conclusion
Mandatory considerations		
136(1)(b)	Social and economic matters are discussed in the EIS and Sections 6.5 of the Department's Assessment Report.	The Department considers that the Project would result in a range of benefits for the local and regional economy and would facilitate efficient recovery of an important hard rock resource.
Factors to be taken into account		
136(2)(a)	Principles of ecologically sustainable development (ESD), including the precautionary principle, have been taken into account, in particular in: • long and short-term economic, environmental, social and equity considerations relevant to this decision; • conditions that restrict environmental impacts, impose monitoring and adaptive management requirements and reduce uncertainty concerning the potential impacts of the Project; • conditions requiring the Project to be operated in a sustainable way that protects the environment for future generations and conserves MNES; • advice provided within this report which reflects the importance of conserving	The Department considers that, subject to the recommended conditions of consent, the Project could be undertaken in a manner that is consistent with the principles of ESD.

EPBC Act section	Consideration	Conclusion
	biological diversity and ecological integrity in relation to the controlling provisions for this Project; and • mitigation measures to be implemented which reflect improved valuation, pricing and incentive mechanisms that promote a financial cost to the applicant to mitigate the environmental impacts of the Project.	
136(2)(e)	Other information on the relevant impacts of the action.	The Department considers that all information relevant to the impacts of the Project has been taken into account in this assessment. The Department's consideration of key issues is in Section 6.
Factors to have regard to		
176(5)	Bioregional plans	There is no relevant bioregional plan.
Considerations on deciding conditions		
134(4)	Must consider: • information provided by the person proposing to undertake the action or by the designated applicant of the action; and • desirability of ensuring as far as practicable that the condition is a cost- effective means for the Commonwealth and the person taking the action to achieve the object of the condition.	Documentation provided by the Applicant is provided in Appendix B, D and E of this report. These documents are available on the Department's website at http://majorprojects.planning.nsw.gov.au/ The Department considers that the recommended conditions of consent (see **Appendix I**) are practicable and cost-effective means to achieve their purposes. The conditions have been prepared following careful consideration of material provided by the Applicant and following consultation with DAWE.

G.3 Conclusions on Controlling Provisions

Threatened Species and Communities (sections 18 & 18a of EPBC Act)

For the reasons set out in **Section 6.7** above, the Department considers that the impacts of the action on threatened species and communities are acceptable, subject to implementation of the

avoidance and mitigation measures described in the EIS, Amended RTS and updated BAR, and compliance with the recommended conditions of consent.

The Department believes that draft conditions B47 to B52 of the recommended development consent provide a suitable regulatory framework to manage the risk of impact to listed threatened species from the proposal.

Accordingly, the Department recommends that the Commonwealth Minister require Hanson to implement conditions B47 to B52 the recommended development consent, where they relate to the management of potential impacts on listed MNES under the EPBC Act.

G.4 Other Protected Matters

DAWE determined that other matters under the EPBC Act are not controlling provisions with respect to the proposed action. These include water resources in relation to large coal mining development, migratory species, Ramsar Wetlands, World Heritage properties, National Heritage places, Commonwealth marine environment, Commonwealth land, nuclear actions, the Great Barrier Reef Marine Park and Commonwealth Heritage places overseas.

G.5 Conclusions

The Department considers that the recommended conditions would provide suitable protection for MNES under the EPBC Act. The Department notes that, if approved by the Commission, the Project would be referred to the Commonwealth Minister for the Environment for determination under the EPBC Act.

Appendix I – Recommended Conditions of Consent

Appendix J - Considerations of Community Views

During the exhibition period, the Department received 182 submissions from members of the public and special interest groups, of which, 169 objected to the Project. The key issues raised by the community and considered in the Department's Assessment Report include amenity and safety impacts associated with increased truck movements and 24-hour operations, air quality, blasting and health impacts from expanded operations, and impacts on biodiversity and property values.

The table below summarises the Department's consideration of these key issues. Other issues are addressed in detail in the Department's Assessment Report.

Table J1 | Summary of the Department's Consideration of Community Views

Issue	Consideration

Noise Impacts
 	
• Road Noise
	• Many submitters considered that increased road noise from additional truck movements would disturb sleep and significantly impact the amenity of the area.
	• The Department considers that careful consideration must be given to trucking impacts during the evening and night periods as the incremental impacts on the amenity of the local community may be higher than would otherwise be the case of a typical sub-arterial road.
	• The Department does not support product transport through the evening and night time periods, noting the extensive rural residential development that has been established around the quarry since it was originally approved in 1983.
	• The Department has recommended that product transport is:
	  ○ limited during the early morning shoulder period to allow early morning product delivery to construction projects from 5:00 am to 7:00 am; and
	  ○ prohibited during the evening (6:00 pm to 10:00 pm) and night (10:00 pm to 5:00 am) periods, except on 20 evenings per year to allow targeted delivery to construction projects that require materials during the night.
	• The Department considers that the recommended dispatch rates would provide Hanson with sufficient flexibility to meet the needs of the construction market whilst preserving the rural/residental amenity of the locality.

Noise Impacts • Operational Noise	• Submitters objected to the Project's proposed 24-hour processing hours. • Hanson advised that secondary and tertiary processing has a 70 perecent output rate compared to the primary processing, and that it could only generate its proposed 1.5 Mtpa production rate if the secondary and tertiary processing hours were extended beyond the day period. • However, having regard to the expanded rural residential setting in which the quarry operates, the Department questions whether it is reasonable to extend processing operations into the evening and

Issue	Consideration
	night periods, when there are options available to meet production demand during the day (ie processing equipment upgrades). • Hanson contend that equipment upgrades would be not reasonable or feasible, however, the Department considers that extending the quarry's processing hours into these sensitive times on a continual basis would also not be a reasonable outcome for the local community. • To facilitate some additional product output, the Department has recommended secondary and tertiary processing activities to occur up to 8:00 pm on weeknights only. However, no processing activities should occur after 8:00 pm and during the night.
Social Impacts	• Community engagement undertaken for the SIA identified potential impacts on way of life, community, health and wellbeing, property values, and access and use of infrastructure as primary issues of concern. • These impacts are predominantly associated with the Project's potential traffic, noise, dust and vibration impacts. • The Department has sought to integrate its assessment of these social aspects of these impacts in the relevant sections of this report and consider that commitments from Hanson and the Department recommended conditions would mitigate these impacts to an acceptable level. • The Department considers that Hanson should continue to engage with the community engagement throughout the duration of the Project in order to improve relationships and provide ongoing information about the quarry and its operations. The Department has recommended a condition requiring Hanson to formerly establish and operate a CCC in accordance with the Department's Community Consultative Committee Guidelines for State Significant Projects.

Safety	• Many local residents raised concern that the proposed increase in daily truck movements would increase safety risks for road users and pedestrians. Brandy Hill Drive is part of a local school bus route
	• In response to these concerns, Hanson has agreed to implement a VPA with Council including:
	  ○ $120,000 towards the construction of bus bays along Brandy Hill Drive, to be provided as an upfront payment of haulage levies required under Council's contributions plan; and
	  ○ $1.5 million towards the construction of a shared pathway along Brandy Hill Drive.
	  ○ The Department has recommended that existing product transport volumes (ie 700,000 tpa) are retained until the proposed bus bays are constructed.
	• Additionally, Hanson has agreed to provide all funding for the shared pathway within two years of the commencement of the Project.

Issue	Consideration
	• The additional truck movements would not result in significant deterioration of existing intersections along the haulage route, and all intersections would operate with safe sight distances. • The Department has recommended Hanson implement a Traffic Management Plan, that details measures to minimise traffic safety issues (including with school buses) and includes a Driver's Code of Conduct.

Air Quality
• Increased dust emissions and health impacts
	• Many submitters objected to the Project's potential impacts on air quality as a result of increased dust emissions and diesel fumes. Local residents raised concern that increased exposure to these emissions would have adverse health impacts for the community.
	• All receivers are predicted to experience minor increases of PM_{10}, $PM_{2.5}$, TSP and deposited dust. However, no exceedances of the air quality criteria specified *in Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales* are predicted to occur and no acquisition or mitigation rights are triggered under the VLAMP.
	• However, the Department considers that careful management will be required to minimise potential impacts, particularly during adverse meteorological conditions.
	• The Department has recommended robust and contemporary air quality management conditions, including:
	  ○ Air quality crtieria in accordance with *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales*;
	  ○ a requirement to minimise air quality impacts during adverse weather conditions;
	  ○ regular air quality monitoting to determine whether the development is complying with relevant criteria in the consent; and
	  ○ the implementation of an Air Quality Management Plan

Air Quality • Tank Water	• Residents of Giles Road advised that their properties relied on tank water and raised concern over the Project's potential impacts on drinking water quality. • Hanson commissioned sampling of water from two properties to determine whether the existing operation is impacting the water quality. Results indicated that tank water was safe to drink • NSW Health recommends that all rainwater tanks are fitted with 'first flush' diverters, which work to capture fine particles before they enter the water tank • Hanson advised that this type of device could be funded for applicable residents under its proposed 'Community Enhancement Fund' • The AQIA does not predict exceedances of air quality criteria, including dust deposition, at residences along Giles Road, and

Issue	Consideration
	therefore the Department considers impacts from the quarry on tank water would be acceptable. • Nonetheless, the Department supports Hanson's initiative to fund first flush diverters for those currently without these devices.
Blasting	• Some residents advised that were already impacted by existing blasting from the site and that any increase would exacerbate amenity impacts and could result in structural damage to their homes. • No exceedances of airblast overpressure and ground vibration are predicted for any sensitive receivers. • The Department has recommended strict operating and management conditions to ensure the blast impacts of the Project are managed appropriately. This includes: o strict operating conditions to protect people, livestock and infrastructure from the impacts of blasting; o the preparation of a Blast Management Plan, including measures to avoid blasting during unfavourable climatic conditions (ie temperature inversions or prevailing winds); and o a condition allowing landowners to request an independent review of impacts at their property, should they consider the Project to be exceeding the relevant blasting criteria.
Biodiversity	• Submitters identified the Project area as home to a diverse range of flora and fauna species and raised concern over the proposed removal of important habitat, particularly for the Koala and native birds. • The Department considers that the Project has been designed to avoid, mitigate and manage biodiversity impacts where practicable. However, the Project would result in a range of residual impacts on biodiversity, including EECs and threatened fauna species listed under the BC Act and EPBC Act. • Residual impacts on biodiversity values would be suitably managed, mitigated and/or offset under the recommended conditions of consent. The Department is confident that the required ecosystem and species credits can be obtained and that the retirement of these credits would sufficiently compensate for residual biodiversity impacts, in accordance with the BC Act.
Property Values	• Many submitters expressed their appreciation of the area's peaceful and rural nature and considered that the Project would detract from these highly valued attributes and potentially impact property values • By imposing conditions that would facilitate appropriate management of the Project's amenity impacts in accordance with applicable standards, the Department considers that adverse impacts on property values would be minimised (see consideration of noise, air quality safety and social impacts above).