

# **Dubbo Quarry Continuation Project**

## **Amendment Report**

Prepared for Holcim (Australia) Pty Limited

October 2022

# Dubbo Quarry Continuation Project

## Amendment Report

Holcim (Australia) Pty Limited

J210189 RP#3

October 2022

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# 1 Introduction

## 1.1 Purpose of this report

This report describes proposed amendments to the Dubbo Quarry Continuation Project (SSD-10417). It details the strategic context for the amendments and justifies why the amendments are necessary and the relative environmental impacts and benefits that would result from making the amendments.

Under Section 37 of the Environmental Planning and Assessment Regulation 2021 an applicant may amend or vary a development application at any time before it is determined with the agreement of the consent authority. If the application relates to State significant development (SSD) it must be in the approved form and be prepared having regard to the *State Significant Development Guidelines* (DPIE 2021).

This amendment report has been prepared by EMM Consulting Pty Limited (EMM) on behalf of the applicant - Holcim (Australia) Pty Limited (Holcim).

## 1.2 Dubbo Quarry

Dubbo Quarry (the quarry) is a basalt quarry owned and operated by Holcim, located on Sheraton Road approximately 5 kilometres (km) south-east of the city of Dubbo, in the Dubbo Regional Council local government area (Dubbo LGA).

Since 1980, the quarry has operated under development consent SPR79/22 and it produces high quality basalt aggregates for use in the construction industry in concrete, asphalt, road base and other applications for commercial and domestic markets.

The quarry operates at a production rate of up to 500,000 tonnes a year. Accessible basalt resources within the land to which the existing consent applies (the existing site) are close to being exhausted. Holcim is therefore seeking planning approval to extract material outside of the existing site to allow the quarry to continue operating. This is referred to as the Dubbo Quarry Continuation Project (the project).

## 1.3 The project

The Dubbo Quarry Continuation Project Environmental Impact Statement (EMM 2021a, herein referred to as 'the EIS') was exhibited from 9 February 2021 to 8 March 2021. The project as exhibited involves continued operations in the existing site and the development of two new resource areas, known as the Western Extension Area (WEA) and Southern Extension Area (SEA).

The project also includes developing the following:

- a new internal quarry access road which intersects with Sheraton Road just north of the existing intersection with Sheraton Road;
- a new internal haul road to connect the existing site with the SEA, which will include construction of a culvert type crossing across Eulomogo Creek;
- modifications to the existing water management infrastructure within the existing site; and
- additions to the existing water management infrastructure to service the WEA and SEA.

The project seeks to continue to operate the quarry to a peak production rate of 500,000 tonnes per annum (tpa), for 25 years.

## 1.4 Proposed amendments

Some aspects of the project have been amended to address submissions received on the EIS or to enable access to basalt resources within the existing site whilst the continuation project is under assessment.

The project amendments include:

- relocation of the mobile processing plant within the quarry's existing pit and potential replacement with a fixed plant;
- modifications to the existing and proposed water management system;
- modification of the WEA pit design;
- alternative stripping methods;
- changes to internal and external site access; and
- potential use of a conveyor system as an alternative to truck haulage between the pit face and the processing plant.

The proposed amendments are minor in the context of the overall project. The amendments seek to make the project more efficient and will result in either no change to, or a decrease in, the environmental impacts that were predicted and described in the EIS.

## 2 Strategic context

### 2.1 Regional context

The project remains strategically important to the Dubbo region as it will allow the quarry to continue to produce a hard rock resource which can satisfy commercial and domestic markets.

Dubbo Regional local government area is the geographic centre and is considered the functional and economic centre of the region, serving as a hub for connections to dispersed rural communities (DPE 2017).

The amended project is, therefore, located in a strategic and central location which will benefit its established and emerging customer base well into the future.

### 2.2 Strategic planning framework

#### 2.2.1 Central West and Orana Regional Plan 2036

The amended project will continue to align with the Central West and Orana Regional Plan 2036 (the Regional Plan) in that it will help the region to become and maintain its diverse economic base.

The amended project remains aligned with the directions and actions set out in the plan. It is consistent with Goal 1 of the plan, as it will ensure the continued contribution of quarrying to the diversity of local economic development and employment in Dubbo.

It will continue to supply locally sourced and financially competitive quarry products required for current customers (refer Section 6.13 of the EIS), as well as forecast growth and economic and industrial development across the region. When considering alternative sources of construction materials (from more distant or greenfield quarries), the quarry has many strategic benefits which will reduce direct environmental impacts and result in efficient use of existing resources approved for this purpose (ie proximity to Dubbo, current use of the surrounding road network, and infrastructure already approved for quarrying operations).

The amended project also remains consistent with Direction 10 of the Regional Plan which is to ‘promote business and industrial activities in employment lands’. The project will ensure the continued long-term use of the existing site as a quarry, being an industrial land use.

#### 2.2.2 Dubbo Region Community Strategic Plan 2040

The Dubbo Region Community Strategic Plan (the DRC Strategic Plan) (DRC 2018) guides and influences the actions and initiatives of DRC, the community, government, and community stakeholders through to 2040.

The key future aspiration outlined in the DRC Strategic Plan relevant to the project is “our hard and our social infrastructure supports our population growth and allows for the development of a diverse regional economy”.

Key objectives outlined in the DRC Strategic Plan that align with the amended project include:

- safe transportation networks;
- providing infrastructure meets the current and future needs of the community;
- employment opportunities are available in all sectors of our economy; and
- the long-term economic growth of the LGA is realised.

The project will contribute to the local and regional economy by providing direct and indirect employment opportunities (see Section 6.13 of the EIS). The project will also provide a much-needed resource for current and future development, building and infrastructure projects, which are projected to increase.

The improvements in infrastructure will consequently enable and support various streams of service provision within the region, boosting the economy and liveability and thereby improving long-term social and economic outcomes.

### 2.3 Need for quarry product

Construction materials are vital to delivering the infrastructure required to support economic and population growth in NSW.

It is clear that the amended project will allow the continued supply of a resource that is in high demand in the region. The basalt resource available within the project area is supplied to road authorities (DRC and TFNSW) for road construction projects. It is also used in civil construction projects, engineering projects, subdivision work, industrial projects, and supplied to various commercial and domestic customers. The amended project will extend the life of the quarry for up to 25 years (at maximum production rate of 500,000 tpa) and will allow for the continued support of the forecasted demand for construction materials in the Dubbo Regional LGA as well as for other areas of NSW.

The amended project will ensure Holcim can continue to directly contribute to the need for basalt products required for a range of local and regional infrastructure projects. The increase in local population and subsequent government investment into infrastructure projects is expected to place further demand on quarry products.

### 2.4 Economic needs analysis

The primary economic benefit of the amended project will be the:

- continued provision of high-quality construction material product to the Dubbo Region in a competitive way;
- the supply of high-quality construction material to Dubbo Regional Council and Transport for NSW, as well as other local and regional customers;
- indirect contributions to the local economy through the employment of the construction and operational workforces, with contractors required for construction of the Eulomogo Creek crossing and the proposed access road, in addition to the ongoing employment of the existing workforce of the quarry (25 years); and
- positive flow-on impacts to the local economy from household expenditure as a result of wages and salaries paid during the life of the quarry (25 years); and purchasing of goods and services for construction of project elements.



## 3 Description of amendments

This chapter provides a detailed description of the amendments to the project activities that were described in Chapter 3 of the EIS. An updated project description that incorporates the proposed amendments is provided in Appendix A. An updated existing site layout is provided in Figure 3.1 and an updated project layout is provided in Figure 3.2.

### 3.1 Changes to existing operations

The project includes the continuation of existing operations, including the use of processing infrastructure. Since the EIS was publicly exhibited, operations at the quarry have continued under the quarry's existing development consent with resource extraction occurring in the existing East Pit.

Extraction within the East Pit has required the decommissioning of the processing infrastructure which was located on the southern boundary of the quarry area and has been relocated to the floor of the West Pit (see Figure 3.1). The West Pit pond, an in-pit water storage, has also been removed to allow for the relocation of the processing infrastructure and continued extraction of the existing resource.

To access available resources and maintain operation of the quarry while the project is being assessed, extraction within the East Pit will continue in a southerly direction (under the existing consent). A revised future extraction boundary for the East Pit has been estimated for the purposes of assessing the amended project. Though the actual East Pit boundary at the time of project commencement may vary, depending on when the project is determined, and the actual rate of extraction during this period.

Continued extraction within the East Pit has had flow-on implications for the project's proposed processing infrastructure, surface water management system, and other operational aspects as detailed further below.

### 3.2 Processing infrastructure

The West pit will continue to be the location of the processing infrastructure for the duration of the project (see Figure 3.1 for indicative location). The processing infrastructure currently includes a mobile processing plant and product stockpiles.

The amended project includes replacement of the mobile processing plant with a fixed processing plant at the same location. The fixed processing plant will have the same throughput capacity, though will have a larger footprint than the mobile processing plant, and, therefore, updated technical assessments have conservatively assessed that the fixed processing plant will be in place for the majority of the project duration (with the exception of Year 1). Note that the fixed processing plant may replace the mobile processing plant later during the project life.

A concept layout diagram for the fixed plant is provided in Appendix B. The fixed plant will include primary, secondary, tertiary and quaternary crushing with the primary section either fixed or a mobile jaw crusher. The indicative footprint for the fixed plant is approximately 100 m x 130 m. The plant components will have a maximum height of 10.5 m from foundations though, with the addition of handrails, platforms and roofs, some structures may be approximately 13 m high.

All fixed plant will have suitable concrete foundations as required by geotechnical assessments and civil structural engineering. The plant will not be visible as it is located within the existing pit. Other than safety devices and handrails, any external plant that might be visible will be designed to blend and be a neutral colour (eg brown).



Source: EMM (2021); DFSI (2017); Nearmap (2020)

\\emmsvr1\emms3\2021\2101.89 - Dubbo Quarry Continuation Project RIS\GIS\02\_Maps\Addendum Submissions Report\G001\_Existing site\_20220522\_01.mxd 22/05/2022

**KEY**

- Surveyed site boundary
- Minor road
- ⋯ Vehicular track
- Watercourse/drainage line
- Pit boundary
- Cadastral boundary (data does not align with surveyed site boundary)

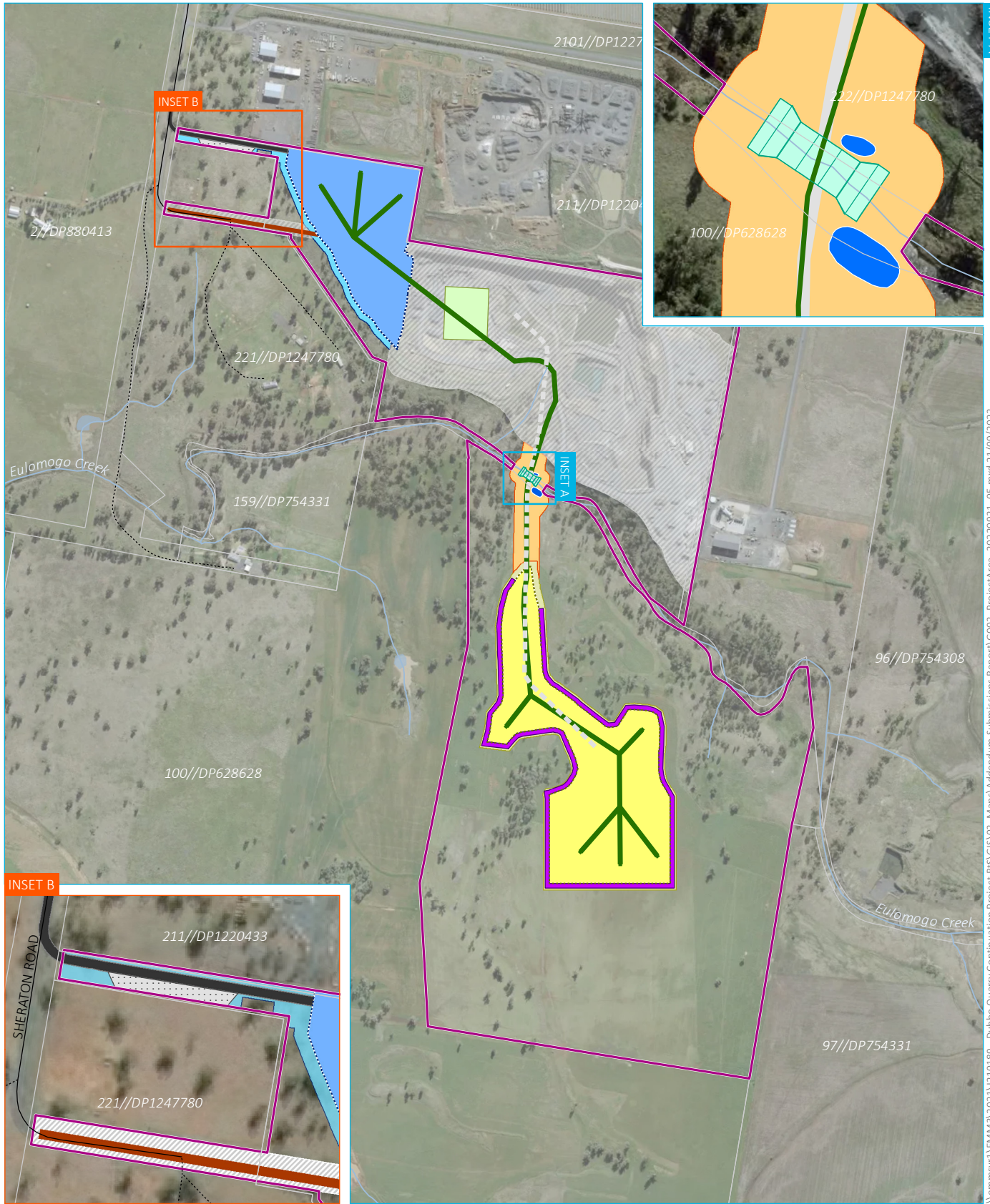
- |                        |                         |
|------------------------|-------------------------|
| Site feature           | 9. Stockpile area       |
| 1. In pit dam          | 10. Pug mill            |
| 2. West pit            | 11. Laydown area        |
| 3. Rehabilitation area | 12. Site office         |
| 4. V-notch weir        | 13. Toilets             |
| 5. Pump 1              | 14. Truck parking       |
| 6. East pit            | 15. Culvert             |
| 7. Diesel store        | 16. Settling pond       |
| 8. Processing area     | 17. Current site access |

- |  |
|--|
| 18. Transformer station                    |
| 19. Jet patcher/ paveline loading facility |
| 20. Bitumen emulsion plant                 |
| 21. Spare part storage                     |
| 22. Employees car park                     |
| 23. Pre coat plant                         |

**Existing site (updated)**

Dubbo Quarry Continuation Project  
Addendum Submissions Report  
Figure 3.1





Source: EMM (2020, 2022); DFSI (2017); GA (2011); Nearmap (2020)

**KEY**

- |                                      |                                    |  |
|--------------------------------------|------------------------------------|--|
| Project area                         | Indicative proposed water crossing | Proposed overland conveyor   |
| Indicative existing disturbance area | Western extension area             | Proposed haul  |
| Existing access                      | Western disturbance area           | Minor  |
| Alternative access                   | Haul road disturbance area         | Vehicular track  |
| Alternative truck tarping area       | Southern extension area            | Watercourse/drainage   |
| Bund wall                            | Southern disturbance area          | Waterbody  |
| Sediment pond                        | Processing plant                   | Cadastral boundary (data does not align with surveyed site boundary) |

Project area (updated)

Dubbo Quarry Continuation Project  
Addendum Submissions Report  
Figure 3.2



INSET A  
INSET B  
\\emmsvr1\EMM\3\2021\1210189 - Dubbo Quarry Continuation Project\GIS\02\_Maps\Addendum Submissions Report\G002\_ProjectArea\_20220921\_05.mxd 21/09/2022

While the actual equipment list and configuration will be confirmed during detailed construction design process, the modelled fixed processing and material handling plant and equipment includes:

- 1 x primary surge section:
  - jaw crusher (mobile or fixed);
  - stacker conveyor(s);
  - reclaim feeders;
- 3 x crushers and associated structures:
  - 2 x cone crushers;
  - 1 x Vertical Shaft Impactor (VSI) crusher;
- 3 x screens and associated structures;
- approximately 8 x transfer conveyors and associated structures; and
- 10 x stacker conveyors.

The location of processing equipment within the West Pit will require some changes to quarry operations described in the EIS, including:

- haul truck routes will be slightly modified to travel from the SEA or WEA to the West Pit;
- an additional excavator will be used to load material into the primary crusher (as needed); and
- an additional stockpile area will be located adjacent to processing plant.

### 3.3 Alternative access

To allow flexibility and efficiency in quarry operations, a ramp will be constructed at the most north-west point of the WEA to allow vehicles to access the site via an access route located within the quarry pit (refer Figure 3.2). This will allow product trucks to be loaded at the stockpile area adjacent to the new processing area.

Product trucks and other vehicles will be able to exit the quarry pit via an existing ramp to the south and access other stockpile areas, administration buildings and the weighbridge. Vehicles will then exit the site via the same route. Appropriate safety barriers and signage will be placed within the pit to direct vehicles and ensure separation of quarry operations from vehicle movements. A tarping area for trucks approximately 20 m x 100 m will be located adjacent to the access road either within or outside of the WEA within the proposed disturbance area.

As a result of the proposed in-pit access, the proposed access road has been modified from that presented in the EIS. It will now finish at the boundary of the WEA instead of being constructed around the boundary of the pit (refer Figure 3.2).

The existing access road will also now finish at the boundary of the WEA and the section of road on the northern edge of the existing quarry would become redundant. This section of the road would either be retained as a buffer between the project and the adjacent South Keswick Quarry or maybe extracted in agreement with the quarry operator (Regional Group Australia).

The EIS considered that the access road would be used until WEA extraction reaches the road boundary, after which the proposed access road would be constructed and used as the primary access route to and from the site. However, in order to allow flexibility in quarry operations, the amended project seeks of the existing access road and the proposed access road for the duration of the project. Whether the existing access road is able to be retained is dependent on agreements with the landowner of Lot 221 DP 1247780. Retaining the existing access road would mean that vegetation disturbance and construction impacts associated with the proposed access road would no longer occur.

### 3.4 Extension to WEA

Removal of the proposed access road around the north and eastern boundaries of the WEA will allow an increase in the area proposed for extraction within the WEA. The area of extraction will depend on the required setback from Lot 211 DP1220433 which will be determined based on blast safety requirements and in consultation with Regional Group Australia. A maximum extraction scenario for WEA is up to the boundary of Lot 211, namely an area of 8.13 hectares (ha) which is an increase of 1.67 ha above that presented in the EIS. This increased extraction area would be within the proposed disturbance area presented in the EIS and would not result in any changes to production limits or quarry life.

### 3.5 Conveyors systems

In order to allow flexibility in quarry operations, Holcim is seeking use of either conveyors and trucks for product transport from the pits to the processing plant.

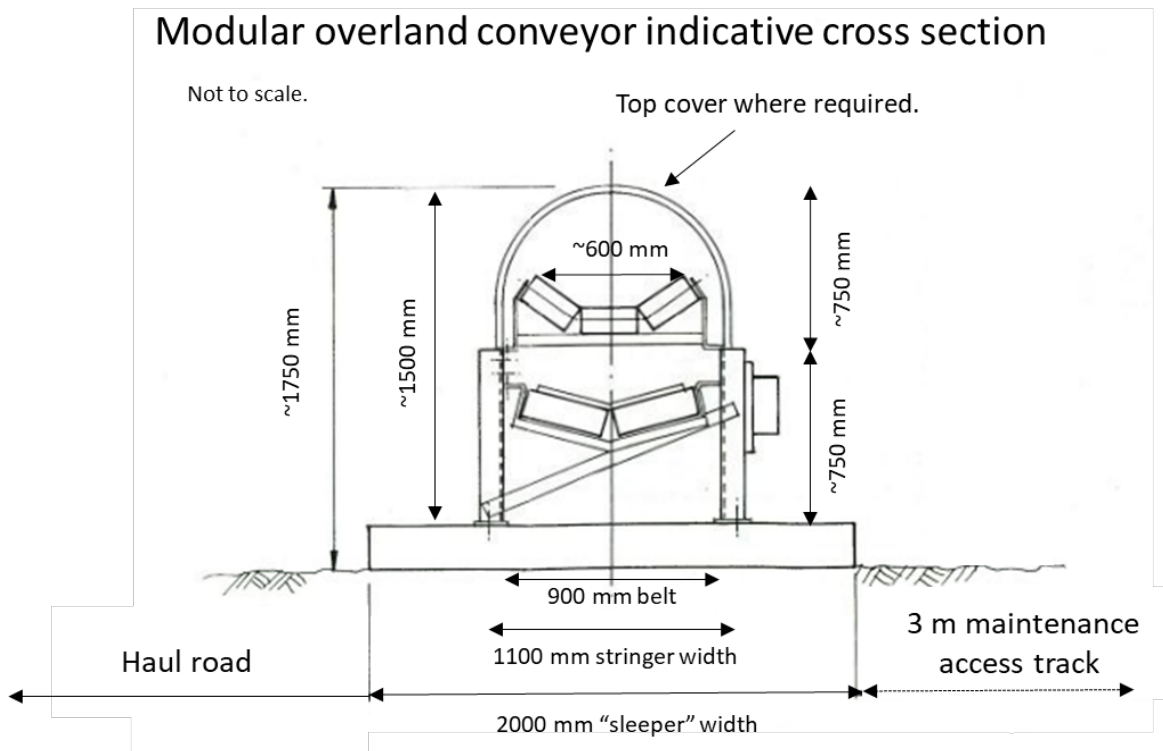
The amended project includes the use of potential overland conveyor systems for the transport of product from the active extraction area, within either the WEA or SEA, to the processing plant in the West Pit. The conveyors would be located in-pit to minimise noise and visual impacts. They would follow the alignment of proposed haul roads within the proposed disturbance footprint presented in the EIS (see Figure 3.2).

A cross-section of a typical overland conveyor is provided in Figure 3.3. The system installed at the quarry will typically be of the dimensions and general characteristics shown, other than where topography dictates to maintain a suitable gradient. Additional height is required at transfer points between conveyors and feed hoppers with an approximate maximum height of 5 m.

Where the system crosses Eulomogo Creek additional design considerations are to be incorporated including setting the height of the belt at 283 m AHD to be above the 100-year flood level and concrete foundations. Spill trays will be installed for the sections spanning over the creek crossing.

The colour scheme for the conveyor systems will be sensitive to the environment and selected to ensure minimal visual impact (eg green). Some sections of the system will remain galvanised though these are not expected to be within the line of sight of residences and can be covered if needed. Should conveyors be constructed, road truck haulage would still be undertaken occasionally during periods of conveyor shutdown or maintenance.

Whilst noise and dust emissions from the conveyor have not been predicted to result in significant impacts, and visual impacts are unlikely (see Chapter 6), mitigation measures are available should impacts exceed predictions. These include fitting of top and/or side covers, fitting foam dust suppression unit, and construction of temporary earthen bunds if necessary. Regular maintenance of the conveyors would be undertaken to ensure noise and dust emissions are minimised.



**Figure 3.3** Typical conveyor dimensions

### 3.6 Water management system

Continued extraction within the East Pit has resulted in the following modifications to the existing water management system and the proposed water management system under the project.

- The East Pit extraction boundary will be increased which will increase the storage within the in-pit dam and intercept a new catchment area that currently drains to the Settling Pond.
- Closure and management of the East Pit Lake will continue under the project. However, the increased extraction boundary will mean that it will take longer to fill and equilibrate (up to 4 years under dry and average rainfall conditions).
- The Western Pit Pond will be removed as the mobile processing plant and stockpile area has been moved to this location.
- An increase to the capacity of the Settling Pond under the project is no longer proposed, given the reduced catchment area that drains to this storage.

The updated existing and proposed water management systems are described in more detail in Appendix F.

### 3.7 Amenity bunds

The construction of amenity bunds on the western boundary of the WEA and around the SEA was initially adopted to mitigate noise and visual impacts from the project as assessed in the EIS. Further investigation has been undertaken of the noise and visual mitigation benefit of the amenity bunds on the western boundary of the WEA which determined that it would provide little to no reduction in noise levels or visual impacts.

Construction of the bund in the WEA is no longer proposed, due to minimal noise reduction impact, and the availability of overburden and topsoil on site for construction. Instead, a smaller safety berm will be constructed. Construction of the amenity bund around the SEA will remain a part of the amended project.

### 3.8 Overburden stripping

In response to submissions received on the EIS, Holcim has investigated ways to reduce noise levels associated with overburden stripping activities. The modelling of the noise bund construction and overburden stripping assumed the use of a CAT D11 dozer in the Noise and Vibration Impact Assessment (NVIA).

Holcim is now proposing to use a Komatsu D375 dozer to undertake these activities, which has a lower sound power level than that of a CAT D11, and hence will result in lower noise levels than those presented in the NVIA for overburden stripping (see Appendix D).

## 4 Statutory context

### 4.1 Approval process

The statutory context for the amended project has not changed from that of the exhibited project. The project remains SSD and the consent authority is the Minister for Planning.

The project is classified as SSD. A development application and EIS were submitted under Part 4, Division 4.7 of the EP&A Act. The DA and EIS for the project were publicly exhibited from 9 February 2021 to 8 March 2021.

Following the public exhibition of the DA and EIS, a total of 17 government agency submissions and six community submissions were received by DPE.

A Submissions Report was submitted on 18 June 2021 and an Addendum Submissions Report, which responds to residual matters raised in submissions that were not included in the Submissions Report (ie noise and water), will be submitted to DPE with this Amendment Report.

Following receipt of this Amendment Report and the Addendum Submissions Report, DPE will finalise its assessment of the amended project and determine the development application.

### 4.2 Permissibility

The project area is zoned IN3 Heavy Industrial, RE2 Private Recreation, and RU1 Primary Production under the Dubbo LEP. Extractive industries are permissible with consent within the IN3 and RU1 zones. Extractive industries are prohibited within the RE2 zone. However, Section 4.38(3) of the EP&A Act states, in relation to the partial prohibition of an SSD project, that:

(3) Development consent may be granted despite the development being partly prohibited by an environmental planning instrument.

No changes to the project area are proposed under the amended project. Therefore, the amended project is wholly permissible with development consent.

### 4.3 Other approvals

This section identifies other approvals that are required to carry out the amended project and explains why they are required. These approvals are outlined in Table 4.1 and have been grouped into the following categories:

- *integrated approvals*: which are approvals that cannot be refused and are required to be issued consistently under section 4.42 of the EP&A Act if the project is approved;
- whether approval is required under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act);
- *other approvals*: approvals that are not expressly integrated into the SSD assessment process; and
- *approvals not required*: approvals that will have been required if the project was not SSD as per section 4.41 of the Act.

No approvals, additional to those identified in the EIS, are required for the amendment project.



**Table 4.1 Approvals and licenses required**

Approval	Requirement
<b>Integrated approvals</b>	
An environment protection licence (EPL) under Chapter 3 of the NSW <i>Protection of the Environment Operations Act 1997</i>	A variation to the Dubbo Quarry existing EPL may be required.
<b>Approvals not required</b>	
An Aboriginal heritage impact permit under section 90 of the <i>National Parks and Wildlife Act 1974</i> (NP&W Act)	An Aboriginal object will be disturbed by the project as detailed Section 6.5.
A water use approval under section 89, a water management work approval under section 90 or an activity approval (other than an aquifer interference approval) under section 91 of the <i>Water Management Act 2000</i> (WM Act)	The project would have required a controlled activity approval, if not for Section 4.41 of the Act.

#### 4.4 Pre-conditions and mandatory considerations

The pre-conditions to the grant of approval and mandatory matters for consideration by the consent authority for the project were outlined in the EIS. No additional pre-conditions or mandatory considerations are triggered by the amended project.

A statutory compliance table that considered all relevant statutory provisions was appended to the EIS. the amended project would not trigger any additional provisions or change the project’s compliance with those provisions identified.

## 5 Engagement

### 5.1 Engagement undertaken since EIS exhibition

Holcim has continued to engage with the local community since the EIS was exhibited. This engagement has, in part, shaped the way the amendments to the project have been designed. Key stakeholders that have been consulted include:

- Department of Planning and Environment (DPE) Resource Assessments;
- Dubbo Regional Council; and
- local community stakeholders, including surrounding landowners.

### 5.2 Matters raised during engagement

Matters raised during consultation post EIS exhibition, including consultation related to the project amendments, and the responses received are detailed in Table 5.1.

**Table 5.1** Amendment report consultation

Stakeholder	Matter	Response
DPE Resource Assessments	Amendment report and design of amendments	The scope of the amendments were discussed with DPE Resource Assessments. Following this engagement this amendment report has been prepared in accordance with the DPE Amendment Report guideline.
Dubbo Regional Council	Terms of the planning agreement for the project	Holcim wrote to Council to discuss the potential terms of a Planning Agreement. This could include a per tonne levy and contributions to local initiatives. The planning agreement is under discussion with Council.
Community Consultative Committee	Project update	Project update letters were sent to CCC members (1-2 September 2022) to inform them of proposed amendments to the project (see Appendix C). Outdated email information delayed receipt of letter for one CCC member by a few days. Holcim followed up with telephone calls to all CCC members the following week to ensure letters were received and to prompt any response information. No concerns were raised.
Surrounding landowners – R2 and R3	Noise assessment Visual impacts	Holcim wrote to the owners of R2 and R3 to discuss potential mitigation measures to minimise noise and visual impacts as outlined in the EIS. No agreement was reached on potential at-receiver mitigation. Therefore, amendments to the project to reduce noise and visual impacts are proposed.
Surrounding landowners – all	Project amendments	Holcim wrote to the surrounding landowners (1-2 September 2022) to inform them of proposed amendments to the project (see Appendix C). Holcim followed up with telephone calls the following week to ensure letters were received and to prompt any response information. No concerns were raised, one landowner requested updated information about remodelled noise impacts.
Landowner of Lot 100	Landowner consent to lodge the SSD application	Consent was received from the landowner in writing on 26 August 2022.
Landowner of Lot 221	Landowner consent to lodge the SSD application	Consent was received from the landowner in writing on 16 September 2022.

## 6 Assessment of impacts

### 6.1 Overview

EMM has undertaken further environmental assessments of noise, air quality, water and visual impacts in response to the project amendments outlined in Chapter 3. The following sections provide a summary of each of the assessments.

It should be noted that the project amendments will not change the proposed disturbance footprint presented in the EIS. The disturbance footprint may be reduced due to the project amendments such as removal of the WEA bund, changes to alignment of haul roads, and continued use of the existing access road (if the proposed access road is not required to be constructed). Therefore, additional assessments of biodiversity or heritage are not required.

### 6.2 Noise

A Supplementary Noise Impact Assessment (NIA) has been prepared by EMM to assess the project amendments (refer Appendix D).

The Supplementary NIA includes the following information and assessment:

- consideration of project amendments detailed in Chapter 3;
- additional noise mitigation measures for the project;
- updated noise impact assessment, which includes additional noise modelling of construction and operation impacts; and
- responses to submissions that raised noise matters.

The Supplementary NIA found that the amended project's residual noise impacts have reduced from those presented in the Noise and Vibration Impact Assessment (EMM 2021b) that accompanied the EIS. For receivers where moderate impacts were predicted, impacts are now marginal or negligible. This is as a result of the new processing plant being at a lower ground elevation (RL 285 m) than the decommissioned processing plant location (RL 300 m). Holcim has also committed to a range of additional noise mitigation measures, the majority being at-source controls.

Under the scenario of using conveyors to transport product from quarry pit faces to the processing area, the NIA found that the conveyor is predicted to have an equal or lower sound power level of that of haul trucks. Therefore, the worst case scenario (hauling product) has been assessed in the NIA and the predicted residual noise impacts would not increase under a conveyor scenario. Sound power levels will be confirmed and, if required, noise mitigation included during detailed design of a conveyor system.

### 6.3 Air quality

A Supplementary Air Quality Impact Assessment (AQIA) has been prepared by EMM to assess the project amendments (refer Appendix E).

The key change to impacts from the AQIA submitted with the EIS relates to the relocation of the processing plant. The processing plant is proposed to be located immediately west of the existing pit and approximately 260 m north-west of the previously modelled location. As a result, changes to haul routes, stockpile locations and exposed areas have also been made to accommodate the change in location. Other changes to the modelling have been made in response to comments raised by the NSW Environment Protection Authority (EPA) and further information becoming available regarding the layout of the site.

The revised modelling shows that predicted incremental PM<sub>10</sub> and PM<sub>2.5</sub> concentrations will increase from that previously modelled as a result of the project refinements. However, incremental and cumulative PM<sub>10</sub> and PM<sub>2.5</sub> concentrations are shown to remain below the applicable EPA assessment criteria at all assessment locations for all averaging periods.

Under the scenario of using conveyors to transport product from quarry pit faces to the processing area, the assessment found that this would have a reduction in PM<sub>10</sub> and PM<sub>2.5</sub> concentrations when compared to truck haulage. Therefore, concentrations would remain below the applicable EPA assessment criterion at all assessment locations for all averaging periods.

## 6.4 Water

A Water Response to Submissions (Water RtS) has been prepared by EMM to address issues raised in submissions on the EIS (refer Appendix F). The Water RtS includes a Water Assessment Addendum report which contains additional assessment of groundwater and surface water impacts of the project in response to water related matters raised in submissions and in consideration of the project amendments. In addition, the Water RtS also includes an updated version of the original Surface Water Assessment that was included with the EIS.

Due to the increase in the East Pit extraction boundary, changes to the water management system, and the additional groundwater assessment that was undertaken as part of the Water Addendum, the water balance for the project has been updated.

The results of the updated water balance demonstrate that the water management strategy for the project will remain effective in substantially reducing both the frequency and magnitude of discharges due to pit dewatering and sedimentation basin overflows, with discharges by both mechanisms occurring during wet weather and at reduced magnitudes.

The revised conceptualisation of water exchange between the palaeochannel and East Pit has also resulted in lower simulated discharges under the amended project than were reported in the EIS. This is because ongoing extraction has created additional storage in the East Pit, which the project proposes to fill to act as a water storage. The revised water balance also allows for seepage from the East Pit to the palaeochannel when the East Pit Lake level exceeds the equilibrium level.

## 6.5 Visual

A Visual Impact Assessment (VIA) Addendum has been prepared by EMM to assess the project amendments (refer Appendix G). The VIA addendum found that the proposed changes (in aggregate) reduce the overall visual impact of the project. Where impacts persist, these are rated as low, and there are opportunities to further reduce any light spill or visual intrusion by the planting of screening vegetation on the site, as already committed to in the EIS.

In relation to removal of the WEA bund, it is noted that this bund (as well as the SEA bund) was not recommended as a mitigation measure to address visual impact. The bunds were proposed primarily as a storage solution for topsoil and overburden and were included as project elements in the original visual assessment. To the contrary, the bunds were noted to be (in the absence of any plantings or screening) an element of the project which represented a potential visual impact to nearby receptors to the west. Therefore, the removal of bunds is not expected to result in visual impacts at any receivers located to the west of the quarry pit.

## 7 Justification of amended project

The evaluation of the project's merits presented in the EIS considered several factors, including the demand for basalt, the suitability of the site, the results of community and stakeholder engagement and the environmental impacts of the project.

The project will provide a range of direct and indirect benefits to the local and regional areas and the State through allowing the sustained delivery of high-quality basalt products. These products are used for the production of concrete, asphalt, road base and other applications.

Due to forecasted population growth in NSW, the Federal and State governments propose to deliver a number of large infrastructure and capital works projects across the region. Therefore, there will be a sustained demand for high quality construction products to meet the demands of the future.

The project area is located in a strategic and central location, which will continue to benefit both Holcim and its customers. It is sufficiently distanced from dense residential areas, minimising environmental impacts to the closest urban environment. In addition, a staged approach will be implemented to reduce potential land use conflicts.

Additional technical assessments have been undertaken in response to submissions received on the EIS and the project amendments. Proposed amendments have further minimised potential environmental and social impacts of the project. The amended project is still considered to be consistent with the objects of the EP&A Act including the principles of Ecologically Sustainable Development.

The assessments undertaken for the amended project show that the continued operations of the Dubbo Quarry will be able to be undertaken in accordance with strict regulatory standards.

The EIS included a comprehensive suite of proposed mitigation measures to minimise and manage the environmental impacts of the project. The mitigation measures have been updated as a result of the project amendments and the assessments undertaken since the EIS was exhibited (see Appendix G).

In conclusion, the amended project is supported by the strategic planning framework for the region, is a permissible land-use and will result in a range of local and regional benefits. The amended project, therefore, remains in the public interest and can be approved.

## References

Department of Planning, Industry and Environment 2021, *State significant development guidelines*.

Dubbo Regional Council 2018, *Dubbo Region Community Strategic Plan*.

EMM 2021a, *Dubbo Quarry Continuation Project – Environmental Impact Statement*, prepared for Holcim (Australia) Pty Ltd by EMM Consulting Pty Ltd.

EMM 2021b, *Dubbo Quarry Continuation Project – Noise and Vibration Impact Assessment*, prepared for Holcim (Australia) Pty Ltd by EMM Consulting Pty Ltd.

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# Appendix A

## Consolidated project description

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## A.1 Introduction

Holcim is seeking SSD consent under Division 4.1 of Part 4 of the EP&A Act to continue and expand the operations of the Dubbo Quarry. The project is known as the Dubbo Quarry Continuation Project (SSD 10417).

The project involves:

- continued quarrying operations at the existing site with an extraction and processing rate of up to 500,000 tpa;
- development of two new resource areas to the west and south of the existing site (the WEA and SEA, respectively) the later of which will have a noise attenuation and visual amenity bund constructed around the perimeter, where possible;
- construction of a new internal access road to connect with Sheraton Road, north of the existing access road and intersection with Sheraton Road (the 'proposed access road');
- construction of a new internal haul road to connect the existing site with the SEA (the 'southern haul road'), which will require construction of a road with culverts across Eulomogo Creek (the 'Eulomogo Creek crossing');
- construction of a conveyor system for transfer of product from the WEA and SEA to the processing plant;
- modification of the existing water management infrastructure within the existing quarry area; and
- construction of new water management infrastructure to service the WEA and SEA.

The WEA and SEA have been designed to extract the resource in the project area as efficiently and economically as possible, while avoiding or minimising adverse impacts to the environment and community and delivering a range of socio-economic benefits to the region.

The proposed project components are shown on Figure 3.2.

## A.2 Project area

The project area includes the existing quarry, the two extension areas (ie quarry pits), ancillary development and disturbance. The WEA and SEA are shown as dark blue and dark yellow in Figure 3.2, respectively. There are four disturbance areas within the project area which include the existing quarry disturbance area (shown as grey hatching in Figure 3.2); and three new disturbance areas: western disturbance area, southern disturbance area and haul road disturbance area (shown as light blue, light yellow and orange in Figure 3.2, respectively). The project area boundary and its components are discussed further below for each disturbance area.

The boundaries of the disturbance areas were designed to avoid the clearance of native vegetation where possible. Further details of vegetation clearance are given in the EIS.

### A.2.1 Existing quarry disturbance area

The existing disturbance area is the perimeter of the existing site within Lot 222 DP 1247780 as well as the portion of the existing quarry access road within Lot 221 DP 1247780. All disturbance within this area has occurred under the existing consent. New infrastructure within this area is limited to part of the proposed haul road where it connects to the existing site. The total size of this area is approximately 33.67 ha.



## A.2.2 Western disturbance area

The western disturbance area is proposed to be located within Lot 222 DP 1247780, immediately west and north west of the existing site. The total size of this area is 9.22 ha. As shown in Photograph A.1, this area is predominantly cleared pasture land with some remnant vegetation.



**Photograph A.1** Western Extension Area looking north-east. Existing access road, tarping area and bund wall along western boundary of the West Pit visible in photo

This area includes the WEA, the proposed access road, a truck tarping area, a safety berm and vehicle access track along the western perimeter of the WEA, and associated disturbance. The existing quarry access road transects this area, as shown in Figure 3.2. To allow the WEA to be fully developed, part of the existing access road will need to be quarried. An existing truck tarping area within the WEA will also be quarried and a new truck tarping area constructed near the site access point or within the WEA.

## A.2.3 Southern disturbance area

The southern disturbance area is proposed to be located within Lot 100 DP 628628, which is located south of the existing site, below the Eulomogo Creek riparian corridor. The total size of this area is 16.85 ha. As shown in Photograph A.2, this area is predominantly disturbed pastural land with some remnant vegetation. This area includes the SEA and a bund wall and vehicle access track that extends around the perimeter of the SEA, except for the proposed haul road access point.



**Photograph A.2** Southern disturbance area

#### A.2.4 Haul road disturbance area

The haul road disturbance area is located within both Lot 222 DP 1247780 and Lot 100 DP 628628 connecting the existing quarry disturbance boundary to the southern disturbance boundary. The total size of this area is 2.42 ha. As shown in Photograph A.3, this area has some disturbed pastural land and remnant native vegetation. This area includes the proposed southern haul road and the Eulomogo Creek Crossing, two proposed sedimentation ponds – north and south of Eulomogo Creek, and associated disturbance.



**Photograph A.3**      **Approximate location of the haul road disturbance area on the southern side of Eulomogo Creek looking towards the former processing area**

## A.3 Proposed operations

### A.3.1 Resource description

The type of resource proposed to be extracted under the project is basalt, an igneous hard rock. Two types of basalt resources will be extracted: fresh basalt and altered basalt. The depth of fresh basalt and the quarry is between 10 and 15 m. Geochemical testing (Geochempet 2019) identified the characteristics of the fresh basalt as:

- finely crystalline and variably glassy;
- contains <1% of vesicles;
- unweathered to slightly weathered;
- fresh to lightly altered;
- average secondary mineral content about 6% (5% green to yellowish smectite clay, 1% zeolite and <1% iddingsite and calcite);
- hard (not easily scratched); and
- strong (resistant to permanent deformation by flow or fracture).

Geochempet 2019 determined that the rock is suitable for use as concrete aggregate, is predicted to be suitable for use in road base, asphalt/sealing aggregate (subject to bitumen stripping and polishing tests) and rail ballast (subject to compliance with Durability Criteria of CT147/AS2758.7). They also predicted it to be suitable for use as rip rap and marine armour rock, provided blocks of sufficient size can be obtained free of weak or permeable joint and other penetrative defects.

Altered basalt varies from fresh basalt in that it is softer with a higher clay content, is less dense and contains more vesicles. When blended with fresh basalt it makes a good road base product. The depth of altered basalt at the quarry varies between 1 and 3 m and is located at the base of the fresh basalt.

### A.3.2 Resource areas and volumes

The project includes continued extraction within areas of the existing site and extraction within the two new resource areas, WEA and SEA. The depth of each quarry pit has been designed to be above the groundwater table.

Extraction within the existing site will be limited to extracting from the floor of the existing quarry pit to remove remaining true basalt and altered basalt. The existing pit floor will be extracted to a maximum depth of RL 280 m. Areas of extraction are within the West Pit and will be developed in an east–west direction.

The void within the WEA will be extracted in an approximate area of 8.13 ha and to a maximum depth of RL 283 m. Fresh basalt resources will be extracted to a depth of RL 285 m across the entire pit, working in a south-east to north-west direction. Altered basalt resources will then be extracted to a depth of RL 283 m working in a north-west to south-east direction to allow progressive rehabilitation of the pit floor behind the working face.

The void within the SEA will be extracted to an approximate area of 13.56 ha. The SEA will be extracted to RL 286 m at its northern end, working southwards and finishing at a depth of RL 288.5 m at its southern end. Deeper resources (fresh and altered basalt) are present in this area; however, the depth of extraction will be constrained to avoid intersecting the groundwater table.

Overburden, including soil and weathered rock, is also present within the WEA and SEA. This is not suitable for processing as a saleable product and will be used for progressive rehabilitation or stored in the bund wall/safety berm or dedicated emplacement areas for future rehabilitation use.

Approximate resource and overburden volumes that will be accessed during the project are approximately 7.8 Mt of basalt resources and 0.3 Mt of overburden.

### A.3.3 Production rate and duration

The project involves operations of a rate of up to 500,000 tpa for extraction, processing, storage and carting of extractive materials. This is consistent with the quarry's EPL and the capacity of existing processing infrastructure. The quarry's actual production rate will be dependent on future market forecasts and demand for quarry products.

The quarrying of the WEA and SEA, as well as continued extraction from the existing pit, will extend extractive activities at the quarry by up to 25 years. Following project approval, quarrying will commence in the WEA with all fresh basalt resources extracted within approximately 9 years. Quarrying in the SEA will commence two years after project approval for approximately 20–23 years.

### A.3.4 Quarrying method

#### i Overview

Quarrying will be undertaken in stages. First, overburden and vegetation will be removed to access the basalt resource. The overburden will be used for rehabilitation or stored for future rehabilitation use in the bund wall/safety berm and dedicated emplacement areas.

The target resource will be recovered through blasting and the development of benches to ensure the quarry pit remains stable. Crushing and screening of the quarried basalt will occur at the existing processing facility, with processed product being stockpiled on site as per current procedures and transported off-site by truck. These steps are described in further detail below.

#### ii Overburden and vegetation removal/stripping

##### a Method

Establishment of the WEA and SEA will require vegetation to be cleared using a dozer or excavator in clearly defined areas. Cleared vegetation will be mulched and used in rehabilitation.

The overburden will be stripped using a dozer or an excavator. Overburden will be used in bund wall/safety berm construction or transported by dump truck for use in rehabilitation. Topsoil and subsoil will be kept separate to allow them to be used effectively in rehabilitation.

##### b Phasing

The WEA will be stripped in two phases:

1. the WEA up to the existing quarry access road; and
2. once quarrying has reached the existing quarry access road, the remainder of the WEA will be stripped.

This will allow the continued use of the existing access road until it is required to be quarried through.

Once quarrying commences in the SEA, stripping will occur once every two years, to allow for an area of approximately two years' worth of quarrying. This will minimise the disruption on the landowners, who could continue to use the non-active parts of the project area for grazing of cattle. Fencing, a minimum of 100 m from the blast face, will be installed for the safety of livestock.

Stripping will be undertaken during daytime hours only (7.00 am–6.00 pm) for approximately 4 weeks in duration, per stripping event.

#### iii Bund wall construction

##### a Method

Where the overburden is to be used in construction of the SEA bund wall, it will either be stripped and pushed using a dozer or stripped with an excavator and loaded into dump trucks for placement. The bund wall will be constructed to a height of 4 m and a width of 10 m. The bund wall will consist mostly of subsoil with an upper layer of 100 mm topsoil. Once formed, the bund wall will be compacted via track rolling with a bulldozer and then the topsoil will be spread over the bund and hydro-mulched with cover crops and appropriate grass species to minimise erosion and weed infestation. The bund wall will remain until the quarry ceases production, at which point the materials will be repurposed for rehabilitation of the quarry's final landform.

## b Phasing

The bund wall will be constructed in phases consistent with the overburden and vegetation removal as described above.

## iv Resource recovery

The WEA and SEA will be extracted using a number of benches which will be established using standard hydraulic rock drills and blasting techniques. Blasts will be carried out no more than once per week and only between the hours of 9.00 am to 5.00 pm, Monday to Friday. Blasting currently occurs using NONEL (non-electric) detonators.

The removal of altered basalt will be undertaken using an excavator to remove the material from the pit floor and create a working face.

Rock will be placed into dump trucks or onto conveyors and taken to the processing infrastructure.

## v Processing

From the pit void, basalt will be loaded onto dump trucks by an excavator or front-end loader. It will be then transported to the processing infrastructure to be fed through the existing primary, secondary and then tertiary crushers. The processing plant operates at up to 320 t per hour. Basalt is transported between each crusher via a system of conveyors. As part of the crushing process, the basalt will be passed through each of the crushers and a series of screens between each crusher. This will sort the crushed basalt into various size categories. The quarry currently sells a number of products, including:

- crusher dust <5 mm;
- aggregates (40 mm, 20 mm, 14 mm, 10 mm, or 7 mm);
- stabilised and bound road bases (40 mm or 20 mm);
- rail ballast (65 mm);
- spalls (100–200 mm); and
- blast rock/shot rock.

Over the life of the project, innovations and customer requirements may change and, therefore, the types and sizes of products sold at the quarry may vary.

It is proposed to replace the current mobile plant with a fixed processing plant. The fixed processing plant will have the same throughput capacity as the mobile processing plant. A concept layout diagram for the fixed plant is provided in Appendix B. The fixed plant will include primary, secondary and tertiary crushing with the primary section either fixed or a mobile jaw crusher. The indicative footprint for the fixed plant is approximately 100 m x 130 m. The plant components will have a maximum height of 10.5 m from foundations though, with the addition of handrails, platforms and roofs, some structures may be approximately 13 m high.

All fixed plant will have suitable concrete foundations as required by geotechnical assessments and civil structural engineering. The plant will not be visible as it is located within the existing pit. Other than safety devices and handrails, any external plant that might be visible will be designed to blend and be a neutral colour (eg brown).

## vi Stockpiling and distribution

There are two stockpile areas currently within the quarry site. The combined capacity of these areas is 150,000 tpa. Maximum stockpile heights are 8 m.

The existing stockpile areas will continue to be used to store aggregate produced by the crushing and screening process. Product will continue to be transported to the stockpile area using a dump truck and front-end loader.

Product trucks will continue to be loaded from the stockpiles using a front-end loader. Trucks will be weighed coming in and out of the site at the weigh bridge located at the administration office.

## vii Other processes

The quarry currently operates a Jet patcher/Paveline loader that supplies aggregate and bitumen emulsion products used for road repairs.

The existing Pre-coat Plant supplies pre-coated aggregates (in sizes 20 mm, 14 mm, 10 mm, 7 mm, or 5 mm) to road sealing contractors at a rate of up to 185 t per hour.

The quarry's Pug Mill blends road base and aggregate products at a rate of 200–250 t per hour.

These processes will continue under the project with no changes to existing infrastructure required.

It is proposed, as part of the project, that fly ash will be received at the quarry and blended with basalt products. The proposed maximum amounts of fly ash received at the site would be around 3,000 tonnes per year. It is also proposed to continue to receive concrete washout at the quarry to blend into product. Both the fly ash and concrete washout materials to be received at the quarry have resource recovery exemptions granted by the EPA under the Protection of the Environment Operations (Waste) Regulation 2014.

## A.3.5 Sequencing

Nominal extraction plans for each quarry stage have been developed (Appendix B). These assume that each stage takes five years to complete at an assumed extraction rate of 350,000 tpa of fresh basalt. As described in Section 6.4, the actual extraction rate, and hence the length of time to complete each stage, may vary.

A description of the activities within each stage and post-quarrying are detailed below.

### i Quarry stage 1 (nominally Years 1–5)

The WEA's first stripping event and construction of part of the WEA's safety berm (from the West Pit to the existing access road) will commence in Year 1. Once stripping has been completed, extraction will commence in the WEA, starting at the most eastern extent and moving west.

A small amount of extraction (10,000 tpa) will continue to occur within the existing quarry pit to extract the remaining altered basalt from the West Pit floor.

The WEA's second (and final) stripping event will occur in about the fifth year of Stage 1. The final section of the WEA safety berm is also expected to be fully constructed by the end of Stage 1.

The following project elements will be constructed within the first two years of operations:

- proposed access road and truck tarping area (if required);
- southern haul road and Eulomogo Creek crossing; and
- modification and additions to the existing water management infrastructure.

Until the new internal access road is constructed, the existing quarry access road and the existing connection with Sheraton Road will continue to be utilised under the project.

Quarrying of the SEA will commence in Year 3 at a rate of 100,000 tpa, until the WEA has been fully extracted of true basalt. The first stripping event within the SEA will occur in Year 3 with a second event potentially undertaken in Year 5.

Rehabilitation of the East Pit faces will commence during this period.

#### ii Quarry stage 2 (nominally Years 6–10)

Extraction of fresh basalt within the WEA will continue in this stage. Small amounts of altered basalt (around 10,000 tpa) will be extracted within the existing quarry pit. The rate of extraction within the SEA will increase as extraction in the WEA is completed. Stripping in the SEA will occur about once every two years.

Rehabilitation of the East Pit faces will be completed in this period. Rehabilitation of the East Pit floor, the West Pit faces and the WEA pit faces will commence in this period.

#### iii Quarry stage 3 (nominally Years 11–15)

Extraction will primarily occur in the SEA with small amounts of altered basalt extraction (around 10,000 tpa) occurring within the existing quarry pit. Stripping in the SEA will occur about once every two years.

Rehabilitation of the East Pit floor, the West Pit faces and the WEA pit faces will be completed.

#### iv Quarry stage 4 (nominally Years 16–20)

Extraction will primarily occur in the SEA with small amounts of altered basalt extraction (around 10,000 tpa) occurring within the WEA. Stripping in the SEA will occur about once every two years.

Rehabilitation of the WEA pit floor (where altered basalt has been extracted to RL 283) will commence. Rehabilitation of the SEA's northern pit faces will commence.

#### v Quarry stage 5 (nominally Years 21–25)

Extraction will primarily occur in the SEA. Extraction in the WEA will be completed in this stage. Stripping in the SEA will occur about once every two years.

Rehabilitation of the WEA pit floor (where altered basalt has been extracted to RL 283) will continue in this stage. Rehabilitation of the SEA's northern pit faces will be completed.

#### vi Post quarrying

Rehabilitation of the remaining SEA pit faces and pit floor and WEA pit floor will be completed.

All buildings, plant, machinery, tanks, footings, slabs, pipelines, power lines and road pavements will be removed unless required for an alternate post-quarrying land use to be determined later in the project's life. All water management areas will be rehabilitated apart from the In-pit Dam which will remain as a water storage.



## A.3.6 Access

### i Quarry access road

The primary access point to the project area for heavy and light vehicles will continue to be via Sheraton Road. To allow flexibility and efficiency in quarry operations, a ramp will be constructed at the most north-west point of the WEA to allow vehicles to access the site via an access route located within the quarry pit (refer Figure 3.1). This will allow product trucks to be loaded at the stockpile area adjacent to the new processing area.

Product trucks and other vehicles will be able to exit the quarry pit via an existing ramp to the south and access other stockpile areas, administration buildings and the weighbridge. Vehicles will then exit the site via the same route. Appropriate safety barriers and signage will be placed within the pit to direct vehicles and ensure separation of quarry operations from vehicle movements.

There will be two options for access to Sheraton Road:

- retention of the existing access road; or
- construction of the proposed access road (if the existing access road is unable to be retained as quarry access. This is dependent on agreements with the landowner of Lot 221 DP 1247780).

Construction details for the proposed access road (if constructed) are provided below.

The proposed access road will connect to the new intersection on Sheraton Road and will extend within the 30 m road corridor of Lot 222 DP 1247780 up to the WEA. The proposed access road has a disturbance corridor of between 15–18 m to allow for batters and drainage channels. The road will be graded and sealed with line markings applied.

The new internal access road will be 10 m wide in order to accommodate simultaneous incoming and outgoing truck movements. The conceptual road design has allowed for the simultaneous turning of trucks up to 20 m long within the site which is the typical size of the quarry's product trucks currently. Throughout the quarry operation, some larger trucks may need to access the site for delivery of equipment and other purposes. Additional traffic management measures will be implemented during access of the quarry site by trucks greater than 20 m (see Section 6.11.4 of the EIS for further detail).

The existing quarry identification sign will be moved to the new site access and a new security gate installed at the new access location.

Development Consent D2017-640, granted by Dubbo Regional Council on 16 August 2018, allowed for the construction of a new intersection on Sheraton Road with the proposed entry/exit to Lot 222 DP 1247780 approximately 175 m north of the existing access point. Therefore, construction of the site access intersection is not included in the project. It is noted that Development Consent D2017-640 limits trucks accessing the site at the new intersection to 19 m long. A modification to Development Consent D2017-640 will be required to allow larger trucks sizes as needed for the project.

### ii Haul roads

Haul roads are internal roads used for the movement of equipment and personnel in and out of extraction areas and the transport of product to the processing infrastructure. The southern haul road, which will connect the existing quarry area to the SEA, will be a two-lane unsealed road around 450 m in length. The haul road will be 15-m wide, narrowing to a single lane (10-m wide) where it crosses Eulomogo Creek. The disturbance boundary allows for construction of batters along the length of the haul road.

Informal haul roads will also be developed within the WEA and SEA to connect to the existing quarry pit and southern haul road.

### iii Conveyors

Conveyor systems may be constructed in-pit, adjacent to the haul roads to provide an alternative method of transporting rock from the active pit to the processing area. A cross-section of a typical modular overland conveyor is provided in Figure 3.3. The system installed at the quarry will typically be of the dimensions and general characteristics shown, other than where topography dictates to maintain a suitable gradient. Additional height is required at transfer points between conveyors and feed hoppers with an approximate maximum height of 5 m.

Where the system crosses Eulomogo Creek additional design considerations are to be incorporated including setting the height of the belt at 283 m AHD to be above the 100 year flood level and concrete foundations. Spill trays will be installed for the sections spanning over the creek crossing.

The colour scheme for the conveyor systems will be sensitive to the environment and selected to ensure minimal visual impact (eg green). Some sections of the system will remain galvanised though these are not expected to be within the line of sight of residences and can be covered if needed. Should conveyors be constructed, road truck haulage would still be undertaken occasionally during periods of conveyor shutdown or maintenance.

Whilst noise and dust emissions from the conveyor have not been predicted to result in significant impacts, and visual impacts are unlikely (see Chapter 6), mitigation measures are available should impacts exceed predictions. These include fitting of top and/or side covers, fitting foam dust suppression unit, and construction of temporary earthen bunds where required. Regular maintenance of the conveyors would be undertaken to ensure noise and dust emissions are minimised.

### iv Creek crossing

A culvert-based crossing of Eulomogo Creek is proposed. Preliminary engineering designs of two options were prepared by Pitt and Sherry. Option 1 includes five 2.1 m diameter precast pipes and Option 2 includes five 3.0 x 2.1 m rectangular box culverts. Both options are similar in terms of the overall design concept and include the following common aspects:

- the haul road will be a single land road to minimise the disturbance footprint and will be slightly skewed relative to the culvert alignment (which will be parallel to the creek). The road surface will be a 400 mm thick concrete pavement;
- the culverts will be approximately 27 m long and will be located within the creek channel zone with invert levels that are similar to the creek bed levels;
- headwalls and scour protection will be provided at the inlet and outlets;
- 1.4 m high vehicle safety berms will be constructed on either side of the haul road; and
- the height from the culvert invert to the top of the safety berm will be approximately 3.9 m.

Both design options have been assessed for the project with a preferred option to be chosen following approval. Concept design drawings for both options are provided in the surface water assessment.

### v Vehicle access tracks

Vehicle access tracks will be constructed around the perimeter of the new resource areas to allow maintenance access if needed such as fencing repairs. The tracks will be up to 4 m wide and will be cleared of vegetation and levelled with a dozer and/or front end loader.

### A.3.7 Water management system and usage

#### i Existing water management system

The quarry's existing water management system includes three key storages: the In-Pit Dam, Pump 2 Storage Pond, and the Settling Pond (refer Figure 3.1). Water is collected from several sources, including runoff from the quarry area and the eastern watercourse catchment and from groundwater inflows into quarry pits.

When the available capacity of these storages is exceeded by excessive runoff from the catchments, water collected in the Pump 2 Storage Pond overflows into the In-Pit Dam via a surface drain or subsurface flow. Water in the In-Pit Dam is then pumped to the Settling Pond or discharged to the Rehabilitation Area.

Groundwater inflows are known to occur into the In-Pit Dam and Pump 2 Storage Pond. Holcim holds Water Access Licence (WAL) 43440 to extract this groundwater.

#### ii Existing water usage

The quarry operation uses between 68 to 74 mega litres per year (ML/year) of process water for haul road dust suppression. The site operates a 13 kL capacity water cart to spray haul roads which completes approximately 15 loads a day and is filled from a pump at the In-Pit Dam. For dust suppression in the processing plant, 18 ML/year of water is sprayed onto conveyors and stockpiles. The water is extracted from the Pump 2 Storage Pond to two 50 kL process water tanks which are filled every 2 days on average. Water from the In-Pit Dam is also used to irrigate the Rehabilitation Area (which is approximately 1 ha).

Drinking water is delivered to the site by truck. Water for the amenities is sourced from rainwater tanks located near the office. When empty, these tanks are also filled with water from the Pump 2 Storage Pond. Wastewater from amenities is discharged to a septic tank, which is then discharged to an absorption trench. The septic tank is periodically pumped out by an approved licensed contractor as required.

Existing water licence entitlements for the quarry are detailed in Section 6.7.3.v of the EIS.

#### iii Proposed water management system

The project will include new additions and modifications to the existing water management system. These include:

- the construction of four new water storages, including sumps in the WEA and SEA and two sedimentation ponds near the proposed southern haul road either side of Eulomogo Creek; and
- combination of the In-Pit Dam and the Pump 2 Storage Pond to form a single water storage in the East Pit.

The East Pit water storage will receive water from groundwater inflows, and from dewatering of existing and new water storages, including the Settling Pond, after rainfall events. When full, the East Pit water storage will be discharged downstream of the Settling Pond in Eulomogo Creek. An assessment of the impacts associated with these changes to the existing water management system, including proposed discharges to Eulomogo Creek and construction of the Eulomogo Creek Crossing, is provided in the Appendix F.

#### iv Proposed water usage

As part of the project, additional water will be required for dust suppression of proposed haul roads. Between 166 and 181 ML/year of water will be required, which will continue to be sourced from the water management system. This water may be sourced from other parts of the water management system, for example water from the SEA sump may be used for dust suppression on haul roads south of Eulomogo Creek.

Water sourced from the water management system can also be used for irrigation of the SEA bund wall and rehabilitation areas if required. No additional water will be required for dust suppression in the processing plant. There will be no change to other components of the water management system, including the use of trucked in potable water or collection of rainwater for amenities.

### A.3.8 Utilities

The existing site is connected to the electricity grid. Existing electricity and telecommunication lines (copper cable line) will need to be realigned to allow for the development of the WEA and proposed access road. The location of the new alignment will be confirmed during detailed design. This will be completed in consultation with the relevant electricity and telecommunications provider and under a separate approvals process.

### A.3.9 Fuel usage, storage and wastes

Approximately 26 kL of fuel per month will be used to operate the fleet and equipment during construction and operation of the project. Fuel is delivered to the site and stored in an appropriately bunded fuel farm. The fleet and equipment are refuelled at dedicated refuelling bays with appropriate environmental protection controls. Waste oil is stored at the fuel farm in a 2,000 L container. When full this is collected by a licensed contractor.

Other wastes generated at the quarry include general waste and recyclable products produced at the administration building. These wastes are put into wheelie bins which is collected by a licensed contractor and taken to landfill or recycling station.

### A.3.10 Fleet and equipment

Construction of the new internal access and haul road will be completed using standard road building equipment, including excavators, loaders, graders and dump trucks. The Eulomogo Creek crossing will be constructed using similar equipment in addition to concrete agitator trucks, cranes and piling equipment.

The indicative fleet and equipment used for modelling the impacts of construction and operation of the project is provided in Table A.1. The fleet and equipment may vary over the life of the quarry depending on the rate of extraction (up to 500,000 tpa), changes to equipment specifications, economics or other factors.

**Table A.1 Required fleet or equipment**

Activity	Required fleet or equipment
<b>Operation</b>	
General operations	1 primary crusher (with rock breaker)
	1 secondary crusher
	1 tertiary crusher
	1 conveyor drive, 22 conveyors
	4 screens
	1 pugmill/generator
	1 front end loader (FEL (WA 500))
	2 FEL (980 loading RT)
	1 FEL (WA 470)
	1 excavators
	2 water pumps
	2 dump trucks
	2 watercarts
Stripping	1 excavator
	2 dump trucks
	1 dozer (D375)
Drilling	2 drills (1,500 diameter)
<b>Construction</b>	
Construction of the southern haul road and proposed access road	grader, scraper and dozer
Construction of Eulomogo Creek crossing	concrete agitator trucks, cranes, piling equipment

### A.3.11 Hours of operation

There is no restriction on operating hours in the quarry's current approval. Under the project, hours of operation will be formalised to:

- 5.00 am–6.00 pm Monday to Saturday for general operations (two shifts);
- 7.00 am–6.00 pm Monday to Saturday for production (processing and extraction);
- 4.00 am–6.00 pm Monday to Saturday for loading and transport (Sundays or public holidays for emergencies); and
- maintenance activities 24 hours/day, 7 days per week.

Blasting will be undertaken no more than once per week between 9.00 am and 5.00 pm, Monday to Friday.

Construction of the proposed access road and Eulomogo Creek crossing will occur within standard construction hours:

- 7.00 am–6.00 pm Monday to Friday;
- 8.00 am–1.00 pm Saturdays; and
- no construction on Sundays or public holidays, unless approval is provided by the Secretary.

### A.3.12 Workforce

The quarry currently employs 12 full-time equivalent (FTE) employees, 25 contractor truck drivers, 28 regular and 10 irregular contractors. The project will utilise the existing quarry workforce during operations. Additional contractors will be required during construction of the Eulomogo Creek crossing (up to 6 persons) and the proposed access road (up to 9 persons) in addition to the existing workforce of the quarry.

### A.3.13 Vehicles and parking

The site currently allows for parking of up to 20 light vehicles and 6 trucks, which can be expanded during peak production periods through relocation of earth bunding used for segregation. There will be no changes to the location or size of the parking area.

The existing truck tarping area will be quarried through as the WEA is fully developed. A new tarping area will be constructed under the project. The location of this area will vary depending on which access option is used at the time; however, it will be located within the proposed western disturbance boundary. It will be approximately 0.2 ha, 20 m x 100 m and will be graded and covered in road base but not sealed. The area will provide for the temporary parking of trucks to check vehicles, uncover/cover loads prior to entering or exiting the site. A colourbond shed and associated concrete slab, located within the existing truck tarping area, will be relocated to the new tarping area.

### A.3.14 Rehabilitation and end of project requirements

Progressive rehabilitation will be undertaken concurrently with extraction of the WEA and SEA where possible. The general sequencing of rehabilitation is detailed in Section 2.3.5 of the EIS. A rehabilitation and landscape management strategy has been completed for the project, which is summarised in Section 6.10 of the EIS and provided in full in Appendix J of the EIS. A rehabilitation management plan will be prepared for the quarry should the project be approved. The future land use for the site will be identified prior to quarry closure and will be agreed with the landowner, consistent with the appropriate land zoning and strategic planning context.

Once extraction has been completed in a pit, or part of a pit will no longer be used, the pit walls will be recontoured via blasting and dozing to have safe and stable gradients. Rehabilitation undertaken to date on the south-western wall of the west pit has a gradient of approximately 1(v):3(h) or 18°. Gradients for future pit wall rehabilitation will be consistent with this, or have a gradient as otherwise specified in the rehabilitation management plan to be safe and stable.

The SEA pit floor will be re-shaped so that it is free draining to Eulomogo Creek. The floor of the West pit generally drains to Pond 1 at the eastern end of the pit. The floor of the WEA will be shaped so that it free drains to Pond 1. Subsoil and topsoil will be respread on the pit floors at sufficient depth to re-establish the pre-quarrying Land and Soil Capability (LSC) class. If during rehabilitation works there is a soil deficit onsite, soil or other suitable materials with applicable waste exemptions will be imported for this purpose. Soils in the floor of the pits will be contour scarified, ameliorated if required, and seeded with pasture species.

Following completion of the project, site infrastructure will be dismantled and recycled where possible or disposed of at an appropriately licensed waste facility. Equipment will be removed from the existing site and recycled where possible or disposed of at an appropriately licenced waste recycling facility.

Once quarrying has ceased, a contamination assessment (for the prospective future use) will be undertaken in the quarry pits and infrastructure areas and any contaminated materials either bioremediated on site or taken to an appropriate disposal facility.

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# Appendix B

## Processing plant conceptual layout

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DO NOT SCALE THIS DRAWING - IF IN DOUBT ASK.

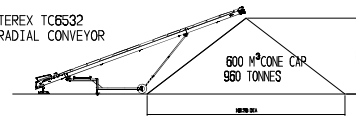
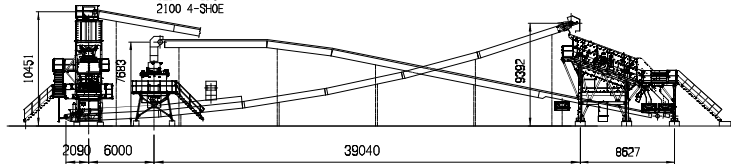
TG320 CONE MODULE WITH SURGE BIN

CEDARAPIDS 2100 4-SHOE

SCREEN STATION No 1

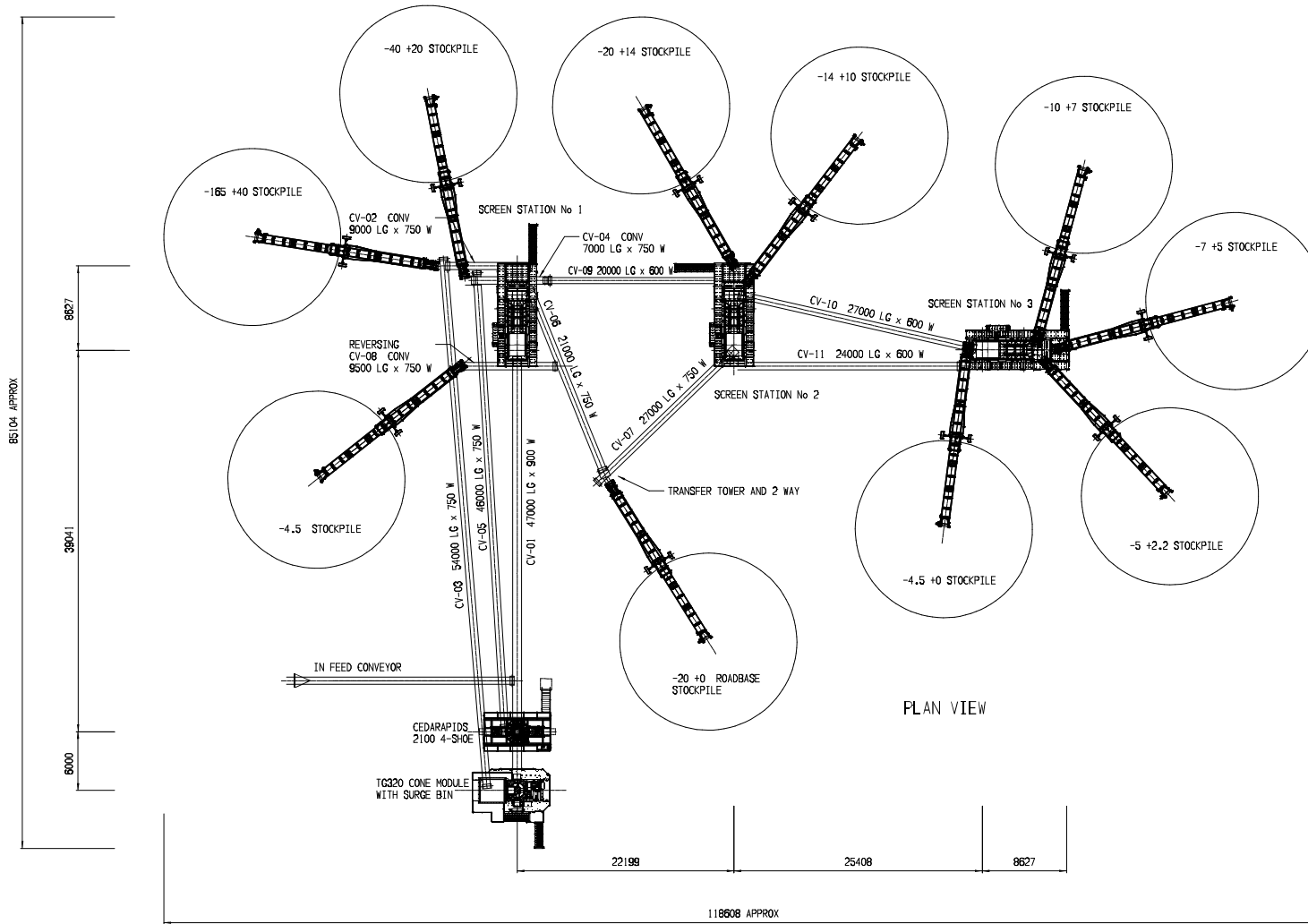
TEREX TC6532 RADIAL CONVEYOR

600 M<sup>3</sup> CONE CAP 960 TONNES



ELEVATION ON CEDARAPIDS 2100 4 SHO E TO SCREEN STATION No 1

TYPICAL PRODUCT STOCKPILE ELEVATION



PLAN VIEW

ISSUE	D.C./H.	DESCRIPTION OF CHANGE	BY	CHECKED	DATE	DESIGN RELEASE APP	DATE	DRAWING No.	REFERENCE DRAWINGS
B		CEDARAPIDS TC320 ADDED INTO CIRCUIT. ADDITIONAL CONVEYOR ADDED. CONVEYORS LENGTHENED.							
A		TEREX TC6532 RADIAL CONVEYORS REPLACE STD STOCK PILE CONVEYORS. RE CRUSH FROM SCREEN No 2 CONNECTED.							

REVISED TO	CONFORM WITH THE SPECIFICATION	SCALE	1:225	NEW DRG BOX	
REVISED TO	ADD TO 100 mm x 100 mm ALL NEW/REVISED SYMBOLS TO 40/100/20	ISSUE DATE	R.L. 05-10-21	DETAIL CHECKED / DATE	
REVISED TO	ADD TO 100 mm x 100 mm ALL NEW/REVISED SYMBOLS TO 40/100/20	DESIGN APPROVED / DATE		RELEASE AUTHORIZED / DATE	
REVISED TO	ADD TO 100 mm x 100 mm ALL NEW/REVISED SYMBOLS TO 40/100/20	REVISED TO		REVISED TO	

**TEREX | JAQUES**  
 320 TPH MODULAR FIXED CRUSHING PLANT LAYOUT  
 WHERE USED: HOLLIM 1 DUBBO  
 WHERE TEST: (kg each)

A  
B  
C  
D  
E  
F  
G  
H

A  
B  
C  
D  
E  
F  
G  
H

85/104 APPROX

8627

39041

8600

22199

25408

8627

118608 APPROX

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# Appendix C

## Engagement letter

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XXXX Sheraton Road  
Dubbo NSW 2830

26 August 2022

**RE: Update – Dubbo Continuation Project**

Dear XXXXX,

I am writing to you regarding Holcim's Dubbo Quarry Continuation Project. The Dubbo Quarry has been operational since 1980, in recent years Holcim has been progressing an application for approval to continue the operation at the site. This letter provides an update on current operations, proposed operations and the approval process.

The Existing Operation

The Dubbo Quarry has operated since 1980 and produces high quality basalt aggregates for use in the construction industry in concrete, asphalt, road base and other applications for commercial and domestic markets. The quarry operates at a rate of up to 500,000 tonnes a year. Accessible, approved basalt resources within the site are close to being exhausted.

The Proposed Operation

Holcim submitted an Environmental Impact Statement (EIS) for the project on 28 January 2021. The proposed operations involve; continued operations at the existing site, and the development of two new resource areas, known as the Western Extension Area (WEA) and Southern Extension Area (SEA). The project area is shown in Figure 1 attached.

The project also includes developing the following:

- a new internal quarry access road which intersects with Sheraton Road just north of the existing intersection with Sheraton Road;
- a new internal haul road to connect the existing site with the SEA, which will include construction of a culvert type crossing across Eulomogo Creek;
- modifications to the existing water management infrastructure within the existing site; and
- additions to the existing water management infrastructure to service the WEA and SEA.

The project seeks to continue a peak production rate of 500,000 tpa, for 25 years.

Since the EIS was submitted, extraction of the existing East Pit has continued under the quarry's existing development consent. Resource life in the existing, approved consent is estimated to end in December 2023 assuming extraction continues at a rate of up to 500,000 tpa. The continued extraction within the East Pit has flow-on implications for the quarry's processing infrastructure, surface water management system, and other operational aspects as detailed further below.

Holcim is seeking planning approval to extract material outside of the existing, approved site to allow the quarry to continue operating.

### The Amended Proposal in Detail

On 3 April 2020, the Secretary of the Department of Planning and Environment issued Secretary's Environmental Assessment Requirements (SEARs) for the project. The project application documentation and technical studies were submitted to the Department on 28 January 2021. The documentation and technical studies were publicly exhibited for 28 days, the exhibition ended on 8 Mar 2021.

During the exhibition period, advice was received from 16 NSW Government agencies and one Council. Submissions were received from six community members. Two submissions were in support of the project, 4 objected to the project and the remainder of the submissions made comments (only) on the proposal. Consequently, a Submissions Report was submitted in June 2021. An Addendum Submissions Report and Project Amendment Report will be submitted to the Department shortly to respond to a final request for information.

Since the exhibition process, Holcim has proposed to amend the original application; to increase efficiencies onsite, and further reduce impacts, also responding to the submissions made. The amendments are summarised below. The overall impacts of the proposal are when compared to the existing, approved quarry operation, this is described further in the paragraphs below.

### ***Processing area location and plant upgrade***

The area to the south of the East Pit was the original location of the quarry's processing plant within the EIS. However, ongoing, continued extraction within the East Pit (under the existing consent) has impacted this area and required removal of the quarry's processing plant. A new mobile processing plant has been assembled within the quarry's existing pit (see Figure 1) under the existing development consent (SPR79/22). The new plant in the existing pit will continue to be the location of the processing plant for the duration of the project. Therefore, updates to certain technical assessments prepared for the EIS (specifically air quality, noise and surface water) have been undertaken and will be submitted to the Department

The location of the processing plant within the new processing area will require some changes to quarry operations described in the EIS, including:

- haul truck routes will be slightly modified to travel from the SEA or WEA to the new processing area;
- an additional excavator (similar to the one currently on-site) will be used to load material into the primary crusher; and
- an additional stockpile area will be located adjacent to the new processing area.

Holcim is considering replacing the mobile processing plant with a fixed processing plant at the same location. A layout diagram for a fixed processing plant is provided in Figure 2. The fixed processing plant will have the same capacity but would have a larger footprint than the mobile processing plant and, therefore, updated technical assessments have conservatively assessed that the fixed processing plant will be in place for the project duration.

The air quality and noise technical studies show an improvement with the plant location being within the East Pit.

### ***Water management system***

The continued extraction within the East Pit results in modifications to the site's water management system.

- The East Pit extraction boundary will be increased (as per the existing consent SPR 79/22) which will increase the storage within the in-pit dam and intercept a new catchment area that currently drains to the Settling Pond.
- The Pump 2 storage pond will be removed as it will not form part of the East Pit Lake.

- The Western Pit Pond will be removed as the mobile processing plant and stockpile area has been moved to this location.
- An increase to the capacity of the Settling Pond under the project is no longer proposed, given the reduced catchment area that drains to this storage location.

The surface water technical study shows less water management structures are needed and shows that existing water management structures can be increased and improved to meet the water management requirements, thus reducing impacts.

### ***Construction activities***

The construction of amenity bunds on the western boundary of the WEA and around the SEA was initially proposed to mitigate noise and visual impacts from the project. Further investigation has been undertaken of the noise and visual mitigation benefit of the amenity bunds on the western boundary of the WEA, which determined that it would provide negligible reduction in noise levels or visual impacts. Construction of the amenity bund around the WEA is no longer proposed, a smaller safety berm will be constructed instead. Construction of the amenity bund around the SEA will remain a part of the project.

In response to submissions received on the EIS, Holcim has investigated ways to further reduce noise levels associated with overburden stripping activities. The modelling of the noise bund construction and overburden stripping assumed the use of a CAT D11 dozer in the Noise and Vibration Impact Assessment. Holcim is now proposing to use a Komatsu D375 dozer to undertake these activities, which has a lower sound power level than that of a CAT D11, and hence will result in lower noise levels for overburden stripping.

### ***Alternative access route option and modification to WEA pit***

To allow efficiency in quarry operations a ramp will be constructed at the north-west point of the WEA to allow vehicles to access the site via an access route located within the quarry pit (see Figure 1). This will allow product trucks to be loaded at the stockpile area adjacent to the new processing area. Product trucks and other vehicles will be able to exit the quarry pit via an existing ramp to the south and access other stockpile areas, administration buildings and the weighbridge. Vehicles will then exit the site via the same route.

As a result of the proposed in-pit access, the proposed access road has been modified from that presented in the EIS. It will now finish at the boundary of the WEA instead of being constructed around the boundary of the pit (see Figure 1). This will allow the boundary of the WEA to extend up to the property boundary, with an appropriate setback determined by quarry safety considerations.

Holcim proposed to use the existing access road for the project until the WEA extraction reaches the road boundary, after which the proposed access road would be constructed and used as the primary access route to and from the site. Retaining the existing access road would mean that vegetation disturbance and construction impacts associated with the proposed access road would no longer occur. Access to Sheraton Road will be via one of the two access points shown on Figure 1. The different access locations are to allow flexibility in quarry operations, as the extraction occurs.

### ***Conveyors systems***

Holcim is proposing an option to use conveyor systems for the project as an alternative to truck haulage of product from the active extraction area (either the WEA or SEA), to the new processing area. The conveyors would follow the alignment of proposed haul roads and would be constructed within the proposed disturbance footprint presented in the EIS. They would be set at approximately 1-1.5 m above the quarry floor (see Figure 3), with the exception of the crossing of Eulomogo Creek, where the conveyor would be set at height of 283 m AHD to be above the 100-year flood level. In this case, road truck haulage would still be undertaken occasionally in case of conveyor shutdown or maintenance.

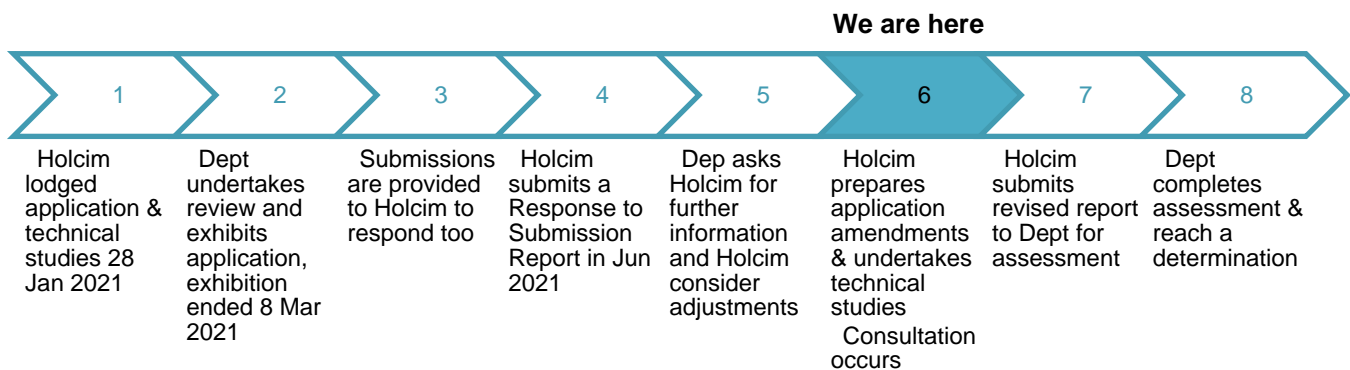
In order to allow flexibility in quarry operations, Holcim is seeking use of both conveyors and trucks for product transport from the pits to the new processing area.

These proposed amendments result in lowering of impacts of the Dubbo Quarry from the 1980 consent. Relocating processing plant to within the pit, considerably reduces a range of impacts. The potential use of conveyors will allow the future operation of the Dubbo Quarry to respond to the operational needs and also lower offsite impacts including visual amenity impacts, air quality and noise impacts.

The Approval Process

Holcim is reaching out to local stakeholders to advise of the amended proposal that provides operational efficiencies, lowers the environmental impact of the operation (from the existing consent SPR 79/22), and also responds to feedback received during the exhibition process. We are proposing to submit our revised report to the Department in mid-September and we would like to extend an offer to discuss the proposed application further with you.

Below is a schematic timeline of our proposal.



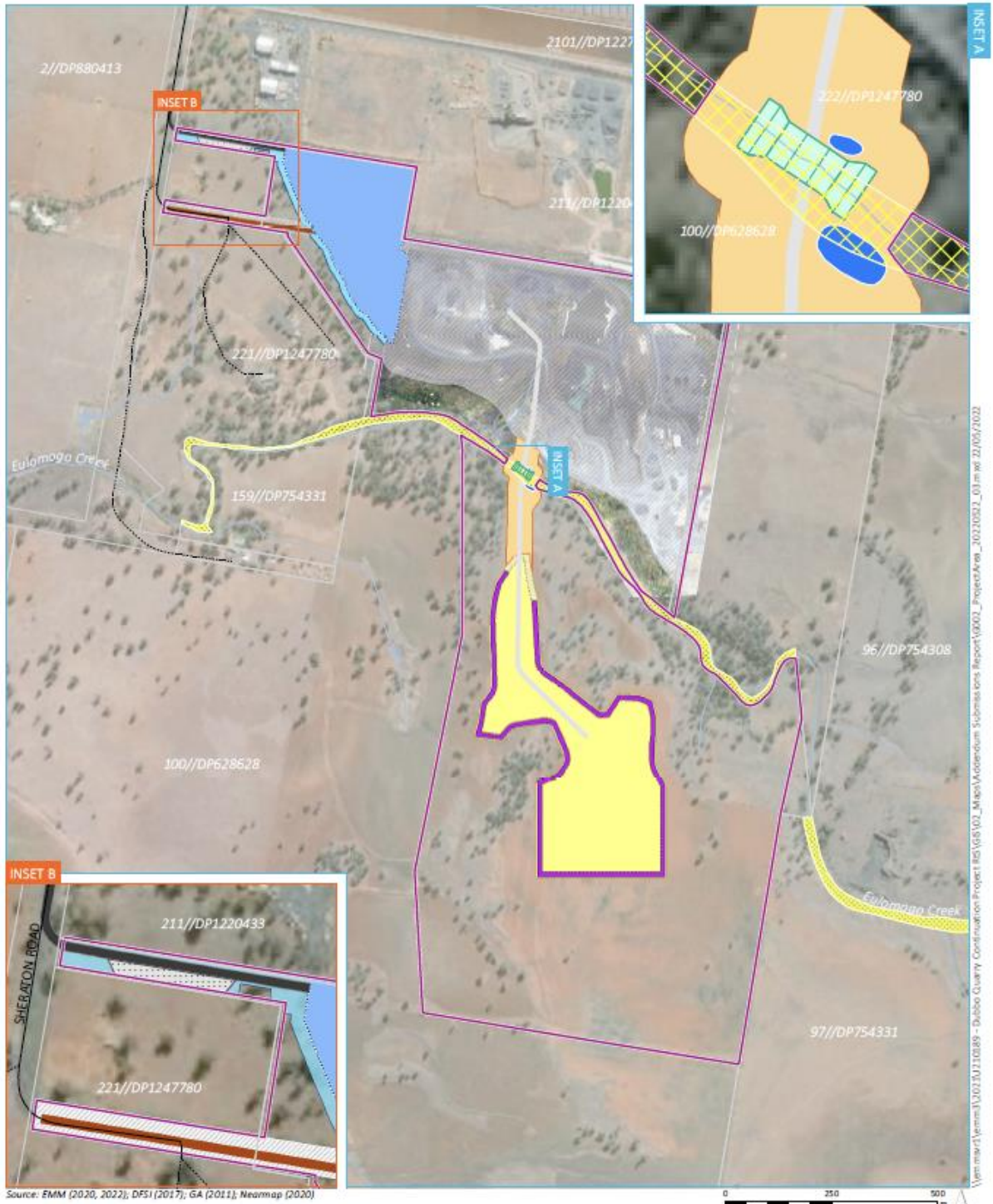
If you would like to meet to discuss further please don't hesitate to make contact with our Quarry Manager at [joey.nichols@holcim.com](mailto:joey.nichols@holcim.com) or 0429 790 561

Our Community Consultative Committee (CCC) last met in November 2021. There have been some personnel changes during this time. We will be seeking to have another meeting in Q4 2022 to continue to discuss ongoing operations and to continue to provide updates on this application.

Regards,

Joey Nichols  
Dubbo Quarry Manager

Figure 1 – Updated Site Map



Source: EMM (2020, 2022), DFSI (2017), GA (2011), Nearmap (2020)

**KEY**

- Project area
- Sediment pond
- Indicative existing disturbance area
- Proposed haul road
- Indicative proposed water crossing
- Western extension area
- Western disturbance area
- Haul road disturbance area
- Minor road
- Vehicular track
- Watercourse/drainage line
- Waterbody
- Crown land
- Cadastral boundary (data does not align with surveyed site boundary)

Project area (updated)

Dubbo Quarry Continuation Project  
Addendum Submissions Report  
Figure 3.2



V:\emms\Yemms\100100110089 - Dubbo Quarry Continuation Project 85\68\101\_Maps\Addendum Submissions Report\6002\_ProjectKey\_20220522\_03.mxd 22/05/2022

Figure 2 - Plant layout – located within the existing pit is approx 100m x 130m, and

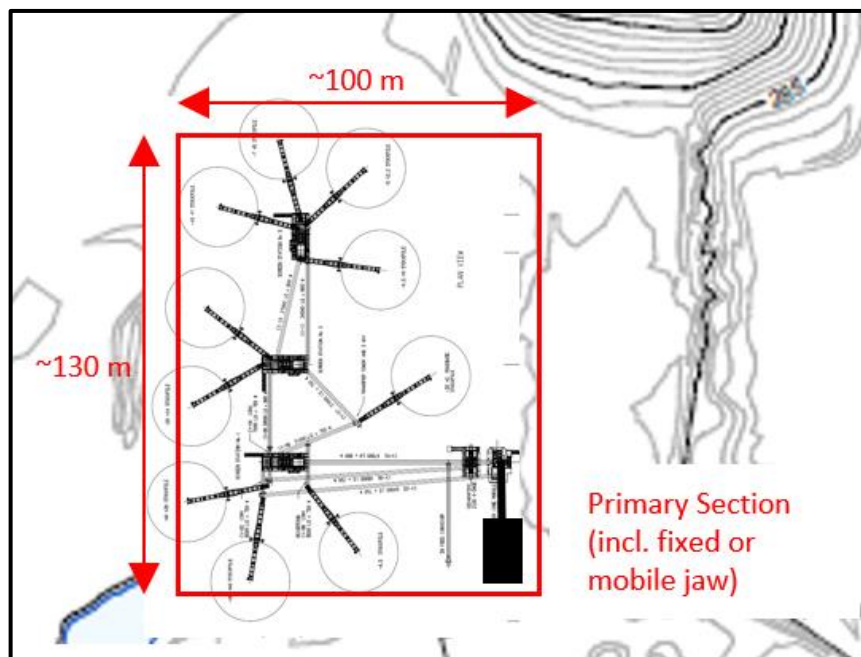
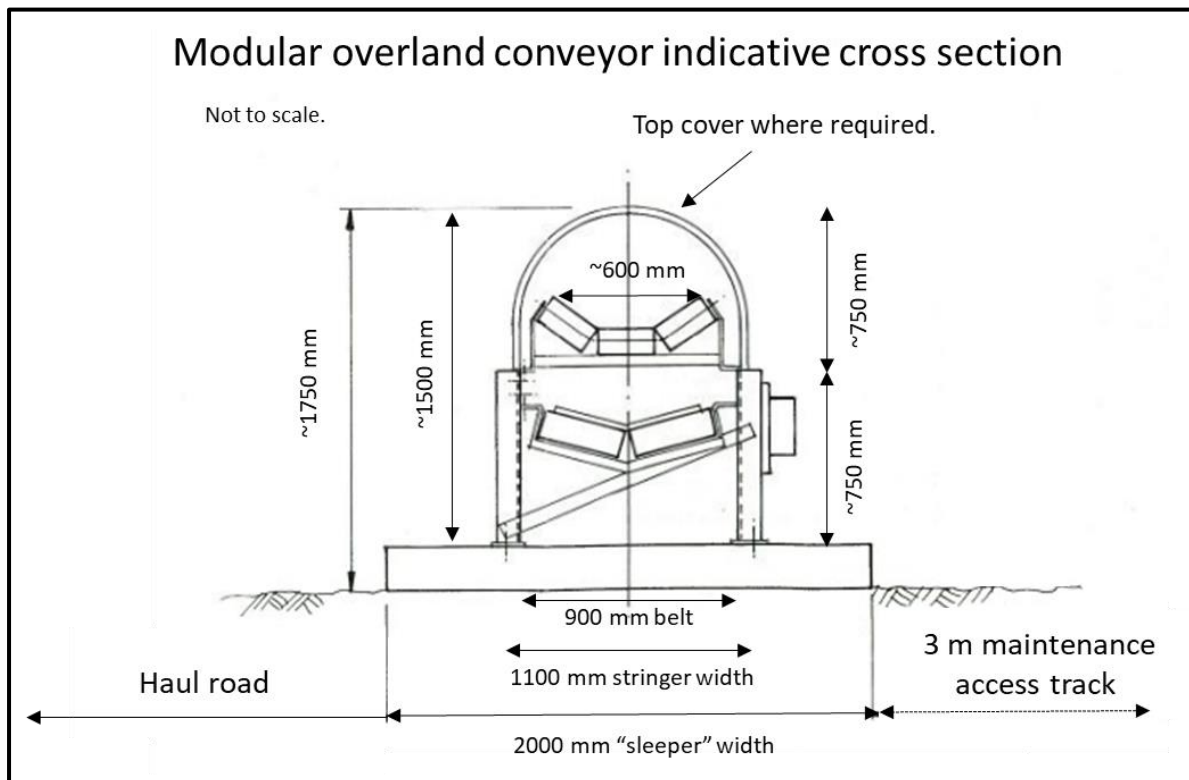


Figure 3 - Typical cross section of a conveyor





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# Appendix D

## Supplementary noise impact assessment

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# **Supplementary Noise Impact Assessment**

## **Dubbo Quarry Continuation Project**

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Prepared for Holcim (Australia) Pty Ltd

September 2022

# Supplementary Noise Impact Assessment

## Dubbo Quarry Continuation Project

Holcim (Australia) Pty Ltd

J210189 RP1

September 2022

Version	Date	Prepared by	Approved by	Comments
6	13/09/2022	Teanuanua Villierme	Najah Ishac	Final

Approved by



**Najah Ishac**

Approved Name

13 September 2022

Level 3 175 Scott Street

Newcastle NSW 2300

This report has been prepared in accordance with the brief provided by Holcim (Australia) Pty Ltd and has relied upon the information collected at the time and under the conditions specified in the report. All findings, conclusions or recommendations contained in the report are based on the aforementioned circumstances. The report is for the use of Holcim (Australia) Pty Ltd and no responsibility will be taken for its use by other parties. Holcim (Australia) Pty Ltd may, at its discretion, use the report to inform regulators and the public.

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# 1 Introduction

This report provides a Supplementary Noise Impact Assessment for the Dubbo Quarry Continuation Project (the project). Holcim (Australia) Pty Ltd is the applicant for the project. Since preparation of the Noise and Vibration Impact Assessment (NVIA) for the project by EMM Consulting Pty Limited in 2021 (EMM 2021), substantial changes to the project have been made that require a revised assessment of noise impacts. This report is structured to provide an update to the NVIA based on project changes as well as addressing key items raised in submissions in relation to the 2021 NVIA. This report also responds to individual comments in each submission received in relation to the NVIA.

Key changes to the project relevant to the noise assessment are as follows:

- Changes to existing operations:
  - the processing plant (referenced in the NVIA) has been decommissioned;
  - a mobile plant (including a mobile jaw crusher) is currently operating in the west pit as a short-term replacement for the decommissioned processing plant referenced in the NVIA; and
  - haul routes have been updated to reflect the above changes.
- Changes to proposed construction activities:
  - the 4 m high noise bund is no longer proposed to be constructed in the Western Extraction Area (WEA);
  - a different dozer will be used for stripping within the WEA;
  - a different dozer will be used for the 4 m high noise bund construction and stripping within the Southern Extraction Area (SEA); and
  - the section of new quarry access road along the north-eastern boundary of the WEA is no longer proposed to be constructed. The quarry access road is now proposed to go through the WEA pit (once quarried). The connection to Sheraton Road from the WEA pit will be via the western section of the existing quarry access road or the western section of the new quarry access road to the north-west of the WEA.
- Changes to proposed future operations:
  - the processing plant (referenced in the NVIA) has been decommissioned;
  - a modular plant (option 1) or tracked plant (option 2) is proposed as a long-term replacement for the decommissioned processing plant referenced in the NVIA. The existing mobile plant (short-term) currently operating in the west pit will be decommissioned and replaced by the modular plant or tracked plant;
  - a mobile jaw crusher is proposed to be operating in the WEA and SEA. The mobile jaw crusher will be located in the WEA during extraction in the WEA and will be relocated to the SEA during extraction in the SEA;
  - haul routes between the extraction areas and processing area have been updated to reflect the above changes;

- an overland conveyor system option is proposed as a potential alternative to truck haulage to transport excavated material from the extraction areas and the processing area. Hence, if the overland conveyor is constructed, it will be used as an alternative to haul trucks travelling between the extraction areas and the processing area; and
- the on-site transport route (road trucks) has been updated to reflect the proposed changes to the quarry access road.

A detailed description of these project changes is provided in the following section.

This report provides a response to submissions from the NSW Environment Protection Authority (EPA), School Infrastructure NSW (SINSW) and the community on the NVIA. Responses to individual comments in each submission are also provided herein and, where relevant, are addressed in the updated noise assessment provided in Section 3.

## 2 Project updates

### 2.1 Background

Some key elements of the project have changed and/or have been further assessed in response to some of the submissions received on the NVIA. Some of the changes are associated with updates to existing operations at the quarry (in accordance with the current development consent) and hence have been considered separate to proposed constructions and operations. Changes to existing operations as well as proposed construction and future operations considered in this updated noise assessment are discussed in the following sections.

### 2.2 Updated existing operations

The quarry is approved to operate a mobile processing plant in accordance with the development consent. The processing plant referenced in the NVIA has been decommissioned and replaced in the short-term with a mobile processing plant (mobile plant). The mobile plant is located at the base of the west pit. This location is at a lower ground elevation (approximately RL 285 m) than the decommissioned processing plant location (approximately RL 300 m) and hence shielding will be afforded to noise emissions from in-pit processing activities. This provides improved noise outcomes for the community when compared to noise predictions with the decommissioned processing plant as presented in the NVIA.

The mobile plant includes the following key components:

- jaw crusher;
- cone crushers (x2);
- vertical shaft impact crusher (VSI);
- screens (x3); and
- conveyors assembly.

Approved operational activities associated with the existing processing area include:

- haulage of material from existing quarrying area to the existing processing area;
- loading of material into the mobile plant; and
- processing (crushing and screening) of material and stockpiling.

The mobile plant is a short-term solution until it is replaced by a long-term modular processing plant (modular plant – option 1) or tracked processing plant (tracked plant – option 2). This is discussed further in Section 2.4.

The new processing plant (modular or tracked) is also proposed to be located at the base of the west pit, however, will be located slightly to the south of the existing processing area.

### 2.3 Updated construction activities for the project

#### 2.3.1 Noise bund construction and stripping

The construction of 4 m high noise bunds on the western boundary of the WEA and around the SEA was initially adopted to mitigate noise from the project as assessed in the NVIA. Further investigation has been undertaken of the noise mitigation benefit of the noise bund on the western boundary of the WEA which determined that it would provide little to no reduction (ie up to 1 dB) in noise levels at assessment locations.



Furthermore, at assessment locations where a reduction of 1 dB is predicted (ie to the west of the WEA), noise levels are predicted to satisfy the relevant PNTLs. Construction of the noise bund would also present some operational difficulties as minimal overburden/topsoil is present within the WEA area to construct it. Therefore, this noise bund is no longer proposed to be constructed; however, stripping activities in the WEA are still required to remove topsoil and overburden for future use in rehabilitation activities. The construction of the noise bund on the boundaries of the SEA and associated stripping activities are still proposed and hence remain consistent with the NVIA.

Importantly, a different dozer is proposed for stripping and the SEA noise bund construction. The modelling of the noise bund construction and stripping assumed the use of a CAT D11 dozer in the NVIA. Holcim is now proposing to use a Komatsu D375 dozer to undertake these activities, which has a lower sound power level than that of a CAT D11, and hence will result in lower noise levels than those presented in the NVIA for stripping.

Except for this change, modelling assumptions for the noise bund construction and stripping remain consistent with those in the NVIA.

### 2.3.2 Quarry access road

The existing quarry access road is proposed to remain as is until resources in the southern portion of the WEA are exhausted and access to the northern portion of the WEA (north of the existing quarry access road) is required. The section of the existing quarry access road within the WEA will then be removed. This is expected to occur approximately halfway through extraction of the WEA resources (approximately three years from the commencement of the project). This is consistent with the NVIA.

The new quarry access road, as assessed in the NVIA, is proposed to change. Access to the quarry from Sheraton Road is proposed to remain via the remaining western section of the existing quarry access road. Road trucks and other traffic entering the quarry would then travel through the WEA pit (at the pit base) to access other areas of the quarry (eg stockpile area, admin offices or weighbridge). Traffic would exit the quarry the same way they came in, via the WEA pit.

Once quarrying finishes in the remaining northern portion of the WEA, a new quarry access road is proposed as an option (option 1). The new quarry access road is proposed to be constructed from the north-western corner of the WEA to Sheraton Road, along the north-western site boundary. This section of the new quarry access road is consistent with that assessed in the NVIA. Road trucks and other traffic would then travel in and out of the quarry through the WEA pit.

The other option (option 2) would be to not construct the new quarry access road and to keep the connection to Sheraton Road via the western section of the existing quarry access road. Road trucks and other traffic entering the quarry would travel through the WEA pit. This option is being considered by Holcim, however further negotiation is required to determine the most appropriate option for the landowner and the project.

## 2.4 Updated operational activities for the project

### 2.4.1 Existing mobile plant (short-term)

As mentioned in Section 2.2, the existing mobile plant will continue to operate in the short-term during initial stages of the project until it is replaced by the new processing plant. This is not expected to occur until Year 3.

Activities associated with the mobile plant have been adopted for the modelling of future Year 1 operational noise levels. The noise modelling of Year 1 future operational noise levels has been updated as follows:

- the mobile plant will remain operational in the west pit. The jaw crusher associated with the mobile plant will be located near the WEA pit face during extraction;
- haul trucks will be travelling between the WEA extraction area and the mobile plant;

- haul trucks will unload material at the mobile plant location;
- an additional excavator (similar to the one currently on-site) will be used to load material into the mobile plant (ie secondary cone crusher); and
- as recommended by the EPA in its submission on the NVIA, stripping in the WEA is to be assessed as construction and hence has not been included in the operational assessment for the project.

#### 2.4.2 New processing plant (long-term)

Two options for the new processing plant are proposed for the project; the modular plant (option 1) or the tracked plant (option 2). The new processing plant is not expected to be operational until Year 3.

The new processing plant, whether modular (option 1) or tracked (option 2), will include the following key components:

- mobile jaw crusher;
- cone crushers (x2);
- vertical shaft impact crusher (VSI);
- screens (x3); and
- conveyors assembly.

Activities associated with the new processing plant have been adopted for modelling future Year 3 and Year 21 operational noise levels. The modelling of future Year 3 and Year 21 operational noise levels has been updated as follows:

- the new processing plant will operate at the base of the west pit. The mobile jaw crusher associated with the new processing plant will be located near the SEA pit face during extraction;
- haul trucks will be travelling between the SEA extraction area and the new processing plant;
- haul trucks will unload material at the new processing plant location;
- an additional excavator (similar to the one currently on-site) will be used to load material into the new processing plant (ie secondary cone crusher);
- the modelled on-site transport route (used by road trucks) has been updated to reflect the proposed changes to the quarry access road (refer to Section 2.3.2); and
- as recommended by the EPA in its submission on the NVIA, noise bund construction and stripping in the SEA are to be assessed as construction and hence have not been included in the operational assessment for the project.

#### 2.4.3 Overland conveyor (option)

An overland conveyor is proposed as a potential alternative to truck haulage to transport excavated material from the extraction areas (WEA and SEA) to the processing area. Similarly to haul trucks and processing operations, the overland conveyor would only be operational during the day period.

The overland conveyor is proposed to be located along the haul routes (inside haul road corridors), from the WEA or SEA to the processing area (refer to Figure 2.1).

The overland conveyor will be located within the pit and typically below the line of sight of neighbouring residential receivers. The overland conveyor will generally run along the ground (ie noise source at 1 m above ground level on average), except for transfer points which will be more elevated.

Noise from the overland conveyor is predicted to be lower or, at most, the same to that from haul trucks at neighbouring residential receivers. Noise modelling for the project used a sound power level of 111 dB(A) (per unit) for haul trucks, whereas a sound power level of up to 84 dB(A) (per linear metre) has been assumed for the type of overland conveyor that would be installed under the project. Where noise issues have the potential to arise, for example at transfer points or where the overland conveyor runs outside the pit, noise mitigation measures (eg attenuation covers) may be implemented to minimise potential noise impacts at neighbouring residential receivers. Additional noise mitigation measures such as the use of 'quieter' systems (eg varied rollers) and regular maintenance could also be implemented where required.

Therefore, the overland conveyor option could provide noise benefits when compared to typical truck haulage operations at the quarry. It is proposed that confirmation of sound power levels and, if warranted, further assessment of noise impacts be undertaken during the detailed construction design process of the conveyors to provide Holcim with design inputs so that noise impacts are minimised at residences.

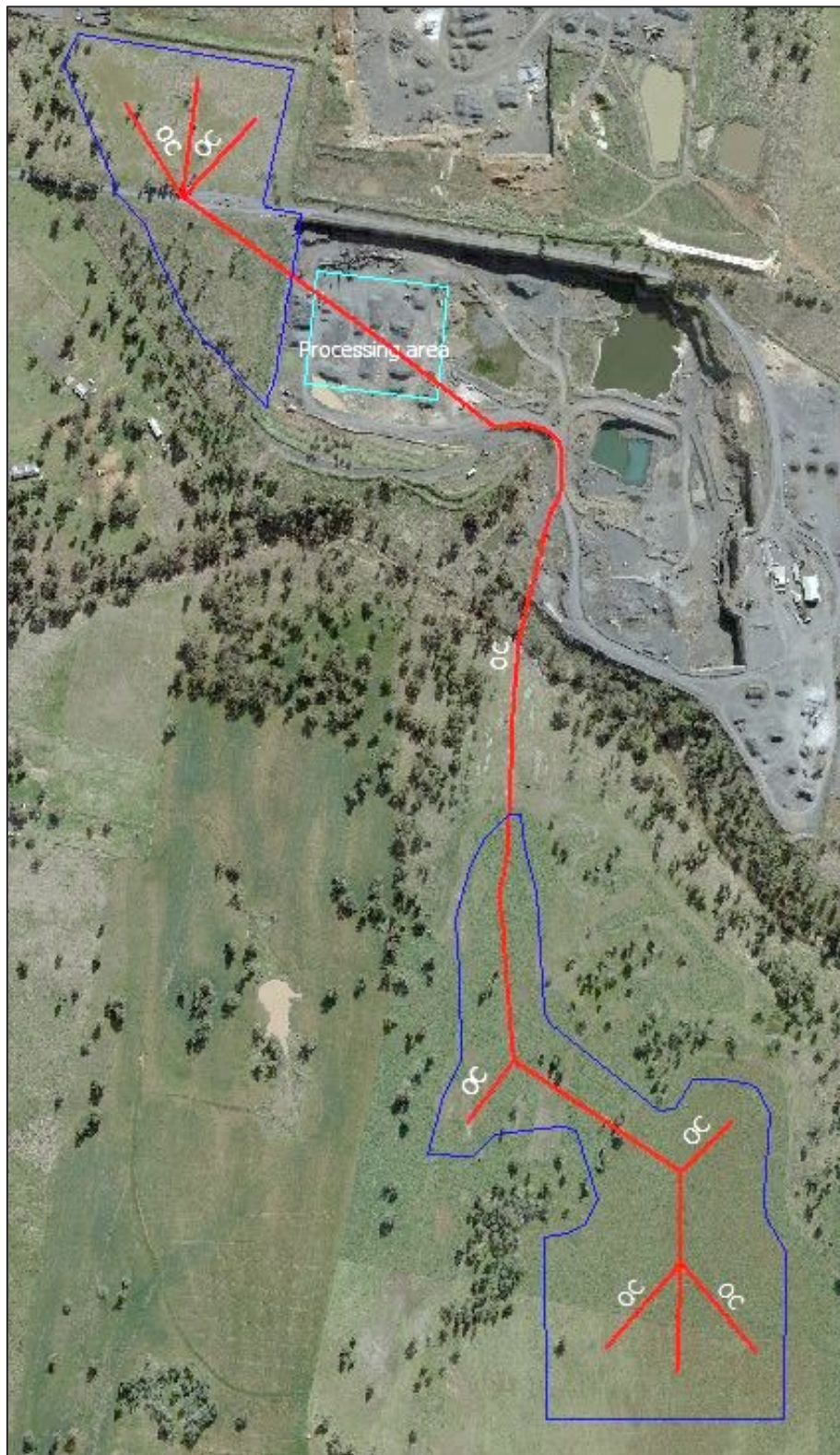


Figure 2.1 Indicative overland conveyor location

## 2.4.4 Noise mitigation

### i Significance of residual noise impacts

Where noise levels from the project are predicted above the PNTLs, all feasible and reasonable mitigation measures are to be considered for the project to reduce noise levels towards the PNTL before any residual impacts are identified and addressed.

The significance of the residual noise impacts is generally based around the human perception to changes in noise levels in the environment. For example, a 1 to 2 dB change in noise level is typically indiscernible to the human ear in the environment. The characterisation of a residual noise impact of 1 to 2 dB above the PNTL is, therefore, considered negligible. The NPfI characterisation of residual noise impacts is outlined further in Table 2.1, reproduced from Table 4.1 of the NPfI.

**Table 2.1** Significance of residual noise impacts

If the predicted noise level minus the project noise trigger level is:	And the total cumulative industrial noise level is:	Then the significance of the residual noise level is:
≤2 dB	Not applicable	Negligible
≥3 but ≤5 dB	< recommended amenity noise level or > recommended amenity noise level, but the increase in total cumulative industrial noise level resulting from the development is ≤1 dB	Marginal
≥3 but ≤5 dB	> recommended amenity noise level and the increase in total cumulative industrial noise level resulting from the development is >1 dB	Moderate
>5 dB	≤ recommended amenity noise level	Moderate
>5 dB	> recommended amenity noise level	Significant

Source: NPfI (EPA 2017).

### ii Feasible and reasonable mitigation

Consideration of the feasibility and reasonableness of existing and proposed noise mitigation measures has been undertaken with reference to the guidance provided in Section 3.4 of the NPfI. The NPfI also provides the following guidance on the application of noise mitigation to existing premises:

The range of noise reduction strategies for existing situations is generally more limited than those available for new development at the planning stage. For example, spatial separation between the source and receiver is not an option for existing situations. The initial focus for existing sites should be operational procedures and prioritising noise-control measures that provide the greatest benefits to residents at least cost.

Feasible and reasonable mitigation strategies have been considered in the following hierarchical approach:

1. control of noise at the source;
2. control the transmission of noise, once the feasible and reasonable controls at the source are exhausted; and;
3. mitigation measures at the noise-sensitive receivers, once source and transmission feasible and reasonable controls are exhausted.

### iii Noise mitigation for the project

The main noise sources from the project contributing to offsite noise levels are those associated with processing activities (existing mobile plant and the proposed new processing plant), stripping (construction) and material haulage (haul trucks). Mitigation options targeting these noise sources have been considered and where relevant adopted in the noise modelling as summarised by the mitigation decision making matrix in Table 2.2 noting that additional investigations will be undertaken during initial stages upon approval of the project. Several additional management and mitigation measures were considered in the updated assessment, with some deemed to be not feasible and/or reasonable. These are also summarised in Table 2.2.

**Table 2.2 Mitigation decision making matrix**

Mitigation option	Feasible?	Reasonable?	Justification for adopting / disregarding and expected noise benefit
<b>At-source controls</b>			
Existing mobile plant – use of noise barrier (screening)	Y	Y	This measure will result in a significant reduction to noise emissions; up to 5 dB reduction. Being one of the main contributors to off-site noise emissions, this control will have the benefit of reducing noise at residences. It is also anticipated that these measures could improve low frequency noise from the site. For the purpose of the updated assessment, a noise barrier has been adopted in the model to primarily shield receiver R2.
Proposed modular plant or tracked mobile plant – locate in the west pit	Y	Y	This measure will minimise noise emissions from processing activities by maximising topographical shielding of the new processing plant.
Proposed modular plant – enclose crusher equipment (Cone x2 and VSI)	Y	Y	These measures will require significant capital investment but are expected to result in a significant reduction to noise emissions from the modular plant; 5 to 10 dB reduction. Being one of the main contributors to off-site noise emissions, these controls will have the benefit of reducing noise at residences. It is also anticipated that these measures could improve low frequency noise from the site. For the purpose of the updated assessment, a 5 dB reduction in the relevant sound power level(s) has been adopted in the noise modelling.
Proposed modular plant – use of polyurethane and rubber deck for screens	Y	Y	These measures will require significant capital investment but are expected to result in a significant reduction to noise emissions from the modular plant; 5 to 10 dB reduction. Being one of the main contributors to off-site noise emissions, these controls will have the benefit of reducing noise at residences. It is also anticipated that these measures could improve low frequency noise from the site. For the purpose of the updated assessment, a 5 dB reduction in the relevant sound power level(s) has been adopted in the noise modelling.
Proposed tracked mobile plant – use of noise barrier (screening)	Y	Y	These measures will require significant capital investment but are expected to result in a significant reduction to noise emissions from the modular plant; 5 to 10 dB reduction. Being one of the main contributors to off-site noise emissions, these controls will have the benefit of reducing noise at residences. It is also anticipated that these measures could improve low frequency noise from the site. For the purpose of the updated assessment, a 5 dB reduction in the relevant sound power level(s) has been adopted in the noise modelling.
Proposed tracked mobile plant – use of polyurethane and rubber deck for screens	Y	Y	These measures will require significant capital investment but are expected to result in a significant reduction to noise emissions from the modular plant; 5 to 10 dB reduction. Being one of the main contributors to off-site noise emissions, these controls will have the benefit of reducing noise at residences. It is also anticipated that these measures could improve low frequency noise from the site. For the purpose of the updated assessment, a 5 dB reduction in the relevant sound power level(s) has been adopted in the noise modelling.
Jaw crusher – use of noise barrier (screening)	Y	Y	This measure will result in a significant reduction to noise emissions from the jaw crusher; 5 dB to 8 dB reduction. Being one of the main contributors to off-site noise emissions, this control will have the benefit of reducing noise at residences. It is also anticipated that these measures could improve low frequency noise from the site. For the purpose of the updated assessment, a noise barrier has been adopted in the model to primarily shield receiver R2.
Jaw crusher – locate near quarry face (shielding)	Y	Y	This measure will result in a reduction to noise emissions from the jaw crusher. Being one of the main contributors to off-site noise emissions, this control will have the benefit of reducing noise at residences.
Use of dozer with a lower sound power level (ie Komatsu D375) for stripping	Y	Y	This measure will result in a reduction to noise emissions from the dozer; up to 4 dB reduction compared to the CAT D11. Being one of the main contributors to off-site noise emissions during stripping (campaign), this will have the benefit of reducing noise at residences.
Limit night-time quarry operations (4 am to 7 am) to product dispatch activities (ie no processing or extracting activities)	Y	Y	This measure will reduce potential noise impacts during the most sensitive (night) period.

Attenuation to overland conveyor option (if constructed)	Y	Y, to be confirmed	Attenuation measures such as covers and the use of ‘quieter’ systems (eg varied rollers) may be implemented to minimise potential noise impacts. A further assessment of noise impacts will be undertaken during the overland conveyor construction design process to provide Holcim with noise mitigation inputs if required. Additional factors to be considered during this process will be the practicality of attenuation measures and potential operational issues (eg access and safety) that could arise from those.
Attenuation to other plant and equipment	Y	N	Several noise sources were considered for attenuation (eg excavator and dump trucks); however, such measures would not decrease total offsite quarry noise levels.
Control transmission of noise			
Construct a noise attenuation bund between receivers and the WEA	Y	N	A 4 m high bund on the western boundary of the WEA was considered in the model; however, such measure would not decrease total offsite quarry noise levels.
Construct a noise attenuation bund between receivers and the SEA	Y	Y	A 4 m high bund on the boundaries of the SEA will result in a reduction to noise emissions from quarry activities in the SEA.
At-receiver mitigation			
Mechanical ventilation to allow for closed windows	Y	Y	The project will result in improved noise emissions compared to existing operations at all residences. This is only applicable to privately-owned residential properties where a ‘marginal’ residual impact has been predicted (ie R2 and R3). Refer to Section 3.5.3. The type of mitigation measures that could be implemented at the residence(s) will depend on the outcomes of relevant negotiations.
Upgrade to façade elements (windows, doors and roof)	Y	N	The project will not result in ‘moderate’ residual impacts.

All feasible and reasonable noise mitigation measures identified in Table 2.2 have been adopted in the noise modelling and are anticipated to be implemented by Holcim. The implementation of all noise mitigation measures proposed will require significant operational planning, engineering design and, in some cases significant capital investment. Holcim will require an appropriate timeline to coordinate and implement all these measures.

#### 2.4.5 Other activities

Except for the updates discussed in the previous sections, modelling assumptions associated with other operational activities are consistent with those in the NVIA.



## 3 Updated noise impact assessment

### 3.1 Assessment locations and criteria

The assessment locations adopted in this updated assessment are consistent with those in the NVIA.

The noise criteria adopted in this updated assessment are generally consistent with those in the NVIA. The exception is for the proposed stripping activities and the SEA noise bund construction which have been assessed as construction activity in this updated assessment. This is consistent with the submission from the EPA. In the NVIA, these were assessed as part of operations and hence against the more stringent operational noise criteria. This is discussed further in Section 3.4.2.

### 3.2 Noise modelling software and meteorological conditions

Quantitative modelling of construction and operational noise was completed using DGMR iNoise noise prediction software. This software applies the EPA accepted ISO 9613 approach and calculates total noise levels at assessment locations from the concurrent operation of multiple noise sources. Three-dimensional digitised ground contours of the site and surrounding land were incorporated to model topographic effects. Equipment was modelled at locations and heights representative of existing operations, proposed construction activities and future operations.

These modelling methodologies are consistent with those adopted in the NVIA.

### 3.3 Existing operations modelling

The majority of existing plant and equipment currently in operation at the quarry were modelled as part of the NVIA. The exception is the processing plant referenced in the NVIA which has been decommissioned and replaced with the existing mobile plant. The sound power levels adopted for the noise modelling as presented in the NVIA were based on measurements undertaken during a site visit in July 2020. Except for the existing mobile plant (short-term) and the proposed new processing plant (long-term), the plant and equipment included in the noise modelling for this updated assessment including sound power levels are consistent with those presented in the NVIA. The sound power level adopted for each component of the existing mobile plant and the new processing plant are provided in Table 3.1.

**Table 3.1 Processing plant equipment sound power levels**

Processing plant type	Equipment	Sound power level <sup>1</sup> (L <sub>Aeq,15min</sub> ), dB
Existing mobile plant	Jaw crusher	118 <sup>2</sup>
	Cone crusher	115 <sup>2</sup>
	Screen (x 3)	120 <sup>2</sup>
	Tracked conveyor	112 <sup>2</sup>
New processing plant – modular plant (option 1) or tracked plant (option 2)	Jaw crusher	116 <sup>3</sup>
	Cone crusher (x 2)	113 <sup>3</sup>
	Vertical impact crusher (VSI)	114 <sup>3</sup>
	Screen (x 3)	112 <sup>4</sup>

- Notes:
1. Per unit. Unmitigated.
  2. Referenced from the manufacturer’s specifications.
  3. Based on measured data provided by the supplier.
  4. Based on EMM database for similar projects.

The location of the existing mobile plant and the new processing plant is at the base of the west pit which is less exposed to surrounding receivers in comparison to the decommissioned processing plant location assessed in the NVIA.

Modelled noise levels presented in the NVIA have been updated based on the aforementioned assumptions for the purpose of this updated assessment.

### 3.4 Noise bund construction and stripping activities

#### 3.4.1 Overall noise bund construction and stripping approach

Proposed daytime stripping in the WEA (from Year 1) and noise bund construction and stripping in the SEA (from Year 3) (referred to as “stripping” hereafter) are anticipated to occur on a progressive basis with an expected duration of up to four weeks per campaign (weather permitting). This approach is consistent with the quarrying method historically and currently adopted at the quarry.

There are significant operational implications for changing the historic stripping arrangement. Within the WEA, the progressive stripping approach allows Holcim to maximise the time the existing quarry access road can be used, until quarrying commences in the northern portion of the WEA (north of the existing quarry access road).

Stripping in the WEA is proposed to occur twice over the life of the WEA. Once in the initial stages of the project in the southern portion of the WEA up to the existing quarry access road and another time after the removal of the existing quarry access road within the WEA. This equates to approximately eight weeks of stripping proposed in total in the WEA.

The proposed stripping approach within the SEA will allow two years’ worth of quarrying each time for a total of seven four-week campaigns over the life of the SEA. This approach will allow the landowner to maximise the agricultural use of the land. If the entire SEA were to be stripped in one event, this would leave a large portion of the land unusable for agricultural purposes and likely have other negative environmental consequences (eg dust from surface erosion). The proposed progressive stripping approach is consistent with current practices and considered to be the most appropriate scenario for both the current and future land uses whilst minimising environmental consequences.

### 3.4.2 Stripping as construction

Construction activities in the NVIA were assessed under the NSW Department of Environment and Climate Change (DECC) *Interim Construction Noise Guideline* (ICNG) (2009). These included the construction of the new quarry access road and the creek crossing over Eulomogo Creek.

For this updated assessment, noise from stripping in the WEA (from Year 1) and in the SEA (from Year 3) have also been assessed against the ICNG criteria (referred herein as construction noise management levels) as recommended in the EPA's submission. This is because stripping is considered necessary to enable access to quarry reserves and is only proposed to be temporary (campaign basis as the quarry progresses). The EPA has recently released for consultation the Draft Construction Noise Guideline (Draft CNG) (2020) which will replace the ICNG (2009) following the public consultation process and after being finalised. The Draft CNG states that certain 'defined activities' associated with mining and extractive industries may be assessed as construction as long as:

- they fall within the meaning of 'construction of infrastructure necessary to support an operational activity' (eg construction of noise barriers and mounds); and
- they have a specific outcome or endpoint that is clearly differentiated from an operational activity.

Furthermore, consideration has been given to the following:

- purpose – to obtain topsoil and overburden for use in rehabilitation activities (WEA and SEA), to enable access to quarry reserves (WEA and SEA) and to construct a noise mitigation bund (SEA only);
- type of activity – stripping (WEA and SEA) and noise bund construction (SEA only);
- equipment – hired mobile equipment (eg dozer);
- timing – initial stage of the project (WEA only) and typically two years between campaigns;
- duration – up to four weeks per campaign (weather permitting);
- hours of work – limited to the ICNG standard hours; and
- management and mitigation – implementation of additional feasible and reasonable measures as required.

In the NVIA, stripping in the WEA and SEA were assessed against the NSW EPA's Noise Policy for Industry (NPfI) (2017) day period Monday to Friday, which corresponds to the ICNG standard hours of construction. This remains consistent with this updated assessment and hence noise from stripping has been assessed against the noise management levels (NMLs) for standard construction. Furthermore, noise during each stripping campaign will be managed through the implementation of feasible and reasonable measures as discussed in the NVIA (construction) and the updated assessment (refer to Section 2.4.3).

Noise from stripping in the WEA and SEA has been assessed against the NMLs shown in Table 3.9 of the NVIA which are reproduced in Table 3.2.

**Table 3.2 Project construction NMLs**

Assessment locations	Receiver type	Assessment period	Adopted RBL <sup>1</sup> , dB	NML L <sub>Aeq,15min</sub> , dB
R1-R8, R13-R16, R18-R22	Residential	Day (ICNG standard hours <sup>2</sup> )	35 <sup>3</sup>	45
R10-R12	School	When in use	n/a	45 (55 external <sup>4</sup> )
R9	Commercial	When in use	n/a	70
R17	Industrial	When in use	n/a	75

Notes: 1. Rating background level based on the NPfl minimum level for the day period.  
 2. Monday to Friday 7 am to 6 pm; Saturday 8 am to 1 pm; and no construction work on Sundays or public holidays.  
 3. The NPfl minimum RBL of 35 dB for the day period has been adopted in accordance with the ICNG.  
 4. External level based on an external-to-internal noise reduction of 10 dB in accordance with the ICNG.

A highly noise-affected level of 75 dB L<sub>Aeq,15min</sub> is also provided in the ICNG for residential receivers and represents the point above which there may be strong community reaction to noise. Where noise is above this level, the relevant authority (consent, determining or regulatory) may require respite periods by restricting the hours that the very noisy activities can occur.

### 3.4.3 Dozer stripping

A Komatsu D375 dozer has been adopted for the noise modelling of stripping in place of the CAT D11 dozer assumed in the NVIA. The sound power level for the Komatsu D375 dozer is lower than that of the CAT D11 dozer adopted in the NVIA. A comparison between the sound power levels is provided in Table 3.3.

**Table 3.3 Comparison of dozer sound power levels**

Dozer make/model	Sound power level (L <sub>Aeq,15min</sub> ), dB
CAT D11 – adopted in the NVIA	116
Komatsu D375 – adopted in this updated assessment	112 <sup>1</sup>

Notes: 1. Based on measured data provided by the supplier.

Other modelling assumptions related to stripping (eg location of equipment and proposed activities) are consistent with those adopted in the NVIA.

For the purpose of this updated assessment, predicted noise levels for stripping presented in the NVIA have been updated based on the aforementioned assumptions.

### 3.4.4 Modelling results for stripping

Predicted noise levels during Year 1 (Y1), Year 3 (Y3) and Year 21 (Y21) stripping presented in the NVIA (Table 5.1) have been assessed against the NMLs as shown in Table 3.4.

. Stripping is proposed during the ICNG standard hours of construction (Monday to Friday 7 am to 6 pm and Saturday 8 am to 1 pm) and within a four-week period (weather permitting) in the WEA in Y1 (early stages of the project) and in the SEA from Y3 through to Y21 (later stage of the project).

**Table 3.4 Predicted noise levels during stripping compared to ICNG NMLs**

Assessment location	Receiver type	Predicted site $L_{Aeq,15min}$ noise level, dB			Day NML, dB	Exceedance, dB		
		Y1	Y3	Y21		Y1	Y3	Y21
R1	Residential <sup>1</sup>	49	47	47	n/a	n/a	n/a	n/a
R2	Residential	43	46	43	45	Nil	1	Nil
R3	Residential	<40	42	43	45	Nil	Nil	Nil
R4	Residential	<40	40	41	45	Nil	Nil	Nil
R5	Residential	<40	<40	<40	45	Nil	Nil	Nil
R6a	Residential	<40	<40	<40	45	Nil	Nil	Nil
R6b	Residential	<40	<40	<40	45	Nil	Nil	Nil
R7	Residential	<40	<40	<40	45	Nil	Nil	Nil
R8	Residential	<40	<40	<40	45	Nil	Nil	Nil
R9	Commercial	<70	<70	<70	70	Nil	Nil	Nil
R10	School	<40	<40	<40	45	Nil	Nil	Nil
R11	School	<40	<40	<40	45	Nil	Nil	Nil
R12	School	<40	<40	<40	45	Nil	Nil	Nil
R13	Residential	<40	<40	<40	45	Nil	Nil	Nil
R14	Residential	<40	<40	<40	45	Nil	Nil	Nil
R15	Residential	<40	<40	<40	45	Nil	Nil	Nil
R16	Residential	<40	<40	<40	45	Nil	Nil	Nil
R17	Industrial	<75	<75	<75	75	Nil	Nil	Nil
R18	Residential	<40	<40	<40	45	Nil	Nil	Nil
R19	Residential	<40	<40	<40	45	Nil	Nil	Nil
R20	Residential	<40	<40	<40	45	Nil	Nil	Nil
R21	Residential	<40	<40	<40	45	Nil	Nil	Nil
R22	Residential	<40	<40	<40	45	Nil	Nil	Nil
R23	Subdivision <sup>2</sup>	<40	41	42	45	Nil	Nil	Nil

Notes: 1. Holcim currently has a negotiated agreement in place with the landowner of this residential property and hence the NMLs do not apply at this location.

2. Approved residential subdivision, however there are no proposed residential development.

During stripping in the WEA in the early stages of the project in Y1 and in the SEA from Y3 through to Y21 in later stages of the project, it is predicted that the NMLs will be achieved at most assessment locations. The exception is at potentially the most exposed assessment location R2 where the relevant NML is predicted to be negligibly exceeded by 1 dB.

Furthermore, noise levels are not predicted to exceed the 75 dB highly noise affected NML at any residence and all works will be restricted to standard daytime construction hours.

## 3.5 Future operation modelling

### 3.5.1 Overall approach

Modelled noise levels from future proposed operations presented in the NVIA have been updated based on the updated existing operations (refer to Section 2.2) and updates to the project outlined in Section 2.3 and Section 2.4. Future site operations during Y1, Y3 and Y21 were selected on the basis that these are representative of worst-case operational scenarios. This is discussed further in Section 6.5.

This included the modelling of the existing mobile plant (short-term), the new processing plant (modular or tracked) and associated sound power levels and noise mitigation measures. The predicted noise levels shown for future operational activities when the new processing plant will be operational (ie Y3 and Y21) are the maximum levels predicted from either the modular plant (option 1) or tracked mobile plant (option 2) scenarios. Therefore, predicted noise levels for Y3 and Y21 could be lower than those shown depending on the new processing plant option.

As discussed in Section 2.4.3, noise from the overland conveyor option is predicted to be lower or at most the same to that from the haul trucks as received at neighbouring residential locations. Therefore, the overland conveyor option could potentially provide noise benefits when compared to typical truck haulage operations at the quarry. Furthermore, if constructed, the overland conveyor is unlikely to increase total site operational noise levels (from all quarry operations combined) at residences. The predicted noise levels shown for future daytime operational activities with the existing mobile plant (ie Y1) and when the new processing plant will be operational (ie Y3 and Y21) are based on the modelled truck haulage scenario (ie no overland conveyor).

### 3.5.2 Modifying factors

In accordance with the guideline provided in Fact sheet C of the NPfl, modifying factor adjustments were assessed in the NVIA. Based on the type of existing plant and equipment used at the quarry and plant or equipment proposed for the project, it is unlikely that operational noise sources (existing and proposed) would contain annoying characteristics such as tonal noise or intermittent noise.

Low frequency noise (or LFN) was assessed based on predicted one-third octave centre frequency noise levels at assessment locations. Positive adjustments for LFN were found to be applicable during extractive and processing operations only (ie during general daytime and night-time operations).

Relevant modifying factor adjustments for LFN were discussed in the NVIA but were not included in the predicted noise levels for general daytime and night-time operations. It is our experience that LFN is appropriately assessed during compliance monitoring and that predictions from models are best presented as per model outputs, noting the likely LFN adjustment. Nonetheless, modifying factor adjustments for LFN were added to predicted noise levels (where relevant) for general daytime and night-time operations as presented in the following sections.

### 3.5.3 Updated daytime operations

#### i Daytime operations with drilling activity

The modelling scenario of drilling activity (eg operational scenario, drill location or sound power level etc.) for this updated assessment is as described in Section 4.1.2 of the NVIA. Site noise levels predicted at assessment locations during daytime operations with drilling activity including modifying factor adjustments for LFN are provided in Table 3.5.

Only 'negligible' or 'marginal' exceedances of the PNTL (as per the NPfI) were predicted for the project during proposed daytime operations with drilling activity.

**Table 3.5 Predicted operational noise levels during daytime operations with drilling activity**

Assessment location	Receiver type	Predicted site $L_{Aeq,15min}$ noise level, dB				Day PNTL, dB	Exceedance, dB			
		Exist.	Y1	Y3	Y21		Exist.	Y1	Y3	Y21
R1	Residential <sup>1</sup>	52	49	48	49	n/a	n/a	n/a	n/a	n/a
R2	Residential	51	43	43	43	40	11	3	3	3
R3	Residential	47	<40	42	43	40	7	Nil	2	3
R4	Residential	44	<40	40	41	40	4	Nil	Nil	1
R5	Residential	41	<40	<40	<40	40	1	Nil	Nil	Nil
R6a	Residential	<40	<40	<40	<40	40	Nil	Nil	Nil	Nil
R6b	Residential	<40	<40	<40	<40	40	Nil	Nil	Nil	Nil
R7	Residential	<40	<40	<40	<40	40	Nil	Nil	Nil	Nil
R8	Residential	<40	<40	<40	<40	40	Nil	Nil	Nil	Nil
R9	Commercial	<63	<63	<63	<63	63	Nil	Nil	Nil	Nil
R10	School	<40	<40	<40	<40	40	Nil	Nil	Nil	Nil
R11	School	<40	<40	<40	<40	40	Nil	Nil	Nil	Nil
R12	School	<40	<40	<40	<40	40	Nil	Nil	Nil	Nil
R13	Residential	40	<40	<40	<40	40	Nil	Nil	Nil	Nil
R14	Residential	41	<40	<40	<40	40	1	Nil	Nil	Nil
R15	Residential	40	<40	<40	<40	40	Nil	Nil	Nil	Nil
R16	Residential	<40	<40	<40	<40	40	Nil	Nil	Nil	Nil
R17	Industrial	<68	<68	<68	<68	68	Nil	Nil	Nil	Nil
R18	Residential	<40	<40	<40	<40	40	Nil	Nil	Nil	Nil
R19	Residential	<40	<40	<40	<40	40	Nil	Nil	Nil	Nil
R20	Residential	<40	<40	<40	<40	40	Nil	Nil	Nil	Nil
R21	Residential	<40	<40	<40	<40	40	Nil	Nil	Nil	Nil
R22	Residential	<40	<40	<40	<40	40	Nil	Nil	Nil	Nil
R23	Subdivision <sup>2</sup>	44	<40	41	42	53	Nil	Nil	Nil	Nil

Notes: 1. Holcim currently has a negotiated agreement in place with the landowner of this residential property and hence PNTLs do not apply at this location.  
 2. Approved residential subdivision, however there are no proposed residential development.

A reduction in the category of residual noise impacts (as per the NPfI) for daytime operations with drilling activity presented in the NVIA has resulted from this updated assessment. From 'moderate' residual noise impacts predicted at R2 in the NVIA to 'marginal' residual noise impacts predicted at R2 in this updated assessment. Negligible residual noise impacts (as per the NPfI) for daytime operations with drilling activity have resulted at R4 from the updated assessment. No change to the category of residual noise impacts (as per the NPfI) for daytime operations with drilling activity presented in the NVIA has resulted from the updated assessment at other assessment locations.

ii **General daytime operations (without drilling activity)**

Site noise levels predicted at assessment locations during general daytime operations (without drilling activity) including modifying factor adjustments for LFN are provided in Table 3.6.

Only 'negligible' or 'marginal' exceedances of the PNTL (as per the NPfI) were predicted for the project during general daytime operations (without drilling activity).



**Table 3.6 Predicted operational noise levels during general daytime operations (without drilling activity)**

Assessment location	Receiver type	Predicted site $L_{Aeq,15min}$ noise level, dB				Day PNTL, dB	Exceedance, dB			
		Exist.	Y1	Y3	Y21		Exist.	Y1	Y3	Y21
R1	Residential <sup>1</sup>	52	48	50	49	n/a	n/a	n/a	n/a	n/a
R2	Residential	51	42	44	42	40	11	2	4	2
R3	Residential	46	43	42	43	40	6	3	2	3
R4	Residential	44	40	41	41	40	4	Nil	1	1
R5	Residential	41	41	<40	<40	40	1	1	Nil	Nil
R6a	Residential	<40	<40	<40	<40	40	Nil	Nil	Nil	Nil
R6b	Residential	<40	<40	<40	<40	40	Nil	Nil	Nil	Nil
R7	Residential	<40	<40	<40	<40	40	Nil	Nil	Nil	Nil
R8	Residential	<40	<40	<40	<40	40	Nil	Nil	Nil	Nil
R9	Commercial	<63	<63	<63	<63	63	Nil	Nil	Nil	Nil
R10	School	<40	<40	<40	<40	40	Nil	Nil	Nil	Nil
R11	School	<40	<40	<40	<40	40	Nil	Nil	Nil	Nil
R12	School	<40	<40	<40	<40	40	Nil	Nil	Nil	Nil
R13	Residential	<40	<40	<40	<40	40	Nil	Nil	Nil	Nil
R14	Residential	41	40	<40	<40	40	1	Nil	Nil	Nil
R15	Residential	40	40	<40	<40	40	Nil	Nil	Nil	Nil
R16	Residential	<40	<40	<40	<40	40	Nil	Nil	Nil	Nil
R17	Industrial	<68	<68	<68	<68	68	Nil	Nil	Nil	Nil
R18	Residential	<40	<40	<40	<40	40	Nil	Nil	Nil	Nil
R19	Residential	<40	<40	<40	<40	40	Nil	Nil	Nil	Nil
R20	Residential	<40	<40	<40	<40	40	Nil	Nil	Nil	Nil
R21	Residential	<40	<40	<40	<40	40	Nil	Nil	Nil	Nil
R22	Residential	<40	40	<40	<40	40	Nil	Nil	Nil	Nil
R23	Subdivision <sup>2</sup>	44	<40	41	42	53	Nil	Nil	Nil	Nil

Notes: 1. Holcim currently has a negotiated agreement in place with the landowner of this residential property and hence PNTLs do not apply at this location.  
 2. Approved residential subdivision, however there are no proposed residential development.

A reduction in the category of residual noise impacts (as per the NPfI) for future general daytime operations (without drilling activity) presented in the NVIA has resulted from this updated assessment. From 'moderate' residual noise impacts predicted at R2 in the NVIA to 'marginal' residual noise impacts in this updated assessment. Marginal and negligible residual noise impacts (as per the NPfI) for future general daytime operations has resulted at R3 and R4 respectively in this updated assessment. No change to the category of residual noise impacts (as per the NPfI) for future general daytime operations presented in the NVIA has resulted at other assessment locations in this updated assessment. Based on 'marginal' residual noise impacts predicted at R2 and consistent with the NPfI, receiver-based mitigation measures (ie mechanical ventilation) remain relevant.

### 3.5.4 Updated night-time operations

Site noise levels predicted at assessment locations during night-time operations (4 am-7 am and limited to product dispatch activities for the project from Y1) including modifying factor adjustments for LFN are provided in Table 3.7.

Only a 'negligible' exceedance of the PNTL as per the NPfI was predicted for the project during night-time operations (limited).

**Table 3.7 Predicted operational noise levels during night-time operations**

Assessment location	Receiver type	Predicted site $L_{Aeq,15min}$ noise level, dB				Night PNTL, dB	Existing (all operations)	Exceedance, dB		
		Exist.	Y1	Y3	Y21			Future operations (limited to dispatch only)		
								Y1	Y3	Y21
R1	Residential <sup>1</sup>	55	39	39	40	n/a	n/a	n/a	n/a	n/a
R2	Residential	54	<35	<35	35	35	19	Nil	Nil	Nil
R3	Residential	50	<35	<35	37	35	10	Nil	Nil	2
R4	Residential	47	<35	<35	<35	35	12	Nil	Nil	Nil
R5	Residential	44	<35	<35	<35	35	9	Nil	Nil	Nil
R6a	Residential	38	<35	<35	<35	35	3	Nil	Nil	Nil
R6b	Residential	35	<35	<35	<35	35	Nil	Nil	Nil	Nil
R7	Residential	<35	<35	<35	<35	35	Nil	Nil	Nil	Nil
R8	Residential	<35	<35	<35	<35	35	Nil	Nil	Nil	Nil
R9	Commercial	<63	<63	<63	<63	63	Nil	Nil	Nil	Nil
R10	School	36	<35	<35	<35	n/a	n/a	n/a	n/a	n/a
R11	School	36	<35	<35	<35	n/a	n/a	n/a	n/a	n/a
R12	School	36	<35	<35	<35	n/a	n/a	n/a	n/a	n/a
R13	Residential	42	<35	<35	<35	35	7	Nil	Nil	Nil
R14	Residential	44	<35	<35	<35	35	9	Nil	Nil	Nil
R15	Residential	43	<35	<35	<35	35	8	Nil	Nil	Nil
R16	Residential	41	<35	<35	<35	35	6	Nil	Nil	Nil
R17	Industrial	<68	<68	<68	<68	68	Nil	Nil	Nil	Nil
R18	Residential	41	<35	<35	<35	35	6	Nil	Nil	Nil
R19	Residential	40	<35	<35	<35	35	5	Nil	Nil	Nil
R20	Residential	<35	<35	<35	<35	35	Nil	Nil	Nil	Nil
R21	Residential	<35	<35	<35	<35	35	Nil	Nil	Nil	Nil
R22	Residential	42	<35	<35	<35	35	7	Nil	Nil	Nil
R23	Subdivision <sup>2</sup>	48	<35	<35	37	38	10	Nil	Nil	Nil

Notes: 1. Holcim currently has a negotiated agreement in place with the landowner of this residential property and hence PNTLs do not apply at this location.

2. Approved residential subdivision, however there are no proposed residential development.

Modifying factor adjustments for LFN were only found to be applicable during future night-time operations (Y1, Y3 and Y21) at R1. This is because future night-time operations (between 4 am and 7 am) are limited to product dispatch activities (no extracting and processing operations). During existing night-time operations (all operations including extracting and processing operations), an LFN modifying factor adjustment of +2 dB has been applied to existing noise levels at assessment locations R5, R6, R13 to R16, R18, R19 and R22, and an LFN modifying factor adjustment of +5 dB has been applied to existing noise levels at assessment locations R1 to R4 and R23. This demonstrates a positive outcome for the project when comparing existing to future night-time noise levels (ie decrease in predicted site noise).

A reduction in the category of residual noise impacts (as per the NPfl) for future general night-time operations presented in the NVIA has resulted from this updated assessment. From 'marginal' residual noise impacts predicted at R3 in the NVIA to 'negligible' residual noise impacts in this updated assessment. From 'negligible' residual noise impacts (as per the NPfl) to no impact (ie predictions satisfy the PNTLs) for future general daytime operations has resulted at R2 and R23 respectively in this updated assessment. The modelling results for future general night-time operations in this updated assessment demonstrate once more a positive outcome for the project when comparing existing to future night-time noise levels (ie decrease in predicted site noise).

## 4 EPA submission

### 4.1 Stripping operations and noise bund construction

#### EPA comment:

The NVIA predicts a number of significant impacts (2 dB to 18 dB above Project Noise Trigger Levels (PNTLs) from Table 5.1) to surrounding residences during topsoil stripping works in the Year 1 scenario, during which a noise mitigation bund will be formed around a portion of the WEA. A noise mitigation bund will be formed around most of the SEA in later years. These stripping works are anticipated to occur for a duration of approximately 4 weeks per year.

Typically, shorter term works to establish a noise mitigation bund around a site of this nature would be considered as construction works (limited to the standard hours of work set out in the Interim Construction Noise Guidelines (ICNG)) and would traditionally be carried out once as a separate phase prior to normal quarry production activities. In this approach, noise from the construction of the noise mitigation bund would be managed through the implementation of all feasible and reasonable measures, recognising their temporary duration and fundamentally different nature to production activities.

This is not the approach put forward in the NIVA with its proposed 'campaign' style progressive approach to stripping and bund establishment on a yearly basis. The predicted noise levels from these works are above those which the EPA would normally recommend license limits under the Noise Policy for Industry (NPfI) for if carried out as part of normal quarry operations, despite their limited duration each year. The EPA's preference is that the noise mitigation bunds are fully completed during one defined construction period, not on a campaign basis.

The NVIA should be revised to account for this approach detailing the anticipated duration and timing of the noise mitigation bund construction phase, and any resulting noise impacts to sensitive receivers in the construction and subsequent operational scenarios. If the Proponent does not agree with this approach, the Proponent should clarify how many stripping and noise mitigation bund establishment 'campaign' iterations (each of approximately 4 weeks duration in a year) would be required to complete the proposed bunds for each of the WEA and SEA, the expected timeframe(s) for these bunds to be fully established, the changing noise impacts from stripping, bund establishment and other quarrying activities throughout these timeframes and inclusion of all noise mitigation measures that would be applied.

#### Response:

As mentioned in the updated assessment (refer to Section 2.3 and Section 3.4), the noise bund on the western boundary of the WEA is no longer proposed to be constructed. Stripping activities in the WEA and SEA and the construction of the noise bund on the boundaries of the SEA are still proposed. Additionally, a different dozer (ie Komatsu D375 or equivalent) is proposed for stripping. The sound power level for the newly proposed dozer is lower than that of the dozer (ie CAT D11) adopted in the NVIA. Noise modelling results for stripping presented in the NVIA have been updated as part of the updated assessment.

Further, stripping in the WEA (from Year 1) and in the SEA (from Year 3) have been assessed as construction (standard hours only) and against the ICNG NMLs in the updated assessment. Consideration for the adoption of this approach is provided in Section 3.4.2.

As demonstrated in the updated assessment (refer to Section 3.4.4), noise levels predicted for the WEA stripping (Y1) and SEA stripping (Y3 and Y21) will achieve the relevant NMLs at most assessment locations. The exception is at potentially the most exposed assessment location R2 where the relevant NML is predicted to be negligibly exceeded by 1 dB.

In addition to the stripping approach discussed in the updated assessment (refer to Section 3.4), noise levels predicted for the WEA stripping (Y1) and SEA stripping (Y3 and Y21) as presented in the NVIA will not change if stripping is completed in full in the early stages of the project, as suggested by the EPA. Undertaking all stripping in the WEA and SEA in the early stages of the project will extend the duration of these activities well beyond the proposed initial four-week campaign (within the southern portion of the WEA). Based on an estimated nine stripping campaigns for the WEA and SEA combined over the life of the project, this represents potentially up to 36 consecutive weeks of stripping if these were to be completed in full in the early stages of the project. This approach would mean that noise associated with these activities would be experienced during 36 consecutive weeks in the early stages of the project and sustaining site noise at such levels (as presented in the NVIA) could mean a greater impact compared to the progressive 'campaign' approach. Assuming that stripping in the WEA and SEA is completed in full under a construction phase in the early stages of the project (potentially 36 weeks in duration) as suggested by the EPA, highest noise levels expected from stripping would be consistent with those shown in Table 3.4.

Furthermore, if the entire SEA were to be stripped in one event, this would leave a large portion of the land unusable for agricultural purposes and likely have other negative environmental consequences (eg dust from surface erosion). The proposed progressive stripping approach is consistent with current practices and considered to be the most appropriate scenario for both the current and future land uses, while also limiting environmental consequences. Noise during each stripping campaign will be managed through the implementation of feasible and reasonable measures as discussed in the NVIA (construction) and the updated assessment (refer to Section 2.4.3).

## 4.2 Modifying factors and Voluntary Land Acquisition and Mitigation Policy

### EPA comment:

The EPA requests that the Proponent clarify whether the NVIA includes the modifying factor adjustments in the predicted noise level tables where relevant.

The NVIA has identified at Sections 5.1.3(i) and 5.1.3(ii) that modifying factor adjustments for low frequency noise may apply to receiver R2 during both existing and future general daytime operations and to some receivers (R2, R5, R16, R19 and R22) during existing night-time (4am to 7am product dispatch) operations, which would result in predicted noise levels at those receivers being higher than those presented in Tables 5.3 and 5.4 respectively.

Residual noise impacts have also been identified at some receivers, in particular at the most affected residential property (R2) and negotiated agreements as per the Voluntary Land Acquisition and Mitigation Policy (VLAMP) may be necessary, depending on the outcomes of the any revised noise assessment above.

### Response:

Modifying factor adjustments for LFN were added to predicted noise levels (where relevant) for general daytime operations and night-time operations as discussed in Section 3.5.2, Section 3.5.3 and Section 3.5.4 of the updated assessment.

The applicability of the Voluntary Land Acquisition and Mitigation Policy (VLAMP) (NSW Government 2018) has been considered based on the updated future site noise levels (with the LFN adjustments). No increase to the category of residual noise impacts for future general daytime or night-time operations presented in the NVIA has been identified as a result. Notwithstanding, feasible and reasonable noise mitigation measures will be adopted for proposed operations as detailed in the updated assessment (refer to Section 2.4.3).

## 5 MAAS Properties and Regional Group submissions

MAAS Properties commissioned an Acoustic Review prepared by MAC (dated 4 March 2021) of the NVIA prepared by EMM in January 2021 upon which its submission was based. Regional Group also referenced the MAC Acoustic Review in its submission. A response to the MAC Acoustic Review is provided in Section 6.

In addition, the MAAS Properties submission specifically states the following with regard to noise and vibration:

There are concerns as the WEA is being located closer to land currently zoned for low density residential purposes. As an example of direct impacts, it is noted that several residential assessment locations across each proposed operational scenario have been assessed with exceedances ranging from negligible (1-2 dB) to significant (>5 dB and >RANL).

There are predicted residual noise impacts as well as recommended at-receiver mitigation measures which will affect future residential lots. Further, general operations are proposed to commence early in the morning and cease late in the evening which will encroaches within the window of sensitive noise for residential development. On this basis the ongoing operation will likely necessitate acoustic attenuation measures to be provided along the western interface of the quarry adjoining Sheraton Road and Southlakes Estate.

Notwithstanding, the above reconsideration of the submitted EIS and supporting reports to accurately reflect land uses it is requested that the quarry implement a high standard of its own management and attenuation treatments which mitigate impacts to the surrounding residential land and demonstrate a reduction in exceedances modelled.

It is further requested that Maas Group Properties be included in ongoing discussions on management mitigation proposals to ensure the adequacy of suitable residential amenity measures.

### Response:

Our response to submissions from MAAS Properties and Regional Group are provided in the following Section 5.1 to Section 5.5.

### 5.1 Approved and existing residential development in the Southlakes Estate

Potential noise impacts from the project on the Southlakes Estate were assessed in the NVIA and updated assessment (refer to Section 3) by adopting assessment locations representative of approved and existing residential development (ie R18 and R19).

As shown in the updated assessment, noise levels from Y1, Y3 and Y21 stripping (four weeks) are predicted to achieve the NMLs at assessment locations representative of residences within the developed Southlakes Estate (ie R18 and R19). If noise from stripping was assessed under the NPfl, the relevant PNTL and recommended amenity noise level (RANL) for the day period would be satisfied as shown in the updated assessment.

Furthermore, future noise levels from daytime operations (with or without drilling activity) and night-time operations are predicted to satisfy the relevant PNTLs at R18 and R19.

## 5.2 Future residential development in the Southlakes Estate

Potential noise impacts from the project on vacant land within the Southlakes Estate were also considered in the NVIA and updated assessment. The modelling results showed that assessment location R23, which is representative of the approved residential subdivision (vacant land) to the north-west of the site, was a conservative assessment location for other 'residential' vacant land surrounding the site. As demonstrated in the updated assessment (refer to Section 3.4.4), noise levels predicted for stripping will achieve the relevant NML at R23 (assuming residential dwellings are constructed and occupied). If noise from stripping was assessed under the NPfI, the relevant PNTL and RANL for the day period would be satisfied at R23 as shown in the updated assessment. As demonstrated in the updated assessment (refer to Section 3.5.3), noise levels predicted for general daytime and night-time operations will achieve the relevant PNTL at R23.

Based on the preliminary noise modelling undertaken in the NVIA, a similar or better outcome was expected at future residential developments within the undeveloped Southlakes Estate. Nonetheless, additional noise modelling was undertaken as part of this RTS to determine noise levels from stripping, general daytime and night-time operations at the eastern boundary of the Southlakes Estate (worst-case). Modelling results showed that noise levels from stripping are predicted to satisfy the relevant NML applicable at future residential developments within the undeveloped Southlakes Estate (assuming residential dwellings are constructed and occupied). Modelling results showed that noise levels from general daytime and night-time operations are predicted to satisfy the relevant PNTLs applicable at future residential developments within the undeveloped Southlakes Estate. Therefore, the updated assessment found that the relevant ICNG and NPfI requirements will be satisfied on vacant lands during future stripping, general daytime and night-time operations.

## 5.3 Existing versus future general night-time operations

Future quarry operations during the night period (4 am to 7 am only) are proposed to be limited to dispatch activities (ie no processing or extracting activities which is currently approved and representative of current night-time operations). This measure will reduce potential noise impacts during the most sensitive night period and is a positive outcome for the community. An analysis of feasible and reasonable noise mitigation measures was undertaken for the project as discussed in the updated assessment (refer to Section 2.4.3).

## 5.4 Road traffic noise

In regard to potential road traffic noise impacts from the project, these are assessed in accordance with the Road Noise Policy (EPA 2011). Road traffic noise was assessed at potentially the most affected residential receivers along the proposed transport route, on Sheraton Road, with no significant impact predicted. There are currently no approved residential developments adjacent to the proposed transport route, including within the nearest north-east portion of the undeveloped Southlake Estate. Therefore, potential impacts from future site related traffic on public road have been appropriately assessed.

The RNP refers to the NSW Government Infrastructure State Environmental Planning Policy (SEPP) (2007) for the assessment of potential noise impacts on new residential developments from traffic on existing roads. The SEPP and Australian Standard AS/NZS 2107-2016 provide guidance on design criteria for the acoustic environment within occupied building spaces. A summary of desirable internal  $L_{Aeq}$  noise levels for future residential developments relevant to the Southlakes Estate and other future residential developments (eg R23) in accordance with the SEPP (2007) are shown in Table 5.1. These are intended for assessment of road and rail traffic noise and provide a benchmark for internal noise expectations.



**Table 5.1 Recommended internal noise levels for residential buildings**

Type of occupancy	L <sub>Aeq</sub> noise level, dB	Applicable time period
Sleeping areas (bedrooms)	35	10 pm to 7 am
Living areas (excluding garages, kitchens, bathrooms & hallways)	40	Any time

Source: NSW Infrastructure SEPP (2007).

Noise levels likely to be experienced from future traffic movements at future residential developments within the Southlakes Estate and other future residential developments (eg R23) on Sheraton Road can achieve the recommended internal L<sub>Aeq</sub> noise levels by the implementation of contemporary building design techniques including provision of mechanical ventilation in accordance with BCA requirements to allow occupants to keep windows/doors closed.

## 5.5 Response to additional comments

Refer to our responses to MAC’s acoustic review in Section 6 of this report, where detailed responses are provided in regard to other submissions from MAAS Properties and Regional Group.

## 6 MAC acoustic review

The following sections respond to the specific items raised within the Acoustic Review (MAC 2021).

### 6.1 Assessed receivers

#### MAC comment:

The NVIA has not assessed potential future residential receivers within Southlakes Estate at 24R Sheraton Road (Lot 2 DP880413). The Southlakes Estate is proposed to front the southern portion of Sheraton Road continuing west to Wheelers Lane. Future receivers in the area would be the nearest receivers after locations R1 and R2 identified in the NVIA and is presented in Figure 2.

Noise levels from the quarry operations and road traffic should be calculated at the potential future residential receiver locations in the approved Southlakes Estate.

#### Response:

Our response to MAC comment on assessed receivers are provided in the following Section 6.1.1 to Section 6.1.3.

#### 6.1.1 24R Sheraton Road (Lot 2 DP880413)

An occupied residence is currently located on the property at 24R Sheraton Road (Lot 2 DP880413) and was included in the NVIA and the updated assessment (ie assessment location R3). Noise from future site operations at R3 was assessed against the relevant PNTLs, in accordance with the NPfI.

#### 6.1.2 Undeveloped Southlakes Estate

Potential noise impacts from future site operations at future residential developments within the Southlakes Estate (currently vacant land), located immediately to the west of the property at 24R Sheraton Road (R3), were considered in the NVIA and the updated assessment. As discussed in Section 5.2, the updated assessment found that the relevant ICNG and NPfI requirements will be satisfied at future residential developments within the undeveloped Southlakes Estate during future stripping, general daytime and night-time operations.

Furthermore, the daytime RANL for 'suburban' land is 55 dB  $L_{Aeq,day}$  as shown in Table 2.2 of the NPfI. This amenity category would be adopted for future residential developments within the undeveloped Southlakes Estate. The 'rural' amenity category as defined in the NPfI does not apply to future residential developments within the undeveloped Southlakes Estate given the R1 (General Residential) and R2 (Low Density Residential) land zoning. Nonetheless, predicted future site noise levels from general daytime and night-time operations at future residential properties (including vacant land) surrounding the site would achieve the 50 dB  $L_{Aeq,day}$  RANL for 'rural' land.

#### 6.1.3 Road traffic noise impacts on vacant land

Refer to EMM's response in Section 5.4.

### 6.2 Receiver classification

#### MAC comment:

The NVIA classifies receivers R18 and R19 as 'suburban' in accordance with NPI methodology Table 3.2. MAC have completed assessments in this area and have taken a conservative approach and classified all receivers as 'rural'.

Whilst this may not alter the resulting Project Noise Trigger Levels (PNTLs), the NPI rural classification is considered a more appropriate representation of the acoustic environment of these receivers, particularly with respect to amenity.

Response:

The ‘suburban’ noise amenity area adopted for assessment locations R18 and R19 is consistent with the NPfI given the residential development in the area and future residential development (ie Southlakes Estate). Furthermore, the land zoning for this area is classified as R1 (General Residential) or R2 (Low Density Residential). These land zoning categories would commonly be associated with ‘suburban’ or ‘urban’ noise amenity area in accordance with Table 2.3 of the NPfI. As indicated by MAC, a change from ‘suburban’ to ‘rural’ noise amenity area would not change the PNTLs adopted for R18 and R19 in the NVIA and hence is inconsequential.

### 6.3 Background noise levels

MAC comment:

Background noise levels were referenced from a report for the South Keswick Quarry Project (reference MAC190962RP1V02) using data from May 2016. Considering that the data is five years old, background and ambient noise levels may have increased due to recent developments in the area such as South Keswick Quarry production increase, Keswick Solar Farm (Noeon) and the proposed residential subdivisions. Although contemporary data may still result in similar Rating Background Levels (RBL), contemporary data would alleviate any concerns around changes in ambient and background noise levels that may have occurred from recent developments in the area and provide for a more robust assessment.

Response:

As noted in the Acoustic Review (MAC 2021), contemporary noise monitoring data may result in similar or higher RBLs, leading to less strict noise targets. The background noise levels measured in May 2016 were below the NPfI minimum levels for day, evening and night periods (ie 30 dB). It is highly unlikely that the recent developments (ie South Keswick Quarry production increase and Keswick Solar Farm) would have the effect of increasing background noise levels above the NPfI minimum levels, especially above the NPfI minimum daytime level of 35 dB. Notwithstanding the preceding, adoption of the NPfI minimum background levels provides a conservative approach to the assessment of noise emissions from the project.

### 6.4 Meteorology

MAC comment:

Section 2.4.1 and Section 2.4.2 of the NVIA states that the EPA’s Noise Policy for Industry (NPI) ‘noise enhancing meteorological conditions’ have been adopted as defined in Table D1 of the NPI and are reproduced in Table 1.

Table 1 NPI Noise-Enhancing Meteorological Conditions	
Meteorological Conditions	Meteorological Parameters
Noise Enhancing Meteorological Conditions	Daytime/evening: stability categories A–D with light winds (up to 3 m/s at 10m AGL).
	Night-time: stability categories A–D with light winds (up to 3m/s at 10m AGL) and/or stability category F with winds up to 2m/s at 10 m AGL.

However, Table 4.3 in Section 4.1.5 of the NVIA presents the meteorological conditions used for noise modelling (reproduced in Figure 1) which do not align with the NPI noise enhancing conditions. It is likely that noise levels will be higher than those presented in the NVIA when the NPI noise enhancing conditions are applied to the noise modelling.

Figure 1 – NVIA Modelled Meteorological Conditions

<b>Modelling algorithm</b>	<b>Assessment period</b>	<b>Air temperature</b>	<b>Wind speed<sup>1</sup></b>	<b>Relative humidity</b>	<b>Stability class</b>
ISO_9613	Day	20°C	2 m/s	70%	n/a
	Night	10°C	2 m/s	90%	n/a

Notes: Downwind conditions in accordance with Section 5 and Section 8 of ISO 9613.

Source: EMM

Response:

The noise model utilised international standard ISO 9613-2:1996 ‘Acoustics – Attenuation of sound during propagation outdoors’. Section 1 of ISO 9613 states the following:

The method predicts the equivalent continuous A-weighted sound pressure level (as described in parts 1 to 3 of ISO 1996) under meteorological conditions favourable to propagation from sources of known sound emission.

These conditions are for downwind propagation, as specified in 5.4.3.3 of ISO 1996-2:1987 or, equivalently, propagation under a well-developed moderate ground-based temperature inversion, such as commonly occurs at night.

The adoption of this standard for noise predictions is generally consistent with the ‘noise-enhancing’ conditions as defined in the NPfl. This has been confirmed by EMM in discussions with the NSW EPA on other projects in the past.

An analysis of wind speed and wind direction data recorded by the Bureau of Meteorology Automatic Weather Station located in Dubbo between 2015 and 2019 (5 years of data) showed that no ‘significant’ winds were present. The NPfl defines ‘significant’ as the presence of source-to-receiver wind speed (measured at 10 m above ground level) of 3 m/s or less, occurring for 30% of the time in any assessment period and season. Based on the preceding, the approach in the NVIA to utilise the ISO 9613 for noise predictions is considered conservative for the purpose of the assessment.

Furthermore, the noise model was validated based on site noise contributions determined during operator-attended noise measurements undertaken on-site and at site boundary locations.

## 6.5 Assessment scenarios

MAC comment:

The NVIA calculated noise emissions from existing quarry operations and future Year 1, Year 3 and Year 21. Appendix B of the Dubbo Quarry Continuation Project EIS shows stage plans in five yearly increments. Clarification is sought as to why these particular stages of the quarry development were chosen and why more stages between Year 3 and Year 21 were not modelled and there are potential implications to the Southlakes Estate.

Response:

Future site operations during Y1, Y3 and Y21 were selected on the basis that these are representative of worst-case operational scenarios.

Site operations in Y1 represent the start of the project and commencement of extraction activities within the WEA, which is the most western area of the site and closest to receivers to the west of the project. Site operations in Y3 represent the commencement of extraction activities within the SEA whilst extraction within the WEA is also occurring. Site operations in Y21 represent extraction activities within the SEA towards the end of the project, which is the most southern area of the site and closest to receivers to the south of the project.

Site noise representative of future operations proposed between Y3 and Y21 (ie southward progression of the quarry activities within the SEA) will be between those shown for Y3 and Y21 and hence the 'outer envelope' of noise has been captured in the assessment. This is particularly true for the Southlakes Estate as site operations progress away from this area. Therefore, the modelling scenarios presented in the NVIA and the updated assessment are considered worst-case and appropriate for the assessment of future site noise levels.

## 6.6 Predicted noise levels

### MAC comment:

Predicted noise levels from stripping operations during Year 1 significantly exceed the PNTLs and the recommended (Rural) Amenity Noise Levels (ANLs) at most identified receiver locations. Whilst there is a significant reduction of 8dB from Year 1 to Year 3, predicted noise levels at R2 exceed the PNTLs by 10dB in Year 3 and 8dB in Year 21. Therefore, it is assumed that similar exceedances will occur during stripping operations in the intervening 18 year period.

Predicted noise levels from normal operations exceed the daytime and night time PNTLs and the recommended (Rural) ANL of 45dBA at residential receivers R2 and R3 over the life of the quarry.

Hence, it is likely that noise levels would also exceed the daytime and night time PNTLs over the life of the quarry at the proposed future residential receivers in the Southlakes Estate, situated between R2, R3 and R18, R19.

Noise contour diagrams for five yearly stages for quarry operations, identifying stripping and drilling contributions are recommended to be prepared to fully understand the potential noise impacts at existing residential receivers and potential future residential receivers in the Southlakes Estate.

### Response:

During stripping in the WEA in the early stages of the project in Y1 and in the SEA from Y3 through to Y21 in later stages of the project, it is predicted that the NMLs will be achieved at most assessment locations. The exception is at potentially the most exposed assessment location R2 where the relevant NML is predicted to be negligibly exceeded by 1 dB. Furthermore, stripping will be of relatively short duration (four weeks, weather permitting) as discussed in the NVIA and the updated assessment (refer to Section 3.4.1 and Section 3.4.2).

The stripping approach is consistent with approved and current activities and hence poses no change to historic noise levels. The likely timing of occupancies within the undeveloped Southlakes Estate is unknown as is whether potential impacts will eventuate. Any future developments in the area must be cognisant of existing noise levels as per Clause 13 of the NSW Government Mining SEPP (2007) as relevant to Mining, Petroleum Production and Extractive Industries.

Noise levels from future general daytime and night-time operations are predicted to satisfy the adopted 'rural' RANLs of 50 dB  $L_{Aeq,day}$  and 40 dB  $L_{Aeq,night}$  at assessment locations R2 and R3 over the life of the project, as shown in the updated assessment (Table 3.6 and Table 3.7).

Subsequently, noise levels from future daytime operations (with or without drilling activity) and night-time operations will also satisfy the 'suburban' RANLs of 55 dB  $L_{Aeq,day}$  and 40 dB  $L_{Aeq,night}$  relevant to future residential receivers in the undeveloped Southlakes Estate (immediately to the west of R3) over the life of the project.

As discussed in the previous sections, future site operations during Y1, Y3 and Y21 were selected on the basis that these are representative of worst-case operational scenarios over the life of the project. Therefore, it is considered that potential noise impacts from future proposed daytime operations (with or without drilling activity) and night-time operations have been adequately assessed in the NVIA and the updated assessment.

## 6.7 Residual impacts

### MAC comment:

The NVIA presents future operational noise levels that exceed the PNTLs and the recommended ANLs at R2 and R3. The NVIA discussion compares a negligible reduction in noise from the future quarry operations to existing noise emissions that currently exceed NPI noise criteria to justify the impacts for future operations. This justification is not appropriate as the purpose of the ANLs is to limit total industrial noise at a given receiver location or catchment, in particular the Southlakes Estate.

Section 2.4 of the NPI states "To limit continuing increases in noise levels from application of the intrusiveness level alone, the ambient noise level within an area from all industrial noise sources combined should remain below the recommended amenity noise levels specified in Table 2.2 where feasible and reasonable. The recommended amenity noise levels will protect against noise impacts such as speech interference, community annoyance and some sleep disturbance".

The development of two additional quarry extraction areas triggers the application of the NPI. Whilst existing emissions may exceed NPI criteria, comparison of emissions from future operations that exceed NPI PNTLs does not justify the impacts presented in the NVIA without further consideration of noise reduction strategies.

Predicted noise levels from the quarry exceed the recommended (Rural) ANL of 45dBA for rural residential receivers R2, R3 and potential future residential receivers in the Southlakes Estate which may affect acoustic amenity.

### Response:

The NPfI states the following in relation to the assessment of noise impacts from existing industrial sites:

Many existing industrial sources were designed for higher noise emission levels than the project noise trigger levels outlined in this policy. In other cases, industries may have been in existence before neighbouring noise-sensitive developments and even before noise-control legislation was introduced. The range of mitigation measures available for these sites can be limited or costly.

Applications for extensions to existing premises often provide an opportunity to redress issues that relate to the whole site. Where noise emissions from the site exceed the project noise trigger levels, the regulatory authorities and the noise-source manager will determine achievable noise limits for the site, taking into account matters that must be considered in accordance with the relevant legislation or process, including negotiation with proponents and discussion with stakeholders as required.

There is no 'one-size-fits-all' approach to determine the impact from an existing industry. The following governing principles should be applied when determining the project noise trigger levels and/or assessment requirements for existing industry:

- The project noise trigger levels should not be applied as mandatory noise limits. The project noise trigger level is the level used to assess noise impact and drive the process of assessing all feasible and reasonable control measures.
- Where an existing industry has been in operation for more than 10 years and existing site operations exceed the project amenity noise level, the project amenity noise level may be adopted as the project noise trigger level to assess existing, and existing plus proposed site operations, as relevant.
- Where a development proposal involves a discrete process, and premises-wide mitigation has or is to be considered outside of the development proposal, a project noise trigger level for noise from new/modified components (not the whole site) of the operation may be set at 10 dB(A) or more below existing site noise levels or requirements. This approach means that the increase in noise from the whole site is minimised and provides scope for existing components to achieve noise reductions over time.

Note that for sites with limited mitigation measures available, the achievable noise limits can be above the project noise trigger levels.

In some instances noise will be required to be managed as an integral part of site upgrades. The development of formal operating practices to reduce noise generation do not always need to be linked to site upgrades and, where feasible, these operating practices should be applied at the earliest opportunity. Where this process occurs as a part of the EPA's regulatory activity, the measures required to achieve the noise limits are usually set out in a pollution reduction program attached to the environment protection licence.

In line with the NPfl assessment requirements for existing industrial sites, comparison of predicted future noise levels to existing noise levels is an observation of relative noise impacts rather than a justification for noise impact. An assessment of feasible and reasonable noise mitigation measures relevant to the project has been undertaken with all measures that were identified as both feasible and reasonable, implemented within the noise model and recommended for inclusion in the project (refer to Section 2.4.3).

Further, noise levels from future daytime operations (with or without drilling activity) and night-time operations are predicted to satisfy the 'rural' RANL of 50 dB  $L_{Aeq,day}$  at assessment locations R2 and R3 over the life of the project.

Noise levels from future daytime operations (with or without drilling activity) and night-time operations are predicted to satisfy the adopted 'suburban' RANL of 55 dB  $L_{Aeq,day}$  at future residential receivers in the undeveloped Southlakes Estate (immediately to the west of R3) over the life of the project.

## 6.8 Maximum noise levels

### MAC comment:

As discussed in Section 3.3, it is possible that maximum noise levels will be higher than those presented in the NVIA when the NPI noise enhancing conditions are applied to the noise modelling.

Clarification is sought on the potential impacts NPI noise enhancing conditions would have at all identified existing and future residential receivers in the Southlakes Estate.

### Response:

The adoption of the ISO9613 standard for noise predictions is generally consistent with the 'noise-enhancing' conditions as defined in the NPfl. Refer to Section 6.4 for our detailed response on this matter.

As mentioned in Section 6.4, an analysis of wind speed and wind direction data recorded by the Bureau of Meteorology Automatic Weather Station located in Dubbo between 2015 and 2019 (5 years of data) showed that no ‘significant’ winds were present. The NPfl defines “significant” as the presence of source-to-receiver wind speed (measured at 10 m above ground level) of 3 m/s or less, occurring for 30% of the time in any assessment period and season.

Based on the preceding, the approach to utilise the ISO 9613 for noise predictions is considered conservative and therefore appropriate for the assessment of night-time maximum noise levels (sleep disturbance) at residential receivers. Further, the quarry is proposing to limit night-time operations (4 am to 7 am) to product dispatch activities. This means no processing or extracting activities during the NPfl night period, which will reduce existing night-time noise emissions from the quarry.

## 6.9 Noise management plan

### MAC comment:

Further conceptual detail on how the noise monitoring and management plans will be applied would be beneficial to those receivers affected and provide further clarity in managing future noise emissions.

### Response:

As per Section 6.1.2 of the NVIA, a noise management plan and monitoring program will be developed to include verification noise monitoring completed for representative stages of proposed operations to confirm actual noise levels from the site at most affected residences. Additionally, it is likely that the project approval, if granted, will include conditions requiring the preparation of a noise monitoring and/or management plan to be prepared to the satisfaction of the Planning Secretary. This will include regular noise compliance monitoring in accordance with relevant NSW EPA methodology incorporating, as a minimum, operator-attended noise monitoring at representative locations surrounding the quarry.

## 6.10 Road traffic noise

### MAC comment:

Section 4.3.2 of the NVIA discusses existing and proposed road traffic flows from classified traffic counts completed. The NVIA states “site related traffic on this day was relatively low compared to normal operations. These traffic numbers have been adopted for the assessment of road traffic noise at three assessment locations on Sheraton Road, including R3, R10-R12 (schools) and R23 on Sheraton Road. The NVIA also states that: “the existing traffic movements assumed for assessment of road traffic noise is considered to be conservative, as it is representative of a relatively quiet day for general traffic, thus resulting in a greater increase in road traffic noise levels due to the project.”

The determination of a “conservative assessment” because low site (quarry) related traffic compared to low general traffic is unjustified. If site traffic was considered to be at “normal” volumes, then this would be a conservative assessment.

Additionally, discussion of existing and projected traffic volumes needs further clarification of the terms movements and the periods being assessed – for example, is a day 24 hours, 15 hours, etc.

The Federal Highway Administration (FHWA) traffic noise model (TNM) is suitable for use of the assessment of road traffic noise for the project. However, the TNM Low Volume Tool may be a more appropriate method for this situation. Additionally, the FHWA is a part of the United States Department of Transport (DoT), not the US Environmental Protection Agency.



Overall, the quarry traffic volume is proposed to increase from 132 Heavy Vehicle (HV) movements per day to 242 HV per day. This would result in an approximate increase of 2dB to 3dB depending on the assessment period and transportation hours. The road traffic noise assessment (Section 5.5 of the NVIA) generally results in predicted increase of 1dB for the daytime and night periods.

Whilst it is recognised that an increase of 2dB would not change the outcome of the assessment for the daytime period, an increase of 3dB during the night time period would result in a noise level of 56dB LAeq(1h), exceeding the night time RNP criteria. Further clarification is required for the determination of traffic volumes for the relevant assessment periods.

The road traffic noise assessment has not assessed potential future residential receivers within the two proposed residential subdivisions that interact with Sheraton Road and predictions of road traffic noise at reasonable nominal offsets should be calculated for completeness.

Response:

### 6.10.1 Overall approach to road traffic noise assessment

Road traffic noise levels from the project have been assessed by calculating existing and future (at a worst-case maximum production scenario) at potentially the most affected existing assessment locations. Whilst site related traffic volumes during the traffic count surveys were “relatively low compared to normal operations” as stated in the NVIA, the traffic survey data was used to determine existing traffic volumes excluding site related traffic.

Existing site related traffic volumes adopted in the road traffic noise calculations were based on existing approved volumes. Furthermore, the calculation of road traffic noise levels from site, existing and future, was based on operator-attended noise measurements undertaken on Sheraton Road. In accordance with the findings of the NVIA, the project is not expected to cause any additional road traffic noise impacts.

Road traffic noise levels shown in Section 5.5 of the NVIA are based on the  $L_{Aeq,1hr}$  descriptor and hence hourly traffic movements. Hourly traffic movements adopted in the NVIA are based on daily traffic movements averaged over the relevant period (eg operating period). One truck movement represents one truck passing by a point on a road. One truck trip represents two movements, one movement to its destination and one movement back to its origin.

### 6.10.2 Adopted road traffic noise model

It is agreed that the Federal Highway Administration (FHWA) is a part of the United States Department of Transport, not the US Environmental Protection Agency. The FHWA’s Low Volume Road Tool adopts the FHWA algorithm for prediction of road traffic noise, and hence the adopted FHWA method in the NVIA is appropriate.

### 6.10.3 Road traffic noise increase

Road traffic noise levels shown in Section 5.5 of the NVIA are based on several assumptions as listed in Section 4.3.4 of the NVIA. The road traffic noise assessment methodology assumes various vehicle travelling speed and distances to the nearest residential assessment location (ie R3). The NVIA showed that road traffic noise levels are predicted to increase by up to 1.5 dB at R3 as a result of the increase (approx. 45%) in quarry related road truck movements proposed for the project. The MAC acoustic review provides that such an increase in traffic would typically result in a 2 to 3 dB increase in road traffic noise levels. This is not the case for the project because the proposed new quarry access road (option 1) is located further to the north of the existing quarry access road and, hence, at a greater distance from R3. Therefore, if constructed, the proposed new quarry access road (option 1), would assist in reducing the potential increase in future road traffic noise levels at R3.

If the new quarry access road is not constructed (option 2), quarry related traffic movements will continue to travel via the existing quarry access road.

Based on the proposed increase in quarry related traffic movements, there is the potential for an increase in road traffic noise levels of up to 3 dB at R3. The road traffic noise assessment methodology adopted in the NVIA assumes a vehicle speed of 60-80 km/h for the section of Sheraton Road to the north of the proposed new quarry entrance gate and to the south of the South Keswick Quarry entrance gate. The vehicle speed on this section of Sheraton Road is actually 60 km/h and hence road traffic noise levels for the project would be lower than those shown in Table 5.10 of the NVIA at R3. A 3 dB increase in road traffic noise levels due to the proposed increase in quarry related traffic movements would not cause road traffic noise levels at R3 to increase above the relevant RNP criteria. In accordance with the findings of the NVIA, future road traffic noise levels at the nearest residential receiver are predicted to satisfy relevant RNP criteria and hence the project is not expected to cause any additional road traffic noise impacts.

Road traffic noise levels from the project have been assessed at all receivers on the transport route (Sheraton Road) in accordance with the RNP assessment guidelines. Whilst there are residential subdivisions proposed on the transport route (eg Southlakes Estate), no proposed developments have been approved for construction and hence do not require to be assessed in accordance with the RNP. Refer to EMM's response in Section 5.4.

## 6.11 School Infrastructure NSW

### School Infrastructure NSW submission:

SINSW has reviewed the Environmental Impact Statement (EIS) and supporting documents for SSD-10417 and has identified potential impacts on the public schools located in proximity to the proposal (refer Figure 1 below). These include:

- Dubbo College South Campus (located approximately 3km north-west from the existing site).
- Dubbo South Public School (located approximately 3.88km north-west); and
- Orana Heights Public School (located 3.33km north-west of the site).

Whilst the SINSW assets listed above are not assessed as sensitive receivers as part of the application, the Noise and Vibration Assessment (prepared by EMM) discusses the potential impacts on two receivers in proximity to Dubbo College South Campus and Orana Heights Public School (Receivers R18 and R19).

The report concludes that these receivers will not be impacted during the drilling, road construction or general operations stages (day and night) of the development, but moderate exceedances of the relevant noise levels will be apparent during initial 'Stripping Operations' (removing the soil above the bedrock). These activities will be limited to a 4-week period per expansion area.

Any noise disruptions have the potential to create impacts on student learning outcomes. SINSW therefore requests that high impact works and activities should, where possible, be undertaken outside of school hours or during school holidays.

### Response:

The SINSW assets listed above (Dubbo College South Campus, Dubbo South Public School and Orana Heights Public School) are further away from site than other schools closer to site and that were adopted as assessment locations R10, R11 and R12. The day PNTL adopted for schools in the NVIA (40 dB  $L_{Aeq,1hr}$  external) would also be adopted for these assets. Based on the updated assessment, noise levels from stripping are predicted to satisfy the relevant NMLs and PNTLs at R10, R11 and R12. Therefore, it is demonstrated that noise levels from stripping would also satisfy the day NML and PNTL applicable at the SINSW's assets and other schools further away from site.

Further, the day NML and PNTL adopted for schools are based on a 'windows open' scenario assuming an external-to-internal reduction of 10 dB. It has been assumed that classrooms would be fitted with mechanical ventilation and operate with windows closed. A 'windows closed' scenario would typically provide an external-to-internal reduction of 20 dB. Based on the latter and future noise levels predicted at R18 and R19, future noise levels predicted during stripping at SINSW's assets and other schools further away from site would achieve an adopted day PNTL of 50 dB  $L_{Aeq,1hr}$  external with windows closed.

## 7 Anonymous public submission – truck noise

### An anonymous public submission:

If there is an intention of using the newly developed Boundary Road when it connects to Sheraton Road this feeds into a residential area, will create traffic safety issues, truck noise too early with the plan to start at 7am Monday to Saturday with an Aged Care facility on Wheelers Lane and an over 55's Lakeview village on Boundary Road. The hours need to be shortened and number of trucks per day should be much less frequent.

### Response:

Project related traffic will use Sheraton Road to connect to the Mitchell Highway and will not use the newly developed Boundary Road through the Southlakes Estate, as discussed in Section 4.3 of the NVIA.

## 8 Conclusion

This report responds to submissions made about the potential noise and vibration impacts of the Dubbo Quarry Continuation Project during exhibition.

Further, the response provides an updated noise assessment based on project changes and key items raised in submissions and to respond to individual comments in each submission.

The findings of the updated noise assessment are:

- Stripping activity:
  - Predicted noise levels during stripping have been assessed against the ICNG NMLs for the ICNG standard hours of construction (Monday to Friday 7 am to 6 pm and Saturday 8 am to 1 pm).
  - During stripping in the WEA in the early stages of the project in Y1 and in the SEA from Y3 through to Y21 in later stages of the project, NMLs will be achieved at most assessment locations. The exception is at potentially the most exposed assessment location R2 where a negligible exceedance of the relevant NML is predicted.
  - Site noise levels during stripping are not predicted to exceed the 75 dB highly noise affected NML at any residence.
- Daytime operations with drilling activity:
  - Site noise levels during daytime operations with drilling activity including modifying factor adjustments for LFN are predicted to 'negligibly' or 'marginally' exceed the PNTLs (as per the NPfI).
  - A reduction in the category of residual noise impacts (as per the NPfI) presented in the NVIA has resulted from this updated assessment. From 'moderate' residual noise impacts predicted at R2 in the NVIA to 'marginal' residual noise impacts predicted at R2 in the updated assessment. Negligible residual noise impacts (as per the NPfI) have resulted at R4 from the updated assessment. No change to the category of residual noise impacts (as per the NPfI) presented in the NVIA has resulted from the updated assessment at other assessment locations.
- General daytime operations (no drilling activity):
  - Site noise levels during general daytime operations (without drilling activity) including modifying factor adjustments for LFN are predicted to 'negligibly' or 'marginally' exceed the PNTLs (as per the NPfI).
  - A reduction in the category of residual noise impacts (as per the NPfI) presented in the NVIA has resulted from the updated assessment. From 'moderate' residual noise impacts predicted at R2 in the NVIA to 'marginal' residual noise impacts predicted at R2 in the updated assessment. Marginal and negligible residual noise impacts (as per the NPfI) have resulted at R3 and R4 respectively in the updated assessment. No change to the category of residual noise impacts (as per the NPfI) presented in the NVIA has resulted from the updated assessment at other assessment locations.
- Night-time operations:
  - Site noise levels during night-time operations (4 am-7 am and limited to product dispatch activities) including modifying factor adjustments for LFN are predicted to 'negligibly' exceed the PNTLs (as per the NPfI).

- A reduction in the category of residual noise impacts (as per the NPfI) presented in the NVIA has resulted from the updated assessment. From 'marginal' residual noise impacts predicted at R3 in the NVIA to 'negligible' residual noise impacts predicted at R3 in the updated assessment. From 'negligible' residual noise impacts (as per the NPfI) to no impacts (ie predictions satisfy the PNTLs) has resulted at R2 and R23 respectively in the updated assessment.
- The modelling results for future general night-time operations in the updated assessment demonstrate once more a positive outcome for the project when comparing existing to future night-time noise levels (ie decrease in predicted site noise).
- Overall quarry operations:
  - The modelling results for future daytime and night-time operations in the updated assessment demonstrate a positive outcome for the project when comparing existing to future noise levels (ie decrease in predicted site noise) at all assessment locations.

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# Appendix E

## Addendum air quality impact assessment

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24 June 2022

Luke Edminson  
Planning and Environment Manager NSW/ACT  
Holcim (Australia) Pty Ltd  
Level 7, Tower B, 799 Pacific Highway  
Chatswood, NSW, 2067

**Re: Dubbo Quarry Continuation Project - revised RtS (v2) air quality modelling**

Dear Luke,

EMM Consulting Pty Limited (EMM) prepared an air quality impact assessment (AQIA) for the Dubbo Quarry Continuation Project ('the project') in January 2021 as part of the environmental impact statement (EIS). At the request of Holcim (Australia) Pty Limited (Holcim), EMM revised the original dispersion modelling to allow for proposed changes to the layout of the Dubbo Quarry (the quarry). This work forms part of the Addendum Submissions Report for the project.

This letter provides a summary of the changes to the modelling and the results.

We hope that this letter meets your needs. Please do not hesitate to contact me using the details below if you have any questions.

Yours sincerely



**Francine Manansala**  
Associate, Air Quality  
[fmanansala@emmconsulting.com.au](mailto:fmanansala@emmconsulting.com.au)

# 1 Changes to the previous air quality modelling

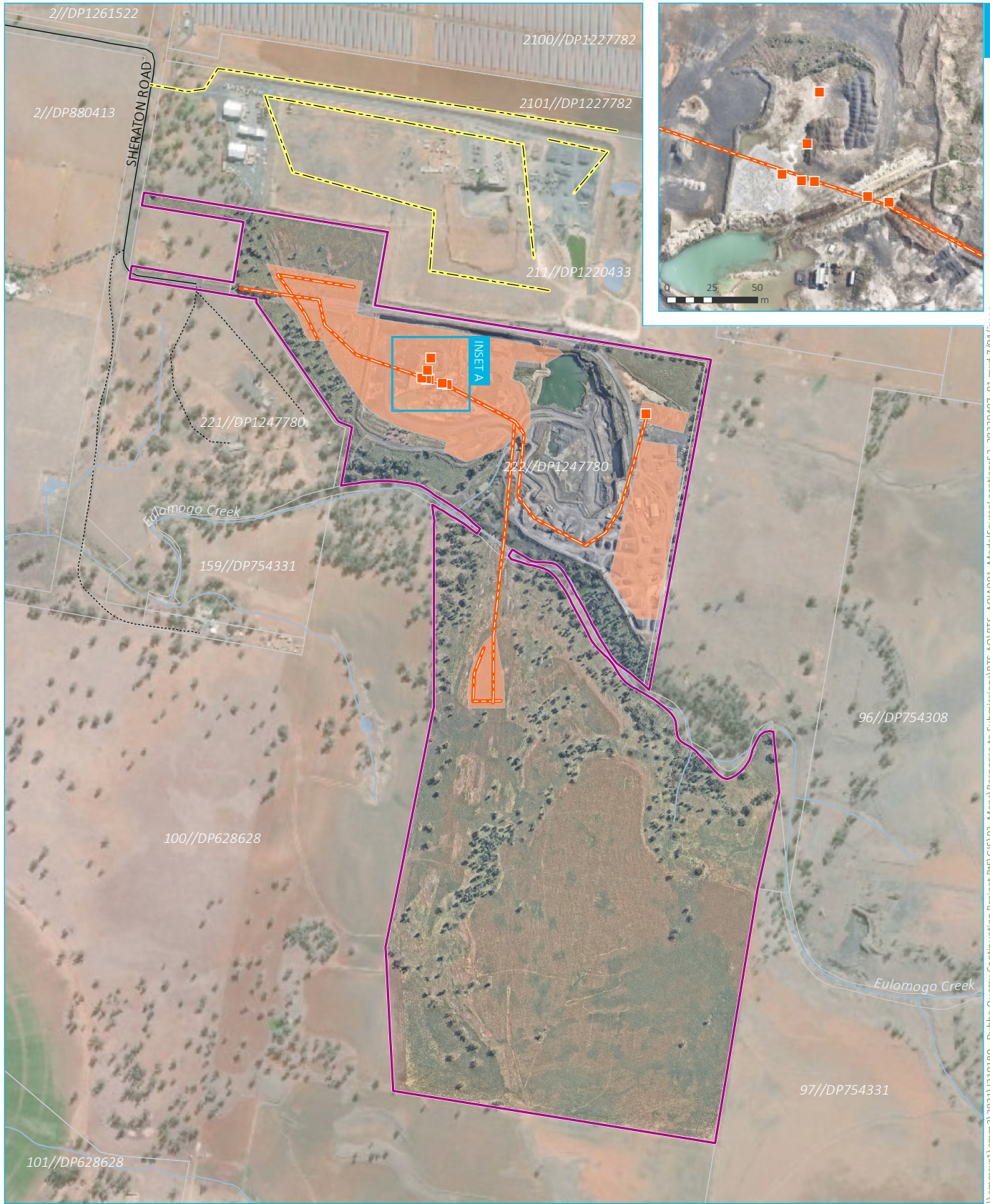
Dispersion modelling completed to date for the project has assessed two future proposed scenarios:

- Scenario 2 – extraction occurring in both the Western Extension Area (WEA) and Southern Extension Area (SEA) with additional ‘floor rock’ excavated from the existing pit; and
- Scenario 3 – majority of extraction occurring in the SEA with floor rock extracted from the WEA.

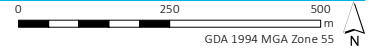
Since the completion of the revised modelling as part of the ASR, Holcim has requested that EMM assess several changes to the quarry layout. These include:

- the processing plant will be located approximately 120 m west of the previously modelled location;
- the exposed area in the existing pit west of the new processing plant area has increased in Scenario 3 to account for the change in location and to allow for associated stockpiles;
- Scenario 2 includes an additional small, exposed area to the north of the processing plant;
- haul routes entering and exiting the new processing plant have been adjusted to account for the change in location;
- the alignment of the quarry access road entering the western extraction boundary has changed to allow trucks to enter the site using the existing Sheraton Road; and
- the alignment of the haul road from the southern extension area to the processing plant has been changed slightly to account for changes to the Eulomogo Creek crossing.

The above changes have been incorporated into the revised modelling of the quarry for Scenarios 2 and 3. Maps showing the location of modelled sources are provided in Figure 1.1 and Figure 1.2.



Source: EMM (2022); DFSI (2017); Nearmap (2020)



**KEY**

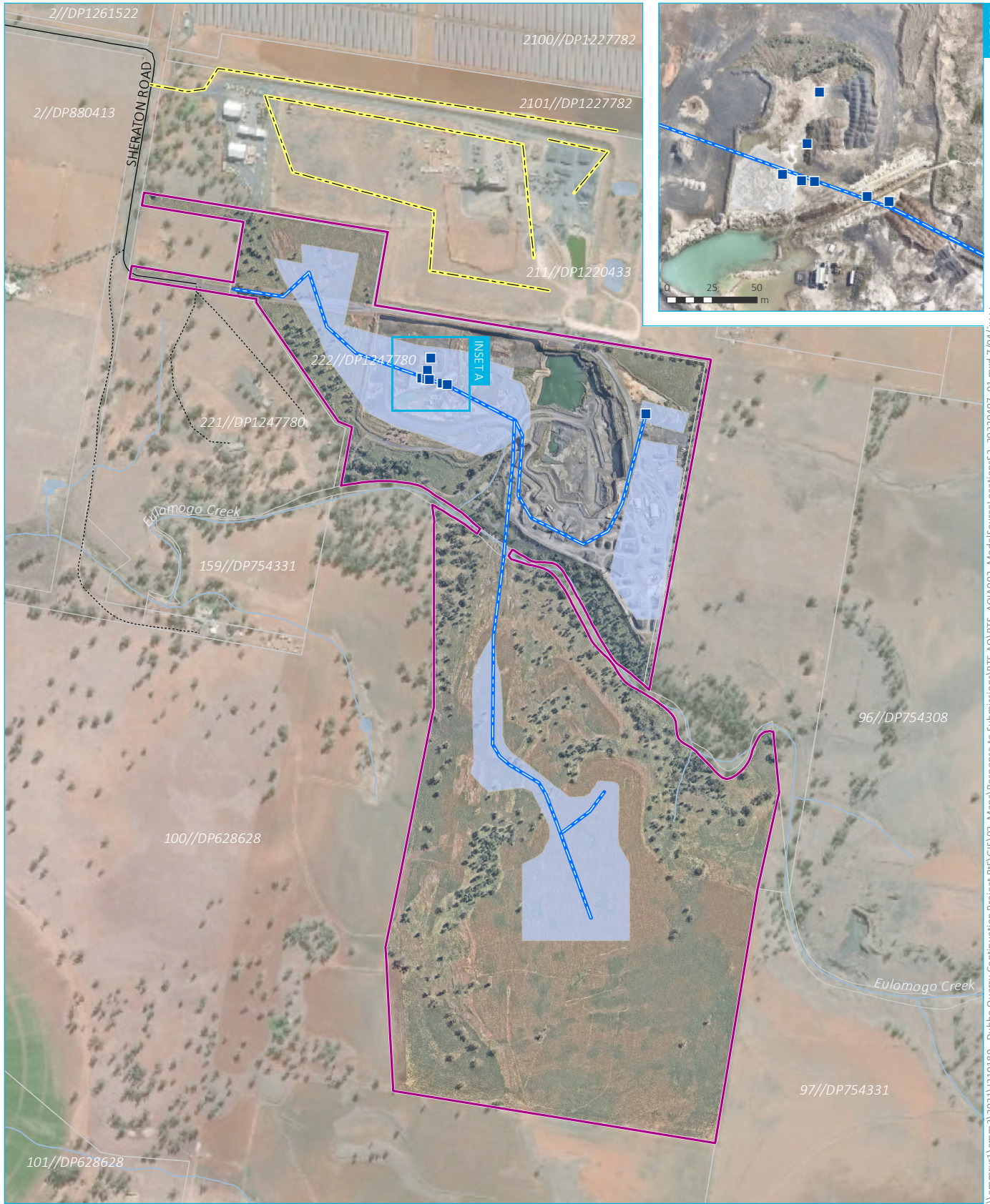
- Project area
- Volume source
- Line-volume source
- Area source
- South Keswick source
- Minor road
- Vehicular track
- Cadastral boundary (data does not align with surveyed site boundary)
- Watercourse/drainage line
- Waterbody

Model source locations - scenario 2

Dubbo Quarry Continuation Project  
 Response to submissions - air quality assessment  
 Figure 1.1



INSET A  
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Source: EMM (2022); DFSI (2017); Nearmap (2020)

**KEY**

- Project area
- Volume source
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- Waterbody

Model source locations - scenario 3

Dubbo Quarry Continuation Project  
 Response to submissions - air quality assessment  
 Figure 1.2

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INSET A