

4 March 2021

MAC190962-03LR1

Attention: Steve Guy
Regional Group Australia Pty Ltd
20L Sheraton Road
Dubbo NSW 2830

Dear Steve,

Acoustic Review: Holcim Dubbo Quarry Continuation Project on behalf of Regional Group Australia Pty Ltd

Muller Acoustic Consulting Pty Ltd (MAC) has been engaged by Regional Group Australia Pty Ltd to complete an Acoustic Review (AR) of a Noise and Vibration Impact Assessment (NVIA) for the Holcim Dubbo Quarry Continuation Project (the 'proposal'). The letter presents the findings of the review and raises key areas of concern that may affect future operations of the South Keswick Quarry.

1 Background

A NVIA for the Holcim Dubbo Quarry Continuation Project was completed by EMM Consulting Pty Ltd (EMM) – Report Number J180313RP17, dated 14 January 2021 (the 'NVIA'). Holcim is seeking approval for the continued operation of their Dubbo Quarry (the 'quarry') through the development of two additional extraction areas to the south and the west of the existing quarry.

The AR has been completed in general accordance with:

- NSW Environment Protection Authority (EPA), Noise Policy for Industry (NPI) 2017;
- Australian Standard AS 1055:2018 - Acoustics - Description and measurement of environmental noise - General Procedures; and
- Association of Australasian Acoustical Consultants (AAAC) - Consultants Guideline for Report Writing, 2017.

2 Purpose

The purpose of the AR is to establish that the appropriate level of diligence has been applied to the assessment of the proposal so that:

- the proposal does not result in significant cumulative noise impacts or restrictions to other existing industries in the area in terms of acoustic amenity and road traffic noise;
- the proposal demonstrates the compatibility of existing and proposed land uses;
- the proposal does not result in potential land use conflicts; and
- the proposal allows the cohabitation of complementary land uses for appropriate and sustainable developments.

3 Technical Review

Key findings of the AR are presented in the following sections.

3.1 Receivers

3.1.1 Assessed Receivers

The NVIA has not assessed all the residential receivers within the potentially affected area of influence of the quarry extension. The following receivers were not included in the assessment:

- 4R Lidscomb Road (Lot 32 DP247415);
- 1R Basalt Road (Lot 28 DP247415) – possible second dwelling south of R16;
- Approved dwelling at 25R Sheraton Road (Lot 159 DP754331); and
- Potential future residential receivers in the proposed residential subdivisions.

For clarity, there are two proposed residential subdivisions:

- Sheraton Road Estate, 1 Sheraton Road (Lot 1 DP880413); and
- Southlakes Estate, 24R Sheraton Road (Lot 2 DP880413). This estate continues further to the west, and is the closest parcel of land to be subdivided into future residential.

The NVIA refers to location R23 as an approved residential subdivision (Sheraton Road Estate). The location of R23 is the nearest point of the subdivision to the quarry, however, it is likely that possible future receivers along the Sheraton Road interface that may be affected by road traffic noise which has not been assessed.

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. The additional receivers and subdivisions are presented in **Figure 1**.

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

3.1.2 Receiver Classifications

The NVIA classifies receivers R18, R19 and R23 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.

Table 3.3 of the NVIA does not assign an intrusiveness noise level or amenity noise level to receiver R23 and applies the Voluntary Land Acquisition and Mitigation Policy (VLAMP) (DPIE 2018) criteria. MAC believe this is an inappropriate application of the VLAMP.

3.2 Background Noise Levels

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.

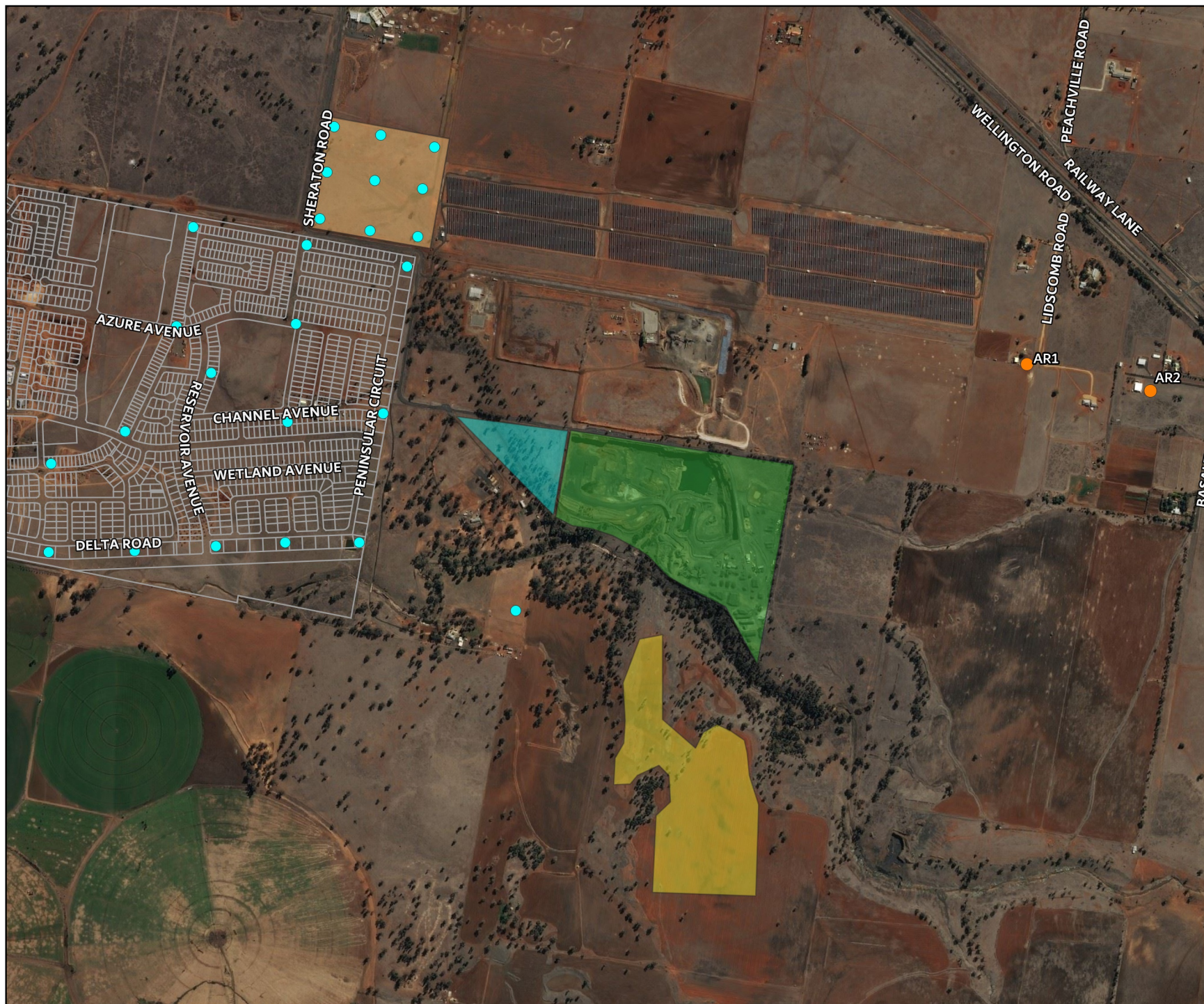


FIGURE 1
PROJECT LAYOUT
MAC190962-03
Holcim Dubbo Quarry
Continuation Project
Acoustic Review

KEY

- Additional Receivers
- Future Receivers
- Sheraton Road Estate
- Southlakes Estate
- Current Holcim Site (Approx)
- West Extraction Area (Approx)
- South Extraction Area (Approx)



3.3 Meteorology

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 2**) 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 2 – NVIA Modelled Meteorological Conditions

Table 4.3 Meteorological conditions adopted for noise modelling					
Modelling algorithm	Assessment period	Air temperature	Wind speed ¹	Relative humidity	Stability class
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

3.4 Assessment Scenarios

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.

Section 4.1.2 (Part ii) of the NVIA describes the modelled operational scenarios, for which the results are presented in Section 5.1.1. Clarification is sought for the following:

- Table 5.1 – Predicted operational noise results during stripping operations. Clarification is sought as to whether the results represent stripping operations only or stripping operations in conjunction with normal quarry operations (load, haul and processing etc).

- Table 5.2 – Predicted operational noise results during drilling operations. Clarification is sought as to whether the results represent drilling operations only or drilling operations in conjunction with normal quarry operations (load, haul and processing etc).
- It is unclear if stripping operations occur at the same time as drilling operations.

Further detail is required of the operational scenarios modelled, describing the plant and equipment in use during the daytime and night time including their locations.

3.5 Predicted Noise Levels

Predicted noise levels from stripping operations during Year 1 significantly exceed the PNTLs and the recommended (Rural) Amenity Noise Levels (ANLs) at most 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, R3 and R23 for the life of the quarry. Hence, it is likely that noise levels would also exceed the daytime and night time PNTLs for the life of the quarry at the proposed residential dwelling at 25R Sheraton Road and future residential receivers in the Southlakes Estate, situated between R2, R3, and R18, R19 and R23.

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 receiver in the approved subdivisions (Sheraton Road Estate and Southlakes Estate).

3.6 Residual Impacts

The NVIA presents future operational noise levels that exceed the PNTLs and the recommended ANLs at R2, R3 and R23 (Sheraton Road Estate). 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.

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 trigger 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, the proposed dwelling at 25R Sheraton Road and potential future residential receivers in the Southlakes Estate. Considering the recommended (Rural) ANL are expected to be exceeded, this may result in restrictions for any further industrial developments in the area, deterioration of acoustic amenity, compromise the compatibility of existing and proposed land uses and potential land use conflicts.

Section 5.1.3 (Part ii) of the NVIA describes the impact at receiver R23 in terms of complying with VLAMP criteria as the land is currently vacant, however the assessment does not address the potential future residential receivers in the Sheraton Road Estate and Southlakes Estate subdivisions and the proposed dwelling at 25R Sheraton Road.

3.7 Maximum Noise Levels

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 receivers.

3.8 Noise Mitigation Measures

Section 6 (Table 6.1) of the NVIA summarises the noise mitigation and management measures considered and adopted for the future quarry operation.

The mitigation matrix (Table 6.1) has not considered the replacement of the primary screen and secondary crusher with a new enclosed crushing plant that would offer further noise reduction than the partially enclosed existing plant. Furthermore, were alternative locations of the primary screen and secondary crusher assessed.

The use of a smaller (CAT D9) dozer for stripping was assessed and deemed unreasonable compared to a D11 bulldozer. Assessment of alternative, similar large tracked bulldozers has not been completed, such as the Komatsu D375 or D475A for example which have significantly lower noise emission levels. Other alternative earthmoving equipment with lower noise emissions, such as scrapers, could be considered in the NVIA.

A 4m bund is proposed on the western boundaries of the quarry extraction areas. Clarification is sought whether various bund heights were considered and their attenuation performance.

The NVIA does not identify the significant noise sources attributable to the exceedances presented, provision of this would provide for a more adequate assessment of the mitigation matrix (Table 6.1) to be completed.

3.9 Road Traffic Noise

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 movements 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.

4 Conclusion

Muller Acoustic Consulting Pty Ltd (MAC) has been engaged by Regional Group Australia Pty Ltd to complete an Acoustic Review of a Noise and Vibration Impact Assessment (NVIA) for the Holcim Dubbo Quarry Continuation Project (the 'proposal').

The key findings of the review can be summarised as follows:

- The NVIA has not assessed quarry noise emissions and road traffic noise at all residential receivers within the potentially affected area of the quarry extension including the potential future residential receivers in the Sheraton Road Estate and the Southlakes Estate.
- Application of the rural receiver category for R18, R19 and R23 may provide a more appropriate representation of the acoustic environment of these residential receivers and associated Amenity Noise Levels.
- Background noise levels used in the assessment are from May 2016. Use of contemporary data may result in similar Rating Background Levels (RBL), but would alleviate any concerns around changes in ambient and background noise levels that may have occurred from recent industrial developments in the area.
- The meteorological conditions used for noise modelling do not align with the NPI noise enhancing conditions as stated in the assessment methodology. It is anticipated that noise levels will be higher than those presented in the NVIA when the NPI noise enhancing conditions are applied.
- Clarification is sought as to why future Year 1, Year 3 and Year 21 stages of the quarry development were chosen and why more stages between Year 3 and Year 21 were not modelled.
- Clarification is required for the operational scenarios modelled, describing the plant and equipment in use during the daytime and night time including their locations.
- Production of noise contour diagrams for five yearly stages for quarry operations, stripping and drilling would allow for a more transparent understanding of the noise impacts at the potential future residential receiver locations in the Sheraton Road Estate and Southlakes Estate subdivisions.
- Predicted noise levels from normal operations exceed the daytime and night time PNTLs and the recommended ANL of 45dBA for rural receivers for the life of the quarry at R2, R3 and R23. It is anticipated that noise levels would also exceed the daytime and night time

PNTLs for the life of the quarry at the proposed dwelling at 25R Sheraton Road and future residential receivers in the Southlakes Estate, situated between R2 and R23.

- Comparison of noise emissions from future operations to existing noise emissions do not justify the impacts presented. Predicted noise levels from the quarry exceed the recommended (Rural) Amenity Noise Level of 45dBA for existing residential receivers and potential future residential receivers, which may deteriorate acoustic amenity, compromise the compatibility of existing and proposed land uses and potential land use conflicts creating restrictions for further industrial developments in the area.
- Additional noise mitigation measures and level of attenuation achieved should be considered.
- Further clarification is required for the determination of traffic volumes for the relevant assessment periods which may result in exceedances of the Road Noise Policy criteria.

We trust this is satisfactory for your current requirements. If you have any further questions or would like to discuss, please contact the undersigned.

Yours sincerely



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Reviewed: OM