

Operational and Road Noise Management Plan

Roberts Road Quarry
Corner of Roberts Road and Old Northern Road
Maroota, NSW

Prepared for: HB Maroota Pty Ltd
October 2023
MAC160257-02NMP1V1



Document Information

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Prepared for: HB Maroota Pty Ltd

Corner of Roberts Road and Old Northern Road

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1 Introduction

Muller Acoustic Consulting Pty Ltd (MAC) has been commissioned by VGT Environmental Compliance Solutions Pty Ltd (VGT) on behalf of HB Maroota Pty Ltd (HBM) to prepare an Operational and Road Noise Management Plan (ORNMP) for Hodgson Quarries and Plant Hire Pty Ltd (the 'quarry'), situated off Roberts Road, Maroota, NSW.

Hodgson Quarries and Plant Pty Ltd are obliged to prevent and minimise harm to the environment throughout the life of the project. All practicable measures will be taken to prevent and minimise harm that may result from the construction, operation and decommissioning of the development.

All activities on the site, including those undertaken by contractors and sub-contractors will be carried out generally in accordance with the EIS, Modifications 1 to 4 and the conditions of the development consent. This plan will be implemented to ensure that all activities on the premises will be carried out in a manner that will minimise disturbance and maximise rehabilitation at the premises.

The ORNMP has been prepared to assist with the management of noise emissions associated with quarry operations and off-site road traffic to satisfy Condition 48 to Condition 51 of the quarry's latest modified Project Approval, DA No.267-11-99 (Department of Planning and Environment (DPE), 2021).

This assessment has been undertaken in accordance with the following documents:

- NSW Environment Protection Authority (EPA), Noise Policy for Industry (NPI) 2017;
- NSW Environment Protection Authority (EPA), Approved Methods for the measurement and analysis of environmental noise in NSW, 2022;
- NSW Department of Environment, Climate Change and Water (DECCW) – NSW Road Noise Policy (RNP), March 2011;
- Department of Planning, Industry and Environment (DPIE) Consolidated Consent DA 267-11-99 Mod 4, August 2021;
- NSW Environment Protection Authority (EPA) Environmental Protection License (EPL) #6535, 16 June 2023; and
- Umwelt, Noise Impact Assessment, Hodgson Quarries and Plant Pty Ltd, Modification 4 Rev 1, 2020.

A glossary of terms, definitions and abbreviations used in this report is provided in **Appendix A**.

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2 Project Approval and License

Extracts from the relevant project approval and EPL are summarised below.

2.1 Condition 48 – Operational Noise Management Plan

The Applicant shall prepare a Noise Management Plan as part of the EMP. The Noise Management Plan shall:

- a) identify existing and potential noise sources and their relative contribution to noise impacts from the development;*
- b) specify appropriate intervals for noise monitoring to evaluate, assess and report noise emission levels due to construction and normal operations of the development under prevailing weather conditions;*
- c) outline the methodologies to be used, including justification for monitoring intervals, weather conditions, seasonal variations, selecting locations, periods and times of measurements, the design of any noise modelling or other studies, including the means for determining the noise levels emitted by the development;*
- d) specify measures to be taken to document any higher level of impacts or patterns of temperature inversions, and detail actions to quantify and ameliorate enhanced impacts if they occur*
- e) provide details of noise amelioration measures, including measures to be used to reduce the impact of intermittent, low frequency and tonal noise (including truck reversing alarms) and reactive management responses for particular noise sources; and*
- f) contingency measures to be implemented should noise complaints be received.*
- g) provision for the notification of adjoining property owners of the commencement and duration of works adjoining the boundary;*
- h) construction of temporary noise shielding to residences affected by short-term noise impacts, including the bund recommended under Modification 2, and include an assessment of the effectiveness of this measure in reducing noise levels; and*
- i) include a noise reduction strategy for typical operations to ensure the noise levels from these operations do not exceed the noise criteria specified in Condition 47.*

The Applicant shall implement the approved management plan as approved from time to time by the Secretary.

2.2 Condition 51 – Road Noise Management Plan

The Applicant shall prepare a Road Noise Management Plan as part of the EMP. The Plan shall document measures to be taken to meet the criteria, including a monitoring, reporting and response program; and methods for educating drivers in the reduction of road noise impacts.

The Applicant shall implement the approved management plan as approved from time to time by the Secretary.

2.3 Applicable Operational Noise Criteria

The project has operational noise criteria prescribed by Condition 49 of the Development Consent and Condition L3 of the EPL. Each condition is reproduced below.

2.3.1 Consent Condition 49 – Noise Operating Conditions

The Applicant must ensure that the noise generated by the development does not exceed the criteria in Table 1 at any residence on privately-owned land.

| Table 1 Operational Noise Criteria | | | |
|------------------------------------|--------------------|--------------------|--------------------|
| Receiver | Day (7am-6pm) | 6am-7am | 6am-7am |
| | Monday to Saturday | Monday to Saturday | Monday to Saturday |
| | dB LAeq(15min) | dB LA1(1min) | dB LAeq(15min) |
| Receiver B | 44 | 50 | 40 |
| All other receivers | 43 | 50 | 40 |

Noise generated by the development is to be measured in accordance with the relevant requirements of the NSW Industrial Noise Policy (as may be updated or replaced from time-to-time).

However, these criteria do not apply if the Applicant has an agreement with the owner/s of the relevant residence or land to generate higher noise levels, and the Applicant has advised the Department in writing of the terms of this agreement.”

2.3.2 Environmental Protection License 6535 – L3 Noise Limits

L3.1 Noise generated at the premises that is measured at each noise monitoring point established under this license must not exceed the noise levels specified in Column 4 of the table below for that point during the corresponding time periods specified in Column 1 when measured using the corresponding measurement parameters listed in Column 2.

| Table 2 Noise Monitoring Parameters | | | |
|-------------------------------------|------------------------|-----------------------|--------------------|
| Receiver | Measurement Parameters | Measurement Frequency | Noise Level, dB(A) |
| Point 1,3,4,5,6,7 | dB LAeq(15min) | - | 43 |
| Point 2 | dB LAeq(15min) | - | 44 |

A review of the noise monitoring locations indicates that location B from the DPIE consent corresponds with Point 2 from the EPL. A summary of the individual noise monitoring locations and applicable noise criteria is presented in **Table 5** of this plan.

2.3.3 Noise Monitoring Requirements

In addition to the noise limits outlined in condition L3 of the EPL, the following requirements must be adhered to during the completion of noise compliance assessments at the quarry.

L3.2 For the purpose of condition L3.1:

Day means the period from 7am to 7pm Monday to Saturday and the period from 8am to 6pm Sunday and public holidays.

L3.3 a) the noise limits set out in Condition L3.1 apply under the meteorological conditions shown in the table below.

b) For those meteorological conditions not referred to in Condition L3.3(a), the noise limits that apply are the noise limits in Condition L3.1 plus 5dB.

Table 3 Noise Monitoring Meteorological Conditions

| Assessment Period | Meteorological Conditions |
|-------------------|--|
| Day | Stability Categories A, B, C, D and E with wind speeds up to and including 3m/s at 10m above ground level. |

L3.4 For the purpose of condition L3.3:

a) The meteorological conditions are to be determined from meteorological data obtained from a meteorological weather station.

b) Stability category shall be determined using the following method from fact Sheet D of the Noise Policy for Industry (NSW EPA, 2017):

i. Pasquill-Gifford stability classification scheme (section D1.3.1).

L3.5 To assess compliance:

a) with LAeq (15 minutes) noise limits in condition L3.1, the noise measurement equipment must be located:

- i. approximately on the property boundary, where any residence is situated 30 metres or less from the property boundary closest to premises:
- ii. or where applicable,
- iii. in an area within 30 metres of a residence facade, but not closer than 3 metres where any residence on the property is situated more than 30 metres from the property boundary closest to the premises; or, where applicable,
- iv. in an area within 50 metres of the boundary of a National Park or Nature Reserve,
- v. at any other location identified in condition L3.1

b) with the LAeq (15 minutes) noise limits in condition L3.1, the noise measurement equipment must be located:

- i. at the reasonably most affected point at a location where there is no residence at the location; or,*
- ii. at the reasonably most affected point within an area at a location prescribed by condition L3.5(a).*

L3.6 A non-compliance of Condition L3.1 will still occur where noise generated from the premises is measured in excess of the noise limit at a point other than the reasonably most affected point at the locations referred to in condition L3. 5 (a) or L3.5 (b).

Notes to L3.5 and L3.6: The reasonably most affected point is a point at a location or within an area at a location experiencing or expected to experience the highest sound pressure level from the premises.

L3.7 For the purpose of determining the noise generated from the premises, the modifying factor corrections in Table C1 in Fact Sheet C of the Noise Policy for Industry (NSW EPA, 2017) may be applied, if appropriate, to the noise measurements by the noise monitoring equipment.

L3.8 Noise measurement must not be undertaken where rain or wind speed at microphone level will affect the acquisition of valid measurements.

2.4 Consent Condition 50 – Road Noise Criteria

The Applicant shall ensure that traffic noise from the development does not exceed (LAeq(1hr)) 55 dB(A) between 7am and 10pm and 50 dB(A) between 10pm and 7am at any affected residence under adverse weather conditions. Where ambient Leq levels already exceed these criteria, the Applicant shall ensure that traffic noise from the development does not result in an increase of more than 2 dB(A).

Note: Adverse weather conditions means in the presence of winds up to 3 metres per second and/or temperature inversions of up to 4 degrees Centigrade per 100 metres.

3 Best Practice Management and Control of Noise Emissions

3.1 Engineering Noise Controls

The Mod 2 assessment identified that generally typical operations complied with relevant criteria at all receivers. The exception was for a few weeks (less than 3 weeks) during new cell establishment when dozers were working at exposed and elevated positions.

The Mod 4 noise assessment (Umwelt, 2020) identified VENM and ENM importation and application process also complied with relevant criteria at all receivers with the exception of a negligible exceedance at R10 during worst case operations and weather conditions. To address this negligible exceedance, noise control strategies may be implemented to assist quarry operations with complying with the relevant criteria.

- Prior to the commencement of extraction or VENM and ENM placement and profiling, in each new stage, a noise bund will be created around the stage perimeter, i.e. between the operational area and noise receivers;
- Other temporary bunds are to be established when extraction and/or VENM and ENM placement or profiling occurs in close proximity to the property boundary of neighboring receivers. Prior to constructing or installing the bunds, consultation with the neighboring residence shall be sought to provide clear lines of communication between the quarry and community;
- Following the addition or replacement of any quarry equipment, the new plant will be screen tested for noise emissions when introduced to site. The screening tests are designed to ensure new or modified equipment operates with a sound power level equivalent to or less than identified in the Mod 4 Noise Impact Assessment;
- All employees and contractors working at the Quarry will undergo a project induction as detailed in **Section 3.2** of this plan;
- Operations at exposed locations and undertaken during unfavorable weather conditions, e.g. winds blowing towards noise receives, will be modified, where necessary, to reduce potential noise-related impacts;
- All relevant equipment will be regularly serviced to ensure sound power levels of each item remains equivalent to or less than the sound powers specified in the Mod 4 Noise Impact Assessment;

- The internal road network will be maintained to the current standard and if any new roads are proposed these will be constructed to similar standards to limit body noise from empty trucks; and
- Maintenance work on all plant and equipment will only be undertaken outside the standard hours of operation if these are inaudible at all residential premises surrounding the quarry site.

3.2 Training and Education

All employees and contractors undertaking any work at the quarry will undergo a site-specific induction, during which personnel will be made aware of the location of noise sensitive receivers and the mitigation measures to be implemented to reduce noise impact to the community. Records of inductions and noise training awareness for all staff and contractors will be held on site. Signage is to be placed at the front entrance advising truck drivers of their requirement to minimise noise both on and off-site.

3.3 Sound Power Levels and Noise Reduction Strategy

Acoustically significant sources that may operate at the quarry are summarised in Section 5.1.1 of the Noise Impact Assessment (Umwelt, 2020) undertaken as part of the Modification 4 Application. The plant and equipment were consistent with those assessed as part of the Noise Assessment undertaken as part of the Modification 2 Application. The sound power levels of the sources were confirmed during measurements conducted on site in 2013 and 2014. **Table 4** provides a summary of indicative quarry noise sources.

Table 4 Indicative Noise Sources and Sound Power Levels

| Item | Sound Power Level, dBA |
|---|------------------------|
| Volvo L150 loader Stationary | 104 |
| Volvo L150 loader Dynamic | 105 |
| Volvo L180E loader Stationary | 103 |
| Top screening plant Operating | 96 |
| Portostack TC80 engine Operating | 90 |
| Powerscreen commander screening plant Operating | 105 |
| Volvo A40D dump truck Dynamic forward | 100 |
| Volvo A40D dump truck Dynamic reverse | 101 |
| Hitachi Zaxis 330 excavator Stationary | 93 |
| Hitachi Zaxis 240 excavator Stationary | 99 |
| Komatsu 375A dozer Stationary | 109 |

3.4 New or Modification to Plant Fleet

Any addition to or significant changes to the existing quarry fleet or equipment upgrades will be screened for noise emissions prior to operating onsite. The screening tests are designed to identify noisy plant that is brought to site which may generate elevated levels within the surrounding community. It is recommended that any new plant item introduced to site will have a sound power level equivalent to or less than items of plant presented in Mod 4 Noise Impact Assessment (Umwelt, 2020).

This information will be used to help plan operations and ensure compliance with relevant noise criteria. The testing will be completed in general accordance with the following Australian and International Standards:

- ISO 3744:2010 'Acoustics Determination of sound power levels and sound energy levels of noise sources using sound pressure Engineering methods for an essentially free field over a reflecting plane';
- ISO 6393:2008 'Acoustics – Measurement of exterior noise emitted by earth-moving machinery – Stationary test conditions'; and
- ISO 6395:2008 'Acoustics – Measurement of exterior noise emitted by earth-moving machinery – Dynamic test conditions'.

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4 Monitoring, Actions and Reporting

4.1 Noise Monitoring Methodology

Noise monitoring is proposed to be conducted annually or in the event of any noise complaints received at the quarry. It is noted that quarry operations commence at 6am, with processing occurring after 7am. Therefore, two monitoring rounds of 15 minutes in duration will be completed at each of the noise monitoring locations presented in **Table 5** and shown visually in **Figure 1**.

Table 5 Noise Monitoring Locations (EPL)

| EPL Receiver ID | Consent ¹ Receiver ID | Address | Criteria | | |
|-----------------|----------------------------------|---------------------------------|--|--|--|
| | | | Day (7am-6pm) Monday to Saturday dB LAeq(15min) | 6am-7am Monday to Saturday dB LA1(1min) | 6am-7am Monday to Saturday dB LAeq(15min) |
| 1 | A | 100 Old Telegraph Road, Maroota | 43 | 50 | 40 |
| 2 | B | 35 Roberts Road, Maroota | 44 | 50 | 40 |
| 3 | C | 4471 Northern Road, Maroota | 43 | 50 | 40 |
| 4 | D | 11 Roberts Road, Maroota | 43 | 50 | 40 |
| 5 | F | 4460 Old Northern Road, Maroota | 43 | 50 | 40 |
| 6 | G | 59 Roberts Road, Maroota | 43 | 50 | 40 |
| 7 | H | 45 Roberts Road, Maroota | 43 | 50 | 40 |

Note 1: As per Appendix 2 of Consolidated Consent (DPIE, 2021).

All attended noise surveys are to be conducted in general accordance with the procedures described in Australian Standard AS 1055:2018, "Acoustics - Description and Measurement of Environmental Noise", the EPL and NMP.

All acoustic instrumentation used should carry appropriate and current NATA (or manufacturer) calibration certificates with records of all calibrations available as per Approved Methods for the measurement and analysis of environmental noise in NSW (EPA, 2022) and complies with AS/NZS IEC 61672.1-2019-Electroacoustics - Sound level meters - Specifications. Calibration of all instrumentation was checked prior to and following measurements. Drift in calibration should not exceed ± 0.5 dBA from the commencement to the conclusion of the survey.

A minimum of one round of noise monitoring will be undertaken at all the nominated monitoring locations outlined in **Table 5** during the periods of morning shoulder period (6am to 7am) and daytime period (7am to 6pm) to quantify quarry noise emissions.

Where possible, noise monitoring will coincide with the winter months (either June, July or August) when the presence of inversion conditions during the early hours of the morning may be encountered. This will allow for measurements to be completed under worst case meteorological conditions.

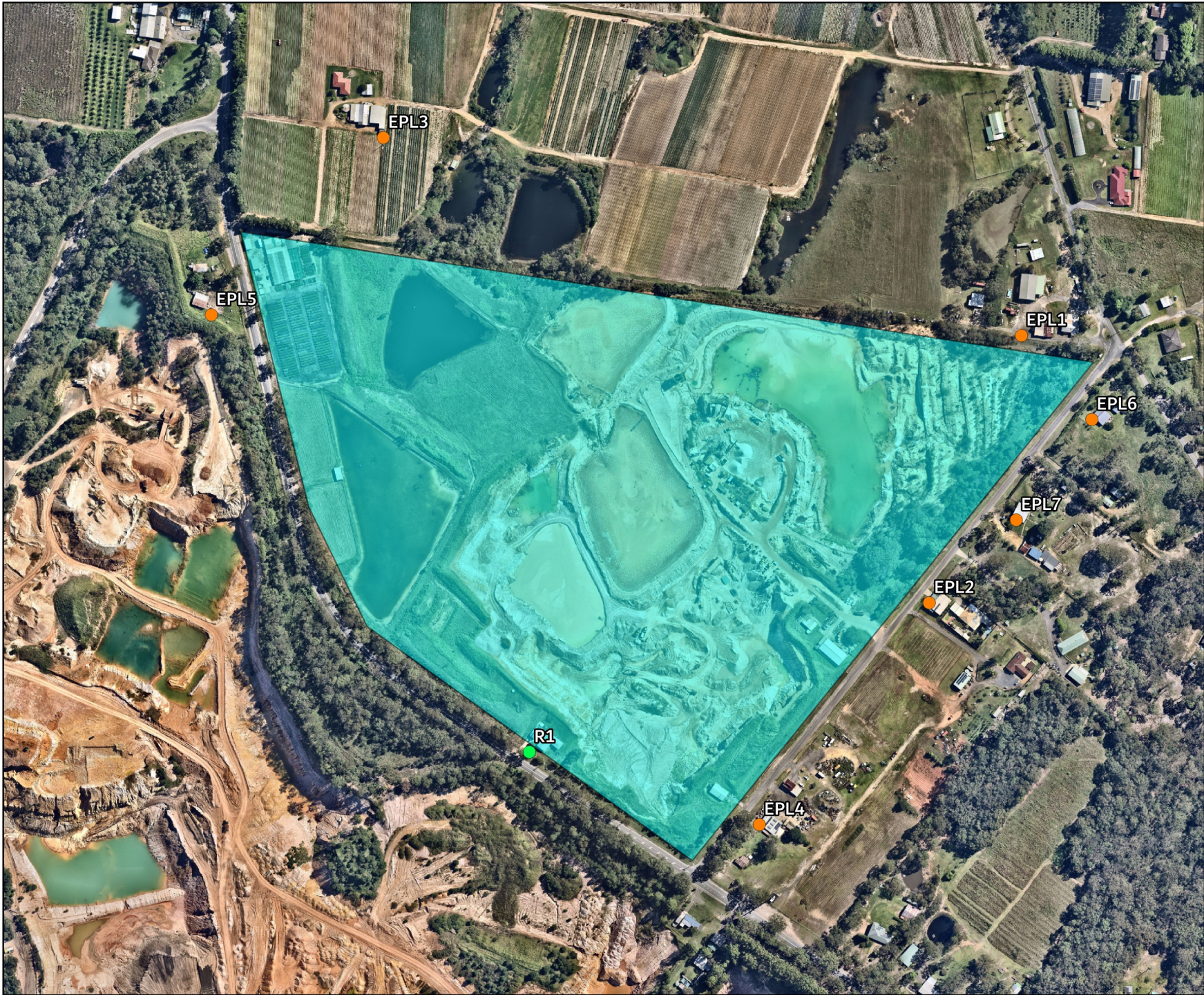
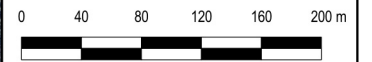


FIGURE 1
 Locality Plan
 MAC160257
 Roberts Road Quarry
 Operational & Road
 Noise Management Plan

KEY

- EPL Noise Monitoring Locations
- R1- Road Noise Monitoring
- Site Boundary



4.2 Noise Exceedance Protocol

If attended noise monitoring indicates that noise generated from the quarry is higher than noise limit criteria the following actions will occur:

- On observing exceedance information during attended noise monitoring, the person undertaking the monitoring will contact the Plant Manager and inform them of the noise level and location of the noise exceedance;
- The Plant Manager will immediately investigate the source of the noise and make necessary arrangements to alter operations to reduce noise levels;
- The Plant Manager will inform the person undertaking the noise monitoring when site operations have been altered; and
- The person undertaking the monitoring will recheck and confirm noise levels with the Plant Manager.

4.3 Additional Attended Noise Monitoring

Triggers that will necessitate attended noise monitoring in addition to the annual assessment include:

- Significant alterations or changes to onsite plant or operational practices;
- Community complaints regarding noise emissions;
- When it is not possible to implement engineering noise controls (ie construct and work behind bunds); and
- When items listed in the Action Response Plan (Noise) are triggered (see **Appendix B**).

4.4 Traffic Noise Monitoring

Road traffic noise monitoring will be conducted annually in conjunction with the operational noise monitoring assessment at the road noise monitoring location (see Location R1 in **Figure 1**). The noise monitoring will be for conducted for two consecutive one hour periods, one hour between 6am to 7am and one hour between 7am and 8am.

Noise monitoring should ideally consist of attended monitoring so that accurate identification of project trucks can be quantified against ambient (non-project) traffic flows. Alternatively, where unattended logging is the preferred approach, the logging device should satisfy specifications of a Type 1 sound level analyser and contain audio capabilities for source identification that can be cross checked with truck ingress and egress data from the site weigh bridge.

Furthermore, in-field noise measurements should be validated using calculation methodologies that are in accordance with Calculation of Road Traffic Noise (CORTN) algorithm (or equivalent), as developed by the UK Department of Transport.

Triggers that will necessitate attended road noise monitoring in addition to the annual assessment include:

- Significant alterations or changes to off-site truck movement;
- Unique projects that arise which may require campaign trucking;
- Community complaints are received regarding excessive off-site truck noise; and
- When the Action Response Plan (Noise) is triggered (see **Appendix B**).

4.5 Responsibility, Community Concerns and Complaints

Responsibility for noise management from site, predominantly lies with the Plant Manager, especially with respect to implementing noise control measures and community consultation.

Notwithstanding, all site staff share the responsibility in minimising noise, whether from general operation of plant, to identifying potential issues that may lead to increasing off-site noise levels such as faulty mufflers or inefficient/ineffective bunds. Additionally, truck drivers share responsibility in minimising noise whilst on and off-site by reducing tailgate 'clanging', eliminating the use of compression brakes and avoiding rapid acceleration.

Where community concerns or complaints pertaining to noise emissions are received the quarry Plant Management will:

- Obtain operations records and weather conditions at the time of the complaint; and
- Attend the location of the complaint to verify and obtain additional details.

It may be identified that noise monitoring is required. Depending on the type and location of the complaint, several measurement methods can be utilised to identify the noise source causing the complaint. Such methods may include:

- Operator attended measurement at the affected location combined with audio recordings or at an alternate representative location;
- Unattended noise monitoring;
- Calculation from near field measurements; and
- A combination of any or all of these methods.
- Where further investigations into the complaint are undertaken, the findings and any corrective action will be discussed with the complainant.

Noise complaints received will be recorded in a Complaints Register which will include the following details:

- The date and time of the complaint;
- The method by which the complaint was made;
- Any personal details of the complainant which were provided by the complainants or, if no such details were provided, a note to that effect;
- The nature of the complaint;

- The action taken by the quarry in relation to the complaint, including any follow-up contact with the complainant; and,
- If no action was taken by the quarry, the reasons why no action was taken.

4.5.1 Property Boundary Operations

For project works occurring at the boundary of site the following community consultation will be completed:

- A sign on the front gate of the site prominently displays the telephone number, 4372 1649 and postal address to register a complaint. As part of the modification process, surrounding landowners and the Maroota Public School are to be notified by letter of the proposed changes to the site's operation;
- Any updated strategies, plans and programs, including the Operational Environmental Management Plan are available to the public 14 days after approval by the DPE;
- Community consultation is undertaken when changes are planned to the quarry operations that will impact on the surrounding neighbours. Where atypical operations are planned that may create adverse impacts, all affected receptors are to be notified 24 hours prior to the works; and
- The notification shall include the duration and extent of the works, the likely noise to be experienced, and a contact telephone number. The operator does not hold open days or distribute regular newsletters, however regular verbal communication with neighbours and the community is undertaken on an informal and unplanned basis.

5 Reporting & Complaint Handling

5.1 Annual Review

In accordance with Condition 66 of the Development Consent, the results and findings of the annual noise monitoring assessment will be reported as part of the Annual Environmental Return (AER) for the quarry.

The reported details in the AER should include the time and date of monitoring, noise monitoring equipment utilised, prevailing meteorological conditions, measured noise sources and the quarry noise contribution.

5.2 Incidents and Non-Compliances

Any incidents, complaints, non-compliances or exceedances will be managed and reported according to the procedures outlined in the OEMP and the Pollution Incident Response Management Plan (PIRMP) required by the EPA and includes the following:

- Incident Notification
 - The DPE will be immediately notified and any other relevant agencies immediately after it becomes aware of an incident. The notification must be in writing via the Major Projects Website and identify the DA and name and set out the location and nature of the incident.
- Non - Compliance Notification
 - Within seven days of becoming aware of a non-compliance, the DPE will be notified. The notification must be in writing via the Major Projects Website and identify the DA and name and set out the consent that the site is not compliant with, the way in which it does not comply, the reasons for the non-compliance (if known) and what actions have been, or will be, undertaken to address the non-compliance.

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6 Ongoing Review and Improvements

The quarry will ensure ongoing review and implementation of this NMP.

The Plant Manager (or their delegate) will review and resubmit the ORNMP in accordance with Condition 67 of the Development Consent. A revised and updated ORNMP will be submitted to the relevant authorities within three months of any of the following occurrences.

- An annual review under Condition 66 of the consent;
- An incident report under Condition 68 the consent;
- An audit report under Condition 70 the consent; or
- Any modification to the conditions of this Consent (unless the conditions require otherwise).

Following the occurrence of any of the above, the quarry manager or their delegate shall review the NMP, and if necessary, revise the strategies, plans, and programs required to adequately address and manage noise from the quarry. Where this review leads to revisions, the updated NMP will be submitted within four weeks for the Secretary's review and approval.

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Appendix A – Glossary of Terms

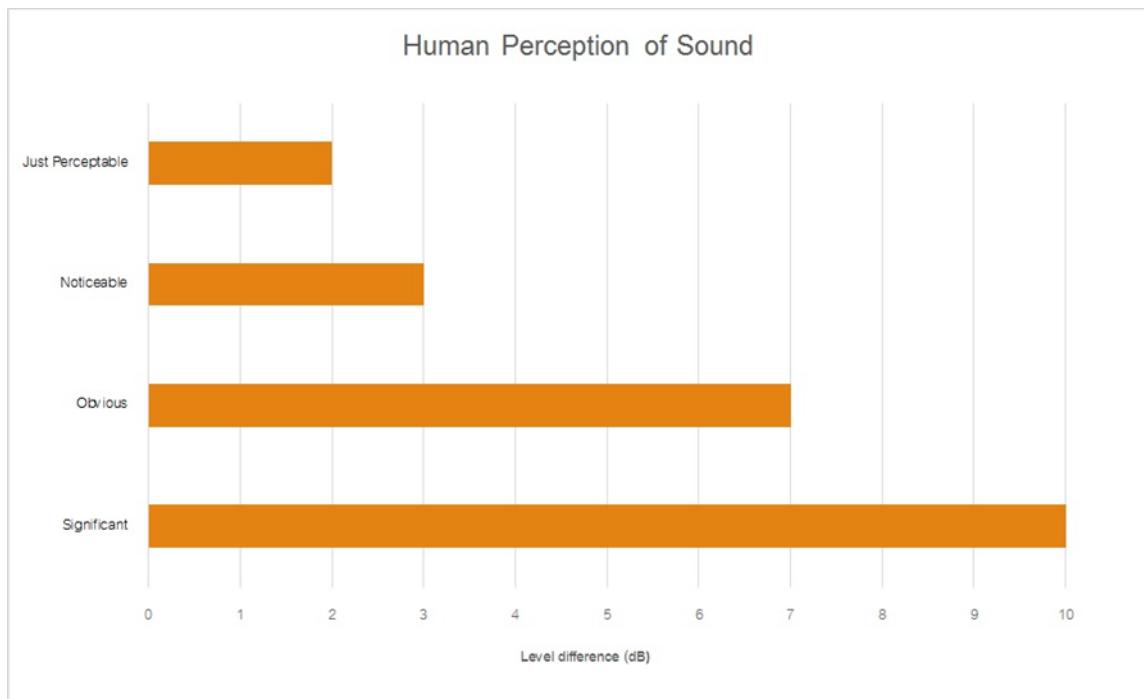
A number of technical terms have been used in this report and are explained in **Table A1**.

| Table A1 Glossary of Acoustical Terms | |
|---|---|
| Term | Description |
| 1/3 Octave | Single octave bands divided into three parts |
| Octave | A division of the frequency range into bands, the upper frequency limit of each band being twice the lower frequency limit. |
| ABL | Assessment Background Level (ABL) is defined in the NPI as a single figure background level for each assessment period (day, evening and night). It is the tenth percentile of the measured L90 statistical noise levels. |
| Ambient Noise | The total noise associated with a given environment. Typically, a composite of sounds from all sources located both near and far where no particular sound is dominant. |
| A Weighting | A standard weighting of the audible frequencies designed to reflect the response of the human ear to sound. |
| Background Noise | The underlying level of noise present in the ambient noise, excluding the noise source under investigation, when extraneous noise is removed. This is usually represented by the LA90 descriptor |
| dba | Noise is measured in units called decibels (dB). There are several scales for describing noise, the most common being the 'A-weighted' scale. This attempts to closely approximate the frequency response of the human ear. |
| dB(Z), dB(L) | Decibels Z-weighted or decibels Linear (unweighted). |
| Extraneous Noise | Sound resulting from activities that are not typical of the area. |
| Hertz (Hz) | The measure of frequency of sound wave oscillations per second - 1 oscillation per second equals 1 hertz. |
| LA10 | A sound level which is exceeded 10% of the time. |
| LA90 | Commonly referred to as the background noise, this is the level exceeded 90% of the time. |
| LAeq | Represents the average noise energy or equivalent sound pressure level over a given period. |
| LAm _{ax} | The maximum sound pressure level received at the microphone during a measuring interval. |
| Masking | The phenomenon of one sound interfering with the perception of another sound. For example, the interference of traffic noise with use of a public telephone on a busy street. |
| RBL | The Rating Background Level (RBL) as defined in the NPI, is an overall single figure representing the background level for each assessment period over the whole monitoring period. The RBL, as defined is the median of ABL values over the whole monitoring period. |
| Sound power level (L _w or SWL) | This is a measure of the total power radiated by a source in the form of sound and is given by $10 \cdot \log_{10} (W/W_0)$. Where W is the sound power in watts to the reference level of 10^{-12} watts. |
| Sound pressure level (L _p or SPL) | the level of sound pressure; as measured at a distance by a standard sound level meter. This differs from L _w in that it is the sound level at a receiver position as opposed to the sound 'intensity' of the source. |

Table A2 provides a list of common noise sources and their typical sound level.

| Table A2 Common Noise Sources and Their Typical Sound Pressure Levels (SPL), dBA | |
|--|------------------------------|
| Source | Typical Sound Pressure Level |
| Threshold of pain | 140 |
| Jet engine | 130 |
| Hydraulic hammer | 120 |
| Chainsaw | 110 |
| Industrial workshop | 100 |
| Lawn-mower (operator position) | 90 |
| Heavy traffic (footpath) | 80 |
| Elevated speech | 70 |
| Typical conversation | 60 |
| Ambient suburban environment | 40 |
| Ambient rural environment | 30 |
| Bedroom (night with windows closed) | 20 |
| Threshold of hearing | 0 |

Figure A1 – Human Perception of Sound



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Appendix B – Action Response Plan (Noise)

Table B1 Action Response Plan (Noise)

| Event | Potential Adverse Outcome | Trigger Level | Actions to be implemented | Responsibility |
|---|---|--|---|--------------------------------|
| New plant item introduced to site | Elevated off-site noise levels and potential non-compliance | Complete in field observations to identify if new plant is audible in off-site locations or if sound power level of items is greater than an equivalent plant items listed in Table 1 | Measures plant item in question to determine sound power level. If louder than equivalent item in Mod 4 NIA, replace with quieter unit or implement noise controls (ie mufflers etc) | Plant Manager |
| Community complaint regarding noise emissions | Non-compliance with noise limits | Community reaction to noise from site | <p>See Section 5</p> <ul style="list-style-type: none"> - log details of complaint - relocate or eliminate the noise source in question - confirm with complainant that amelioration measures are effective - the results will also be discussed with the complainant to ensure a resolution is reached - if a resolution cannot be reached, the EPA will be contacted - where required, the quarry plant manager may need to engage a suitably qualified acoustic consultant to complete attended compliance testing to validate compliance | Plant Manager |
| Noisy trucks (exhaust noise) | Generating on-site and off-site elevated noise levels | Check serviceability of exhaust system | Where faulty muffler or exhaust is identified organise repairs to rectify noise emissions | Plant Manager / All drivers |
| Using air brakes (site ingress) | Generating off-site elevated noise levels with tonal and low frequency components | Instruct drivers to minimise the use of air brakes when possible and minimise air brake usage when entering site via Roberts Road | Re-iterate this management strategy during inductions, and regularly communicate the importance of reducing non and off-site noise emissions | Plant Manager / All drivers |

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