Noise & Blast Management Plan

Blakebrook Quarry

MP07-0020

October 2022

Noise & Blast Management Plan

TABLE OF CONTENTS

TABLES

FIGURES

DOCUMENT HISTORY

Revision	Date	Prepared By (Name)	Reviewed By (Name)	Change Remarks
1.0	May 2010	LCC & ERM Australia	Manager Commercial Services & ERM Australia	Final draft
Rev A	June 2010	LCC & ERM Australia	Manager Commercial Services & ERM Australia	
Rev B	April 2011	LCC & ERM Australia	Manager Commercial Services & ERM Australia	
2.0	Dec 2017	LCC & ERM Australia	Manager Business Development & ERM Australia	Update plan
3.0	March 2018	LCC & ERM Australia	Manager Business Development & ERM Australia	Update as per CoA
3.1	August 2018	LCC & ERM Australia	Compliance Manager & ERM Australia	Update as per CoA
4.0	June2022	Commercial Services Compliance (LCC)	Compliance Manager, Manager Commercial Services DPE Secretary	Update as per CoA
4.1	Sept 2022	Commercial Services Compliance (LCC)	Compliance Manager, Manager Commercial Services DPE Secretary	Final draft

DEFINITIONS

Term	Definition
Audit	Systematic, independent and documented process for obtaining evidence and objectively evaluating it to determine the extent to which environmental management system meets the criteria set.
Contractor	Contractor engaged by LCC.
Environment	Surroundings in which Contractor operates including air, water, land, natural resources, flora, fauna, humans, heritage and their interrelation.
Environmental Aspect	Element of organisational activities or products that can interact with the environment.
Environmental Impact	Any changes to the environment, whether adverse or beneficial, wholly or partially resulting from an organisational aspect.
Environmental Management	The management system used to develop and implement the environmental system policy and manage environmental aspects.
Environmental Objective	Overall environmental goal, consistent with the environmental policy that an organization sets itself to achieve.
Environmental Performance	Measurable results of an organisation's management of environmental aspects.
Integrated Management System	A single system designed to manage multiple aspects of an organization's operations in line with multiple standards, such as those for quality, environmental and health and safety management.
Non-conformance	Non fulfilment of a requirement.
Performance Indicators	Indicators that have been developed as leading or lagging to monitor and assess performance.
Procedure	Specified way to carry out an activity or process.
Subcontractor	Any company, body or person who is contracted to the Contractor for the purpose of supplying services or goods.

ABBREVIATIONS

Abbreviation	Meaning
BoM	Bureau of Meteorology
CoA	Conditions of Approval
DP	Deposited Plan
DPE	Department of Planning and Environment
EAR	Environmental Assessment Report
EMP	Environmental Management Plan
EMS	Environmental Management Strategy
EPA	NSW Environment Protection Authority
EPL	Environmental Protection Licence
ERM	Environmental Resources Management
IMS	Integrated Management System
INP	Industrial Noise Policy
ISO	International Organisation for Standardisation
LCC	Lismore City Council
LEP	Local Environmental Plan
LGA	Local Government Area
NIA	Noise Impact Assessment (Assured Environmental)
NPfI	Noise Policy for Industry (2017)
NEPC	National Environment Protection Council
NBMP	Noise and Blast Management Plan
OHWP	Out of Hours Work Protocol relating to Asphalt operations
SEE	Statement of Environmental Effects (Mitchel Hanlon)

Noise & Blast Management Plan

1 INTRODUCTION

This Noise and Blast Management Plan (NBMP) has been prepared by Lismore City Council (LCC) in order to manage noise and blast impacts at Blakebrook Quarry (the Quarry), pursuant to Project Approval 07_0020.

Blakebrook Quarry (the Quarry) is operated by Northern Rivers Quarry (NRQ) which is a commercial entity owned by Lismore City Council. The Quarry is located at 550 Nimbin Road, Blakebrook, approximately seven (7) kilometres north west of Lismore on Lot 53 DP 1254990 for Extraction Areas and Lot 54 DP 1254990 for Asphalt Plant an ancillary activity.

The site occupies an area of approximately 128 ha (incorporating 45ha rezoned to C2 Environmental Conservation (gazetted on 18 December 2020), providing long term security for the biodiversity offset area. Surrounding land is used for agricultural and rural purposes. The location of the Quarry is as shown in *Figure 1.* Nearby potentially sensitive receptors have also been identified as part of this management plan and are outlined in *Figure 2*

The Quarry is identified as a State Significant Development (SSD) and provides a range of products to northern NSW on behalf of Council including:

- Aggregates
- Drainage rock
- Road base
- Basalt products
- Metal dust
- Fill material
- Bituminous products including hot mix and cold mix – blended according to mix design

1.1 PURPOSE

The purpose of this NBMP is to provide procedures to avoid or minimise the noise, vibration and blasting impacts associated with the Quarry operation.

The NBMP will:

- Describe how LCC will manage, and control risks associated with noise, vibration and blasting during the expansion of the Quarry.
- Ensure that the relevant stakeholders including LCC, EPA and DPE are involved in the formulation and implementation of this NBMP.
- Address the requirements of applicable legislation and any ongoing approvals as they are applicable to the expansion of the Quarry.
- Meet the Project Conditions of Approval (CoA).
- Meet the existing EPL requirements for noise at the Quarry.
- Address the requirements of the EAR (ERM 2009) and Statement of Environmental Effects (Mitchel Hanlon 2019) relating to Noise

1.2 OBJECTIVES

The objectives of the NBMP are:

- Identify environmental obligations and legislative requirements applicable to noise, vibration and blasting monitoring during the period of the Quarry expansion.
- Describe the specific environmental management requirements and strategies for environmental elements, define objectives and set targets for environmental performance.
- Provide ongoing monitoring of noise, vibration and blasting levels in the vicinity of the Quarry, to allow prompt identification of any increased impacts.
- Demonstrate how any potential impacts on surrounding residential receivers will be managed and mitigated.
- Consult with the relevant parties during the preparation and implementation (as required) of this NBMP.
- Define key roles and responsibilities.

1.3 REVIEW SCHEDULE

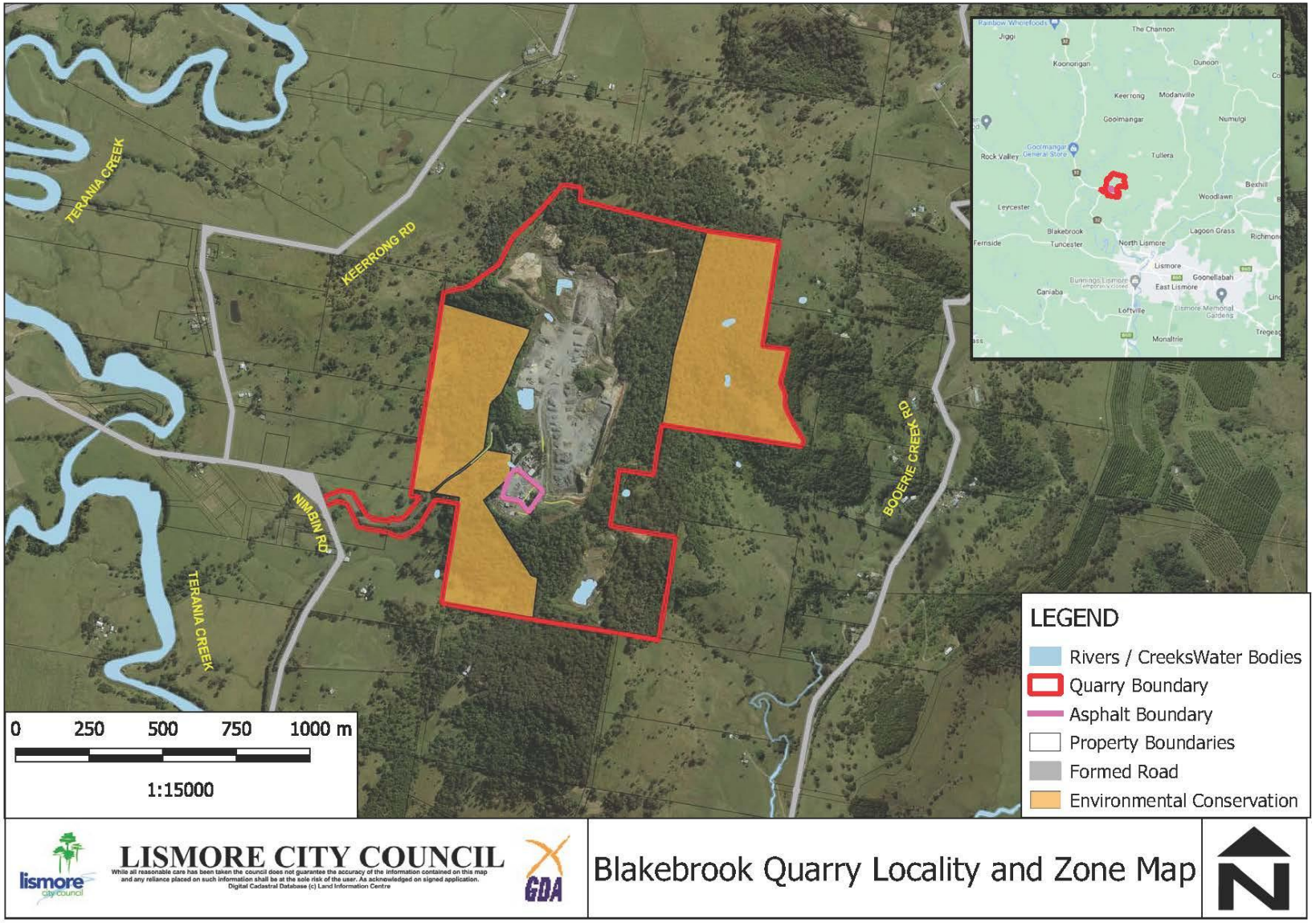
In accordance with the CoA Schedule 5, condition 11, this NBMP will be formally reviewed by LCC each year as part of the annual review and reporting process. An official update/revision will be submitted to the NSW DPE at minimum every three (3) years. Noting minor revisions as part of the outcomes of the yearly review and administrative corrections will be undertaken without EPA and DPE consultation. A copy will be provided to all parties for record.

Accordingly, the next reviews are listed in *Table A*.

Table A: Review Schedule

No.	Date	Review Type	Reviewer
R3	23 Mar 2018	Revision (Submission of amended NBMP)	LCC / DPE
R4	18 Dec 2018	Internal review	LCC
R5	18 Dec 2019	Internal review	LCC
R6	18 Dec 2020	Internal review	LCC
R7	30 Sept 2022	Revision (extension granted by DPE)	LCC / DPE
R8	30 Sept 2023	Internal review	LCC
R9	30 Sept 2024	Internal review	LCC
R10	30 Sept 2025	Revision	LCC / DPE

Figure 1: Project Locality and Land Zoning Map



1.4 QUARRY OPERATIONS

The Quarry Conditions of Approval (CoA) – Limits on Approval, (Schedule 2, condition 6-8) permit the Quarry may carry out quarrying and asphalt plant operations on the site until 31 December 2039.

The Quarry must not undertake quarrying operations below 55m AHD in the North Pit or 105m AHD in the South Pit.

The Quarry must not:

- *Transport more than 600,000 tonnes of quarry products from the site per calendar year*
- *Transport more than 50,000 tonnes of asphalt from the site per calendar year*
- *Dispatch more than 120 laden trucks from the site on any calendar day prior to the completion of the intersection upgrade required by Schedule 3, condition 21(f) to the satisfaction of TfNSW*
- *Dispatch more than 150 laden trucks from the site on any calendar day following completion of the intersection upgrade required by Schedule 3, condition 21(f) to the satisfaction of TfNSW.*

EPL3384, condition A1 authorises extractive or processed activities annually scaled between >100,000 tonnes – 500,000 tonnes.

1.5 BACKGROUND

The Quarry has an identified resource of approximately 13.6 million tonnes which, based on an extraction rate of 600,000 tonnes per annum, would allow for quarrying for approximately 22 years. The maximum proposed extraction rate was not expected to be achieved in all years of quarrying. Project approval was therefore sought for an area sufficient for 30 years of quarrying with a maximum extraction rate of 600,000 tonnes per annum, continuing in the existing main pit (referred to as the 'North Pit') and a new smaller pit (herein also referred to as the 'South Pit') located to the south of the existing pit.

In August 2017, LCC submitted a Modification Application to the DPE seeking to mine the first 10 metres of the cap rock in the South Pit at the Quarry. The South Pit was previously unable to be mined until late 2018, at the completion of the detailed groundwater assessment. On 18 September 2017, approval was granted to LCC to undertake these works, in accordance with the revised CoA.

On 11 January 2019, LCC submitted a Modification Application to amalgamate the approvals for the Asphalt Plant and the Quarry. This application was subsequently approved (Modification 3) by the Minister of Planning in July 2021.

1.6 OPERATIONAL OVERVIEW

Quarrying has initially commenced laterally in the existing North pit before extraction in the southern pit occurs, in order to ensure continued demands for the hard rock material can be met. LCC has engaged a contractor with a mobile crushing and screening plant for operations in the North pit which will result in a significant reduction in plant noise.

Initial excavation works for the South Pit commenced in late 2014 under a temporary approval to service a specific state government project. These initial works have been completed and no further excavation works for the South Pit are expected in the near future.

Initially, it was expected that over the initial 10 years of the 30 year life of the Quarry that production would average approximately 450,000 tonnes per annum including extraction of high quality product from the southern pit. The production was expected to increase beyond 10 years to the maximum 600,000 tonnes per annum. Production tonnages to date have been substantially less than originally projected as result of changing market demands, cost of production and unprecedented weather events impacting operational performance.

Asphalt operations were amalgamated into the Mod 3 CoA as of 20 July 2021. and include asphalt operations to be undertaken for limited campaign works as per Schedule 3, condition 2A. Asphalt operations are conducted during standard work hours to the fullest extent, however require the additional operating hours to cope with the current demands of the region.

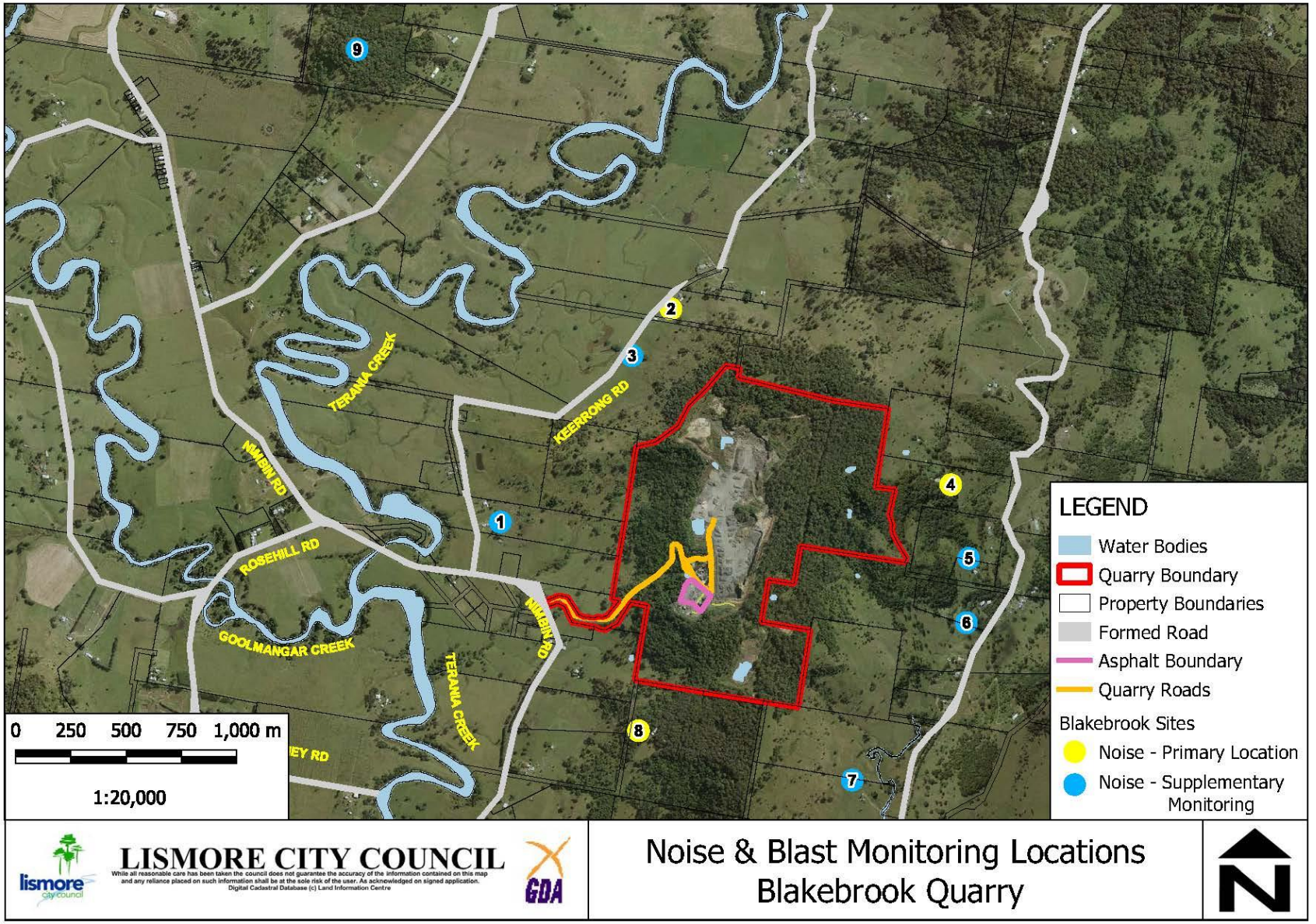
The Asphalt Plant is permitted to transport up to 50,000 tonnes of Asphalt from the Quarry each calendar year (as per Schedule 2, condition 8). An Out of Hours Work Protocol (OHWP) was developed to undertake limited campaign Asphalt operations as required by the Mod 3 CoA, this was accepted by DPE in February 2022.

Activities permitted under the OHWP are asphalt operations consisting of bituminous products (hot or cold mix). Limited campaign asphalt plant operations (within tonnage limits imposed) may be undertaken (during the hours of 6pm to 7am Monday to Sunday), as requested by public authorities. Out of hours operations are anticipated to occur approximately 5 nights per month.

The mobile asphalt plant (operated by RPQ as an ancillary activity) offers a quieter and more efficient operation, with a production capacity of 80 tonnes per hour. The Quarry and Asphalt plant are situated on separate lots within the same deposited plan (DP) and operate within the same site footprint. As such, the Quarry supply aggregate, tested to asphalt specification requirements to the asphalt plant, where it is stockpiled

Trucks are used to haul asphalt aggregate out of the pit, while most material will be hauled directly off-site.

Figure 2: Noise & Blast Monitoring Locations Map



2 STATUTORY REQUIREMENTS

2.1 LEGISLATION & POLICIES

The applicable legal and other requirements related to noise, vibration, blasting and environmental management for the Quarry are outlined in *Table B*.

Table B: Legislation & Policies of Relevance

Legislation and Policies	
Commonwealth Legislation	• Environment Protection and Biodiversity Conservation Act 1999
New South Wales Legislation	• Environment Planning and Assessment Act 1979 • Protection of the Environment Operations Act 1997 • Protection of the Environment Operations (General) Regulations 2022 • Protection of the Environment Operations (Noise Control) 2017 • EPA NSW Noise Policy for Industry 2017 • Work Health and Safety (Mines and Petroleum Sites) Regulation 2022
Regional Planning Documents	• North Coast Regional Plan 2036
Local Government Documents	• Lismore Local Environmental Plan 2012

2.2 APPROVAL CONDITIONS

MINISTER'S CONDITIONS OF APPROVAL

Pursuant to the Environmental Planning and Assessment Act 1979 (EP&A Act), the quarry expansion was declared to be a project under Part 3A of the Act and Project Approval has been granted by the Minister for Planning. Project Approval MP07_0020 is identified under a State significant development (SSD) under Division 4.7 of the EP&A Act.

Schedule 3, Conditions 1 to 9 of the CoA outline the requirements for noise and blast management, with the specific requirement to prepare a NBMP contained in Conditions 5 and 9. The relevant conditions are provided as follows:

NOISE

Hours of Operation

1. *The Proponent must comply with the operating hours set out in Table 1.*

Table 1: Operating Hours

Activity	*Permissible Hours*
Quarrying operations, asphalt plant operations and loading and dispatch of laden trucks	• *7 am to 6 pm Monday to Friday* • *7 am to 3 pm Saturday* • *At no time on Sundays or public holidays*
Blasting	• *10 am to 3 pm Monday to Friday (except public holidays)* • *At no time on Saturday, Sunday or public holidays*
Maintenance	• *May be conducted at any time, provided that these activities are not audible at any privately owned residence*

2. *The following activities may be carried out outside the hours specified in Condition 1 above:*
   (a) Delivery or dispatch of materials as requested by Police or other public authorities.
   (b) Emergency work to avoid the loss of lives, property or to prevent environmental harm.

In such circumstances, the Proponent must notify the Secretary and the affected residents prior to undertaking the activities, or as soon as practical thereafter.

2A. *With the prior written agreement of the Secretary, the Proponent may undertake limited campaign asphalt plant operations (within the limits imposed under Condition 8 of Schedule 2) outside of the operating hours prescribed in Condition 1 of this Schedule, as requested by public authorities.*

In such circumstances, the applicant must prepare an Out of Work Hours Protocol. This protocol must:
(a) Be prepared in consultation with the EPA and any residents who may be affected by noise generated by these works.
(b) Be approved by the Secretary prior to the commencement of any out of hours Asphalt plant operations.

3. *The Proponent must ensure that the noise generated by the project does not exceed the criteria in Table 2 at any residence on privately owned land.*

Table 2: Noise Criteria dB(A)

Receiver	Day L_{Aeq} (15 minute)
Location 2 and 7	36
All other locations	35

Noise generated by the project is to be measured in accordance with the relevant requirements and exemptions (including certain meteorological conditions) of the NSW Industrial Noise Policy. Appendix 5 sets out the meteorological conditions under which these criteria apply and the requirements for evaluating compliance with these criteria.

However, the noise criteria in Table 2 do not apply if the Proponent has an agreement with the relevant landowner to exceed the noise criteria, and the Proponent has advised the Department in writing of the terms of this agreement.

Operating Conditions

4. *The Proponent must:*
(a) Implement 'Best Practice' management to minimise the construction, operational and road transportation noise of the project.
(b) Minimise the noise impacts of the project during meteorological conditions when the noise criteria in this approval do not apply (see Appendix 5).
(c) Carry out noise monitoring (at least every 3 months or as otherwise agreed with the Secretary) to determine whether the project is complying with the relevant conditions of this approval.
(d) Regularly assess noise monitoring data and modify and/or stop operations on the site to ensure compliance with the relevant conditions of this approval, to the satisfaction of the Secretary.

Note: Required frequency of noise monitoring may be reduced if approved by the Secretary.

Noise Management Plan

5. *The Proponent must prepare a Noise Management Plan for the project to the satisfaction of the Secretary. This plan must:*
(a) Be prepared in consultation with the EPA.
(b) Be submitted to the Secretary within 3 months of the determination of Modification 1, unless otherwise agreed by the Secretary.
(c) Describe the measures to be implemented to ensure:
- *Compliance with the noise criteria and operating conditions of this approval.*
- *'Best Practice' management is being employed.*
- *The noise impacts of the project are minimised during meteorological conditions under which the noise criteria in this approval do not apply (see Appendix 5).*

(d) Describe the proposed noise management system.
(e) Include a monitoring program to be implemented to measure noise from the project against the noise criteria in Table 2.

The Proponent must implement the Noise Management Plan as approved from time to time by the Secretary.

BLASTING

Blasting Impact Assessment Criteria

6. *The Proponent must ensure that blasting on site does not cause any exceedance of the criteria in Table 3.*

Table 3: Blasting Criteria

Receiver	Air Blast Overpressure (dB (Lin Peak))	Ground Vibration (mm/s)	Allowable Exceedance
Any residence on privately owned land	120	10	0%
	115	5	5% of the total number of blasts over a period of 12 months

However, these criteria do not apply if the Proponent has a written agreement with the relevant owner to exceed the limits in Table 3, and the Proponent has advised the Department in writing of the terms of this agreement.

Blasting Frequency

7. *The Proponent may carry out a maximum of two (2) blasts per month, unless an additional blast is required following a blast misfire. This condition does not apply to blasts required to ensure the safety of the Quarry or workers on site.*

   Note: For the purposes of this condition, a blast refers to a single blast event, which may involve a number of individual blasts fired in quick succession in a discrete area of the Quarry.

Operating Conditions

8. *During blasting operations, the Proponent must:*
   - *(a) Implement 'Best Practice' management to:*
     - *Protect the safety of people and livestock.*
     - *Protect public or private infrastructure and property from damage.*
     - *Minimise the dust and fume emissions.*
   - *(b) Operate a suitable system to enable the local community to get up-to-date information on the proposed blasting schedule on site.*
   - *(c) Carry out regular monitoring to determine whether the project is complying with the relevant conditions of this approval, to the satisfaction of the Secretary.*

Blast Management Plan

9. *The Proponent must prepare a Blast Management Plan for the project to the satisfaction of the Secretary. This plan must:*
   - *(a) Be submitted to the Secretary for approval within three (3) months of the determination of Modification 1, unless otherwise agreed by the Secretary.*
   - *(b) Describe the measures to be implemented to ensure compliance with the blast criteria and operating conditions of this approval.*
   - *(c) Include measures to manage flyrock to ensure the safety or people and livestock and to protect property.*
   - *(d) Include a monitoring program for evaluating and reporting on compliance with the blasting criteria in this approval.*
   - *(e) Include local community notification procedures for the blasting schedule, in particular to nearby residences.*
   - *(f) Include a protocol for investigating and responding to complaints relating to blasting operations.*

   The Proponent must implement the Blast Management Plan as approved from time to time by the Secretary.

Schedule 4, condition 1 of the CoA outline the requirements for Notification of Landowners:

NOTIFICATION OF LANDOWNERS

1. *As soon as practicable, and no longer than 7 days, after obtaining monitoring results showing:*

   (a) an exceedance of any criteria in Schedule 3, the Proponent must notify the affected landowners in writing of the exceedance, and provide regular monitoring results, at least every 3 months, to each affected landowner until the project is again complying with the relevant criteria;

Out of Hours Work Protocol – Asphalt Operations

Management and staff responsible for asphalt plant operations, will notify in writing to LCC, EPA and local residents of the timing and expected duration of any out of hours construction works, prior to each instance. LCC will notify the EPA on behalf of the Asphalt plant operators.

Activities permitted under the OHWP are asphalt operations consisting of bituminous products (hot or cold mix). Limited campaign asphalt plant operations (within the limits imposed under Schedule 2, condition 8) may be undertaken (during the hours of 6pm to 7am Monday to Sunday), as requested by public authorities. Out of hours operations are anticipated to occur approximately 5 nights per month.

Works will be forward planned with notification of out of hours work provided to the EPA via info@epa.nsw.gov.au at least 7 working days prior to activities being undertaken, with a Register for all work retained, containing:

- Identify the location, duration and description of works
- Provide a contact number of the Asphalt site manager during the out of hours campaign.

The OHWP has provided management strategies for potential noise sources involving asphalt operations and truck movements. The evening and night project-specific noise level criterion is 35 dB(A) LAeq (15 minute).

Other Conditions

The EPL 3384 for the Quarry has in place existing conditions for noise, air blast overpressure and vibration levels which are as follows:

L4.1 Noise from the licenced premises must not exceed an LAeq (15 minute) noise emission criteria of 36 dB(A) at Location 2 and 7, and 35 dB(A) at all other sensitive receivers, except as expressly provided by in this licence.

L4.2 Noise from the premises is to be measured at the most affected noise sensitive receiver who has not given written permission for an exceedance of condition L4.1 to determine compliance with this condition.

Where LA_{eq} means the equivalent continuous noise level – the level of noise equivalent to the energy-average of noise levels occurring over a measurement period.

L5.1 The air blast overpressure level from blasting operating in or on the premises must not exceed:

(a) 115dB (Lin Peak) for more than 5% of the total number of blasts during each reporting period.
(b) 120dB (Lin Peak) at any time.

as measured at the nearest sensitive receiver.

L5.2 The ground vibration peak particle velocity from blasting operations carried out in or on the premises must not exceed:

(a) 5 mm/s for more than 5% of the total number of blasts carried out on the premises during each reporting period.
(b) 10 mm/s at any time.

At the most affected residence or noise sensitive location that is not owned by the licensee or subject to a private agreement between the owner of the residence or noise sensitive location and the licensee as to an alternative ground vibration level.

Noise & Blast Management Plan

Work Health and Safety (Mines and Petroleum Sites) Regulation 2022 stipulates the Operator of a mine site must develop an Explosive Control Plan, as part of the sites Safety Management System. This is enforced and audited by NSW Resource Regulator at regular inspections. The Explosive Control Plan is to be reviewed internally each year, to ensure compliance with legislative updates and identified risks on site.

2.3 GUIDELINES & STANDARDS

Relevant project management standards, policies and guidelines, applicable to this management plan are provided in *Table C*

Table C: Environmental Standards, Policies & Guidelines

Guidelines and Standards	
Australian and New Zealand Environment and Conservation Council - ANZECC (1990)	Technical Basis for Guidelines to Minimise Annoyance Due to Blasting Overpressure and Ground Vibration
NSW EPA	Noise Policy for Industry 2017
NSW Department of Environment, Climate Change and Water (DECCW)	NSW Road Noise Policy (RNP), March 2011
AS 2436–2016	Guide to Noise and Vibration Control on Construction, Demolition and Maintenance Sites.
AS 1055	Acoustics – Description and measurement of environmental noise
AS/NZS IEC 61672.1	Electroacoustics – Sound Level Meters Specifications
AS IEC 60942:	Electro Acoustics – Sound Calibrators
AS 2187.2	Explosives – Storage and Use – Use of Explosives
SafeWork NSW	Managing noise and preventing hearing loss at work – Code of Practice

2.4 RELATED MANAGEMENT PLANS

This NBMP forms part of an overarching Environmental Management Strategy (EMS) for the Quarry. Where relevant, reference should also be made to the other management plans, as listed in *Table D*.

Table D: Blakebrook Quarry Management Plans

Reference No.	Management Plan
EMS	Environmental Management Strategy
EMS-MP2	Air Quality Management Plan
EMS-MP3	Soil and Water Management Plan
EMS-MP4	Biodiversity and Rehabilitation Management Plan
EMS-MP5	Aboriginal Heritage Management Plan
EMS-MP6	Operational Traffic Management Plan

3 EXISTING ENVIRONMENT

3.1 BASELINE ASSESSMENT

A detailed Noise Assessment (ERM 2009) was undertaken to understand the existing acoustic environment and to assess the potential noise impacts associated with the proposed expansion of the Quarry on the surrounding environment, using noise modelling, consisting of:.

- Potential noise and vibration impact at noise assessment locations from existing and proposed operational noise from the Quarry, including blasting.
- Potential noise impact at noise assessment locations due to increased traffic flows to and from the Quarry expansion.

Six (6) residential properties were identified as being potentially affected by noise associated with the Quarry expansion and were therefore used as noise assessment locations (referred to as noise assessment locations 1 to 6) in the Blakebrook Quarry Noise Assessment (ERM 2009). These locations formed the basis of the noise modelling scenarios

A Statement of Environmental Effects (SEE) was undertaken by Mitchel Hanlon Consulting Pty Ltd on behalf of LCC in 2019, to identify potential environmental issues in the process of streamlining operating conditions for the Quarry and Asphalt plant, Modification 3 application. Assured Environmental Pty Ltd were appointed to conduct a Noise Impact Assessment (NIA), appendix F, in accordance with NSW NPfI (2017) to assess the potential impacts on nearby sensitive receptors.

It is important to note that background noise is presently higher than the prescribed noise limits in the consent.

Blasting Noise and Vibration

As the Quarry was undertaking changes to its blasting regime, historic reports were not felt to be representative of new blasting scenarios. An indicative assessment was therefore undertaken by ERM in 2009. Vibration and overpressure levels for the Quarry were found to be within the accepted guidelines for nearby residences. As blasting will be carried out for the life of the Quarry, each blast will be carefully designed and monitored to ensure that peak particle velocity (PPV) and overpressure criteria continue to be met at residential locations as prescribed by EPL Condition L5 and CoA Schedule 3, condition 6.

Dilapidation surveys were undertaken for seven (7) properties in the vicinity of the Quarry in 2012 by a building surveyor, to satisfy CoA Schedule 4, condition 3 and condition 4, enabling baseline information for each property. In the event of any future request from a landowner, this baseline information will be used to assess any potential damage that may occur as a consequence of the sites operational activities.

Assessment Guidelines

The Noise Assessment was prepared in accordance with EPA Noise Policy for Industry (NPfI (2017) and noise measurements were undertaken in accordance with the requirements of Australian Standard *AS 1055-1997 'Acoustics – Description and measurement of environmental noise'.* Noting the CoA refers to INP which has been superseded by the NPfI.

Assessment Methodology

Continuous noise monitoring was undertaken using a Rion NL21 environmental noise logger. The Rion was situated in a free-field position and an averaging time of 15 minutes was adopted. Microphones positioned at a height of 1.2 metres above ground level and fitted with a windshield throughout the measurements.

Assessment Results

The NIA summarised the average noise levels of each period for a variety of noise parameters. The periods are defined as follows:

- Day – 7 am to 6 pm;
- Evening – 6 pm to 10 pm;
- Night – 10 pm to 7 am.

The results of the noise monitoring indicate that existing background (RBL) noise levels in the area surrounding the quarry were significantly higher than the noise limits provided in the EPL. In particular, for the week of monitoring undertaken, the measured day-time RBL of 45 dB(A) is 10 dB higher than the adopted noise limit for the site. Given this, where quarry noise complies with the EPL noise limits, it would be expected to be inaudible at nearby sensitive receptors for the majority of the time. This finding appears consistent with the results of attended noise monitoring undertaken at sensitive receptors near to the quarry since 2012

Although predicted levels due to the Quarry expansion marginally exceed existing noise levels at noise assessment locations 1 (now superseded under landholder agreement), 2 (now location 1) and 5 (now location 4), it is important to note that the NPfI addresses 'Existing Situation' in Chapter 6 and states:

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.*

The results of the assessment have identified that compliance with the existing EPL limits is expected to be achieved for all receptors except monitoring location 8 (referred to Receptor R7 within the NIA) For this receptor, the results of the noise modelling indicate that an exceedance of up to 1 dB is possible for the expanded operations. In practical terms, this level of exceedance is considered to be insignificant with most people unable to discern a difference in noise levels of less than 1 dB. Furthermore, the predicted noise levels are noted to be well below existing baseline noise levels measured in the area. As such, based on the results of the noise modelling, the risk of adverse impacts on existing residential uses in the area is considered to be low provided roadways are maintained to an acceptable standard (smooth roadways with all metal grates, cattle grid etc removed) .

Construction Noise

There will be no significant construction activities that are likely to add to received noise levels at residences.

Road Traffic Noise

Based on 2006 daily traffic volumes of 3,200 vehicles per day and a linear growth rate of 2.2%, non-site related traffic on Nimbin Road is forecast at 4,100 vehicles per day for the year 2018. This volume of traffic is equivalent to a noise level of 65dB(A) L_{eq} 15 hour. This complies with former DECCW criteria as site related traffic noise on Nimbin Road will increase existing road traffic noise by 1dB on average over a 15-hour period, which is under the 2dB recommendation. A study conducted by Geocounts (2022) on traffic volumes utilising Nimbin Road to the north and south of the quarry access indicated average weekday (7am-7pm) traffic volume of 2338 vehicles north of the quarry access (Keerong Road) increasing to 2375 vehicles south of the quarry access. Truck Volumes

(including single unit tippers and buses) account for 13% (average) of the traffic stream and heavy trucks (articulated) accounting for 1.2% (average) in both directions from the quarry access

The NIA noted *"the assessment has considered the potential impacts associated with noise emissions from the maximum expected 300 heavy vehicle movements per hour (or 3,330 vehicle movements over a full operational day), from the site entry along Nimbin Road (assuming all vehicles travel in the same direction)."*

Assessment Criteria

The assessment of potential road traffic noise impacts has considered the noise criteria provided in the *NSW Road Noise Policy* (RNP). Based on the type of roadway, Table 13 below presents the applicable road traffic noise criteria for existing residences affected by traffic on existing roadways generated by land use developments.

Table 13: Applicable Road Traffic Noise Criteria

Road Category	Type of Project & Land Use	Assessment Criteria
Freeway / arterial / sub-arterial road	Existing residences affected by additional traffic on existing freeways/arterial/sub-arterial roads generated by land use developments	Day: LAeq,15 hour 60 dB(A) Night: LAeq,9 hour 55 dB(A) (external)

4 ENVIRONMENTAL IMPACTS & RISK ANALYSIS

4.1 ENVIRONMENTAL IMPACTS

The Quarry activities that are most likely to have the potential to result in noise and vibration impacts on residential receivers will be quarrying activities including operating machinery, blasting, and transport of materials on and off site for the expansion of the Quarry.

4.2 RISK ANALYSIS

Given that the activities undertaken at the Quarry have the potential to impact on the surrounding environment, the commensurate level of risk associated with these impacts is required to be identified in order to better ensure that it can be mitigated and managed to an acceptable level via means of this management plan.

Accordingly, *Table E* summarises the likely risk level associated with each of the prospective noise, vibration, and blasting impacts, assuming that no mitigation measures or controls are in place to manage impacts. The risk assessment process is in accordance with that described in the EMS for the Quarry.

By implementing the measures outlined in this NBMP, these traffic impacts and associated risks can be managed to an acceptable level, such that the risk would be considered negligible.

Table E: Noise, Vibration & Blasting Impact Risk Analysis

ID	Aspect	Impact	Risk
N1	Quarrying activities including excavation and crushing of material	Increase in noise impacts at residential receptors	Low
N2	Blasting to expand Quarry	Increase in vibration and noise impacts on residential receivers	Low
N3	Transport of material on and off site	Increase in traffic movements increasing noise on surrounding roads	Low

Note: Risk Ratings
- High (serious impacts and potential repercussions)
- Medium (significant impacts and potential repercussions)
- Low (minor impacts and potential repercussions)

Additionally the Quarry has invested significantly towards development and identification of risk management on site regarding noise and blast management through accreditation of ISO 45001, ISO 14001, ISO 9001 and compliance with *Work Health and Safety (Mines and Petroleum Sites) Regulation 2022* with Principal Hazard Management Plans and site risk registers.

As part of the Quarry IMS compliance schedule, Quality, Safety and Environmental Risk Registers have been developed for task specific activities on site. The risk registers are reviewed six (6) monthly by Quarry operations and Compliance staff, to ensure a proactive approach towards identification and controlling of risks.

5 PERFORMANCE CRITERIA & INDICATORS

The intention of the NBMP is to ensure that the Quarry and Asphalt works do not have an adverse impact on the identified sensitive receptors as a result of general operational noise emissions and blasting activities.

In order to achieve this intent, the following Performance Criteria and Indicators have been developed to guide noise management for the Quarry and Asphalt operations based on the following (refer to *Table F*).

Table F: Performance Criteria & Indicators

Performance Criteria	Performance Indicator	Management/Control
C1: No significant impacts on sensitive receptors due to noise emissions	I1.1: Comply with operating hours set out in condition 1 in Schedule 3 of Project Approval (MP 07_0020)	Refer to *Section 2.2, 6, 7.3 & 7.4*
	I1.2: Noise generated by the Quarry does not exceed the criteria nominated in Condition 3 in Schedule 3 of Project Approval (MP 07_0020)	
C2: No significant impacts on sensitive receptors due to blasting activities	I2.1: Ensure blasting activities does not cause an exceedance of the criteria identified in Condition 6 in Schedule 3 of Project Approval (MP 07_0020)	Refer to *Section 2.2, 6 & 7.4*
	I2.2: Carry out a maximum of two (2) blasts per month, unless an additional blast is required following a blast misfire	

6 MANAGEMENT & MITIGATION CONTROLS

6.1 'BEST PRACTICE' MANAGEMENT APPROACH

In managing the Quarry, LCC is seeking to ensure that a 'Best Practice' management approach is used across all areas of potential impact management. This approach involves incorporating a suite of site-specific mitigation measures and management controls (like those provided in the sections below) in accordance with the most relevant guidelines and standards to minimise, mitigate and manage noise and blasting impacts associated with Quarry and Asphalt operations.

Such guidelines, policies and standards include:

- NSW Environment Protection Authority (EPA) Noise Policy for Industry (2017)
- AS 1055 – Description and Measurement of Environmental Noise – Parts 1, 2 and 3
- NSW Department of Environment, Climate Change and Water – NSW Road Noise Policy (RNP)

6.2 PROPOSED MANAGEMENT CONTROLS

The list of the work practices that will be used to control environment impacts during the Quarry and Asphalt operations are provided in *Table G*.

Table G: Management Strategies & Work Practices

Issue	Strategy/Practice
Expansion of Quarry increases traffic movement.	• Ensure all vehicles leaving site are maintained and noise levels are with in equipment specifications.
Increase in noise impacts at residential receptors from quarrying activities.	• Mitigation measures as outlined in *Section 6.3* are implemented. Monitoring of compliance with criteria as per *Section 7.8*. Non-compliance to result in consideration of further mitigation measures.
Increase in vibration and noise impacts on residential receivers from blasting activities.	• Blasting impacts will be assessed in accordance with the recommended ANZECC criteria (Where appropriate – noting Guideline has been archived by NEPC). These criteria are used to assess human annoyance, discomfort and potential property impacts from blasting activities. Assessments will identify quarrying areas that may require additional management of blasting practices to reduce potential blast and vibration impacts. Vibration monitoring to confirm conformance with criteria in EPL.
Asphalt plant Out of Hours Work notification	A register will be maintained for Out of Hours Work (as described in section 2.2) containing: • Identify the location, duration and description of works • Provide a contact number of the Asphalt site manager during the out of hours campaign. Works will be forward planned and advised in writing to LCC, EPA and local residents at least 7 working days prior to being undertaken.

6.3 PROPOSED MITIGATION MEASURES

Several noise and blast mitigation measures are currently in place at the Quarry and will continue to be employed throughout the proposed expansion. These measures are summarised as follows:

- Ensure that works on site are limited to the approved Quarry and Asphalt operating hours (between 7am and 6pm Monday to Friday, and 7am and 3pm Saturday) in an endeavour to undertake as much work as possible during standard work hours, unless work is approved in accordance with the approved OHWP.
- Ensure that all significant noise generating plant and equipment are procured, maintained and managed to reduce noise and that mitigation is applied where feasible, reasonable and necessary.

- Avoid concentrations of equipment in sensitive work areas e.g. on top of the dump or bund.
- Road traffic noise created by the haul trucks accessing the site is ameliorated by imposing a speed limit of 40 km/h in the site and compression braking is limited whilst on site.
- Avoid trucks congregating along internal haul roads.
- Instruct drivers to travel directly to site and avoid any extended periods of engine idling at or near residential areas.
- Ensure all machines used on the site are in good condition, with particular emphasis on exhaust silencers, covers on engines and transmissions and squeaking or rattling components. Excessively noisy machines will be repaired or removed from the site.
- All mechanical plant and equipment will be silenced by the best practical means using current technology. Mechanical plant, including noise-suppression devices, will be maintained to the manufacturer's specifications.
- All mechanical plant, equipment and vehicle movements are optimised in a forward direction to avoid triggering reversing motion alarms that are typically required when these items are used in reverse. Consideration for low frequency reversing alarms is to be prioritised.
- The location of activities, plant and equipment will optimise attenuation effects through measures such as topography, natural and purpose built barriers.
- Limiting contact of loader buckets with metal surfacesCombine predictive meteorological forecasting and noise monitoring data to guide the daily planning of quarrying operations during noise-enhancing meteorological conditions.
- A site specific induction will be provided to all site personnel, drivers and contractors with an emphasis on understanding and managing noise impacts form the work activities being undertaken.
- Plant equipment inspections will be undertaken through Operator Daily Prestarts and serviced (to manufacturers specifications) via LCC Fleet Services maintenance program. If any validated noise complaints are received, operator attended noise measurements will be undertaken to measure and compare the site noise level contributions (L_{Aeq}, 15 minute) to the criteria outlined in the CoA.
- Carry out noise compliance monitoring in accordance with CoA Appendix 5 to ensure the Quarry expansion works are complying with the relevant conditions of this approval. Details of the compliance monitoring plan are outlined in *Section 7*.
- Blasting will be undertaken in accordance with EPL and CoA conditioning
- Best Practice' management must be implemented during blasting operations and blasting design to ensure that the suitable charge masses (or maximum instantaneous charge, MIC) is achieved presented in Table 7.1 of the Noise Assessment (ERM 2009) are adhered to.
- The Quarry *Explosive Control Plan* is legislated and audited by the Resources Regulator and includes measures to control flyrock, as per industry best practice methods. These are implemented in consultation with the blasting contractor on site and audited against quality control checklists imbedded within the Quarry IMS and Safety Management System. These include prescribed distance exclusion zones and relocation of Quarry infrastructure where practicable to reduce the risk of fly rock impacts.

Noise experienced at sensitive receivers is expected to be progressively reduced as the Quarry expansion proceeds, as plant will be relocated to greater pit depths throughout the life of the Quarry, in turn progressively reducing noise at nearby receivers.

As per CoA Schedule 4, condition 3 and condition 4, in the event of any future request from a landowner, baseline information will be used to assess any potential damage that may occur as a consequence of the site's operational activities.

Implementation of the above-mentioned mitigation measures will assist in controlling noise levels and blasting effects emanating from the Quarry.

7 MONITORING PROGRAM

7.1 MONITORING OBJECTIVES

During operation of the Quarry, noise and blast activities will be monitored in the vicinity of the Quarry, in accordance with the monitoring program to ensure compliance with the relevant Conditions of Approval.

The noise measurement procedures employed throughout the monitoring program shall be guided by the requirements of AS 1055:2018 – Acoustics – Description and Measurement of Environmental Noise, and the NSW EPA Noise Policy for Industry (EPA 2017).

Noise, vibration and blasting monitoring will:

- Ensure the Quarry is operating as anticipated with respect to impacts of noise, vibration and blasting on residential receptors.
- Gauge the impact (if any) of the extraction activities on the noise and vibration level across the site.
- Identify any unforeseen noise or vibration impacts from the Quarry operations on residential receptors.
- Implement measures to prevent any as yet unforeseen impacts from the proposed expansion of the Quarry.
- Verify that the Quarry is achieving its environmental objectives.

7.2 MONITORING LOCATIONS

The original Noise Assessment (ERM 2009) and updated NIA (Mitchel Hanlon, SEE 2019) included six (6) noise monitoring locations that were used throughout the assessment, based on proximity to nearby potentially sensitive receptors. Given the proximity between monitoring locations and the location of anticipated noise-generating plant and equipment, the monitoring locations have been revised and separated into primary and supplementary acoustic monitoring locations for the purposes of the NBMP.

Primary and supplementary acoustic locations are identified in *Figure 2*. Primary acoustic monitoring locations consist of locations **2**, **4** and **8** with the remainder of locations being supplementary acoustic monitoring locations.

An agreement was reached with the landowner located along Nimbin Road (previously identified as location 8, ERM 2009) in April 2016, wherein the landowner has agreed to the exceedances in noise levels from Quarry operations. As such the location has been removed as a primary acoustic monitoring location, and a new monitoring location selected being (current) location 8.

Primary monitoring locations will be utilised during noise compliance monitoring and are considered representative in determining compliance with the relevant Conditions of Approval.

In the event that additional monitoring is required then additional monitoring may be undertaken at the most practical supplementary acoustic monitoring locations, as well as at the primary acoustic monitoring locations.

7.3 SCHEDULE

Noise monitoring shall be conducted every six (6) months to represent winter and summer monitoring (unless otherwise agreed to by DPE) and will consist of operator attending noise monitoring and spot checks of equipment.

Noise monitoring shall be undertaken during the below assessment time periods and reported against criteria in Schedule 3, condition 3 (Table 2):

- Day – 7 am to 6 pm;
- Evening – 6 pm to 10 pm; and
- Night – 10 pm to 7 am.

Air blast overpressure and ground vibration monitoring will be undertaken during each blast event. The primary acoustic monitoring locations identified above are considered representative of nearby sensitive receivers,

however supplementary locations may be considered in the event that an additional range of monitoring is required.

7.4 METHODOLOGY

Noise

Operator attended noise measurements shall be conducted at all primary acoustic measurement locations (Locations 2, 4 and 8 – refer *Figure 2*) to quantify and characterise the maximum (L_{Amax}), the energy equivalent (L_{Aeq}), and the background (L_{A90}) noise levels from ambient noise sources and quarrying operations over a 15 minute measurement period.

The operator shall quantify noise emissions and estimate the L_{Aeq} (Period) noise contribution during Quarry activities, as well as the overall level of ambient noise. During attended monitoring, digital recordings will be conducted to allow for additional post analysis of the Quarry noise levels and source identification.

All acoustic instrumentation employed throughout the monitoring program shall meet with the requirements of AS/NZS IEC 61672.1 Sound level meters Specifications & AS/NZS IEC 61672.2 Sound level meters Pattern Evaluation.

Instrument calibration shall be checked before and after each measurement survey, with the variation in calibrated levels not exceeding $\pm$ 0.5 dBa.

Blasting

To measure blasting events, blast monitoring shall be conducted that records air blast and vibration levels once triggered by an electronic trigger connected to a shot firing switch. That is, when the shot is fired, the monitor will be triggered by means of a hardwire switch and will start recording and capture the blast event. This will ensure that the event captured is the blast, significantly reducing the influence of other extraneous sources that could affect the measurement. Instrumentation used to measure the air blast overpressure and ground vibration levels must meet the requirements of AS 2187.2 (latest version).

7.5 METEOROLOGICAL PARAMETERS

Adverse meteorological conditions have the potential to increase noise levels, for example wind speeds up to 3 m/s or temperature inversions, however wind speeds above 5 m/s (and rainfall) have the potential to generate extraneous and erroneous noise events, which reduce the accuracy and confidence in measured data.

As such, meteorological parameters will be evaluated prior to undertaking works on site, to gain an understanding of the weather conditions and the potential for variations in noise levels.

All noise measurements shall be accompanied by both qualitative description (including cloud cover, approximate wind direction and speed) and quantitative measurements of prevailing local weather conditions throughout the survey period. Rainfall data and meteorological parameters will be collected from the weather station located on-site. as shown in *Table H*.

Table H: Meteorological Measurement Parameters

Measured Parameter	Unit	Sample Interval
Mean Wind Speed	m/s	15 minutes
Mean Wind Direction	Degrees	15 minutes
Aggregate Rainfall	mm	15 minutes
Mean Air Temperature	C°	15 minutes

7.6 PLANT & EQUIPMENT

During the attended noise measurements, the operator shall record any significant Quarry generated noise sources (i.e. haul trucks, dozers etc.).

7.7 MONITORING CRITERIA

The purpose of the noise and blast monitoring program is to track potential impacts of operations over time as quarrying continues, to demonstrate that quarrying is not impacting on residential receptors.

The assessment criteria for noise, vibration and blasting for the expanded operations will initially remain the same as stipulated in the EPL. The need for calculating site specific trigger levels may be reviewed after two (2) years of operations once a data set is available.

Accounting For Annoying Noise Characteristics (Low Frequency Noise)

The *Noise Policy for Industry* (NPfI 2017) states that a noise source may exhibit a range of particular characteristics that increase annoyance, such as tones, impulses, low frequency noise and intermittent noise.

Where this is the case, an adjustment ('modifying factor corrections') is applied to the source noise level received at an assessment point before it is compared with criteria to account for the additional annoyance caused by the particular characteristic.

Application of these modifying factors is described in. *Fact Sheet C: Corrections for annoying noise characteristics* and outlines correction factors to be applied to the source noise level at the receiver before comparison with the project noise trigger levels to account for the additional annoyance caused by those modifying factors.

The modifying factor corrections should be applied having regard to:
- the contribution noise level from the premises when assessed/measured at a receiver location, and
- the nature of the noise source and its characteristics (as set out in this fact sheet).

The NPfI provides the following definitions to support the modifying factor corrections:

- Tonal Noise – Containing a prominent frequency and characterised by a definite pitch.
- Low Frequency Noise – Containing major components within the low frequency range (20 Hz to 250 Hz) of the frequency spectrum.
- Impulsive Noise – Having a high peak of short duration or a sequence of such peaks.
- Intermittent Noise – The level suddenly drops to that of the background noise several times during the assessment period, with a noticeable change in noise level of at least 5 dB.

The modifying factor corrections (and how they are applied) are present in *Table C1* of the NPfI and vary depending on the noise characteristic being assessed. All noise levels generated by the Quarry, which may generate tonal or low frequency content, will be assessed as part of the NBMP monitoring with due regard to these modifying factor penalties, and in accordance with the requirements presented in the NPfI.

Impulsive and intermittent noise, as defined by the NPfI, are not typical characteristics of the Quarry, hence tonal and low frequency noise (LFN) are most relevant to the Quarry and those modifying corrections are reproduced in *Table I*.

Table I: Meteorological Measurement Parameters

Tonal Noise	One-third octave band analysis using the objective method for assessing the audibility of tones in noise – simplified method (*ISO1996.2-2007 – Annex D*)	Level of one-third octave band exceeds the level of the adjacent bands on both sides by: • 5 dB or more if the centre frequency of the band containing the tone is in the range 500–10,000 Hz • 8 dB or more if the centre frequency of the band containing the tone is in the range 160–400 Hz • 15 dB or more if the centre frequency of the band containing the tone is in the range 25–125 Hz.	5 dB [2,3]	Third octave measurements should be undertaken using unweighted or Z-weighted measurements. **Note:** Narrow-band analysis using the reference method in *ISO1996-2:2007, Annex C* may be required by the consent/regulatory authority where it appears that a tone is not being adequately identified, e.g. where it appears that the tonal energy is at or close to the third octave band limits of contiguous bands.
Low Frequency Noise	Measurement of source contribution C-weighted and A-weighted level and one-third octave measurements in the range 10–160 Hz	Measure/assess source contribution C- and A-weighted Leq,T levels over same time period. Correction to be applied where the C minus A level is 15 dB or more and: • where any of the one-third octave noise levels in Table C2 are exceeded by up to and including 5 dB and cannot be mitigated, a 2-dB(A) positive adjustment to measured/predicted A-weighted levels applies for the evening/night period • where any of the one-third octave noise levels in Table C2 are exceeded by more than 5 dB and cannot be mitigated, a 5-dB(A) positive adjustment to measured/predicted A-weighted levels applies for the evening/night period and a 2-dB(A) positive adjustment applies for the daytime period.	2 or 5 dB [2]	A difference of 15 dB or more between C- and A-weighted measurements identifies the potential for an unbalance spectrum and potential increased annoyance. The values in Table C2 are derived from Moorhouse (2011) for DEFRA fluctuating low-frequency noise criteria with corrections to reflect external assessment locations.

Notes:
1. Corrections to be added to the measured or predicted levels, except in the case of duration where the adjustment is to be made to the criterion.
2. Where a source emits tonal and low-frequency noise, only one 5-dB correction should be applied if the tone is in the low-frequency range, that is, at or below 160 Hz.
3. Where narrow-band analysis using the reference method is required, as outlined in column 5, the correction will be determined by the *ISO1996-2:2007* standard.

8 ENVIRONMENTAL & OPERATIONAL PERFORMANCE

8.1 ROLES & RESPONSIBILITIES

The Quarry Manager will be responsible for the implementation of this NBMP under the direction of the Manager Commercial Services.

All Quarry personnel and contractors are accountable through conditions of employment or contracts with each individual responsible for ensuring that their work complies with the procedures outlined in this NBMP. Further details of the responsibilities of personnel are provided in *Table J*. A diagram outlining the organisational structure for implementing this NBMP is provided at *Figure 3*.

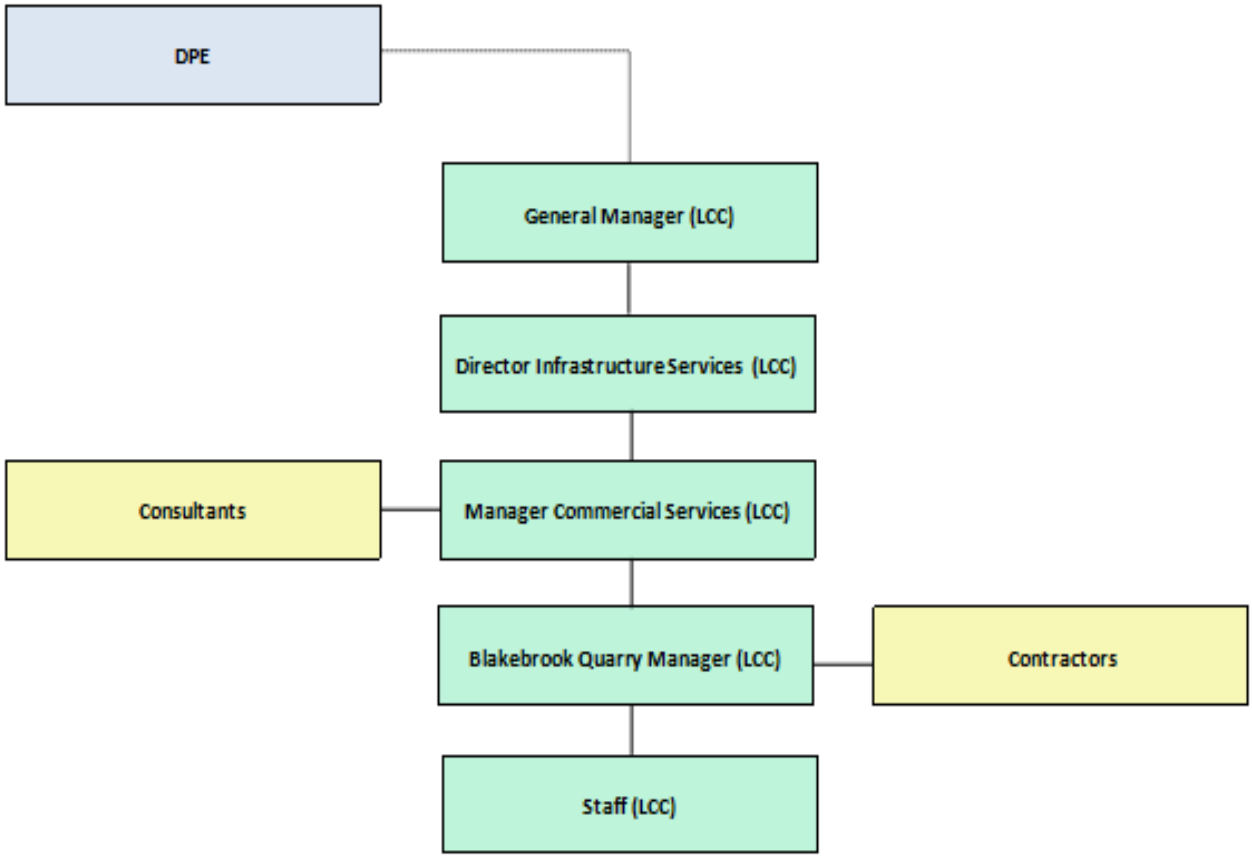
Table J: Roles & Responsibilities

Manager Commercial Services		
Action No.	**Action**	**Timing**
NVBM.MCS.01	Ensure that CoA, Project Commitments and any other approval conditions are adhered to when working in designated quarry expansion areas.	At all times
NVBM.MCS.02	Provide LCC, EPA and DPE (and other relevant stakeholders) with the opportunity to contribute to the development of the NBMP.	Prior to commencement of construction
NVBM.MCS.03	Ensuring all staff and contractors are provided with induction regarding the significance of noise, vibration and blasting impacts as part of general environmental management site induction and ensuring that they know of agreed management and mitigation.	Prior to commencement of construction
NVBM.MCS.04	Ensuring all monitoring commitments made as part of the NBMP are executed.	As detailed in NBMP
NVBM.MCS.05	Ensuring monitoring is completed in response to any complaints regarding noise and/or vibration.	When required

Blakebrook Quarry Manager		
Action No.	**Management Procedure**	**Timing**
NVBM.OC.01	Ensuring that CoA, Project Commitments and any other approval conditions are adhered to when conducting quarrying operations.	At all times
NVBM.OC.02	Notifying the Manager Commercial Services before undertaking any blasting works.	Prior to commencement of works
NVBM.OC.03	Ensuring all residential receptors are informed of all planned blasting works prior to commencement of works.	Prior to commencement of works
NVBM.OC.04	If complaints are received regarding noise or vibration, stop works that have the potential to impact further and contact the Manager Commercial Services immediately.	When and if required

Quarry Personnel and Contractors		
Action No.	**Management Procedure**	**Timing**
NVBM.QP.01	Ensure approval has been given by the Quarry Manager prior to undertaking any blasting works.	Prior to commencement of works

Figure 3: Roles & Responsibilities



8.2 Stakeholder Consultation Schedule

The CoA prescribes the regulatory authorities to be consulted in the preparation of the NBMP. These requirements are summarised in *Table K*.

Table K: NBMP Consultation Requirements

Regulatory Authority	Interest
Department of Planning and Environment (DPE)	DPE is the lead agency in ensuring compliance with the requirements of the CoA and will review and approve amendments to the NBMP.
Environment Protection Authority (EPA)	The EPA is to be involved in the preparation and revision of the NBMP to ensure that it complies with the requirements of the CoA and other NSW legislation, policy, and technical requirements.

Draft copies of the NBMP will be provided to the EPA and DPE for consultation and feedback considerations. A final version will be made available on LCC website.

8.3 Training & Awareness

LCC will provide training to its employees with respect to the expansion works for the Quarry. The objective of the training will be to provide a base level understanding of their individual role in complying with the NBMP. Training will also be provided for specific tasks to ensure employees are competent to perform their required duties.

As part of the general site induction process, all Quarry personnel will be made aware of potential noise and vibration activities, including blasting, that could impact on residential receptors. Those personnel specifically involved in clearing, grubbing and ground disturbance works including topsoil removal and excavation in close proximity to residents will be made aware of their location and an assessment of the need for mitigation measures completed prior to works commencing.

In accordance with the EMS, LCC will also undertake the following with respect to training and awareness:

- Hold daily pre-start/toolbox talks.
- Hold WHS/staff meetings as required.
- Issue Project Environmental Alerts (if required).

8.4 Record Keeping & Document Control

Records are to be maintained for all noise, vibration and blasting management measures and monitoring. All records shall be kept for a minimum of seven (7) years, with record keeping and document control managed in accordance with the requirements set forth in the EMS.

To ensure that the correct procedures and plans are used on site, issue of the EMS, CoA and/or any other relevant document, and any associated amendments that may be required, will be controlled using a document register and stored in LCC's record management system (TRIM).

8.5 Site Inspections

Weekly inspections will be conducted by the Quarry Manager to monitor work practices and identify non-conforming areas and activities or work practices which could lead to potential environmental harm.

A 'Site Daily and Weekly Checklist' will be used to record and report any improvements required. The purpose of the inspections is to:

- Provide a surveillance tool to ensure that safeguards are being implemented.

- Identify where problems might be occurring (or have the potential to occur).
- Identify where sound environmental practices are not being implemented.
- Facilitate the identification and early resolution of problems.

8.6 EXTERNAL COMMUNICATION & NOTIFICATION

In accordance with EPL L5.3 all sensitive receivers will be given at least 24 hours' notice by phone when blasting is to be undertaken, unless otherwise stipulated by the EPL.

Any Asphalt Out of Hours campaign work will be notified in writing to LCC, EPA and local residents at least 7 working days prior to works being undertaken.

General information regarding the environmental performance of the Quarry and contact details regarding complaints will be available at all times through LCC website.

Community meetings will be held at least once per annum, where information regarding the activities being undertaken at the Quarry as well as environmental performance information will be detailed.

Authorities will be kept informed regarding the operation and environmental performance of the Quarry through the Annual Reporting requirements of the CoA and EPL

8.7 COMPLAINT INVESTIGATION & RESPONSE CONTROL

Complaints regarding the Quarry or Asphalt operations (including limited campaign asphalt operations relating to the OHWP) will be managed via LCC's existing complaint management system. Quarry and Asphalt complaints must be received via telephone to LCC's Contact Centre 1300 878 387

Details that are to be logged by Council staff include:

- Complainant's name.
- Telephone number / email address / postal address.
- Date of contact.
- Nature of complaint.

The details of the complaint will be passed on to the Quarry Compliance division. Complaints received regarding Asphalt plant operations (including concerning out of hours work) must be provided to the DPE within 24 hours of receiving the complaint. Management will be committed to rectifying an activity that has caused a complaint as soon as possible, with a response being provided, to the complainant within five (5) days of receipt of the complaint. The Quarry will undertake actions to identify and initiate appropriate action in response to the complaint to resolve (where practicable).

Records of all complaints received are to be kept with in LCC Complaints Management System and added to the Quarry's Non conformance and Improvements Register..

Should further complaints continually be received regarding Asphalt campaign works under the OHWP, the DPE may, under its discretion revoke this approval.

All Quarry staff are responsible for reporting any complaints to the Quarry Manager. Complaints must be made through the correct channel to the LCC Customer Contact Centre in order to ensure correct record keeping and response.

8.8 DISPUTE RESOLUTION PROCESS

In the case that a dispute between the complainant and LCC arises with respect to the management and/or outcomes of the Complaint Investigation and Response Protocol (*Section 8.7*), either party may refer the matter to the DPE for resolution.

If a dispute has developed relating to noise or blast activities on site, Quarry management shall liaise with DPE and EPA for consultation on the matter. LCC are committed to resolving disputes by adopting clear and open communication techniques. In the event the matter cannot be resolved, LCC will follow Schedule 4, condition 5 of the CoA:

If any owner of privately-owned land within 2 kilometres of proposed blasting activities, or any other landowner nominated by the Secretary, claims that his/her property, including vibration-sensitive infrastructure such as water supply or underground irrigation mains, has been damaged as a result of blasting at the project, the Proponent shall within 3 months of receiving this request:

(a) commission a suitably qualified person whose appointment has been approved by the Secretary to investigate the claim and prepare a property investigation report; and
(b) give the landowner a copy of the report.

If this independent investigation confirms the landowner's claim, and both parties agree with these findings, then the Proponent shall repair the damage to the satisfaction of the Secretary.

If the Proponent or landowner disagrees with the findings of the independent property investigation, then either party may refer the matter to the Secretary for resolution.

If a matter is referred to the DPE, and the DPE is satisfied that the dispute is genuine, the DPE will then commence an independent dispute resolution process in order to mediate between the two parties, in order to arrive at an agreed outcome.

9 REVIEW AND REPORTING

Annual review and reporting are required to assess the outcomes of the NBMP, review its effectiveness, and consider works undertaken against annual budgets and targets.

Any issues noted regarding the success of management works will be relayed to the site manager on an ongoing basis so that relevant improvements can be made.

9.1 CONTINGENCY PLANNING & PROTOCOL

Should at any time management results of the NBMP be determined to be negatively impacting on surrounding sensitive receptors for the Quarry and Asphalt expansion, then the NBMP management controls and monitoring program may need to be intensified to allow better identification and understanding of the impacts and facilitate design of appropriate mitigation measures.

Before any significant changes are made to the NBMP, LCC will consult with DPE and the EPA, to obtain their approval. Subsequent to receipt of DPE and EPA approval, the NBMP will be revised in line with any approved changes.

9.2 NON-COMPLIANCE REPORTING PROTOCOL

All non-compliance will be reported in accordance with the EPL andSchedule 5, condition 8 and condition 9 of the CoA that relate to the incident and non-compliance reporting.

i. ***Incident Notification****. The Proponent must immediately notify the Department 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 development (including the development application number and name) and set out the location and nature of the incident.*

The definition of an Incident is described as:
An occurrence or set of circumstances that causes or threatens to cause material harm and which may or may not be or cause a non-compliance

i. ***Non-Compliance Notification****. Within seven days of becoming aware of a non-compliance, the Applicant must notify the Department of the non-compliance. The notification must be in writing via the Major Projects Website and identify the development (including the development application number and name), set out the condition of this consent that the development is non-compliant with, the way in which it does not comply and the reasons for the non-compliance (if known) and what actions have been, or will be, undertaken to address the non-compliance.*

Where there is an exceedance of the limits/performance criteria in the CoA or EPL the relevant agencies will be informed by phone within 24 hours (of the exceedance becoming known to the licensee). Any exceedances are recorded in the Quarry Non conformance & Improvement Register.

In addition, the Quarry will follow conditions as set out in the CoA, Schedule 4, condition 1 – Notification of Landowners where applicable. LCC will meet the requirement of the DPE to address the cause or impact of any incident within the required period as defined by the DPE. LCC will maintain a record of accidents and incidents in the NC&I Register.

9.3 REVIEWS

9.3.1 Internal Auditing

An internal review of this NBMP will be undertaken by LCC on an annual basis. The purpose of the review is to determine the appropriateness of the NBMP in achieving environmental objectives and performance goals throughout the Quarry and Asphalt expansion and ensure that the system is meeting the requirements of relevant

legislation, standards, policies, licences, permits, approvals and objectives. A report will be provided to the Manager Commercial Services with any recommendations for improvement. The Manager (Commercial Services) will review and approve changes to the system (as required).

9.4 EXTERNAL REPORTING

All external reporting required by the CoA or other obligation for the Quarry will be approved by Quarry Management. This includes management and monitoring documentation associated with this NBMP.

Noise Monitoring reports are made available on the project website. Noise monitoring reports are internally audited and reviewed as part of the Annual Environmental Monitoring Report and overall compliance audited every 3 years as part of the Independent Environmental Audit (IEA).

Currently the EPL for the site requires reporting of the results of the air blast over pressure and ground vibration levels as part of the Annual Return.

9.5 NOISE, AIR BLAST OVERPRESSURE & VIBRATION MONITORING REPORT

Recording of Results

Upon receipt of each round of monitoring results a suitably qualified person (the Quarry Manager or nominated representative) will review results and report any identified exceedances where required. If an exceedance is identified an investigation will be undertaken with reports sent to the EPA or DPE within seven (7) days (as appropriate). All records are stored in TRIM.

Monitoring reports will consist of the following information (where applicable):

Noise Monitoring Report

- Reference to:
    - EPL conditions – specifically *Noise Limits, Hours of Operation, Other Monitoring and Recording Conditions*
    - CoA requirements – specifically *Schedule 3 – Noise, Appendix 5 – Noise Compliance Assessment*
    - This *Noise & Blast Management Plan* (where applicable)
    - Best Practice methods and relevant Australian Standards for compliance (namely AS2659.1)
- Summary of attended noise monitoring results
- Measured/calculated and/or operator estimated Quarry L_{Aeq} (Period) contributed noise levels for each monitoring location
- Summarised conclusion determining compliance against licence parameters

Blast Monitoring Report

- Reports identifying vibration and air blast overpressure results from identified monitoring locations
- Calibration of equipment consistent to regulatory requirements and latest version of Australian Standards (namely AS2187.2)
- Best Practice methods and relevant Australian Standards for compliance
- Summarised conclusion determining compliance against licence parameters
- LCC will make reference to:
    - EPL conditions – specifically *Blasting (M5 and M7), Hours of Operation,*
    - CoA requirements – specifically *Schedule 3 – Noise, Appendix 5 – Noise Compliance Assessment*
    - NRQ Explosive Control Plan for content and Checklists

9.6 ANNUAL ENVIRONMENTAL PERFORMANCE REVIEW

In accordance with the Minister's CoA, an annual environmental performance review is to be prepared to the satisfaction of the DPE. The review will be submitted by the end of March and in accordance with CoA Schedule 5, Condition 11.

(a) describe the project (including any progressive rehabilitation) that was carried out in the previous calendar year, and the project that is proposed to be carried out over the current calendar year;
(b) include a comprehensive review of the monitoring results and complaints records of the project over the previous calendar year, which includes a comparison of these results against the:
• relevant statutory requirements, limits or performance measures/criteria;
• requirements of any plan or program required under this approval;
• monitoring results of previous years; and
• relevant predictions in the documents listed in condition 2(a) of Schedule 2;
(c) evaluate and report on:
• the effectiveness of the air quality and noise management systems; and
• compliance with the performance measures, criteria and operating conditions in this approval.
(d) identify any non-compliance over the past calendar year, and describe what actions were (or are being) taken to ensure compliance;
(e) identify any trends in the monitoring data over the life of the project;
(f) identify any discrepancies between the predicted and actual impacts of the project, and analyse the potential cause of any significant discrepancies;
(g) describe what measures will be implemented over the current calendar year to improve the environmental performance of the project.

Report findings are summarised below:

Table L: Report Findings From 2019-2021

Year	Findings
2019	Compliance was achieved across all reporting conditions and consolidation of key assessments and management plans were finalised. The non-compliances recorded for 2019 were in exceedances to groundwater criteria due to soil conditions and geology whereby the Soil and Water Management plan was updated to consider site geology and suitability. Two exceedances were recorded for dust monitoring due to very dry weather conditions resulting in regional fires and increased dust activity during sampling periods.
2020	A high level of compliance was achieved across all reporting conditions with three non-compliances reported and investigated. These are: Truck movements exceeded limits with one additional truck dispatching the Quarry on 8 September 2020; deposited dust exceeded limits (ash >4g/m2/month) at monitoring location D2 (6.7 g/m2/month); and surface water monitoring (turbidity, nutrients, oil and grease) during the March sampling was not conducted.
2021	A high level of compliance within all conditions of approval was achieved. One non-compliance was recorded on 10 December 2021 where excavated road material was brought to the site and lack of storage area reduced the sufficiency of the project whereby Council is progressively transporting material offsite; one complaint was recorded on 13 December 2021 regarding Noise and Blasting.

9.7 INDEPENDENT ENVIRONMENTAL AUDIT

In accordance with the Minister's CoA Schedule 5, condition 12 and condition 13, within three (3) years of quarrying operation, and every three (3) years thereafter, a major review of the NBMP will be undertaken by a suitably qualified person to assess what, if any, environmental impacts have occurred as a result of the expanded operations at the Quarry.

The Quarry Manager will implement any changes arising from the reviews. Records of such reviews will be maintained.

10 REFERENCES

Department of Infrastructure, Planning and Natural Resources, 2004, Guidelines for the Preparation of Environmental Management Plans.

Environmental Resources Management Australia Pty Ltd (ERM), 2009, Blakebrook Quarry Expansion Environmental Assessment Report.

Lismore City Council Statement of Environmental Effects (SEE), Mitchel Hanlon 2019, Blakebrook Quarry Asphalt Plant: Noise Impact Assessment

Northern Rivers Quarry – Blakebrook Quarry Out of Hours Work Protocol (Ardill Payne 2021)

ANNEX A – ACOUSTIC GLOSSARY

A.1 GLOSSARY – ACOUSTICAL CONCEPTS & TERMINOLOGY

What Is Noise and Vibration?

- Noise - Noise is often defined as a sound, especially one that is loud or unpleasant or that causes disturbance[1] or simply as unwanted sound, but technically, noise is the perception of a series of compressions and rarefactions above and below normal atmospheric pressure.
- Vibration - Vibration refers to the oscillating movement of any object. In a sense noise is the movement of air particles and is essentially vibration, though in regard to an environmental assessment vibration is typically taken to refer to the oscillation of a solid object(s). The impact of noise on objects can lead to vibration of the object, or vibration can be experienced by direct transmission through the ground, this is known as ground-borne vibration.

Essentially, noise can be described as what a person hears, and vibration as what they feel.

What Factors Contribute to Environmental Noise?

The noise from an activity, like construction work, at any location can be affected by a number of factors, the most significant being:

- How loud the activity is?
- How far away the activity is from the receiver?
- What type of ground is between the activity and the receiver location e.g. concrete, grass, water or sand?
- How the ground topography varies between the activity and the receiver? For example, is it flat, hilly, mountainous? Blocking the line of sight to a noise source will generally reduce the level of noise.
- Any other obstacles that block the line of sight between the source to receiver e.g. buildings or purpose built noise walls.

How to Measure and Describe Noise

Noise is measured using a specially designed 'sound level' meter which must meet internationally recognised performance standards. Audible sound pressure levels vary across a range of 10^7 Pascals (Pa), from the threshold of hearing at 20µPa to the threshold of pain at 200Pa. Scientists have defined a statistically described logarithmic scale called Decibels (dB) to more manageably describe noise.

To demonstrate how this scale works, the following points give an indication of how the noise levels and differences are perceived by an average person:

- 0 dB – Represents the threshold of human hearing (for a young person with ears in good condition).
- 50 dB – Represents average conversation.
- 70 dB – Represents average street noise, local traffic etc.
- 90 dB – Represents the noise inside an industrial premises or factory.
- 140 dB – Represents the threshold of pain – the point at which permanent hearing damage may occur.

Human Response to Changes in Noise Levels

The following concepts offer qualitative guidance in respect of the average response to changes in noise levels:

- Differences in noise levels of less than approximately 2 dB are generally imperceptible in practice, an increase of 2 dB is hardly perceivable.
- Differences in noise levels of around 5 dB are considered to be significant.
- Differences in noise levels of around 10 dB are generally perceived to be a doubling (or halving) of the perceived loudness of the noise. An increase of 10 dB is perceived as twice as loud. Therefore an increase of 20 dB is four (4) times as loud and an increase of 30 dB is eight (8) times as loud etc.

- The addition of two (2) identical noise levels will increase the dB level by about 3 dBA. For example, if one car is idling at 40 dB and then another identical car starts idling next to it, the total dB level will be about 43 dB.
- The addition of a second noise level of similar character which is at least 8 dB lower than the existing noise level will not add significantly to the overall dB level.
- A doubling of the distance between a noise source and a receiver result approximately in a 3 dB decrease for a line source (e.g. vehicles travelling on a road) and a 6 dB decrease for a point source (e.g. the idling car discussed above).
- A doubling of traffic volume for a line source results approximately in a 3 dB increase in noise, halving the traffic volume for a line source results approximately in a 3 dB decrease in noise.

Terms to Describe the Perception of Noise

The following terms offer quantitative and qualitative guidance in respect of the audibility of a noise source:

- Inaudible/Not Audible – The noise source and/or event could not be heard by the operator, masked by extraneous noise sources not associated with the source. If a noise is 'inaudible' its noise level may be quantified as being less than the measured L_{A90} background noise level, potentially by 10 dB or greater.
- Barely Audible – The noise source and/or event are difficult to define by the operator, typically masked by extraneous noise sources not associated with the source.
- Just Audible – The noise source and/or event may be defined by the operator. However there are a number of extraneous noise sources contributing to the measurement. The noise level should be quantified based on the instantaneous noise level contributions, noted by the operator.
- Audible – The noise source and/or event may be easily defined by the operator. There may be a number of extraneous noise sources contributing to the measurement. The noise level should be quantified based on instantaneous noise level contributions, noted by the operator.
- Dominant – The noise source and/or event are noted by the operator to be significantly 'louder' than all other noise sources. The noise level should be quantified based on instantaneous noise level contributions, noted by the operator.

The following terms offer qualitative guidance in respect of acoustic terms used to describe the frequency of occurrence of a noise source during an operator attended environmental noise measurements:

- Constant – This indicates that the operator has noted the noise source(s) and/or event to be constantly audible for the duration of the noise measurement e.g. an air conditioner that runs constantly during the measurement.
- Intermittent – This indicates that the operator has noted the noise source(s) and/or event to be audible, stopping and starting intervals for the duration of the noise measurement e.g. cars passing by.
- Infrequent – This indicates that the operator has noted the noise sources(s) and/or event to be constantly audible, however, not occurring regularly or at intervals for the duration of the noise measurement e.g. small number of aircraft are noted during the measurement.

How to Calculate or Model Noise Levels

There are two (2) recognised methods which are commonly adopted to determine the noise at a particular location from a proposed activity. The first is to undertake noise measurements whilst the activity is in progress and measure the noise, the second is to calculate the noise based on known noise emission data for the activity in question.

The second option is preferred as the first option is largely impractical in terms of cost and time constraints, notwithstanding the meteorological factors that may also influence its quantification. Furthermore, it is also generally considered unacceptable to create an environmental impact simply to measure it. In addition, the most effective mitigation measures are determined and implemented during the design phase and often cannot be readily applied during or after the implementation phase of a project.

Because a number of factors can affect how 'loud' a noise is at a certain location, the calculations can be very complex. The influence of other ambient sources and the contribution from a particular source in question can

be difficult to ascertain. To avoid these issues, and to quantify the direct noise contribution from a source/site in question, the noise level is calculated using noise modelling software packages. The noise emission data used may be obtained from the manufacturer or from ERM's database of measured noise emissions.

Acoustic Terminology & Statistical Noise Descriptors

Environmental noise level such as noise generated by industry, construction and road traffic are commonly expressed in dBA. The A-weighting scale follows the average human hearing response and enables comparison of the intensity of noise with different frequency characteristics. Time varying noise sources are often described in terms of statistical noise descriptors. The following descriptors are commonly used when assessing noise and are referred to throughout this acoustic assessment:

- Decibel (dB) – This unit is used to describe sound levels and noise exposure. It is the equivalent of ten (10) times the logarithm (to base 10) of the ratio of a given sound pressure to a reference pressure.
- dBA – This unit is used to measure 'A-weighted' sound pressure levels. A-weighting is an adjustment made to sound level measurement to approximate the response of the human ear.
- dBC – This unit is used to measure 'C-weighted' sound pressure levels. C-weighting is an adjustment made to sound level measurements which takes account of low frequency components of noise within the audibility range of humans.
- dBZ or dBL – This unit is used to measure 'Z-weighted' sound pressure levels with no weighting applied, linear.
- Hertz (Hz) – The measure of frequency of sound wave oscillations per second. One (1) oscillation per second equals one (1) hertz.
- Octave – A division of the frequency range into bands, the upper frequency limit.
- ⅓ Octave – Single octave bands divided into there (3) parts.
- L_{eq} – This level represents the equivalent or average noise energy during a measurement period. The L_{eq}, 15 minute noise descriptor simply refers to the L_{eq} noise level calculated over a 15 minute period. Indeed, any of the below noise descriptors may be defined in this way, with an accompanying time period e.g. L_{10} 15 minute, as required.
- L_{max} – The absolute maximum noise level in a noise sample.
- L_N – The percentile sound pressure level exceedance for N% of the measurement period calculated by statistical analysis.
- L_{10} – The noise level exceeded for 10% of the time and is approximately the average of the maximum noise levels.
- L_{90} – The noise level exceeded for 90% of the time and is approximately the average of the minimum noise levels. The L_{90} level is often referred to as the 'background' noise level and is commonly used as a basis for determining noise criteria for assessment purposes.
- Sound Power Level (L_W) – This is a measure of the total power radiated by a source. The Sound Power of a source is a fundamental property of the source and is independent of the surrounding environment.
- Sound Pressure Level (L_P) – The level of sound pressure, as measured at a distance by a standard sound level meter with a microphone. This differs from L_W in that this is the received sound as opposed to the sound 'intensity' at the source.
- 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 described using the L_{A90} descriptor.
- Ambient Noise – The all-encompassing noise associated within a given environment. It is the composite of sounds from many sources, both near and far. This is described using the L_{Aeq} descriptor.
- Cognitive Noise – Noise in which the source is recognised as being annoying.
- Masking – The phenomenon of one sound interfering with the perception of another sound e.g. the interference of noise traffic with use of a public telephone on a busy street.

Noise Policy for Industry Terminology

The following terminology is from the NSW EPA –Noise Policy for Industry 2017 and relevant application notes:

- Assessment Background Level (ABL) –The single figure background level representing each assessment period: day, evening and night (that is, three assessment background levels are determined for each 24-hour period of the monitoring period). Its determination is by the methods described inFact Sheet B. .

- Rating Background Level (RBL) –The overall single figure background level representing each assessment period (day, evening and night) over the whole monitoring period (as opposed to over each 24 hour period used for the assessment background level). This is the level used for assessment purposes. See Fact Sheets A & B
- Extraneous Noise – Noise resulting from activities that are not typical of the area. Atypical activities may include construction, and traffic generated by holiday periods and by special events such as concerts or sporting events. Normal daily traffic is not considered to be extraneous.
- Most Affected Location(s) – Locations that experience (or will experience) the greatest noise impact from the noise source under consideration. In determining these locations, one needs to consider existing background levels, exact noise source location(s), distance from source (or proposed source) to receiver, and any shielding between source and receiver.
- Noise Criteria – The general set of non-mandatory noise level targets for protecting against intrusive noise (for example, background noise plus 5 dB) and loss of amenity e.g. noise levels for various land uses.
- Noise Limits – Enforceable noise levels that appear in conditions on consents and licences. The noise limits are based on achievable noise levels which the proponent has predicted can be met during the environmental assessment.
- Project Noise Trigger Levels – Target noise levels for a particular noise generating facility. They are based on the most stringent of the project intrusiveness noise level or the project amenity noise level. .
- Compliance – The process of checking that source noise levels meet with the noise limits in a statutory context.
- Non-compliance – In this policy this means not required by legislation. The policy specifies project noise trigger levels to be strived for, but the legislation does not make these levels compulsory. However the policy will be used as a guide to setting statutory (legally enforceable) limits for licences and consents.
- Feasible and Reasonable Measures – As defined in Fact Sheet F
- Meteorological Conditions – Wind and temperature inversion conditions.
- Temperature Inversion – An atmospheric condition in which temperature increases with height above the ground.
- Adverse Weather – Weather effects that enhance noise (that is, wind and temperature inversions) that occur at a site for a significant period of time (that is, wind occurring more than 30% of the time in any assessment period in any season and/or temperature inversions occurring more than 30% of the nights in winter).

Operator Attended Noise Measurements

Table M below presents typical abbreviations that are used to describe common noise sources that may be noted during environmental noise measurements.

Table M: General Field Noise Abbreviations

Noise Source	Abbreviation
Wind-blown Vegetation	WBV
Car Pass-by	CP
Operator Noise	OP
Animal Noise	AN
Distant Traffic	DT
Near Traffic	NT
Aircraft Noise	AN
Metal on Metal Contact	MMC

During operator attended noise measurements, the sound level meter will present the instantaneous level and record acoustical and statistical parameters. In certain acoustical environments, where a range of noise sources are audible and detectable, the sound level meter cannot measure a direct source noise level and it is often necessary to account for the contribution and duration of the sources.

Noted Percentile Contribution – *Table N* presents noise level deductions that are typically applied based on the percentage contribution of a noise source(s).

Table N: Noise Level Deductions - Noted Percentile Contribution

Percentage Contribution	Noise Level Adjustment dBA
5%	-13.0
10%	-10.0
15%	-8.2
20%	-7.0
25%	-6.0
30%	-5.2
35%	-4.6
40%	-4.0
45%	-3.5
50%	-3.0
55%	-2.6
60%	-2.2
65%	-1.9
70%	-1.5
75%	-1.2
80%	-1.0
85%	-0.7
90%	-0.5
95%	-0.2
100%	0.0

Example: The measured L_{Aeq} 15 minute noise level is 49 dB, and the site contribution was observed to be 10% of this level (extraneous noise sources were noted to dominate the measurement), therefore the L_{Aeq} 15 minute noise level deduction is 10 dB, with a resultant noise level contribution of approximately 39 dB.

Noted Time Contribution – *Table O* presents noise level deductions that may be applied based on the percentage of time that a noise source(s) is audible during a 15-minute measurement.

Table O: Noise Level Deductions - Noted Time Contribution

Event Duration (Minutes)	Noise Level Adjustment dBA
1	-11.8
2	-8.8
3	-7.0
4	-5.7
5	-4.8

6	-4.0
7	-3.3
8	-2.7
9	-2.2
10	-1.8
11	-1.3
12	-1.0
13	-0.6
14	-0.3
15	0.0

Example: The measured L_{Aeq} 15 minute noise level contribution of an excavator was noted to be 56 dB, however it was only audible for 6 minutes during the 15 minute measurement period, therefore the L_{Aeq} 15 minute noise level deduction is 4 dB, with a resultant noise level contribution of approximately 52 dB.

Where the noise emission from a source is clearly detectable and the contribution can be measured, these deductions are not necessary.

A.2 VIBRATION – GLOSSARY OF TERMS, DEFINITIONS & METHODOLOGY

How to Measure and Control Vibration

Vibration refers to the oscillating movement of any object. In relation to construction projects, ground borne vibration is the most likely outcome of works and potentially has three (3) effects on vibration sensitive receivers. These are:

- Ground borne vibration that may cause annoyance.
- Ground borne vibration that may have an adverse effect on a structure e.g. a building.
- Regenerated noise due to ground borne vibration.

Each of these potential effects can be assessed in accordance with the relevant standard. Perceptible levels of vibration often create concern for the surrounding community at levels well below structural damage guideline values, this issue needs to be managed as part of the vibration monitoring program.

Vibration is typically measured using specific devices that record the velocity or acceleration at a designated receiver location, usually being the closest premises to works. Modern vibration monitoring devices will typically capture amplitude data for the three (3) orthogonal axes, being the transverse, longitudinal and vertical, and also the frequency at which the measured vibration event occurs.

Monitoring of this level of detail enables analysis of significant vibration events to determine compliance with relevant guidelines, such as the NSW Department of Environment and Conservation – NSW Environmental Noise Management – Assessing Vibration: A Technical Guide (The NSW Vibration Guideline) (February 2006), and the German Institute for Standardisation –) DIN 4150-3:2016-12) – Structural Vibration – Effects of Vibration on Structures.

Vibration propagates in a different manner to noise and can be difficult to control depending on the frequency of the source in question, although identifying the strategy best suited to controlling vibration follows a similar approach to that of noise. This includes elimination, control at the source, control along the propagation path and control at the receiver and/or a combination of these, such as no work/respite periods.

Vibration Descriptors

The following terms are often used to describe measured vibration levels:

- Parameter – An attribute with a value e.g. weighting.
- Particle Velocity – The instantaneous value of the distance travelled by a particle per unit time in a medium that is displaced from its equilibrium state by the passage of a sound or vibration wave.

- Peak Component Particle Velocity (PCPV) – Is the highest (maximum or peak) particle velocity which is recorded during a particular vibration event over the three (3) axes. PCPV is measured in the unit mm/s.
- Phase – The relative position of a sound wave to some reference point, the phase of a wave is given in radians, degrees, or fractions of a wavelength.
- Acceleration – The change in velocity over time. Acceleration is dependent on the velocity and the frequency of the vibration event (velocity is a vector), as such acceleration changes in two (2) ways, magnitude and/or direction. Acceleration is measured in the unit m/s^2.
- Perceptible – Vibration levels that a receiver of building occupant may 'feel'. 0.2 mm/s is typically considered to be the human threshold for perception of vibration.
- Geophone or Accelerometer – The transducer/device typically used to measure vibration.
- Damage – Is defined in DIN 4150-3 to include minor non-structural effects such as cosmetic damage or superficial cracking in paint or cement render, the enlargement of cracks already present, and the separation of partitions or intermediate walls from load bearing walls.
- Vibration Dose Value (VDV) – A concept outlined in the NSW Vibration Guideline, which is a calculative approach to assessing the impact of intermittent vibration or extended periods of impulsive vibration. VDV require the measurement of the overall weighted RMS (Root Mean Square) acceleration levels over the frequency range 1 Hz to 80 Hz. To calculate VDV the following formula (refer to *Section 2.4.1* of the guideline) is used:

$$VDV = \left[\int_0^T a^4(t)dt\right]^{0.25}$$

Where VDV is the vibration dose value in $m/s^{1.75}$ *a (t)* is the frequency weighted RMS of acceleration in m/s^2 and *T* is the total period of the day (in seconds) during which vibration may occur.

- MIC – Maximum Instantaneous Charge or explosive charge mass (kg) detonated per delay (any 8ms interval).
- SD (m) – The scaled distance for air-blast and ground vibration from the charge to the receiver.

ANNEX B – NOISE MONITORING RESULTS (2021)

Ambience Audio Services

Acoustic Measurement and Analysis

[redacted]
Richmond Hill NSW 2480
ambienceaudio.com.au

Mobile: [redacted]

Results of Noise Monitoring

Blakebrook Quarry
550 Nimbin Road
Blakebrook NSW 2480

Prepared for

Ecoteam
13 Ewing Street
Lismore NSW 2480

Prepared by
[redacted]
December 22nd 2021

Table of Contents

Noise & Blast Management Plan

1 INTRODUCTION

Ambience Audio Services have been engaged by Ecoteam to conduct noise monitoring at Blakebrook Quarry, 550 Nimbin Road, Blakebrook NSW.

Noise monitoring was conducted on the 18th of November and 16th of December 2021 with the quarry and asphalt plant operating under normal conditions and suitable weather conditions. The noise monitoring was conducted over two days, due to breakdowns with some of the crushing equipment, unsuitable weather, the asphalt plant did not operate at some times, and other scheduled work commitments.

Quarry operations while noise monitoring was conducted included: crushing, screening and stockpiling on the southern side of the quarry floor, asphalt production at the mobile plant at the top of the quarry, and trucks and loader on the quarry floor and internal haul roads. A diagram of equipment operating on the quarry floor during noise monitoring at residential receivers is provided in Appendix C.

To assist with the interpretation of some of the terminology used in this report, Appendix A provides definitions of acoustic terms. Appendix B is a chart of everyday sound pressure levels.

2 NOISE MONITORING REQUIREMENTS

The noise monitoring requirements for the Blakebrook Quarry are outlined in Section 2.2, Sections 7.1, 7.2, 7.4, 7.5 and 7.7 of the Noise and Blast Management Plan Revision 3.1 (Aug 2018) prepared by Environmental Resources Management Australia Pty Ltd (ERM).

Extracts of the relevant parts are copied below.

Section 2.2

3. The Proponent must ensure that the noise generated by the project does not exceed the criteria in Table 2 at any residence on privately-owned land.

Table 2: Noise criteria dB(A)

Receiver	*Day* L_{Aeq} *(15 minute)*
Location 2	*36*
All other locations	*35*

Noise generated by the project is to be measured in accordance with the relevant requirements and exemptions (including certain meteorological conditions) of the NSW Industrial Noise Policy. Appendix 5 sets out the meteorological conditions under which these criteria apply and the requirements for evaluating compliance with these criteria.

However, the noise criteria in Table 2 do not apply if the Proponent has an agreement with the relevant landowner to exceed the noise criteria, and the Proponent has advised the Department in writing of the terms of this agreement.

L6.1 Noise from the premises must not exceed:

(a) 35dB(A) LAeq(15 minute) during the day (7am to 6pm) Monday to Saturday;

Where LAeq means the equivalent continuous noise level – the level of noise equivalent to the energy-average of noise levels occurring over a measurement period.

7.1 MONITORING OBJECTIVES

The noise measurement procedures employed throughout the monitoring program shall be guided by the requirements of AS 1055-1997 "Acoustics - Description and Measurement of Environmental Noise" and the NSW EPA Noise Policy for Industry (EPA, 2017).

7.2 MONITORING LOCATIONS

The Noise Assessment (ERM, 2009) included seven noise monitoring locations that were used throughout the assessment, based on proximity to nearby potentially sensitive receptors. Given the proximity between monitoring locations and the location of anticipated noise-generating plant and equipment, the monitoring locations have been revised and separated into **primary** and **supplementary** acoustic monitoring locations for the purposes of this NBMP.

Primary and supplementary acoustic monitoring locations are identified in ***Figure 1.3.*** Primary acoustic monitoring locations consist of **locations 2, 4** and **8**, with the remainder consisting of supplementary acoustic monitoring locations.

An agreement was reached with the landowner located along Nimbin Road (previously identified as location 8, ERM 2009) in April 2016, wherein the landowner has agreed to exceedances in noise levels from quarry operations. As such the location has been removed as a primary acoustic monitoring location, and a new monitoring location selected.

Primary monitoring locations will be utilised during noise compliance monitoring and are considered representative in determining compliance with the relevant Conditions of Approval.

7.4 METHODOLOGY

Noise

Operator attended noise measurements shall be conducted at all primary acoustic measurement locations (Locations 2, 4 and 9 - refer ***Figure 1.3***) to quantify and characterise the maximum (LAmax), the energy equivalent (LAeq), and background (LA90) noise levels from ambient noise sources and quarrying operations over a 15 minute measurement period.

The operator shall quantify noise emissions and estimate the LAeq (Period) noise contribution during day time activities from each of the quarrying operations, as well as the overall level of ambient noise.

During attended monitoring, digital recordings will be conducted to allow for additional post analysis of the quarry noise levels and source identification.

All acoustic instrumentation employed throughout the monitoring program shall meet with the requirements of AS 1259.2-1990, "Sound Level Meters".

Instrument calibration shall be checked before and after each measurement survey, with the variation in calibrated levels not exceeding ±0.5 dBA.

7.5 METEOROLOGICAL PARAMETERS

Adverse meteorological conditions have the potential to increase noise levels, for example wind speeds up to 3m/s or temperature inversions, however wind speeds above 5m/s (and rainfall) have the potential to generate extraneous and erroneous noise events, which reduce the accuracy and confidence in measured data.

As such, meteorological parameters will be evaluated prior to undertaking works on site, to gain an understanding of the weather conditions and the potential for variations in noise levels.

All noise measurements shall be accompanied by both qualitative description (including cloud cover, approximate wind direction and speed) and quantitative measurements of prevailing local weather conditions throughout the survey period. Rainfall data will be collected from the rain gauge located on-site. All other weather data for the monitoring period will be purchased from the Bureau of Meteorology (BoM) website for the Lismore Observation Station, which is programmed to continuously record the meteorological parameters as shown in *Table 7.1*.

Table 7.1 Meteorological Measurement Parameters

Measured Parameter	Unit	Sample Interval
Mean Wind Speed	m/s	15 minutes
Mean Wind Direction	degrees	15 minutes
Aggregate Rainfall	Mm	15 minutes
Mean Air Temperature	C°	15 minutes

Modifying Factor Corrections

Factor	Assessment and Measurement	When to Apply	Correction	Comment
Tonal Noise	One-third octave or narrow band analysis.	Level of one-third octave band exceeds the level of the adjacent bands on both sides by: • 5 dB or more if the centre frequency of the band containing the tone is above 400 Hz. • 8 dB or more if the centre frequency of the band containing the tone is 160 to 400 Hz inclusive. • 15 dB or more if the centre frequency of the band containing the tone is below 160 Hz.	5 dB	Narrow-band frequency analysis may be required to precisely detect occurrence.
Low Frequency Noise	Measurement of C-weighted and A-weighted level.	Measure/assess C and A weighted levels over same time period. Correction to be applied if the difference between the two levels is 15 dB or more.	5 dB	C-weighting is designed to be more responsive to low-frequency noise.

The latest project approval by the NSW Department of Planning, Industry and Environment (Mod 3 May 2021) requires the asphalt plant to be included in the noise assessment at receiver locations. Appendix 5 of Mod 3 requires additional assessment of low frequency noise in accordance with Fact Sheet C of the NSW Noise Policy for Industry (EPA,2017).

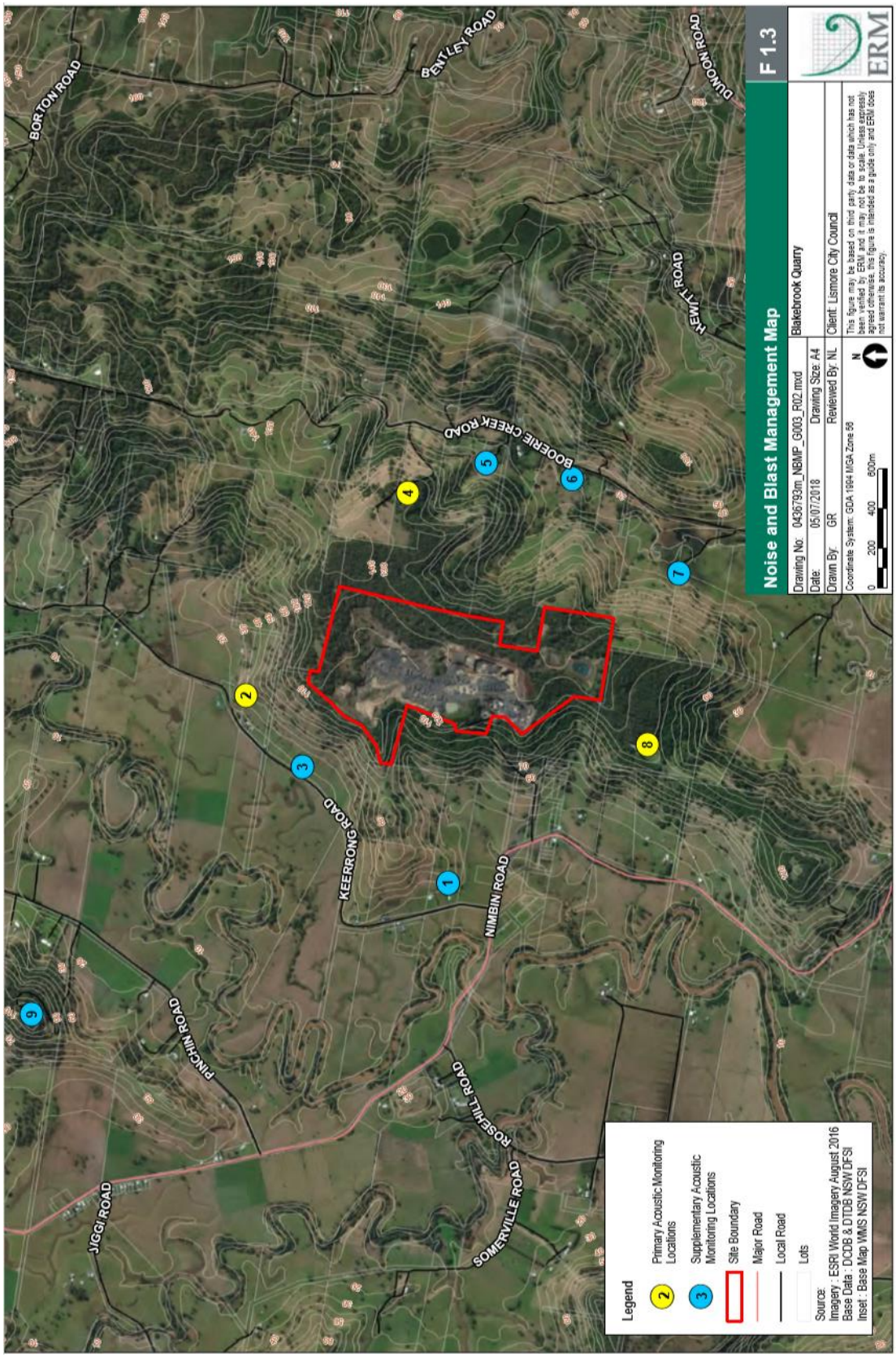
Section 7.4 (Methodology – Noise) in the ERM NBMP v3.1 indicates noise monitoring to be conducted at receiver locations 2, 4 and 9, and refers to figure F1.3. Monitoring was conducted at receiver location 8 instead of Receiver 9 as F1.3 identifies Receiver 8 as the primary receiver and receiver 9 as a supplementary receiver.

Noise monitoring at the receiver locations were conducted within 30m of the residential dwelling in the direction of the quarry.

Table 2.1 Primary Receiver Locations

Receiver	Street Address
2	[redacted]
4	[redacted]
8	[redacted]

Figure 2.1 Noise Monitoring Locations NBMP v3.1



3 MEASUREMENT PROCEDURE AND RESULTS

3.1 INSTRUMENTATION

Table 3.1 Instrumentation		
Instrument	**Serial #**	**Calibration Date**
Brüel and Kjær 2250L G4 Sound Level Meter	3006868	July 2021
Bruel & Kjaer 2250 G4 Sound Level Meter	3008548	Dec 2019, Dec 2021
Brüel and Kjær 2250 G4 Sound Level Meter	3028735	Jan 2020
Bruel & Kjaer 4231 Calibrator	2292735	Jan 2021, Dec 2021

Note : Two of the instruments were sent for calibration between the 2 monitoring days -18th of November and the 16th of December 2021.

The sound level meters (SLM) used during the noise survey conform to Australian Standard 1259 "Acoustics - Sound Level Meters", (1990) as type 1 precision sound level meters, and have an accuracy suitable for both field and laboratory use.
The meters' calibrations were checked before and after the measurement periods with a Bruel & Kjaer acoustic calibrator. No significant system drift occurred over the measurement periods.

The SLMs and calibrator have been checked, adjusted and aligned to conform to the factory specifications and issued with conformance certificates by a certified NATA facility.

3.2 MEASUREMENT PROCEDURE

Measurements were made in general accordance with procedures laid down in:

1. Australian Standard AS 1055 : 2018 ***Acoustics - Description and measurement of environmental noise***

2. The NSW Government *Noise Policy for Industry* (EPA Oct 2017)

The microphone of a B&K 2250 G4 SLM was mounted at a height of 1.5m above the ground and a Bruel and Kjær outdoor windscreen fitted to the microphone. The SLM was located above the cliff face where the working equipment was operating to monitor noise levels while measurements were being conducted at the receiver locations.

The microphone of a B&K 2250L G4 was mounted on a 1.5m high tripod, a Bruel and Kjær outdoor windscreen fitted to the microphone, and located near the asphalt plant to monitor noise levels of the asphalt plant while measurements were being conducted at the receiver locations.

Both SLMs were set to record continuously for the duration of receiver monitoring with 1 second samples. A sound recording was conducted simultaneously.

A third SLM (B&K 2250 G4) was mounted on a 1.2m high tripod and a Bruel and Kjær outdoor windscreen fitted to the microphone. The SLM was used at the receiver locations to monitor noise levels while the quarry and asphalt plant were operating.

A 15 minute period was recorded at each receiver location with A and C weighting, fast response, and 1 second samples with a simultaneous sound recording.

3.3 WEATHER CONDITIONS

Weather conditions were generally good for acoustic measurements. Observations were taken at each receiver location with a Kestrel 3000 pocket weather meter.

Table 3.2 Receivers Weather Summary Nov Dec 2021

Date	Time	Receiver	Temp	Relative Humidity	Wind Speed (m/s)	Wind Dir	Cloud Cover
			°C	%			
18/11/2021	7:45am	2	21	82	Calm		8/8
18/11/2021	9:00am	8	22	75	Calm		8/8
16/12/2021	8:15am	4	21	78	Calm		7/8

Table 3.3 Blakebrook Quarry Local Weather Station

Time	Temp °C	Relative Humidity %	Wind		
			Dir.	Speed	
				(km/h)	(m/s)
18/11/2021					
7:00 AM	17.5	86	E	0	0.0
7:30 AM	18.3	85	E	0	0.0
8:00 AM	18.9	84	ENE	0	0.0
8:30 AM	19.9	82	ESE	0	0.0
9:00 AM	21.7	75	SSE	0	0.0
9:30 AM	23.7	70	ENE	1.6	0.4
16/12/2021					
7:00 AM	17.0	92	---	0	0.0
7:30 AM	17.3	92	E	0	0.0
8:00 AM	18.1	92	SE	0	0.0
8:30 AM	19.6	92	E	0	0.0
9:00 AM	21.7	88	E	0	0.0
9:30 AM	24.2	82	E	0	0.0

3.3 MEASUREMENT RESULTS

Table 3.4 Blakebrook Quarry Measurements Summary Nov Dec 2021									
Measurement Location	**Date**	**Start Time**	**Elapsed Time**	**LAeq [dB]**	**LCeq [dB]**	**LAFmax [dB]**	**LAFmin [dB]**	**LAF10.0 [dB]**	**LAF90.0 [dB]**
Receiver 2	18/11/2021	7:42 AM	0:15:00	50.0	70.0	67.8	31.0	51.7	37.3
Receiver 8	18/11/2021	8:31 AM	0:15:00	41.2	53.4	64.4	35.2	42.3	37.5
Receiver 4	16/12/2021	8:07 AM	0:15:00	39.1	55.8	66.8	31.7	41.6	33.8
Top of Quarry	18/11/2021	6:32 AM	3:40:24	75.6	79.8	89.4	36.9	79.0	57.5
Top of Quarry	16/12/2021	7:00 AM	2:27:22	68.8	74.1	82.7	42.2	72.4	49.3
Asphalt Plant	18/11/2021	6:39 AM	3:38:16	61.8	78.4	90.2	42.8	62.7	60.0
Asphalt Plant	16/12/2021	6:54 AM	2:39:02	63.5	79.0	84.2	53.4	64.5	62.1

Note: The above results are the ambient noise levels and includes noise from the rural surroundings and quarry noise if audible.

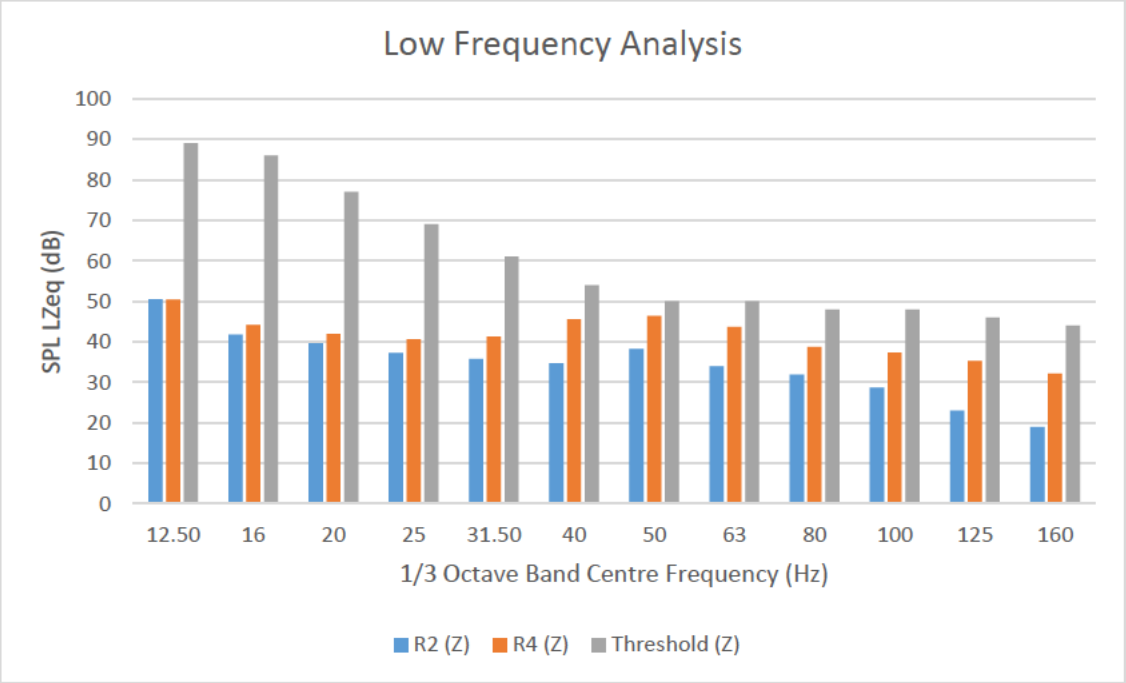
Table 3.5 Noise Observations at Receiver Locations (All measurements 15 mins)				
Receiver	**Date**	**Start Time**	**Observed Noise Sources**	**Quarry Noise**
2	18/11/2021	7:42am	Birds, insects consistent, occasional local traffic on Keerrong Rd, semi trailer on Keerrong Road	Quarry not audible
8	18/11/2021	8:31am	Insects, birds, distant traffic on Nimbin Rd, occasional dog barking, occasional truck on entry haul road	Quarry barely audible. Low frequency of machine just audible at times.
4	16/12/2021	8:07am	Birds, occasional insects, distant aircraft, helicopter	Quarry not audible

3.4 Low Frequency Analysis

The C-A for Receivers 2 and 4 was greater than 15 decibels. Even though the quarry operatios were not audible at these receivers a low frequency analysis is provided as information only.

Table 3.6 Low Frequency Analysis

	Measured A Weighted		Z Correction	Z Weighted		Threshold	Difference	
1/3 Octave band Centre Frequency (Hz)	R2	R4		R2	R4		R2	R4
12.50	-12.9	-13.0	63.4		50.4	89	-38.5	-38.6
16	-15.0	-12.5	56.7	41.7	44.2	86	-44.3	-41.8
20	-10.9	-8.6	50.5	39.6	41.9	77	-37.4	-35.1
25	-7.5	-4.1	44.7	37.2	40.6	69	-31.8	-28.4
31.50	-3.7	1.8	39.4	35.8	41.2	61	-25.3	-19.8
40	0.1	10.9	34.6	34.7	45.5	54	-19.3	-8.5
50	8.0	16.2	30.2	38.2	46.4	50	-11.8	-3.6
63	7.7	17.5	26.2	33.9	43.7	50	-16.1	-6.3
80	9.4	16.2	22.5	31.9	38.7	48	-16.1	-9.3
100	9.6	18.2	19.1	28.7	37.3	48	-19.3	-10.7
125	6.9	19.2	16.1	23.0	35.3	46	-23.0	-10.8
160	5.6	18.8	13.4	19.0	32.2	44	-25.0	-11.9



4 DISCUSSION OF RESULTS

The noise loggers above the quarry and near the asphalt plant indicated that there was consistent quarry and asphalt plant noise during the measurement periods at receiver locations.

Receiver 2 - quarry noise was not audible. The $L_{A90,15min}$ was 37.3 dB(A) and mainly due to consistent insects. The C-A was greater than 15 decibels. The low frequency analysis (Table 3.6 and Chart 3.1) indicates the corrected Z weighted 1/3 octave band noise levels are below the threshold specified in Table C2 in Fact Sheet C of the NSW NPfI.

The $L_{Aeq,15\ min}$ of the quarry operations is estimated to be below 35 dB(A).

Receiver 4 - quarry noise was not audible. Insect noise was consistent. The $L_{A90,15min}$ was 33.8 dB(A). The C-A was greater than 15 decibels. The low frequency analysis indicates the corrected Z weighted 1/3 octave band noise levels are below the threshold specified in Table C2 in Fact Sheet C of the NSW NPfI.

The $L_{Aeq,15\ min}$ of the quarry operations is estimated to be below 33 dB(A).

The resident noted at times the quarry was audible and mainly dependent on the wind.

Receiver 8 - quarry noise was barely audible. Low frequency from quarry machinery was audible at times. The $L_{A90,15min}$ was 37.8 dB(A) and mainly attributed to insects.

The $L_{Aeq,15\ min}$ of the quarry operations is estimated to be below 35 dB(A).

The resident noted that the quarry was audible at times depending on wind conditions and the equipment being used. The resident had noted that recently noise levels were higher for some periods of the day, but were not audible during the noise monitoring.

The asphalt plant is the closest quarry operation to receiver 8. A screener was temporarily located near the asphalt plant which may have attributed to the additional noise level. The screener was not operating during the noise monitoring and has since been located on the quarry pit floor.

The resident also noted that sometimes on start up of the asphalt plant, machinery noise is audible inside the residential dwelling. During a site visit at 9am on the 16th of December the noise was not audible.

Analysis of the logged noise levels of the noise logger at the asphalt plant on the 16th of December showed an increase of approximately 4 decibels in the C weighting, with no change in the A weighting for approximately 15 minutes from 7am. The spectrum data indicated an increase in the 50 Hz 1/3 octave band.

Top of Quarry

Graphs D.4 and D.5 in Appendix D indicates that quarry operations on the pit floor are approximately 6-8 decibels lower on the 16th of December compared to the 18th of November. This is mainly due to machinery (the excavator in particular) operating at a further distance on the 16th of December, from the noise logger located at the top of the quarry.

5 SUMMARY

A noise monitoring survey was conducted to assess compliance of the quarry and asphalt plant operational noise levels at Blakebrook Quarry, Blakebrook, via Lismore NSW. Measurements were undertaken with calibrated noise monitoring equipment on the 18th of November and the 16th of December 2021 and conducted in general accordance with procedures laid down in Australian Standard AS 1055:2018 and the NSW Noise Policy for Industry.

The Blakebrook Quarry operates under EPL No. 3384. Condition L6.1 stipulates that noise from the premises must not exceed 35dB(A) $L_{Aeq,15min}$ during the day (7am to 6pm) Monday to Saturday at residential receiver locations. The current Noise and Blast Management Plan v3.1 (Aug 2018) allows a limit of 36dB(A) $L_{Aeq,15min.}$ at Receiver 2.

The latest project approval by the NSW Department of Planning, Industry and Environment (Mod 3 May 2021) requires the asphalt plant to be included in the noise assessment at receiver locations. Appendix 5 of Mod 3 requires additional assessment of low frequency noise in accordance with Fact Sheet C of the NSW Noise Policy for Industry (EPA,2017).

Measurements were conducted at the 3 primary receiver locations while the quarry and asphalt plant was operating. The quarry and asphalt plant operations were not audible at receiver locations 2 and 4, and occasional low frequency was observed at Receiver 8.

The quarry operational noise levels ($L_{Aeq,15min}$) were not able to be accurately assessed at residential receiver monitoring locations, as the quarry noise was not audible, or barely audible against other noise sources such as distant traffic, insects and birds.

It is estimated from the recorded $L_{A90,15\ min}$ levels, listening to the sound recordings and observations, that the combined quarry and asphalt plant noise levels are below the Project Specific Noise Level of 35 dB(A) $L_{eq,15min}$ at receiver locations 4 and 8, and below the Project Specific Noise Level of 36 dB(A) $L_{eq,15min}$ at receiver location 2.

The current crushing, screening, rock hammering and stock piling operations are on the main pit floor, which provides a substantial noise barrier to receivers. If crushing, screening, rock hammering and stock piling operations change to a higher ground level, then there is potential for increased noise impact at receivers and it is recommended that noise monitoring be conducted at residential receivers.

Receiver 8 is close to the southern cell. It is recommended that noise monitoring be conducted at Receiver 8 when work in the southern cell is undertaken, to assess the noise impact at Receiver 8.

[redacted]

Acoustic Consultant
Ambience Audio Services

APPENDIX A – DEFINITION OF TERMS

Sound pressure level (L_p): A measurable quantity of the size or amplitude of the pressure fluctuations (sound waves) above and below normal atmospheric pressure compared to a reference pressure. Sound pressure levels are measured in decibels whereas sound pressure is measured in pascals (N/m^2).

Decibels (dB): a ratio of energy flows. When used for sound measurement, it is the ratio between a measured quantity of sound pressure and an agreed reference sound pressure. The dB scale is logarithmic and uses the threshold of hearing of 20 μPa (micro pascals) as the reference pressure. This reference level is defined as 0 dB.

Frequency (Hz): The number of pressure variations per second (cycles per second) is called the **frequency** of sound and is measured in **Hertz (Hz)**. The rumble of distant thunder has a low frequency, while a whistle has a high frequency. The normal range of hearing for a healthy young person extends from approximately 20Hz up to 20 000 Hz (20 kHz) while the range from the lowest to highest note on a piano is approximately 27.5 Hz to 4.2 kHz.

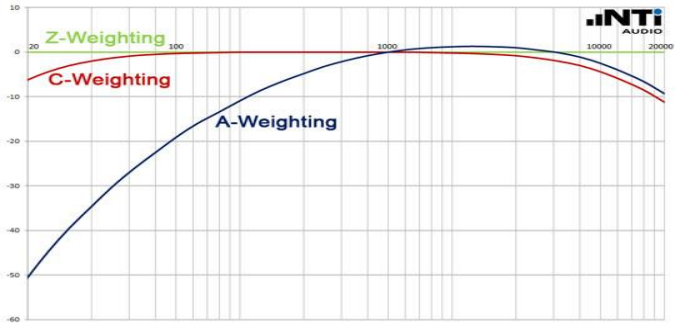
Spectral characteristics: The frequency content of noise.

Octave: a logarithmic unit for ratios between frequencies, with one octave corresponding to a doubling of frequency. For example, the frequency one octave above 40 Hz is 80 Hz.

1/3 Octave: a logarithmic unit of frequency ratio equal to one third of an octave.

"A" frequency weighting: The method of frequency weighting the electrical signal within a noise-measuring instrument to give a very approximate simulate to the human perception of loudness. The symbols for the noise parameters often include the letter "A" (e.g., L_{Aeq}, dBA) to indicate that frequency weighting has been included in the measurement. "A" weighting is most commonly used with regard to noise control issues, regulations and environmental standards.

"C" frequency weighting: The filters used in C weighting captures lower frequencies than A weighting as indicated in the chart below.

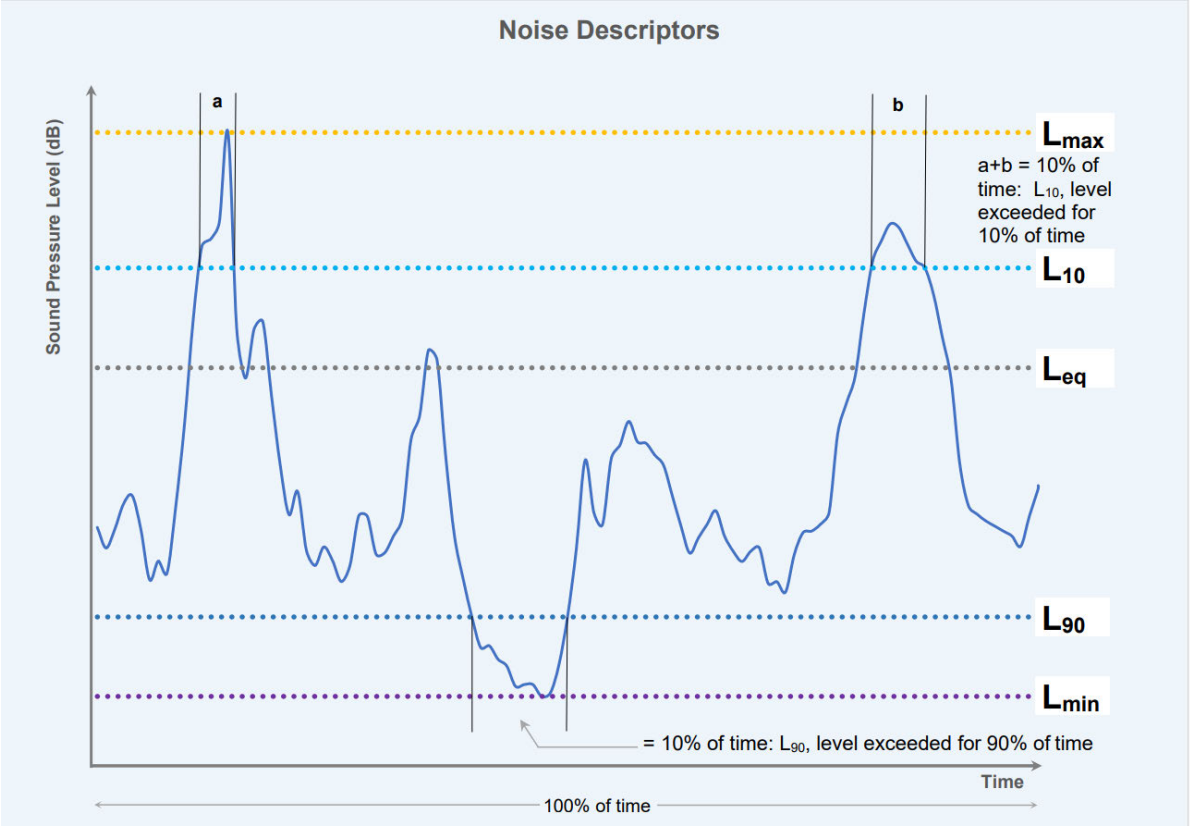


The A-weighting curve is used extensively for general purpose noise measurements but the C-weighting correlates better with the human response to high noise levels.
Fast, Slow and Impulse time weightings: Standardised root-mean-square (rms) averaging times to help define fluctuating noise levels. Impulsive noises have high peak levels with a very short duration (e.g., gun shot), or a sequence of such peaks. The 'Slow' time weighting averages the fluctuations over a one second time base whilst the 'Fast' time weighting averages the fluctuations over a one-eighth of a second time base. Environmental assessment standards usually specify the time weighting (**F**, **S**, or **I**) to be used.

L_{Aeq}: The A-weighted equivalent continuous noise level. A widely used noise descriptor which provides an average of the energy of a constant level of noise which is the same as the varying noise signal being measured. The time in which the measurement was sampled, is indicated with a subscripted number e.g. $L_{Aeq,15\ minute}$ is a 15-minute sample.

Percentile Levels L_N: The sound pressure level that is exceeded for N per cent of the time over which a given sound is measured. e.g. L_{A90} is the A-weighted sound pressure level that is exceeded for 90% of the time over which a given sound is measured.

L_{A90} is commonly used to describe the **background noise level** for community noise assessments.



Ambient noise: The all-encompassing noise associated within a given environment. It is the composite of sounds from many sources, both near and far.

Extraneous noise: Noise resulting from activities that are not typical of the area. Atypical activities may include construction, and traffic generated by holiday periods and by events such as concerts or sporting events. Normal daily traffic is not to be considered extraneous.

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 described using the $\mathbf{L_{A90}}$ descriptor, fast time weighting.

Intrusive Noise: Refers to noise that intrudes above the background level by more than 5 decibels.

Noise limits: Enforceable noise levels that appear in consents and licences. The noise limits are based on achievable noise levels, which the proponent has predicted can be met during the environmental assessment. Exceedance of the noise limits can result in the requirement for either the development of noise management plans or legal action.

References:

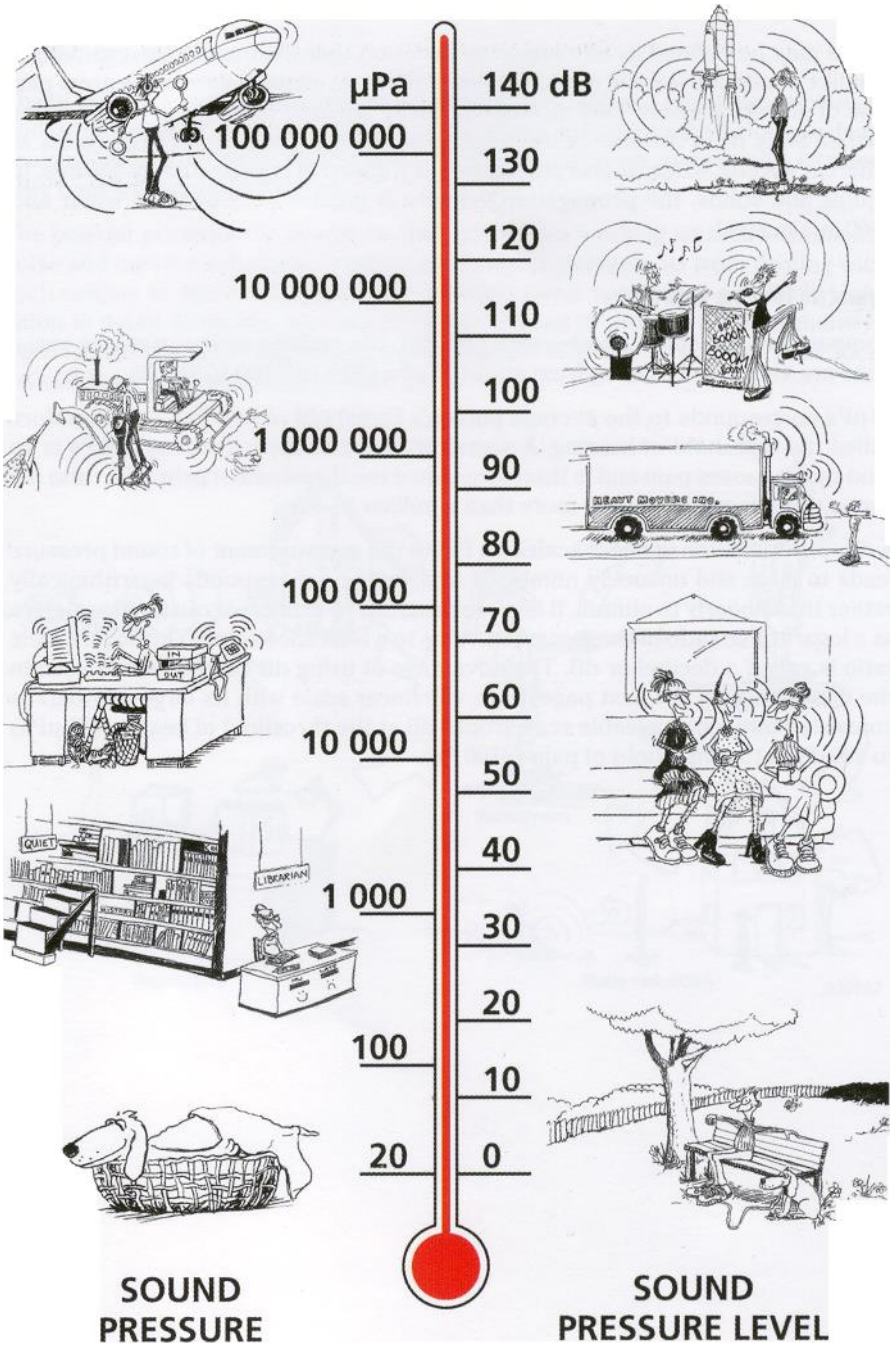
Measuring Sound Brüel and Kjær Sound & Vibration Measurements A/S September 1984

Environmental Noise Brüel and Kjær Sound & Vibration Measurements A/S 2000, 2001

New South Wales Industrial Noise Policy NSW Environment Protection Authority January 2000

https://www.nti-audio.com/en/support/know-how/frequency-weightings-for-sound-level-measurements

APPENDIX B – COMPARISON OF SOUND PRESSURE LEVELS



Our hearing covers a wide range of sound pressures – a ratio of over a million to one. The dB scale makes the numbers manageable.
Reproduced from
Environmental Noise Brüel and Kjær Sound & Vibration Measurements A/S 2000, 2001

APPENDIX C - QUARRY OPERATIONS NOVEMBER, DECEMBER 2021

Image Source – Lismore City Council Online Mapping
Note : Aerial photo not of November\, December 2021 operations
Quarry Pit Floor Operations 18th November 2021

Quarry equipment in use during noise monitoring

1 x Hyundai 520 excavator
1 x Kleeman MC110Z jaw crusher
1 x Powerscreen Warrior 1400 reclaimer
1 x 12/75 hydraulic stockpile
1 x Kleeman MC09S cone crusher
1 x Komatsu 500 loader
1 water truck
various haul trucks
various service vehicles

The mobile asphalt plant was also operating

Quarry Pit Floor Operations 16th December 2021

Quarry equipment in use during noise monitoring

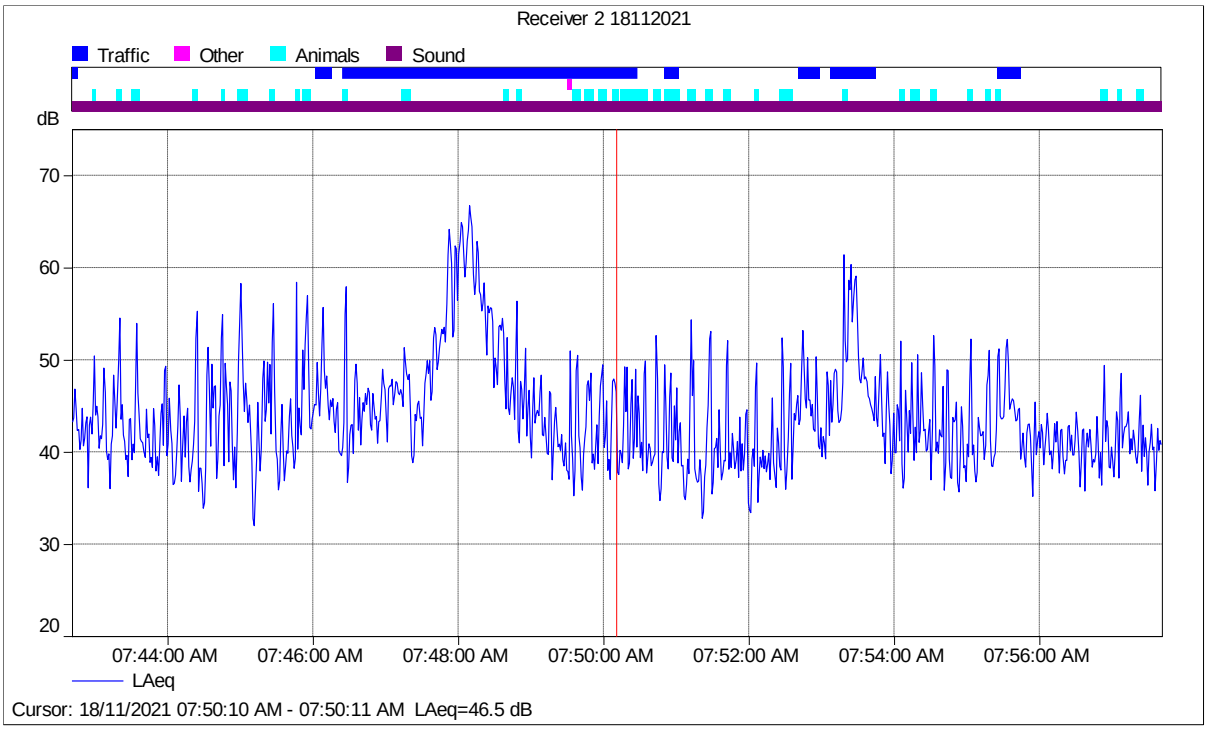
1 x Hyundai 430 excavator
1 x Kleeman MC110Z jaw crusher
1 x Powerscreen Warrior 1400 reclaimer
1 x 16/75 hydraulic stockpile
1 x Precision Screenn 350VSI
1 x Powerscreen Horizon 6203 flat deck screen
1 x Komatsu 500 loader
1 water truck
various haul trucks
various service vehicles

The mobile asphalt plant was also operating

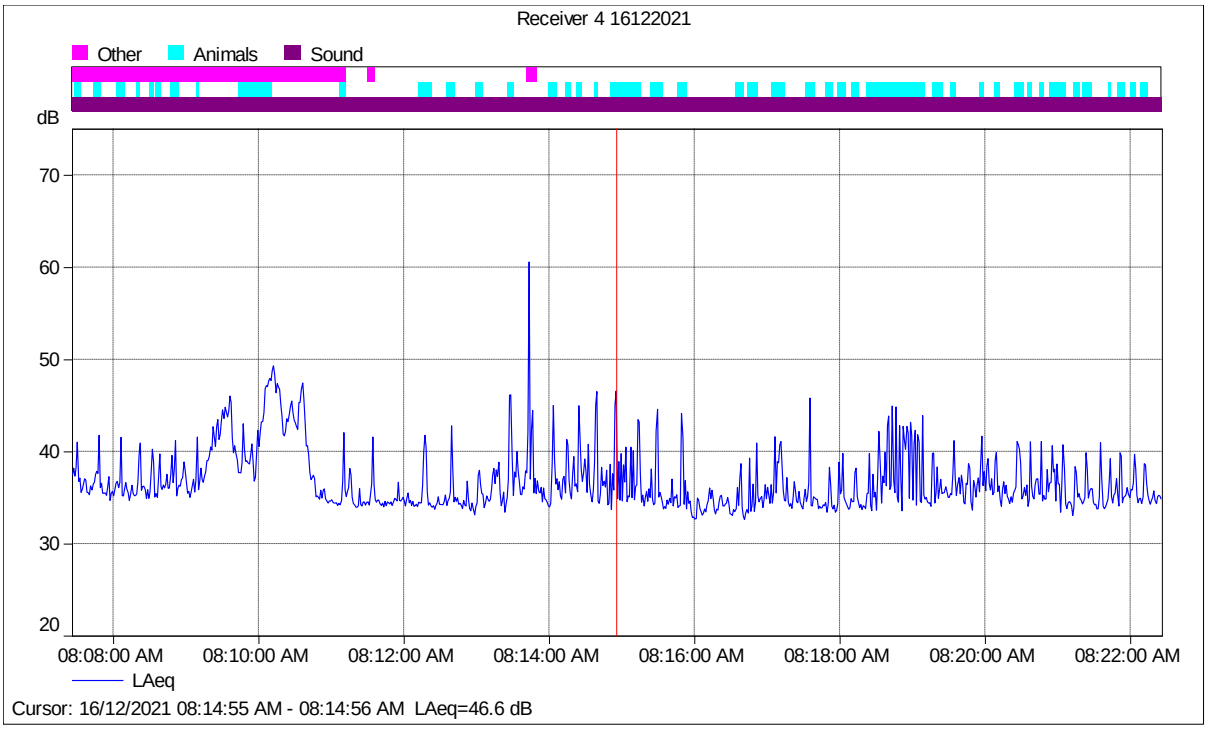
Mobile Asphalt Plant November, December 2021

APPENDIX D - LOGGED NOISE PROFILES

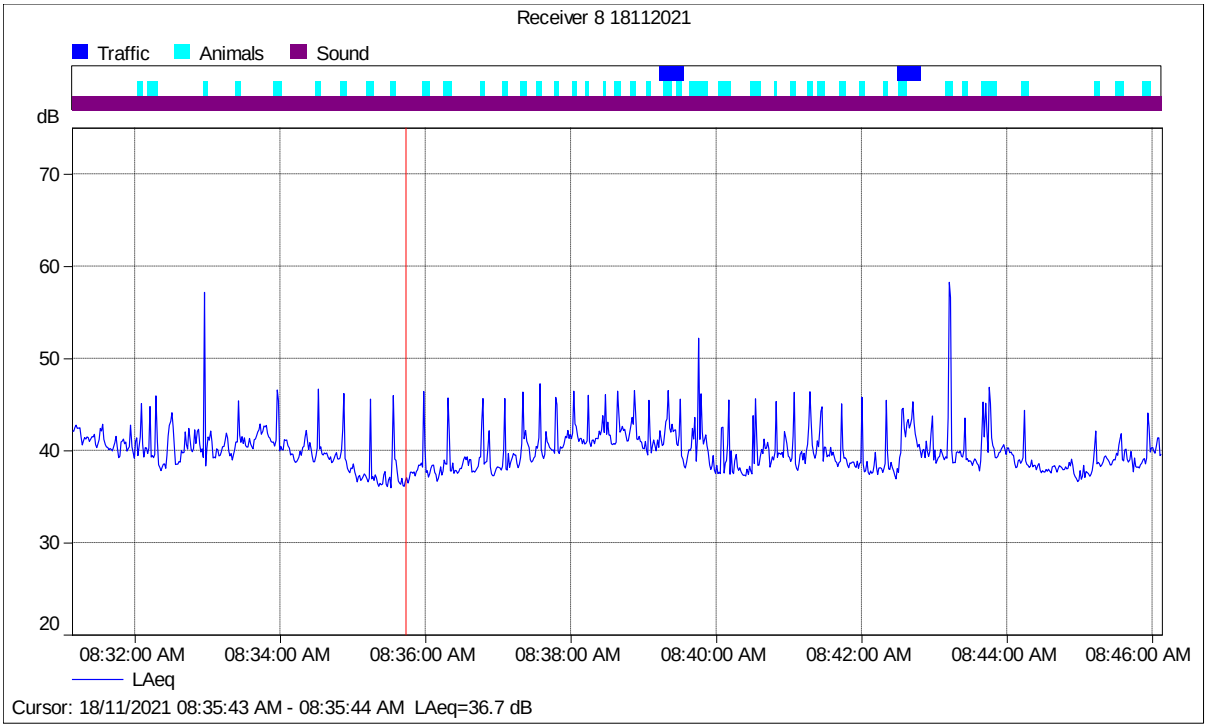
Graph D.1



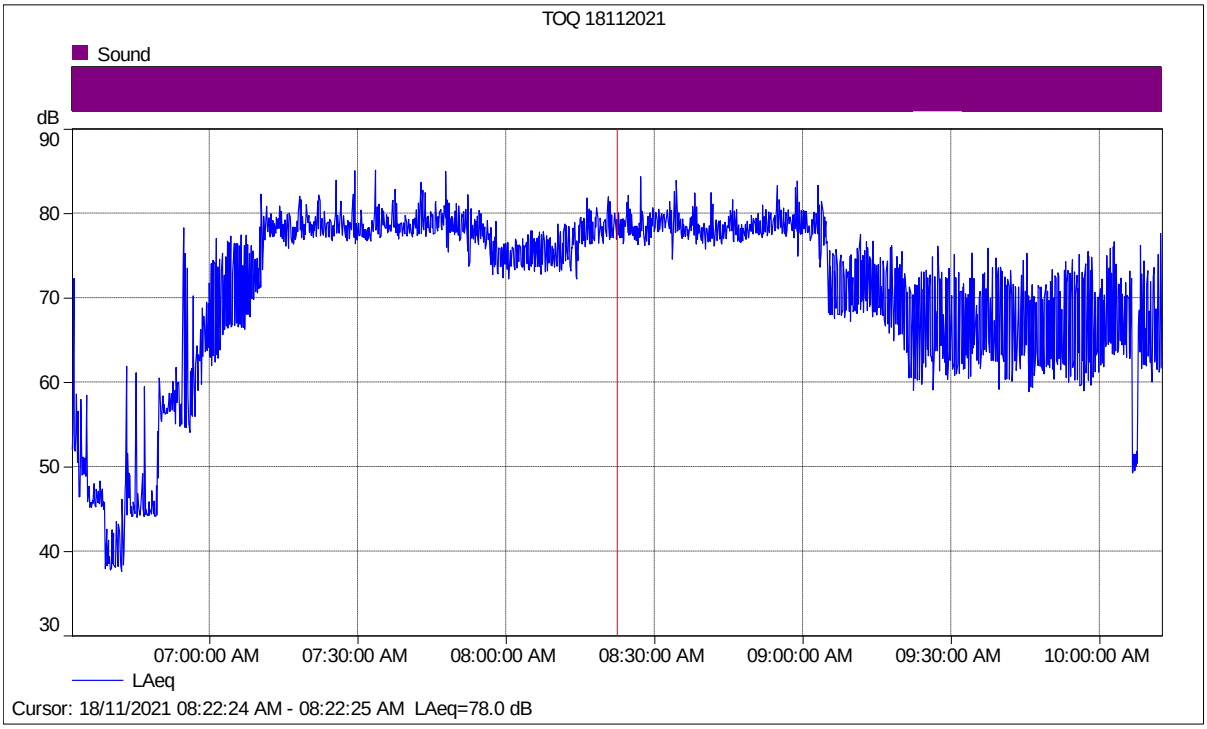
Graph D.2



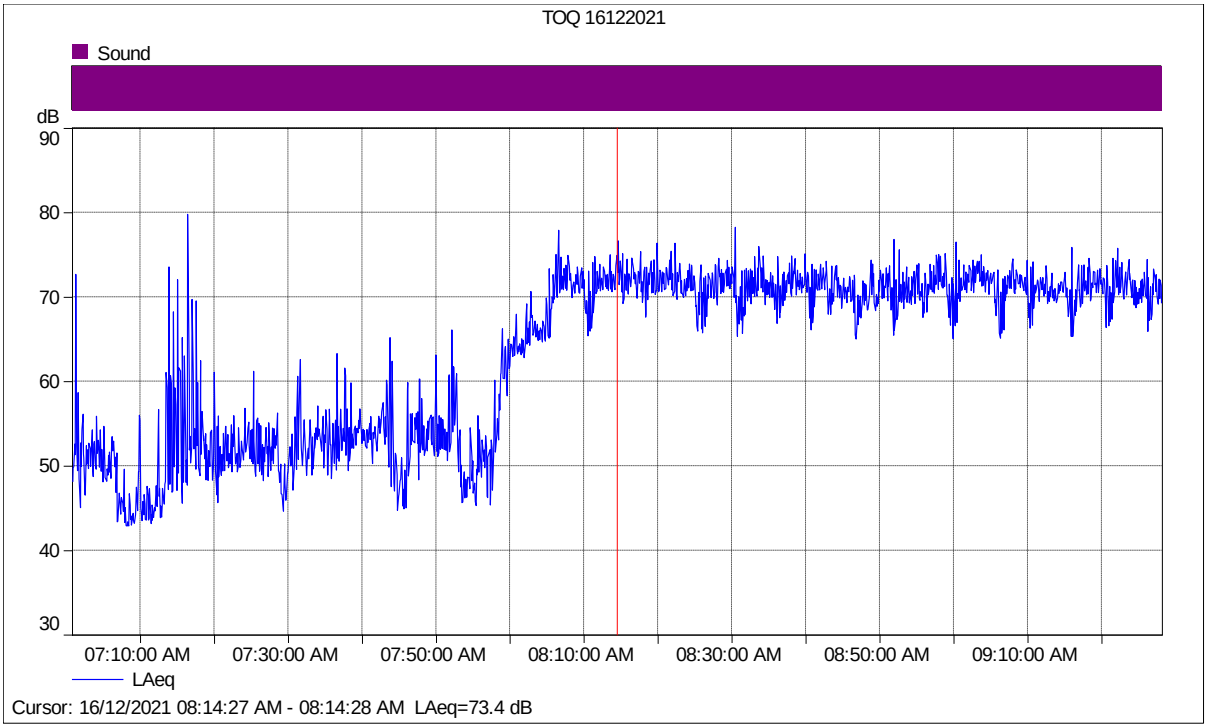
Graph D.3



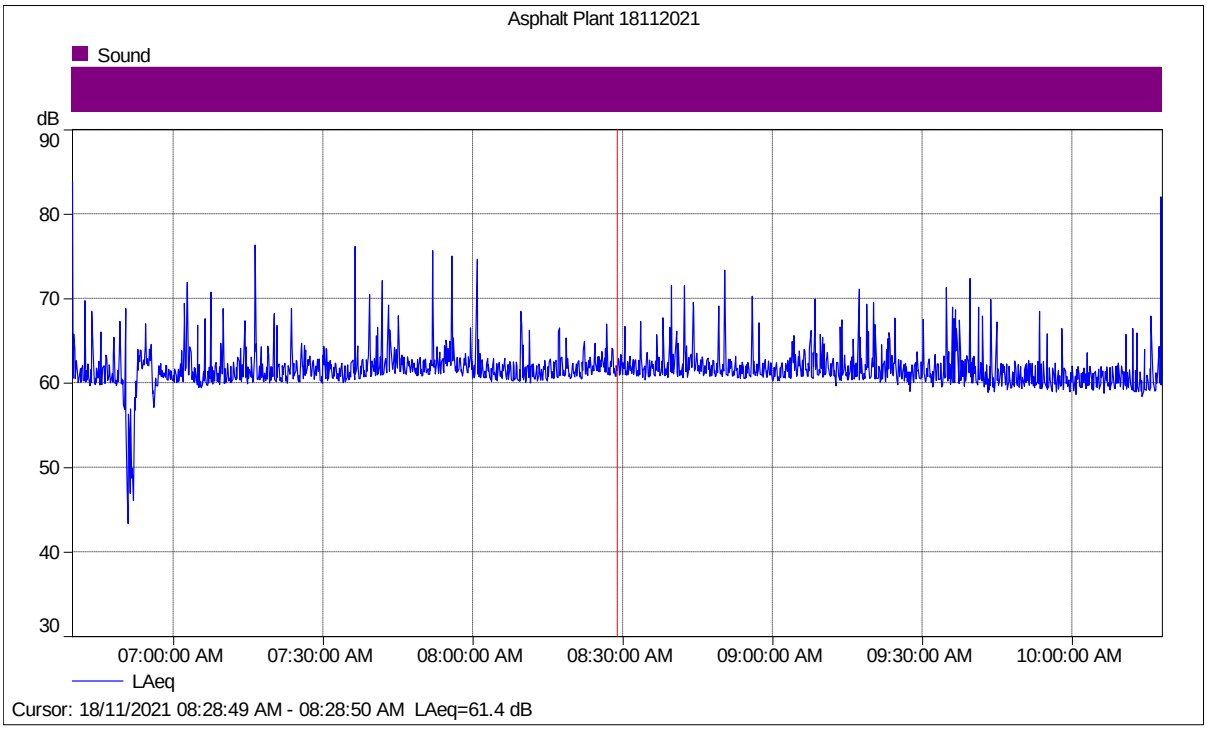
Graph D.4



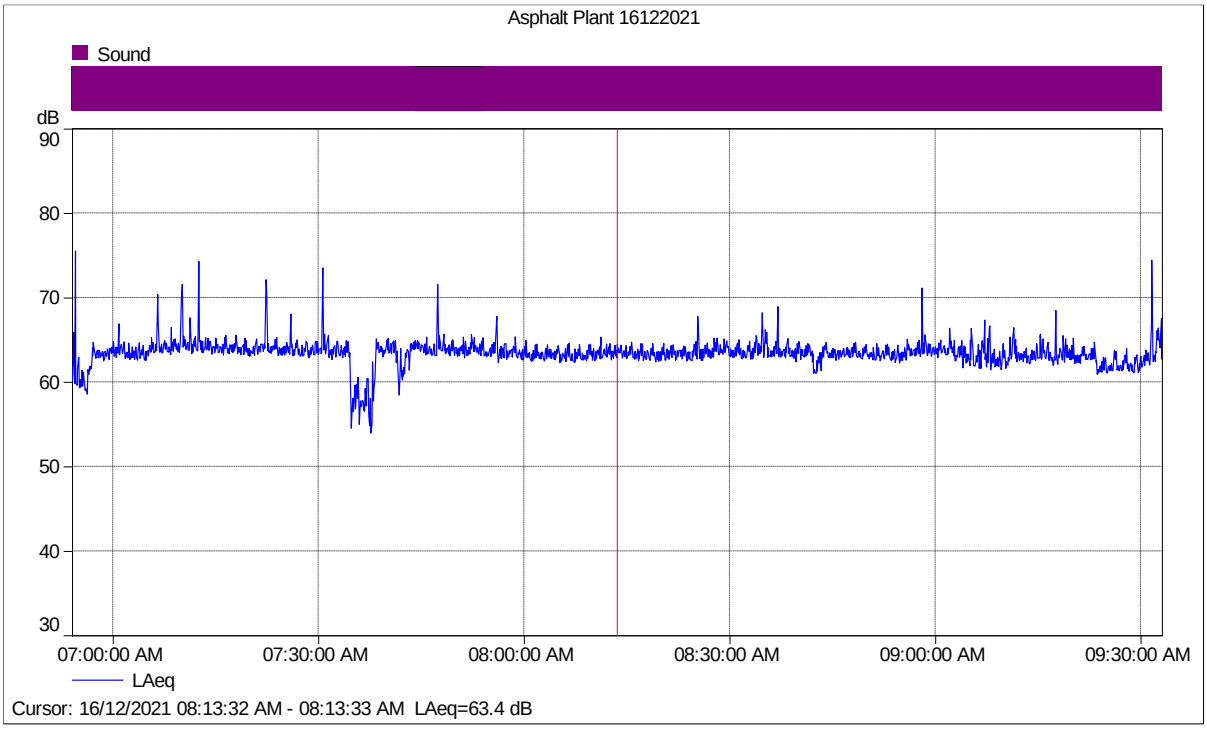
Graph D.5



Graph D.6



Graph D.7


Asphalt Plant 16122021
Sound
dB
90
80
70
60
50
40
30
07:00:00 AM
07:30:00 AM
08:00:00 AM
08:30:00 AM
09:00:00 AM
09:30:00 AM
LAeq
Cursor: 16/12/2021 08:13:32 AM - 08:13:33 AM LAeq=63.4 dB

APPENDIX E – DOCUMENT COMPLIANCE

CoA Condition	Compliance reference
Noise Management Plan 5. The Proponent must prepare a Noise Management Plan for the project to the satisfaction of the Secretary. This plan must: a) be prepared in consultation with the EPA; b) be submitted to the Secretary within 3 months of the determination of Modification 1, unless otherwise agreed by the Secretary; c) describe the measures to be implemented to ensure: • compliance with the noise criteria and operating conditions of this approval; • best practice management is being employed; and • the noise impacts of the project are minimised during meteorological conditions under which the noise criteria in this approval do not apply (see Appendix 5); d) describe the proposed noise management system; and e) include a monitoring program to be implemented to measure noise from the project against the noise criteria in Table 2.	Condition 5.a – *Addressed in section 8. Refer to consultation correspondence Appendix F (a).* Condition 5.b – *Extension granted by DPE refer to Appendix F (b).* Condition 5.c – Addressed in sections 2, 6, 7 (7.5) and 8 Condition 5.d – Addressed in sections 1, 5 and 9 (1-9) Condition 5.e – Addressed in section 7
Blast Management Plan 9. The Proponent must prepare a Blast Management Plan for the project to the satisfaction of the Secretary. This plan must: a) be submitted to the Secretary for approval within 3 months of the determination of Modification 1, unless otherwise agreed by the Secretary; b) describe the measures to be implemented to ensure compliance with the blast criteria and operating conditions of this approval; c) include measures to manage flyrock to ensure the safety or people and livestock and to protect property; d) include a monitoring program for evaluating and reporting on compliance with the blasting criteria in this approval; e) include local community notification procedures for the blasting schedule, in particular to nearby residences; and f) include a protocol for investigating and responding to complaints related to blasting operations.	Condition 9.a – *Extension granted by DPE refer to Appendix F (b).* Condition 9.b – Addressed in sections 5, 6 and 7. Condition 9.c – Addressed in section 6 (6.3). Condition 9.d – Addressed in sections 7, 8 and 9. Condition 9.e – Addressed in sections 2 and 8 (8.6). Condition 9.f – Addressed in section 8 (8.7 & .8.8)

Post Approval Review Table – Appendix G

APPENDIX F – SUPPORTING DOCUMENTS

a) EPA Consultation

RE: REQUEST: EPA Consultation - Blakebrook Quarry EPL3384 - Revised Noise and Blast Management Plan

JH [redacted]@epa.nsw.gov.au>
To [redacted]
Cc

Reply | Reply All | Forward | ...
Wed 13/07/2022 12:39 PM

You replied to this message on 13/07/2022 12:45 PM.
Click here to download pictures. To help protect your privacy, Outlook prevented automatic download of some pictures in this message.

Noise Blast Management Plan - Blakebrook Quarry - June 2022 (tracked changes).docx
11 MB

CAUTION: This email was sent from outside our organisation. Be cautious, particularly with links and attachments unless you recognise the sender and know the content is safe.

Good afternoon [redacted]

The EPA have reviewed the Revised Noise and Blast Management Plan (NBMP) for Blakebrook Quarry (EPL 3384).

After reviewing the NBMP, the EPA have no issues or concerns with the revisions made.

Kind regards,

[redacted]
Operations Officer
Regulatory Operations Regional
NSW Environment Protection Authority
M [redacted]

Right-click or tap and hold here to download pictures. To help protect your privacy, Outlook prevented automatic download of this picture from the Internet.
NSW EPA logo

www.epa.nsw.gov.au @NSW_EPA

b) DPE correspondence

Department of Planning and Environment

[redacted]
Compliance Manager, Commercial Services
Lismore City Council

60 BRUNSWICK STREET
LISMORE NSW 2480

Via email: [redacted]@lismore.nsw.gov.au

Ref: ED22/6741

Dear Ms [redacted]

Blakebrook Quarry - Flood Emergency Request (MP07_0020)
Extension of Time Request

Thank you for your correspondence to the Department of Planning and Environment (the "Department") dated 3 &12 March 2022 seeking an extension of time for the submission of reports required under the conditions of consent and additionally, seeking increased limits on hours of operation, production, and vehicle movements for the Blakebrook Quarry (MP07_0020) to enable Council to repair necessary infrastructure.

The Department acknowledges that the Lismore region and its residents have been significantly impacted by the recent unprecedented flooding and associated impacts to infrastructure. The Department wishes to assist in any way possible to support Council and the community that have been impacted by this tragic event.

Reports and Environmental Management Plans

The Department has considered your request for the extension of time for the submission of the following reports and management plans;

- Annual Environmental Management Review (AEMR); and
- Modification 3 Management Plan revisions (including Site Water Balance)

Accordingly, the Planning Secretary has approved your request for an extension of time until 30 **June 2022** for the submission of the Annual Environmental Management Review, and until 30 **September 2022** for the submission of revised Management Plans required under Modification 3 (including the Site Water Balance).

Increased production limits, hours of operation and vehicle movements

In relation to your request seeking increased hours of operation, production limits, and vehicle movements, the Department provides assurance that it will not take enforcement action for

4 Parramatta Square, 12 Darcy Street, Parramatta NSW 2150 | Locked Bag 5022, Parramatta NSW 2124 | dpie.nsw.gov.au | 1

these exceedances for an initial period of 3 months and will review the Council's circumstances at that time in determining whether this period should be extended.

The Department notes that the Council has committed to the following measures:

- Continue to monitor and record tonnages of quarry products and asphalt leaving the site;
- Continue to monitor and record the number of laden truck movements exiting the site;
- Limit hours of operation wherever possible;
- Record and respond to any complaints; and
- Continue to meet the requirements of management plans and programs.

Additionally, the Department considers that blasting activities at the site should be undertaken within the approved hours unless considered critical for production or for safety reasons (such as a misfire). The Department further requests that the Council conducts engagement with sensitive receivers prior to increasing production, truck movements or conducting operations outside of the approved hours.

Finally, the Department requests that a short monthly summary report be provided during the period of works, outlining the works conducted outside of the limits of consent, whether complaints have been received and the Council's response to such complaints.

Should you wish to discuss the matter further, please contact Mr [redacted] Compliance Officer at the Department on 6670 8657 or [redacted]@planning.nsw.gov.au

Yours sincerely

16-8-2022

[redacted]
Director Compliance
As nominee of the Planning Secretary

APPENDIX G – POST APPROVAL REVIEW COMPLIANCE

Planning, Industry & Environment

Blakebrook Quarry
Post Approval Review

Document: Noise and Blast Management Plan
Revision: Version 4 Dated July 2022
Reviewed: [redacted] on 09 August 2022

Condition of consent		Sufficient (Yes/No/Partial)	Document reference and comment	Action Required
Schedule 3 condition 5	**Noise Management Plan**	N/A		
	The Proponent must prepare a Noise Management Plan for the project to the satisfaction of the Secretary. This plan must	N/A		
	(a) be prepared in consultation with the EPA;	Yes	Section 8.2 Appendix F	
	(b) be submitted to the Secretary within 3 months of the determination of Modification 1, unless otherwise agreed by the Secretary;	Yes	Extension granted to 30 September 2022 Appendix F(b)	
	(c) describe the measures to be implemented to ensure: • compliance with the noise criteria and operating conditions of this approval; • best practice management is being employed; and • the noise impacts of the project are minimised during meteorological conditions under which the noise criteria in this approval do not apply (see Appendix 5);	Yes	Section 2.2 and Section 7	
	(d) describe the proposed noise management system; and	Yes	Sections 6-9	
	(e) include a monitoring program to be implemented to measure noise from the project against the noise criteria in Table 2. The Proponent must implement the Noise Management Plan as approved from time to time by the Secretary.	Yes	Section 7	
Schedule 3 condition 9	**Blast Management Plan**	N/A		
	The Proponent must prepare a Blast Management Plan for the project to the satisfaction of the Secretary. This plan must: (a) be submitted to the Secretary for approval within 3 months of the determination of Modification 1, unless otherwise agreed by the Secretary;	Yes	Extension granted to 30 September 2022 Appendix F(b)	
	(b) describe the measures to be implemented to ensure compliance with the blast criteria and operating conditions of this approval;	Yes	Sections 2.2, 6 and 7.4	
	(c) include measures to manage flyrock to ensure the safety or people and livestock and to protect property;	Yes	6.3	
	(d) include a monitoring program for evaluating and reporting on compliance with the blasting criteria in this approval;	Yes	7, 8, 9	

Planning, Industry & Environment

Blakebrook Quarry
Post Approval Review

Document: Noise and Blast Management Plan
Revision: Version 4 Dated July 2022
Reviewed: [redacted] on 09 August 2022

Condition of consent		Sufficient (Yes/No/Partial)	Document reference and comment	Action Required
	(e) include local community notification procedures for the blasting schedule, in particular to nearby residences; and	Partial	8.6 states 24 hours prior to blasting notification will be provided. Does not describe the procedure.	Please include how they will be notified. Specify the method of notification. LCC Response – contact by phone. included in sections 8.6 & 9.2
	(f) include a protocol for investigating and responding to complaints related to blasting operations. The Proponent must implement the Blast Management Plan as approved from time to time by the Secretary	Yes	Addressed in Sections 8.7 and 8.8	
Schedule 4 condition 1	**NOTIFICATION OF LANDOWNERS**			
	1. As soon as practicable, and no longer than 7 days, after obtaining monitoring results showing: (a) an exceedance of any criteria in Schedule 3, the Proponent must notify the affected landowners in writing of the exceedance, and provide regular monitoring results, at least every 3 months, to each affected landowner until the project is again complying with the relevant criteria;	**No**	Not addressed	Please include notification of exceedance to landowners LCC Response – included into document in sections 2.2 & 9.2
Schedule 5 condition 3	**Management Plan Requirements**			
	The Proponent must ensure that the management plans required under this approval are prepared in accordance with any relevant guidelines, and include: (a) detailed baseline data;	Partial	Baseline data provided for noise, not for blasting. See conditions 3, 4 and 5 of Schedule 4 below.	LCC Response – baseline assessment in section 3.1. *Blasting Noise & Vibration*
	(b) a description of: • the relevant statutory requirements (including any relevant approval, licence or lease conditions); • any relevant limits or performance measures/criteria; and • the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the project or any management measures;	Yes	Addressed in Section 2	
	(c) a description of the measures that to be implemented to comply with the relevant statutory requirements, limits, or performance measures/criteria;	Yes	Addressed in Sections 6 and 7	
	(d) a program to monitor and report on the: • impacts and environmental performance of the project; and • effectiveness of any management measures (see (c) above);	Yes	Addressed in Section 7	

Planning, Industry & Environment

Blakebrook Quarry
Post Approval Review

Document: Noise and Blast Management Plan
Revision: Version 4 Dated July 2022
Reviewed: [redacted] on 09 August 2022

Condition of consent		Sufficient (Yes/No/Partial)	Document reference and comment	Action Required
	(e) a contingency plan to manage any unpredicted impacts and their consequences and to ensure that ongoing impacts reduce to levels below relevant impact assessment criteria as quickly as possible;	Yes	Addressed in Section 9.3	
	(f) a program to investigate and implement ways to improve the environmental performance of the project over time;	Yes	Addressed in Section 9	
	(g) a protocol for managing and reporting any: • incidents; • complaints; • non-compliances with statutory requirements; and • exceedances of the impact assessment criteria and/or performance criteria; and	Partial	Addressed in Section 9. Must include notification to land owners.	Include notification of exceedances to land owners LCC Response – included in section 9.2
	(h) a protocol for periodic review of the plan	Yes	Addressed in Section 9.5 annual review of plan	
Schedule 4 condition 3	**PROPERTY INSPECTIONS** 3. Prior to 30 June 2010, the Proponent must advise all owners of privately-owned land within 2 kilometres of proposed blasting activities, and any other landowner nominated by the Secretary, that they are entitled to a property inspection to establish the baseline condition of the property.	N/A No	Not addressed	Please make reference to any baseline property condition monitoring and how that will be used to evaluate any future impacts. LCC Response – dilapidation surveys were conducted in 2012 (section 3.1)
Schedule 4 condition 4	4. If the Proponent receives a written request for a property inspection from any such landowner, the Proponent must: (a) commission a suitably qualified person, whose appointment has been approved by Secretary, to inspect and report on the condition of any building or structure on the land, and recommend measures to mitigate any potential blasting impacts; and (b) give the landowner a copy of this property inspection report. Note: It is preferable for the property inspection to be carried out prior to the commencement of blasting activities on the site, and the Proponent should facilitate this occurring wherever possible.	No	Not addressed	Please include procedure LCC Response – dilapidation surveys were conducted in 2012 (as per section 3.1). Included in section 6.3 Proposed Mitigation Measures

Planning, Industry & Environment

Blakebrook Quarry
Post Approval Review

Document: Noise and Blast Management Plan
Revision: Version 4 Dated July 2022
Reviewed: [redacted] on 09 August 2022

Condition of consent		Sufficient (Yes/No/Partial)	Document reference and comment	Action Required
Schedule 4 condition 5	**PROPERTY INVESTIGATIONS**	N/A		
	5. If any owner of privately-owned land within 2 kilometres of proposed blasting activities, or any other landowner nominated by the Secretary, claims that his/her property, including vibration-sensitive infrastructure such as water supply or underground irrigation mains, has been damaged as a result of blasting at the project, the Proponent shall within 3 months of receiving this request: (a) commission a suitably qualified person whose appointment has been approved by the Secretary to investigate the claim and prepare a property investigation report; and (b) give the landowner a copy of the report. If this independent investigation confirms the landowner's claim, and both parties agree with these findings, then the Proponent shall repair the damage to the satisfaction of the Secretary. If the Proponent or landowner disagrees with the findings of the independent property investigation, then either party may refer the matter to the Secretary for resolution.	No	Not addressed	Please address in revised plan LCC Response – included in section 8.8 Dispute Resolution Process
Approval of OHWP	**Out of Hours Work Protocol**	N/A		
	Only activities listed in the OHWP must be undertaken	No	Activities are not listed.	Please describe what activities the OHWP allows and during what time periods LCC Response – included in section 2.2
	All activities included in the OHWP must comply with the nominated noise level of 35 dB(A) LAeq (15 minute) for works during the evening and night periods, being the Project Noise Trigger Level for those periods under the NSW Noise Policy for Industry (EPA, 2017) and agreed with the EPA.	Yes	Section 2.2	Remove word 'proposed'. LCC Response - removed
	The quarry Noise Management Plan must be updated with this noise level for the evening and night periods and the plan approved by the Planning Secretary prior to any out of hours works under this approval.	Yes	This plan Section 2.2	
	The additional noise mitigation measures included in Table 2 of the OHWP must be adopted and implemented.	No		Please include additional mitigation measures included in Table 2 od the OHWP LCC Response – additional not already included, now exist in section 1.6 & 6.3

Planning, Industry & Environment

Blakebrook Quarry
Post Approval Review

Document: Noise and Blast Management Plan
Revision: Version 4 Dated July 2022
Reviewed: [redacted] on 09 August 2022

Condition of consent		Sufficient (Yes/No/Partial)	Document reference and comment	Action Required
Approval of OHWP	Written notification of the out of hours work must be provided to the EPA and the surrounding residential landowners at least seven days prior to activities commencing. a. The written notification must: identify the location, duration and activities that would occur outside of the approved hours of operation; and b. provide a telephone contact of the duty site manager during the extended hours.	No	Not addressed	Please include in procedures written notification to EPA and landowners 7 days prior to out of hours work activities commencing. LCC Response – Out of Hours Work procedure included in section 2.2, 6.2 and 8.6
	If any complaint is received, appropriate mitigation measures must be identified for implementation. The Department and the complainant must be informed of the measures that will be implemented to address the complaint. Should any further complaints be received regarding works under the OHWP during the extended hours, this approval may be revoked by the Department.	No	Section 8.7 does not address these actions.	Please include: • Identification of appropriate measures to be implanted • Notification to the department and complainant of the identified measures • Understanding that if further complaints are received the OHWP approval may be revoked by the Department LCC Response – included in section 8.7, 9.1 & 9.2
	A record of any complaints received on works undertaken during the extended hours must be provided to the Department within 24 hours of the complaint.	No	Section 8.7 does not address these actions.	Please include LCC Response – included in section 8.7

General Comments	Action Required
Ensure table of contents and page numbers (and any errors present) are revised prior to publication	
Ensure all figure and table references are correct throughout document	
Ensure all acronyms are defined	

Department of Planning and Environment

Our ref: MP07_0020-PA-29

[redacted]
Compliance Manager
Lismore City Council
60 Brunswick Street
Lismore NSW 2480

20/10/2022

Subject: Noise and Blast Management Plan for Blakebrook Quarry (condition 5 and 9 of Schedule 3 of MP07_0020)

Dear Miss [redacted]

I refer to the Noise and Blast Management Plan (version 4.1, dated September 2022) submitted in accordance with conditions 5 and 9 of Schedule 3 of the approval for the Blakebrook Quarry Project (MP07_0020).

The Department has carefully reviewed the document and is satisfied it meets the relevant requirements of the conditions of consent.

Accordingly, the Planning Secretary has approved the Noise and Blast Management Plan (version 4.1, dated September 2022).

You are reminded that if there is any inconsistency between the approved document and the conditions of approval, then the requirements of the conditions of approval prevail.

Please ensure you make the document and this approval letter publicly available on the project website at the earliest convenience.

If you wish to discuss the matter further, please contact [redacted] on (02) [redacted] or at [redacted]@dpie.nsw.gov.au.

Yours sincerely

[redacted]
Team Leader
Resource Assessments

As nominee of the Planning Secretary