

Annual Noise Monitoring Assessment

Millers Metals Quarry
Wyalong, NSW
October 2023

Prepared for: Regional Quarries Australia Pty Limited
November 2023
MAC231914-04RP1



Document Information

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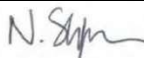

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1 Introduction

Muller Acoustic Consulting Pty Ltd (MAC) has been commissioned by Regional Quarries Australia Pty Limited (Regional Quarries) to complete a Noise Monitoring Assessment (NMA) for the Millers Metals Quarry (the quarry), Wyalong, NSW.

The NMA involved quantifying the noise contribution of the quarry by direct attended measurements to determine quarry noise emissions so that effective management and controls can be implemented where required. It is noted that this assessment has been completed as part of an internal noise management initiative and does not form part of the noise monitoring program to address conditions of the Environmental Protection License (EPL).

The assessment has been conducted in accordance with the following documents:

- NSW Environment Protection Authority (EPA), Noise Policy for Industry (NPI), 2017;
- NSW Environment Protection Authority (EPA's), Approved Methods for the measurement and analysis of environmental noise in NSW, 2022;
- Bland Shire Council West Wyalong, Notice of Determination of Development Application (DA 2020/0004);
- Environment Protection Licence EPL 1379 (EPL);
- Draft Licence Variation, Environment Protection Licence EPL 1379 (EPL);
- Standards Australia AS/NZS IEC 61672.1-2019-Electroacoustics - Sound level meters – Specifications; and
- Standards Australia AS 1055:2018 - Acoustics - Description and measurement of environmental noise - General Procedures.

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

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2 Environmental Protection License Noise Limits

Table 1 reproduces the operational noise limits for the two nearest residential assessed receivers. Noise limits adopted for this NMA are referenced from Section L3 of the Draft Variation EPL.

Table 1 Noise Limits, dBA			
Receivers	Receiver Address ¹	Day Period ²	All other times
		LAeq(15min) ³	
NM1	364 Wargin Road, Wyalong, NSW, 2671	40	35
NM2	381 Wargin Road, Wyalong, NSW, 2671		

Note 1: Receiver addresses are considered the two nearest receivers to Millers Metals Quarry.

Note 2: Day – the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sunday and public holidays; Evening – the period from 6pm to 10pm; Night – the remaining periods.

Note 3: Criteria noise levels refer to Condition L3 of the Millers Metals Quarry EPL #1379.

Conditions stated in Section L3 of the projects Draft Variation Environmental Protection License (EPL #1379) are reproduced below.

L3.1 Noise from the premises must not exceed an Leq (15 minute) noise emission criterion of 40dB(A) during the daytime period (7am to 6pm) and 35dB(A) at all other times.

L3.2 Noise from the premises is to be measured at the nearest affected sensitive receptor not associated with the development to determine compliance with this condition.

It is noted that there are no noise related conditions in the current EPL (EPL #1379) dated 6 August 2020 or in the Notice of Determination of Development Application (DA 2020/0004).

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3 Methodology

3.1 Locality

Millers Metals Quarry is located at 331 Wargin Road, Wyalong, NSW. Receivers in the locality surrounding the quarry are primarily rural/residential. The two nearest residential receivers have been assessed for this NMA and monitoring locations with respect to the quarry are presented in the locality plan shown in **Figure 1**.

3.2 Assessment Methodology

The attended noise survey was conducted in general accordance with the procedures described in Standards Australia AS 1055:2018, "Acoustics - Description and Measurement of Environmental Noise" and the EPL. Measurements were carried out using a Svantek Type 1, 971 noise analyser on Tuesday 10 October 2023. The acoustic instrumentation used carries appropriate and current NATA (or manufacturer) calibration certificates with records of all calibrations maintained by MAC as per Approved Methods for the measurement and analysis of environmental noise in NSW (EPA, 2022) and complies with AS/NZS IEC 61672.1-2019-Electroacoustics - Sound level meters - Specifications. Calibration of all instrumentation was checked prior to and following measurements. Drift in calibration did not exceed ± 0.5 dBA.

Daytime measurements were of 15-minutes in duration. Where possible, throughout each survey the operator quantified the contribution of each significant noise source. Extraneous noise sources were excluded from the analysis to calculate the $L_{Aeq}(15min)$ quarry noise contribution for comparison against the relevant noise criteria.

Prevailing meteorological conditions for the monitoring period were sourced from the nearest Bureau of Meteorology (BoM) station (West Wyalong Airport AWS, NSW, no.50017). Results obtained during non-prevailing meteorological conditions (ie F Class Stability in conjunction with a 2m/s drainage or G Class Stability) are considered not applicable against relevant criteria.

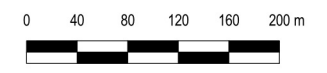
Where the quarry is inaudible, the contribution is estimated to be at least 10dBA below the ambient noise level.



FIGURE 1
LOCALITY PLAN
MAC231914-04
Millers Metals Quarry,
Wyalong, NSW

KEY

- Receivers
- Site Boundary



4 Results

The monitoring and assessment results are presented in individual tables for each assessment location.

4.1 Meteorological Conditions

Weather data for the noise assessment was sourced from the nearest BoM Station (no.50017) as well as operator measured conditions on site at nominated receiver locations. The data was used to determine prevailing meteorological conditions at the time of the attended measurements, which are presented in **Table 2**.

Table 2 Prevailing Meteorological Conditions				
Date & Time	Bureau of Meteorology Station		Operator Measured Weather	
	West Wyalong Airport AWS, NSW (no.50017)		Monitoring Location (1.8m AGL)	
	Wind Direction	Wind (m/s)	Wind Direction	Wind (m/s)
10/10/2023 14:14	SW	7.0	S	2.5
10/10/2023 14:31	WSW	4.6	S	2.5

4.2 Assessment Results - Location NM1

The results of the attended noise measurements at location NM1 for the October 2023 survey are summarised in **Table 3** with the relevant EPL limits, the calculated quarry noise contribution and prevailing meteorological conditions at the time of each measurement.

Table 3 Operator-Attended Noise Survey Results – Location NM1							
Date	Time (hrs)	Descriptor (dBA re 20 µPa)			EPL Limit	Meteorology ¹	Description and SPL, dBA
		L _{Amax}	L _{Aeq}	L _{A90}			
10/10/2023	14:14 (Day)	59	45	40	40	WD: S WS: 2.5m/s Rain: Nil	Birds 36-59 Wind in vegetation 34-42 Quarry Crushing 36-40 (7 minutes)
Millers Metals Quarry L _{Aeq} (15min) Contribution							35

Note 1: Meteorological data obtained from direct measurement by the operator.

4.3 Assessment Results - Location NM2

The results of the attended noise measurements at location NM2 for the October 2023 survey are summarised in **Table 4** with the relevant EPL limits, the calculated quarry noise contribution and prevailing meteorological conditions at the time of each measurement.

Table 4 Operator-Attended Noise Survey Results – Location NM2							
Date	Time (hrs)	Descriptor (dBA re 20 µPa)			EPL Limit	Meteorology ¹	Description and SPL, dBA
		L _{Amax}	L _{Aeq}	L _{A90}			
10/10/2023	14:31 (Day)	58	45	37	40	WD: S WS: 2.5m/s Rain: Nil	Wind in vegetation 32-44 Birds 32-58 Quarry Crushing 32-36 (1 minute)
Millers Metals Quarry L _{Aeq} (15min) Contribution							22

Note 1: Meteorological data obtained from direct measurement by the operator.

5 Discussion

5.1 Discussion of Results - Location NM1

Monitoring conducted on Tuesday 10 October 2023 identified that noise emissions from quarry jaw crushing were audible during the assessment period at location NM1. The estimated quarry contribution was measured at 35dBA, therefore quarry emissions remained below the relevant EPL noise limit of 40dB LAeq(15min). Extraneous sources such as birds and wind in vegetation were audible during the measurement period.

5.2 Discussion of Results - Location NM2

Monitoring conducted on Tuesday 10 October 2023 identified that noise emissions from quarry mobile plant were audible during the assessment period at location NM2. The estimated quarry contribution was measured at 22dBA, therefore quarry emissions remained below the relevant EPL noise limit of 40dB LAeq(15min). Extraneous sources such as birds and wind in vegetation were audible during the measurement period.

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6 Conclusion

Muller Acoustic Consulting Pty Ltd (MAC) has completed a Noise Monitoring Assessment (NMA) on behalf of Regional Quarries Australia Pty Limited. The assessment was completed to provide annual monitoring data so that Millers Metals Quarry can actively quantify and manage site noise emissions.

Attended monitoring conducted on Tuesday 10 October 2023 identified that Millers Metals Quarry noise emissions were audible on both occasions during the attended measurement period. A review of monitoring data and operator attended observations determined that Millers Metals Quarry contributions remained below relevant limits during the monitoring period.

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Appendix A – Glossary of Terms

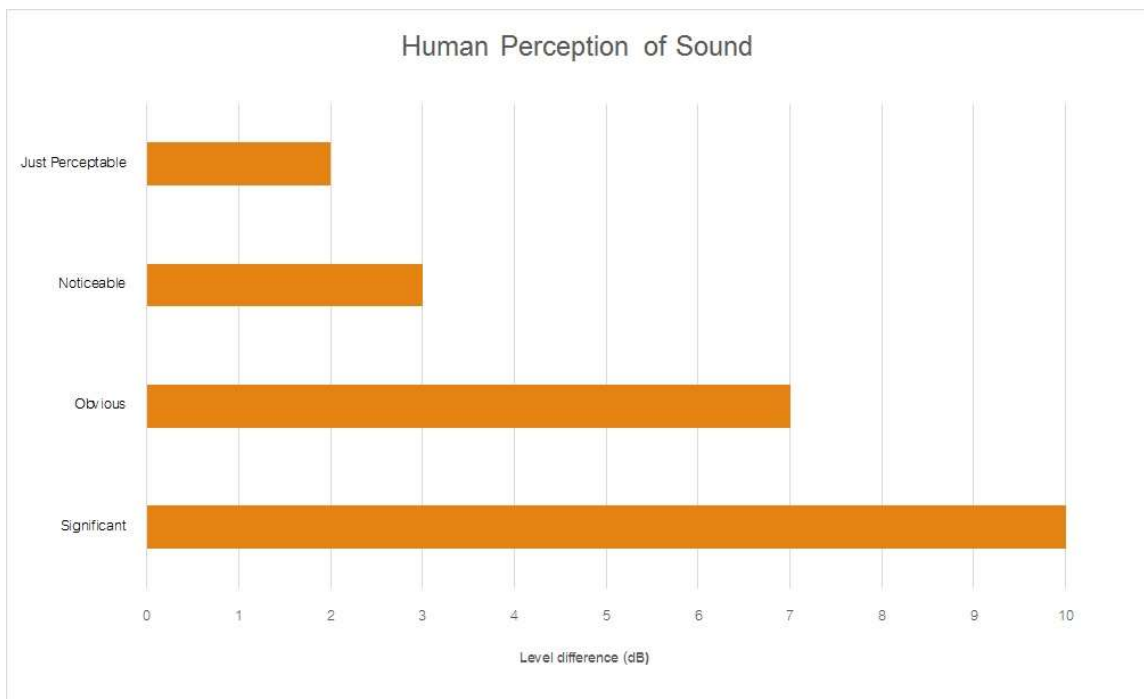
A number of technical terms have been used in this report and are explained in **Table A1**.

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

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

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

Figure A1 – Human Perception of Sound



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