

# Annual Noise Monitoring Assessment

Bylong Quarry  
Bylong, NSW  
October 2023

Prepared for: Regional Quarries Australia Pty Limited  
October 2023  
MAC231914-01RP1V1



# Document Information

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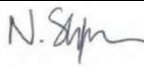

**Prepared by:** Muller Acoustic Consulting Pty Ltd

PO Box 678, Kotara NSW 2289

ABN: 36 602 225 132

P: +61 2 4920 1833

[www.mulleracoustic.com](http://www.mulleracoustic.com)

DOCUMENT ID	DATE	PREPARED	SIGNED	REVIEWED	SIGNED
MAC231914-01RP1V1	26 October 2023	Nicholas Shipman		Oliver Muller	

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APPENDIX A – GLOSSARY OF TERMS

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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 Bylong Quarry (the quarry), Bylong, 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. The monitoring has been conducted in general accordance with Conditions P1.4 and L4.1 to L4.6 of the EPL #20950 at two representative receiver locations, P5 and P6. It is noted that this assessment has been completed as part of an internal noise management initiative to address compliance against noise criteria within 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;
- Environment Protection Licence EPL 20950 (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 assessed receivers referenced from Section L4 of the EPL that have been adopted for this NMA and are consistent with historic EPL monitoring locations.

Table 1 Noise Limits, dBA		
Receivers	Receiver Address <sup>1</sup>	Day, Evening and Night <sup>2</sup>
		LAeq(15min) <sup>3</sup>
P5	"Bylong Station" Lot 154 DP 755421, 5906 Wollar Road, Bylong, NSW, 2849	35
P6	"Murrumbo" Lot 1 DP 843528, 8807 Bylong Valley Way, Murrumbo, NSW, 2849	

Note 1: Receiver address refers to Condition P1.4 of the Bylong Quarry EPL #20950.

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 level refers to Condition L4.1 of the Bylong Quarry EPL #20950.

The subsequent conditions stated in Section L4 of the projects EPL (EPL #20950) are reproduced below.

*L4.3 For the purposes of determining the noise generated at the premises the modification factors in Section 4 of the NSW Industrial Noise Policy must be applied, as appropriate, to the noise levels measured by the noise monitoring equipment.*

*L4.4 The noise limits set out in condition L4.1 apply under all meteorological conditions except for the following:*

- *wind speeds greater than 3 metres/second at 10 metres above ground level; or*
- *stability category F temperature inversion conditions and wind speeds greater than 2 metres/second at 10 metres above ground level; or*
- *stability category G temperature inversion conditions.*

*L4.5 To determine compliance with the LAeq(15 minute) noise limits in condition L4.1, the noise measurement equipment must be located:*

- *approximately on the property boundary, where any dwelling is situated 30 metres or less from the property boundary closest to the premises; or*
- *within 30 metres of a dwelling façade, but not closer than 3 metres where any dwelling on the property is situated more than 30 metres from the property boundary closest to the premises; or, where applicable*
- *within approximately 50 metres of the boundary of a National Park or Nature Reserve*

*L4.6 A non-compliance of L4.1 will still occur where noise generated from the premises in excess of the appropriate limit is measured:*

- *at a location other than an area prescribed by condition L4.4; and/or*
- *at a point other than the most affected point at a location.*

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### 3 Methodology

#### 3.1 Locality

Bylong Quarry is located in the village of Bylong, NSW. Receivers in the locality surrounding the quarry are primarily rural/residential and for consistency the naming conventions for each receiver have been retained from Condition P1.4 of the EPL. The monitoring locations with respect to the quarry are presented in the locality plan shown in **Figure 1**.

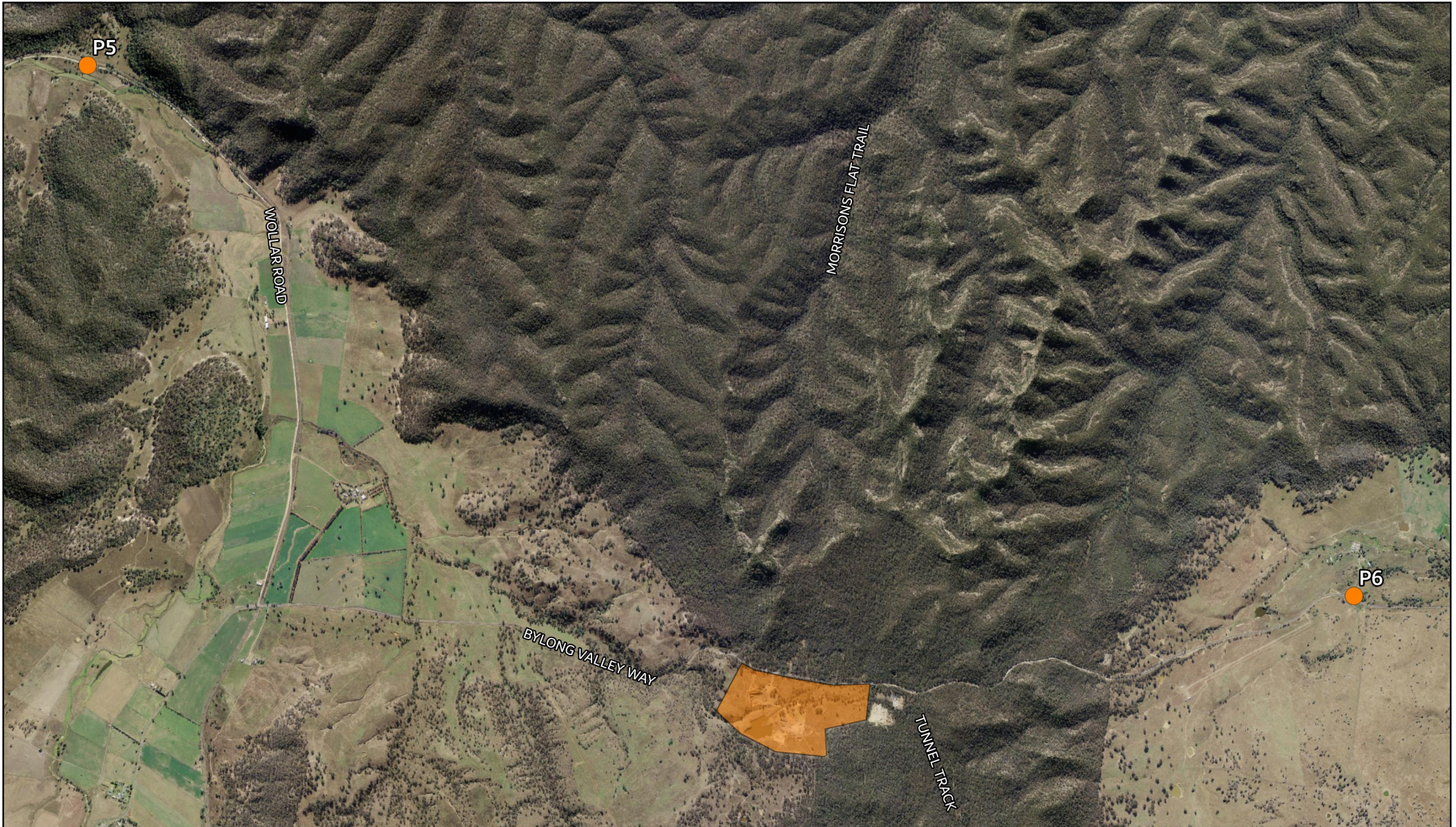
#### 3.2 Assessment Methodology

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 Monday 9 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  $\pm 0.5\text{dBA}$ .

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  $L_{Aeq}(15\text{min})$  quarry noise contribution for comparison against the relevant EPL limit.

Prevailing meteorological conditions for the monitoring period were sourced from the nearest Bureau of Meteorology (BoM) station (Merriwa 'Roscommon', NSW, no. 61287). 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 the EPL criteria.

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



0 500 1,000 1,500 2,000 2,500 3,000 m



**KEY**

- EPL Receiver Locations
- Site Boundary



**FIGURE 1**  
**LOCALITY PLAN**  
 MAC231914-01  
 Bylong Quarry

## 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. 61287) as well as operator measured conditions on site at the EPL 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	
	Merriwa 'Roscommon', NSW (no. 61287)		Monitoring Location (1.8m AGL)	
	Wind Direction	Wind (m/s)	Wind Direction	Wind (m/s)
09/10/2023 11:20	NNW	4.05	E	1.8
09/10/2023 11:52	WNW	2.97	E	1.5

### 4.2 Assessment Results - Location P5

The results of the attended noise measurements at location P5 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 P5							
Date	Time (hrs)	Descriptor (dBA re 20 µPa)			EPL Limit	Meteorology <sup>1</sup>	Description and SPL, dBA
		L <sub>Amax</sub>	L <sub>Aeq</sub>	L <sub>A90</sub>			
09/10/2023	11:52 (Day) <sup>2</sup>	88	66	30	35	WD: E WS: 1.5m/s Rain: Nil	Birds 30-55
							Traffic 28-78
							Wind in vegetation 35-42
							Train 35-88
							Quarry inaudible
Bylong Quarry L <sub>Aeq</sub> (15min) Contribution							
<20							

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

Note 2: Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays.

### 4.3 Assessment Results - Location P6

The results of the attended noise measurements at location P6 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 P6							
Date	Time (hrs)	Descriptor (dBA re 20 µPa)			EPL Limit	Meteorology <sup>1</sup>	Description and SPL, dBA
		L <sub>Amax</sub>	L <sub>Aeq</sub>	L <sub>A90</sub>			
09/10/2023	11:20 (Day) <sup>2</sup>	83	66	29	35	WD: E	Birds 26-40
						WS: 1.8m/s	Wind in vegetation 26-34
						Rain: Nil	Traffic 26-83
							Quarry inaudible
Bylong Quarry L <sub>Aeq</sub> (15min) Contribution							
						<20	

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

Note 2: Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays.

## 5 Discussion

### 5.1 Discussion of Results - Location P5

Monitoring conducted on Monday 9 October 2023 identified that quarry activities remained inaudible during the assessment period at location P5. The estimated quarry contribution was measured at <20dBA, therefore quarry emissions remained below the relevant noise limit of 35dB LAeq(15min). Extraneous sources such as birds, traffic, wind in vegetation and train pass-by were audible during the measurement period.

### 5.2 Discussion of Results - Location P6

Monitoring conducted on Monday 9 October 2023 identified that quarry activities remained inaudible during the assessment period at location P6. The estimated quarry contributions were measured at <20dBA, therefore quarry emissions remained below the relevant noise limit of 35dB LAeq(15min). Extraneous sources such as traffic, wind in vegetation and birds 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 Bylong Quarry can actively quantify and manage site noise emissions.

Attended monitoring conducted on Monday 9 October 2023 identified that Bylong Quarry noise remained inaudible during the attended measurement period. A review of monitoring data and operator attended observations determined that Bylong Quarry contributions remained below relevant limits.

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# Appendix A – Glossary of Terms

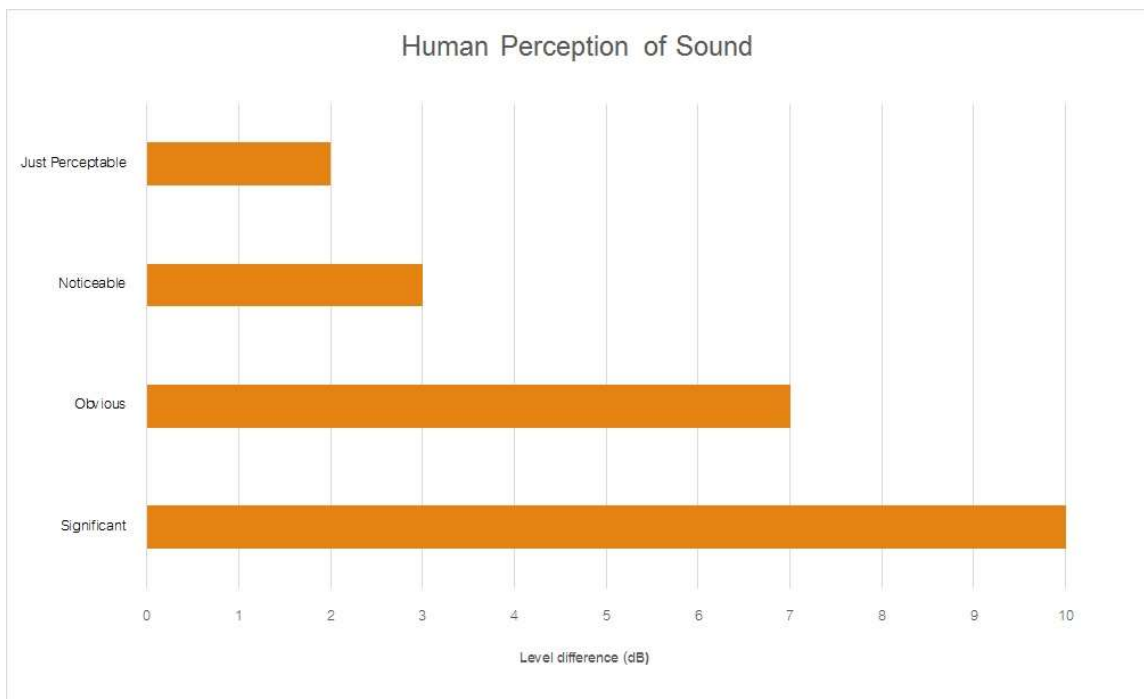
A number of technical terms have been used in this report and are explained in **Table A1**.

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 <sub>ax</sub>	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 <sub>w</sub> 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 <sub>p</sub> or SPL)	the level of sound pressure; as measured at a distance by a standard sound level meter. This differs from L <sub>w</sub> 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



Muller Acoustic Consulting Pty Ltd

PO Box 678, Kotara NSW 2289

ABN: 36 602 225 132

Ph: +61 2 4920 1833

[www.mulleracoustic.com](http://www.mulleracoustic.com)

