RODNEY STEVENS ACOUSTICS
Acoustic Consultants

REPORT R220985R2

Revision 0

Noise Impact Assessment

Temporary Events

13 Saltwater Road, Old Bar

PREPARED FOR:
Paul Cooper Kelly & Co Hotels
13 Saltwater Road,
Old Bar

6 December 2024

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Noise Impact Assessment

Temporary Events

13 Saltwater Road, Old Bar

PREPARED BY:

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DOCUMENT CONTROL

Reference	Status	Date	Prepared	Checked	Authorised
R220985R2	Revision 0	6 December 2024	Desmond Raymond	-	Desmond Raymond

TABLE OF CONTENTS

1 INTRODUCTION

Rodney Stevens Acoustics Pty Ltd (RSA) has been engaged by the Paul Cooper Kelly & Co Hotels to prepare a Noise Impact Assessment for the proposed temporary events at the existing Hotel located at 13 Saltwater Road, Old Bar. This assessment forms part of the supporting documentation for DA submission to Mid-Coast Council.

The purpose of this report is to determine possible noise impacts on nearby receivers and if necessary provide acoustic control recommendations so that the proposed temporary events may operate in an acoustically compliant manner in accordance with Mid-Coast Council's requirements and Liquor and Gaming NSW license conditions.

This report presents RSA's methodology, assessment criteria and recommendations regarding patron noise, music and car park emissions from the operation of the hotel. Noise emission from the alterations and the temporary events be covered in this report. Mechanical services noise emission from the hotel do not form part of this assessment.

Specific acoustic terminology is used in this report. An explanation of common acoustic terms is provided in Appendix A.

2 PROPOSED DEVELOPMENT

2.1 Site Description

The proposal seeks to for the venue to host temporary events adjacent to the hotel. The events include Cultural/Arts Festival, Beer/Wine Festival, Comedy show and Local Live Music. The temporary events will total 20 events per year.

The Old Bar Tavern is located within a rural environment with residential receivers surrounding the site. Figure 2-1 shows an aerial image of the location of the Old Bar Tavern, the surrounding environment and the noise monitoring location.

There are a number of sensitive receivers surrounding the proposed development, these receivers will be affected by noise generated by the proposed development. The following table shows the most affected receivers

Table 2-1 Sensitive Receivers

Receiver	Sensitive Receiver's Address
R1	2 Red Gum Road
R2	1 Saltwater Road
R3	210 Old Bar Road
R4	115 Saltwater Road

2.2 Proposed Development

The proposal is to have temporary events. The patron capacity for each space includes:

- Temporary events 350 patrons

Error! Reference source not found. below show the floor plan of the proposed changes.

2.3 Hours of Operation

It is understood that the Old Bar Tavern has the following hours of operation:

- Monday to Thursday: 10:00 am to 12:00 am
- Friday to Saturday: 10:00 am to 3:00 am
- Sunday: 10:00 am to 10:00 pm

The temporary events will have hours of operation between 10:00 am to 10:00 pm.

Figure 2-1 Site Location

Image Courtesy of Six Maps © 2023

3 BASELINE NOISE SURVEY

3.1 Unattended Noise Monitoring

In order to characterize the existing acoustical environment of the area unattended noise monitoring was conducted between 1st February 2023 and 7th February 2023. The logger was located at the rear of the site away from any noise generating equipment from the hotel, this location is representative of the ambient noise levels of the area.

Logger location was selected with consideration to other noise sources which may influence readings, security issues for noise monitoring equipment and gaining permission for access from residents and landowners.

Instrumentation for the survey comprised of a ARL Ngara Frequency Analyzing Environmental Noise Logger (serial number 878007) fitted with microphone windshield. Calibration of the logger was checked prior to and following measurements. Drift in calibration did not exceed ±0.5 dB(A). All equipment carried appropriate and current NATA (or manufacturer) calibration certificates. The extraneous noise event on 5th February has been removed from the data processing.

The logger determines L_{A1}, L_{A10}, L_{A90} and L_{Aeq} levels of the ambient noise. L_{A1}, L_{A10}, L_{A90} are the levels exceeded for 1%, 10% and 90% of the sample time respectively (see Glossary for definitions in Appendix A).

Detailed results at the monitoring location are presented in graphical format in Appendix B. The graphs show measured values of L_{A1}, L_{A10}, L_{A90} and L_{Aeq} for each 15-minute monitoring period.

3.2 Data Processing

In order to establish the ambient noise criteria of the area, the data obtained from the noise logger has been processed in accordance with the procedures contained in the NSW Environmental Protection Authority's (EPA) *Noise Policy for Industry* (NPfI, 2017) to establish representative noise levels that can be expected in the residential vicinity of the site. The monitored baseline noise levels are detailed in Table 3-1.

Table 3-1 Measured Baseline Noise Levels Corresponding to Defined NPfI Periods

Location	Measurement Descriptor	Measured Noise Level – dB(A) re 20 µPa		
		Daytime 7 am - 6 pm	Evening 6 pm – 10 pm	Night-time 10 pm – 7 am
On site	L_{Aeq}	57	54	52
	RBL (Background)	46	43	45

Notes: All values expressed as dB(A) and rounded to nearest 1 dB(A);

L_{Aeq} Equivalent continuous (energy average) A-weighted sound pressure level. It is defined as the steady sound level that contains the same amount of acoustic energy as the corresponding time-varying sound.

L_{A90} Noise level present for 90% of time (background level). The average minimum background sound level (in the absence of the source under consideration).

4 NOISE CRITERIA

4.1 Temporary Events Criteria

Noise Guide for Local Government aims to provide practical guidance to council officers in the day-to-day management of local noise problems and in the interpretation of existing policy and legislation.

It focuses on how to assess and manage noise issues dealt with by council officers, such as neighbour-to-neighbour problems and those resulting from commercial or industrial premises.

Importantly, the Guide is also aimed at planners. It outlines planning considerations that can have a significant bearing on prevention of future noise problems.

The Guide is advisory in nature, and council officers are encouraged to use it to develop council procedures or policy to deal with noise issues relevant to local circumstances.

Section 3.2 of the guide provides a case study for open air concerts for crowds greater than 200 people. The guide states:

To avoid a repeat of the previous year's complaints council had developed and released a Management of Outdoor Entertainment Events Policy. This policy specified that all events must finish at midnight, that the LAmax noise level from the concert activities must not exceed 75 dB(A) at the nearest residential boundary and listed a range of management measures that the organisers should take to minimise the noise outside the venue.

From the above guide, the operation noise criteria for the temporary events is therefore derived to be L_{Amax} 75 dB(A).

5 NOISE IMPACT ASSESSMENT

5.1 Typical Patron Vocal Levels

The following sections summarise the results of patron and music noise assessment and predicted levels at nearby receivers as a result of the operation of the proposed alterations and additions (see Figure 2-1).

Calculations of the amount of noise transmitted to these receivers from the proposed licensed venue have been based on voice levels as referenced in the AAAC Licensed Premises Noise Assessment Technical Guide V2.0. This document provides voice spectrums in different vocal efforts at 1 meter from the talker on axis of the mouth. The spectrum is given in Table 5-1.

Table 5-1 Speech Spectrums - AAAC Licensed Premises Noise Assessment Technical Guide V2.0.

Type	Lzeq at 1m (dB) Octave Band Centre Frequency (Hz)							
	125	250	500	1 k	2 k	4 k	8 k	Overall dB(A)
Male (Normal)	47	56	58	52	48	44	39	58
Male (Raised)	56	63	65	62	57	52	46	66
Male (Loud)	59	67	73	72	67	62	53	76

5.2 Patron Sound Power Levels

Based on the maximum number of patrons in all areas as shown in Section 2.2, the following worst-case operational scenarios have been assumed for our assessment:

- Only 50% of all patrons per room will be talking at any given time, this is assuming that 1 person will be talking and 1 person will be listening.
- A total of 350 patrons in the temporary events

The spectra have been scaled based upon the overall number of patrons expected to be in the respective areas at any given time.

Table 5-2 Sound Power Levels of People talking with Raised Voice - Lw – dB

Scenario	Resultant Sound Power Level per Octave Band (dB)							
	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz
175 Patrons with Raised Vocal in the Temporary Events	88	95	98	94	90	84	78	88

It is generally agreed that the human voice is not capable of producing noise at 32 Hz and 63Hz octave bands at significant amplitudes. It is also very likely that even if noise emission in this low frequency octave bands exceeds the noise criterion; it will be very close to, if not below, the human threshold of hearing at the receivers.

Appropriate sound power levels conversations have been made for the varying distribution number of patrons.

5.3 Music Sound Power Level

RSA has conducted measurements of background music noise levels at various licensed venues, based on these measurements the sound power level spectrum of typical music is shown in Table 5-3 below:

Table 5-3 Typical Sound Power Level of Typical Music - Lw – dB

Scenario	Resultant Sound Power Level per Octave Band (dB)								
	31.5Hz	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz
Typical Background Music	70	79	87	84	79	82	80	78	71
Typical Live Band	93	103	103	102	104	97	91	90	87

The following figure shows the proposed development in relation to the most affected receivers.

Figure 5-1 Affected Receiver Locations

The site is surrounded by residential receivers as indicated on the figure above.

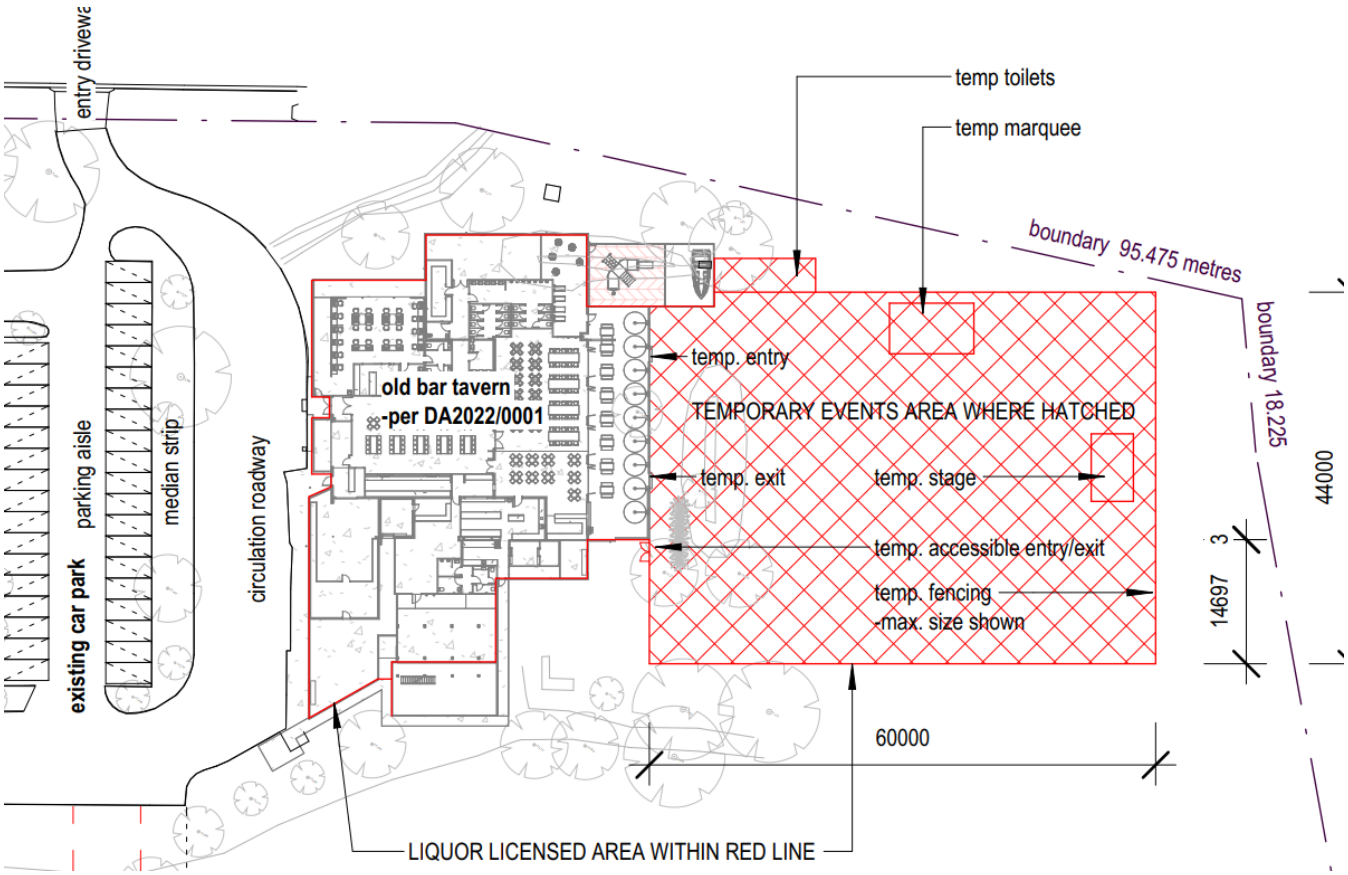
The resulting noise levels from the operation of the temporary events are presented in the table below, we have assumed the worst case scenario were the live music, bistro and the beer garden are operating simultaneously and at full capacity.

5.4 Predicted Noise Impacts – Temporary Events

The proposal also seeks to for the venue to host temporary events adjacent to the hotel. The events include Cultural/Arts Festival, Beer/Wine Festival, Comedy show and Local Live Music. The temporary events will total 30 events per year. The temporary events will have a maximum of 350 patrons with music being played through a PA system.

The layout of the events including the stage is presented in the figure below.

Figure 5-2 Temporary Event Layout



Predictive resultant noise spectrums have been calculated for the temporary events. Noise emissions at the nearest receivers are presented in the tables below. The predicted noise calculations take into account the following:

- A worst case scenario of:
  - The event being at capacity with 350 patrons
  - Live Entertainment performing on the stage (see Figure 5-2)
- Heights of receivers are assumed to be 1.5 m above their respective floor level.
- Patron noise levels as per Table 5-2
- Live music having a maximum noise level of L_p 85 dBA
- Resulting noise levels have been calculated to the most affected point on the boundary of the affected receivers
- Sensitive receive location as per Figure 5-1

Table 5-4 Predicted Noise Impact Levels – Temporary Events

Receiver	*Time Period*	Calculated Noise Level L_{Amax} – dB(A)	Criteria	Compliance
R1	10:00 am to 10:00 pm	L_{Amax} 45 dB(A)	L_{Amax} 75 B(A)	Yes
R2		L_{Amax} 42 B(A)		Yes
R3		L_{Amax} 51 dB(A)		Yes
R4		L_{Amax} 42 dB(A)		Yes

Based on the predicted noise levels from the temporary events, the predicted noise levels comply with the established noise criteria with the implementation of the following noise control measures.

6 RECOMMENDATIONS

The noise emissions from the proposed alterations to the Hotel and the temporary event have the potential to comply with the required criteria with the implementations of the following recommendations:

6.1 Temporary Events

- A noise limiter is to be installed to ensure the live music does not exceed 80 dB(A) at 1 meter from the speakers. All amplified equipment must be connected to the limiter.
- PA system should be designed to have multiple speakers surrounding the audience area rather than having two large speakers. This is to ensure music coverage while maintaining acoustic compliance from the PA system.
- All events are to cease at 10:00 pm
- Any power generators should be placed away from the event boundaries.

7 CONCLUSION

A noise impact assessment has been conducted in relation to the operation of the the temporary events at the Old Bar Tavern located at 13 Saltwater Road, Old Bar.

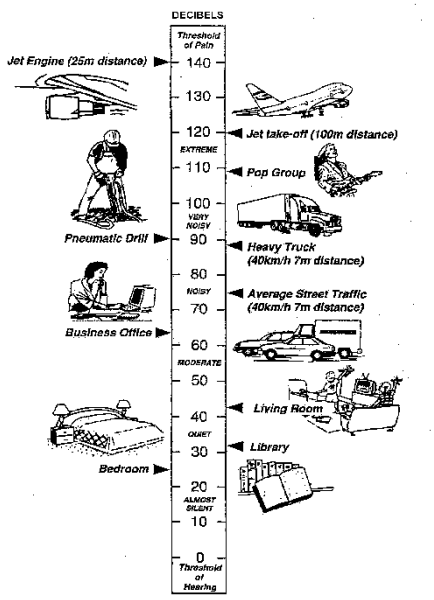
This assessment has been conducted and appropriate noise emission criteria have been established in accordance with the Noise Guideline for Local Government.

This report shows compliance with the specific noise criteria with the implementation of the recommendations provided in this report. It is therefore recommended that planning approval be granted for the temporary events on the basis of acoustics.

Appendix A – Acoustic Terminology

A-weighted sound pressure	The human ear is not equally sensitive to sound at different frequencies. People are more sensitive to sound in the range of 1 to 4 kHz (1000 – 4000 vibrations per second) and less sensitive to lower and higher frequency sound. During noise measurement an electronic '*A-weighting*' frequency filter is applied to the measured sound level *dB(A)* to account for these sensitivities. Other frequency weightings (B, C and D) are less commonly used. Sound measured without a filter is denoted as linear weighted dB(linear).
Ambient noise	The total noise in a given situation, inclusive of all noise source contributions in the near and far field.
Community annoyance	Includes noise annoyance due to: ▪ character of the noise (e.g. sound pressure level, tonality, impulsiveness, low-frequency content) ▪ character of the environment (e.g. very quiet suburban, suburban, urban, near industry) ▪ miscellaneous circumstances (e.g. noise avoidance possibilities, cognitive noise, unpleasant associations) ▪ human activity being interrupted (e.g. sleep, communicating, reading, working, listening to radio/TV, recreation).
Compliance	The process of checking that source noise levels meet with the noise limits in a statutory context.
Cumulative noise level	The total level of noise from all sources.
Extraneous noise	Noise resulting from activities that are not typical to 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.
Feasible and reasonable measures	Feasibility relates to engineering considerations and what is practical to build; reasonableness relates to the application of judgement in arriving at a decision, taking into account the following factors: ▪ Noise mitigation benefits (amount of noise reduction provided, number of people protected). ▪ Cost of mitigation (cost of mitigation versus benefit provided). ▪ Community views (aesthetic impacts and community wishes). ▪ Noise levels for affected land uses (existing and future levels, and changes in noise levels).
Impulsiveness	Impulsive noise is noise with a high peak of short duration or a sequence of these peaks. Impulsive noise is also considered annoying.

Low frequency	Noise containing major components in the low-frequency range (20 to 250 Hz) of the frequency spectrum.
Noise criteria	The general set of non-mandatory noise levels for protecting against intrusive noise (for example, background noise plus 5 dB) and loss of amenity (e.g. noise levels for various land use).
Noise level (goal)	A noise level that should be adopted for planning purposes as the highest acceptable noise level for the specific area, land use and time of day.
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. Exceedance of the noise limits can result in the requirement for either the development of noise management plans or legal action.
Performance-based goals	Goals specified in terms of the outcomes/performance to be achieved, but not in terms of the means of achieving them.
Rating Background Level (RBL)	The rating background level is the overall single figure background level representing each day, evening and night time period. The rating background level is the 10^{th} percentile min L_{A90} noise level measured over all day, evening and night time monitoring periods.
Receptor	The noise-sensitive land use at which noise from a development can be heard.
Sleep disturbance	Awakenings and disturbance of sleep stages.
Sound and decibels (dB)	Sound (or noise) is caused by minute changes in atmospheric pressure that are detected by the human ear. The ratio between the quietest noise audible and that which should cause permanent hearing damage is a million times the change in sound pressure. To simplify this range the sound pressures are logarithmically converted to decibels from a reference level of 2 x 10-5 Pa. The picture below indicates typical noise levels from common noise sources.



dB is the abbreviation for decibel – a unit of sound measurement. It is equivalent to 10 times the logarithm (to base 10) of the ratio of a given sound pressure to a reference pressure.

Sound power Level (SWL)

The sound power level of a noise source is the sound energy emitted by the source. Notated as SWL, sound power levels are typically presented in *dB(A)*.

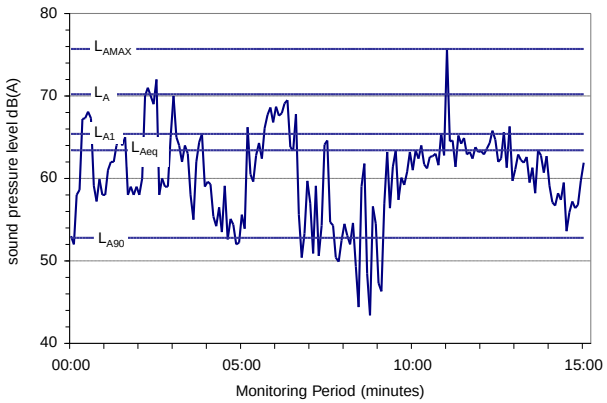
Sound Pressure Level (SPL)

The level of noise, usually expressed as SPL in *dB(A)*, as measured by a standard sound level meter with a pressure microphone. The sound pressure level in *dB(A)* gives a close indication of the subjective loudness of the noise.

Statistic noise levels

Noise levels varying over time (e.g. community noise, traffic noise, construction noise) are described in terms of the statistical exceedance level.

A hypothetical example of A weighted noise levels over a 15 minute measurement period is indicated in the following figure:



Key descriptors:

L_{Amax} Maximum recorded noise level.

L_{A1} The noise level exceeded for 1% of the 15 minute interval.

L_{A10} Noise level present for 10% of the 15 minute interval. Commonly referred to the average maximum noise level.

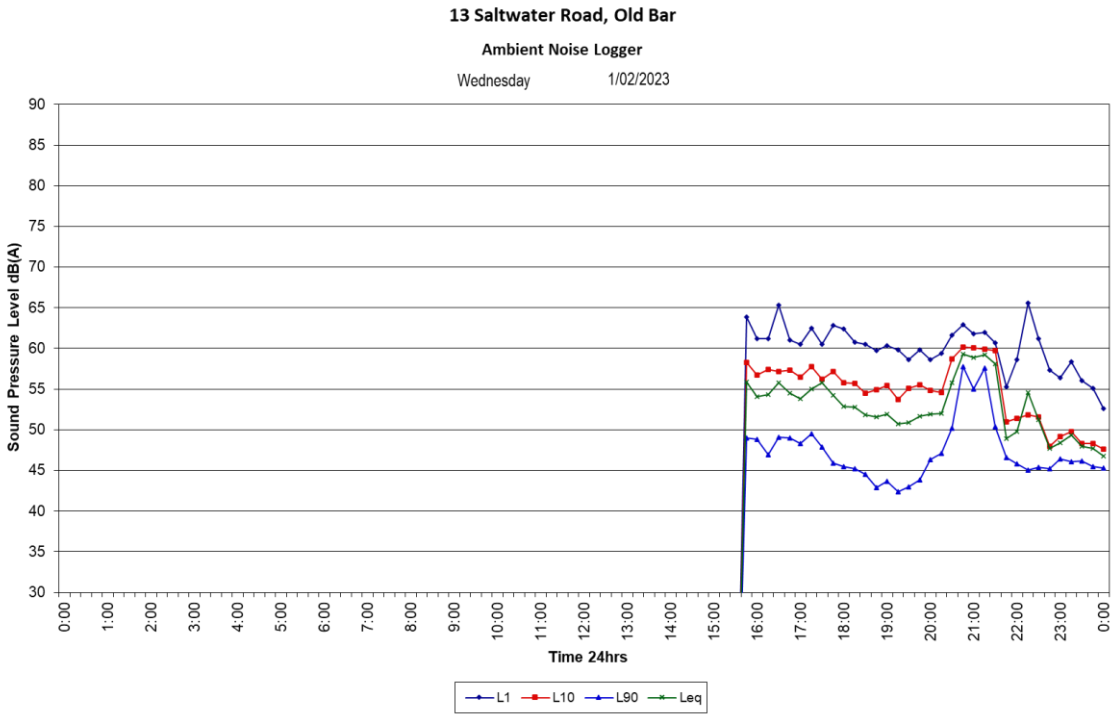
L_{Aeq} Equivalent continuous (energy average) A-weighted sound pressure level. It is defined as the steady sound level that contains the same amount of acoustic energy as the corresponding time-varying sound.

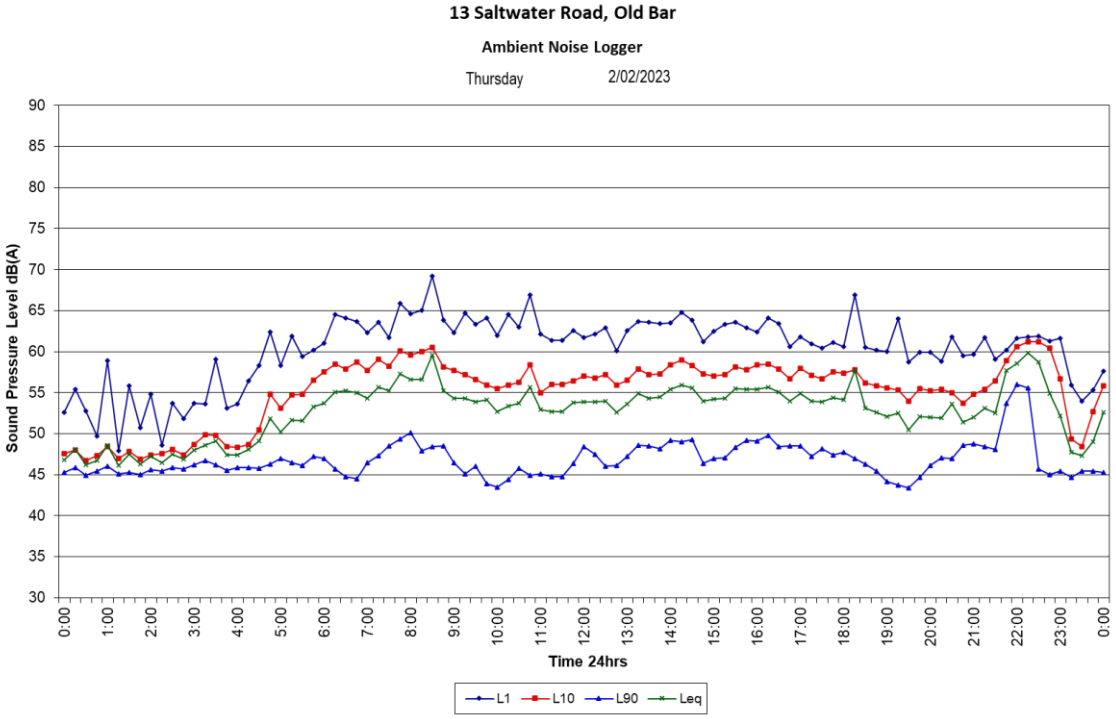
L_{A90} Noise level exceeded for 90% of time (background level). The average minimum background sound level (in the absence of the source under consideration).

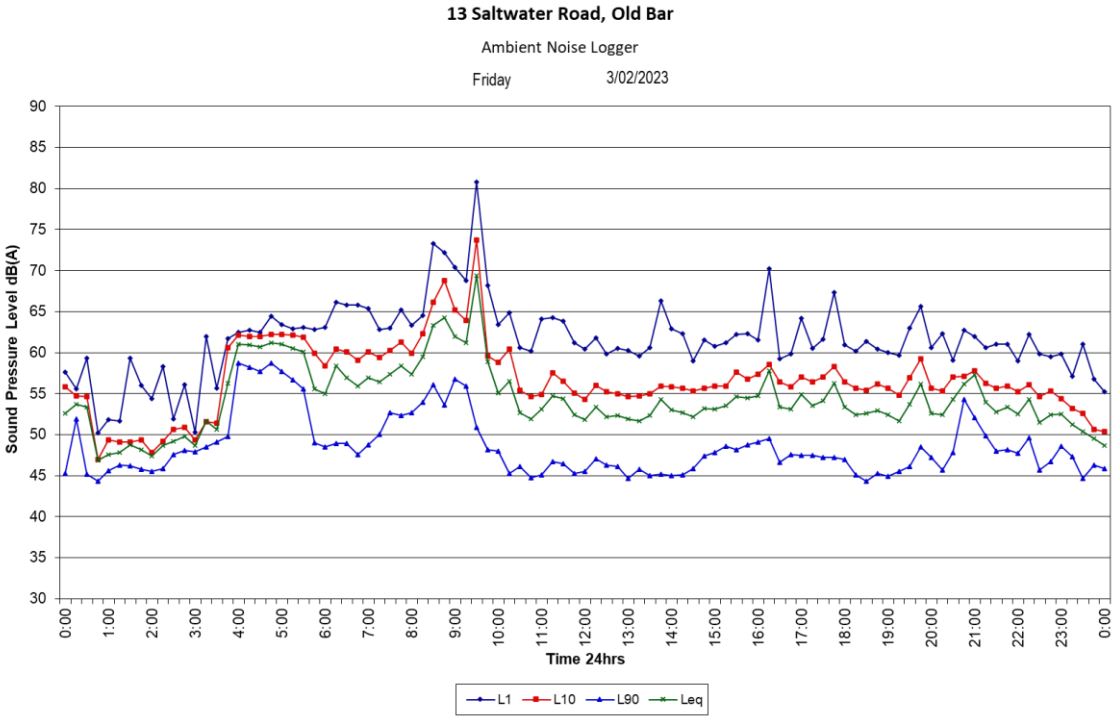
Threshold The lowest sound pressure level that produces a detectable response (in an instrument/person).

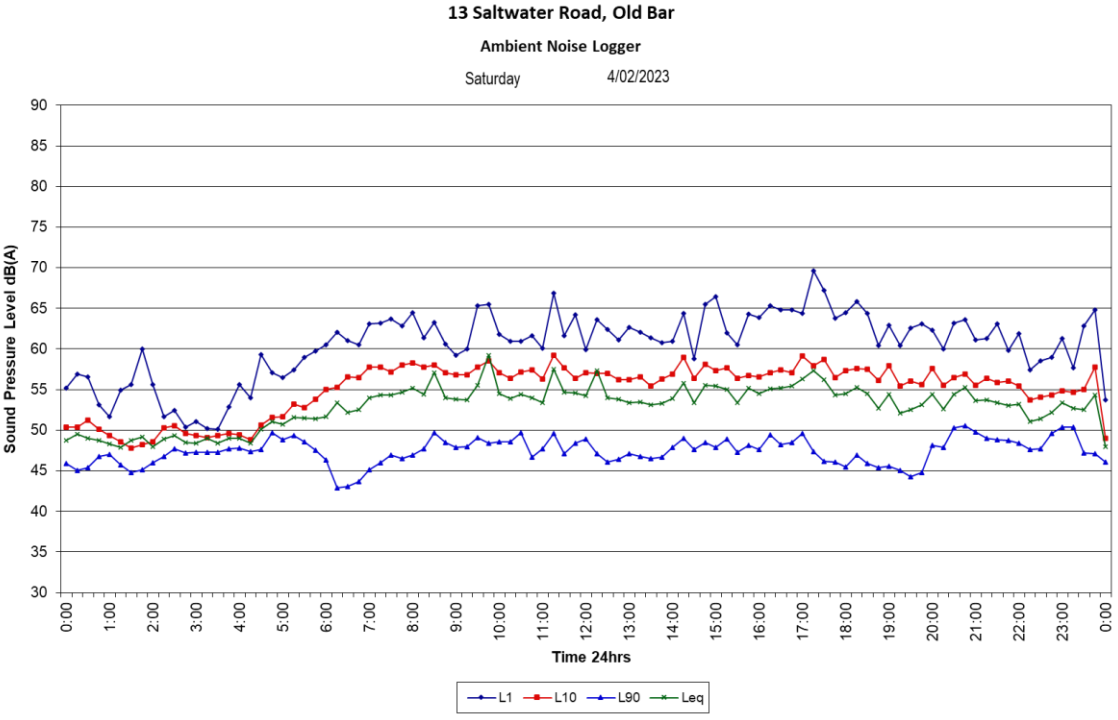
Tonality Tonal noise contains one or more prominent tones (and characterised by a distinct frequency components) and is considered more annoying. A 2 to 5 dB(A) penalty is typically applied to noise sources with tonal characteristics

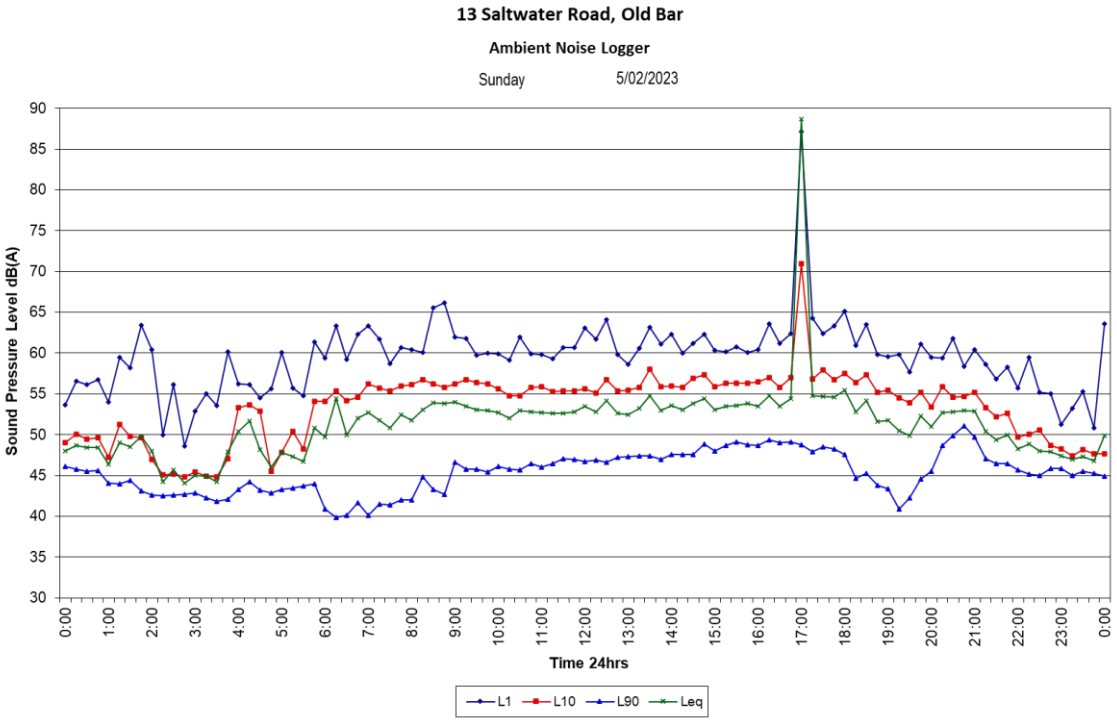
Appendix B – Baseline Noise Survey Graphs

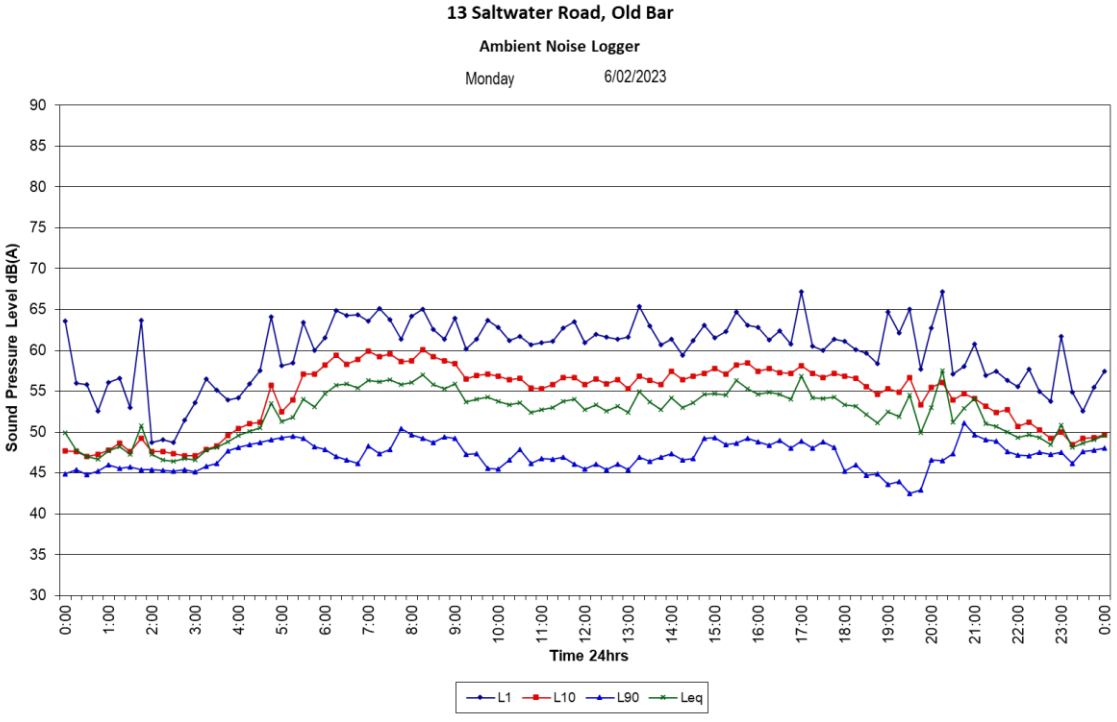


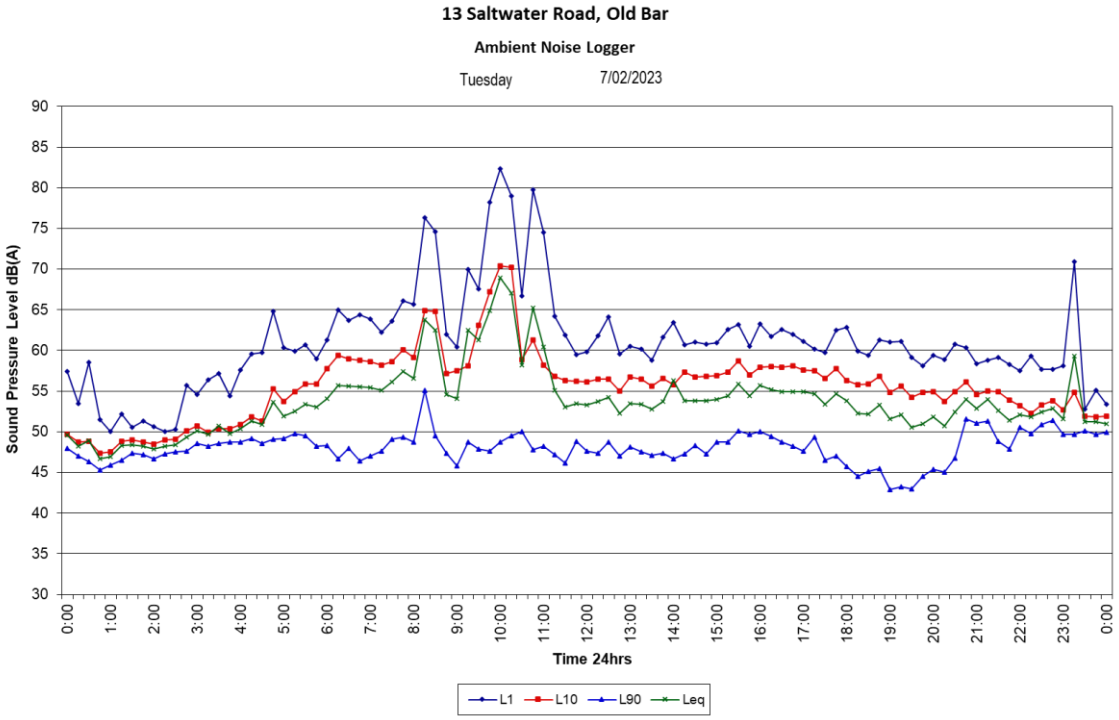


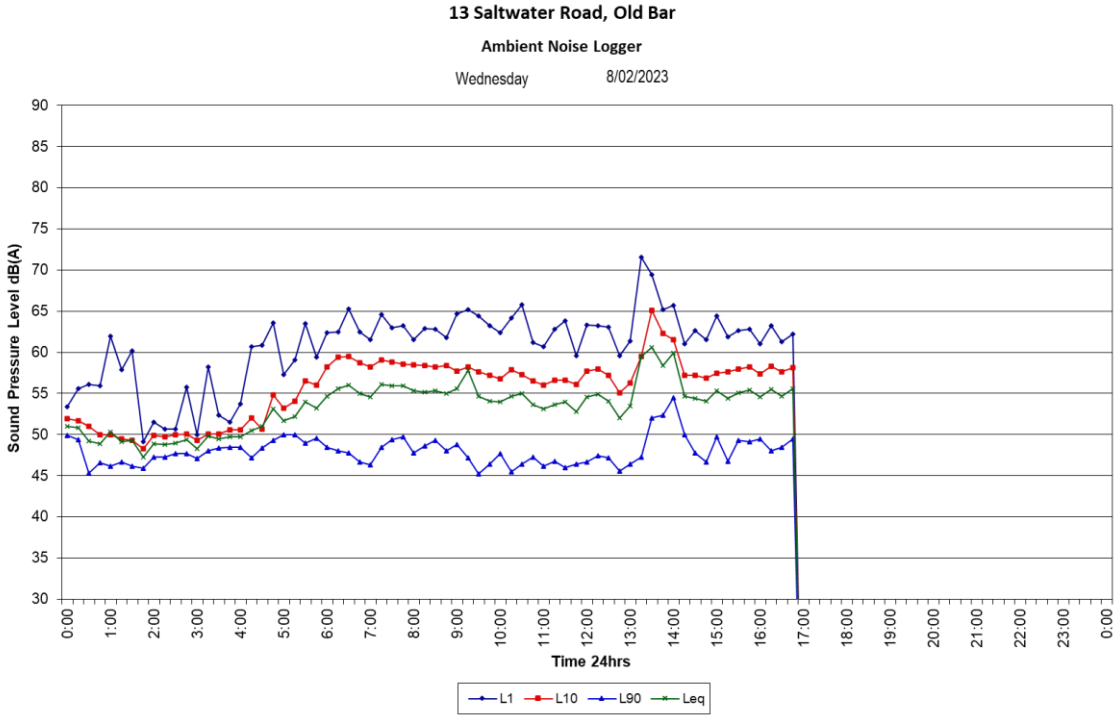

13 Saltwater Road, Old Bar
Ambient Noise Logger
Friday 3/02/2023
Sound Pressure Level dB(A)
Time 24hrs
L1 L10 L90 Leq


13 Saltwater Road, Old Bar
Ambient Noise Logger
Saturday 4/02/2023
Sound Pressure Level dB(A)
Time 24hrs
L1 L10 L90 Leq


13 Saltwater Road, Old Bar
Ambient Noise Logger
Sunday 5/02/2023
Sound Pressure Level dB(A)
Time 24hrs
L1 L10 L90 Leq


13 Saltwater Road, Old Bar
Ambient Noise Logger
Monday 6/02/2023
Sound Pressure Level dB(A)
Time 24hrs
L1 L10 L90 Leq


13 Saltwater Road, Old Bar
Ambient Noise Logger
Tuesday 7/02/2023
Sound Pressure Level dB(A)
Time 24hrs
L1 L10 L90 Leq


13 Saltwater Road, Old Bar
Ambient Noise Logger
Wednesday 8/02/2023
Sound Pressure Level dB(A)
Time 24hrs
L1 L10 L90 Leq

Appendix C – Instrument Calibration Certificate

Acoustic Research Labs Pty Ltd
Unit 36/14 Loyalty Rd
North Rocks NSW AUSTRALIA 2151
Ph: +61 2 9484 0800 A.B.N. 65 160 399 119
www.acousticresearch.com.au

Sound Level Meter
IEC 61672-3:2013
Calibration Certificate

Calibration Number C22742

Client Details	Acoustic Research Labs Pty Ltd 36/14 Loyalty Road North Rocks NSW 2151
Equipment Tested/ Model Number :	ARL Ngara
Instrument Serial Number :	878007
Microphone Serial Number :	321293
Pre-amplifier Serial Number :	27678
Firmware Version :	12.6

Pre-Test Atmospheric Conditions		Post-Test Atmospheric Conditions	
Ambient Temperature :	24.2°C	**Ambient Temperature :**	24.6°C
Relative Humidity :	45.2%	**Relative Humidity :**	41.5%
Barometric Pressure :	98.96kPa	**Barometric Pressure :**	100.38kPa

Calibration Technician :	Lucky Jaiswal	**Secondary Check:**	Dylan Selge
Calibration Date :	17 Nov 2022	**Report Issue Date :**	18 Nov 2022

Approved Signatory : Ken Williams

Clause and Characteristic Tested	Result	Clause and Characteristic Tested	Result
12: Acoustical Sig. tests of a frequency weighting	*Pass*	17: Level linearity incl. the level range control	*N/A*
13: Electrical Sig. tests of frequency weightings	*Pass*	18: Toneburst response	*Pass*
14: Frequency and time weightings at 1 kHz	*Pass*	19: C Weighted Peak Sound Level	*N/A*
15: Long Term Stability	*Pass*	20: Overload Indication	*Pass*
16: Level linearity on the reference level range	*Pass*	21: High Level Stability	*Pass*

The sound level meter submitted for testing has successfully completed the class 1 periodic tests of IEC 61672-3:2013, for the environmental conditions under which the tests were performed.

However, no general statement or conclusion can be made about conformance of the sound level meter to the full requirements of IEC 61672-1:2013 because evidence was not publicly available, from an independent testing organisation responsible for pattern approvals, to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1:2013 and because the periodic tests of IEC 61672-3:2013 cover only a limited subset of the specifications in IEC 61672-1:2013.

Uncertainties of Measurement -

Acoustic Tests		Environmental Conditions	
125Hz	*±0.13dB*	*Temperature*	*±0.1°C*
1kHz	*±0.13dB*	*Relative Humidity*	*±1.9%*
8kHz	*±0.14dB*	*Barometric Pressure*	*±0.014kPa*
Electrical Tests	*±0.13dB*		

All uncertainties are derived at the 95% confidence level with a coverage factor of 2.

This calibration certificate is to be read in conjunction with the calibration test report.

Acoustic Research Labs Pty Ltd is NATA Accredited Laboratory Number 14172.
Accredited for compliance with ISO/IEC 17025 - Calibration.

The results of the tests, calibrations and/or measurements included in this document are traceable to SI units.

NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration and inspection reports.

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