RODNEY STEVENS ACOUSTICS

REPORT R240926R1

Revision 3

Noise Impact Assessment

Proposed Micro-Brewery

5, 380 Pittwater Road, North Manly

PREPARED FOR:

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20 June 2025

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Noise Impact Assessment

Proposed Micro-Brewery

5, 380 Pittwater Road, North Manly

PREPARED BY:

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DOCUMENT CONTROL

Reference	Status	Date	Prepared	Checked	Authorised
R240926R1	Revision 0	18 December 2024	Brian Mendieta	Desmond Raymond	Desmond Raymond
R240926R1	Revision 1	24 January 2025	Brian Mendieta	Desmond Raymond	Desmond Raymond
R240926R1	Revision 2	14 February 2025	Brian Mendieta	Desmond Raymond	Desmond Raymond
R240926R1	Revision 3	20 June 2025	Brian Mendieta	Desmond Raymond	Desmond Raymond

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1 INTRODUCTION

Rodney Stevens Acoustics Pty Ltd (RSA) has been engaged by Mitchell & Shorten Lawyers to prepare a noise assessment of a proposed micro-brewery located at 5, 380 Pittwater Road, North Manly.

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 micro-brewery may operate in an acoustically compliant manner in accordance with the Liquor and Gaming NSW license conditions.

This report presents RSA's methodology, assessment criteria and recommendations regarding patron noise emissions from the operation of the proposed micro-brewery.

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

2 PROPOSED DEVELOPMENT

2.1 Existing Site

The commercial unit is located on the ground floor within a two-storey commercial lot development consisting of 9 commercial units. The commercial lot is bounded by a commercial structure to the north and south side, Rowe Street to the east and Girard Street to the west. According to the Northern Beaches Council's Land Zoning Map, the site and surrounding commercial structures are located within a General Industrial (E4) area.

The nearest residences potentially affected by the operation of the licensed venue are the residential properties located farther north from the site. According to the Northern Beaches Council's Land Zoning Map, the residential properties located farther north and south from the site are within a Low and Medium Density Residential area.

Figure 2-1 shows an aerial image of the micro-brewery in question, the surrounding environment and the noise monitoring location.

2.2 Proposed Development

The proposal is to refurbish the existing commercial unit 5 of 380 Pittwater Road, North Manly into a micro-brewery with an indoor seating area and a small seating area at the front. The expected patron numbers are presented below:

Outdoor Sitting Area	6 Patrons
Inside Micro-Brewery	24 Patrons

Figure 2-2 below show plans of the proposed micro-brewery.

2.3 Hours of Operation

It is understood that the micro-brewery proposes the following hours of operation:

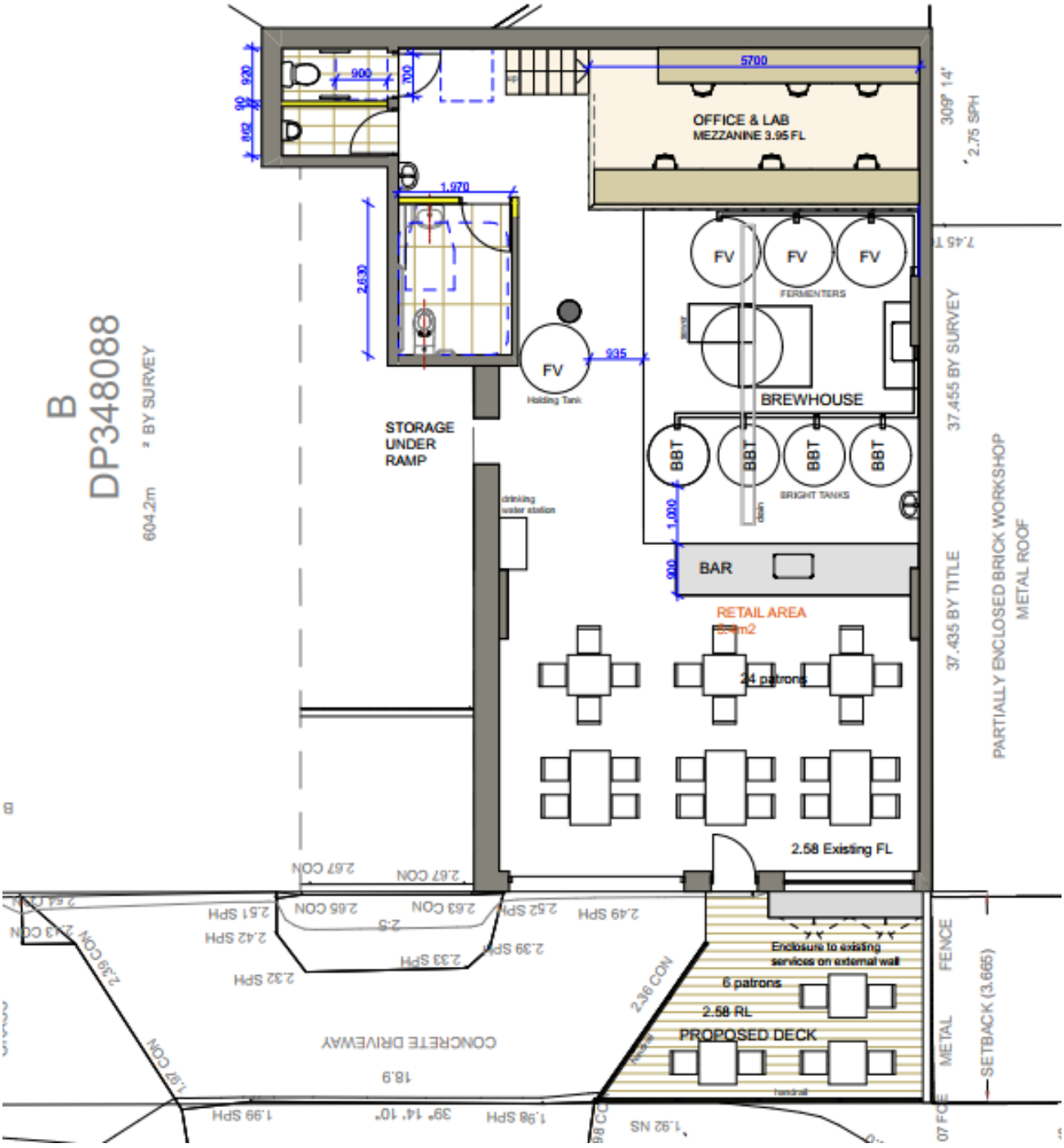
- Brewery: Monday to Sunday: 7:30 am to 4:00pm
- Bar:
    - Monday to Thursday: 4:00pm – 10:00pm
    - Friday: 4:00pm – midnight
    - Saturday: Midday – Midnight
    - Sunday and Public Holidays: Midday – 8:00pm

The outside deck area will close at 10:00pm.

Figure 2-1 Site Location, Surrounding Area and Noise Logger Location

Aerial image courtesy of Six Map © 2024

Figure 2-2 Site Plan



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 Tuesday 10th and Tuesday 17th December 2024. The noise logger was located at the frontyard of 6 Rower Street, Freshwater, 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 RION NL-42EX octave environmental noise logger (serial number 322762) fitted with microphone windshields. Calibration of the loggers 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. Noise data was not affected by significant weather conditions such as heavy rain or strong winds during the monitoring period.

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 assess noise emission from the proposed micro-brewery, 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
Frontyard of 6 Rowe Street, Freshwater	L_{Aeq}	68	57	57
	RBL (Background)	56	41	29

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

The establishment of the noise criteria for the assessment of the proposed micro-brewery have been based on the Liquor and Gaming NSW noise guidelines.

4.1 Liquor and Gaming

Liquor and Gaming NSW guidelines for the assessment of noise from licensed premises is as follows:

a) *The L_{A10} noise level emitted from the use must not exceed the background noise level in any Octave Band Centre Frequency (31.5 Hz to 8 kHz inclusive) by more than 5 dB between the hour of 7.00 am and 12.00 midnight when assessed at the boundary of any affected residence.*

b) *The L_{A10} noise level emitted from the use must not exceed the background noise level in any Octave Band Centre Frequency (31.5 Hz to 8 kHz inclusive) between the hour of 12.00 midnight and 7.00 am when assessed at the boundary of any affected residence.*

c) *Notwithstanding compliance with a) and b) above, the noise from the use must not be audible within any habitable room in any residential property between the hours of 12.00 midnight and 7.00 am.*

4.2 International Standard ISO 226-2023

The International Standard ISO 226 : 2023- Normal Equal-Loudness-Level Contours provides a set of values in decibels that represent the minimum amount of sound that the human ear can register (threshold of hearing) per frequency band. The threshold of hearing values are presented in Table 1 of the ISO standard, the specific values are presented in the table below:

Table 4-1 Threshold of Hearing in Accordance to ISO 226-2003

Description	Tf Level per Octave Band -dB								
	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1k Hz	2k Hz	4k Hz	8k Hz
Threshold of hearing	60	38	22	11	4	2	-1	-5	13
A-Weightings	-39	-26	-16	-9	-3	0	1	1	-1
A-Weighted Hearing Thresholds for Reference	20	11	6	3	1	2	0	-4	12

4.3 Project Specific Noise Criteria

Based on the spectral data from the noise logger the project specific noise criteria for the operation of the proposed micro-brewery have been established in accordance with LG noise guidelines. The project specific noise criteria for the proposed micro-brewery are presented in tables below.

Table 4-2 External Criteria for Operational Noise

Description	Ambient Noise Level per Octave Band -dBA								
	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1kHz	2kHz	4kHz	8kHz
Measured Daytime L_{A90} Background Noise Level	20	22	27	29	31	35	32	22	17
L_{A10} Daytime Criterion (Between 7 am and 12 midnight): At Surrounding Residences	25	27	32	34	36	40	37	27	22
Measured Night-time L_{A90} Background Noise Level	20	13	20	23	24	23	19	15	13
L_{A10} Night-time Criterion (Between 12 midnight and 7 am): At Surrounding Residences	20	13	20	23	24	23	19	15	13

The internal noise criterion for inaudibility will be based on the threshold of hearing. Table 4-3 presents the established internal noise criterion for residential receivers as defined by International Standard ISO 226 : 2003- Normal Equal-Loudness-Level Contours then the value of Tf corresponding to that Octave Band Centre Frequency shall be used instead.

Table 4-3 Internal Criteria for Operational Noise

Description	Ambient Noise Level per Octave Band -dBA								
	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1k Hz	2k Hz	4k Hz	8k Hz
Inaudibility Criterion L_{A90} (Between 12 midnight and 7 am): Inside Residences	20	11	9	8	2	1	7	6	12

4.4 Non-Residential Noise Criteria

Responsibility for the control of noise emissions in New South Wales is vested in Local Government and the EPA. The EPA oversees the Noise Policy for Industry (NPfI) October 2017 which provides a framework and process for deriving noise criteria. The nearest and most affected receivers to the south and west have been identified as commercial and industrial premises. The NPfI criteria is therefore **65 dB(A)** for commercial tenancies and **70 dB(A)** for Industrial premises.

5 NOISE IMPACT ASSESSMENT

5.1 Patron Noise Assumptions

5.1.1 Typical Patron Vocal Levels

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 metre from the talker on axis of the mouth. The spectrum is given in the table below.

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

5.1.2 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.

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
6 Patrons with normal ranged voices at the front of Brewery	72	77	80	76	69	63	56	72
24 Patrons with raised voices inside the Brewery	77	81	85	81	74	68	61	77

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.

5.2 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	74	71

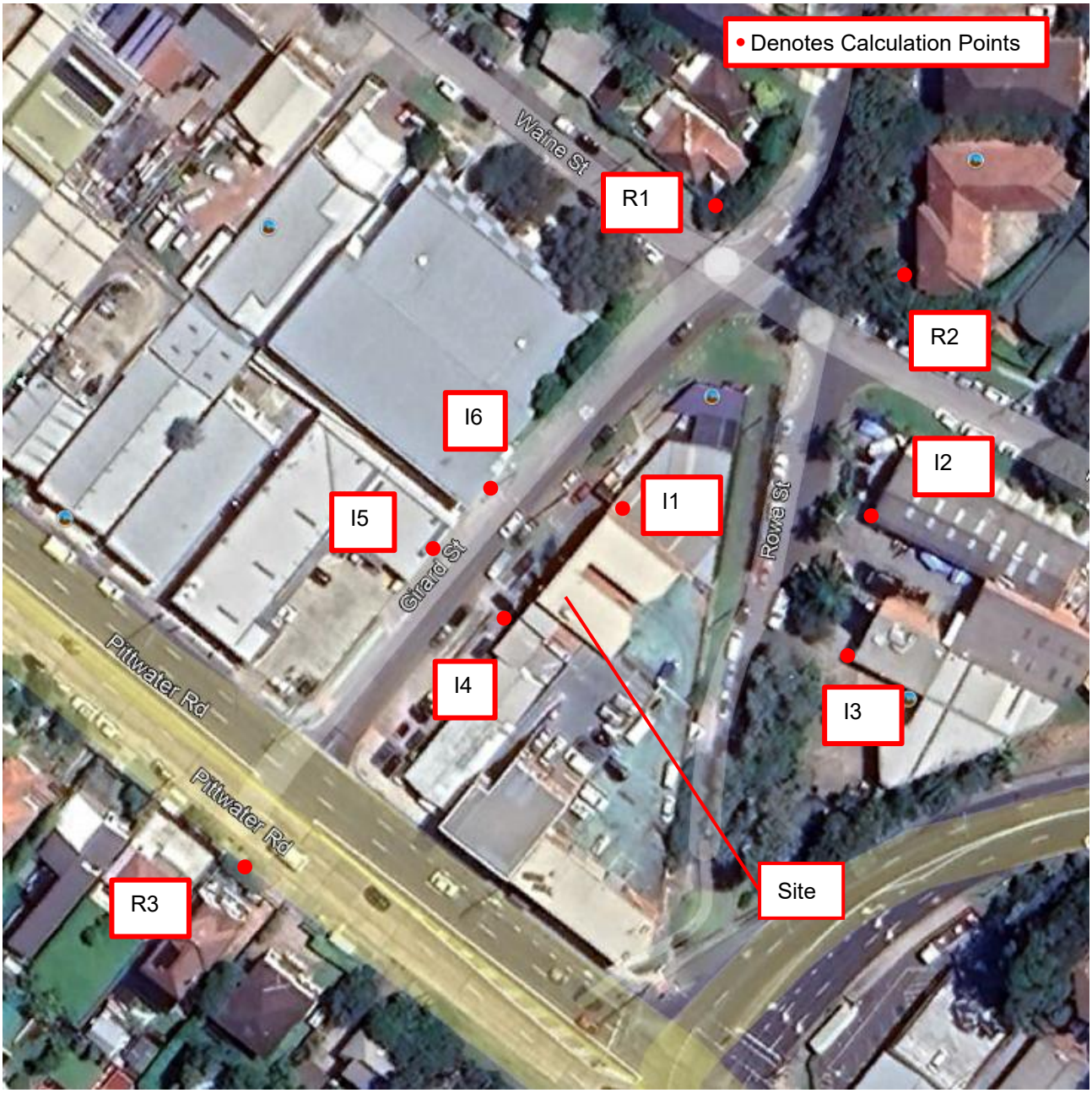
5.3 Predicted Noise Impacts

Noise modelling scenario to assess the worst-case operational scenario of the proposed micro-brewery was undertaken. The following points have been assumed for our assessment (including noise control measures):

- Heights of receivers are assumed to be 1.5 m above their respective floor level.
- The number of patrons inside and outside the micro-brewery as outlined in Section 5.1.2.
- Background music is playing inside the micro-brewery. The sound power level of the background music is outlined in Section 5.2.
- The front door, window and the roller door of the microbrewery is assumed to be open.
- The interior of the micro-brewery consists of brick-wall, plasterboard ceiling and hard timber floor.
- Resulting noise levels have been calculated to the calculation point as indicated in the figure below.

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 commercial tenancies and residential premises farther north and south. Table 5-4 shows the address of each affected receiver.

Table 5-4 Sensitive Receivers

Receiver	Number of Levels	Sensitive Receiver's Address
I1	1	4 Rowe Street, Freshwater
I2	2	5 Rowe Street, Freshwater
I3	2	1 Rowe Street, Freshwater
I4	1	386 Pittwater Road, North Manly
I5	1	390 Pittwater Road, North Manly
I6	2	4-8 Waine Street, Freshwater
R1	1	6 Rowe Street, Freshwater
R2	3	7 Rowe Street, Freshwater
R3	1	393 & 395 Pittwater Road, North Manly

The resulting noise levels from the operation of the proposed micro-brewery are presented in the table below, we have assumed the worst case scenario where the micro-brewery is at maximum capacity and all noise sources are operating simultaneously.

5.4 Predicted Noise Impacts

Table 5-5 shows the predicted noise level results for the residential receivers.Table 5-6 presents the predicted noise impact results for nearby commercial receivers.

Table 5-5 Predicted External Noise Impact Levels - Residential Receivers Daytime (7:00am to Midnight)

Receivers	Resultant Sound Pressure Level per Octave Band - dBA								
	31.5 Hz	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz
Daytime Assessment (7:00am to 12:00am)									
L_{A10} Noise Level									
R1	-26	-4	16	25	33	33	29	22	7
R2	-33	-15	2	23	31	31	27	20	4
R2 Lv2 Window	-34	-15	2	23	31	31	27	20	4
R3	-26	-4	16	25	33	34	32	25	9
Daytime Criteria	25	27	32	34	36	40	37	27	22
Exceedance R1	-	-	-	-	-	-	-	-	-
Exceedance R2	-	-	-	-	-	-	-	-	-
Exceedance R2 Lv1	-	-	-	-	-	-	-	-	-
Exceedance R3	-	-	-	-	-	-	-	-	-

Table 5-6 Predicted Noise Impact Levels at Nearby Commercial Receivers

Receiver	Calculated Noise Level	Criteria	Compliance
I1	45	70	Yes
I2	21	70	Yes
I3	24	70	Yes
I4	55	70	Yes
I5	54	70	Yes
I6	53	70	Yes

6 RECOMMENDATIONS

The noise emissions from the proposed micro-brewery have the potential to comply with the required criteria with the implementations of the following recommendations:

6.1 Noise Management

- Music should only be played inside the micro-brewery.
- The micro-brewery should operate within the hours of 7:00am and midnight.

6.2 Acoustic Absorption Within Indoor Sitting Area of Microbrewery

- 70m^2 of the walls and/or the ceiling within the sitting area inside the microbrewery should be fitted with acoustic absorption material/spray-on material with a Noise Reduction Coefficient (NRC) of 0.7.

6.3 Music Inside the Micro-brewery

The following music and speaker noise control recommendations must be implemented:

- A noise limiter is to be installed to ensure background music does not exceed 72 dB(A) at one meter from the speakers. All amplified equipment must be connected to the limiter.
- Speakers should be placed at least two metres away from the front façade.
- Any small musical performer (single or duo) should adhere to the recommended noise limits inside the micro-brewery. It is not recommended that live music bands or DJs perform inside or outside the micro-brewery.

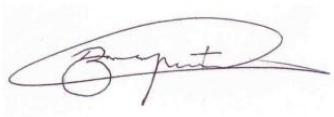
7 CONCLUSION

A noise impact assessment has been conducted in relation to the operation of the proposed micro-brewery located at 5, 380 Pittwater Road, North Manly.

This assessment has been conducted and appropriate noise emission criteria have been established in accordance with the Liquor & Gaming NSW noise guidelines.

This report shows compliance with the specific noise criteria has been achieved, provided the acoustic treatment and noise mitigation measures presented in this report are implemented.

Prepared by:



Brian Mendieta

Senior Acoustic Consultant

Approved by:

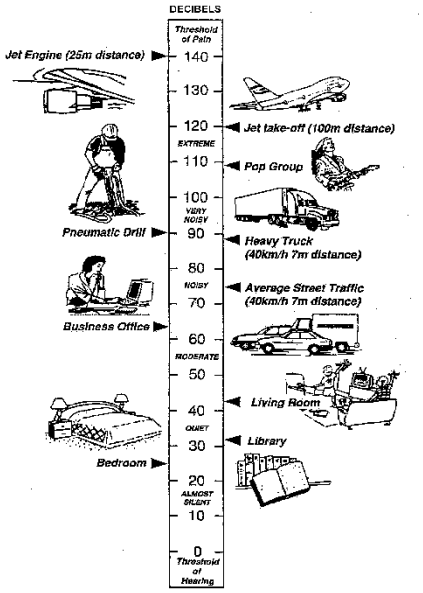
Desmond Raymond

Director

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)	Rating background noise level (RBL) – the overall single-figure background level representing each assessment period (day/evening/night) over the whole monitoring period (as opposed to over each 24-hour period used for the assessment background level). The rating background level is the median 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)*.

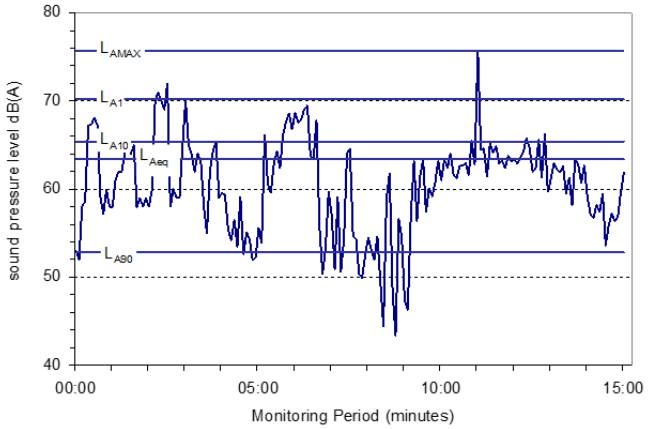
Sound Pressure Level (SPL)

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).

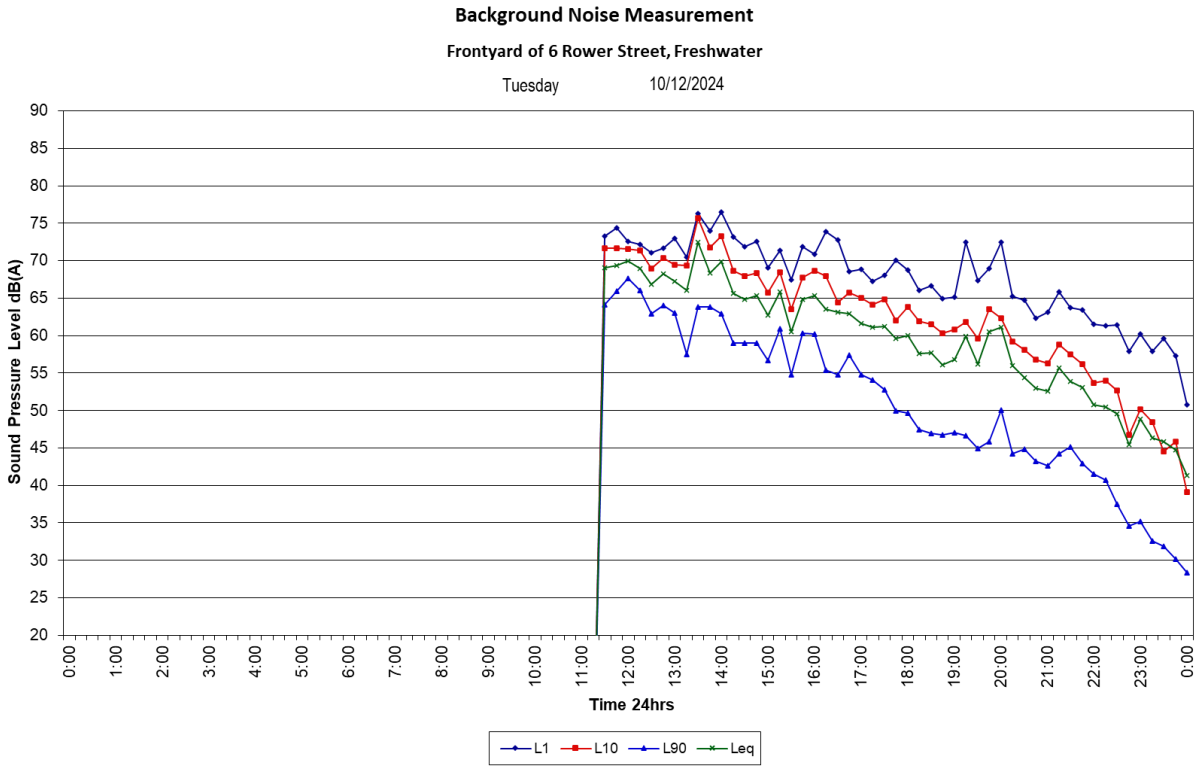
Threshold

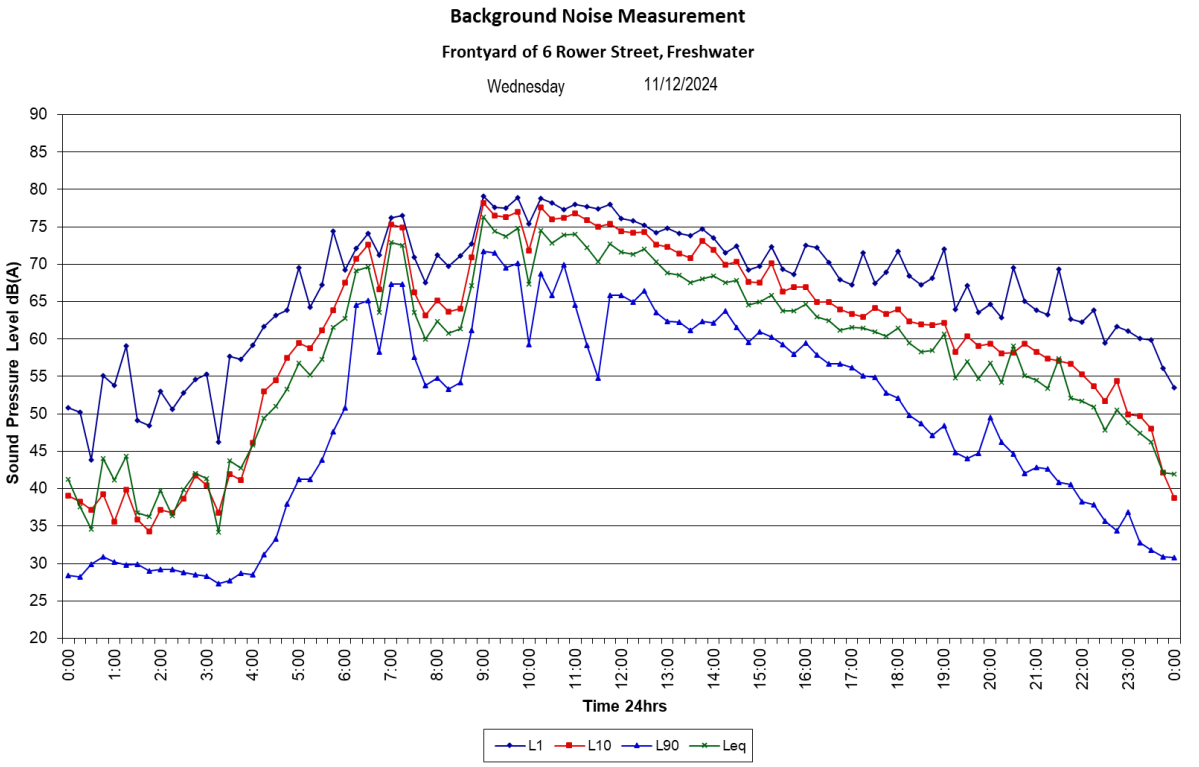
The lowest sound pressure level that produces a detectable response (in an instrument/person).

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 – Logger Graphs

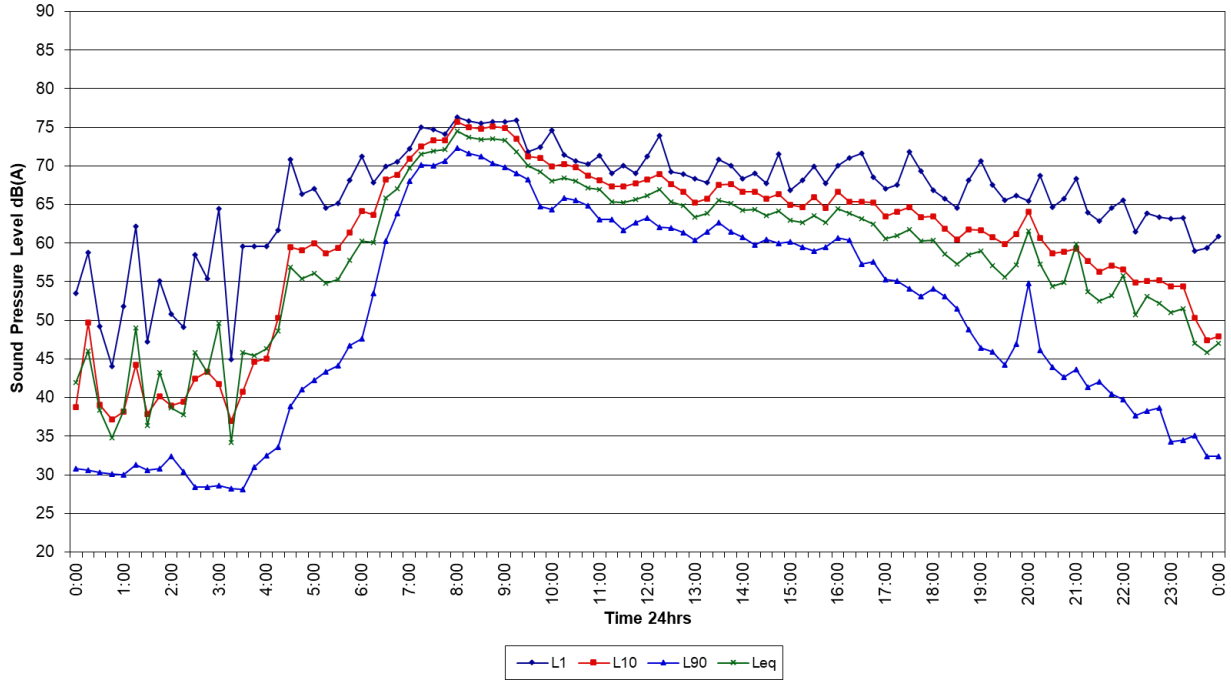




Background Noise Measurement

Frontyard of 6 Rower Street, Freshwater

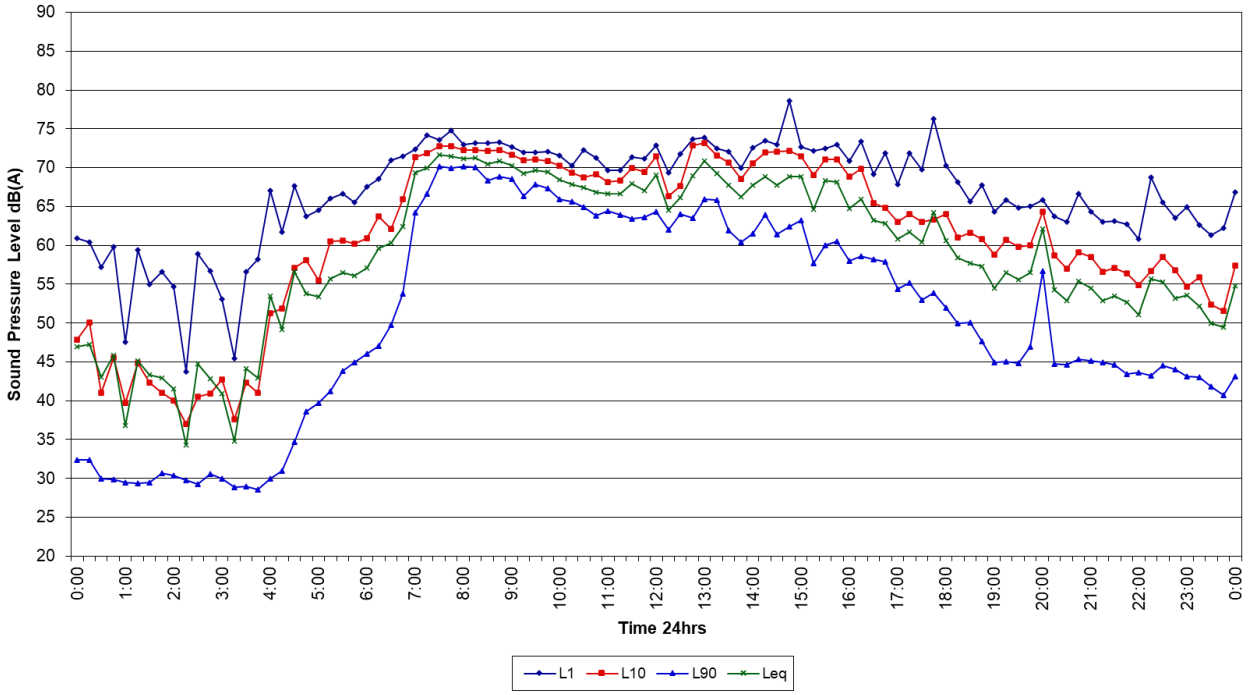
Thursday 12/12/2024



Background Noise Measurement

Frontyard of 6 Rower Street, Freshwater

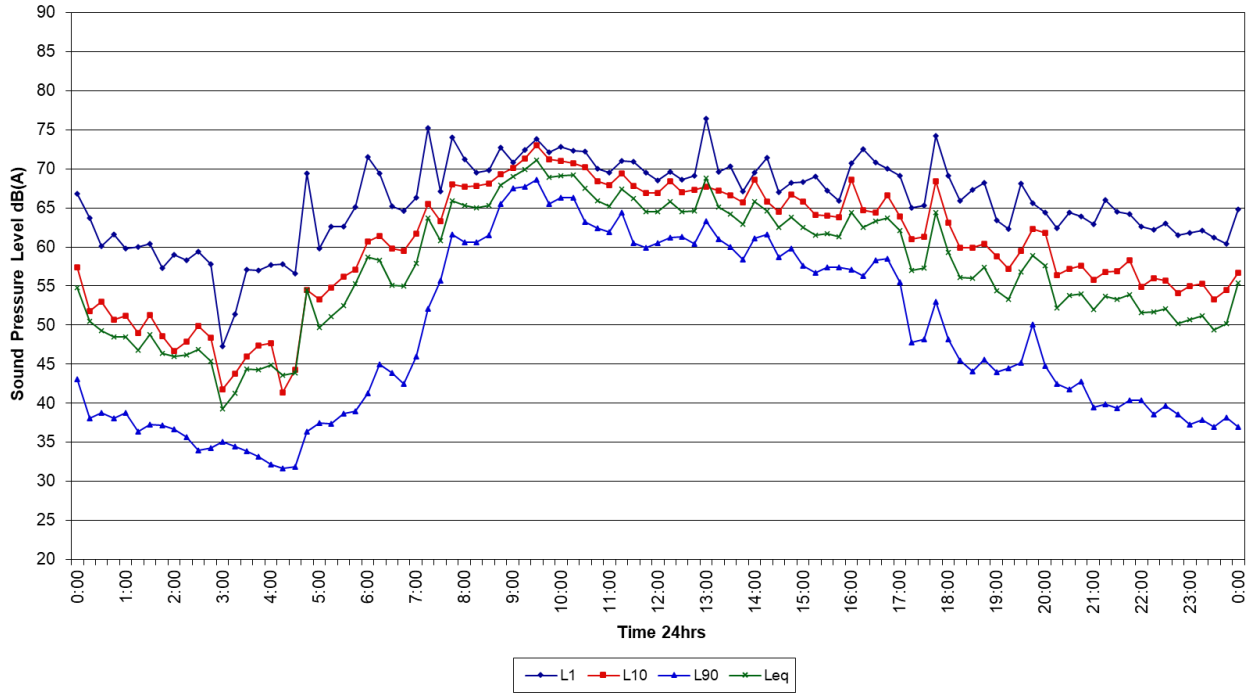
Friday 13/12/2024



Background Noise Measurement

Frontyard of 6 Rower Street, Freshwater

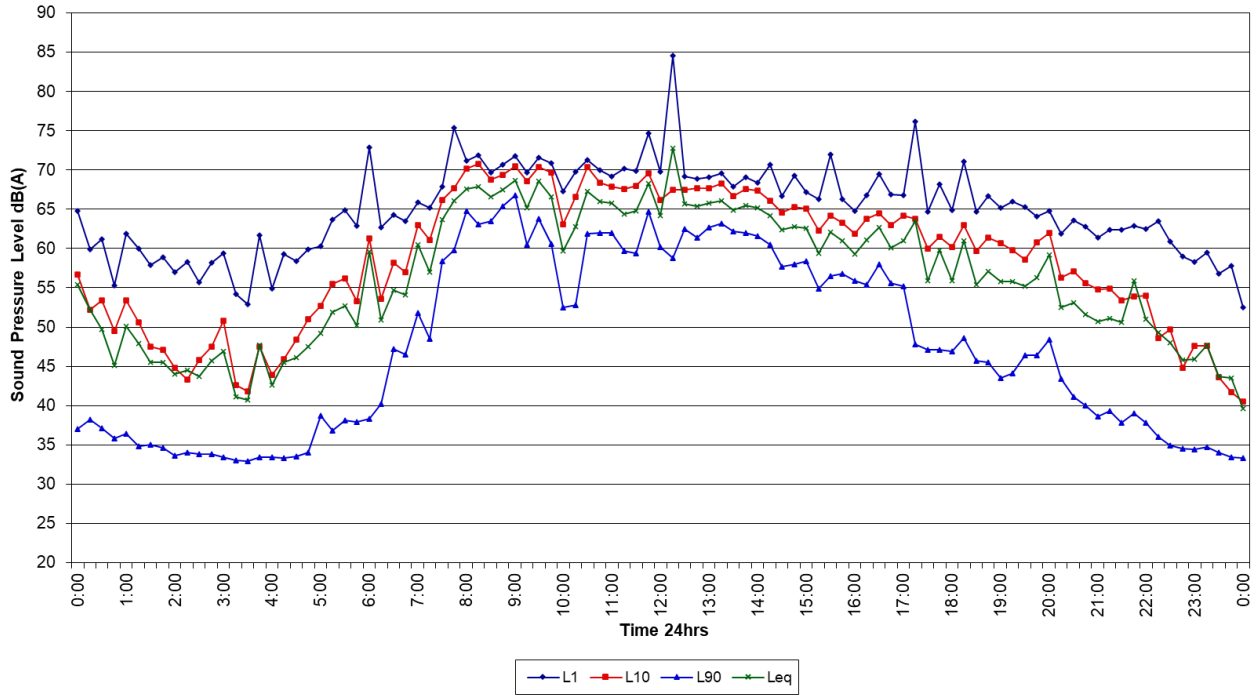
Saturday 14/12/2024



Background Noise Measurement

Frontyard of 6 Rower Street, Freshwater

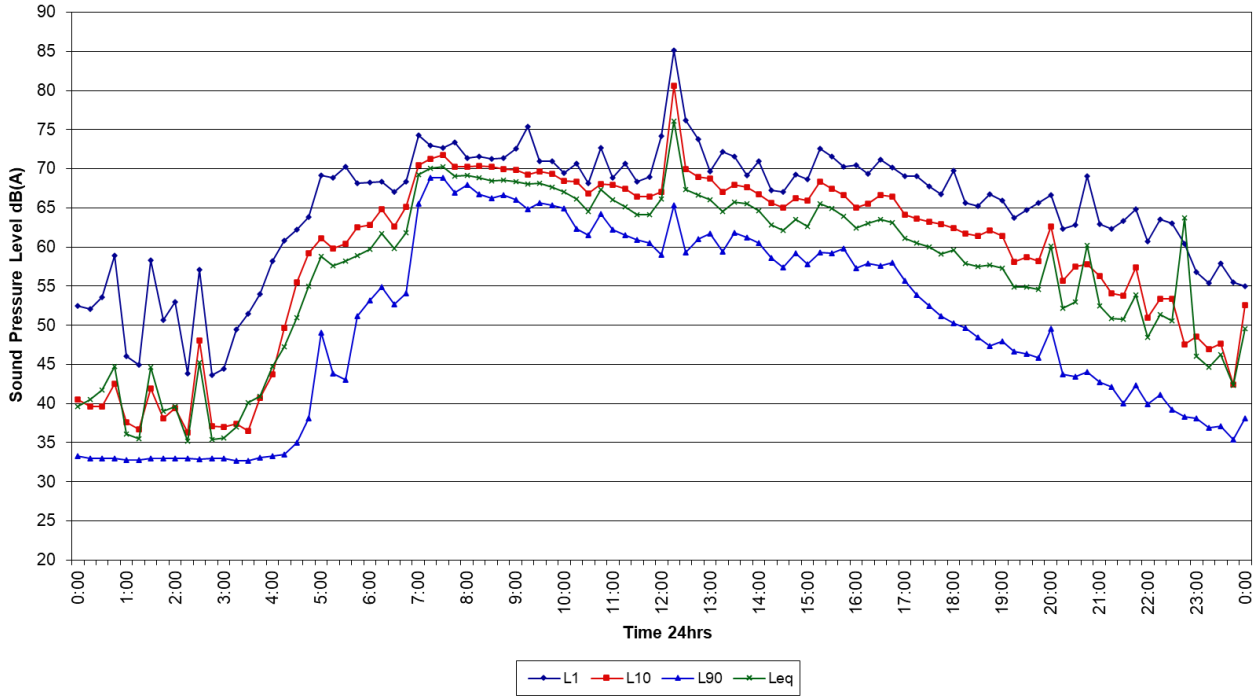
Sunday 15/12/2024



Background Noise Measurement

Frontyard of 6 Rower Street, Freshwater

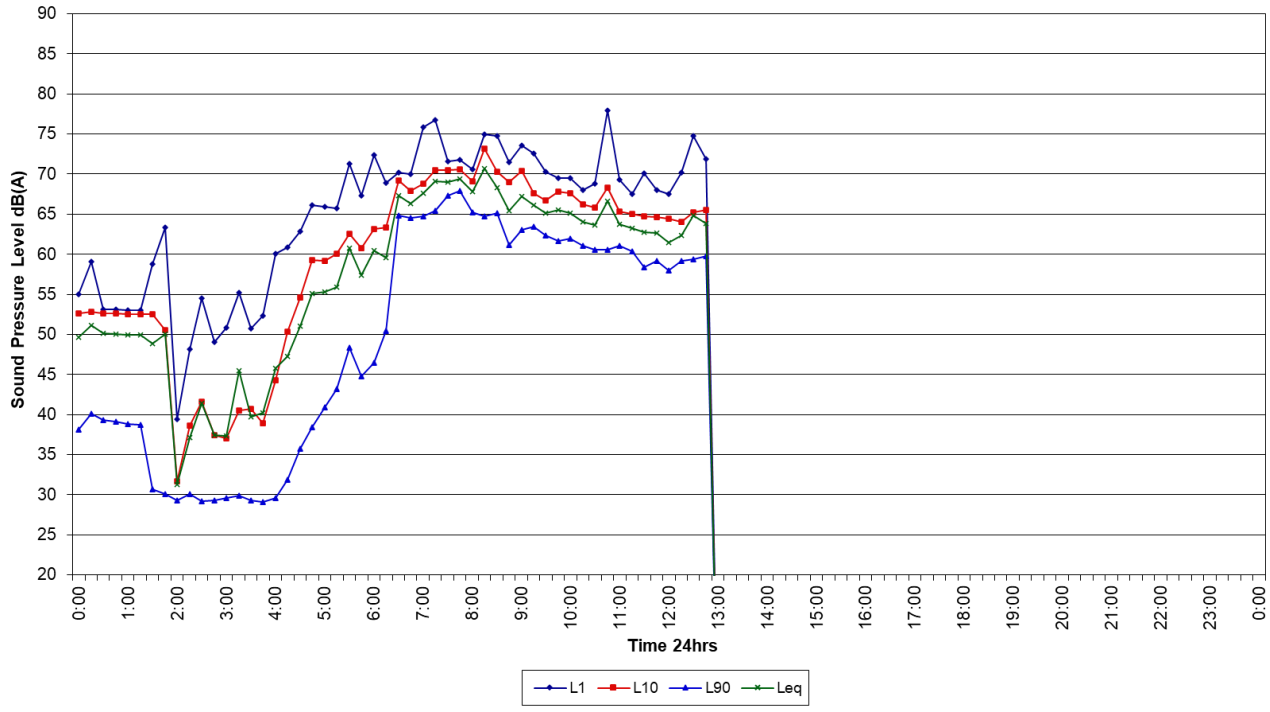
Monday 16/12/2024



Background Noise Measurement

Frontyard of 6 Rower Street, Freshwater

Tuesday 17/12/2024



Appendix C – 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 C24512

Client Details	Rodney Stevens Acoustics Pty Ltd PO Box 552 Wahroonga NSW, 2076
Equipment Tested/ Model Number :	NL-42AEX
Instrument Serial Number :	00322762
Microphone Serial Number :	170370
Pre-amplifier Serial Number :	72880
Firmware Version :	v1.1

Pre-Test Atmospheric Conditions		**Post-Test Atmospheric Conditions**	
Ambient Temperature :	21.7 °C	**Ambient Temperature :**	22.7 °C
Relative Humidity :	50.5 %	**Relative Humidity :**	48.6 %
Barometric Pressure :	102.42 kPa	**Barometric Pressure :**	102.41 kPa

Calibration Technician :	Peter Elters	**Secondary Check:**	Cooper Sallway
Calibration Date :	4 Jul 2024	**Report Issue Date :**	4 Jul 2024

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	*Pass*
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 2 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	*±0.13 dB*	*Temperature*	*±0.1 °C*
1kHz	*±0.13 dB*	*Relative Humidity*	*±1.9 %*
8kHz	*±0.14 dB*	*Barometric Pressure*	*±0.11 kPa*
Electrical Tests	*±0.13 dB*		

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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