RODNEY STEVENS ACOUSTICS

REPORT R240971R1

Revision 0

Noise Impact Assessment

Proposed Function Facility

235-353 Mill Road, Yabulu, QLD

PREPARED FOR:

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2 July 2026

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Proposed Function Facility

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1 INTRODUCTION

Rodney Stevens Acoustics Pty Ltd (RSA) has been engaged by Trevor Holley to conduct a Noise Impact Assessment (NIA) for the Proposed Function Facility at 235-353 Mill Road, Yabulu, QLD, properly described as Lot 3 on RP743037.

This NIA has been prepared in support of a Material Change of Use (MCU) application for the development. The function facility is proposed to be located in the central eastern portion of the site. The nearest noise sensitive receiver is located on the adjacent site to the east, at 357 Mill Road, approximately 628 m from the proposed function area.

The proposed operation hours are from 12:00 pm to 21:30 pm Sunday to Thursday, and from 12:00 pm to 12:00 am Friday and Saturdays. The maximum number of patrons will be limited to 100.

This report summarises the results of an environmental noise survey conducted on site and assesses the potential noise impacts associated with the operation of the function facility under the conditions proposed by the applicant. The NIA forms part of the supporting documentation for the Development Application (DA) submission to Townsville City Council.

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

2 INFORMATION SOURCES

This report has been prepared considering the following information:

- Town Planning Report for Development Application prepared by EDPI Australia, dated 3rd March 2026
- Traffic Impact Assessment prepared by Northern Consulting Engineers, dated 15th June 2026
- Australian Standard AS 1055:2018 *Acoustics - Description and Measurement of Environmental Noise*
- Queensland Government *Environmental Protection (Noise) Policy 2019*
- DETSI (2020) *Noise Measurement Manual*, ESR/2016/2195, Department of the Environment, Tourism, Science and Innovation, Queensland Government
- DETSI (2026) *EIS Information Guideline Noise and Vibration*, ESR/2020/5305, Department of the Environment, Tourism, Science and Innovation, Queensland Government
- Townsville City Plan (Version 2025/01)
- Environmental long-term noise measurements conducted by RSA (refer to Section 5)
- Meteorological data sourced from the Bureau of Meteorology — Townsville Aero, ID 032040

3 SITE LOCATION

The proposed function facility is to be located at 235-353 Mill Road, Yabulu, QLD, described as Lot 3 on RP743037. The 36.5 ha site and surrounding land are zoned rural under the Townsville City Plan (Version 2025/01).

Figure 3-1 Zoning Map - Townsville City Planning Scheme

The function facility is proposed within the central eastern portion of the site, approximately 200 m east of the western boundary. The site location, proposed function area, and nearest noise sensitive receivers are shown in Figure 3-2.

Distances to the nearest noise sensitive receivers were obtained from the TownsvilleMaps Mapping Service (see Figure 3-3) and are summarised below:

- **R1** - 357 Mill Road, at approximately 627 m south of the proposed venue
- **R2** - 223 Mill Road, at approximately 673 m north of the proposed venue
- **R3** - 226 Mill Road, at approximately 788 m west of the proposed venue
- **R4** - 104 Pope Road, at approximately 851 m east of the proposed venue

Figure 3-2 Site Location, Proposed Function Facility Area, and Surroundings Sites

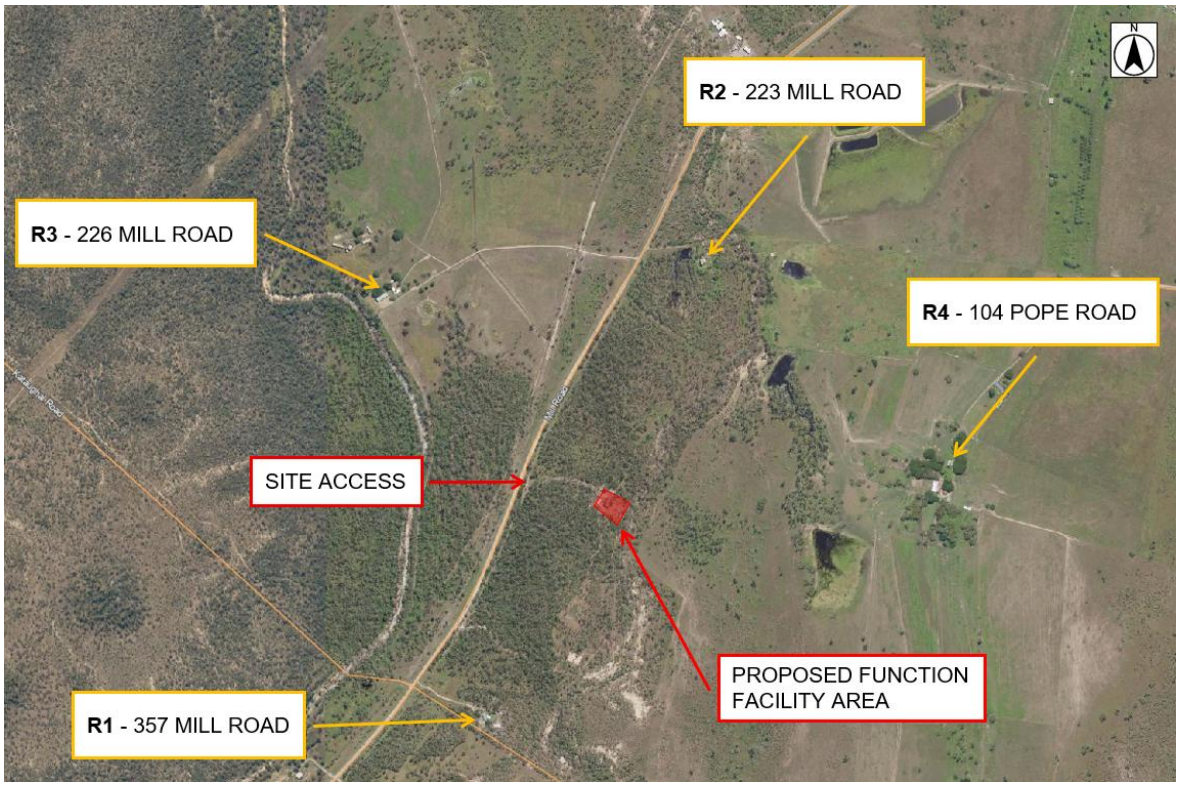
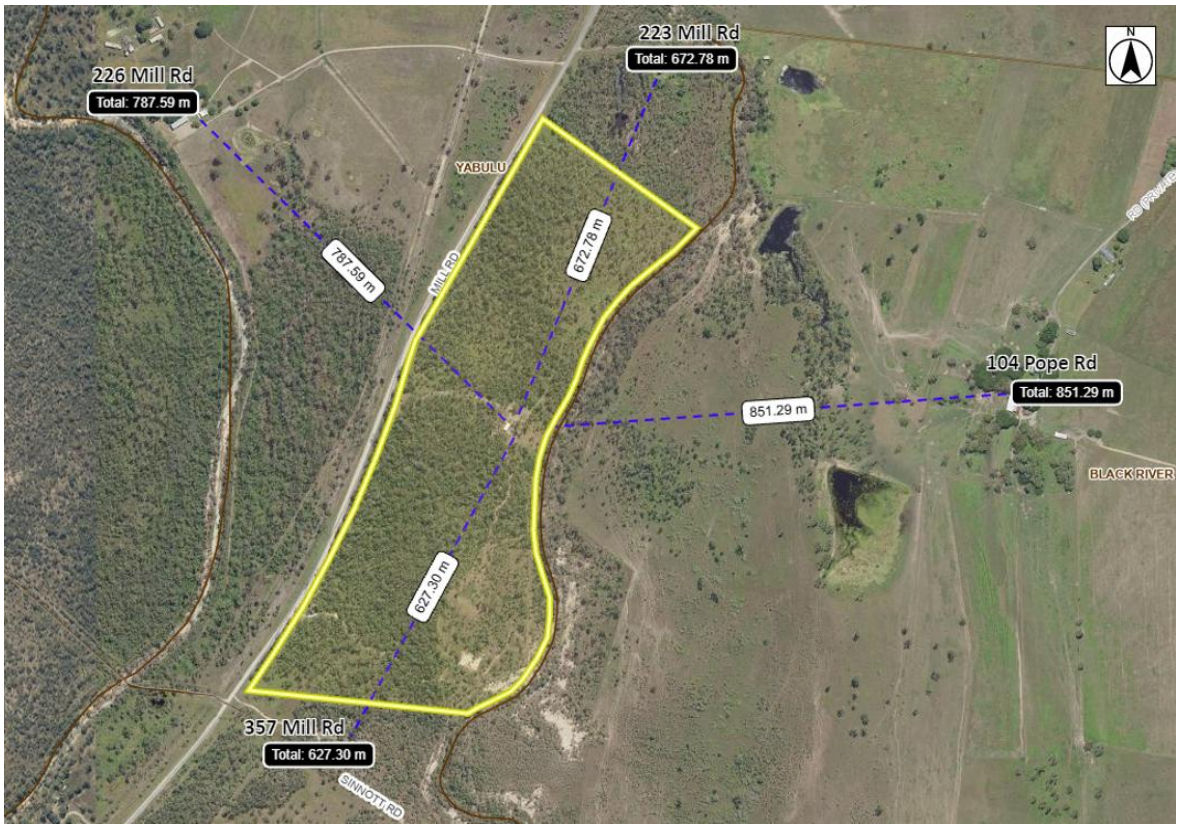


Figure 3-3 Approximate Distances from Function Facility Area to Nearest Noise Sensitive Receivers



4 PROPOSED DEVELOPMENT

The proposed development consists of the establishment of a function facility designed to host private events such as weddings, parties and other celebrations. Events are proposed to be held within a temporary marquee located in the designated entertainment area (see Figure 4-1). Amplified music and speeches are expected to occur during events, and depending on the nature of the function, live music performances may also be included.

The proposed operation hours are:

- 12:00 pm to 21:30 pm - Sunday to Thursday
- 12:00 pm to 12:00 am - Friday and Saturdays

The facility will be designed to accommodate a maximum 100 patrons and is expected to operate mainly between May and October, occasional events may occur outside this period.

Site access will be provided via the existing driveway from Mill Road (see Figure 3-2). Car parking spaces are proposed along the Mill Road frontage, with an accessible parking space and drop off area located adjacent to the function area.

An emergency power backup generator will be onsite inside a Besser Block Shed, and a compressor is expected to serve the proposed cold room. No air conditioning units or other mechanical plant are proposed.

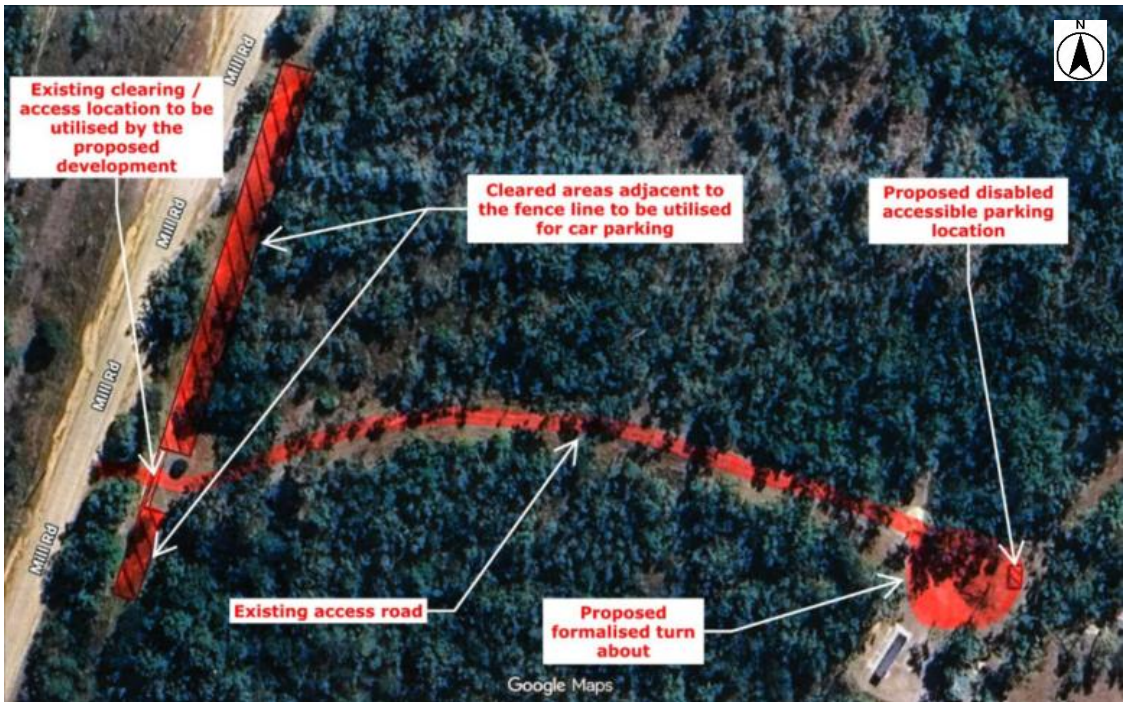
The proposal includes the following amenity and service areas (see Figure 4-1 and Figure 4-2):

- Service Shed
- Kitchen
- Toilet Block
- Covered Entertainment Area (proposed as a temporary marquee structure)
- Car parking Area

Figure 4-1 Proposed Function Facility Layout

Source: EDPI Australia Town Planning Report for Development Application

Figure 4-2 Proposed Access and Parking Plan



Source: Northern Consulting Engineers Traffic Report

5 BASELINE NOISE SURVEY

5.1 Environmental Noise Measurements

To characterise the existing noise environment of the area, unattended noise monitoring was conducted between Wednesday 6th and Monday 11th May 2026 at the logging location shown in Figure 5-1.

Logger locations were selected with consideration to other noise sources which may influence readings, security issues for noise monitoring equipment and gaining permission for access from other landowners. It is noted that permission was not granted from the owners of the adjoining properties; therefore, noise loggers installed at the northern and southern ends of the subject site. The noise monitoring at these locations is representative of the ambient noise of the area.

Instrumentation comprised of two Rion NL-42EX environmental noise logger (serial numbers 1000322 and 184112). Both devices were fitted with microphone windshields. Calibration of the noise monitoring devices was checked prior to and following measurements. Drift in calibration did not exceed ±0.5 dB(A). The equipment carried appropriate and current NATA (or manufacturer) calibration certificates (see Appendix C).

Noise measurements were conducted in accordance with Australian Standard AS 1055:2018 Acoustics - Description and Measurement of Environmental Noise and the Queensland Department of Environment and Science (DES) Noise Measurement Manual (2020).

Upon consultation with historical weather reports provided by the Bureau of Meteorology, no measured data was affected by adverse weather.

The logger determines L_{A1}, L_{A10}, L_{A90} and L_{Aeq} levels for each 15-minute period. 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 time-history graphs are provided in Appendix C.

The following assessment time periods are specified in the DES Noise measurement Manual:

- Day: 7 am to 6 pm
- Evening: 6 pm to 10 pm
- Night: 10 pm to 7 am

The monitored baseline noise levels are summarised in Table 5-1.

Table 5-1 Measured Baseline Noise Levels Corresponding to Defined DES Periods

Location	Acoustic Descriptor	Measured Noise Level – dB		
		Daytime 7 am - 6 pm	Evening 6 pm – 10 pm	Night-time 10:00 pm – 7 am
Noise Logger #1	L_{Aeq}	46	53	46
	L_{A90}	32	47	35

Noise Logger #2	L_{Aeq}	43	55	44
	L_{A90}	29	45	32

Notes:

- All values 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).

Fauna noise (i.e. cicadas, crickets, frogs, cane toads) was observed during evening (mostly) and nighttime periods This influence was considered when determining the project noise criteria.

Figure 5-1 Noise Monitoring Locations

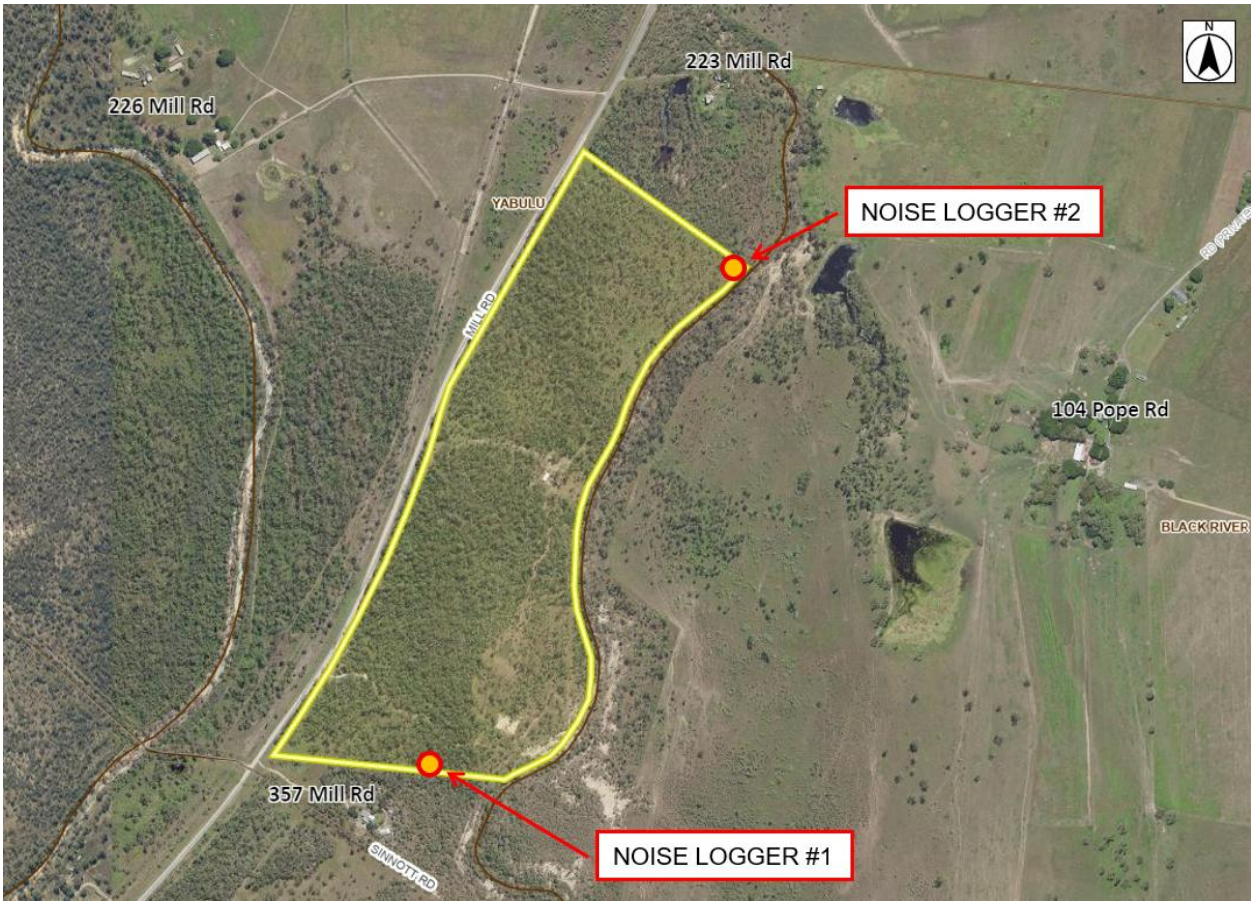
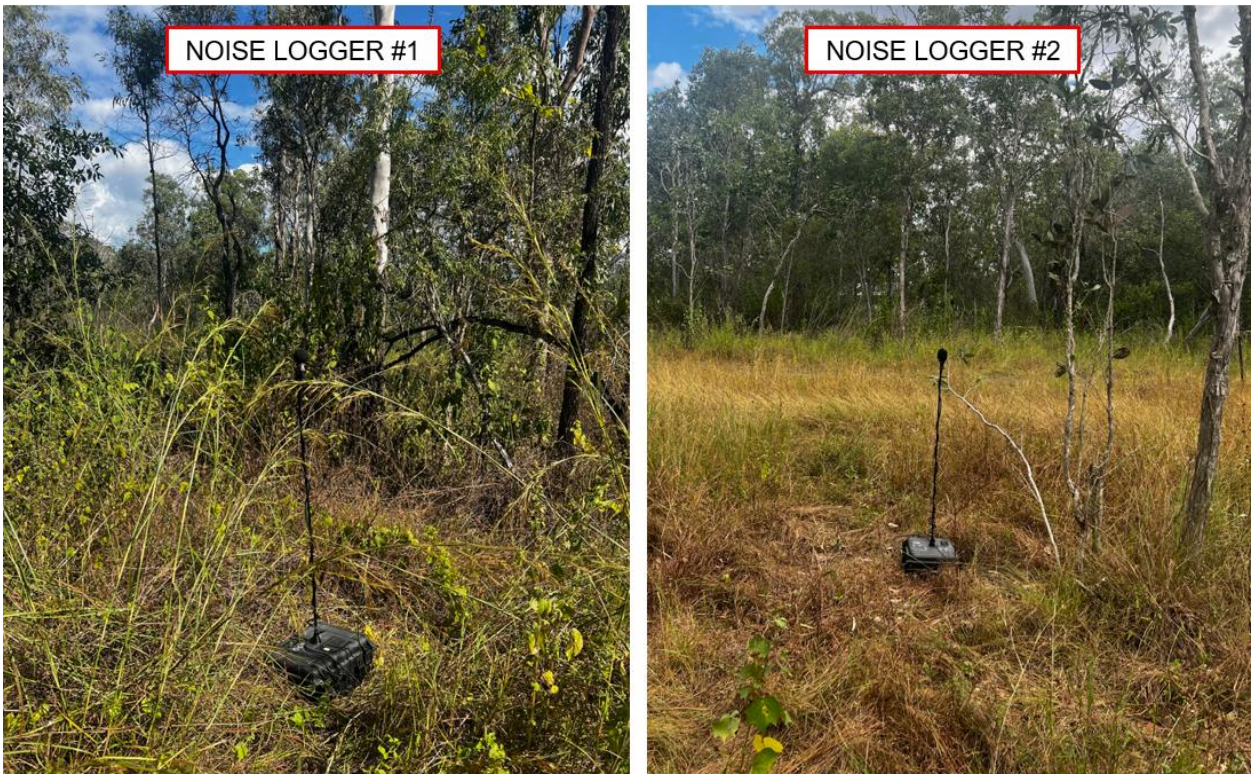


Figure 5-2 Noise Loggers



6 NOISE GUIDELINES AND CRITERIA

6.1 Townsville City Plan (Version 2025/01)

Performance Outcome P017 of the Townsville City Plan (Version 2025/01) requires that the development does not adversely impact on the character, amenity or scenic values of the locality, having regard to noise.

The City Plan does not provide specific noise limits for development within the rural zone. Accordingly, assessment of the proposed Function Facility is based on the criteria prescribed in the Environmental Protection (Noise) Policy 2019.

6.2 Department of Environmental Science (DES) - Environmental Protection (Noise) Policy 2019

The environmental values for the acoustic environment as specified in the Part 6 of the Environmental Protection (Noise) Policy 2019 include the following as relevant to sensitive receptors (dwellings):

"***6 Environmental values***

The environmental values to be enhanced or protected under this policy are—

(a) the qualities of the acoustic environment that are conducive to protecting the health and biodiversity of ecosystems; and

(b) the qualities of the acoustic environment that are conducive to human health and wellbeing, including by ensuring a suitable acoustic environment for individuals to do any of the following—

(i) sleep;

(ii) study or learn;

(iii) be involved in recreation, including relaxation and conversation;

(c) the qualities of the acoustic environment that are conducive to protecting the amenity of the community. "

The Environmental Protection (Noise) Policy 2019 specifies Acoustic Quality Objectives (AQO) in Schedule 1 that are stated to be prescribed for enhancing or protecting the environmental values at sensitive receptors. The relevant AQO for dwellings that, if reasonable in the circumstances, are applied for the protection of environmental values relating to health and wellbeing are presented in Table 6-1:

Table 6-1 Acoustic Quality Objectives - Environmental Protection (Noise) Policy 2019

Sensitive Receptor	Time of day L_{Aeq}	Acoustic quality objectives (measured at the receptor) dB(A)			Environmental value
		$L_{Aeq,adj,1hr}$	$L_{A10,adj,1hr}$	$L_{A1,adj,1hr}$	
Residence (for outdoors)	daytime and evening	50	55	65	health and wellbeing
Residence (for indoors)	daytime and evening	35	40	45	health and wellbeing
Residence (for indoors)	night-time	30	35	40	health and wellbeing, in relation to the ability to sleep

Note: Time periods are as per defined in the DES Noise measurement Manual, refer to Section 5.1.

RSA experience indicates that L_{Aeq} acoustic descriptor is most stringent and relevant descriptor for assessing noise from event venues. On this basis, this assessment focuses on $L_{Aeq,1hr}$ acoustic descriptor.

The AQO does not specify outdoor noise limits for dwellings during nighttime. In accordance with the DETSI (2026) *EIS Information Guideline – Noise and Vibration*, an outdoor to indoor noise attenuation of 7 dB is applied. Therefore, the applicable night-time outdoor criterion is:

- 30 + 7 = 37 $L_{Aeq,adj,1hr}$ (dB)

6.3 Background Creep

Noise limits for background creep is not specified in the Environmental Protection (Noise) Policy 2019 (current policy), however states in Section 9 part 2(b) the following:

"background creep in an area or place is prevented or minimised"

To assess background creep the following criterion for "controlling background creep" provided in the superseded Noise Policy (2008) has been adopted.

(2) To the extent that it is reasonable to do so, noise from an activity must not be—

(a) for noise that is continuous noise measured by $L_{A90,T}$— more than nil dB(A) greater than the existing acoustic environment measured by $L_{A90,T}$; or

(b) for noise that varies over time measured by $L_{Aeq,adj,T}$— more than 5dB(A) greater than the existing acoustic environment measured by $L_{A90,T}$.

Noise emissions from patrons, amplified music, vehicle movements are considered time-varying noise, while noise emissions from mechanical plant are considered continuous noise. Accordingly, the applicable criterion is:

Based on the lowest measured L_{A90} values (Section 5), and applying adjustments for fauna noise where required, the background creep criteria (in bold) are summarised in Table 6-2.

Table 6-2 Background Creep Noise Criteria (To the extent that it is reasonable to do so)

Type of Noise	Acoustic Descriptor	Background Creep Criteria, L_{Aeq} (dB)		
		Daytime 7 am - 6 pm	Evening 6 pm – 10 pm	Nighttime 10:00 pm – 7 am
Time Varying Noise	L_{Aeq}	(29 + 5) **34**	(45 + 5 - 6)[1] 44[2]	(32 + 5 - 6)[1] **31**
Continuous Noise	L_{A90}	**29**	(45 + 0 - 6)[1] 39[2]	(32 + 0 - 6)[1] **26**

Notes:

1. Adjustment applied due to continuous extraneous noise from insects or frogs, determined through post-processing data filtering.
2. Evening L_{A90} was inconclusive due to fauna noise; therefore, daytime criteria applied (consistent with AQO day and evening methodology).

6.4 Environmental Protection Act 1994

6.4.1 Regulated Devices

Section 440S states the following:

440S Regulated devices

(2) A person must not operate a regulated device in a way that makes an audible noise—

(a) on a business day or Saturday, before 7.00a.m. or after 7.00p.m; or

(b) on any other day, before 8.00a.m. or after 7.00p.m.

Generators and compressors are considered regulated devices under the Act.

6.5 Low Frequency Emissions from Patrons and Amplified Music

Low-frequency noise emissions from licensed venues are regulated by the Office of Liquor and Gaming Regulation (OLGR) under the Liquor Act 1992. The OLGR ensures venues comply with site specific noise criteria, imposes operational conditions, and investigates community complaints related to amplified music, patron activity, and mechanical plant noise.

Noise standards for licenced venues are detailed in in Section 40 of the Liquor Act Regulation 2002, which requires an operational noise emissions assessment to demonstrate compliance with prescribed limits. These criteria are provided for information only.

Table 6-3 OLGR Assessment Criteria (for information only)

Source Type	Octave Band Centre Frequency (Hz), dB						dB
	63	125	250	500	1K	2K	
Before 10 pm	-	-	-	-	-	-	BG* + 10 dB(A)
After 10 pm	BG* + 8	BG* + 8	BG* + 8	BG* + 8	BG* + 8	BG* + 8	dB(C)

* BG = background noise level L_{A90}(dB)

In this assessment, a maximum of 85 dBC at 3 m from each speaker has been considered to account for low frequency emissions.

6.6 Summary of Applicable Noise Criteria

Based on the baseline noise survey and the noise criteria applicable to the site, the project specific noise limits at all identified noise sensitive receptors (see Section 3) are summarised in Table 6-4.

Table 6-4 Specific Project Noise Limits

Noise Sensitive Receptor	Time of the Day	L_{Aeq}, dB	L_{A90}, dB
Acoustic Quality Objectives (For Outdoors) – $L_{Aeq,1hr}$			
R1 - 357 Mill Road R2 - 223 Mill Road R3 - 226 Mill Road R4 - 104 Pope Road	Daytime (7 am - 6 pm)	50	-
	Evening (6 pm – 10 pm)	50	-
	Nighttime (10:00 pm – 7 am) – Sleep Disturbance	37	-
Background Creep – $L_{Aeq,15min}$	Time Varying Noise	Continuous Noise	
	Daytime (7 am - 6 pm)	34	29 L_{Aeq} (dB)

R1 - 357 Mill Road	Evening (6 pm – 10 pm)	34	29 L_{Aeq} (dB)
R2 - 223 Mill Road R3 - 226 Mill Road R4 - 104 Pope Road	Nighttime (10:00 pm – 7 am)	31	26 L_{Aeq} (dB)

Noise from mechanical plant must not be audible before 7:00am or after 7:00pm on a business day or Saturday, and before 8:00am or after 7:00pm on any other day.

A noise is considered inaudible when it is at least 10 dB below the background noise level (L_{A90}). Based on the measured background noise levels and the applied fauna noise corrections, mechanical plant is considered not audible when below 16 dB(A).

7 NOISE MODEL METHODOLOGY

A three-dimensional noise model was developed using SoundPLAN V9.0, applying the ISO 9613-2:1996 *Acoustics – Attenuation of sound during propagation outdoors* algorithm.

The ISO 9613, use a method to predict the equivalent continuous A-weighted sound pressure levels (L_{Aeq}). As outlined in Section 6.2, this assessment focuses on the more stringent L_{Aeq} acoustic descriptor, which aligns with the ISO standard methodology.

For reference, percentile descriptors associated with the Acoustic Quality Objectives (AQOs) may be approximated as:

- $L_{A10} = L_{Aeq} + 3$
- $L_{A01} = L_{Aeq} + 8$

The modelling parameters, assumptions, and source sound power levels detailed below were incorporated to predict noise emissions from all proposed activities.

Table 7-1 Noise Modelling Parameters and Assumptions

Modelling parameters and assumptions	
Noise propagation algorithm	ISO9613
Wind direction	Calm
Ground absorption coefficient (grass areas)	1.0 (ISO 9613-2)
Ground absorption coefficient (paved areas)	0.0 (ISO 9613-2)
Temperature - humidity	20°C - 80%
One story building	5 m height

Modelling parameters and assumptions	
Patrons' height above ground level (area source)	1.7 m
Vehicle engine height	0.5 m (cars), 1.0 m (buses)
Speaker height (point source)	2.5 m (one speaker at each corner of the entertainment area, 4 in total)
Receiver height above ground level	1.5 m

The accounts for geometric spreading, ground absorption, shielding from terrain and structures, meteorological effects, and atmospheric absorption. Terrain contours were sourced from QTopo - online topographic maps, provided by the Queensland Government.

7.1 Modelled Scenarios

The following operational scenarios were modelled to represent worst-case conditions:

- Situation 1 – Four amplified music speakers (2.5 m height) and 100 patrons
- Situation 2 – Live music band and 100 patrons
- Situation 3 – Vehicles arriving (28 cars and 2x12 seater buses)
- Situation 4 – Vehicles leaving (28 cars and 2x12 seater buses)

7.2 Noise Sources

The following sections detail the noise generating activities associated with the proposed development that may may impact nearby sensitive receptors.

7.2.1 Vehicle Movements

Vehicle movements associated with the Function Facility were based on the Traffic Impact Assessment prepared for the project. For events accommodating up to 100 patrons, the following worst-case operational assumptions were adopted:

- 2 x 12-seater buses (arrival and departure)
- 28 private vehicles, including 1 vehicle using the accessible parking space adjacent to the Entertainment Area
- Total of 60 vehicle movements (30 movements during arrival and 30 during departure)

Representative vehicle types were included in the model, including:

- Toyota Hiace 12 seater bus (Reported noise level of 85 dBA at 1050 mm from the exhaust). Noise data has been sourced from the Department of Infrastructure, Transport, Regional Development, Communications and the Arts.

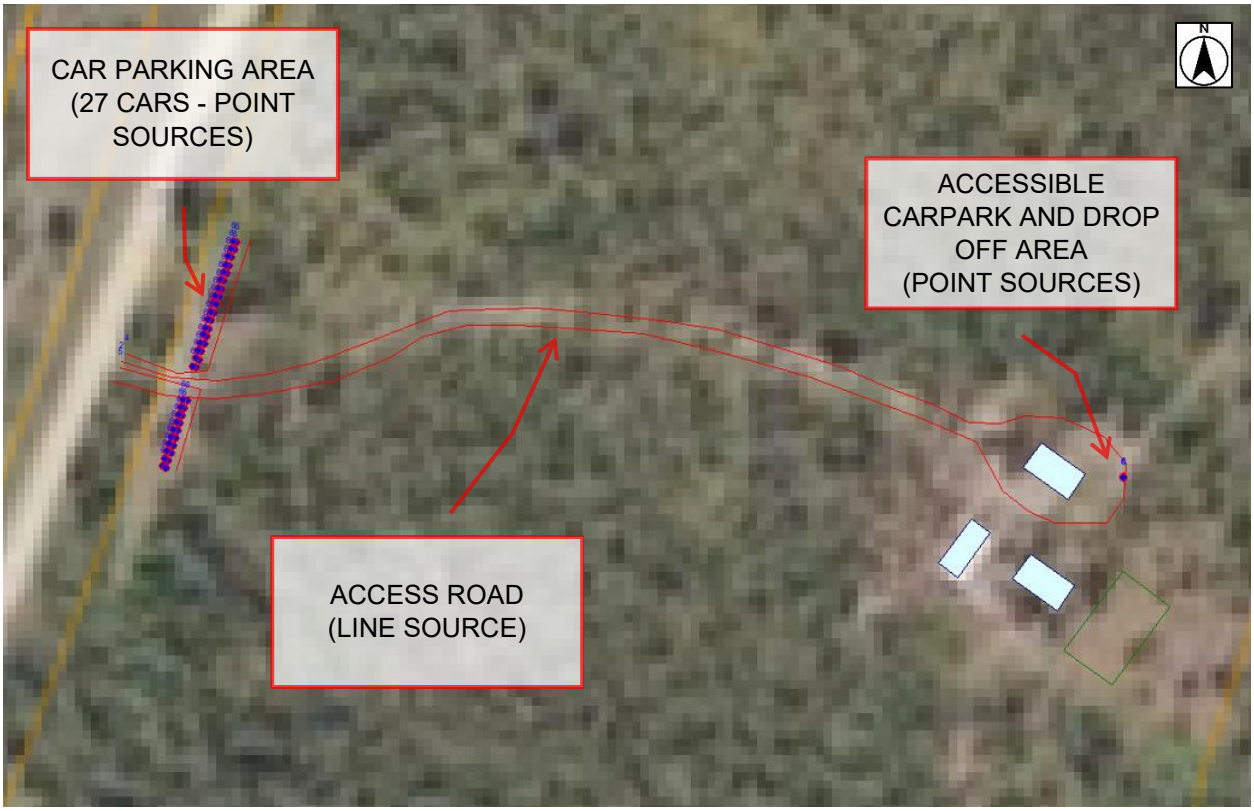
- Private vehicle noise levels were based on RSA internal database (see Table 7-2)

Table 7-2 Car Pass by Sound Power Level Spectrum – RSA library

Source	Octave Band Centre Frequency (Hz), dB								
	63	125	250	500	1k	2k	4k	8k	dBA
Car	83	87	82	81	80	79	73	64	85

An excerpt from the noise model is presented in Figure 7-1.

Figure 7-1 Vehicle Sources - Noise Model Distribution



7.2.2 Patrons Noise

Noise from patrons has been predicted using the methodology described in Hayne et al. (2011), "*Prediction of Noise from Small to Medium Sized Crowds*". The A-weighted sound power level for a crowd of size N is calculated using:

$$L_{WAeq} = 15 \log (N) + 64dB(A)$$

This method is widely used in Queensland acoustic assessments and provides a conservative estimate of crowd noise for outdoor event environments.

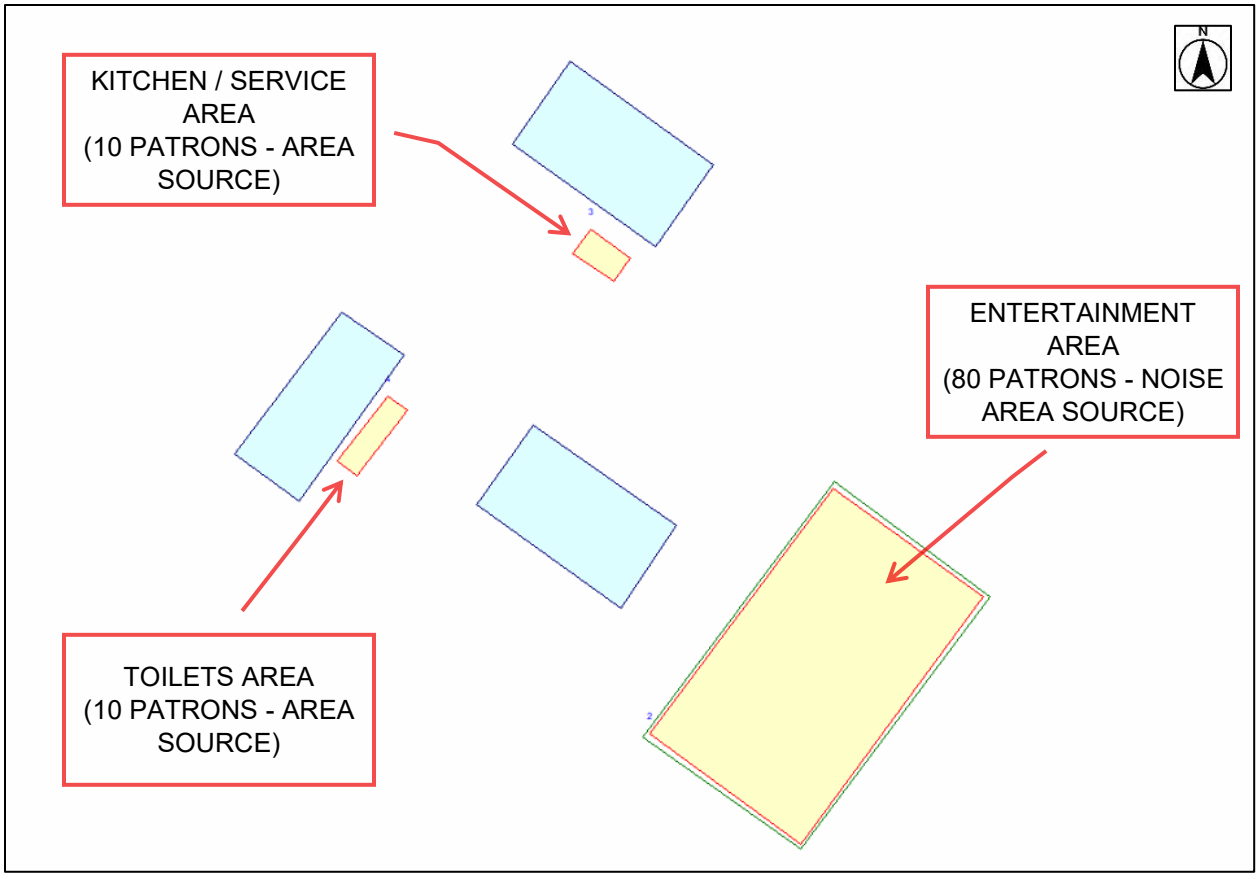
Based on this formula, the predicted overall A-weighted sound power levels for patron activity within each area of the Function Facility are summarised in Table 7-3.

Table 7-3 Patrons Sound Power Level

Area	Crowd Number	Predicted A-weighted sound power level, dB
Entertainment Area	80	93
Toilet Area	10	79
Kitchen/Service Area	10	79

An excerpt from the noise model is presented in Figure 7-2.

Figure 7-2 Patrons Noise Source Locations Within the Function Area – Noise Model Distribution



7.2.3 Music – Entertainment Noise

Amplified Music

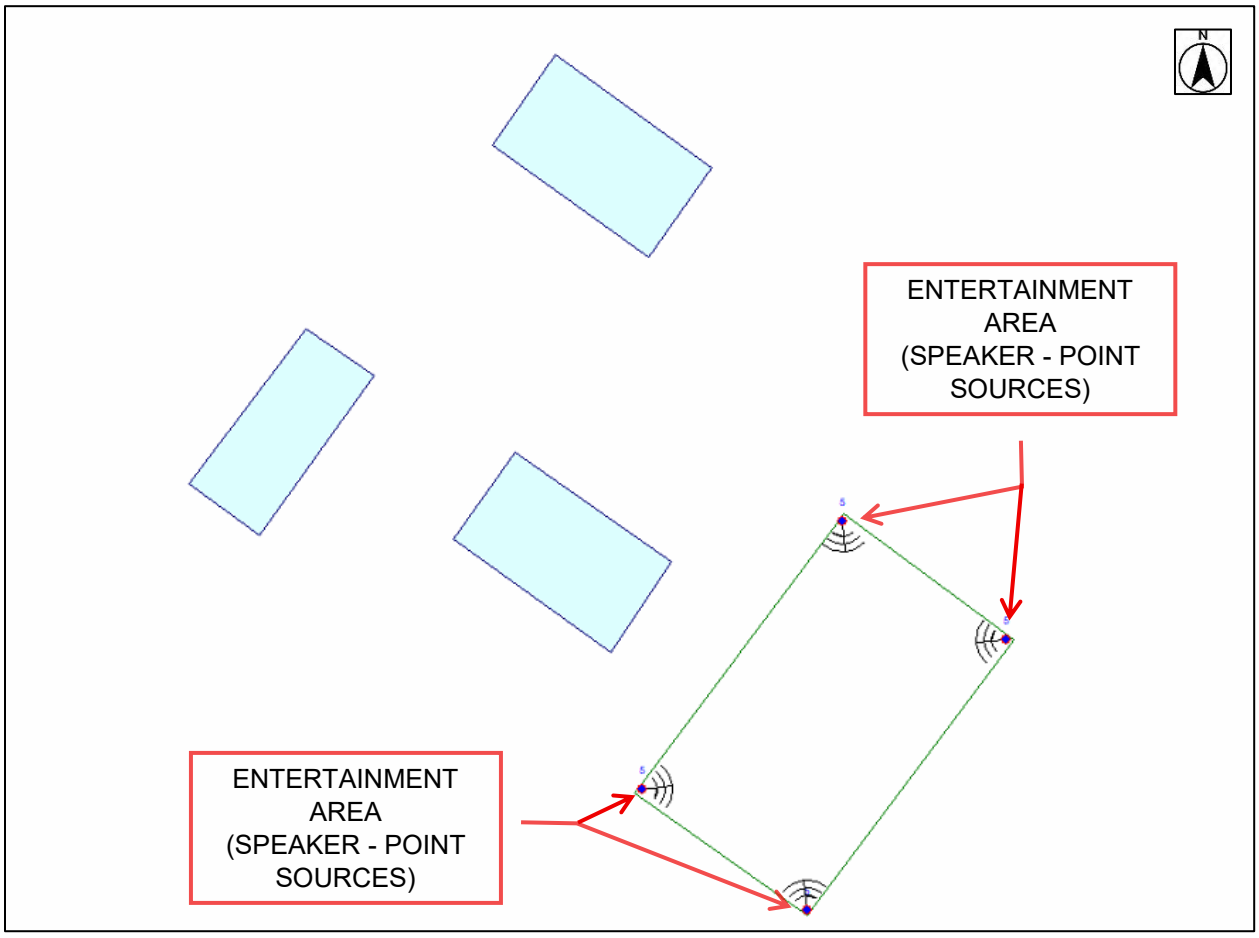
The sound system will be supplied by the function producer; no in-house sound system is proposed. A conservative amplified music scenario has been modelled, consisting of four speakers located at each corner of the designated Entertainment Area. Each speaker has been modelled at a sound power level of 102 dB(A) (81 dBA at 3 m from each speaker).

Table 7-4 Speaker Sound Power Level Spectrum – RSA library

Source	Octave Band Centre Frequency (Hz), dB								
	63	125	250	500	1k	2k	4k	8k	dBA
Speaker	95	98	93	104	91	85	85	79	102

An excerpt from the noise model is presented in Figure 7-3.

Figure 7-3 Speaker Locations in the Entertainment Area – Noise Model Distribution



Live Band

For events involving live music, the following assumptions have been adopted:

- All musical instruments are connected to the sound system
- A 5-piece band, comprising guitar, bass, drums, keyboard, and vocals

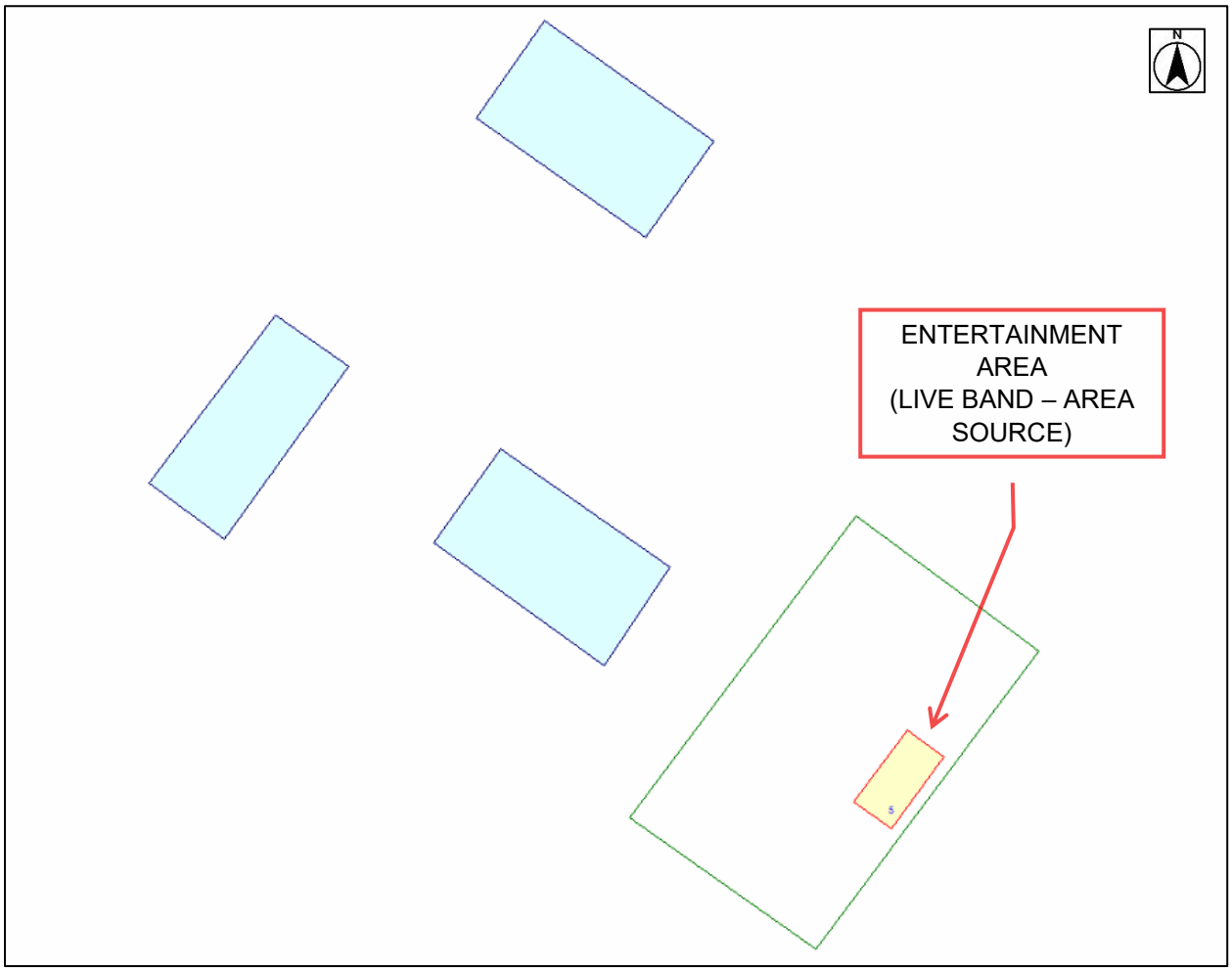
The sound power spectrum used for the live band is sourced from the RSA library, based on measurements undertaken at a comparable function venue. The spectral data is presented in Table 7-5.

Table 7-5 5 Piece Live Band Sound Power Level Spectrum – RSA library

Source	Octave Band Centre Frequency (Hz), dB								
	63	125	250	500	1k	2k	4k	8k	dBA
Live Band	101	104	99	106	97	91	91	85	105

An excerpt from the noise model is presented in Figure 7-4.

Figure 7-4 Live Band Location in the Entertainment Area – Noise Model Distribution



7.2.4 Mechanical Plant

Mechanical plant associated with the Function Facility includes an emergency power backup generator and a cool room compressor, both assumed to be located within the designated function facility area. As specific equipment models are not yet confirmed, predictions are based on typical venue equipment. A desktop noise propagation prediction has been conducted for the operation of the mechanical plant to determine compliance with the Environmental Protection Act 1994 noise criteria at the identified noise sensitive receivers.

Generator

The emergency power backup generator will be housed in a Besser Block Shed. with a minimum noise reduction of 20 dB assumed to be provided by the structure.

An 8kVA generator (Hyundai diesel engine, model GHD6400E-MS) has been assumed to operate under emergency conditions only. The overall sound power level and octave-band spectrum have been calculated using the generator methodology described in Engineering Noise Control (Bies & Hansen).

Table 7-6 Calculated generator Sound Power Level Spectrum

Source	Octave Band Centre Frequency (Hz), dB								
	63	125	250	500	1k	2k	4k	8k	dB
8kVA Generator	77	78	78	78	76	74	71	66	85

Cool Room Compressor

A small reciprocating compressor has been assumed, as this type is commonly used in commercial refrigeration. Based on data presented in Engineering Noise Control (Bies & Hansen), the following octave-band sound pressure levels at 1 m are adopted.

Table 7-7 Estimated Reciprocating Compressor Sound Power Level Spectrum

Source	Octave Band Centre Frequency (Hz), dB								
	63	125	250	500	1k	2k	4k	8k	dB
Reciprocating Compressor (35-175 kW)	94	95	98	94	92	90	86	80	98

The compressor must be located inside a ventilated enclosed space that provides a minimum noise reduction of 20 dB.

8 PREDICTED NOISE LEVELS AND PROJECT COMPLIANCE

Predicted noise levels have been calculated for all the proposed noise sources detailed above. Noise emissions at the nearest sensitive use receivers have been predicted, with compliance evaluated against the specific project noise limits detailed in Table 6-4.

Results reflect worst-case operating conditions, including amplified music, live performances, and peak vehicle movements. The modelling incorporates directional speaker placement, ground absorption, and atmospheric attenuation consistent with ISO 9613-2.

Predicted noise levels have been calculated at the nearest noise sensitive receivers identified in Section 3. Appendix G presents the predicted noise contours at 1.5 m height.

Table 8-1 Predicted Operational Noise Levels ($L_{Aeq,1hr}$) at the nearest receivers – AQO For Outdoors

Noise Sensitive Receiver	Period	Amplified Music + Patrons $L_{Aeq,1hr}$ (dB)	Live Band + Patrons $L_{Aeq,1hr}$ (dB)	Vehicle Arriving/Leaving $L_{Aeq,1hr}$ (dB)	Criteria $L_{Aeq,1hr}$ (dB)	Compliance
R1 - 357 Mill Road	Day / evening	31	31	0	50	Yes
R2 - 223 Mill Road		29	28	0		Yes
R3 - 226 Mill Road		26	26	0		Yes
R4 - 104 Pope Road		26	23	0		Yes
R1 - 357 Mill Road	Night	31	31	3	37	Yes
R2 - 223 Mill Road		29	28	0		Yes
R3 - 226 Mill Road		26	26	0		Yes
R4 - 104 Pope Road		26	25	0		Yes

The predicted $L_{Aeq,1hr}$ noise levels comply with the AQO criteria for both daytime/evening and night-time periods.

Table 8-2 Predicted Operational Noise Levels ($L_{Aeq,1hr}$) at the nearest receivers – Background Creep (Time Varying Noise)

Noise Sensitive Receiver	Period	Amplified Music + Patrons $L_{Aeq,15m}$ (dB)	Live Band + Patrons $L_{Aeq,15m}$ (dB)	Vehicle Movements $L_{Aeq,15m}$ (dB)	Criteria $L_{Aeq,15m}$ (dB)	Compliance
R1 - 357 Mill Road	Day / evening	31	31	2.7	34	Yes
R2 - 223 Mill Road		29	28	0		Yes
R3 - 226 Mill Road		26	26	0		Yes
R4 - 104 Pope Road		26	25	0		Yes
R1 - 357 Mill Road	Night	31	31	2.7	31	Yes
R2 - 223 Mill Road		29	28	0		Yes
R3 - 226 Mill Road		26	26	0		Yes
R4 - 104 Pope Road		26	25	0		Yes

The predicted noise levels comply with background creep (Time Varying Noise) criteria. Predicted noise levels for continuous noise sources (mechanical plant) are summarised in Table 8-3, and demonstrate that the mechanical plant can also comply with the Background Creep Continuous Noise criteria when installed within the assumed enclosures.

Table 8-3 Predicted Operational Noise Levels (L_{Aeq}) at the nearest receivers – Environmental Protection Act 1994 (Regulated Devices)

Noise Sensitive Receiver	Period	Mechanical Plant $L_{Aeq,}$ (dB)	Criteria $L_{Aeq,15m}$ (dB)	Compliance
R1 - 357 Mill Road	• between 7:00pm and 7:00am (business day or Saturday), or • between 7:00pm and 8:00am (on any other day)	16	16	Yes
R2 - 223 Mill Road		15		Yes
R3 - 226 Mill Road		14		Yes

R4 - 104 Pope Road	13	Yes

Noise levels from mechanical plant are predicted to comply with the Environmental Protection Act 1994 criteria for regulated devices at all identified noise sensitive receivers.

It is noted that the generator must be located within the Besser Block Shed enclosure, and the compressor must be installed within a ventilated enclosed structure, consistent with the assumptions described in Section 7.2.4.

9 RECOMMENDATIONS

Based on the results of the noise impact assessment, the proposed Function Facility at 235–353 Mill Road, Yabulu is predicted to comply with all relevant noise criteria under worst case operating conditions. To ensure continued compliance and maintain amenity for nearby sensitive receptors, the following is recommended:

- Minimised the number of speakers and maintain inward facing orientation toward the centre of the Entertainment Area.
- Prior to each event, conduct a noise level measurement to ensure amplified music levels do not exceed 81 dB(A) at 3 m per speaker.
- Live band instruments should be connected to the calibrated PA system, ensuring consistent control of sound levels.
- Conduct pre-event briefings with vendors and organisers regarding noise limits, operational conditions and capacity restrictions.
- The site manager or designated responsible person should be present during all functions to oversee compliance with the operational noise conditions.
- Inform patrons to minimise noise when entering and leaving the premises. This includes, but is not limited to:
  - Vehicle stereos should be turned off or operating at low volume with windows closed
  - Prohibition of vehicle horn use
  - Responsible driving behaviour, avoiding excessive engine noise or revving
- The emergency power backup generator must be installed inside the Besser Block Shed enclosure, providing a minimum noise reduction of 20 dB (R_w 20).
- The generator should not exceed the sound power levels detailed in Table 7-6.
- The cool room compressor must be installed within a ventilated enclosed structure providing a minimum noise reduction of 20 dB (R_w 20).

- The cool room compressor should not exceed the sound power levels detailed in Table 7-7.
- Provide the nearest residential noise sensitive receivers with contact details for the venue manager or responsible person for queries, concerns, or complaints.
- Maintain a complaint register, including time, nature of complaint, and corrective actions taken.

10 CONCLUSION

A comprehensive noise impact assessment has been conducted for the proposed operation of the Function Facility at 235-353 Mill Road, Yabulu, QLD, in support of a Material Change of Use application.

An environmental noise survey was conducted to characterise existing background noise levels in the area, and a detailed noise model was developed to predict noise emissions from all proposed activities, including amplified music, live band performances, patron noise, and vehicle movements. Predicted noise levels were assessed against the Acoustic Quality Objectives (including sleep disturbance) and background creep criteria.

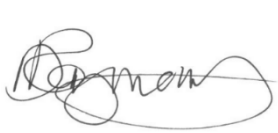
The results demonstrate that predicted noise levels comply with the applicable noise limits at the nearest sensitive receptors under worst case operating conditions, including night-time periods.

With the implementation of the recommended operational controls outlined in Section 9, the proposed development is expected to operate without causing adverse noise impacts to surrounding noise sensitive receivers.

Prepared by:

Alvaro Liberona
Senior Acoustic Engineer (MAAS)

Approved by:

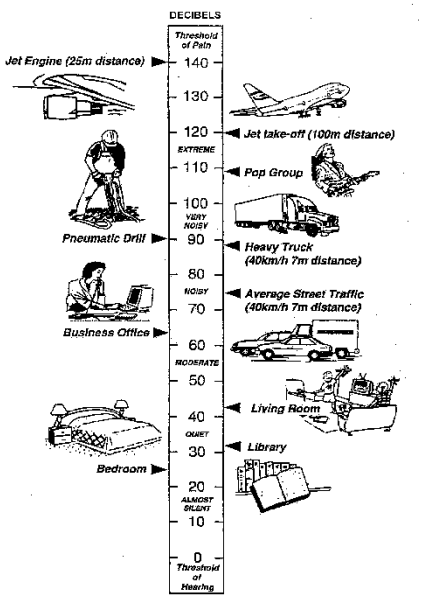


Desmond Raymond
Director

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)	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 10th 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)*.

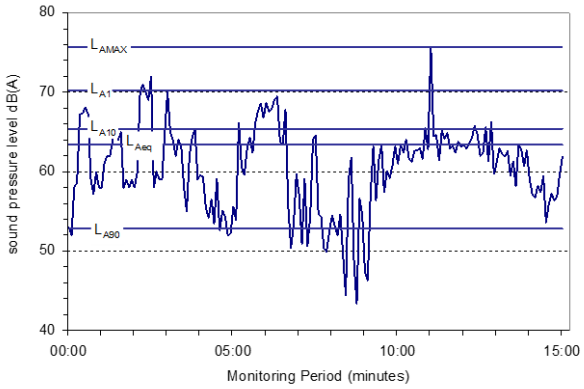
Sound Pressure Level (SPL)

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).

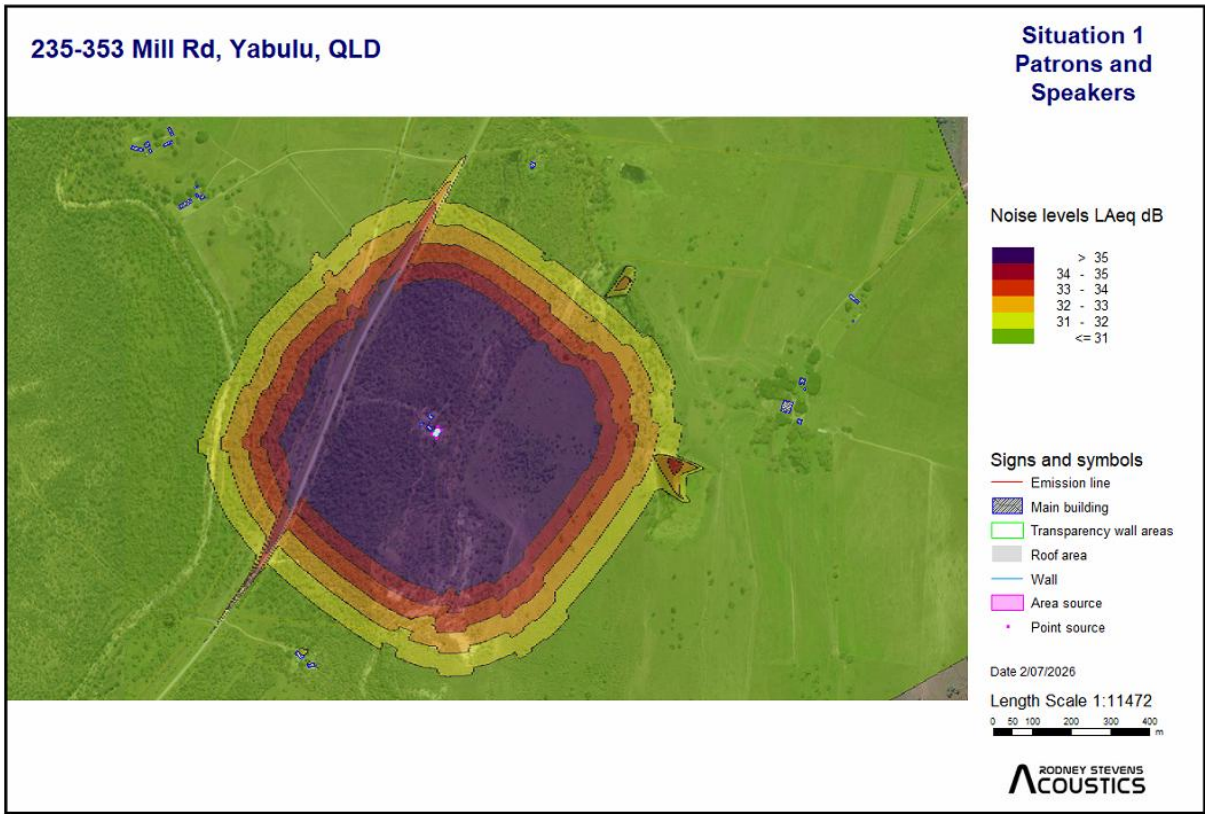
Threshold

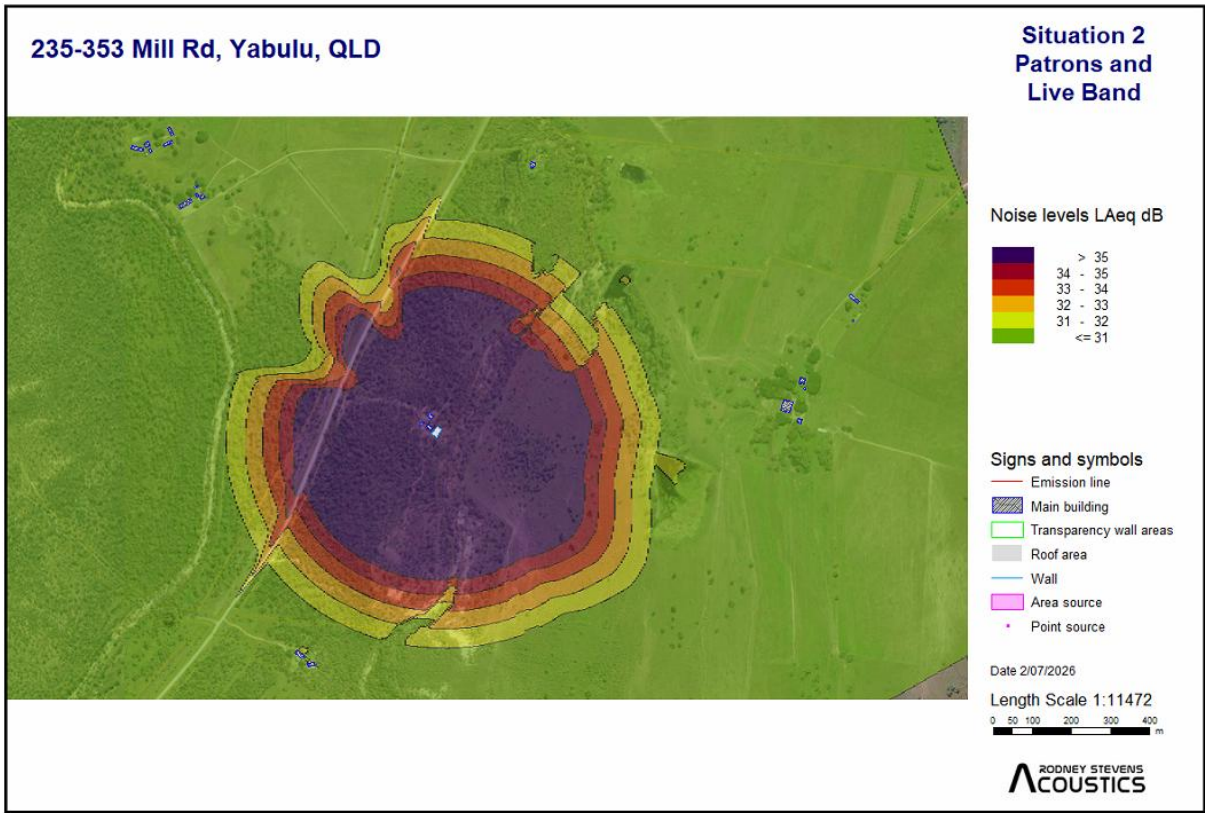
The lowest sound pressure level that produces a detectable response (in an instrument/person).

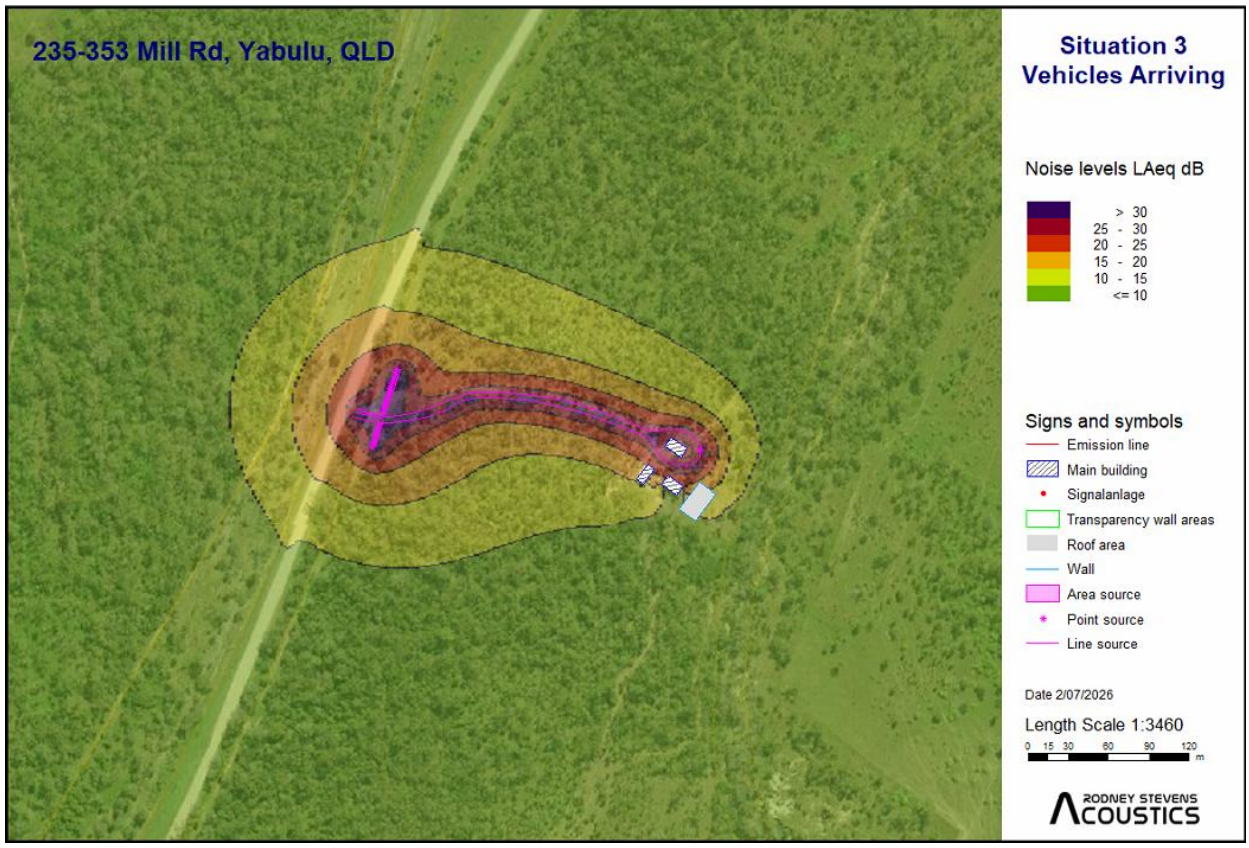
Tonality

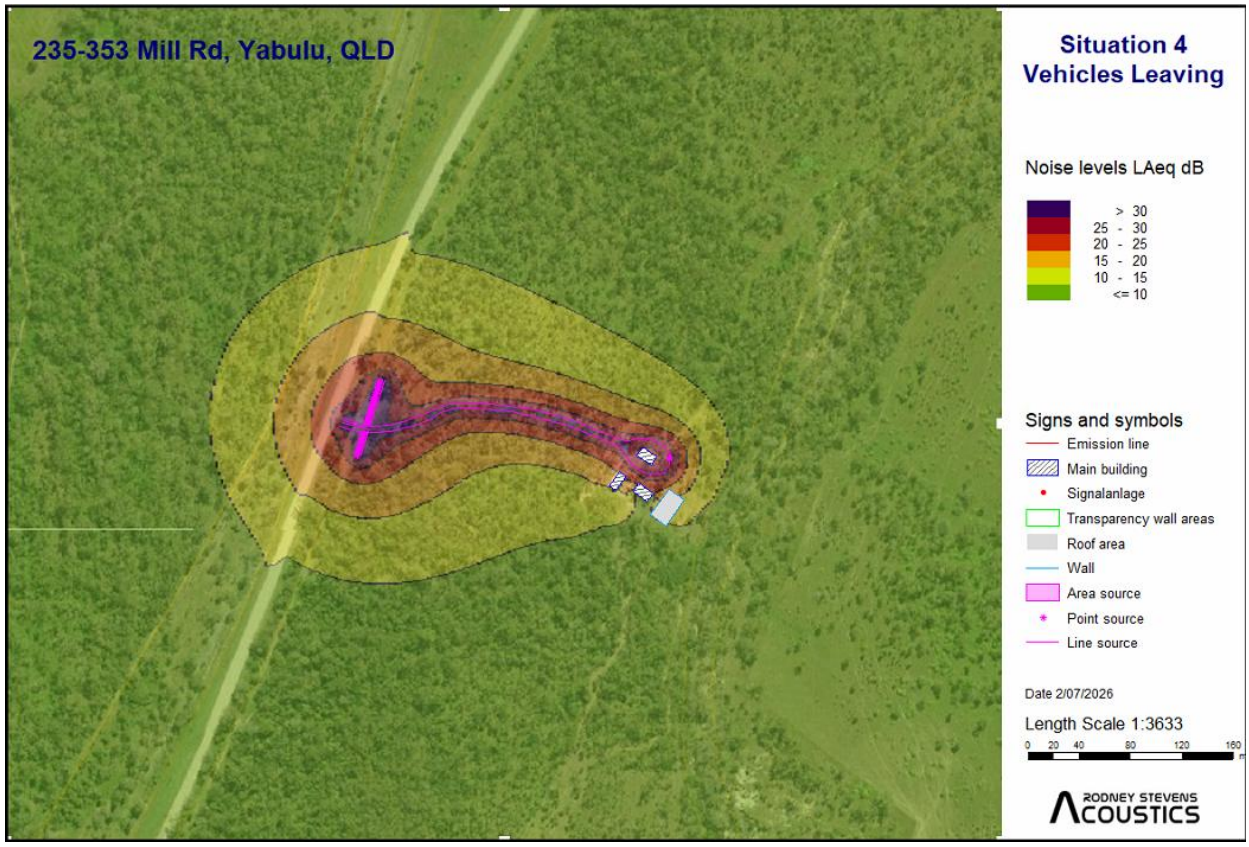
Tonal noise contains one or more prominent tones (and characterised by a distinct frequency components) and is considered more annoying. A 2 to 5 dB(A) penalty is typically applied to noise sources with tonal characteristics

Appendix B – Predicted Noise Contours

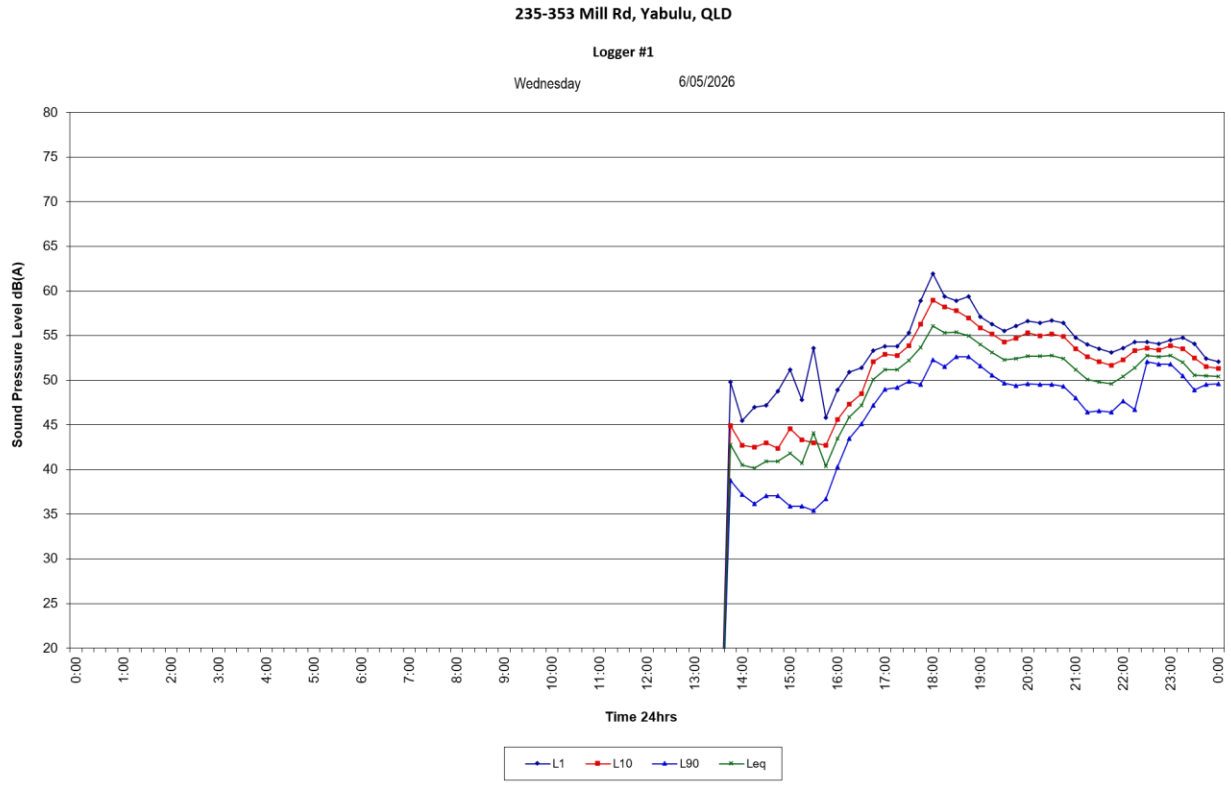


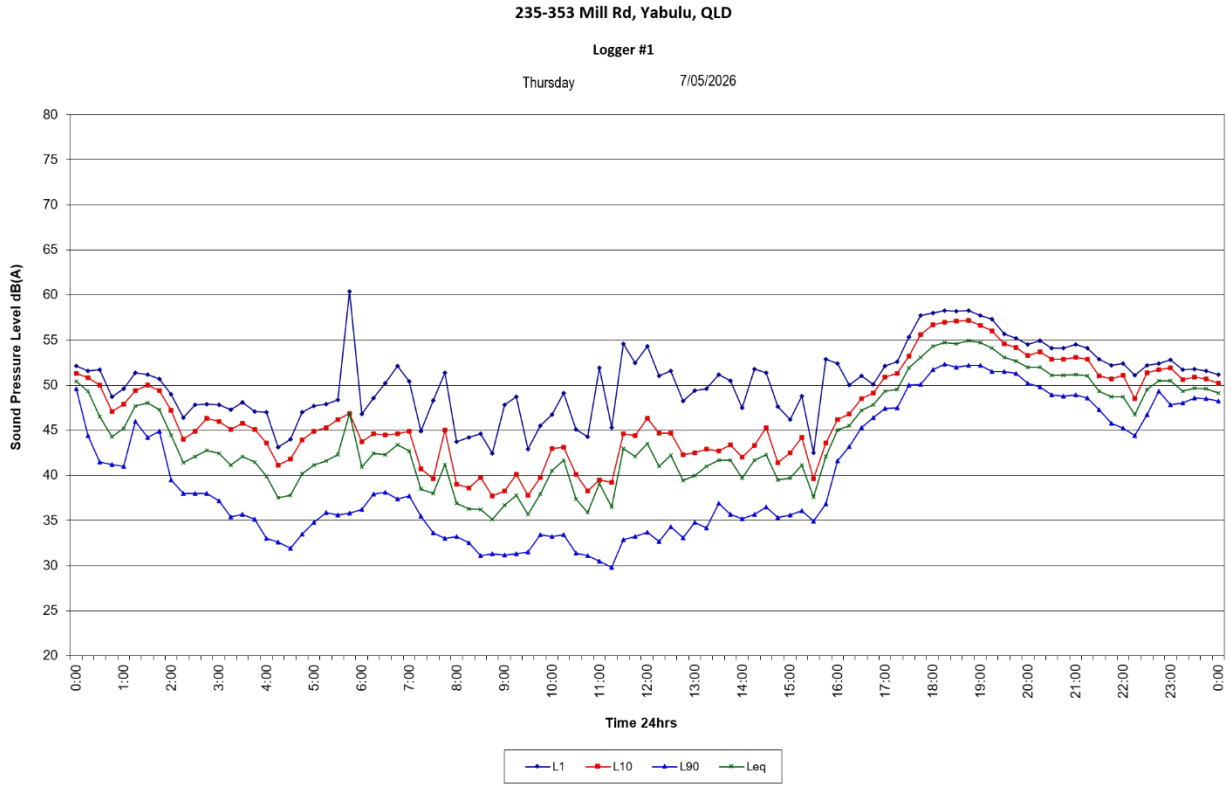


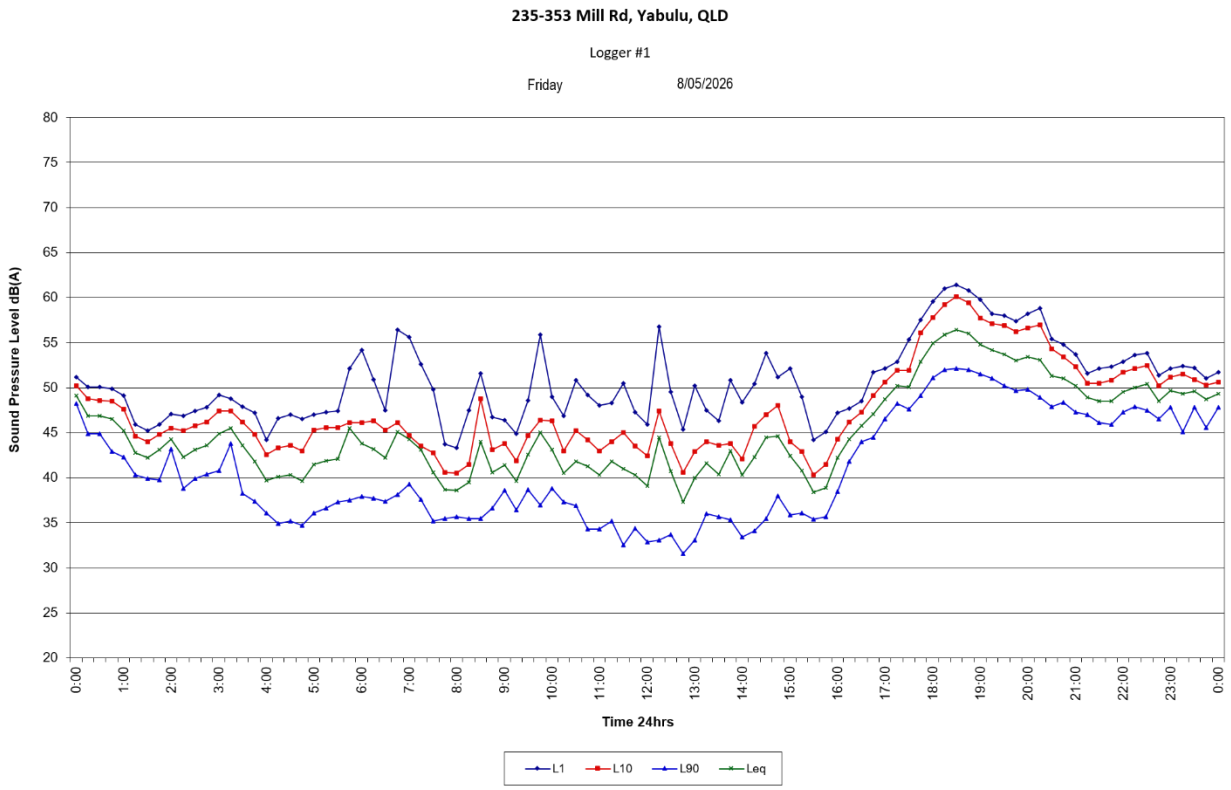


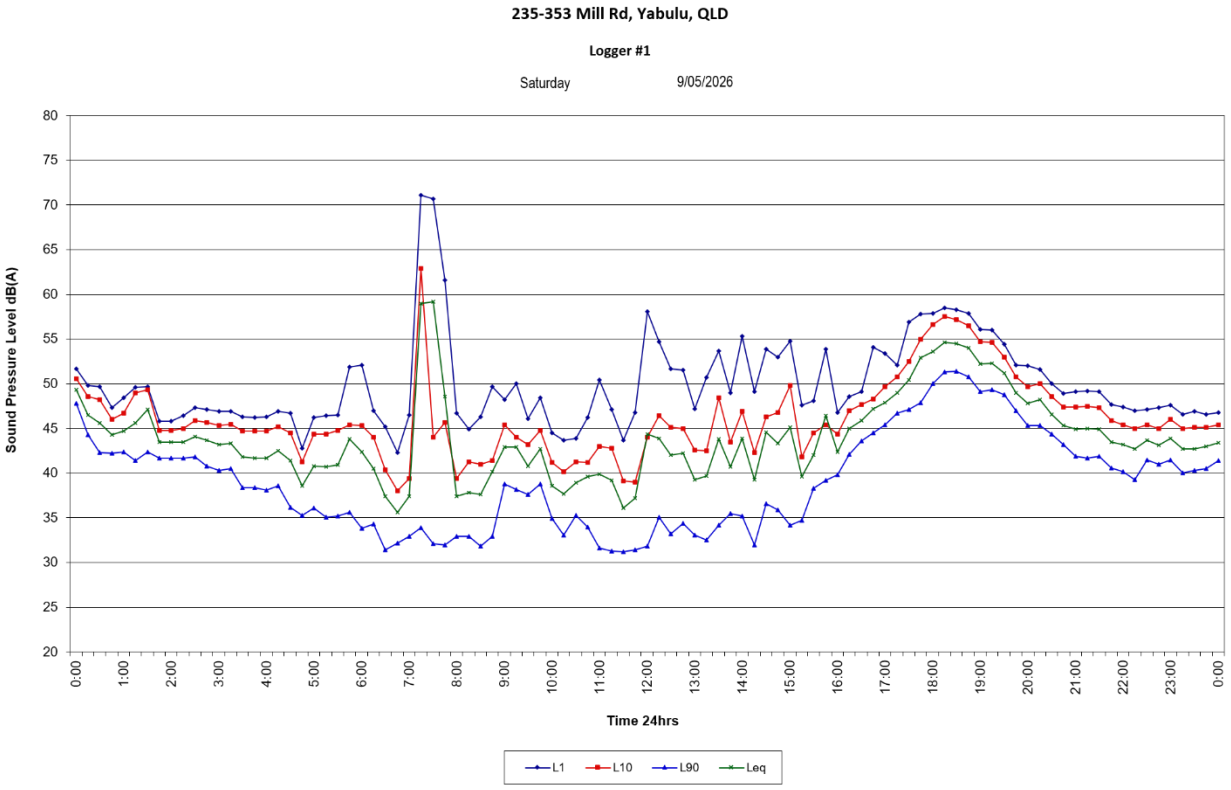


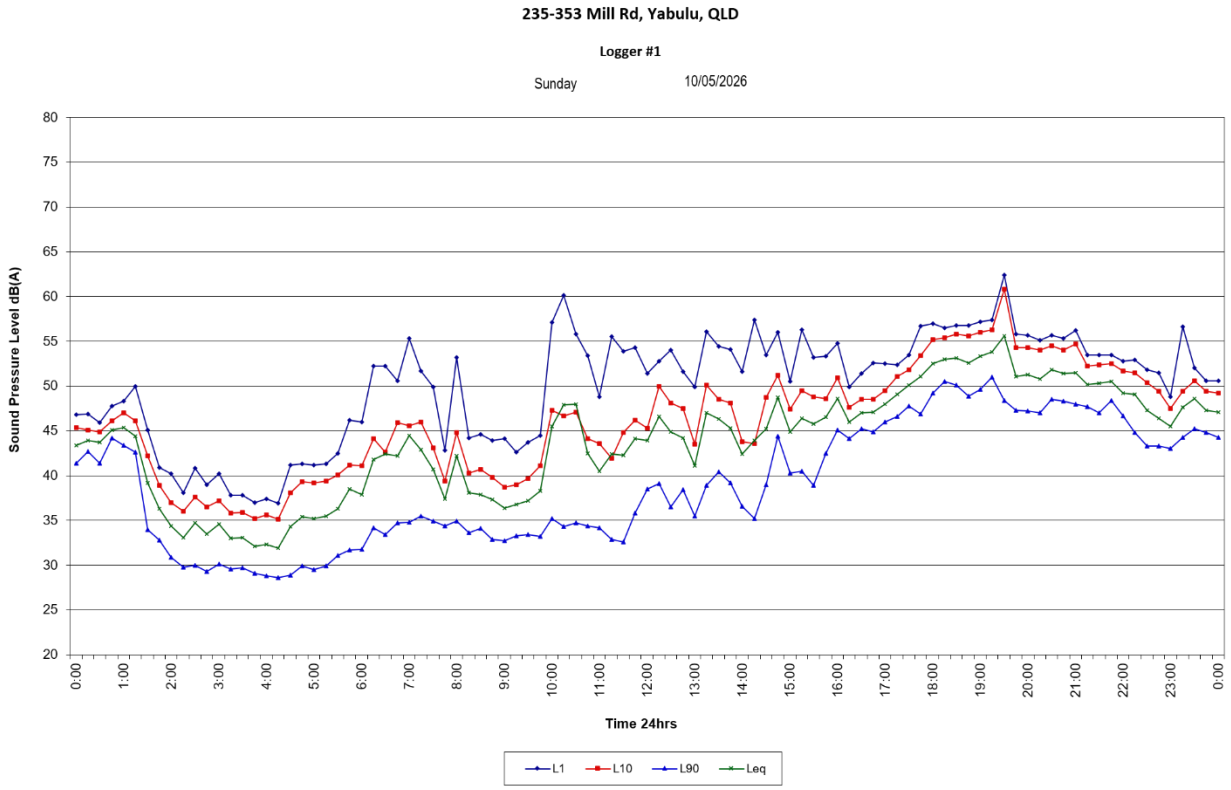
Appendix C – Noise logger graphs

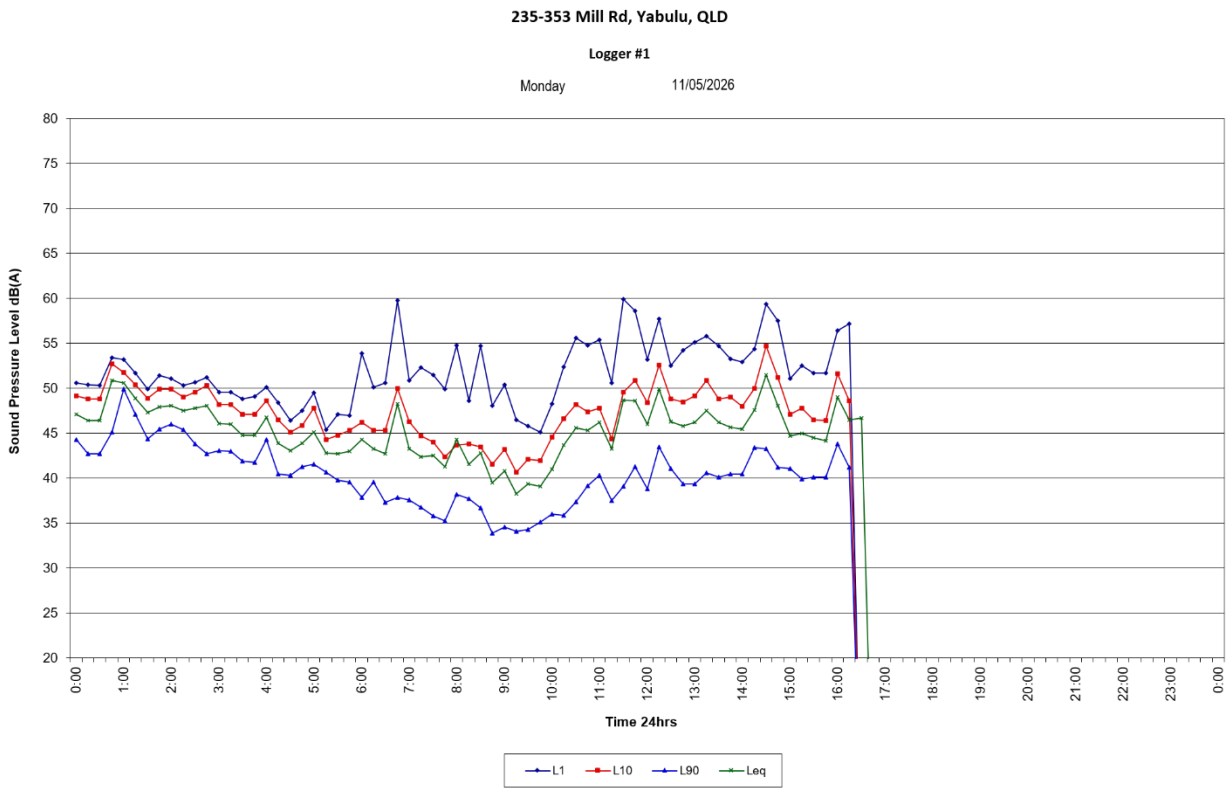


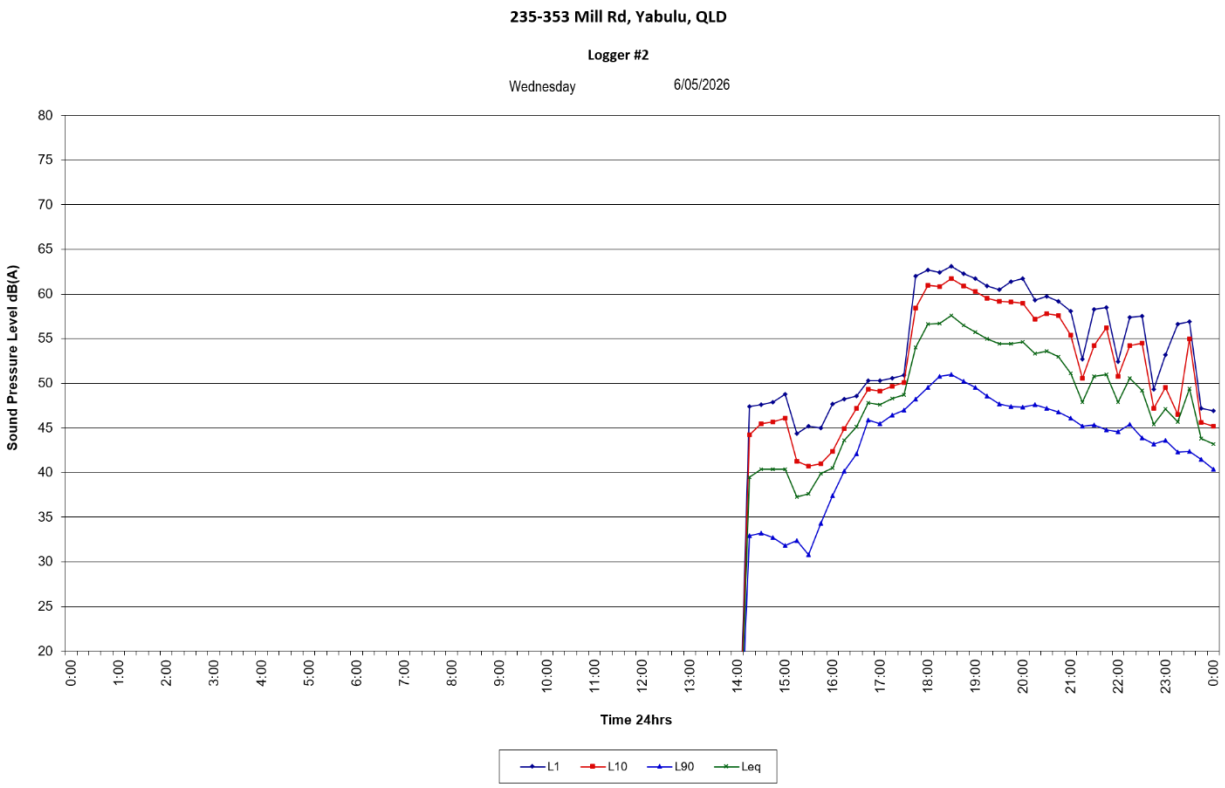


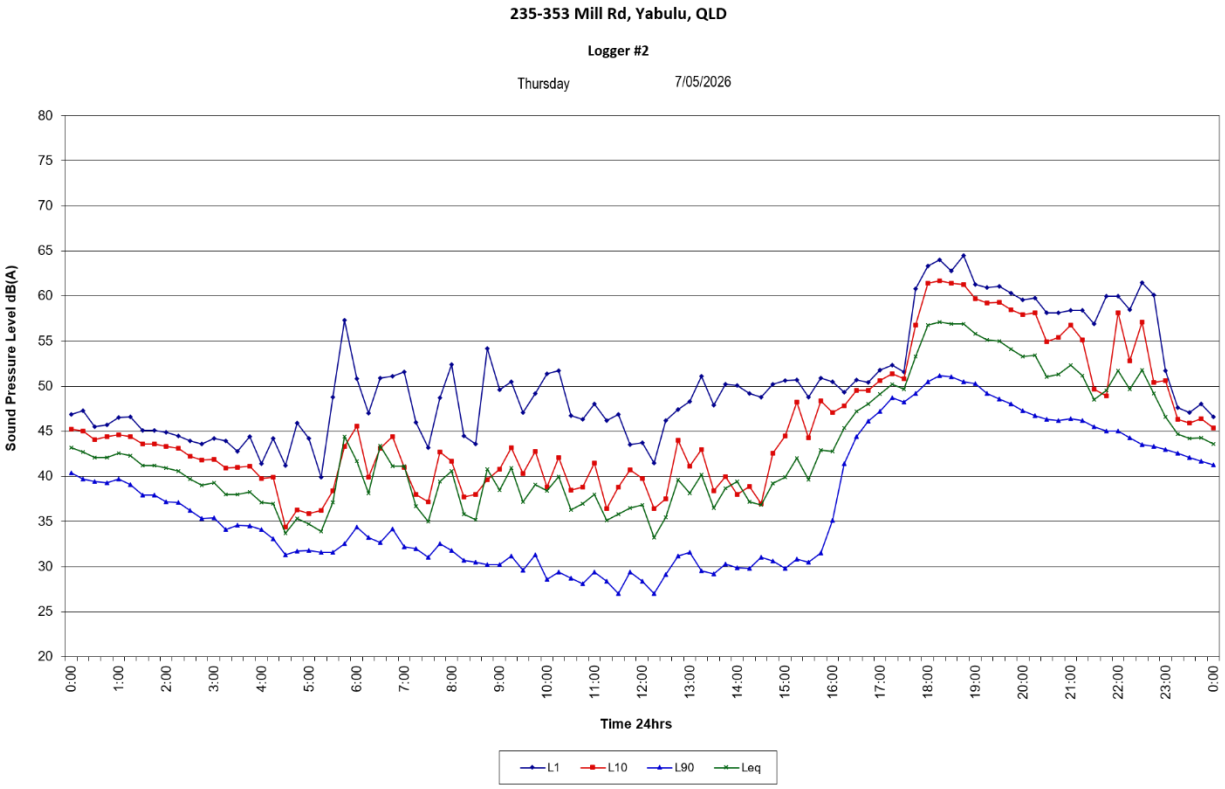


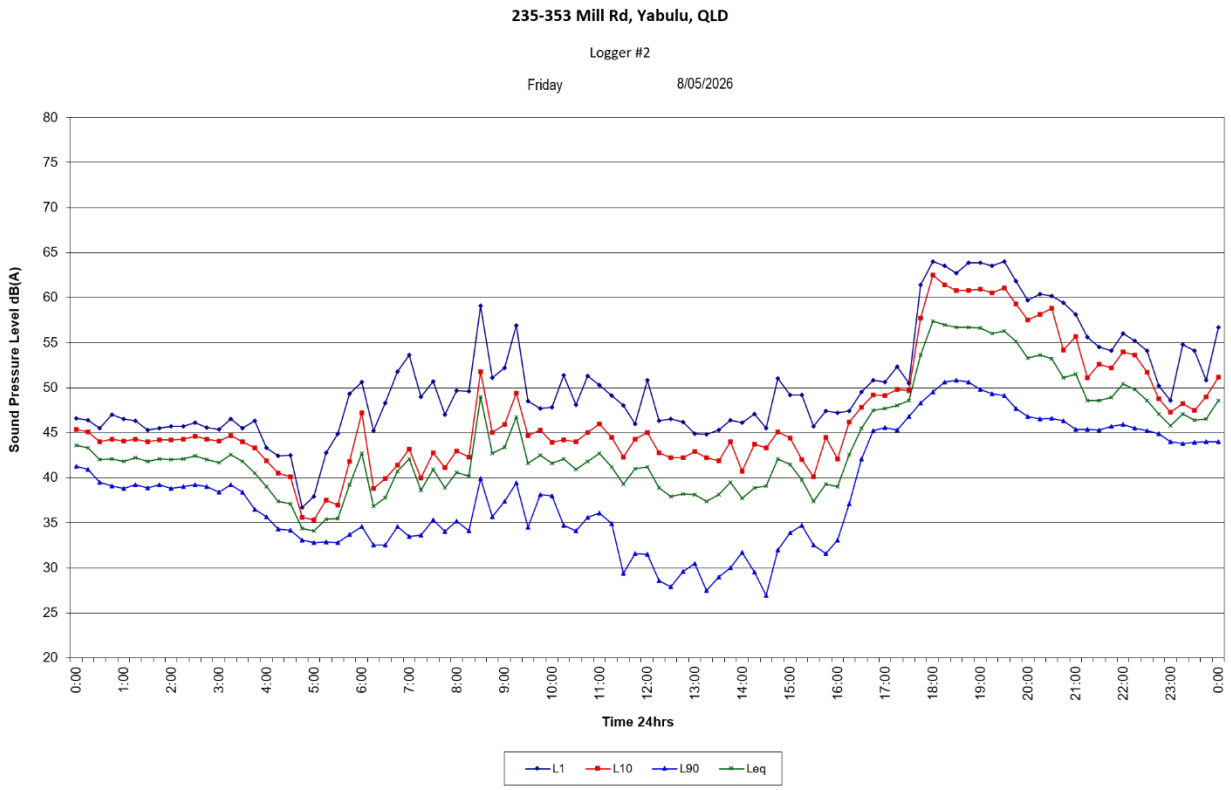


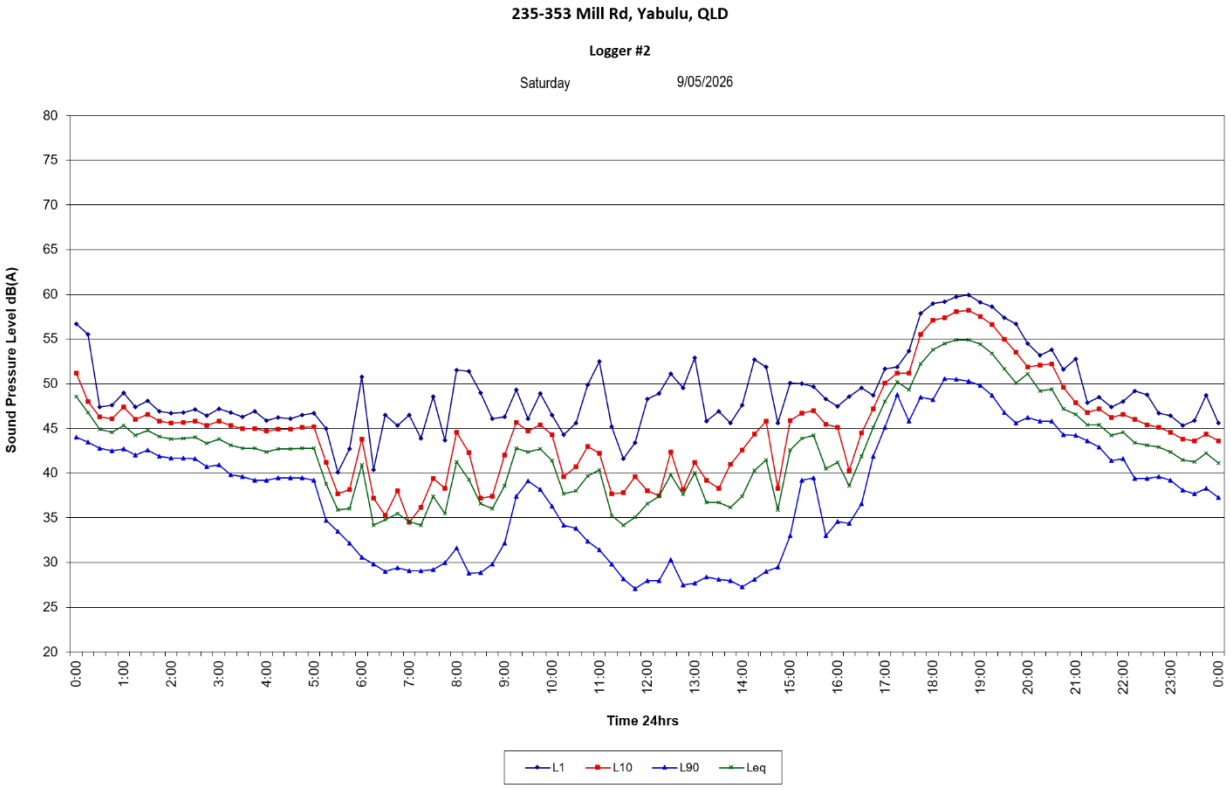


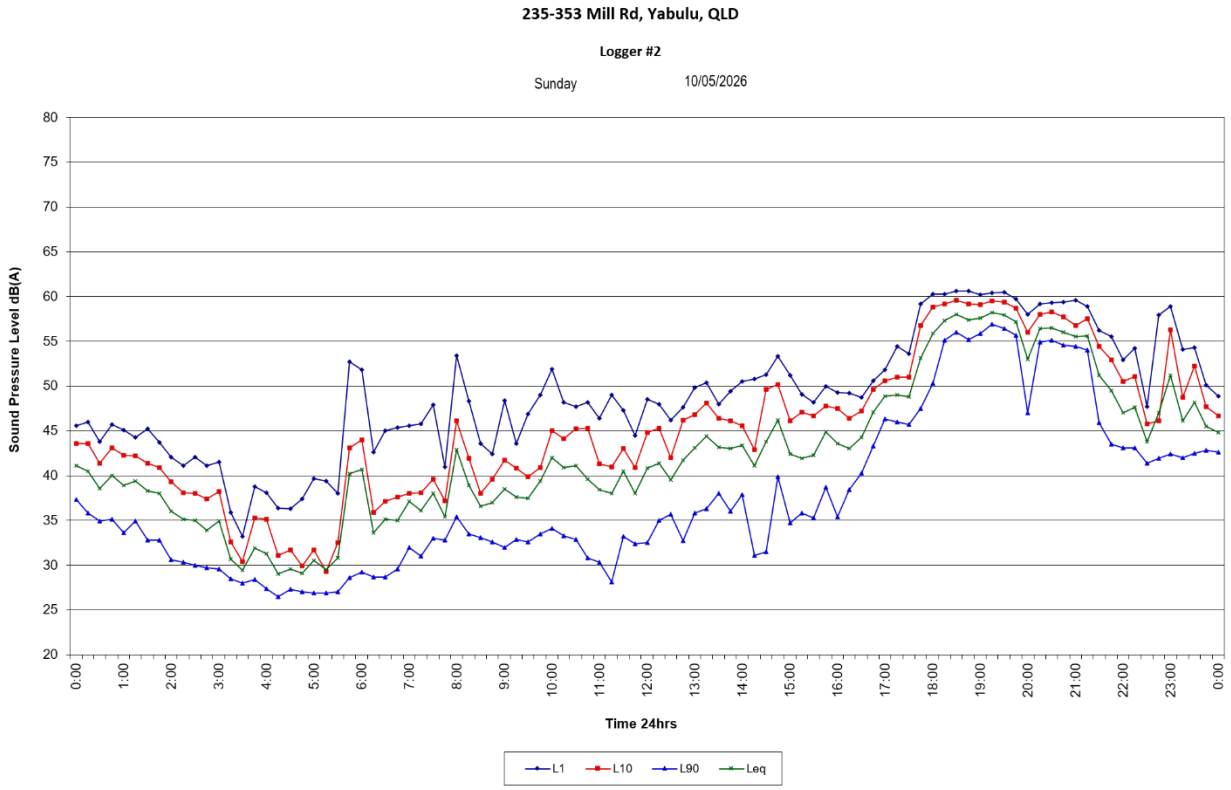


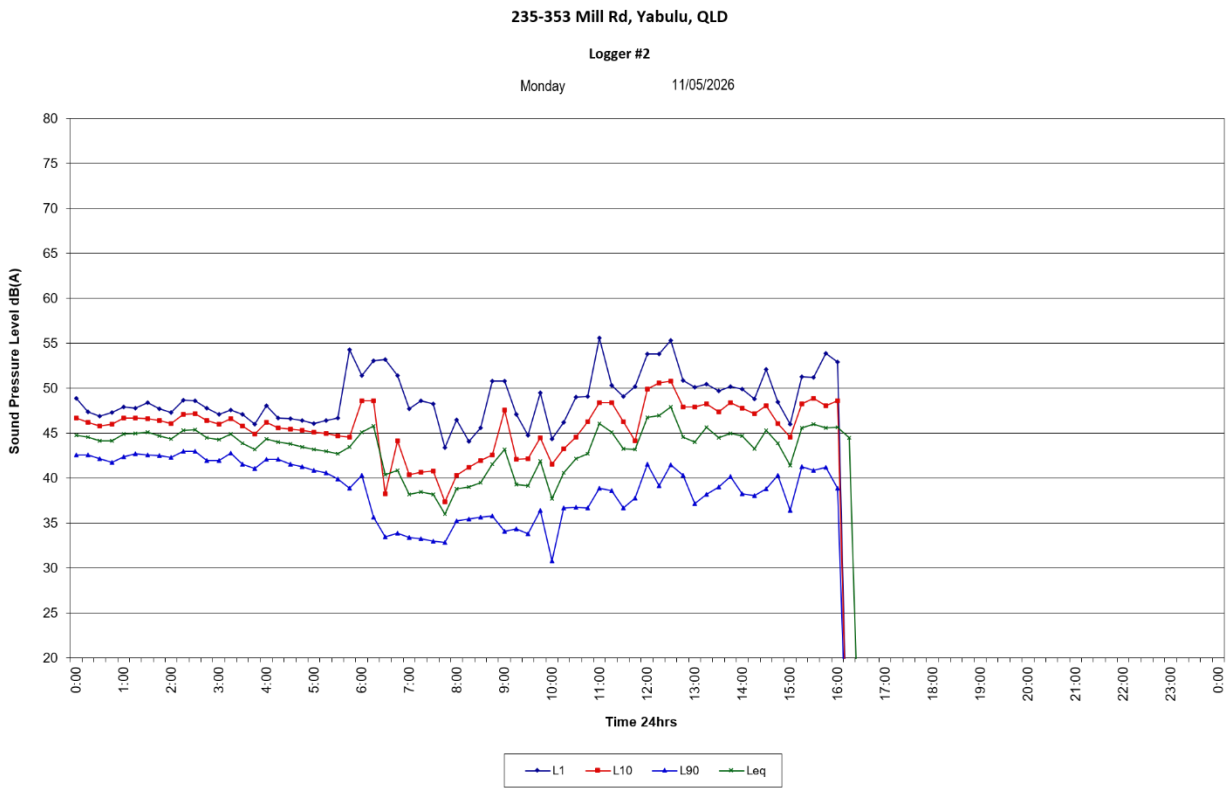












Appendix D – Calibration certificates

Acoustic Research Labs Pty Ltd
Unit 36/14 Loyalty Rd
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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 C25333-V1

Client Details	Rodney Stevens Acoustics Pty Ltd PO Box 522 Wahroonga, NSW, 2076

	Manufacturer	*Model*	*Serial*
Equipment Tested :			
Instrument :	Rion	NL-42EX	01000322
Microphone :	Rion	UC-52	201990
Pre-amplifier :	Rion	NH-24	25844
Firmware Version :	v2.0		

Pre-Test Atmospheric Conditions		Post-Test Atmospheric Conditions	
Ambient Temperature :	20.5 °C	**Ambient Temperature :**	20.8 °C
Relative Humidity :	45.3 %	**Relative Humidity :**	44.9 %
Barometric Pressure :	100.54 kPa	**Barometric Pressure :**	100.57 kPa

Calibration Technician :	Peter Elters	**Secondary Check:**	Rhys Gravelle
Calibration Date :	04-Jun-2025	**Report Issue Date :**	05-Jun-2025

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.

PAGE 1 OF 1

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www.acousticresearch.com.au

Sound Level Meter
IEC 61672-3:2013
Calibration Test Report

Calibration Number C24524

Client Details	Rodney Stevens Acoustics Pty Ltd PO Box 522 Wahroonga NSW, 2076
Equipment Tested/ Model Number :	NL-42EX
Instrument Serial Number :	00184112
Microphone Serial Number :	192152
Pre-amplifier Serial Number :	72897
Firmware Version :	v2.0

Pre-Test Atmospheric Conditions		Post-Test Atmospheric Conditions	
Ambient Temperature :	20 °C	**Ambient Temperature :**	22.5 °C
Relative Humidity :	53.7 %	**Relative Humidity :**	49.6 %
Barometric Pressure :	101.64 kPa	**Barometric Pressure :**	101.61 kPa

Calibration Technician :	Peter Elters	**Secondary Check:**	Cooper Sallway
Calibration Date :	8 Jul 2024	**Report Issue Date :**	8 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.