



Cogent Acoustics

French Island Eco Inn

10 Tankerton Road, French Island

Acoustic Engineering Report

French Island Eco Inn

10 Tankerton Road, French Island

Acoustic Engineering Report

Prepared for:

French Island Eco Inn
10 Tankerton Road
French Island VIC 3921

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Revision History

Rev.	Date	Purpose	Prepared by:	Reviewed by:
0	23/07/2021	Draft – Not for Endorsement	Andrew Mitchell	Te-liang Chong
1	26/07/2021	Final issue including amendment to site details	Andrew Mitchell	Te-liang Chong

Executive Summary

Cogent Acoustics Pty Ltd has been appointed to provide acoustic engineering consulting services in relation to music noise from proposed events and functions at French Island Eco Inn, 10 Tankerton Road, French Island.

This report presents details of an acoustic assessment that has been undertaken to determine the maximum permissible indoor music levels to comply with the requirements of Environment Protection Regulations 2021 and State Environment Protection Policy (Control of Music Noise from Public Premises) No. N-2 (SEPP N-2).

The following permissible indoor music sound pressure levels have been determined:

	Day / Evening L _{Aeq} dB(A)	Night, L _{OC10} , dB(Z)						
		63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz
Indoor Music Level	114	120	115	108	111	112	110	107

If an Electronic Noise Limiter is installed at the premises, it will need to be configured to comply with the above values inside the bar / lounge area. However, it is noted that the permissible indoor music levels are considerably higher than would be generated by a musician or small band of the type proposed to play at the premises. Additionally, the levels are higher than was able to be generated by the high-powered test speaker used by Cogent Acoustics. As such, it is considered that installation of an Electronic Noise Limiter at the venue would be a redundant measure.

Contents

1	Introduction	1
1.1	Purpose	1
1.2	Report Limitations	1
2	Project Characteristics	3
2.1	Site Location	3
2.2	Proposed Function Venue	4
2.3	Sound System	6
3	Legislation and Guidelines	7
3.1	Summary of Relevant Documents	7
3.2	EPA Noise Protocol (Music Noise)	8
4	Noise Sensitive Areas	9
5	Background Noise Levels	10
6	Environmental Noise Limits - Music	12
7	Permissible Indoor Music Levels	13
7.1	Method of Determination	13
7.2	Indoor-to-Outdoor Noise Test Results	14
7.3	Permissible Indoor Music Levels	15
8	Conclusion	16
9	References	17
Appendix A	Glossary of Acoustic Terms	18
Appendix B	Instrumentation Details	21

1 Introduction

1.1 Purpose

Cogent Acoustics Pty Ltd has been appointed to provide acoustic engineering consulting services in relation to music from proposed events and functions at French Island Eco Inn, 10 Tankerton Road, French Island.

The scope of this report comprises:

- Review of the existing acoustic environment and background noise levels at the site.
- Determination of the environmental noise limits that will apply to music noise emissions from the premises in accordance with the Environment Protection Regulations 2021 (State of Victoria, 2021) and State Environment Protection Policy (Control of Music Noise from Public Premises) No. N-2 (SEPP N-2) (State of Victoria, 1999).
- Determination of the maximum permissible indoor music levels within the function space to achieve compliance with the established environmental noise criteria.

A glossary of the acoustic nomenclature used in this report is presented in Appendix A.

1.2 Report Limitations

The following limitations are applicable with respect to the acoustic advice presented in this report:

- Cogent Acoustics has prepared this document for the sole use of the Client and for the specific purpose expressly stated in the document. No other party should rely on this document without the prior written consent of Cogent Acoustics. Cogent Acoustics undertakes no duty, nor accepts any responsibility, to any third party who may rely upon or use this document.
- The information contained in this document provides advice in relation to acoustics and vibration only. No claims are made and no liability is accepted in respect of design and construction issues falling outside of the specialist field of acoustics and vibration engineering including and not limited to structural integrity, fire rating, architectural buildability and fitness-for-purpose, waterproofing and the like. Supplementary professional advice should be sought in respect of these issues.
- Reports marked 'Not for Construction' or 'Draft' may be subject to change and are not released as final reports. Cogent Acoustics accepts no liability pending release of the final version of the report.
- In preparing this document Cogent Acoustics may have relied upon information provided by the Client and other third parties, some of which may not have been verified. Cogent Acoustics accepts no responsibility or liability for any errors or omissions which may be incorporated into this document as a result.

- The recommendations, data and methodology presented in this document are based on the listed reference documentation. The recommendations apply specifically to the project under consideration and must not be utilised for any other purpose. Any modifications or changes to the project from that described in the listed reference documentation may invalidate the advice provided in this document, necessitating a revision.
- Subject to the above conditions, this document may be transmitted, reproduced or disseminated only in its entirety.

2 Project Characteristics

2.1 Site Location

The project site is located at 10 Tankerton Road, French Island, as shown in Figure 1.

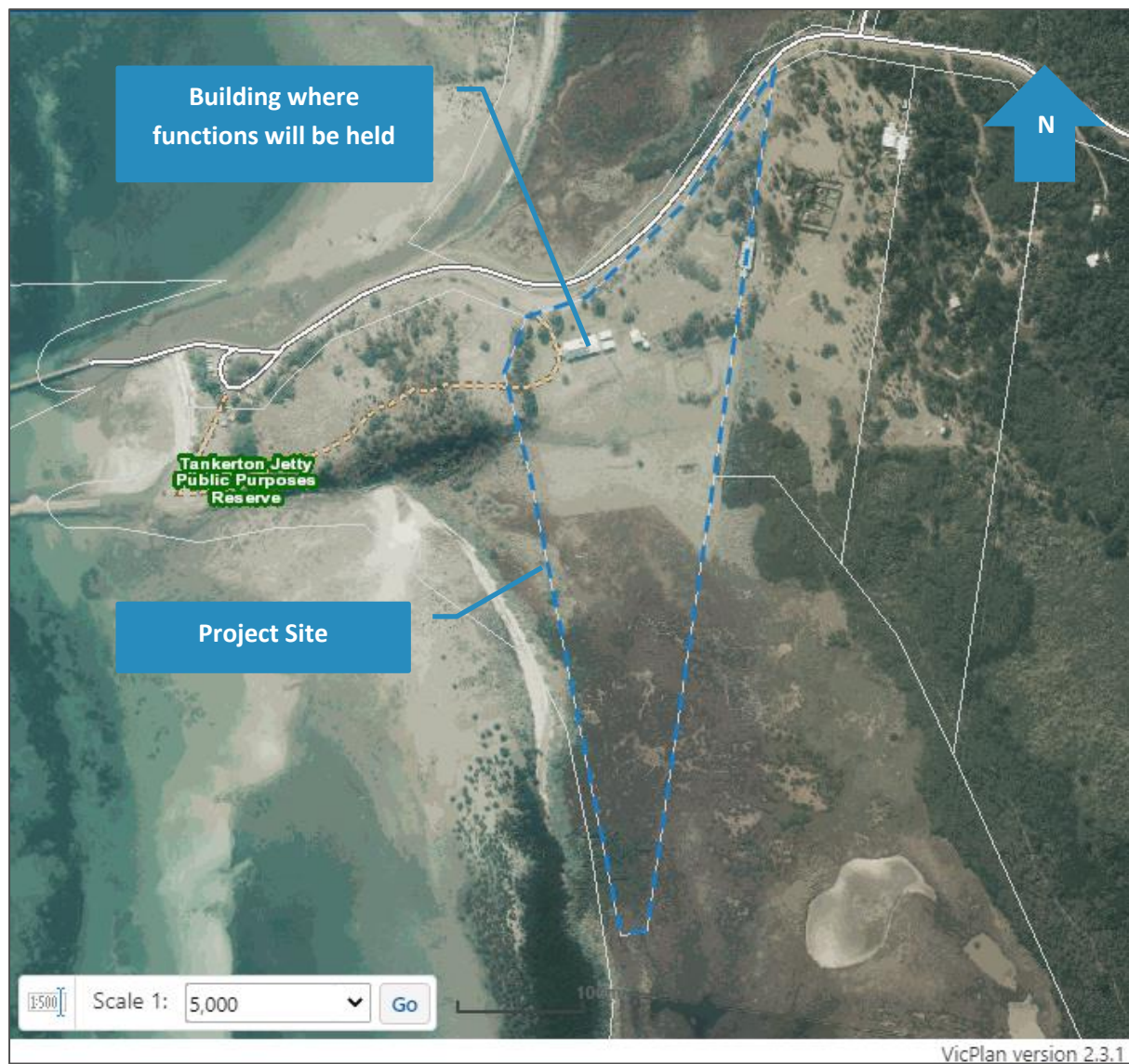


Figure 1 Aerial Image of Site (Image Source: VicPlan)

2.2 Proposed Function Venue

The proposed function venue comprises a small bar and a lounge / dining area inside the main building at 10 Tankerton Road, as shown in Figure 2 and Figure 3. It is proposed that musicians playing at the venue would be located at the south eastern corner of the room near to the bar.



Figure 2 Bar and Musician Location



Figure 3 Lounge Area Viewed from Bar

The exterior walls and roof of the bar / lounge area comprise weatherboard external cladding and a steel skillion roof as shown in Figure 4 and Figure 5. Interior wall and ceiling linings are a combination of timber and plasterboard. All windows in the bar / lounge area are single glazed with approximately 4 to 6 mm glass thickness.



Figure 4 Building Exterior Viewed from Northeast



Figure 5 Building Exterior Viewed from Southeast Corner (Adjacent to Musician Location)

2.3 Sound System

No permanent sound system is currently installed at the premises. It is anticipated that musicians will generally bring their own portable amplifiers / loudspeakers.

3 Legislation and Guidelines

3.1 Summary of Relevant Documents

Table 1 presents a summary of the relevant legislation and guidelines applicable to the proposed use.

Table 1 Summary of Relevant Statutory Requirements and Guidelines

Document	Status	Relevance to this Project
Environment Protection Regulations 2021 (State of Victoria, 2021)	Legislation	Defines unreasonable or aggravated noise from commercial, industrial and trade premises, as well as from entertainment venues and outdoor entertainment events.
EPA Publication 1826 – Noise Limit and Assessment Protocol for the Control of Noise from Commercial, Industrial and Trade Premises and Entertainment Venues (EPA Noise Protocol) (EPA Victoria, 2021)	Legislation	Prescribes the methods for determining the statutory environmental noise limits that apply to music noise emissions from public premises within Victoria in accordance with the Environment Protection Regulations 2021, and the methods to be used for assessment. Section 3.2 presents further detail on the methodology.
State Environment Protection Policy (Control of Music Noise from Public Premises) No. N-2 (SEPP N-2) (State of Victoria, 1999)	Superseded Legislation	Prescribes the procedures that were used to determine limits for, and assess, music noise emissions from public premises in Victoria prior to 1 July 2021. It is understood that the town planning conditions for the proposed venue prescribe requirements relating to SEPP N-2. Note: The Environment Protection Regulations 2021 became effective on 1 July 2021, superseding SEPP N-2. The new regulations incorporate very similar provisions to SEPP N-2. For consistency with current legislation this report refers to the current Environment Protection Regulations 2021 herein. Compliance with the music noise limits of the Environment Protection Regulations 2021 will also result in compliance with SEPP N-2.

3.2 EPA Noise Protocol (Music Noise)

Part II of the EPA Noise Protocol (EPA Victoria, 2021) prescribes the procedures used to determine limits for, and assess, music noise emissions from entertainment venues and events.

For indoor venues, the noise limits prescribed by the EPA Noise Protocol are dependent on the background noise levels at the Noise Sensitive Area, and on the time of day, as follows:

Table 2 EPA Noise Protocol Noise Limit Calculation

Period	Applicable Times	Noise Limit, dB / dB(A)
Day / Evening	- Monday to Saturday (other than a public holiday) from 7 am to 11 pm; - Sunday or a public holiday (other than if either is preceding a public holiday) from 9 am to 10 pm; - Sunday or a public holiday (if either is preceding a public holiday), from 9 am to 11 pm.	$L_{Aeq} \leq L_{A90}$ Background Noise + 5 dB(A)
Night	- Monday to Friday (other than a public holiday or a day preceding a public holiday), from 11 pm to 7 am the following day; - Saturday or any day preceding a public holiday, from 11 pm to 9 am the following day; - Sunday or a public holiday (if neither is preceding a public holiday), from 10 pm to 7 am the following day.	$L_{OCT10} \leq L_{OCT90}$ Background Noise + 8 dB

The base (minimum) noise limits presented in Table 3 apply in accordance with the Environment Protection Regulations 2021 where background noise levels are very low:

Table 3 Base Noise Limits for Music

	Day / Evening L_{Aeq} dB(A)	Night, L_{OCT10} , dB(Z)						
		63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz
Base Noise Limit	32	40	30	20	20	15	10	10

The noise levels are to be assessed over a 15-minute period, and, except where the conditions prescribed by Clause 106 of the EPA Noise Protocol apply, the noise limits apply outdoors within 'Noise Sensitive Areas' defined by the Environment Protection Regulations 2021.

Generally, a Noise Sensitive Area is the part of a property that is within 10 m of a residential dwelling or other type of building where people may sleep, or within 10 m of a school or childcare building during the operating hours of the school / childcare centre - see Appendix A for full definition.

4 Noise Sensitive Areas

Figure 6 shows the locations of the nearest and potentially most-affected Noise Sensitive Areas (NSAs) in the vicinity of the project site, as defined by the relevant environmental noise legislation.

It is expected that compliance with the environmental noise criteria at these locations will also result in compliance at all other nearby NSAs.

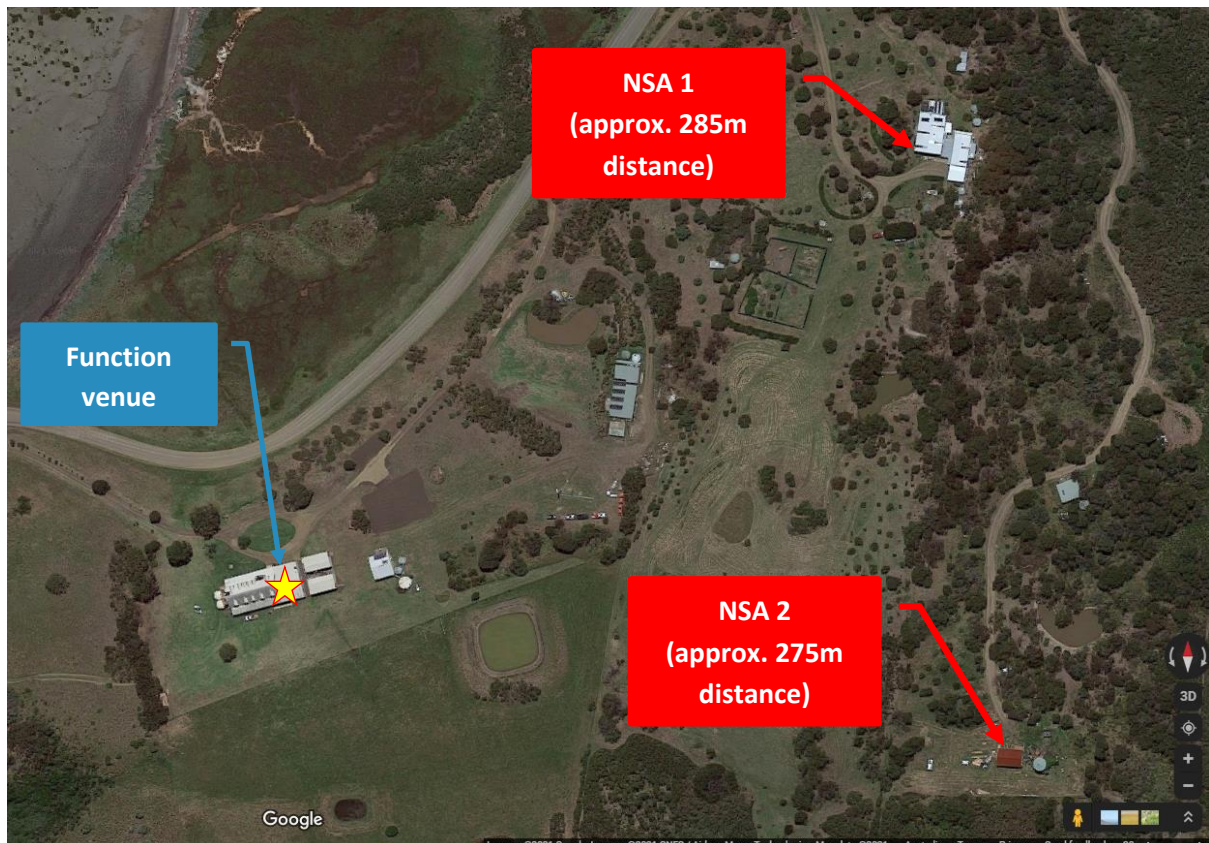


Figure 6 Locations of Potentially Most-Affected Noise Sensitive Areas (NSAs)
(Aerial Photo Source: Google Maps)

5 Background Noise Levels

Background noise levels were measured at the boundary between the project site and NSA 1, as shown in Figure 7. It is considered that the background noise levels at this location would be representative of the background noise levels at the two closest Noise Sensitive Areas.



Figure 7 Background Noise Measurement Location (Aerial Photo Source: Google Maps)

The background noise measurements were performed between 10.30 am and 10.45 am on Thursday 24 June 2021. At the time of the measurements the local weather conditions comprised clear skies and no wind other than an occasional very light NNE breeze. Details of the acoustic instruments used for the measurements are presented in Appendix B.

The background noise environment at the time of the measurements was dominated by noise from the sea in distance, but also included intermittent bird and insect noise.

Given the relatively isolated nature of the project site and the type of background noise sources, it is unlikely that background noise levels will vary much between daytime and night-time. As such, it is considered that the measured background noise levels would be representative of the night-time background noise levels, despite the measurement being performed during the day.

Table 4 presents the measured background noise levels.

Table 4 Measured Background Noise Levels

	Overall L_{A90} dB(A)	L_{OCT90} Sound Pressure Level, dB(Z)						
		63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz
Background Noise	28	46	33	25	23	21	19	20

6 Environmental Noise Limits - Music

Based on the measured background noise levels the following music noise limits are determined apply at the nearby Noise Sensitive Areas in accordance with the Environment Protection Regulations 2021:

Table 5 Environmental Noise Limits - Music

	Day / Evening L _{Aeq} dB(A)	Night, L _{Oct10} , dB(Z)						
		63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz
Music Noise Limit	33	54	41	33	31	29	27	28

7 Permissible Indoor Music Levels

7.1 Method of Determination

In order to determine the noise reduction provided by the building and the maximum permissible indoor music levels to comply with the Environment Protection Regulations 2021, an indoor-to-outdoor noise reduction test was performed by placing a high-powered dodecahedron loudspeaker in the bar / lounge area at the proposed position where musicians will play, and measuring the noise levels indoors and outdoors with a pink noise test signal playing at a high level.

Figure 8 shows the position of the loudspeaker in the bar area and Figure 9 shows the outdoor measurement positions. All measurements were performed with windows and external doors to the bar / lounge area closed.

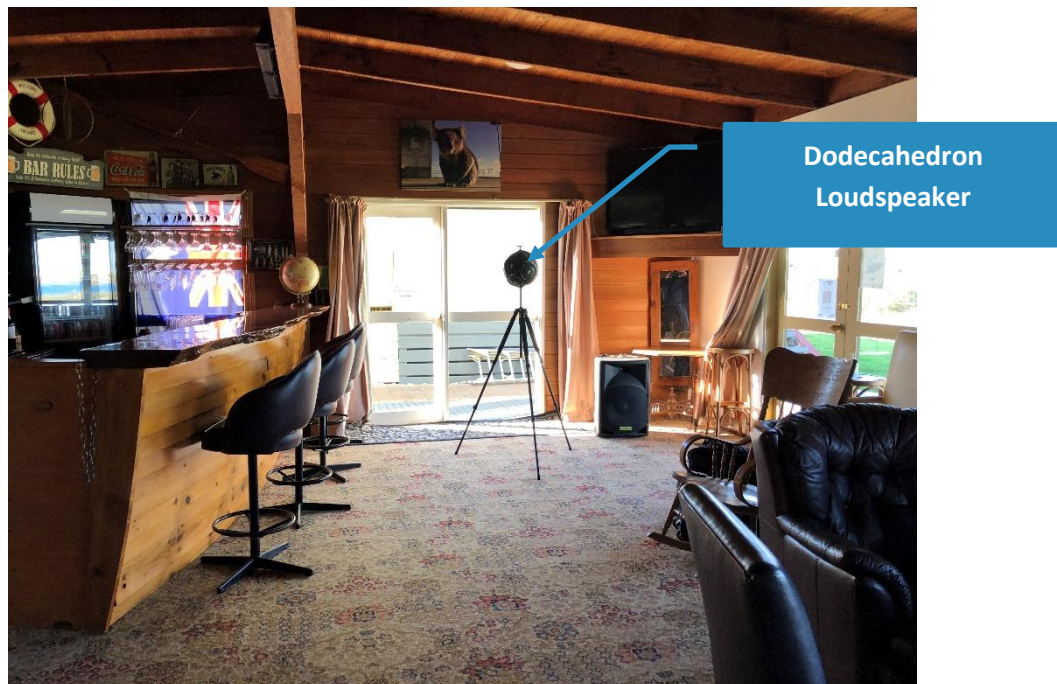


Figure 8 Loudspeaker Position in Bar Area

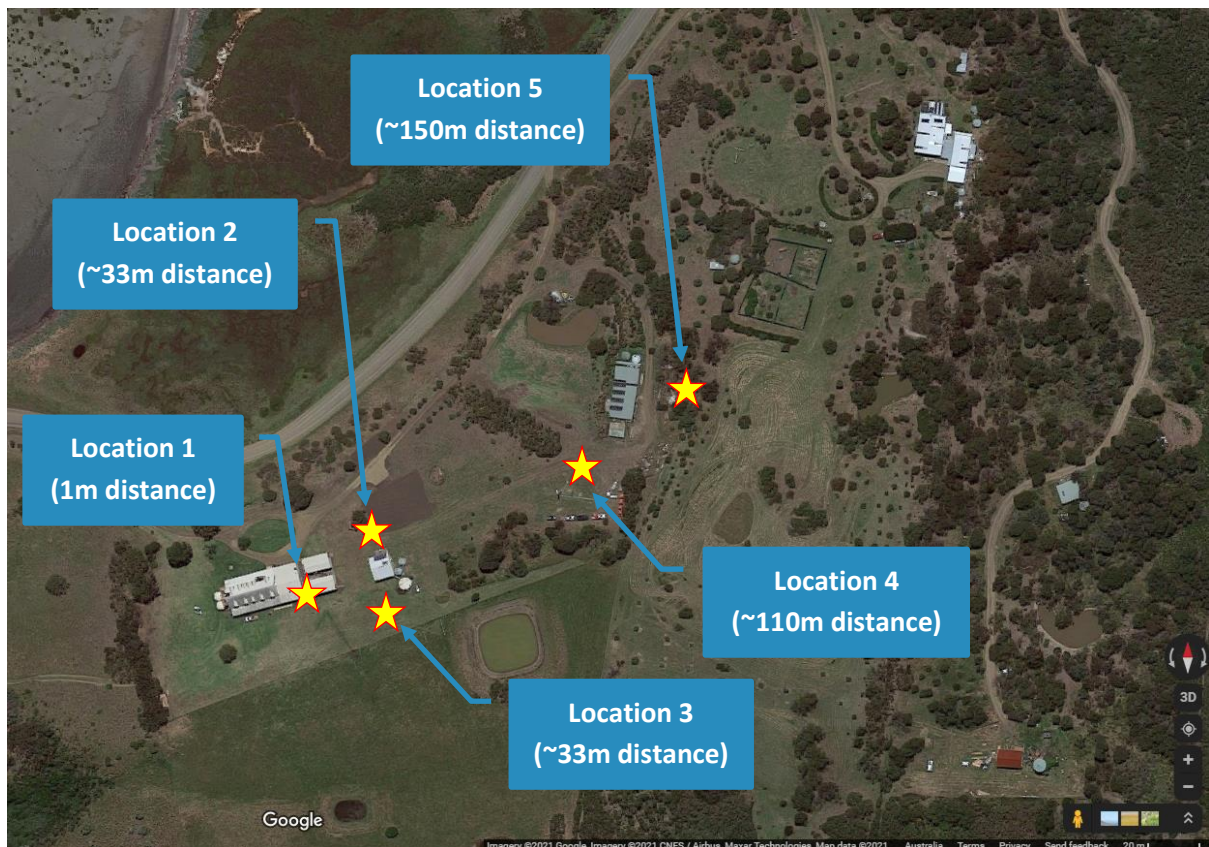


Figure 9 Outdoor Noise Assessment Positions

7.2 Indoor-to-Outdoor Noise Test Results

The following noise levels were measured:

Table 6 Measured Sound Pressure Levels with Test Signal Playing in Bar Lounge Area

Measurement Description	Overall L_{Aeq} dB(A)	Octave Band Sound Pressure Level, L_{eq} dB(Z)						
		63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz
Indoors with Dodecahedron Loudspeaker	107	83	98	103	103	102	100	94
Outdoor Location 1	75	66	73	76	73	67	66	63
Outdoor Location 2	43	56	51	45	39	36	33	30
Outdoor Location 3	44	63	52	44	36	35	36	30
Outdoor Location 4	Barely audible, not able to be measured.							
Outdoor Location 5	Barely audible, not able to be measured.							

Note: All outdoor locations were measured using the high-powered Dodecahedron Loudspeaker.

Based on the above test results, the noise reduction achieved from indoors to outdoors with windows and external doors closed is presented in Table 7. Also presented in Table 7 is the calculated total attenuation from indoors to a position 265 m away (i.e. the distance from the function venue to the edge of the closest Noise Sensitive Area).

Table 7 Indoor to Outdoor Noise Reduction

	Attenuation, dB						
	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz
Indoor to Outdoor Reduction	-17	-25	-27	-31	-35	-34	-31
Distance Attenuation over 265 m	-48	-48	-48	-48	-48	-48	-48
Total Attenuation between Venue Indoor and Closest NSA	-66	-73	-75	-79	-83	-82	-79

7.3 Permissible Indoor Music Levels

Table 8 presents the calculated maximum permissible indoor music levels to achieve compliance with the Environment Protection Regulations 2021 at the closest Noise Sensitive Areas. If an Electronic Noise Limiter is installed at the premises, it will need to be configured to comply with these values inside the bar / lounge area.

The levels are calculated based on windows and doors of the bar / lounge area being kept closed during loud music performances, and are to be measured inside the bar area at a position in-line with the eastern end of the bar.

Table 8 Permissible Indoor Music Sound Pressure Levels

	Day / Evening L _{Aeq} dB(A)	Night, L _{Oct10} , dB(Z)						
		63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz
Indoor Music Level	114	120	115	108	111	112	110	107

Note: The permissible indoor music levels presented in Table 8 are considerably higher than would be generated by a musician or small band of the type proposed to play at the premises. The permissible indoor music levels are also at least 5 dB higher in every octave band than the level that was able to be generated in the bar area by our high-powered test speaker at maximum volume.

On the above basis, it is considered that installation of an Electronic Noise Limiter at the venue would be a redundant measure.

8 Conclusion

An acoustic assessment has been undertaken to determine the maximum permissible indoor music levels at French Island Eco Inn to enable music noise from proposed events and functions to comply with the requirements of Environment Protection Regulations 2021 and State Environment Protection Policy (Control of Music Noise from Public Premises) No. N-2 (SEPP N-2) at the potentially most-affected Noise Sensitive Areas in the vicinity of the site.

The maximum permissible indoor music levels have been presented in Table 8 of this report.

It is noted that the permissible indoor music levels are considerably higher than would be generated by a musician or small band of the type proposed to play at the premises. Installation of an Electronic Noise Limiter at the venue would therefore be a redundant measure.

9 References

EPA Victoria. (2021, May). EPA Publication 1826.4 – Noise Limit and Assessment Protocol for the Control of Noise from Commercial, Industrial and Trade Premises and Entertainment Venues.

State of Victoria. (1999). State Environment Protection Policy (Control of Music Noise from Public Premises) No. N-2. *No. S43, 17/7/1989, Gazette 3/8/1989, As varied 16/3/1999, No. G12, Gazette 25/3/1999.*

State of Victoria. (2021, May 25). *Environment Protection Regulations 2021 - Statutory Rule Number 47/2021.*

Appendix A Glossary of Acoustic Terms

dB / dB(A) Decibels or 'A'-weighted Decibels, the units of Sound Pressure Level. 'A'-weighting adjusts the levels of frequencies within the sound spectrum to better reflect the sensitivity of the human ear to different frequencies at Sound Pressure Levels typical of everyday sounds. [Unit: dB / dB(A)]

The following are examples of the decibel readings of every day sounds;

- 0 dB The faintest sound we can hear
- 30 dB A quiet library or in a quiet location in the country
- 45 dB Typical office space. Ambience in the city at night
- 60 dB The sound of a vacuum cleaner in a typical lounge room
- 70 dB The sound of a car passing on the street
- 80 dB Loud music played at home
- 90 dB The sound of a truck passing on the street
- 100 dB The sound of a rock band
- 120 dB Deafening

L_{A90,T} The value of A-weighted Sound Pressure Level which is exceeded for 90 percent of the time during given measurement period T. This is commonly used to represent the background noise level. [Unit: dB / dB(A)]

L_{Aeq,T} The Equivalent Continuous A-weighted Sound Pressure Level measured over the period T (also known as Time-Average Sound Pressure Level). The Equivalent Continuous A-weighted Sound Pressure Level is the constant value of A-weighted Sound Pressure Level for a given period that would be equivalent in sound energy to the time-varying A-Weighted Sound Pressure Level measured over the same period. In simple terms, this can be thought of as the average Sound Pressure Level. [Unit: dB / dB(A)]

L_{OC10} Means the C-weighted or Linear Sound Pressure Level for a specified octave band that is exceeded for 10 per cent of the time interval considered. [Unit: dB]

L_{OC90} Means the C-weighted or Linear Sound Pressure Level for a specified octave band that is exceeded for 90 per cent of the time interval considered. [Unit: dB]

Noise Sensitive Area For the purposes of assessment of noise levels in relation to *Environment Protection Regulations 2021*, a Noise Sensitive Area is defined as:

- a) That part of the land within the boundary of a parcel of land that is—

- i. within 10 metres outside the external walls of any of the following buildings–
 - A. a dwelling (including a residential care facility but not including a caretaker’s house);
 - B. a residential building;
 - C. a noise sensitive residential use; or
 - ii. within 10 metres of the outside of the external walls of any dormitory, ward, bedroom or living room of one or more of the following buildings–
 - A. a caretaker’s house;
 - B. a hospital;
 - C. a hotel;
 - D. a residential hotel;
 - E. a motel;
 - F. a specialist disability accommodation;
 - G. a corrective institution;
 - H. a tourist establishment;
 - I. a retirement village;
 - J. a residential village; or
 - iii. within 10 metres of the outside of the external walls of a classroom or any room in which learning occurs in the following buildings (during their operating hours)–
 - A. a child care centre;
 - B. a kindergarten;
 - C. a primary school;
 - D. a secondary school; or
- b) subject to paragraph c), in the case of a rural area only, that part of the land within the boundary of–
- i. a tourist establishment;
 - ii. a campground;
 - iii. a caravan park; or
- c) despite paragraph b), in the case of a rural area only, where an outdoor entertainment event or outdoor entertainment venue is being operated, that part of the land within the boundary of the following are not noise sensitive areas for the purposes of that event or venue–
- i. a tourist establishment;
 - ii. a campground;

- iii. a caravan park.

Sound Pressure Level A measure of the magnitude of a sound wave. Mathematically, it is twenty times the logarithm to the base ten of the ratio of the root mean square sound pressure at a point in a sound field, to the reference sound pressure; where sound pressure is defined as the alternating component of the pressure (Pa) at the point, and the reference sound pressure is 2×10^{-5} Pa. [Unit: dB]

Appendix B Instrumentation Details

All acoustic instrumentation used for the measurements held a current certificate of calibration from a National Association of Testing Authorities (NATA) accredited laboratory or from the manufacturer at the time of the measurements.

A field check to confirm correct calibration of the instrumentation was performed at the beginning and end of the measurement period using a laboratory calibrated portable Sound Level Calibrator. At the time of each check the instrumentation was found to be reading correctly and the deviation between consecutive checks was found to be less than 1 dB.

Details of the acoustic instrumentation used for measurements are presented in Table 9.

Table 9 Acoustic Instrumentation Details

Location Reference	Instrument Description	Serial No.	Date of Last Laboratory Calibration*
All	Svante 977 Class 1 Sound Level Meter	45763	5/02/2021
-	Svante SV35A Portable Sound Level Calibrator	58054	10/06/2021
-	QSources Qohm Dodecahedron Loudspeaker	8172D	n/a
-	QSources Qam Signal Generator and Amplifier	3178B	n/a

* In accordance with AS 1055.1-1997 and National Association of Testing Authorities Guidelines, Sound Level Meters and Environmental Noise Loggers are required to have comprehensive laboratory calibration checks carried out at intervals not exceeding two years. Sound Level Calibrators require calibration annually.