Operational Noise Emission Assessment
1031 Barrenjoey Road, Palm Beach, NSW

Client:
Ms Nicki Keogh
C/o- Turnbull Planning International Pty Ltd

21 July 2021

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GLOSSARY

NOISE

Noise is produced through rapid variations in air pressure at audible frequencies (20 Hz – 20 kHz). Most noise sources vary with time. The measurement of a variable noise source requires the ability to describe the sound over a particular duration of time. A series of industry standard statistical descriptors have been developed to describe variable noise, as outlined in **Section 2** below.

NOISE DESCRIPTORS

dB – Decibels. The fundamental unit of sound, a Bell is defined as the logarithm of the ratio of the sound pressure squared over the reference pressure squared. A Decibel is one-tenth of a Bell. Probably the most common usage of the Decibel in reference to sound loudness is dB sound pressure level (SPL), referenced to the nominal threshold of human hearing. For sound in air and other gases, dB(SPL) is relative to 20 micropascals (μPa) = 2×10^{-5} Pa, the quietest sound a human can hear.

L_{Aeq} – The A-weighted sound pressure level averaged over the measurement period. It can be considered as the equivalent continuous steady-state sound pressure level, which would have the same total acoustic energy as the real fluctuating noise over the same time period. Measured in dB.

L_{Amax} – The maximum or peak A-weighted noise level that occurs over the measurement period. Measured in dB.

Indoor Design Level – The recommended maximum level in dB(A) inside a building from external noise sources.

A-WEIGHTING

"A-weighting" refers to a prescribed amplitude versus frequency curve used to "weight" noise measurements in order to represent the frequency response of the human ear. Simply, the human ear is less sensitive to noise at some frequencies and more sensitive to noise at other frequencies. The A-weighting is a method to present a measurement or calculation result with a number representing how humans subjectively hear different frequencies at different levels.

NOISE CHARACTER, NOISE LEVEL AND ANNOYANCE

The perception of a given sound to be deemed annoying or acceptable is greatly influenced by the character of the sound and how it contrasts with the character of the background noise. A noise source may be measured to have only a marginal difference to the background noise level, but may be perceived as annoying due to the character of the noise.

Acoustic Dynamics' analysis of noise considers both the noise level and sound character in the assessment of annoyance and impact on amenity.

1 INTRODUCTION

1.1 SUMMARY & BACKGROUND INFORMATION

Acoustic Dynamics is engaged by **Turnbull Planning International Pty Ltd** on behalf of **Ms Nicole Keogh** to assess the impact of noise emission at nearby receiver locations resulting from the use and operation of the subject café located at 1031 Barrenjoey Road, Palm Beach, NSW. The cafe has been operating for a number of years and seeks to amend its hours of operation.

Acoustic Dynamics understands that the café proposes is to operate during the following hours:

- 6:30am to 8:00pm Sunday to Thursday; and
- 7:00am to 9:30pm Friday and Saturday.

Accordingly, an assessment of the predicted noise emission levels against the acoustic requirements of relevant authorities has been undertaken for the operations of the cafe. This assessment is based on the inspections and noise measurements undertaken by Acoustic Dynamics at the subject site. As a part of this assessment, recommendations are provided to enable compliance with the relevant noise emission criteria.

This document provides an assessment of the measured noise emission associated with the use and operation of the venue when assessed at nearby receivers and is prepared in accordance with acoustic requirements of the Northern Beaches Council, the NSW Environment Protection Authority (EPA) and other relevant Australian Standards.

1.2 LOCATION & DESCRIPTION OF COMMERCIAL PREMISES

The café is located at 1031 Barrenjoey Road, Palm Beach, NSW. Acoustic Dynamics understands that the subject site is zoned *R2: Low Density Residential*. The subject site includes an outdoor area for patrons on the street entry footpath and a deck area to the south of the indoor area of the cafe.

The nearest receivers have been identified as:

- **[R1]** Residential receiver at 3A Iluka Road [North];
- **[R2]** Residential receiver at 1028 Barrenjoey Road [East];
- **[R3]** Residential receiver at 1029 Barrenjoey Road [South]; and
- **[R4]** Residential receiver at 1027 Barrenjoey Road [South].

The proposed operation is to include:

- Maximum of 4 patrons (seated) internally;
- Maximum of 16 patrons (seated) externally in the deck area;
- Maximum of 16 patrons (seated) externally in the front footpath area; and
- Provision of light background music.

Further to the above, Acoustic Dynamics understands that the kitchen and associated mechanical equipment is only in operation between:

- 7:00am to 8:00pm Sunday to Thursday; and
- 7:30am to 9:30pm Friday and Saturday.

The site is shown in the location map, aerial image, drawings and acoustic mark-ups presented within **Appendix A**.

1.3 SCOPE

Acoustic Dynamics is engaged to provide a noise assessment of the subject development.

A summary of the scope is provided below:

- Review of criteria from Council, NSW EPA, and other relevant documents relating to acoustics;
- Travel to site to conduct inspections of the proposed site, and the location of the adjacent receivers;
- Conduct unattended noise monitoring at a representative location to determine existing emission noise levels;
- Establish relevant project specific noise emission criteria; and
- Conduct modelling to determine noise emission levels from the proposed extension of trading hours.

2 RELEVANT ACOUSTIC CRITERIA & STANDARDS

Responsibility for the control of noise emission at the subject site is vested in Local Council. Guidelines for the assessment of noise emission is contained within the NSW EPA's Noise Policy for Industry (NPfI). In addition to these guidelines, some Councils have specific noise criteria, against which, certain noise sources must be assessed.

2.1 NORTHERN BEACHES COUNCIL REQUIREMENTS

Acoustic Dynamics has conducted a review of the local council, state government and federal legislation that is applicable to the noise assessment for the proposed development. The following section presents the criteria used in the assessment.

2.1.1 LOCAL ENVIRONMENT PLAN

A review of the Pittwater *Local Environment Plan (LEP) 2014* was conducted. No relevant acoustic requirements and relevant noise criteria were presented within the LEP.

2.1.2 DEVELOPMENT CONTROL PLANS

A review of the Pittwater 21 *Development Control Plan (DCP) 2019* (as amended 01 Dec 2019) was conducted. No relevant acoustic requirements and relevant noise criteria were presented within the DCP.

2.1.3 PROTECTION OF THE ENVIRONMENT OPERATIONS (POEO) ACT

We advise that noise emission from the cafe must also comply with the requirements of the relevant legislation, being the *Protection of the Environment Operations* (POEO) *Act 1997*. The POEO Act 1997 requires that the subject plant and equipment must not generate "offensive noise". Offensive noise is defined as follows:

> *"**"offensive noise"** means noise:*
>
> *(a) that, by reason of its level, nature, character or quality, or the time at which it is made, or any other circumstances:*
> *(i) is harmful to (or is likely to be harmful to) a person who is outside the premises from which it is emitted, or*
> *(ii) interferes unreasonably with (or is likely to interfere unreasonably with) the comfort or repose of a person who is outside the premises from which it is emitted, or*
> *(b) that is of a level, nature, character or quality prescribed by the regulations or that is made at a time, or in other circumstances, prescribed by the regulations."*

Council can enforce the above planning controls under the Environmental Planning and Assessment Act of 1979.

2.2 NSW ENVIRONMENT PROTECTION AUTHORITY (EPA)

2.2.1 NOISE POLICY FOR INDUSTRY (NPfI)

The EPA, in its Noise Policy for Industry (NPfI) document published in October 2017, outlines and establishes noise criteria for industrial or other noise sources in various zoning areas.

Acoustic Dynamics advise that the following criteria have been applied for the assessment of the operational noise associated with the subject commercial development.

2.2.1.1 PROJECT NOISE TRIGGER LEVEL

The *project noise trigger level* provides a benchmark or objective for assessing a proposal or site. It takes into account (amongst other factors):

- The receiver's background noise environment;
- The time of day of the activity
- The character of the noise; and
- The type of receiver and nature of the area.

Put simply, the *project noise trigger level* is the lower (that is, more stringent) value of the *project intrusiveness noise level* and the *project amenity noise level*.

2.2.1.2 PROJECT INTRUSIVENESS NOISE LEVEL

The intrusiveness noise level is determined as follows:

$L_{Aeq, 15min}$ = rating background noise level + 5 dB	
where:	
$L_{Aeq, 15min}$	represents the equivalent continuous (energy average) A-weighted sound pressure level of the source over 15 minutes.
and	
Rating background noise level	represents the background level to be used for assessment purposes, as determined by the method outlined in Fact Sheets A and B.

2.2.1.3 PROJECT AMENITY NOISE LEVEL

The recommended amenity noise levels represent the objective for **total** industrial noise at a receiver location, whereas the **project amenity noise level** represents the objective for a noise from a **single** industrial development at a receiver location.

To ensure that industrial noise levels (existing plus new) remain within the recommended amenity noise levels for an area, a project amenity noise level applies for each new source of industrial noise as follows:

Project Amenity Noise Level for Industrial Developments = Recommended Amenity Noise Level (Table 2.2) minus 5 dB(A)

2.2.1.4 PROJECT NOISE TRIGGER LEVEL

To establish the acoustic environment at the subject site in accordance with the guidelines of the NSW EPA's NPfI, an unattended noise logging was installed within the front yard of 3 Iluka Road, between Tuesday 8 June and Wednesday 16 June 2021. The selected location is likely to be representative of the existing noise environment of the nearest residential receivers to the subject cafe, without the presence of noise emission from the use and operation of the existing café and the traffic noise associated with Barrenjoey Road. The prevailing weather conditions during the unattended noise monitoring were generally calm and did not influence the noise measurements taken.

Following the general procedures outlined in the EPA's NPfI, a summary of the established noise environment, and relevant environmental noise criteria is presented in **Table 2.1.**

Table 2.1 Measured Noise Levels and Project Noise Objectives – External Residential Receiver

Location	Assessment Period	Rating Background Noise Level (RBL) L_{A90} [dB]	Measured L_{Aeq} [dB]	Project Intrusiveness Noise Level L_{Aeq} [dB]	Project Amenity Noise Level L_{Aeq} [dB][1]	Project Noise Trigger Level L_{Aeq} [dB]
Nearest residential receiver(s)	Day (7am – 6pm)	40	58	45	53	45
	Evening (6pm – 10pm)	35	55	40	43	**40**
	Night (7am – 8am)	30	48	35	38	**35**
	Morning Shoulder (6am – 7am)[2]	39	56	44	N/A	**44**

Note: 1) Amenity adjustment based on "Suburban" receiver type. The noise emission objective has been modified in accordance with the recommendations detailed within the NPfI Section 2.2, for time period standardising of the intrusiveness and amenity noise levels ($L_{Aeq,15min}$ will be taken to be equal to the $L_{Aeq,period}$ **+ 3 dB)**.

2) A morning shoulder measured L_{A90}, measured L_{Aeq} and derived Project Intrusiveness L_{Aeq}, have been determined in accordance the methodology detailed with the NPfI Section A3 Dealing with 'shoulder' periods.

The EPA's NPfI specifies additional noise emission level corrections that should be applied when a noise source is determined to include "modifying factors" that can vary the perceived intrusiveness of a noise source. Such modifying factors include tonal, low frequency, or intermittent noise. Acoustic Dynamics advise that a 5 dB modifying factor has been applied to the kitchen exhaust.

2.2.2 SLEEP DISTURBANCE CRITERION

Acoustic Dynamics advises that sleep disturbance is a complex issue and the potential for sleep disturbance to occur depends on both the level of noise at a residential receiver and the number of events that occur.

The EPA has in the past investigated overseas and Australian research on sleep disturbance. The method of assessing noise for sleep disturbance relies on the application of a screening that indicates the potential for this to occur. The EPA's Noise Guide for Local Government, provides the following guidance for such a screening test:

> *"Currently, there is no definitive guideline to indicate a noise level that causes sleep disturbance and more research is needed to better define this relationship. Where likely disturbance to sleep is being assessed, a screening test can be applied that indicates the potential for this to occur. For example, this could be where the subject noise exceeds the background noise level by more than 15 dB(A). The most appropriate descriptors for a source relating to sleep disturbance would be $L_{A1(1\ minute)}$ (the level exceeded for 1% of the specified time period of 1 minute) or L_{Amax} (the maximum level during the specified time period) with measurement outside the bedroom window."*

Additionally, the guidelines of the NSW EPA's NPfI provide the following additional information:

> *"Where the subject development/premises night-time noise levels at a residential location exceed:*
>
> - *$L_{Aeq,15min}$ 40dB(A) or the prevailing RBL plus 5 dB, whichever is the greater, and/or*
> - *L_{AFmax} 52 dB(A) or the prevailing RBL plus 15 dB, whichever is greater"*

Further to the above information, the following summarizes the sleep disturbance criteria:

$L_{Aeq,15min} \leq 40$ dB or $L_{Aeq,15min} \leq$ (RBL + 5 dB), whichever is greater

AND

L_{Amax} or $L_{A1(1\ minute)} \leq L_{A90}$ + 15 dB or 52 dB(A), whichever is greater

In addition to the above, the EPA has published the following additional information relating to findings of significant research carried out for sleep disturbance:

> *"Maximum internal noise levels below 50-55 dBA are unlikely to cause awakening reactions… One or more noise events per night, with maximum internal noise levels of 65-70 dBA, are not likely to affect health and wellbeing significantly."*

Therefore, in accordance with the EPA guidelines detailed above, the following sleep disturbance screening criterion has been applied for this project:

Sleep Disturbance Criteria:

$L_{Aeq,15min} \leq$ **40 dB(A)**

AND

L_{Amax} or $L_{A1(1\ minute)} \leq$ **52 dB(A)**

2.2.3 ROAD NOISE POLICY (RNP)

The NSW Environment Protection Authority (EPA) presents guidelines for assessment of road traffic noise in its Road Noise Policy (RNP). The document provides road traffic noise criteria for proposed road as well as other developments with the potential to have an impact in relation to traffic noise generation. **Table 2.3** presents the relevant RNP noise criteria for the subject development site.

Table 2.3 Road Traffic Noise Assessment Criteria for Residential Land Uses

Road category	Type of project / land use	Assessment Criteria [dB]	
		Day (7am – 10pm)	Night (10pm – 7am)
Local Roads	6. Existing residences affected by **additional traffic** on existing local roads generated by land use developments	$L_{Aeq,\ (1\ hour)}$ 55 (external)	$L_{Aeq,(1\ hour)}$ 50 (external)

2.3 RELEVANT AUSTRALIAN STANDARDS

2.3.1 AS 2107 – "ACOUSTICS – RECOMMENDED DESIGN SOUND LEVELS ...FOR BUILDINGS"

Australian Standard 2107-2016 recommends satisfactory and maximum design sound levels for various types of occupancy within buildings. AS 2107 recommends the following satisfactory and maximum design sound levels, detailed in **Table 2.4**, for the relevant types of occupancies and areas which are likely to be located adjacent to the studio:

Table 2.4 Recommended Design Sound Levels for Different Areas of Occupancy in Buildings

(Extract from Australian Standard 2107:2016 Table 1)

Type of Occupancy / Activity	Design Sound Level ($L_{Aeq,t}$) range
7 RESIDENTIAL BUILDINGS	
Houses and apartments in suburban areas or near minor roads —	
Living areas	30 to 40
Sleeping areas (night-time)	30 to 35

Acoustic Dynamics advises that any levels of airborne noise or regenerated noise transmitted into the tenancies adjacent to the proposed studio should not exceed the relevant maximum design sound levels presented in **Table 2.4** above. By ensuring the noise levels from the studio received within the adjacent tenancies do not exceed the above recommended maximum internal design level, it is likely to ensure occupants of the adjacent tenancies are not adversely affected by the use and operation of the proposed studio.

3 NOISE MEASUREMENT EQUIPMENT & STANDARDS

All measurements were conducted in general accordance with Australian Standard 1055.1-1997, *"Acoustics - Description and Measurement of Environmental Noise Part 1: General Procedures"*. Acoustic Dynamics' sound measurements were carried out using precision sound level meters conforming to the requirements of IEC 61672-2019 *"Electroacoustics: Sound Level Meters – Part 1: Specifications"*. The survey instrumentation used during the survey is set out in **Table 3.1**.

Table 3.1 Noise Survey Instrumentation

Type	Serial Number	Instrument Description
2270	2664115	Brüel & Kjaer Modular Precision Sound Level Meter
4189	2385698	Brüel & Kjaer 12.5 mm Pre-polarised Condenser Microphone
4230	623588	Brüel & Kjaer Acoustic Calibrator
XL2	A2A-05048-E0	NTi Environmental Noise Logger

The reference sound pressure level was checked prior to and after the measurements using the acoustic calibrator and with negligible drift.

4 ASSESSMENT

The following subsections provide an assessment of the maximum cumulative noise impacts from noise sources associated with the use of the proposed health studio at nearby sensitive receivers, against the various noise emission criteria and objectives outlined in **Section 2** above. The assessment location is defined as the most affected point on or within any sensitive receiver property boundary. Examples of this location may be:

- 1.5m above ground level;
- On a balcony at 1.5m above floor level; and
- Outside a window on the ground or higher floors, at a height of 300mm below the head of the window.

The cumulative noise impact has been assessed to the potentially most affected point at the adjacent sensitive receiver properties. This would generally be at a height of 1.5 metres above the relative ground level or 300mm below the head of the ground floor or second floor window.

The calculated cumulative noise emission levels at the nearest sensitive receiver locations and the relevant noise emission criteria and objectives are presented below. Acoustic Dynamics advises that although the maximum operational capacity scenario is unlikely to occur for the majority of the time, the assessment is conducted conservatively in this way to demonstrate compliance.

It is advised that by achieving compliance with the nearest sensitive receiver locations, compliance will also be achieved at all other sensitive receiver locations further away.

4.1 METHODOLOGY

4.1.1 CALCULATION ASSUMPTIONS

Acoustic Dynamics has undertaken calculations and modelling to assess compliance, with the following assumptions:

- 4 patrons internally (2 talking at a normal level and 2 listening);
- 16 patrons externally (8 talking at a normal level and 8 listening) on the footpath area;
- 16 patrons externally (8 talking at a normal level and 8 listening) in the deck area;
- Background music – Sound Power Level of 75 dB(A);
- The operation of an existing kitchen exhaust fan on the roof;
- The installation of a barrier on the south western and south eastern ends of the deck area as shown in **Appendix A**;
- Front door of the café open to the footpath area; and
- Side door of the café open to southern deck area.

4.1.2 CALCULATION SCENARIO

Acoustic Dynamics has conducted modelling for the worst-case scenario, relating to the time of day, as follows:

Scenario – Evening (6pm to 10pm)

- Maximum 36 patrons, including 4 internally and 32 externally;
- All mechanical plant operating, including kitchen exhaust, coffee machine and other small appliances; and
- Background music, supplied via the small satellite speakers located internally and facing into the café (i.e. directed away from open doors).

4.2 OPERATIONAL NOISE EMISSION TO RECEIVERS

The calculated maximum noise emission levels at the nearest affected receivers neighbouring the restaurant, resulting from the proposed operation of the restaurant are presented against the most stringent noise criteria in **Table 4.1** are presented below.

Table 4.1 Predicted External Noise Emission & Relevant Criteria at Nearby Sensitive Receivers

Residential Receiver Location	Activity / Noise Source[2]	Relevant Assessment Period	Measured & Calculated L_{Aeq} Noise Level [dB]	Project Noise Trigger Level L_{Aeq} [dB]	Complies?
[R1] 3A Iluka Road [North]	Use & Operation of the Café	Evening (6pm – 10pm)[1]	36	40	**Yes**
[R2] 1028 Barrenjoey Road [East]			36	40	**Yes**
[R3] 1029 Barrenjoey Road [South]			37	40	**Yes**
[R4] 1027 Barrenjoey Road [South]			35	40	**Yes**

Notes: 1) Acoustic Dynamics advises that by achieving compliance with the more stringent evening criterion, compliance will also be achieved with the less stringent daytime criteria and the morning shoulder period criteria.

2) Includes the sound sources detailed in **Section 4.1.1** and the scenarios detailed in **Section 4.1.2**.

The predicted external L_{Aeq} levels at the surrounding sensitive residential receivers achieve compliance with the determined criteria derived in accordance with the EPA Noise Policy for Industry (NPfI 2017).

4.3 SLEEP DISTURBANCE ASSESSMENT

Acoustic Dynamics advises that the $L_{A1(60\ Sec)}$ noise emission, resulting from the proposed changes to the cafe operating hours, is not predicted to increase from existing emission levels during the morning shoulder period.

A worst-case scenario would see a maximum **50 dB** from the closing of car doors (associated with arrival or departure) along Barrenjoey Road, at the nearest residential receiver's window during morning shoulder period (i.e. 6:30am to 7:00am) is predicted to achieve compliance with the sleep disturbance criterion during night-time hours of **L_{Amax} 52 dBA**.

It is advised that by achieving compliance with the nearest residential receiver locations, compliance has also been achieved at all other residential receiver locations further away.

4.4 ROAD TRAFFIC NOISE ASSESSMENT

The calculated maximum noise emission levels due to the vehicle movements by patrons utilising the subject cafe on Barrenjoey Road are presented in **Table 4.2** below. It is advised that by achieving compliance with the nearest residential locations, compliance will also be achieved at all other residential and receiver locations further away.

Acoustic Dynamics has conducted an analysis of road traffic noise due to off-site car movements resulting from the proposed restaurant. The results are attached below in **Table 4.2.**

Table 4.2 Maximum Road Traffic Noise Emission Levels & Criteria for Residential Receivers

Residential Receiver Location	Noise Source	Quietest Period Source Operates	Calculated Maximum $L_{Aeq(1\ hour)}$ Noise Level [dB]	Relevant Noise Criterion $L_{Aeq(1\ hour)}$ [dB]	Complies With Criteria?
Along Barrenjoey Road	Off-site car movements	Night (10pm to 7am)	35	50	**Yes**

Note: 1) Acoustic Dynamics advises that by achieving compliance with the more stringent night time criteria, compliance will also be achieved with the less stringent daytime criterion.

Based on the results of Acoustic Dynamics' noise modelling and calculations, we advise that the predicted maximum road traffic noise associated with the use and operation of the proposed development will comply with the relevant noise emission criteria.

5 RECOMMENDATIONS & ADVICE

Acoustic Dynamics' analysis and prediction calculations indicate the following recommendations are required to be incorporated into the development, to ensure compliance with the relevant noise emission criteria and requirements.

5.1 DECK & TOILET AREA

Acoustic Dynamics advises that acoustic screens/barriers are required to be incorporated into the development, as detailed below.

5.1.1 ACOUSTIC SCREEN/BARRIER LOCATIONS

Acoustic Dynamics advises that acoustic screens/barriers are required for the deck and toilet area of the cafe as indicated in the detailed mark-ups provided in **Appendix A**, as follows:

- On the south western and south eastern extremities of the deck and toilet area, a full height acoustic barrier is required;
- The inside of the acoustic barrier and the underside of the deck area roof is required to have acoustic insulation treated to a minimum of 75% of the area; and
- Acoustic Dynamics advises that the absorptive lining could be a product such as Stratocell Whisper sound absorbing polyethylene foam, or a weather resistant and durable 11kg/m^3, 50mm thick polyester acoustic insulation (CSR Martini or equivalent).

NB: All acoustic screens/barriers are shown indicatively in **Appendix A**. Acoustic Dynamics advises that care should be taken to ensure that no gaps are present, to ensure noise transfer is minimised.

5.1.2 ACOUSTIC SCREEN/BARRIER CONSTRUCTION

Acoustic screens/barriers must meet the following specifications:

- The acoustic barriers/screens must contain no gaps along the surface area of the screen, and be close fitting (i.e. within 30mm) to the ground (to prevent the transmission of noise below the barrier);
- The acoustic barrier(s) must provide a minimum surface density of 15 kg/m^2, and contain no gaps along the surface of the barrier(s). All gaps are to be adequately sealed using a flexible mastic sealant. Acoustic Dynamics advises that the acoustic barrier(s) could be constructed to be:
    - A double layer Colorbond™ (Custom Blue Orb® or equivalent) barrier(s); or
    - Masonry (brick or concrete) construction; or

- A minimum 9mm thick compressed fibre-cement sheeting on timber/steel stud; or
- Other suitable material (minimum surface density of 15 kg/m^2) such as polycarbonate or equivalent; and

- All building materials specified must be tested and certified by a locally recognised and accepted testing agency in respect of their intended use. Where appropriate, materials and noise mitigation measures specified by Acoustic Dynamics must be certified by a locally recognised (qualified) and accepted professional for suitability (structural, wind loading, or other) for the intended use.

Acoustic Dynamics advises the above acoustic screens/barriers will sufficiently reduce noise emission to the adjacent receivers achieves compliance with the various relevant acoustic criteria and objectives. The position of the acoustic barriers/screens is detailed within the mark-up provided in **Appendix A**.

5.2 MANAGEMENT PLAN

The following management plan outlines procedures to ensure noise emission from activities associated with the proposed restaurant are kept to a minimum, including:

1) The number of patrons simultaneously in the deck area and front footpath area are to be a no greater than the maximum numbers detailed within **Section 4.1.1**;

2) Ensuring patrons leave the premises in a quiet and sensible manner to minimise any potential impacts on the surrounding amenity, including signage reminding patrons to be aware of their neighbours;

3) Ensuring any patrons queuing outside the building are behaving in a quiet and sensible manner to minimise any potential impacts on the surrounding amenity;

4) Noise generating activities such as placing empty glass bottles in bottles bins are conducted during the day time hours only;

5) Deliveries to be received during the day time hours only (7am to 6pm Monday to Saturday, 8am to 6pm Sundays and Public Holidays);

6) Background music must not exceed a maximum reverberant sound level of 75 dB(A) within the internal cafe area;

7) Mechanical equipment should be regularly maintained and serviced to maintain low mechanical noise emission levels; and

8) At the cessation of trade, staff and security should actively discourage loitering near the venue to minimise any potential impacts on the surrounding amenity.

6 DISCUSSION

Based on the measured and calculated noise levels presented in **Table 4.1** and **Table 4.2** above:

- Acoustic Dynamics has determined that the maximum $L_{Aeq\ (15\ minute)}$ noise emission levels associated with the operations of the cafe **achieves compliance** with the *EPA Noise Policy for Industry*, when assessed at the nearest residential boundaries; and

- Noise emission associated with patron vehicles utilising the surrounding local roads is predicted to comply with the *Road Noise Policy* at all nearby residential receivers.

7 CONCLUSION & ACOUSTIC OPINION

Acoustic Dynamics has conducted an acoustic assessment of the noise emission resulting from the operation of the cafe located at 1031 Barrenjoey Road, Palm Beach, NSW.

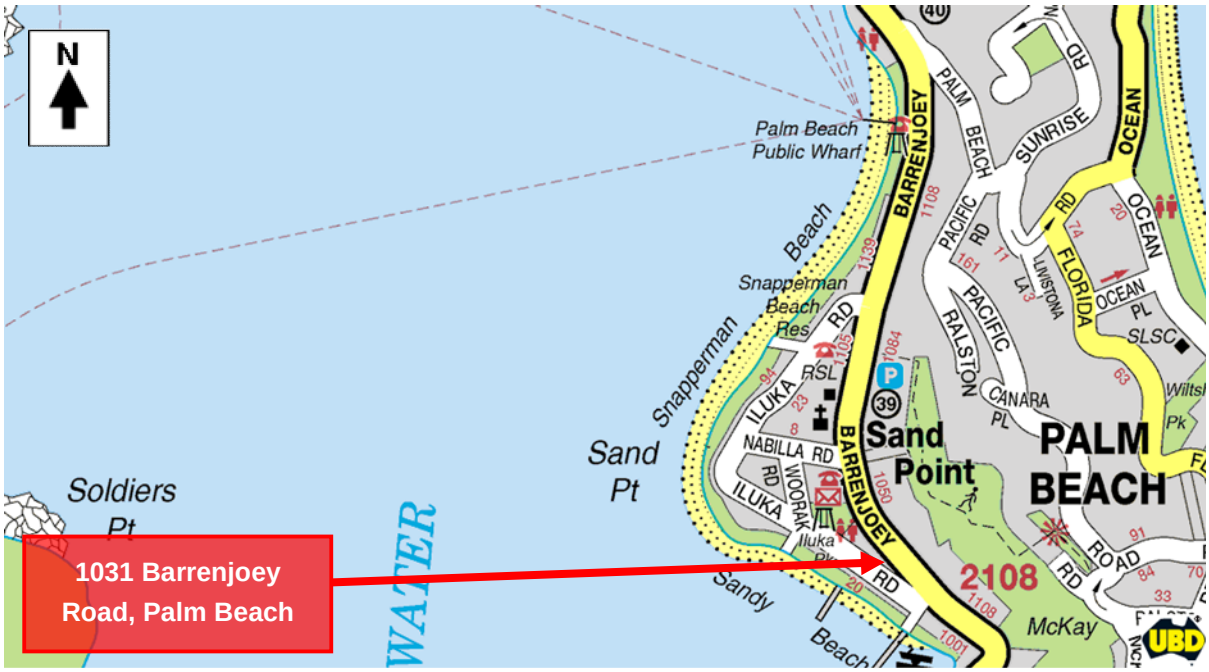
Acoustic Opinion

Further to the noise monitoring and measurements conducted, our review of the relevant acoustic criteria, requirements and our calculations, the proposed operation is predicted to achieve compliance with relevant noise emission criteria of the Northern Beaches Council, NSW EPA and the POEO Act 1997, when recommendations in Section 5 are incorporated.

We trust that the above information meets with your requirements and expectations. Please do not hesitate to contact us on 02 9908 1270 should you require more information.

APPENDIX A – LOCATION MAP, AERIAL IMAGE, DRAWINGS/PHOTOS W/MARK-UPS

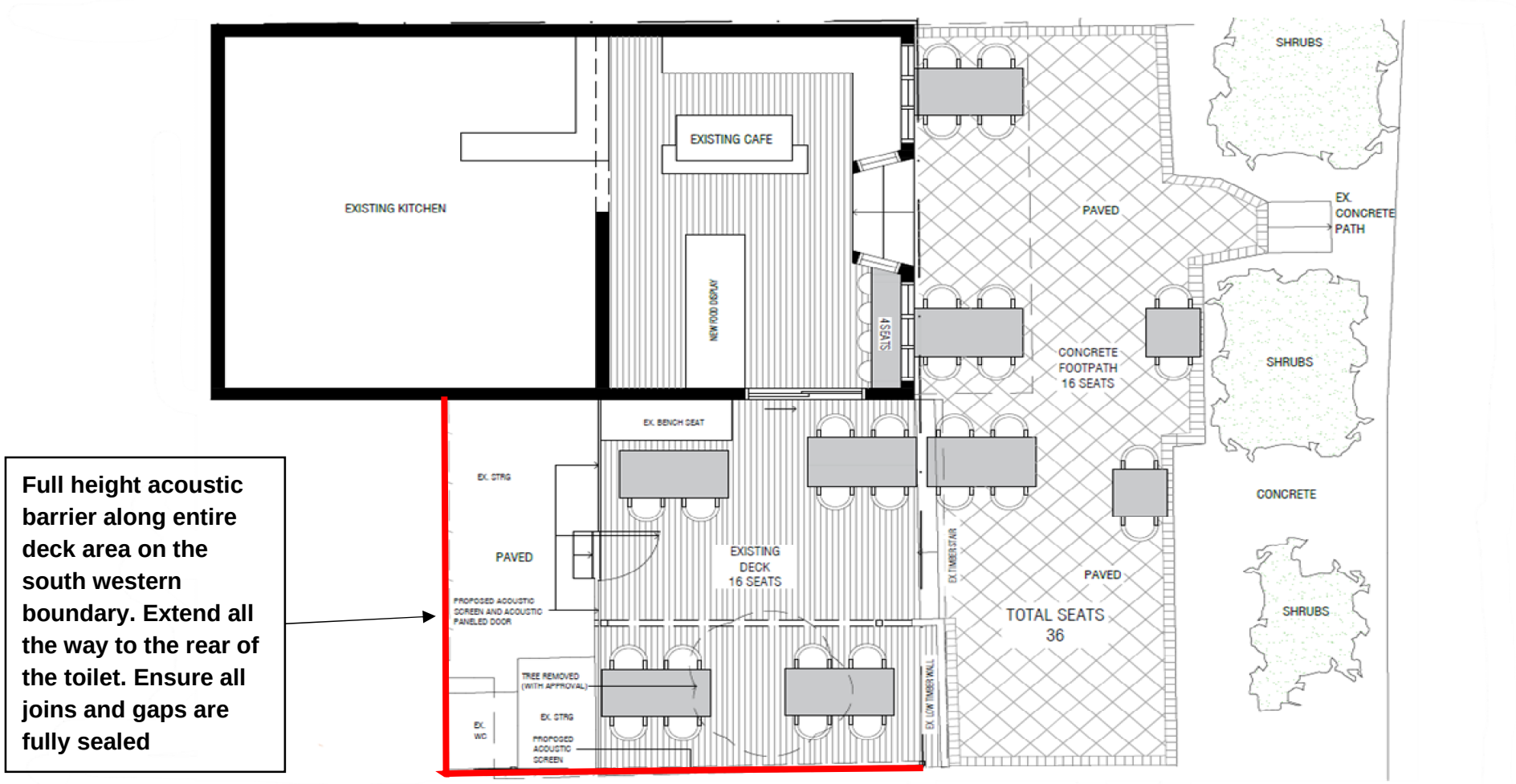
A.1 LOCATION MAP



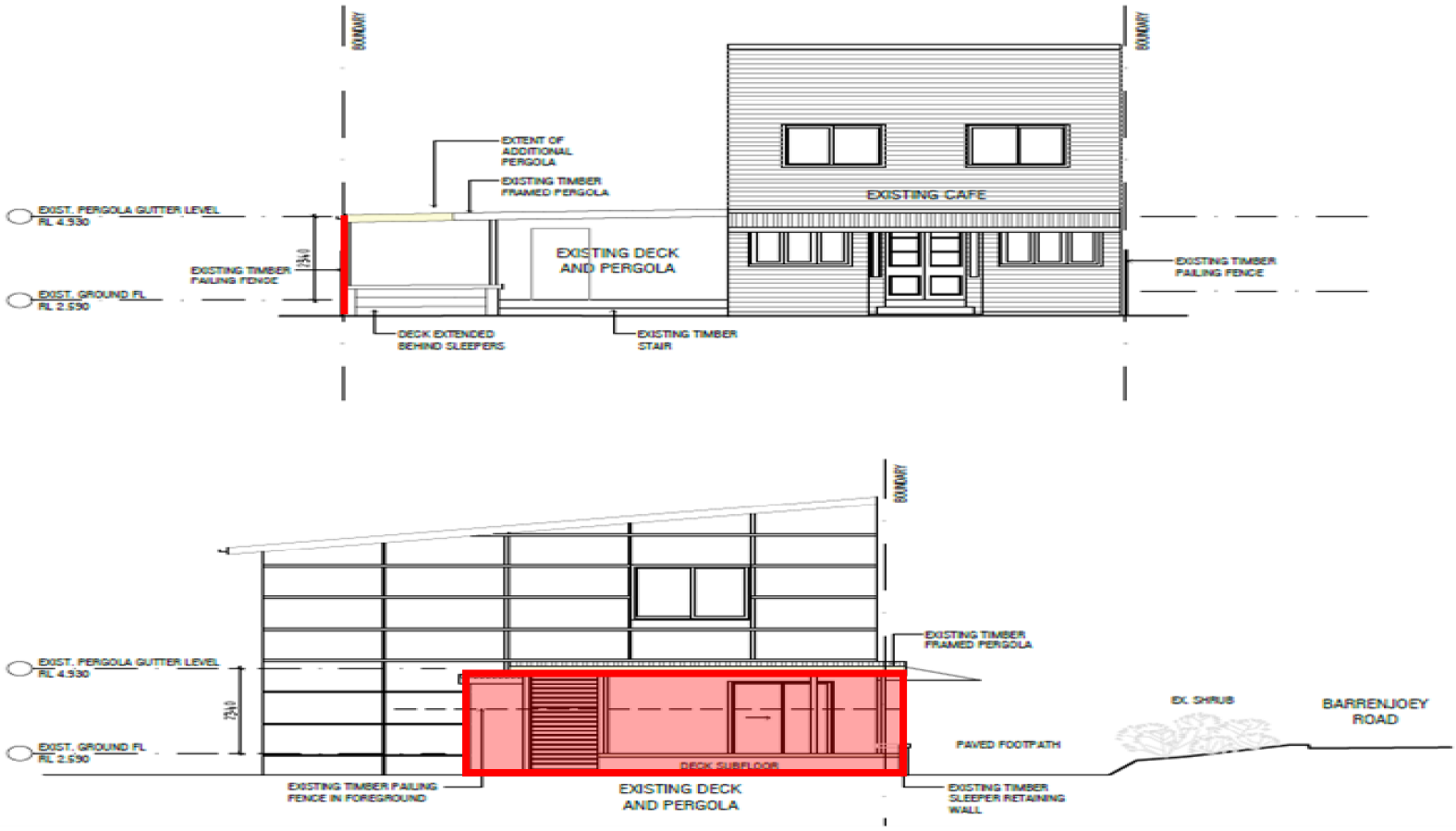
A.2 AERIAL IMAGE (COURTESY OF NSW SPATIAL SERVICES)

A.3 DRAWINGS/PHOTOS WITH MARK UPS

A.3.1 PROPOSED SEATING PLAN (DRW DA03, REV A, DATED 15/7/21)

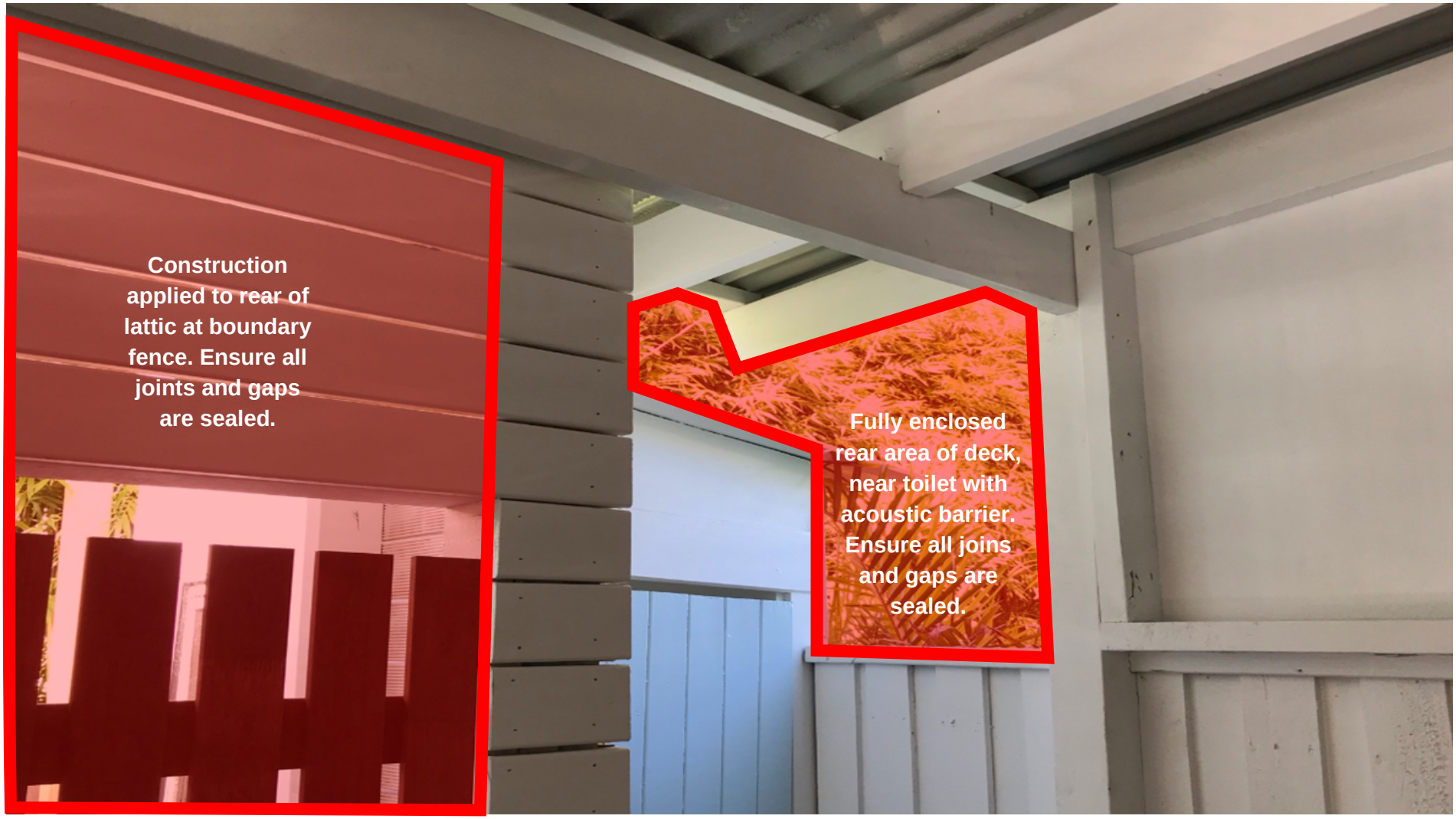


A.3.2 EXISTING ELEVATIONS & STREET VIEW (DRW DA02, REV A, DATED 15/7/21)



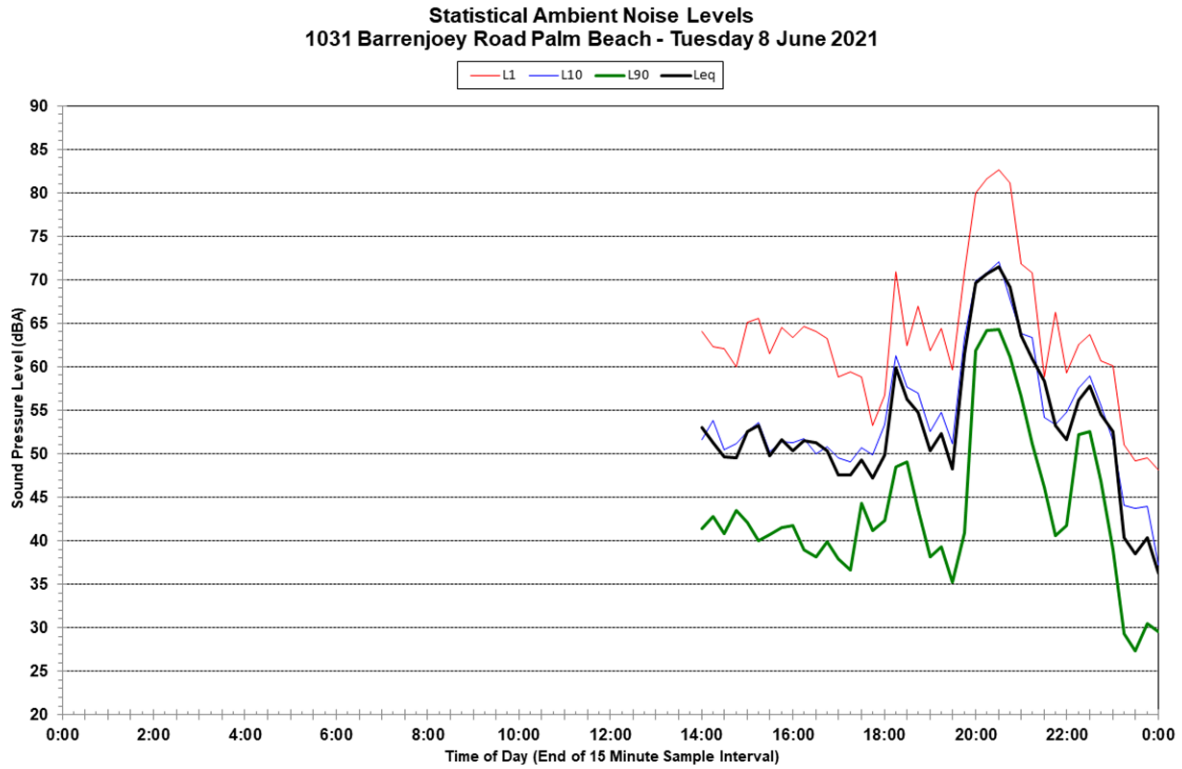
A.3.3 DECK AREA (FACING SOUTHEAST)

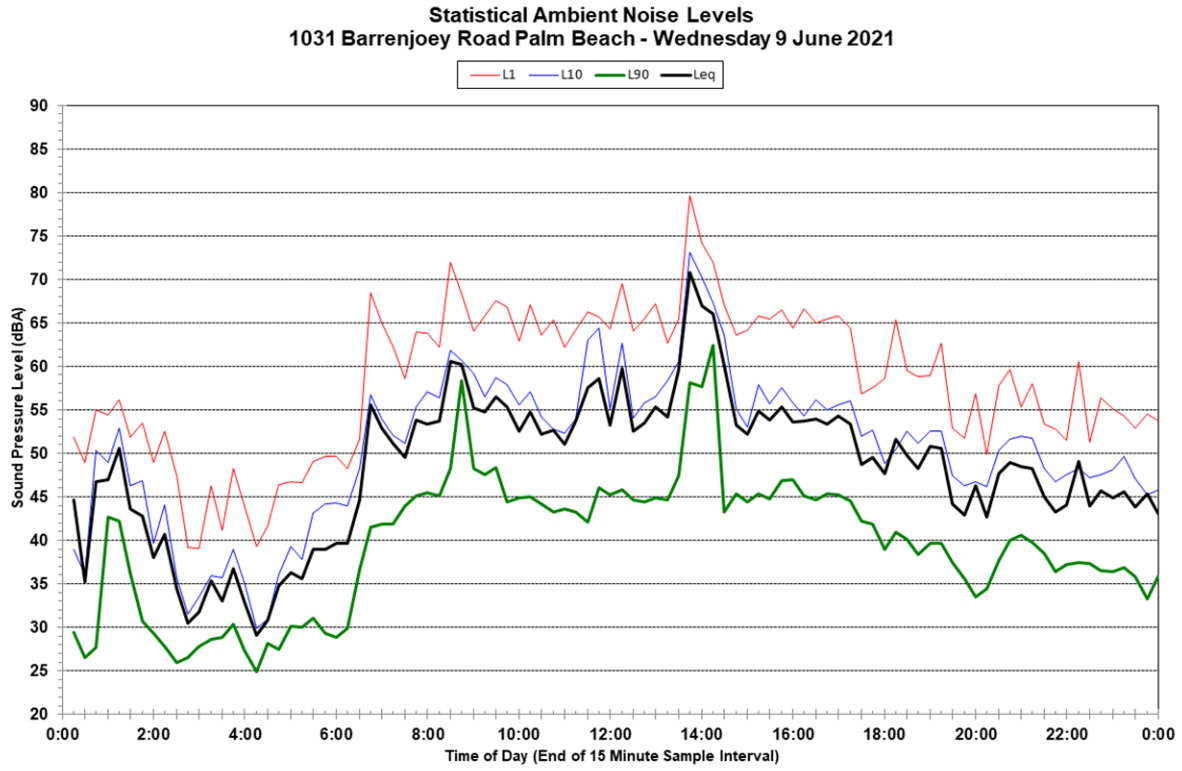
A.3.4 TOILET AT REAR OF DECK AREA (FACING SOUTHWEST)

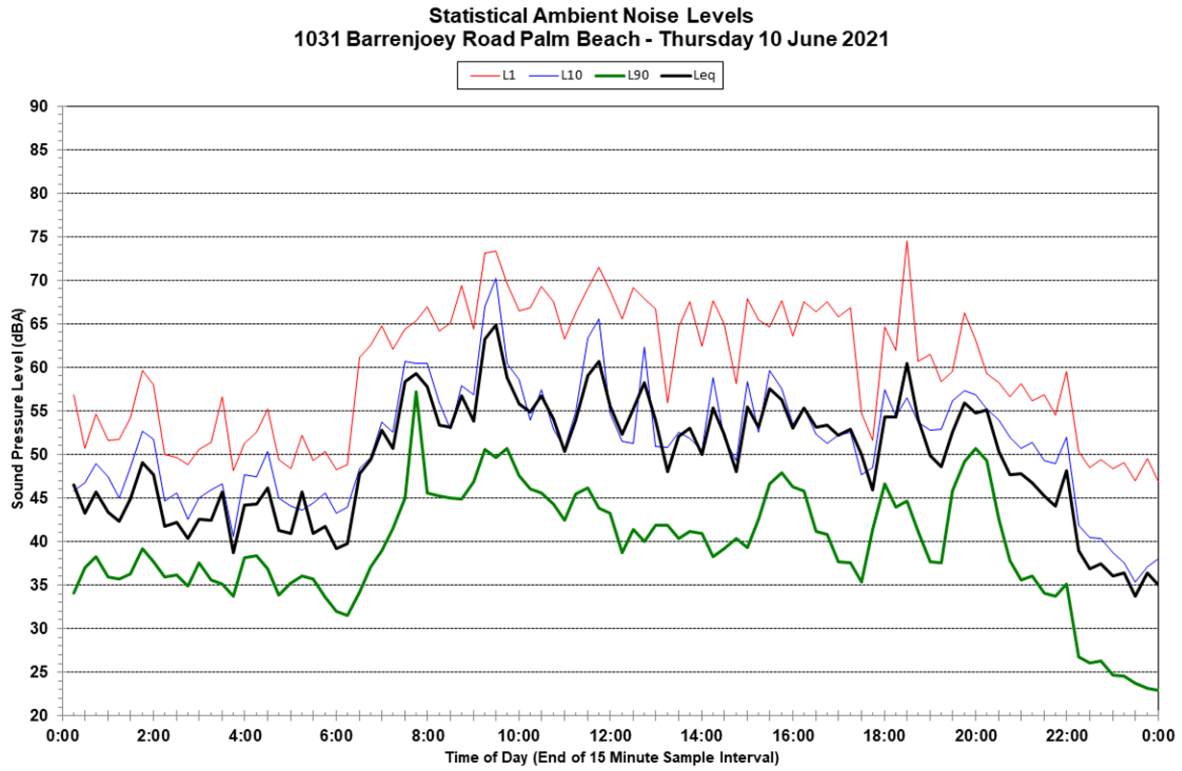


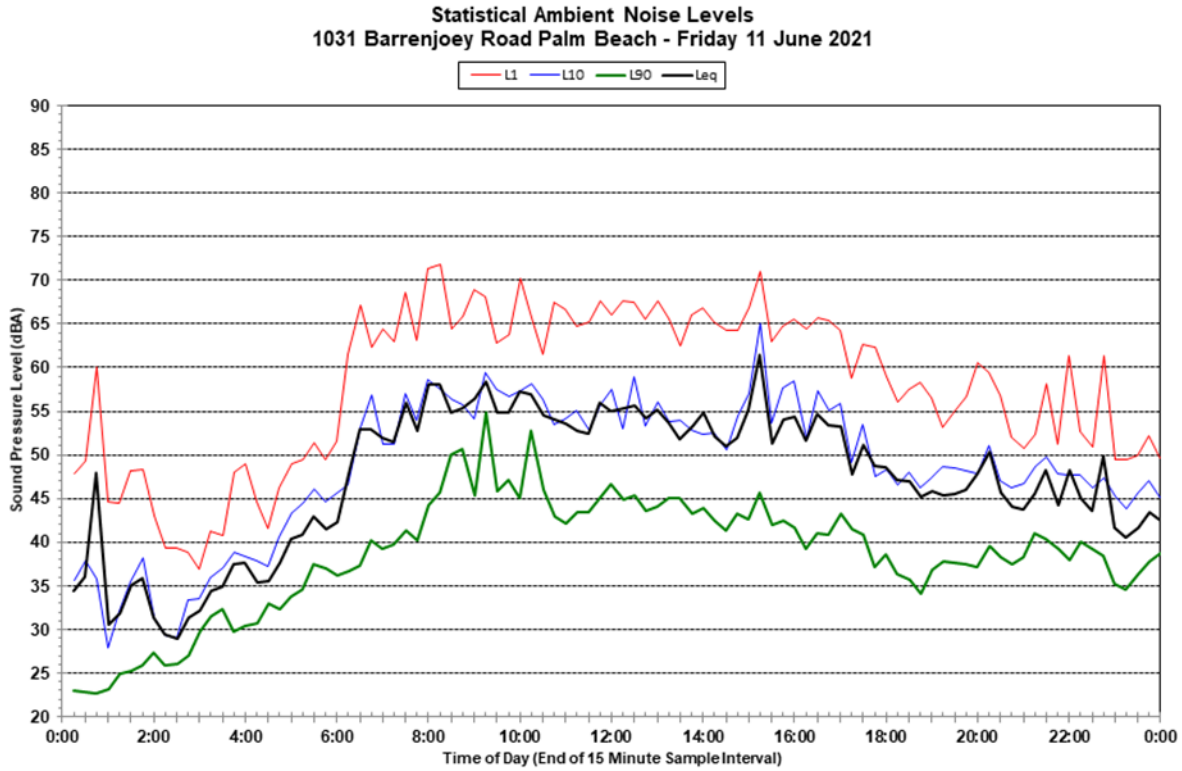
APPENDIX B – UNATTENDED NOISE LOGGING STATISTICAL GRAPHS & ABL'S

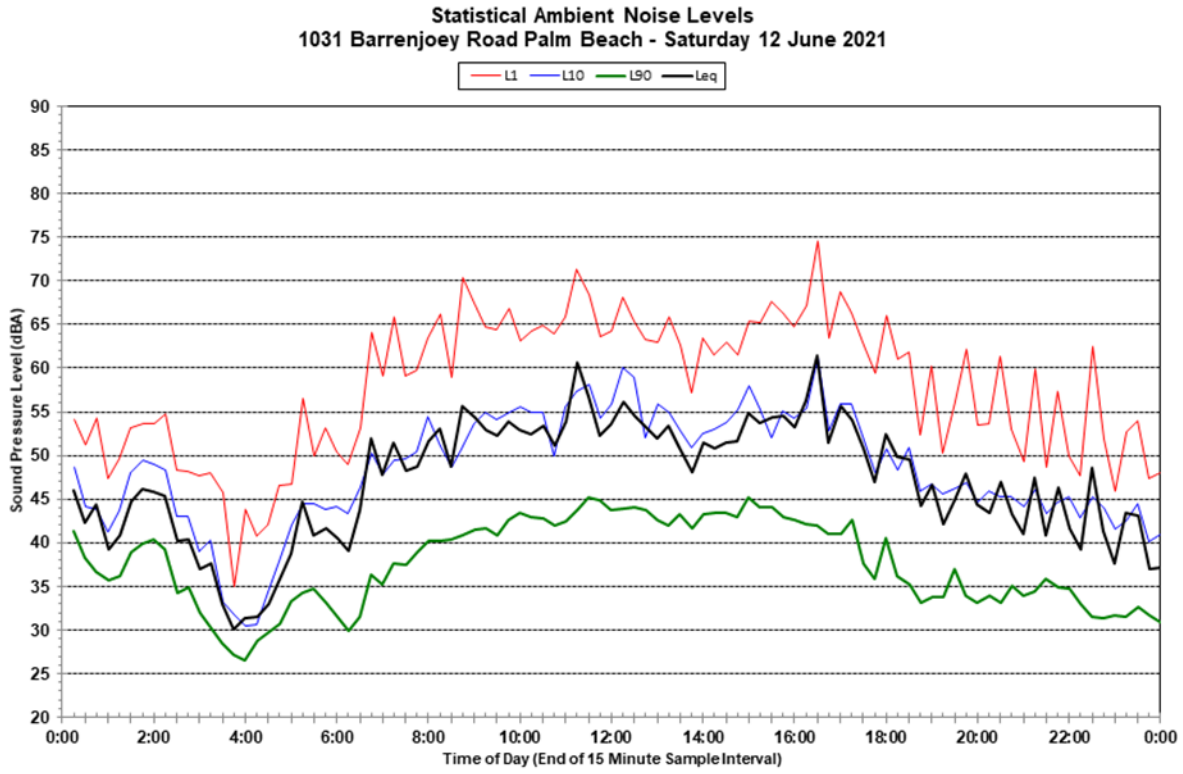
B.1 STATISTICAL GRAPHS

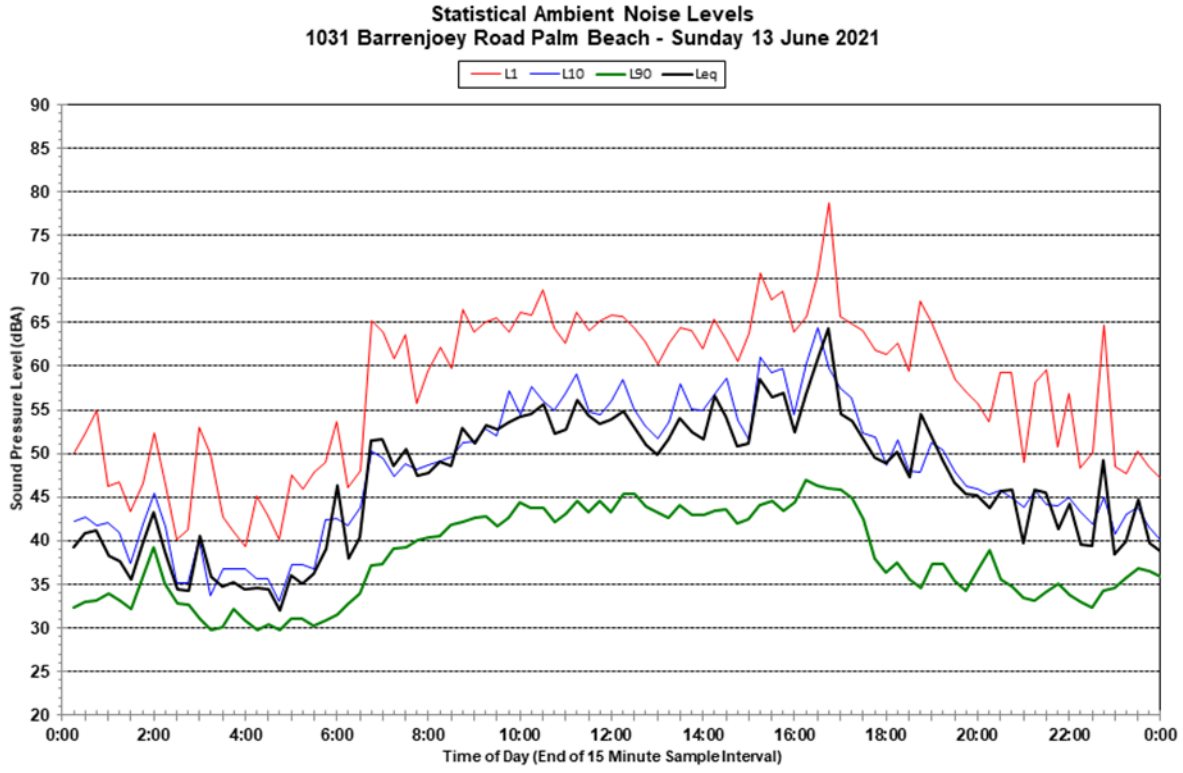


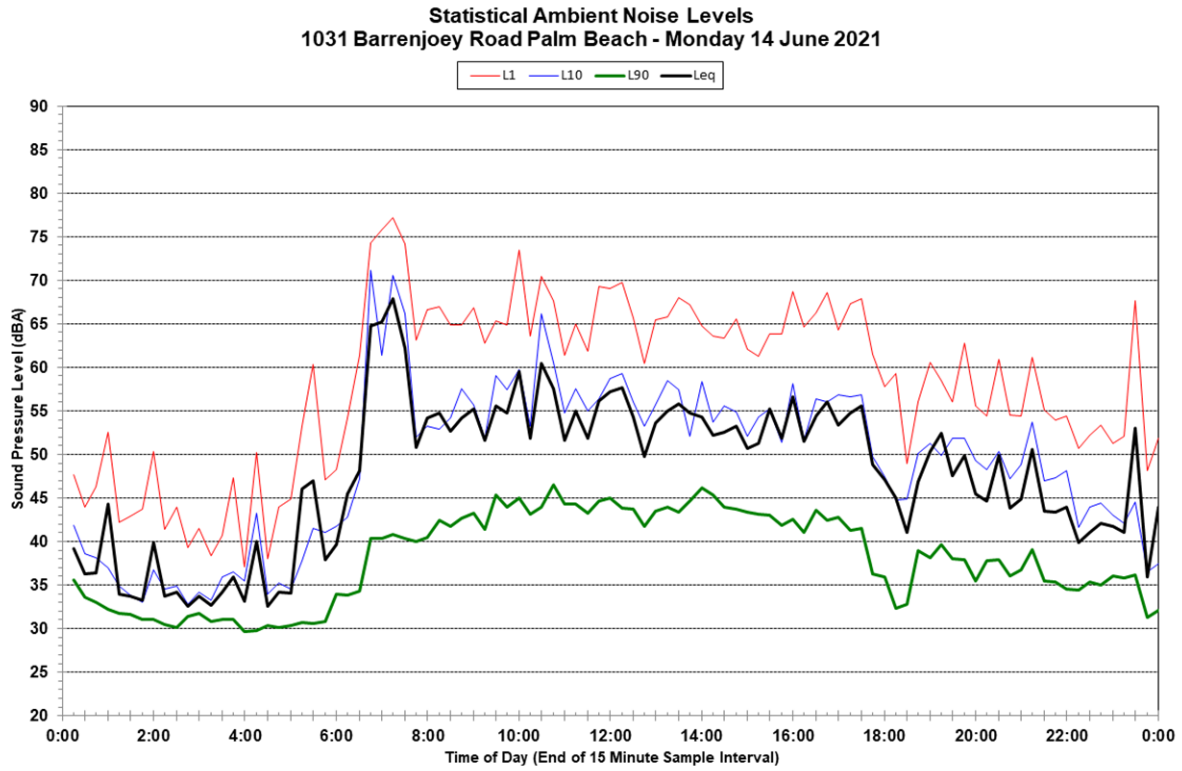


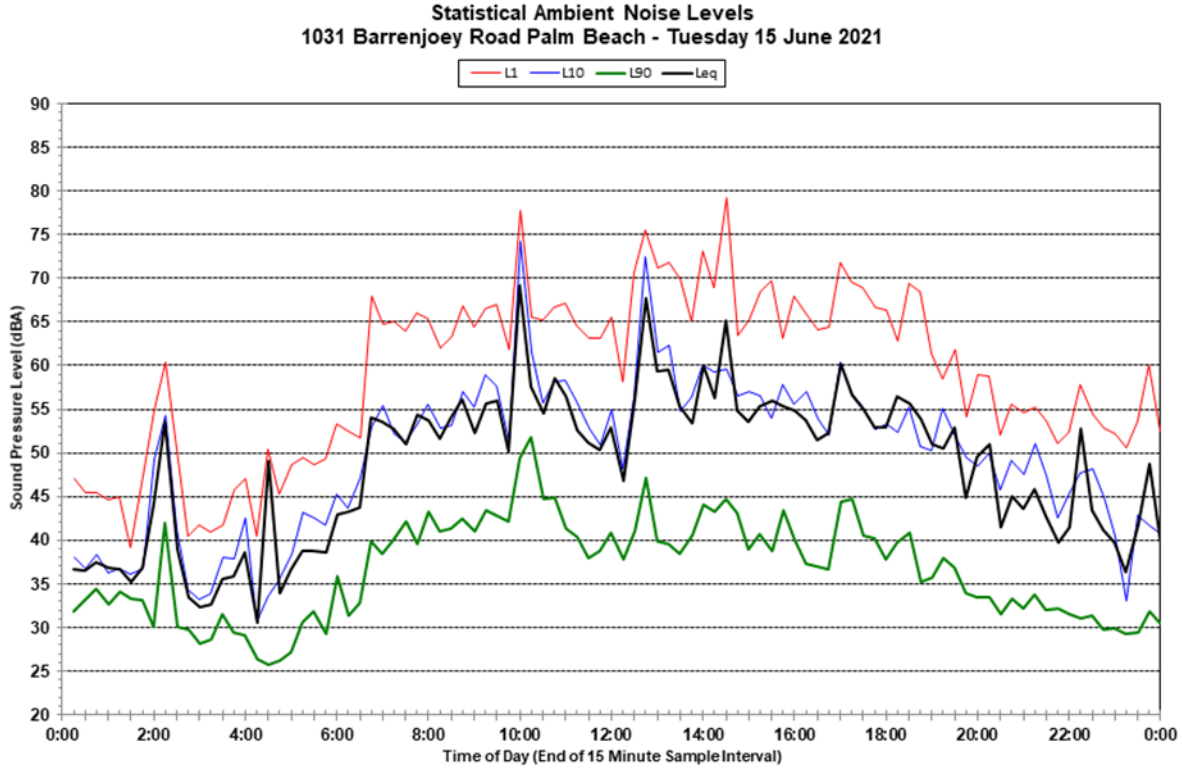

Statistical Ambient Noise Levels
1031 Barrenjoey Road Palm Beach - Thursday 10 June 2021
L1
L10
L90
Leq
Sound Pressure Level (dBA)
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
0:00
2:00
4:00
6:00
8:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
0:00
Time of Day (End of 15 Minute Sample Interval)

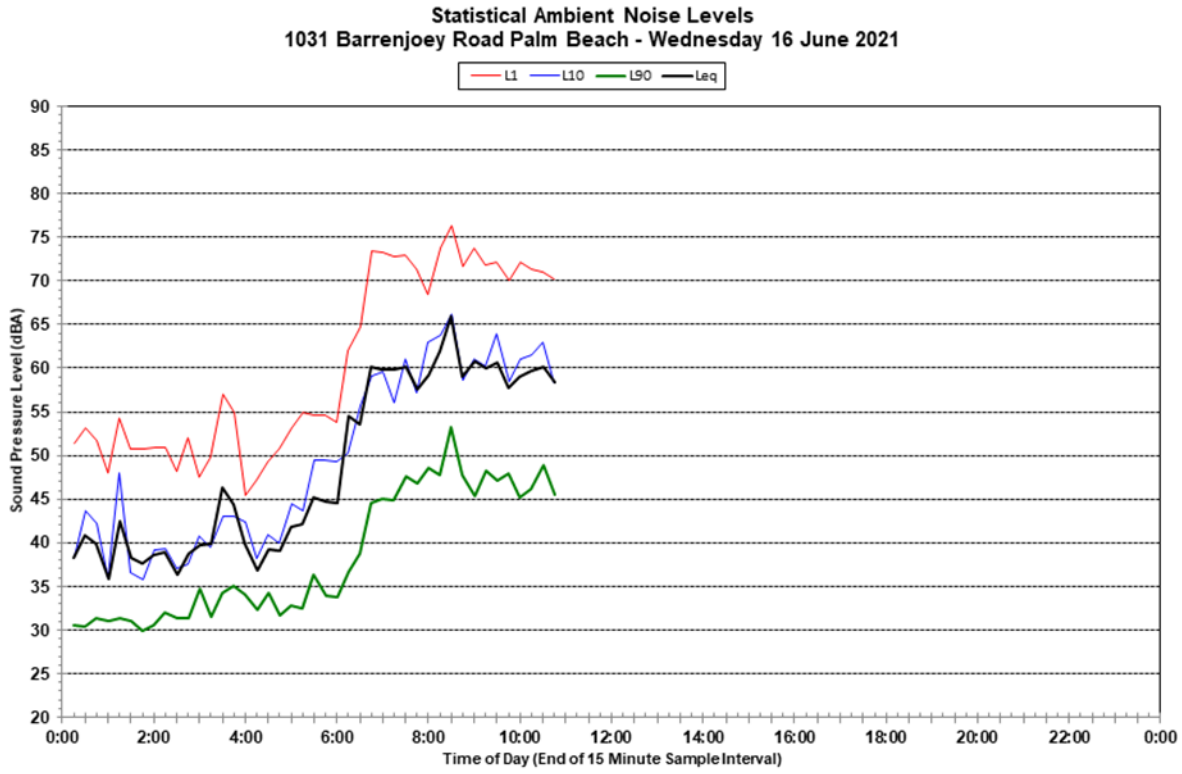

Statistical Ambient Noise Levels
1031 Barrenjoey Road Palm Beach - Friday 11 June 2021
L1
L10
L90
Leq
Sound Pressure Level (dBA)
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
0:00
2:00
4:00
6:00
8:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
0:00
Time of Day (End of 15 Minute Sample Interval)


Statistical Ambient Noise Levels
1031 Barrenjoey Road Palm Beach - Saturday 12 June 2021
L1
L10
L90
Leq
Sound Pressure Level (dBA)
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
0:00
2:00
4:00
6:00
8:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
0:00
Time of Day (End of 15 Minute Sample Interval)


Statistical Ambient Noise Levels
1031 Barrenjoey Road Palm Beach - Sunday 13 June 2021
L1
L10
L90
Leq
Sound Pressure Level (dBA)
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
0:00
2:00
4:00
6:00
8:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
0:00
Time of Day (End of 15 Minute Sample Interval)


Statistical Ambient Noise Levels
1031 Barrenjoey Road Palm Beach - Monday 14 June 2021
L1
L10
L90
Leq
Sound Pressure Level (dBA)
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
0:00
2:00
4:00
6:00
8:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
0:00
Time of Day (End of 15 Minute Sample Interval)


Statistical Ambient Noise Levels
1031 Barrenjoey Road Palm Beach - Tuesday 15 June 2021
L1
L10
L90
Leq
Sound Pressure Level (dBA)
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
0:00
2:00
4:00
6:00
8:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
0:00
Time of Day (End of 15 Minute Sample Interval)



B.2 ASSESSMENT BACKGROUND LEVEL (ABL)

Table B1 Unattended Noise Logging ABL's, RBL's & Leq's & RBL's

Date	ABL L_{90}			L_{eq}		
	Day	Evening	Night	Day	Evening	Night
Tuesday 8 June 2021	(38.1)	35.8	26.9	(50.6)	62.1	46.8
Wednesday 9 June 2021	42.1	35.0	33.7	56.3	48.0	45.5
Thursday 10 June 2021	38.9	34.6	23.1	56.4	53.2	43.6
Friday 11 June 2021	40.4	36.1	29.3	54.9	46.6	43.7
Saturday 12 June 2021	39.4	33.2	30.2	54.1	45.9	43.7
Sunday 13 June 2021	41.8	33.6	30.3	55.1	48.0	52.7
Monday 14 June 2021	40.6	32.3	27.6	56.7	44.8	45.0
Tuesday 15 June 2021	38.2	34.8	32.9	58.9	53.7	52.5
Wednesday 16 June 2021	(48.2)	-	-	(63.6)	-	-
RBL and L_{eq} Overall	40.4	34.7	29.7	57.8	54.6	48.4