Operational Noise Emission Assessment

Dad & Dave's Brewing

45 Mitchell Rd, Brookvale NSW

Client:
Dad and Dave's Brewing

23 June 2022

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Notice

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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 **Dad & Dave's Brewing Pty Ltd** to assess the impact of noise emission at nearby receiver locations resulting from the proposed modified operations of the brewery and tasting room at 45 Mitchell Road, Brookvale NSW.

The site currently has approval for the following operation activities and hours:

Industrial operations for Brewery and Distillery:

- 6am to 5pm Monday to Friday;
- 8am to 12pm Saturday.

Loading of trucks/deliveries:

- 6am to 12pm Monday to Friday;
- 8am to 12pm Saturday.

Internal Tasting Area (100 patrons):

- 4pm to 10pm Monday to Friday;
- 12pm to 10pm Saturday and Sunday

Acoustic Dynamics understands that the client is wishing to amend their Development Application to include extended operation hours, and the use of the carpark as an outdoor area, as follows:

Internal Tasting Area (100 patrons):

- Monday to Friday: 4pm to 12am;
- Saturday: 12pm to 12am; and
- Sunday: 12pm to 10pm.

Outdoor Tasting Area (40 patrons):

- Monday to Friday: 4pm to 12am;
- Saturday: 12pm to 12am; and
- Sunday: 12pm to 10pm.

Accordingly, an assessment of the predicted noise emission levels against the acoustic requirements of relevant authorities has been undertaken for the increased operation hours of the internal area, and the use of the external area by patrons.

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

1.2 LOCATION & DESCRIPTION OF COMMERCIAL PREMISES

The subject brewery is located at 45 Mitchell Rd, Brookvale NSW. Acoustic Dynamics understands that the subject site is zoned IN1 General Industrial. The nearest receivers have been identified as:

- Residential receiver at 59 Wattle Rd, approximately 190m to the south; and
- Commercial receivers, directly adjacent.

The site is shown in the location map, aerial photo and drawings presented within **Appendix A**.

1.3 SCOPE

Acoustic Dynamics has been engaged to provide a noise assessment of the subject site. A summary of the scope is provided below:

- Review of criteria from Council, NSW EPA, OLG, and other relevant documents relating to acoustics;
- Review previously conducted unattended noise monitoring and acoustic assessments for the subject site;
- Establish relevant project specific noise emission criteria; and
- Conduct modelling to determine noise emission levels from the proposed extension of trading hours and use of outdoor area.

2 RELEVANT ACOUSTIC CRITERIA AND STANDARDS

Responsibility for the control of noise emission at the subject site is vested in Local Council. Guidelines for the assessment of noise emission from a licensed premises is contained within the NSW Office of Liquor and Gaming conditions and 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 understands that the newly created Northern Beaches Council is temporarily maintaining the previous planning controls for the given areas. The relevant area for the subject site is Warringah.

2.1.1 LOCAL ENVIRONMENT PLAN

A review of the Warringah Local Environment Plan (LEP) 2011 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 Warringah Development Control Plan (DCP) 2011 was conducted. The following acoustic requirements and relevant noise criteria were found to be relevant to the subject development:

> *"**D3 Noise***
>
> ***Requirements***
> 1. *Noise from combined operation of all mechanical plant and equipment must not generate Noise levels that exceed the ambient background Noise by more than 5dB(A) when measured in accordance with the NSW Industrial Noise Policy at the receiving boundary of residential and other Noise sensitive land uses.*

See also NSW Industrial Noise Policy Appendices

> 2. *Development near existing Noise generating activities, such as industry and roads, is to be designed to mitigate the effect of that Noise.*
> 3. *Waste collection and delivery vehicles are not to operate in the vicinity of residential uses between 10pm and 6am.*
> 4. *Where possible, locate Noise sensitive rooms such as bedrooms and private open space away from Noise sources. For example, locate kitchens or service areas closer to busy road frontages and bedrooms away from road frontages.*
> 5. *Where possible, locate noise sources away from the bedroom areas of adjoining dwellings/properties to minimise impact."*

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 PROTECTION OF THE ENVIRONMENT OPERATIONS (POEO) ACT

We advise that noise emission from the brewery 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 any mechanical plant and equipment associated with the brewery 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.

2.2.2 NOISE POLICY FOR INDUSTRY (2017)

Acoustic Dynamics advises that noise emission assessment at nearby and adjacent noise sensitive receivers has been conducted with reference to the NSW EPA's Noise Policy for Industry (NPFI, 2017), and has yielded the following information.

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.

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)

The **Project Noise Trigger Level** is the lowest value of Project Intrusiveness Noise Level or Project Amenity Noise Level after conversion to L_{Aeq} equivalent value.

To establish the acoustic environment at the subject site in accordance with the guidelines of the NSW EPA's NPfI, Acoustic Dynamics has relied on unattended noise monitoring conducted at the site for previously conducted assessments. The results of the unattended noise monitoring are presented graphically in **Appendix B**.

Acoustic Dynamics advises that the assessment of the site has been based on the **lowest** background noise levels in the area during typical **maximum** use. Acoustic Dynamics advises that such an assessment is conservative and will ensure no loss of amenity to the nearby residential receivers.

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.**

The prevailing weather conditions during the short-term operator attended noise monitoring were generally calm and did not influence the noise measurements taken.

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

Location	Assessment Period	L_{A90} Rating Background Noise Level (RBL) [dB]	Measured L_{Aeq} [dB]	Project Intrusiveness Noise Level [dB]	Project Amenity Noise Level L_{Aeq} [dB][1]	Project Noise Trigger Level L_{Aeq} [dB]
Nearest residential receiver(s)	Morning Shoulder (6am – 7am)	45	61	50	-	**50**
	Day (7am – 6pm)	50	62	55	58	**55**
	Evening (6pm – 10pm)	41	58	46	48	**46**
	Night Shoulder (10pm – 12am)	38	53	43	-	**43**
Commercial Premises	When in Use	-	-	-	65	**65**

Note: 1) Amenity adjustment based on "Industrial Interface - 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**.

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.

Although the NPfI does not apply for the assessment of noise emission from the subject site, Acoustic Dynamics advises that achieving compliance with the NPfI intrusive noise emission objectives applicable at the boundaries of the nearest premises will adequately protect the acoustic amenity of these receivers.

2.2.3 THE EPA'S 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 criterion:

L_{Amax} or $L_{A1(1\ minute)} < L_{A90}$ + 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."*

Conservatively based on an assumed minimum ambient background noise level determined for the night shoulder period, the following sleep disturbance screening criterion was determined for the residential receivers with windows open:

Sleep Disturbance Criterion = **53 dB(A)**

2.3 THE EPA'S ROAD NOISE POLICY

The NSW Environmental 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 roads as well as other developments with the potential to have an impact in relation to traffic noise generation. **Table 2.2** presents the relevant RNP noise criteria for the subject site.

Table 2.2 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)

2.4 NSW OFFICE OF LIQUOR AND GAMING (OLG)

Prior to the *Liquor Act 2007* being gazetted by the NSW State Parliament, and establishment of the *Liquor Regulation 2008*, noise emission from licensed premises had to comply with the Office of Liquor and Gaming noise emission criteria, detailed below. Acoustic Dynamics advises that many NSW liquor licenses still specify the following noise emission criteria:

The OLG conditions required that:

> *"The L_{A10} noise emitted from the licensed premises shall not exceed the background noise level in any octave band frequency (31.5 Hz to 8 kHz inclusive) by more than 5 dB(A) between 7.00am and midnight at the boundary at any affected residence.*
>
> *The L_{A10} noise level emitted from the licensed premises shall not exceed the background noise in any octave band centre frequency (31.5 Hz to 8 kHz inclusive) between midnight and 7.00am at the boundary of any affected residence.*
>
> *Notwithstanding compliance of the above, noise from the licensed premises shall not be audible in any habitable room in any residential premises between the hours of midnight and 7.00am."*

To determine the appropriate intrusive noise emission criteria in accordance with the assessment guidelines of the OLG, Acoustic Dynamics has relied on unattended noise monitoring conducted at the site for previously conducted assessments. The results of the unattended noise monitoring are presented graphically in **Appendix B**.

Note is made that in accordance with the NSW Office of Liquor and Gaming (OLG) noise emission requirements, an octave band L_{A90} external background noise level has also been determined, and is presented in **Table 2.3**.

Table 2.3 Summary of Background L_{A90} Octave Band Noise Level

Location	Assessment Period	Method for Calculation of Criteria	Rating Background Noise Level (Octave Band Centre Frequencies in Hz)									
			32	63	125	250	500	1K	2K	4K	8K	O/A
Residential Receivers - External	Morning Shoulder (6am – 7am)	L_{A10} ≤ RBL	20[1]	27	31	33	37	40	38	31	19	**45**
	Day (7am – 6pm)	L_{A10} ≤ RBL + 5 dB	24	37	40	43	46	49	47	41	28	**53**
	Evening (6pm to 10pm)		20[1]	28	31	34	38	41	36	26	22	**44**
	Night Shoulder (10pm – 12am)		20[1]	24	28	31	35	38	33	24	23	**41**

Notes: 1) Level based on threshold of hearing Tf at any Octave Band Centre Frequency as defined in Table 1 of International Standard ISO 226 - Normal Equal-Loudness-Level Contours

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	2670479	Brüel & Kjaer 12.5 mm Prepolarised Condenser Microphone
4231	909240	Brüel & Kjaer Acoustic Calibrator
XL2	A2A-05048-E0	NTi XL2 Type 1 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 OPERATIONAL NOISE EMISSION ASSESSMENT

The following subsections provide an assessment of the proposed operations against the various noise emission criteria and objectives outlined in Section 2 above.

Within our calculations and acoustic modelling, noise emission contributions from the brewery have been considered taking the following factors into account:

- Airborne noise losses due to distance and ground topography;
- Losses due to direction and diffraction;
- Increases due to reflections; and
- Acoustic shielding.

4.1 CALCULATION SCENARIO

Acoustic Dynamics has conducted acoustic analysis for the proposed operation of the brewery, assuming the following noise sources:

- 100 patrons internally and 40 patrons externally;
- Amplified music within the internal area;
- Car noise due to patrons using the existing car spaces to the north of the site;
- The ingress and egress of patrons through the western entry/exit; and
- Light background music, supplied via portable speakers, for the external area.

4.2 OPERATIONAL NOISE EMISSION TO RECEIVERS (EXTERNAL)

The calculated maximum noise emission levels at the nearest affected receivers to the brewery, resulting from the proposed operation of the brewery, are presented against the most stringent noise criteria in **Table 4.1** and **Table 4.2** are presented below.

Table 4.1 Calculated External Noise Emission Levels at Residential Receivers (OLG)

Receiver	Noise Source[1]	Relevant L_{A10} Noise Emission Criterion [dB] and Calculated L_{A10} Noise Emission Levels at Receivers [dB][2,3]										Complies?
		32	63	125	250	500	1K	2K	4K	8K	O/A	
Night Shoulder Criterion (10pm to 12am)		20[3]	24	28	31	35	38	33	24	23	**41**	
59 Wattle Road	Combined operations	20[3]	11[3]	6[3]	15	27	31	26	18	12[3]	**34**	**Yes**

Notes: 1) Acoustic Dynamics advises that by achieving compliance with the more stringent night shoulder criterion, compliance will also be achieved with all other less stringent criteria.

2) Note is made that the proposed operations of the subject premise is to cease between the hours of 12:00am and 7:00 am.

3) Level based on threshold of hearing Tf at any Octave Band Centre Frequency as defined in Table 1 of International Standard ISO 226 - Normal Equal-Loudness-Level Contours

Table 4.2 Calculated External Noise Emission Levels at Sensitive Receivers (NPfI)

Receiver	Noise Source	Relevant Assessment Period[1]	Measured & Calculated L_{Aeq} Noise Level [dB]	Project Noise Trigger Level L_{Aeq} [dB]	Complies?
59 Wattle Road	Combined operations	Night Shoulder (10pm – 12am)	34	**43**	**Yes**
Adjacent Commercial Receivers		When in use	56	**65**	**Yes**

Notes: 1) Acoustic Dynamics advises that by achieving compliance with the more stringent night shoulder criterion, compliance will also be achieved with all other less stringent criteria.

2) Note is made that the proposed operations of the subject premise is to cease between the hours of 12:00am and 7:00 am.

The determined external L_{A10} and external L_{Aeq} levels are compliant with criteria set out in the office of Liquor and Gaming and the EPA Noise Policy for Industry (NPfI 2017).

4.3 SLEEP DISTURBANCE

Acoustic Dynamics has determined the potential maximum $L_{A1(60\ Sec)}$ **external** noise emission level from the brewery (resulting from sudden impact noises like car door slams), when measured at the nearest residential receivers during the night-time assessment period.

Table 4.3 Calculated Maximum Instantaneous External Noise Levels & Relevant Noise Criteria

Sensitive Receiver	Source	Predicted Maximum L_{Amax} Sound Pressure Level [dB][1]	$L_{A1(60\ Sec)}$ Sleep Disturbance Criterion [dB][2]	Complies?
59 Wattle Road	Impact noises	36	**53**	**Yes**

Note: 1) Predicted L_{Amax} noise level is the maximum noise level measured during the sound event.
2) Maximum instantaneous noise level measured during the night shoulder assessment period (10pm until 12am).

Acoustic Dynamics advises that instantaneous noise events that could exceed the external sleep disturbance criterion at the nearest residential receivers are unlikely to cause awakening reactions.

4.4 ROAD TRAFFIC NOISE EMISSION

Acoustic Dynamics understands that patrons and staff who drive will access the brewery via surrounding local roads. Vehicles utilising local roads are assessed in consideration of the NSW EPA's RNP criteria outlined in **Section 2**.

The calculated maximum noise emission levels at the nearest residential receivers, due to the vehicles utilising surrounding local roads, are presented below. Acoustic Dynamics advises that by achieving compliance with the nearest sensitive receiver locations, compliance will also be achieved at all other sensitive receiver locations further away.

Table 4.4 Calculated Road Traffic Noise Emission Levels & Relevant Noise Criteria

Receiver	Predicted Maximum $L_{eq,1hr}$ Sound Pressure Level [dB][1]	Relevant $L_{Aeq,1hr}$ Criterion [dB][2,3]	Complies?
Nearest Residential Receivers	48	**50**	**Yes**

Note: 1) Predicted L_{Aeq} noise level is the maximum noise level measured within a 1-hour period.
2) Measured noise level within a 1-hour period during the night shoulder assessment period (10pm until 12am).
3) Compliance with this most sensitive assessment period criterion ensures compliance during all other less stringent assessment periods.

5 DISCUSSION

The calculated noise emission levels associated with the proposed operations of the brewery indicate the following:

1. Noise emission resulting from the proposed use and operations of the brewery is **predicted to comply** with the relevant **external** noise emission criteria of Northern Beaches Council, the NSW OLG, the NSW EPA and federal legislation during all proposed hours of operation when assessed at the nearest sensitive receivers;

2. Noise emission associated with additional traffic on surrounding local roads is **predicted to comply** with the NSW EPA's *Road Noise Policy (RNP) 2011* when assessed at the nearest sensitive receivers;

3. Maximum instantaneous external noise events are **predicted to comply** with the NSW EPA's guidelines on sleep disturbance when assessed at the nearest sensitive receivers;

4. There is **low risk** of acoustic disturbance to the nearest sensitive residential, commercial and industrial receivers during the proposed hours of operation;

5. To ensure the assessment is conducted in a conservative manner, noise emission has been assessed as a **worst-case** scenario (i.e. all noise generating activities and noise sources occurring simultaneously and at maximum capacity). Generally, noise emission associated with the operations of the brewery is **predicted to be lower** than the calculations presented; and

6. The noise calculations and operational assumptions should not be considered prescriptive. They are modelling assumptions that have been used to demonstrate typical noise sources and operations associated with the facility **can be designed to achieve compliance** with the relevant criteria.

6 RECOMMENDATIONS & ADVICE

The following recommendations are provided to ensure noise emission associated with proposed operations is adequately managed and minimised during operation.

6.1 AMPLIFIED MUSIC AND LIVE BANDS

Acoustic Dynamics advises the following:

- The internal reverberant Sound Pressure Level (SPL) resulting from bands and/or amplified music must not exceed **85 dB(A)**; and

- Any external amplified music must not exceed a SPL of **75 dB(A)** when measured at 1m.

6.2 BEST MANAGEMENT PRACTICE AND NOISE MANAGEMENT PLAN

Acoustic Dynamics recommends the adoption of a management plan incorporating best management practice procedures to protect the acoustic amenity of the surrounding area. Such a management plan should outline policies and procedures to ensure noise emission from the brewery are kept to a minimum, including:

1) Ensure doors and windows are closed at sensitive times to contain noise within the site;

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

3) At the cessation of trade, ensure staff and patrons leave the premises quietly and respectfully to minimise any potential impacts on the surrounding amenity, including signage reminding staff and patrons to be aware of their neighbours and to leave in a respectful manner; and

4) Implementation of an appropriate community liaison procedure, including a noise complaint procedure and means of ongoing communication with nearby potentially affected receivers once the proposed operations are occurring.

7 CONCLUSION AND ACOUSTIC OPINION

Acoustic Dynamics has conducted an acoustic assessment of the noise emission resulting from the proposed use and operation of Dad & Dave's Brewing Pty Ltd, located at 45 Mitchell Road, Brookvale, NSW.

A review of the applicable local council, state government, federal legislation and international standards was conducted. Noise levels were assessed in accordance with the requirements of:

(a) Northern Beaches Council;
(b) NSW Office of Liquor and Gaming;
(c) NSW Environment Protection Authority; and
(d) Australian Standards.

The relevant assessment criteria, standards, and instrumentation used in this assessment are presented in **Section 2** and **Section 3**. Our assessment methodology, calculations and results are presented in **Section 4,** and a discussion of the results in **Section 5**. Finally, our recommendations and advice for noise control and management are provided in **Section 6**.

Acoustic Opinion

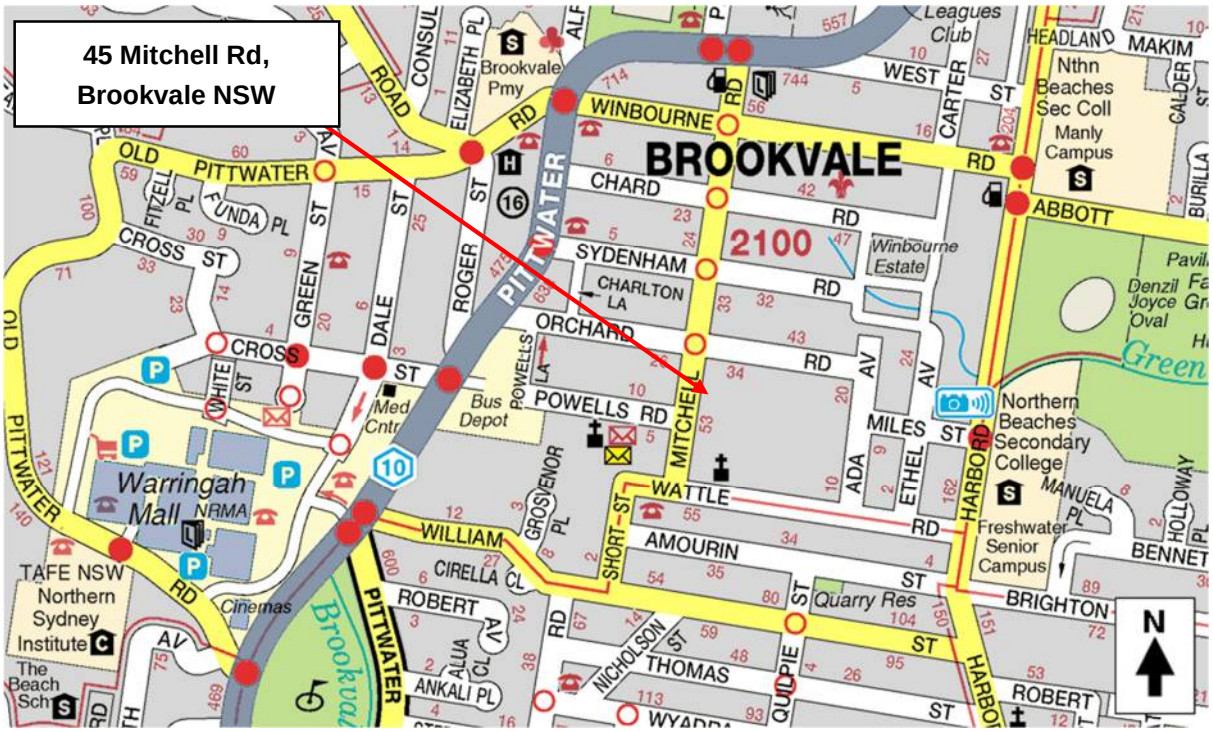
Further to the noise monitoring and measurements conducted, our review of the relevant acoustic criteria, requirements and our calculations, the proposed use and operation of the subject site is compliant with relevant noise emission criteria of the Northern Beaches Council, NSW EPA, the POEO Act 1997, and the OLG for the proposed hours of operation, following the incorporation of our recommendations and advice.

It is our opinion that the acoustic risks associated with the proposal can be adequately controlled and the amenity of neighbouring properties and residents can be satisfactorily protected.

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.

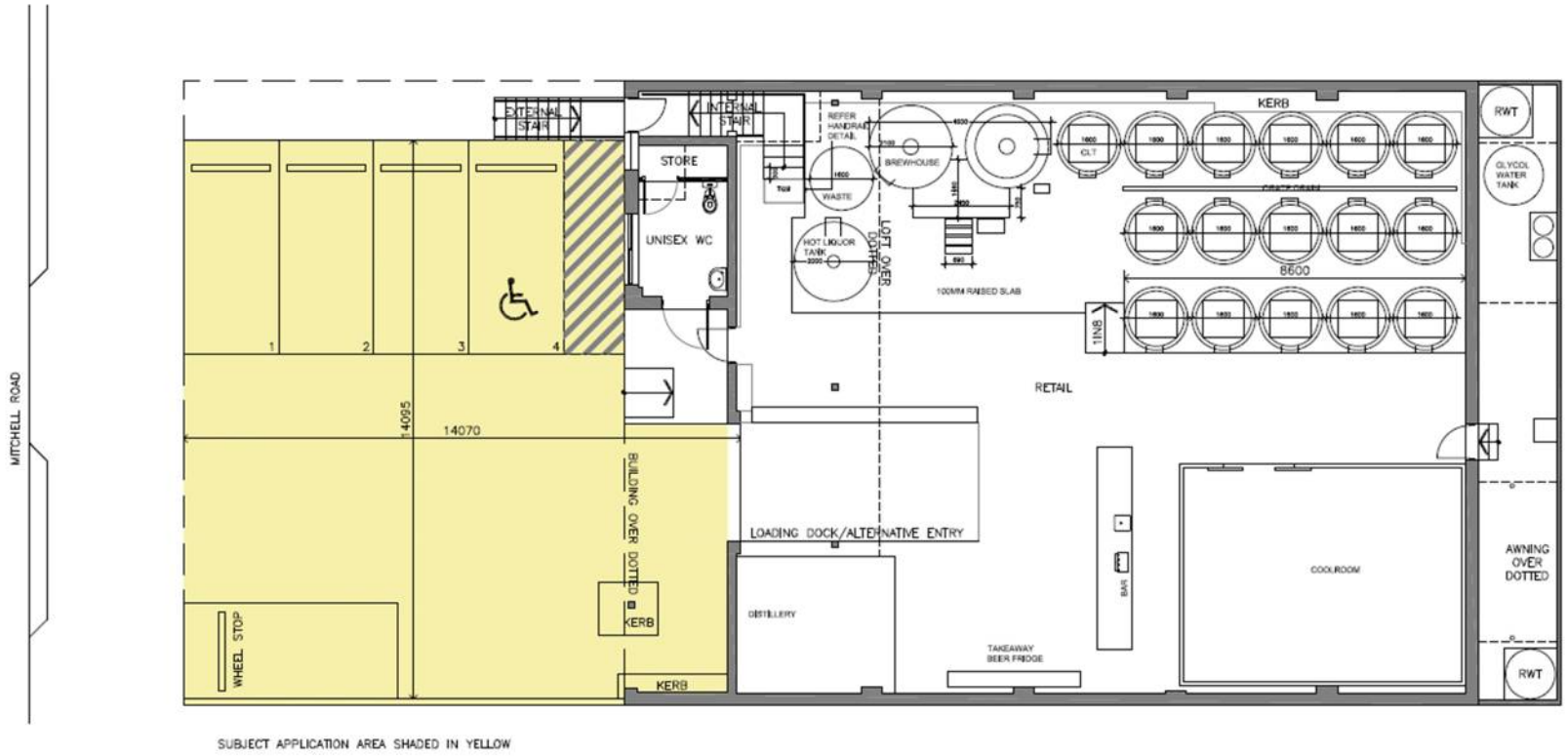
APPENDIX A – LOCATION MAP & AERIAL PHOTO

A.1 LOCATION MAP



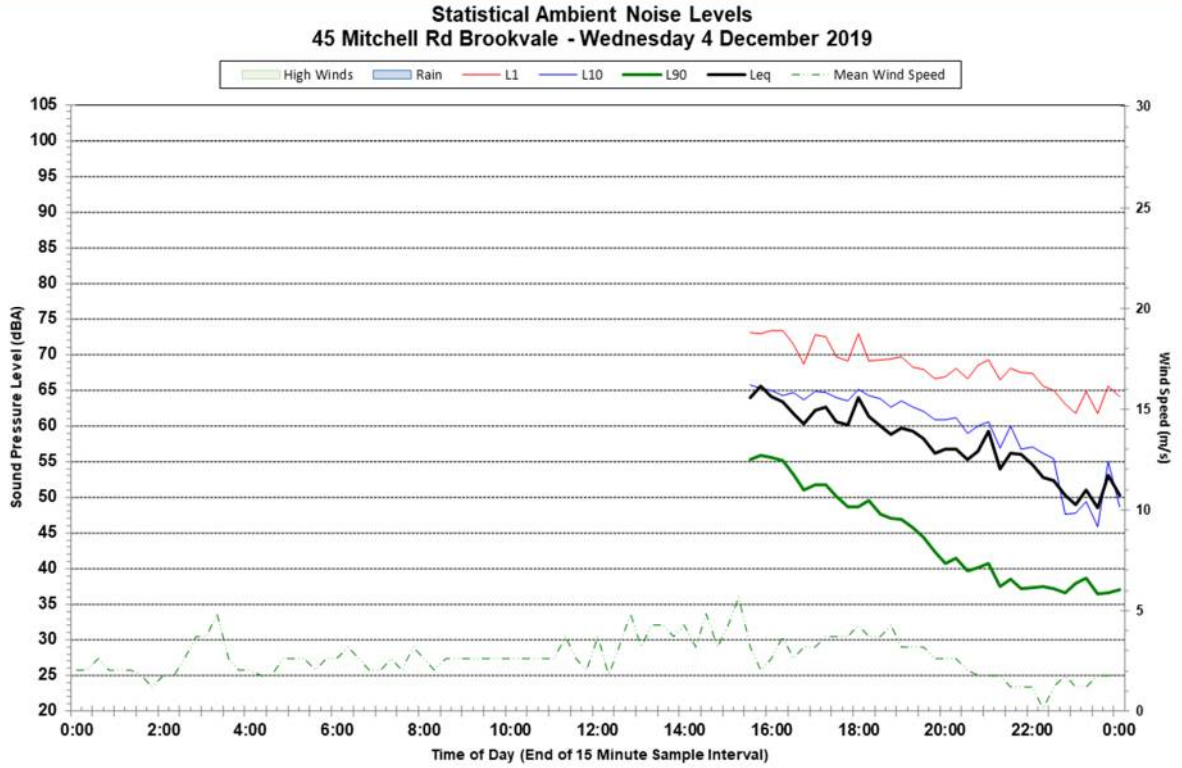
A.2 AERIAL PHOTO (COURTESY OF SIXMAPS.COM)

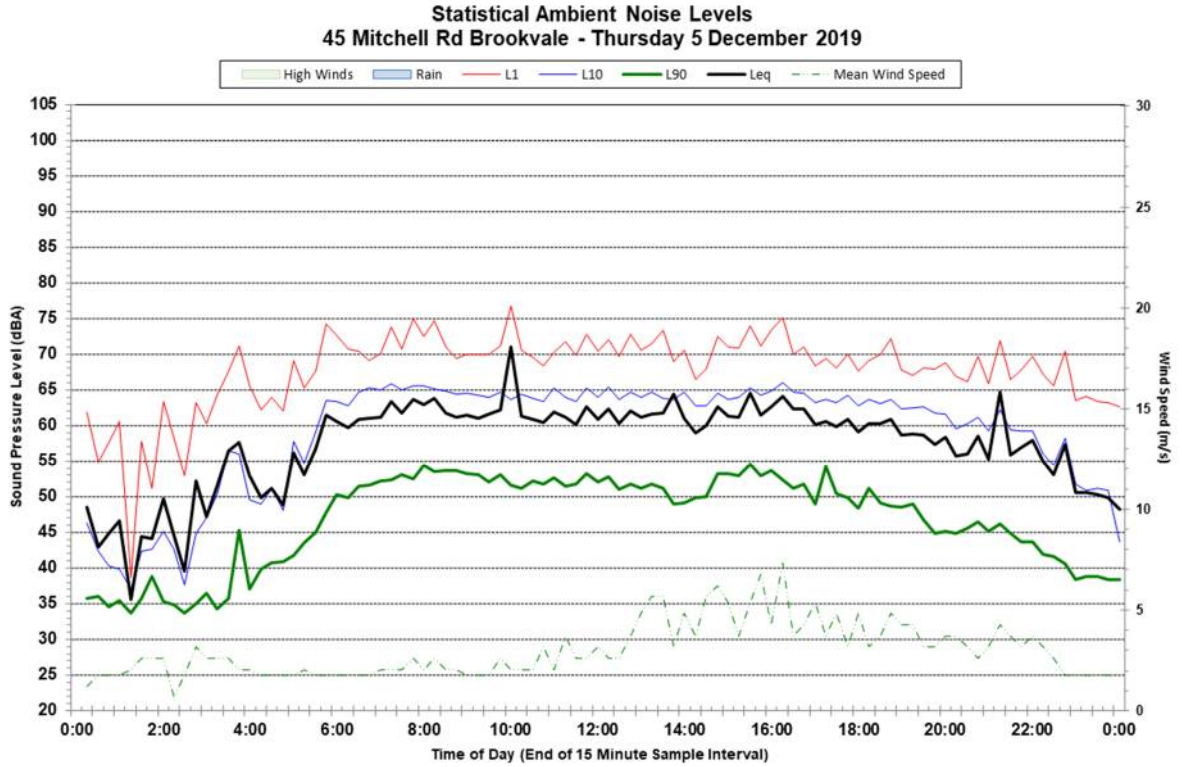
A.2 DRAWINGS

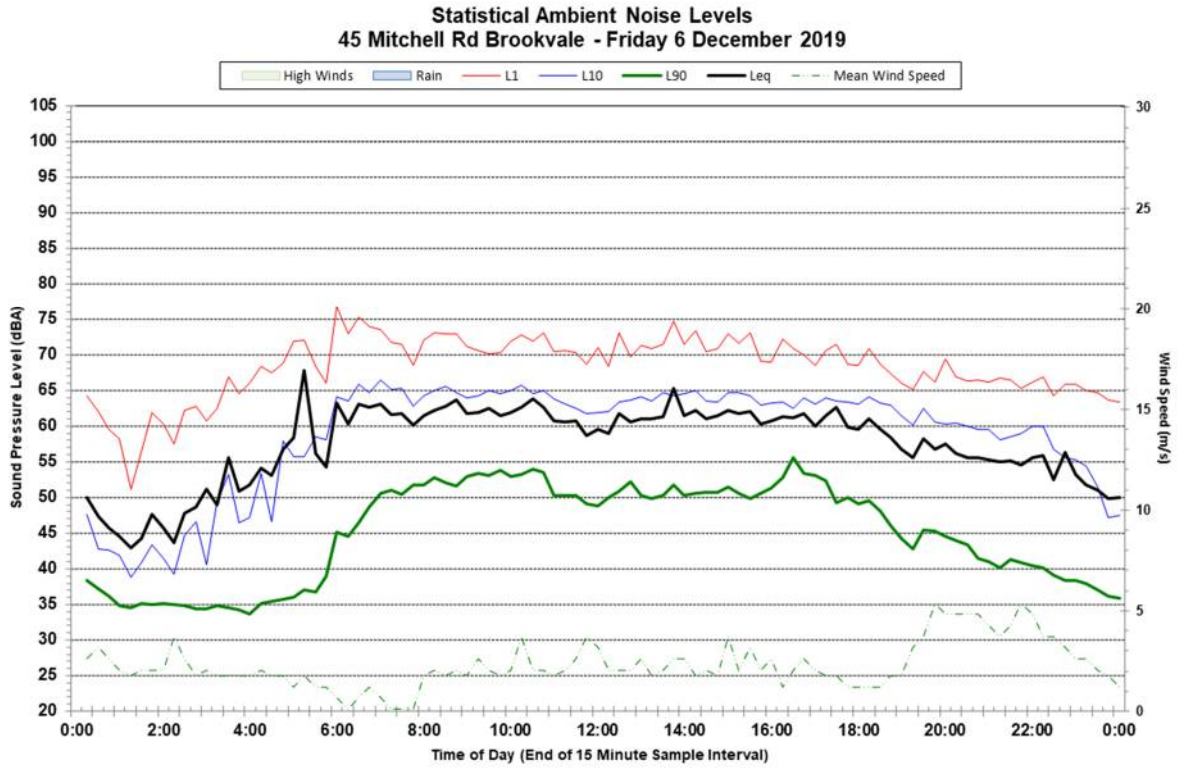


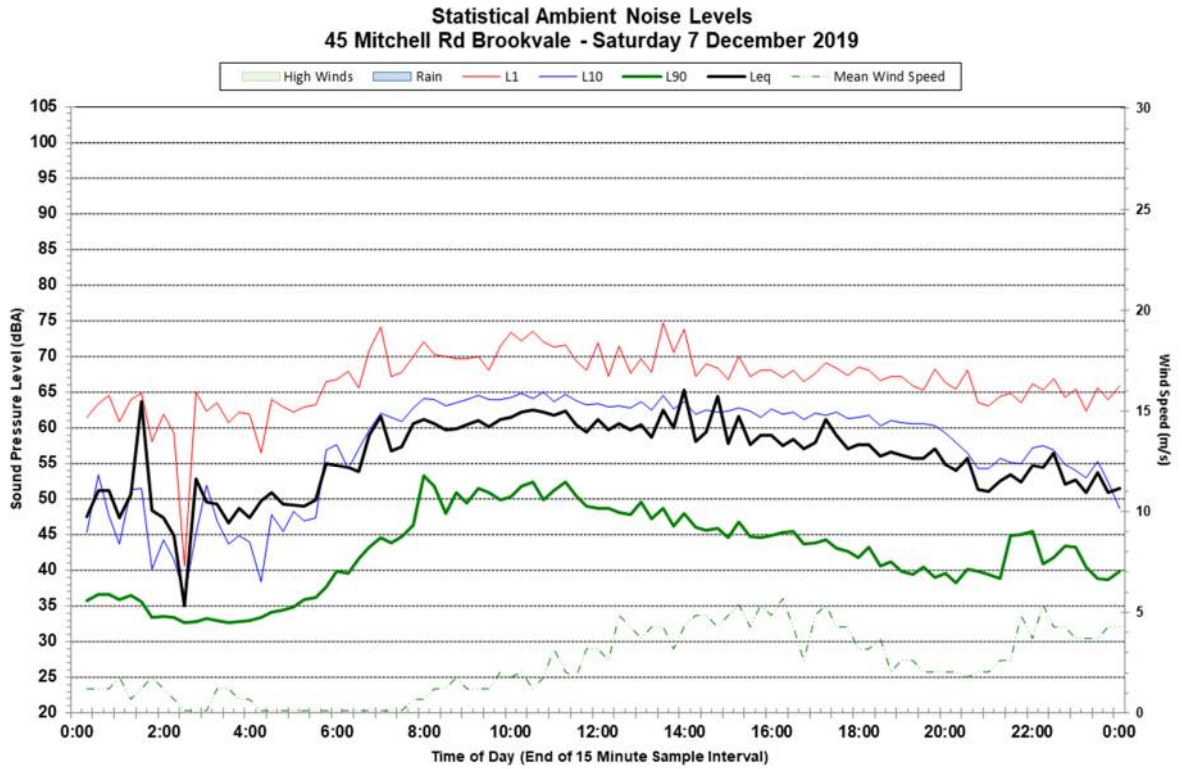
SITE PLAN

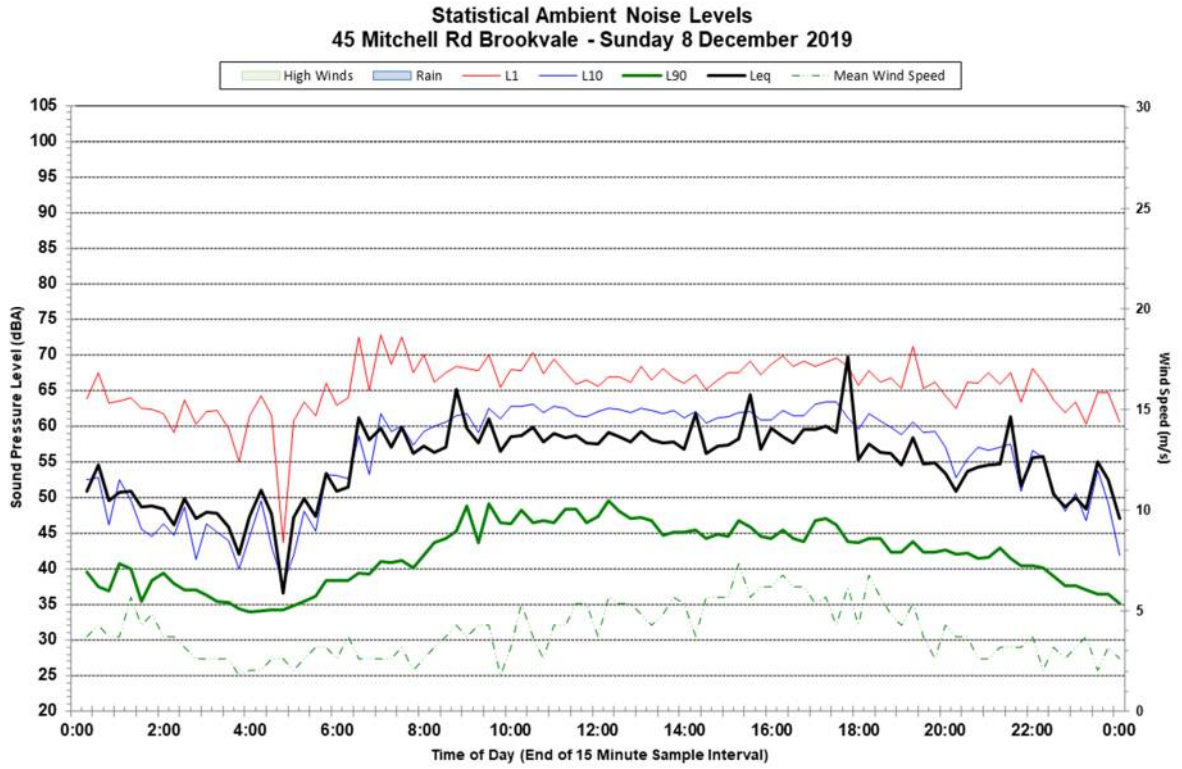
APPENDIX B – UNATTENDED NOISE LOGGER DATA

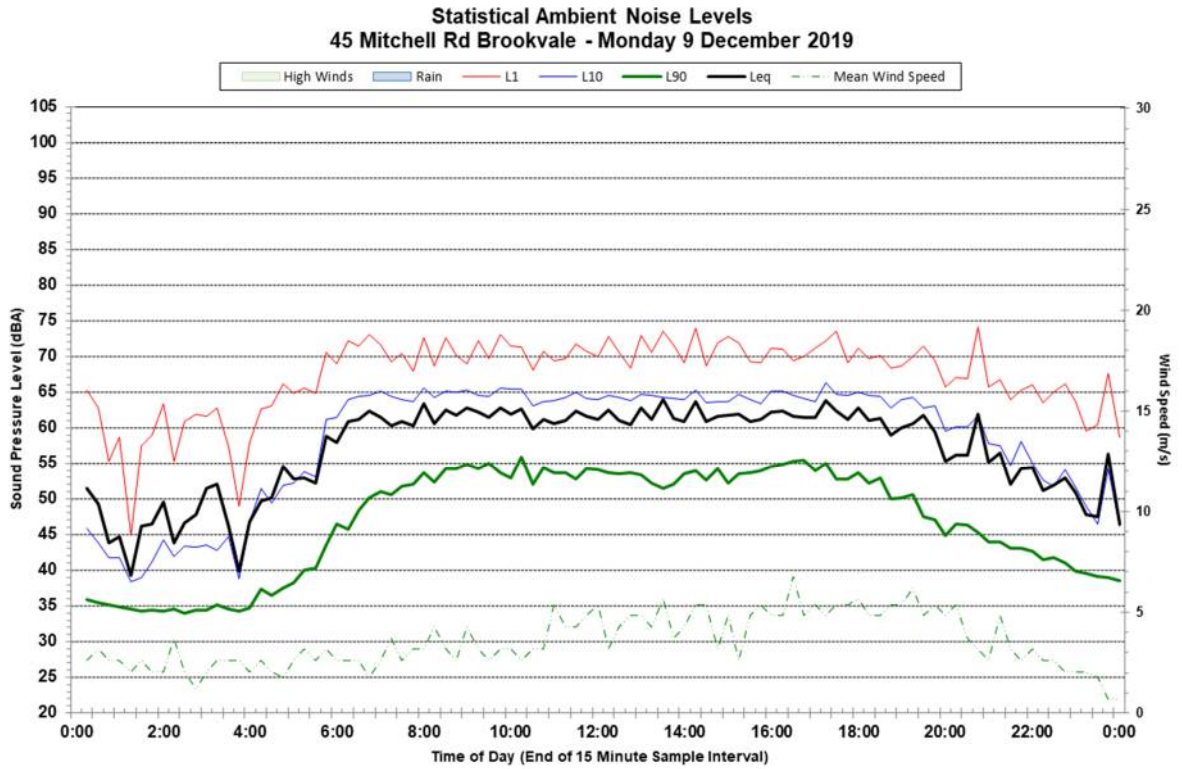


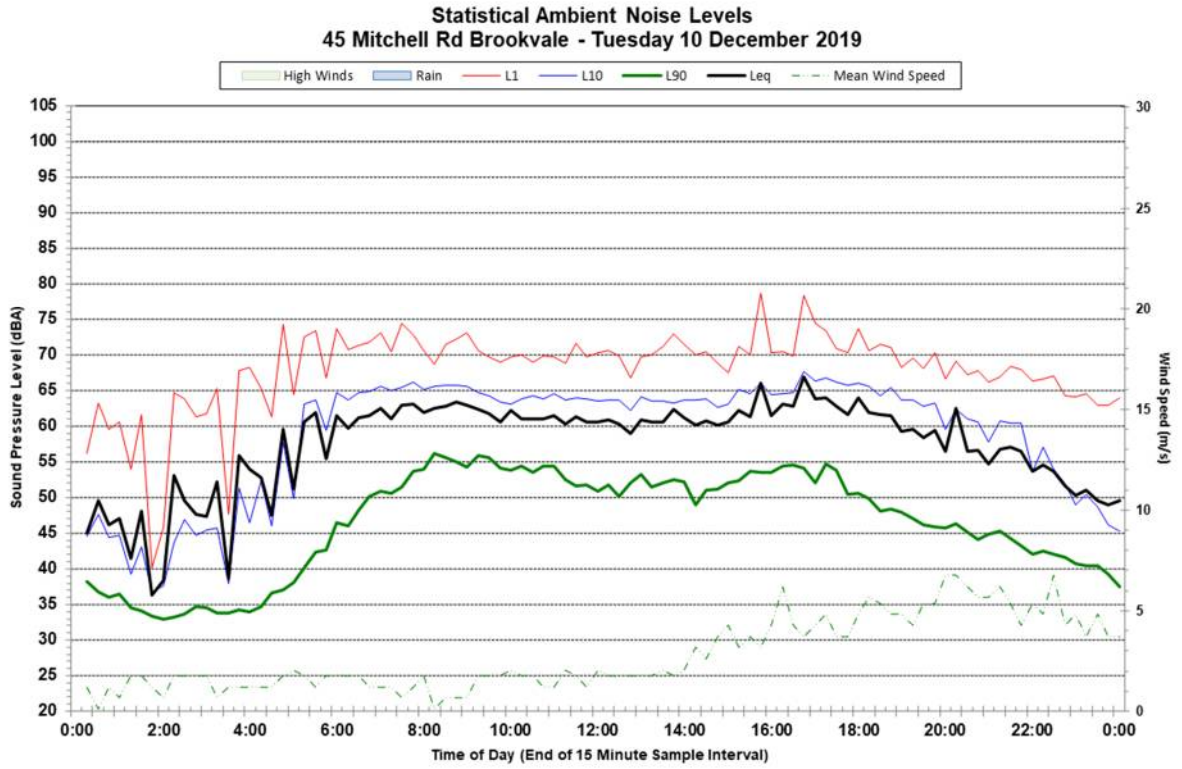


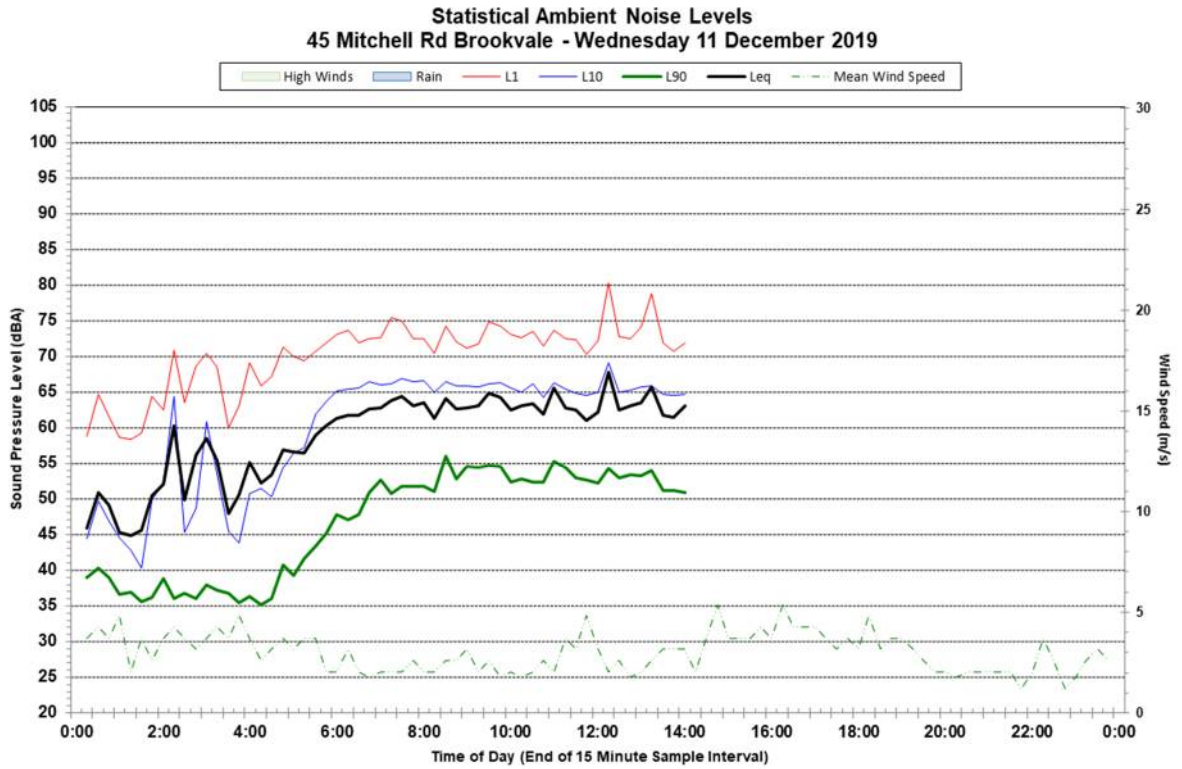

Statistical Ambient Noise Levels
45 Mitchell Rd Brookvale - Friday 6 December 2019
High Winds
Rain
L1
L10
L90
Leq
Mean Wind Speed
Sound Pressure Level (dBA)
Wind Speed (m/s)
Time of Day (End of 15 Minute Sample Interval)


Statistical Ambient Noise Levels
45 Mitchell Rd Brookvale - Saturday 7 December 2019
High Winds
Rain
L1
L10
L90
Leq
Mean Wind Speed
Sound Pressure Level (dBA)
Wind Speed (m/s)
Time of Day (End of 15 Minute Sample Interval)


Statistical Ambient Noise Levels
45 Mitchell Rd Brookvale - Sunday 8 December 2019
High Winds
Rain
L1
L10
L90
Leq
Mean Wind Speed
Sound Pressure Level (dBA)
Wind Speed (m/s)
Time of Day (End of 15 Minute Sample Interval)


Statistical Ambient Noise Levels
45 Mitchell Rd Brookvale - Monday 9 December 2019
High Winds
Rain
L1
L10
L90
Leq
Mean Wind Speed
Sound Pressure Level (dBA)
Wind Speed (m/s)
Time of Day (End of 15 Minute Sample Interval)


Statistical Ambient Noise Levels
45 Mitchell Rd Brookvale - Tuesday 10 December 2019
High Winds
Rain
L1
L10
L90
Leq
Mean Wind Speed
Sound Pressure Level (dBA)
Wind Speed (m/s)
Time of Day (End of 15 Minute Sample Interval)


Statistical Ambient Noise Levels
45 Mitchell Rd Brookvale - Wednesday 11 December 2019
High Winds
Rain
L1
L10
L90
Leq
Mean Wind Speed
Sound Pressure Level (dBA)
Wind Speed (m/s)
Time of Day (End of 15 Minute Sample Interval)