Pilu, 80 Undercliff Road, Freshwater

Acoustic Assessment

Pilu
80 Undercliff Road,
Freshwater NSW 2010

Report Reference: 220001 - Pilu, 80 Undercliff Road, Freshwater - Acoustic Assessment – R5

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1 INTRODUCTION

Pulse White Noise Acoustics (PWNA) have been engaged by Pilu to undertake an acoustic assessment of the proposed amendments to the operational parameters of Pilu Restaurant located at 80 Undercliff Road, Freshwater NSW 2096.

The proposal seeks approval for the following operational changes to the existing approved operation:

- Use of the external pavilion for general dining or gatherings (see location below).
- Increase in the number of patrons permitted, currently 80 and seeking 130.
    - A maximum of 100 patrons in the indoor areas of the main building.
    - A maximum of 50 patrons in the indoor area of the pavilion.
    - **However,** no more than 130 patrons at any one time.
- Use of live music inside and outside during an ancillary outdoor function.

The venue has a permitted operating hour as per the current liquor license of:

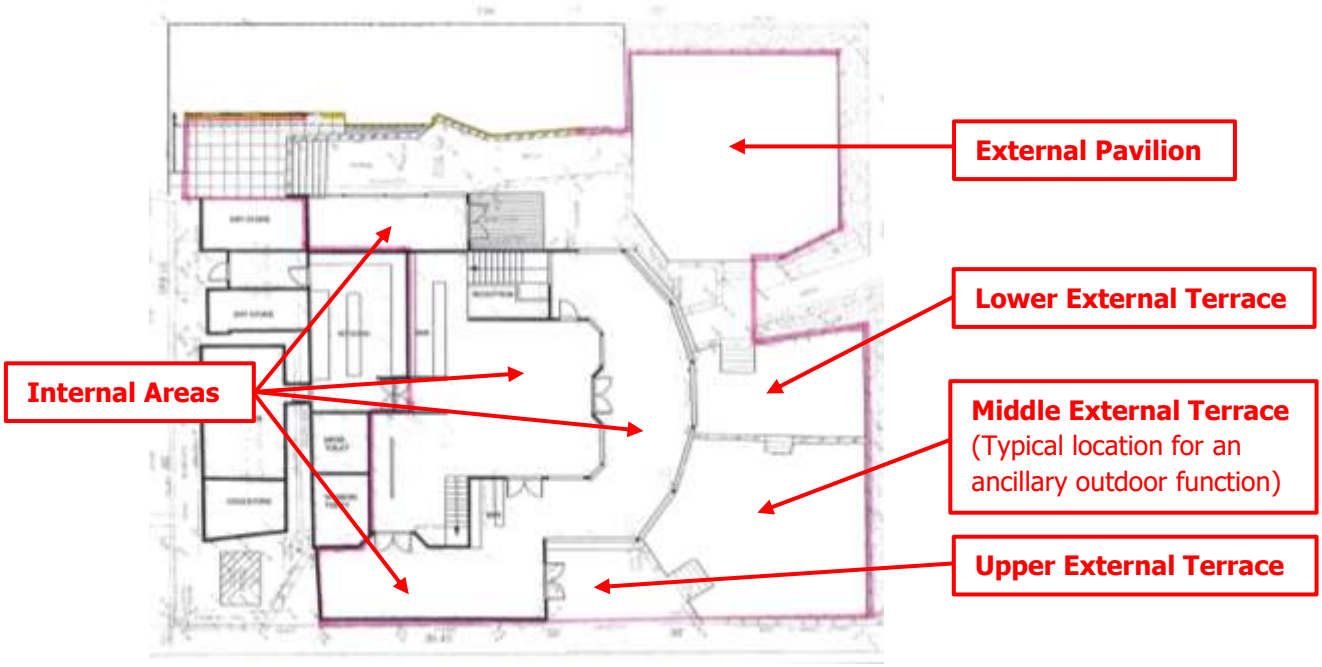
- Indoor (Main Building)
    - 7:00am to 12:00am (midnight), seven days a week.
- Outdoor (i.e., Pavilion)
    - 10:00am to 11:00pm, seven days a week.

Whilst noting above generally the restaurant does not regularly operate these hours, however occasionally.

The application will be assessed against relevant statutory regulations and guidelines including the following.

- Northern Beaches Council (previously Warringah Council) Development Control Plan (DCP) 2011.
- New South Wales (NSW) Environmental Protection Authority (EPA) document titled Noise Policy for Industry 2017 (NPI); and
- NSW Liquor and Gaming typically imposed noise conditions.

Figure 1 Site Layout



2 SITE DESCRIPTION AND SURROUNDING RECEIVERS

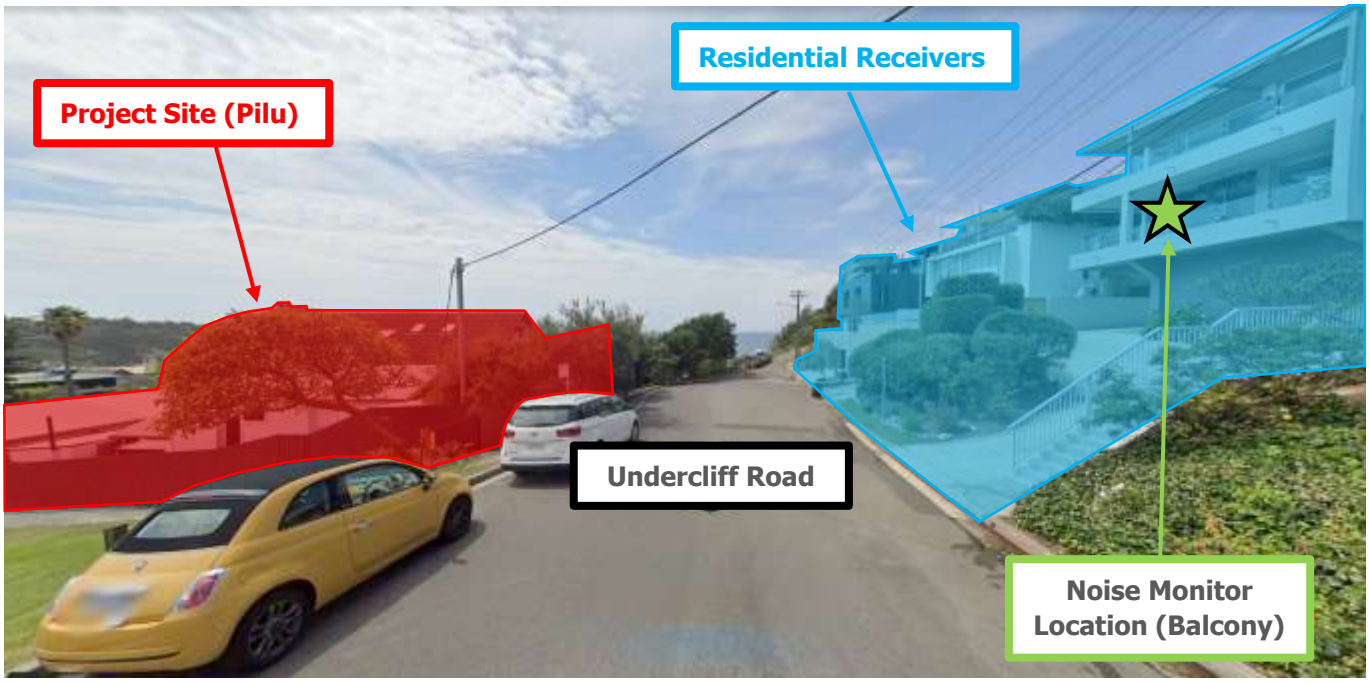
The site is bounded by the following:

- Moore Road along the northern boundary of the site with a public carpark.
- Freshwater Beach along the eastern boundary of the site.
- Undercliff Road along the southern boundary of the site with existing residential receivers located along the southern side.
- Public park along the western boundary of the site with residential recievers.

The nearest sensitive noise receivers to the future food premise are detailed below:

Receiver 1 - Existing residential dwelling located to the south of the site across Undercliff Road, situated at 67 to 75 Undercliff Road.

Figure 2 Google Street View – Undercliff Road, Looking East



A site map has been provided below which identifies and surrounding receivers and noise measuring locations, see Figure 3 below.

Figure 3 Site Map, Measurement Location and Surrounding Receivers – Sourced from SixMaps NSW

3 NOISE DESCRIPTORS AND TERMINOLOGY

Environmental noise constantly varies in level with time. It is therefore necessary to measure environmental noise in terms of quantifiable time periods and statistical descriptors. Typically, environmental noise is measured over 15-minute periods and relevant statistical descriptors of the fluctuating noise are determined to quantify the measured level.

Noise (or sound) consists of minute fluctuations in atmospheric pressure capable of detection by human hearing. Noise levels are expressed in terms of decibels, abbreviated as dB or dB(A), the A indicating that the noise levels have been frequency weighted to approximate the characteristics of normal human hearing. Because noise is measured using a logarithmic scale, 'normal' arithmetic does not apply, e.g. adding two sources of sound of an equal value results in an increase of 3 dB (i.e. 60 dBA + 60 dBA = 63 dBA). A change of 1 dB or 2 dB in the level of a sound is difficult for most people to detect, whilst a 3 dB – 5 dB change corresponds to a small but noticeable change in loudness. A 10 dB change roughly corresponds to a doubling or halving in loudness.

The most relevant environmental noise descriptors are the LAeq, LA1, LA10 and LA90 noise levels. The LAeq noise level represents the "equivalent energy average noise level". This parameter is derived by integrating the noise level measured over the measurement period and is equivalent to a level that would have been experienced had the fluctuating noise level remained constant during the measured time period.

The LA1, LA10 and LA90 levels are the levels exceeded for 1%, 10% and 90% of the sample period. These levels are sometimes thought of as the typical maximum noise level, the average repeatable maximum and average repeatable minimum noise levels, respectively.

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

4 EXISTING NOISE ENVIRONMENT

4.1 Unattended Noise Monitoring

An unattended noise survey was conducted between Tuesday 16th August 2022 and Friday 26th August 2022 at the neighbouring residential receiver (Unit 1, 69 Undercliff Road, Freshwater) as shown in Figure 3 above. This survey was conducted to measure the existing background noise level. All data in the graphs presented in Appendix B have not been corrected (i.e., raw data is presented).

Instrumentation for the survey comprised one Svantek 971 sound level meter. Calibration of the logger was checked prior to and following the measurements. Drift in calibration did not exceed ±0.5 dB. All equipment carried appropriate and current NATA (or manufacturer) calibration certificates.

Charts presenting summaries of the measured daily noise data are attached in Appendix B. The charts present each 24-hour period and show the LA1, LA10, LAeq and LA90 noise levels for the corresponding 15-minute periods. This data has been filtered to remove periods affected by adverse weather conditions based on weather information.

4.1.1Results in accordance with the NSW EPA Noise Policy for Industry (NPI) 2017 (RBL's)

In order to assess the acoustical implications of the development at nearby noise sensitive receivers, the measured background noise data of the logger was processed in accordance with the NSW EPA's Noise Policy for Industry (NPI, 2017).

The Rating Background Noise Level (RBL) is the background noise level used for assessment purposes at the nearest potentially affected receiver. It is the 90th percentile of the daily background noise levels during each assessment period, being day, evening and night. RBL $L_{A90\ (15minute)}$ and L_{Aeq} noise levels are presented in the table below.

Data affected by adverse meteorological conditions and by spurious and uncharacteristic events have been excluded from the results, and also excluded from the data used to determine the noise emission criteria. Meteorological information has been obtained from the Observatory Hill (ID 066214) which is located within 30km. Levels presented below are processed results with extraneous weather events removed.

Table 1 Measured Ambient Noise Levels corresponding to the NPI's Assessment Time Periods

Measurement Location	Daytime [1] 7:00 am to 6:00 pm		Evening [1] 6:00 pm to 10:00 pm		Night-time [1] 10:00 pm to 7:00 am	
	L_{A90} [2] (dBA)	L_{Aeq} [3] (dBA)	L_{A90} [2] (dBA)	L_{Aeq} [3] (dBA)	L_{A90} [2] (dBA)	L_{Aeq} [3] (dBA)
Unit 1, 69 Undercliff Road, Freshwater – See Figure 3	56	60	56	59	55	58

Note 1 For Monday to Saturday, Daytime 7:00 am – 6:00 pm; Evening 6:00 pm – 10:00 pm; Night-time 10:00 pm – 7:00 am. On Sundays and Public Holidays, Daytime 8:00 am – 6:00 pm; Evening 6:00 pm – 10:00 pm; Night-time 10:00 pm – 8:00 am.

Note 2 The LA90 noise level is representative of the "average minimum background sound level" (in the absence of the source under consideration), or simply the background level.

Note 3 The LAeq is the energy average sound level. It is defined as the steady sound level that contains the same amount of acoustical energy as a given time-varying sound.

4.1.2Results in accordance with NSW Liquor and Gaming

In addition to the overall broadband noise levels identified above, the unattended noise monitor in the rear of the site was recording the associated single octave (1/1) noise spectra for each period. These are provided below.

The use of single octave spectra is for the establishment of the patron and music acoustic criteria.

Table 2 Measured Single Octave (1/1) Spectra

Time Period [1]	Parameter 2	dB Octave Band Centre Frequency, Hz									Overall dBA
		31.5	63	125	250	500	1k	2k	4k	8k	
Day	Measured L_{90}	60	52	53	54	54	52	47	41	27	**56**
Evening		58	51	53	54	54	51	47	39	24	**56**
Night		57	49	51	53	53	51	46	37	21	**55**

Note 1 For Monday to Saturday, Daytime 7:00 am – 6:00 pm; Evening 6:00 pm – 10:00 pm; Night-time 10:00 pm – 7:00 am. On Sundays and Public Holidays, Daytime 8:00 am – 6:00 pm; Evening 6:00 pm – 10:00 pm; Night-time 10:00 pm – 8:00 am.

Note 2 The L_{A90} noise level is representative of the "average minimum background sound level" (in the absence of the source under consideration), or simply the background level.

5 ACOUSTIC CRITERIA

5.1 Noise Emission Criteria

5.1.1 Northern Beaches Council (Previously Warringah Council) Development Control Plan (DCP) 2011

A review of the Warringah Council DCP 2011 (now under Northern Beaches Council) shows no relevant numerical acoustic objectives. In the absence of any requirements adoption of the NSW EPA *Noise Policy for Industry (NPI) 2017* and typical *NSW Liquor & Gaming Acoustic Requirements* will be undertaken.

5.1.2 NSW EPA Noise Policy for Industry (NPI) 2017

In NSW, the control of noise emissions is the responsibility of Local Government (Council) and the NSW Environment Protection Authority (NSW EPA).

The NSW EPA has released a document titled Noise Policy for Industry (NSW NPI 2017) which provides a framework and process for determining external noise criteria for the assessment of noise emission from industrial developments. The NSW NPI criteria for industrial noise sources have two components:

- Controlling the intrusive noise impacts for residents and other sensitive receivers in the short term; and
- Maintaining noise level amenity of particular land uses for residents and sensitive receivers in other land uses.

5.1.2.1 Intrusive Noise Impacts (Residential Receivers)

The NSW NPI states that the noise from any single source should not intrude greatly above the prevailing background noise level. Industrial noises are generally considered acceptable if the equivalent continuous (energy-average) A-weighted level of noise from the source (LAeq), measured over a 15 minute period, does not exceed the background noise level measured in the absence of the source by more than 5 dB(A). This is often termed the Intrusiveness Criterion.

The 'Rating Background Level' (RBL) is the background noise level to be used for assessment purposes and is determined by the methods given in the NSW NPI. Using the rating background noise level approach results in the intrusiveness criterion being met for 90% of the time. Adjustments are to be applied to the level of noise produced by the source that is received at the assessment point where the noise source contains annoying characteristics such as tonality or impulsiveness.

5.1.2.2 Protecting Noise Amenity (All Receivers)

To limit continuing increases in noise levels, the maximum ambient noise level within an area from industrial noise sources should not normally exceed the acceptable noise levels specified in Table 2.2 of the NSW NPI. That is, the ambient LAeq noise level should not exceed the level appropriate for the particular locality and land use. This is often termed the 'Background Creep' or Amenity Criterion.

The amenity assessment is based on noise criteria specified for a particular land use and corresponding sensitivity to noise. The cumulative effect of noise from industrial sources needs to be considered in assessing the impact. These criteria relate only to other continuous industrial-type noise and do not include road, rail or community noise. If the existing (measured) industrial-type noise level approaches the criterion value, then the NSW NPI sets

maximum noise emission levels from new sources with the objective of ensuring that the cumulative levels do not significantly exceed the criterion.

5.1.2.2.1 Area Classification

The NSW NPI characterises the "Urban" noise environment as an area with an acoustical environment which shows the following:

- It is dominated by 'urban hum' or industrial source noise, where urban hum means the aggregate sound of many unidentifiable sources, consisting mostly of traffic and/or industrial related sounds
- Has through traffic with characteristically heavy and continuous traffic flows during peak periods
- It is near commercial or industrial districts
- It has a combination of any of the above

The residential area surrounding the proposed development falls under the "Suburban" area classification (residential areas are located within R2 zones which are classified as "suburban" in Table 2.3 of the NSW NPI). However, from the measured onsite noise levels, ambient noise levels are significantly higher due to noise from the beach. Therefore, a more appropriate classification of urban has been determined.

Table 3 NSW NPI – Recommended LAeq Noise Levels from Industrial Noise Sources

Type of Receiver	Indicative Noise Amenity Area	Time of Day 1	Recommended Amenity Noise Level ($L_{Aeq, period}$) [2]
Residence	Urban	Day	60
		Evening	50
		Night	45

Note 1 For Monday to Saturday, Daytime 7:00 am – 6:00 pm; Evening 6:00 pm – 10:00 pm; Night-time 10:00 pm – 7:00 am. On Sundays and Public Holidays, Daytime 8:00 am – 6:00 pm; Evening 6:00 pm – 10:00 pm; Night-time 10:00 pm – 8:00 am

Note 2 The LAeq is the energy average sound level. It is defined as the steady sound level that contains the same amount of acoustical energy as a given time-varying sound.

When the existing noise level from industrial noise sources is close to the recommended "Amenity Noise Level" (ANL) given above, noise from the new source must be controlled to preserve the amenity of the area in line with the requirements of the NSW NPI.

Where existing road traffic noise is high enough to render stationary industrial noise sources effectively inaudible, the ANL can be modified so that the amenity criteria is not unduly stringent in an environment where road traffic noise is the dominant source of environmental noise. If all the conditions below are satisfied, the ANL becomes LAeq,traffic minus 15 dBA. The conditions are:

- The road traffic noise is the dominant noise source.
- The existing noise is 10 dB(A) or more above the acceptable ANL for the area.
- It is highly unlikely the road traffic noise levels would reduce in the near future.

5.1.2.3 Maximum Noise Level Event (Sleeping Disturbance)

Section 2.5 of the NPI states the following:

> *The potential for sleep disturbance from maximum noise level events from premises during the night-time period needs to be considered. Sleep disturbance is considered to be both awakenings and disturbance to sleep stages.*
>
> *Where the subject development/premises night-time noise levels at a residential location exceed:*
>
> - $L_{Aeq,15min}$ *40 dB(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 the greater, a detailed maximum noise level event assessment should be undertaken.*

As outlined in section above, the measured rating background noise level during the night hours (10:00pm to 7:00am) is 55 dBA L_{A90}. Therefore, the resultant RBL + 15 dB is 70 dBA.

5.1.2.4 Project Specific External Noise Emission Criteria (Plant and Onsite Vehicles)

The intrusive and amenity criteria for industrial noise emissions, derived from the measured data, are presented in Table 4. These criteria are nominated for the purpose of determining the operational noise limits for mechanical plant associated with the development which can potentially affect noise sensitive receivers.

For each assessment period, the lower (i.e., the more stringent) of the amenity or intrusive criteria are adopted. These are shown in bold text in Table 4.

Table 4 External noise level criteria in accordance with the NSW NPI

Location	Time of Day 1	Project Amenity Noise Level, $L_{Aeq, period}$ [2] (dBA)	Measured $L_{A90, 15\ min}$ (RBL) [3] (dBA)	Measured $L_{AEQ, 15\ min}$ [4] (dBA)	Intrusive $L_{Aeq, 15\ min}$ Criterion for New Sources [4] (dBA)	Amenity $L_{Aeq, 15\ min}$ Criterion for New Sources [5] (dBA)
Residential Receivers	Day	55	56	60	61	**58**
	Evening	45	56	59	61	**48**
	Night	40	55	58	60	**43**

Note 1 For Monday to Saturday, Daytime 7:00 am – 6:00 pm; Evening 6:00 pm – 10:00 pm; Night-time 10:00 pm – 1:00 am. On Sundays and Public Holidays, Daytime 8:00 am – 6:00 pm; Evening 6:00 pm – 10:00 pm; Night-time 10:00 pm – 1:00 am.

Note 2 Project Amenity Noise Levels corresponding to "Urban" areas, equivalent to the Recommended Amenity Noise Levels minus 5 dBA.

Note 3 LA90 Background Noise or Rating Background Level.

Note 4 The LAeq is the energy average sound level. It is defined as the steady sound level that contains the same amount of acoustical energy as a given time-varying sound.

Note 5 *According to Section 2.2 of the NSW NPI, the LAeq, 15 minutes is equal to the LAeq, period + 3 dB.*

Note 6 *In accordance with section 2.3 of the NSW NPI, evening intrusiveness noise level objectives should not be set higher than the day period. As such the daytime project intrusiveness noise level objective will be adopted.*

In addition, a maximum noise level criterion of 55 dBA L_{AFmax} during the night period (10:00pm to 7:00am) at residential receivers also applies.

5.1.3NSW Liquor & Gaming Acoustic Requirements

Section 79 of the Liquor Act 2007 provides mechanisms for complaints to be made when `the amenity of local areas is disturbed by the use of licensed premises and registered clubs (including disturbances caused by patrons). These

complaints are addressed by the Director of Liquor and Gaming, and in this process they may impose temporary or permanent noise conditions on the licensed venue. Typical noise conditions that are imposed upon licensed premises are as follows:

The LA10 noise level emitted from the licensed premises shall not exceed the background noise level in any Octave Band Centre Frequency (31.5 Hz – 8k Hz inclusive) by more than 5 dB between 07:00 am and 12:00 midnight at the boundary of any affected residence.*

The LA10 noise level emitted from the licensed premises shall not exceed the background noise level in any Octave Band Centre Frequency (31.5 Hz – 8k Hz inclusive) between 12:00 midnight and 07:00 am at the boundary of any affected residence.*

Notwithstanding compliance with the above, the noise from the licensed premises shall not be audible within any habitable room in any residential premises between the hours of 12:00 midnight and 07:00 am.

** For the purposes of this condition, the LA10 can be taken as the average maximum deflection of the noise emission from the licensed premises.*

This is a minimum standard. In some instances the Director may specify a time earlier than midnight in respect of the above condition.

Interior noise levels which still exceed safe hearing levels are in no way supported or condoned by the Director.

Note: NSW Liquor and Gaming criteria does not contain any requirements for commercial or industrial receivers. Noise impacts to these receivers will adopt the broadband criteria outlined in the NSW EPA NPI 2017, see above.

These criteria are applicable to noise emissions from the licensed venue component of the development, excluding noise from mechanical services. For external noise emissions, octave band spectral criteria for each assessment period have been summarised in Table 5 below.

Table 5 Liquor & Gaming NSW – L_{10} Criteria (external) – Residential Criteria Only

Time Period	Parameter 1	Octave Band Centre Frequency, Hz									Overall dBA
		31.5	63	125	250	500	1k	2k	4k	8k	
7:00am to 6:00pm	**Before Midnight Period (BG+5 dBA)**										
	Measured L_{A90} [1]	60	52	53	54	54	52	47	41	27	**56**
	Criteria L_{A10} [2]	69 [3]	57	58	59	59	57	52	46	32	**61**
6:00pm to 10:00pm	**Before Midnight Period (BG+5 dBA)**										
	Measured L_{A90} [1]	58	51	53	54	54	51	47	39	24	**56**
	Criteria L_{A10} [2]	69 [3]	56	58	59	59	56	52	44	29	**61**
10:00pm to 12:00am (Midnight)	**Before Midnight Period (BG+5 dBA)**										
	Measured L_{A90} [1]	57	49	51	53	53	51	46	37	21	**55**
	Criteria L_{A10} [2]	69 [3]	54	56	58	58	56	51	42	26	**60**

Note 1 The LA90 noise level is representative of the "average minimum background sound level" (in the absence of the source under consideration), or simply the background level.

Note 2 The sound pressure level that is exceeded for 10% of the time for which the given sound is measured.

Note 3 Criteria is adjusted to match the threshold of hearing as outlined in International Standard ISO 226:2003.

6 ACOUSTIC ASSESSMENT

Assessment of each of the noise element associated with the proposal is outlined below.

6.1 Licensed Venue Assessment

As previously discussed, the currently permitted maximum number of patrons for the development is 80 patrons at any one time plus staff. The proposal seeks to increase this number to 130 patrons, as per below:

- A maximum of 100 patrons in the indoor areas of the main building.
- A maximum of 50 patrons in the indoor area of the pavilion.
- **However,** no more than 130 patrons at any one time.

The assessment of licensed noise emissions from the development using this operating scenario has been made against the Liquor and Gaming NSW criteria identified previously.

6.1.1Assumed Source Noise Levels

For the purpose of this assessment, it is assumed that a single person speaking with a normal voice has a Sound Power Level (Lw) of 69 dBA. This has been formulated in accordance with the published noise levels from Klark Teknik (The Audio System Designer Technical Reference, Chapman Partnership).

Additionally, we assumed that one in two are talking which is a relatively conservative calculation.

With regards to music within the venue, a sample of Live Acoustic Music has been measured within a similar facility in the past. The measured spectrum is shown below.

Table 6 Measured Single Octave (1/1) Spectra

Measurement Location	Parameter [1]	Octave Band Centre Frequency, Hz									Overall dBA
		31.5	63	125	250	500	1k	2k	4k	8k	
Previous Project	Measured Live Music – Acoustic Guitar and Singer (Amplified)										
	Sound Power Level	58	73	86	84	84	79	78	73	65	85

Note 4 The sound pressure level that is exceeded for 10% of the time for which the given sound is measured.

During periods when live music is not used, it is assumed that background music (or similar) will be playing inside only. For external areas it is assumed background music (or similar) would not be used. Background music within the restaurant will be 65 dBA (sound pressure).

6.1.2Predicted Licensed Venue Noise Levels

Noise emission calculations for the combination of patron noise and live music (where relevant) are provided below.

Predicted noise levels to the surrounding residential receivers are based on a full capacity within the venue and during the proposed operation hours.

The existing building is a double brick masonry construction with a lightweight roof. Existing windows are a 4 mm glazing.

Noise breakout to the environment has been modelled based on the following:

- Breakdown of patrons are as follows:
  - For general dining:
    - 100 patrons located inside.
      - No more than 50 permitted in the External Pavilion.
    - 20 patrons located outside.
    - **However,** no more than 130 patrons at any one time.
  - For an ancillary outdoor function:
    - 100 patrons outside in the middle and upper terrace.
    - Use of amplified speech.
    - Use of amplified music (acoustic).
- Background music inside the venue.
- Double cavity brick wall.
- Existing windows are 4 mm glazing construction.
- Roof is detailed below.
- Construction of the external pavilion is PVC lined (i.e., heavy plastic).

Table 7 Assumed Roof Construction (Inspected Onsite)

External Lining	Truss System	Internal Lining
Sheet Metal Roofing System (Similar to Colorbond™)	Flat roof truss system with a minimum cavity of 200 mm (Approx.) between each lining layer. Insulation is believed to be within the roof cavity for acoustic/thermal purposes.	1 x 13 mm Standard Plasterboard

Outlined in Table 8 and Table 9 below is the prediction licensed venue operational noise to the residential receivers to south of the site. Predicted noise levels include distance attenuation and any barrier effects.

Predicted noise levels in Table 8 are for the general dining within the venue, the predicted noise levels shown below represent noise associated with the venue for most of the operating time.

Table 8 Receiver 1 – Predicted Noise Levels – General Dining

Parameter	Octave Band Centre Frequency, Hz									Overall dBA
	31.5	63	125	250	500	1k	2k	4k	8k	
Predicted L_{A10} Noise Levels	34	34	43	38	34	24	26	14	0	**35**
L&G NSW criterion	69 [3]	54	56	58	58	56	51	42	26	**60**
Compliance	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**

Refer to section 6.1.3 below the for the required management controls to ensure compliance.

Predicted noise levels outlined below are for an ancillary outdoor function being undertaken on the middle and upper external terrace.

Table 9 Receiver 1 – Predicted Noise Levels – Ancillary Outdoor Function

Parameter	Octave Band Centre Frequency, Hz									Overall dBA
	31.5	63	125	250	500	1k	2k	4k	8k	
Predicted L_{A10} Noise Levels	27	42	55	54	54	49	47	40	27	55
L&G NSW criterion	69 [3]	54	56	58	58	56	51	42	26	**60**
Compliance	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes** [1]	**Yes**

Note 1 In accordance with section 4.2 from the NSW EPA NPI 2017, an exceedance of <2dB is considered negligible 3and therefore acoustically acceptable.

Refer to section 6.1.3 below the for the required management controls to ensure compliance.

6.1.3Assessment Results and Recommendations

Predicted noise levels from the operation of the venue in full operation with Live Music between (all patrons and background music) has been predicted. To ensure compliance is achieved, the following recommendations must be implemented:

- No more than 130 patrons in the venue at any one time, staff not included. Breakdown of patrons are as follows:
  - For general dining:
    - Up to 100 patrons located inside.
      - No more than 50 permitted in the External Pavilion.
    - Up to 20 patrons located outside.
  - For an ancillary outdoor function:
    - 100 patrons outside in the middle and upper terrace.
- Operation hours are:

- Monday to Saturday: 5:00am to 12:00am (midnight).
- Sunday: 10:00am to 10:00pm.

- An ancillary outdoor function including the use of amplified music (assumed to be vocal and acoustic) and is permitted during the hours of 7:00am and 10:00pm. However, must be limited to 90 dBA Sound Power Level (or equal to 73 dBA @ 3m) when measured as a sound pressure level.
- Background music is assumed to be 65 dBA for dining areas, all measured as a sound pressure level.
- All doors and windows are to remain shut after 10:00pm and not opened before 7:00am and anytime amplified music is used. Low level background music is permitted to be played with windows open.
- Removal of glass or waste should be done internally and must not be externally of the premises after 10:00pm and before 7:00am.
- A contact number must be displayed for the purposes of receiving any complaints if they arrive.
- Signs must be displayed at all exits reminding patrons to be mindful of noise when leaving the premise.
- A revised Plan of Management (PoM) is to be prepared based on the additional trading hours. The plan should be reviewed regularly to ensure any required updated are captured.

On the assumption the recommendations outlined are incorporated compliance with the acoustic project criteria outlined in section 5 above will be achieved.

7 CONCLUSION

Pulse White Noise Acoustics (PWNA) have been engaged by Pilu to undertake an acoustic assessment of the proposed amendments to the operational parameters of Pilu Restaurant located at 80 Undercliff Road, Freshwater NSW 2096.

Detailed acoustic modelling has indicated that noise from the operation of the licensed venue elements of the development are likely to result in compliance with the typically imposed NSW Liquor and Gaming acoustic requirements. To ensure compliance, recommended building and management controls are recommended in this report.

For any additional information please do not hesitate to contact the person below.

Regards,

Matthew Furlong
Principal Acoustic Engineer
PULSE WHITE NOISE ACOUSTICS PTY LTD
AAS Member and AAAC Member Firm

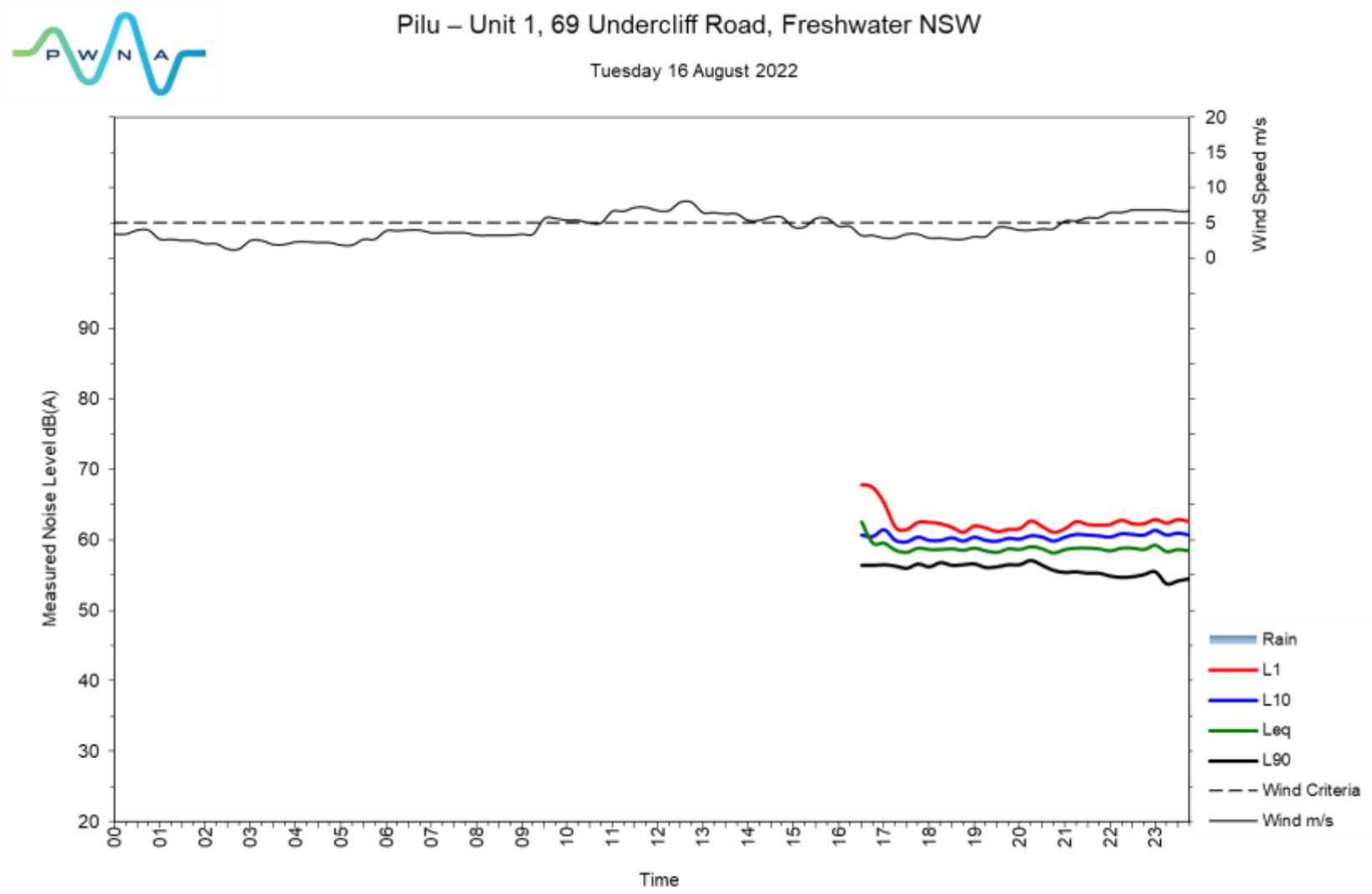
APPENDIX A. APPENDIX TERMINOLOGY

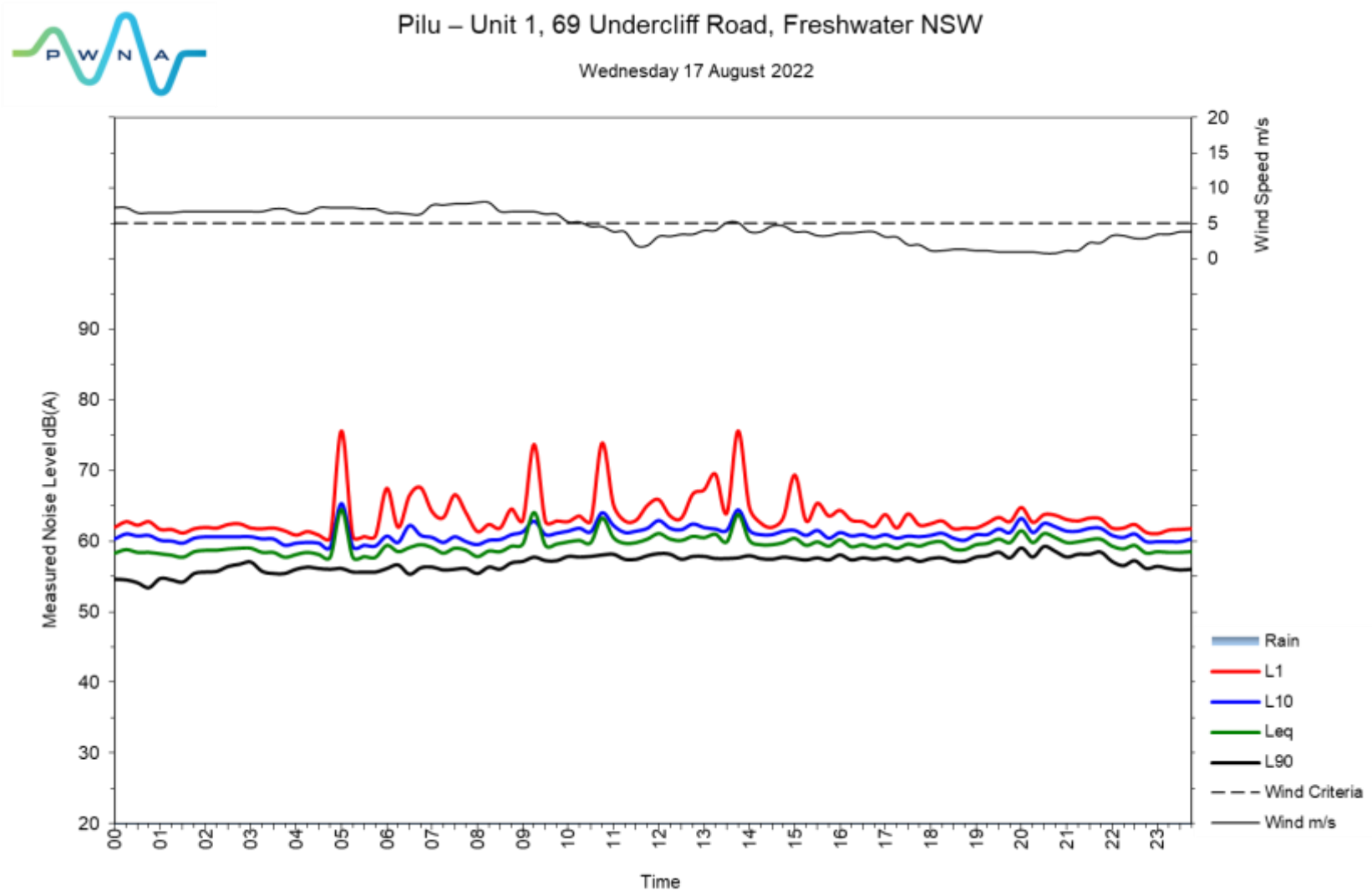
Sound power level	The total sound emitted by a source
Sound pressure level	The amount of sound at a specified point
Decibel [dB]	The measurement unit of sound
A Weighted decibels [dB(A])	The A weighting is a frequency filter applied to measured noise levels to represent how humans hear sounds. The A-weighting filter emphasises frequencies in the speech range (between 1kHz and 4 kHz) which the human ear is most sensitive to, and places less emphasis on low frequencies at which the human ear is not so sensitive. When an overall sound level is A-weighted it is expressed in units of dB(A).
Decibel scale	The decibel scale is logarithmic in order to produce a better representation of the response of the human ear. A 3 dB increase in the sound pressure level corresponds to a doubling in the sound energy. A 10 dB increase in the sound pressure level corresponds to a perceived doubling in volume. Examples of decibel levels of common sounds are as follows:
	0dB(A) Threshold of human hearing 30dB(A) A quiet country park 40dB(A) Whisper in a library 50dB(A) Open office space 70dB(A) Inside a car on a freeway 80dB(A) Outboard motor 90dB(A) Heavy truck pass-by 100dB(A) Jackhammer/Subway train 110 dB(A) Rock Concert 115dB(A) Limit of sound permitted in industry 120dB(A) 747 take off at 250 metres
Frequency [f]	The repetition rate of the cycle measured in Hertz (Hz). The frequency corresponds to the pitch of the sound. A high frequency corresponds to a high pitched sound and a low frequency to a low pitched sound.
Ambient sound	The all-encompassing sound at a point composed of sound from all sources near and far.
Equivalent continuous sound level [L_{eq}]	The constant sound level which, when occurring over the same period of time, would result in the receiver experiencing the same amount of sound energy.
Reverberation	The persistence of sound in a space after the source of that sound has been stopped (the reverberation time is the time taken for a reverberant sound field to decrease by 60 dB)
Air-borne sound	The sound emitted directly from a source into the surrounding air, such as speech, television or music
Impact sound	The sound emitted from force of one object hitting another such as footfalls and slamming cupboards.
Air-borne sound isolation	The reduction of airborne sound between two rooms.
Sound Reduction Index [R] *(Sound Transmission Loss)*	The ratio the sound incident on a partition to the sound transmitted by the partition.
Weighted sound reduction index [R_w]	A single figure representation of the air-borne sound insulation of a partition based upon the R values for each frequency measured in a laboratory environment.
Level difference [D]	The difference in sound pressure level between two rooms.
Normalised level difference [D_n]	The difference in sound pressure level between two rooms normalised for the absorption area of the receiving room.
Standardised level difference [D_{nT}]	The difference in sound pressure level between two rooms normalised for the reverberation time of the receiving room.
Weighted standardised level difference [$D_{nT,w}$]	A single figure representation of the air-borne sound insulation of a partition based upon the level difference. Generally used to present the performance of a partition when measured in situ on site.
C_{tr}	A value added to an R_w or $D_{nT,w}$ value to account for variations in the spectrum.

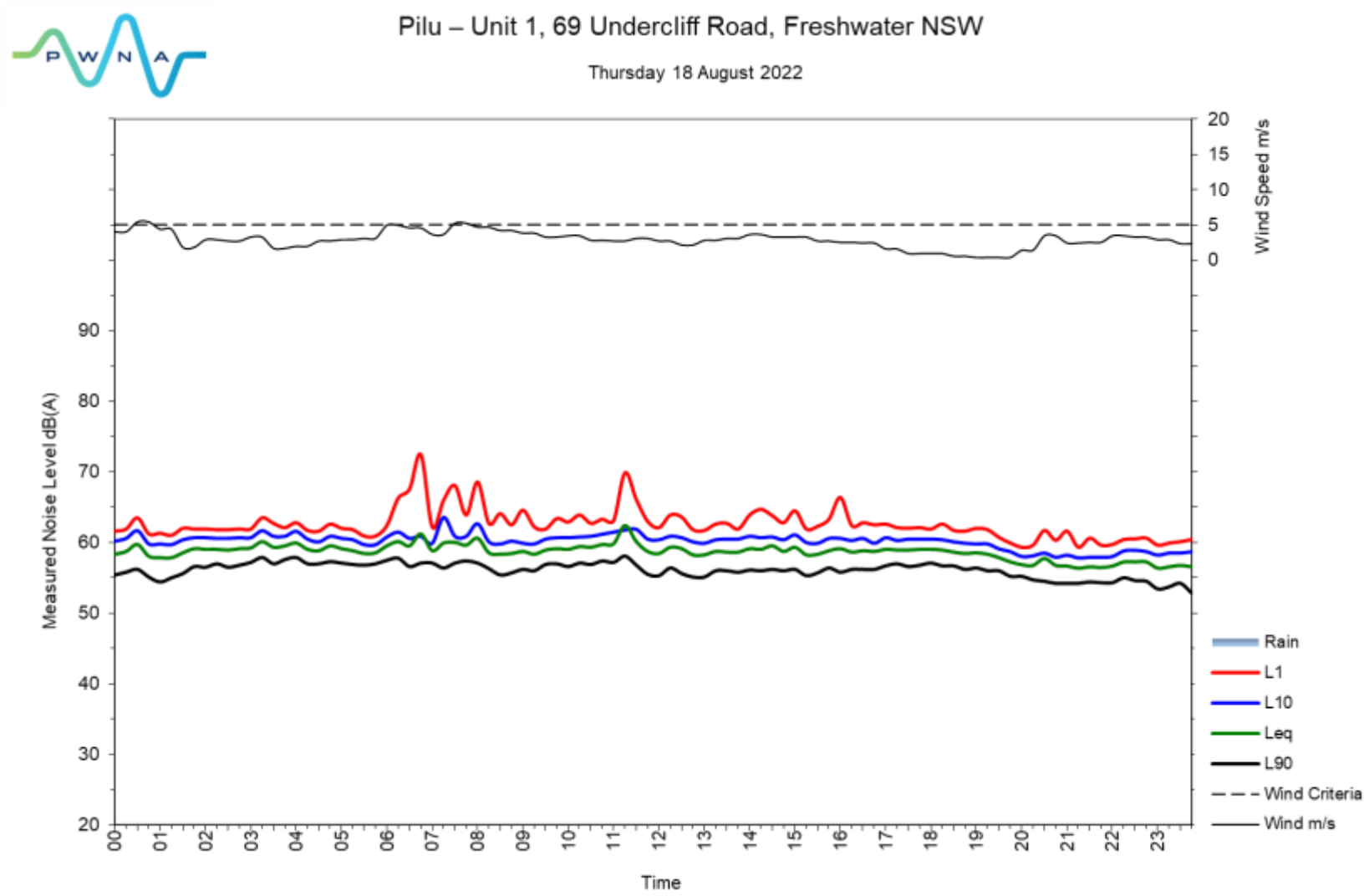
Impact sound isolation	The resistance of a floor or wall to transmit impact sound.
Impact sound pressure level [L_i]	The sound pressure level in the receiving room produced by impacts subjected to the adjacent floor or wall by a tapping machine.
Normalised impact sound pressure level [L_n]	The impact sound pressure level normalised for the absorption area of the receiving room.
Weighted normalised impact sound pressure level [$L_{n,w}$]	A single figure representation of the impact sound insulation of a floor or wall based upon the impact sound pressure level measured in a laboratory.
Weighted standardised impact sound pressure level [$L'_{nT,w}$]	A single figure representation of the impact sound insulation of a floor or wall based upon the impact sound pressure level measured in situ on site.
C_I	A value added to an L_{nW} or $L'_{nT,w}$ value to account for variations in the spectrum.
Energy Equivalent Sound Pressure Level [$L_{A,eq,T}$]	'A' weighted, energy averaged sound pressure level over the measurement period T.
Percentile Sound Pressure Level [$L_{Ax,T}$]	'A' weighted, sound pressure that is exceeded for percentile x of the measurement period T.
Speech Privacy	A non-technical term but one of common usage. Speech privacy and speech intelligibility are opposites and a high level of speech privacy means a low level of speech intelligibility. It should be recognised that acceptable levels of speech privacy do not require that speech from an adjacent room is inaudible.
Sound Pressure Level, LP dB	A measurement obtained directly using a microphone and sound level meter. Sound pressure level varies with distance from a source and with changes to the measuring environment. Sound pressure level equals 20 times the logarithm to the base 10 of the ratio of the rms sound pressure to the reference sound pressure of 20 micro Pascals.
Sound Power Level, Lw dB	Sound power level is a measure of the sound energy emitted by a source, does not change with distance, and cannot be directly measured. Sound power level of a machine may vary depending on the actual operating load and is calculated from sound pressure level measurements with appropriate corrections for distance and/or environmental conditions. Sound power levels is equal to 10 times the logarithm to the base 10 of the ratio of the sound power of the source to the reference sound power of 1 picoWatt
Noise Reduction	The difference in sound pressure level between any two areas. The term "noise reduction" does not specify any grade or performance quality unless accompanied by a specification of the units and conditions under which the units shall apply
Audible Range	The limits of frequency which are audible or heard as sound. The normal ear in young adults detects sound having frequencies in the region 20 Hz to 20 kHz, although it is possible for some people to detect frequencies outside these limits.
Background Sound Low	The average of the lowest levels of the sound levels measured in an affected area in the absence of noise from occupants and from unwanted, external ambient noise sources. Usually taken to mean the LA90 value
Character, acoustic	The total of the qualities making up the individuality of the noise. The pitch or shape of a sound's frequency content (spectrum) dictate a sound's character.
Loudness	A rise of 10 dB in sound level corresponds approximately to a doubling of subjective loudness. That is, a sound of 85 dB is twice as loud as a sound of 75 dB which is twice as loud as a sound of 65 dB and so on
LMax	The maximum sound pressure level measured over a given period.
LMin	The minimum sound pressure level measured over a given period.
L1	The sound pressure level that is exceeded for 1% of the time for which the given sound is measured.
L10	The sound pressure level that is exceeded for 10% of the time for which the given sound is measured.
L90	The level of noise exceeded for 90% of the time. The bottom 10% of the sample is the L90 noise level expressed in units of dB(A).
Leq	The "equivalent noise level" is the summation of noise events and integrated over a selected period of time.

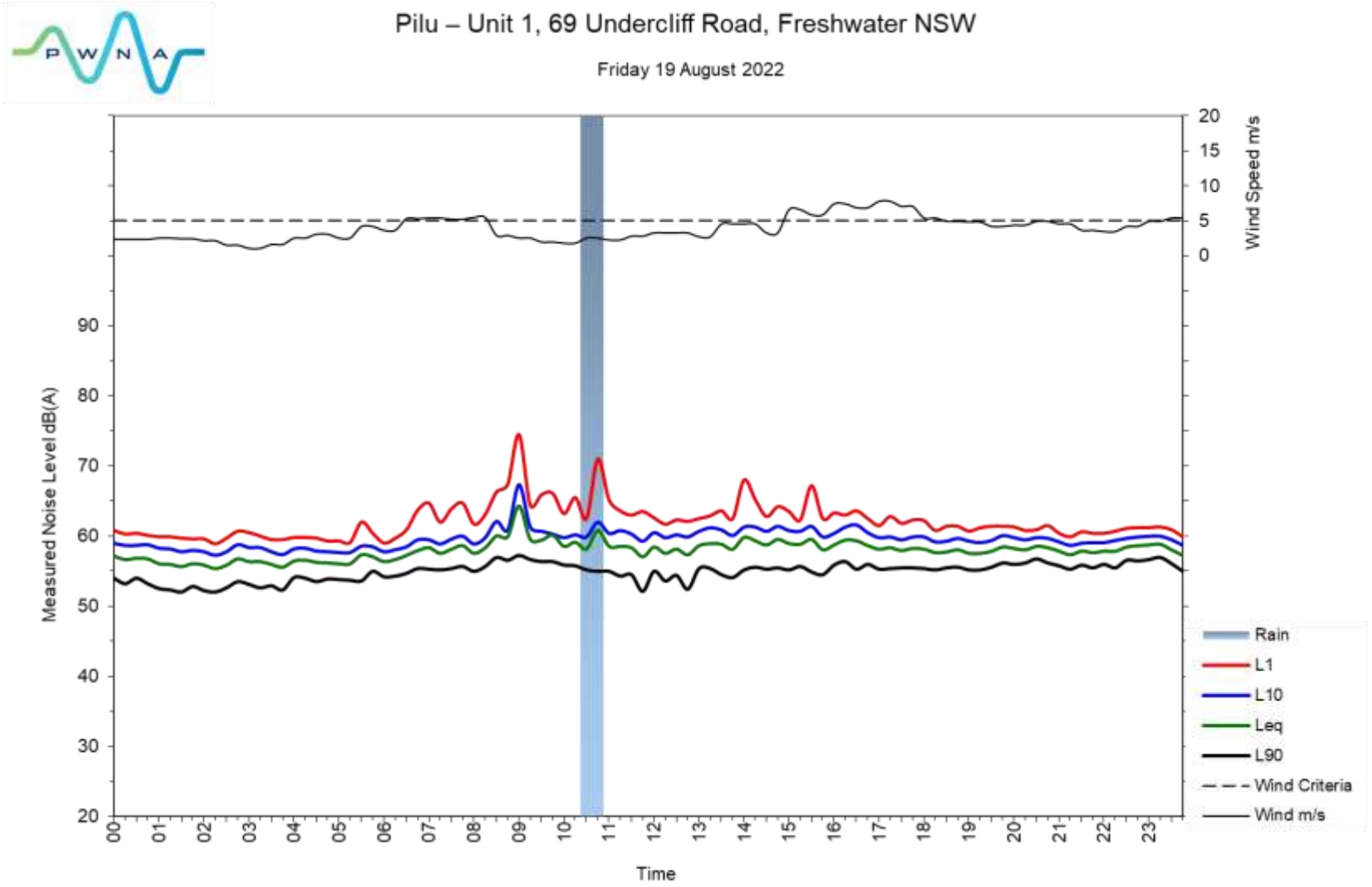
APPENDIX B. UNATTENDED NOISE MONITORING RESULTS – UNIT 1, 69 UNDERCLIFF ROAD, FRESHWATER

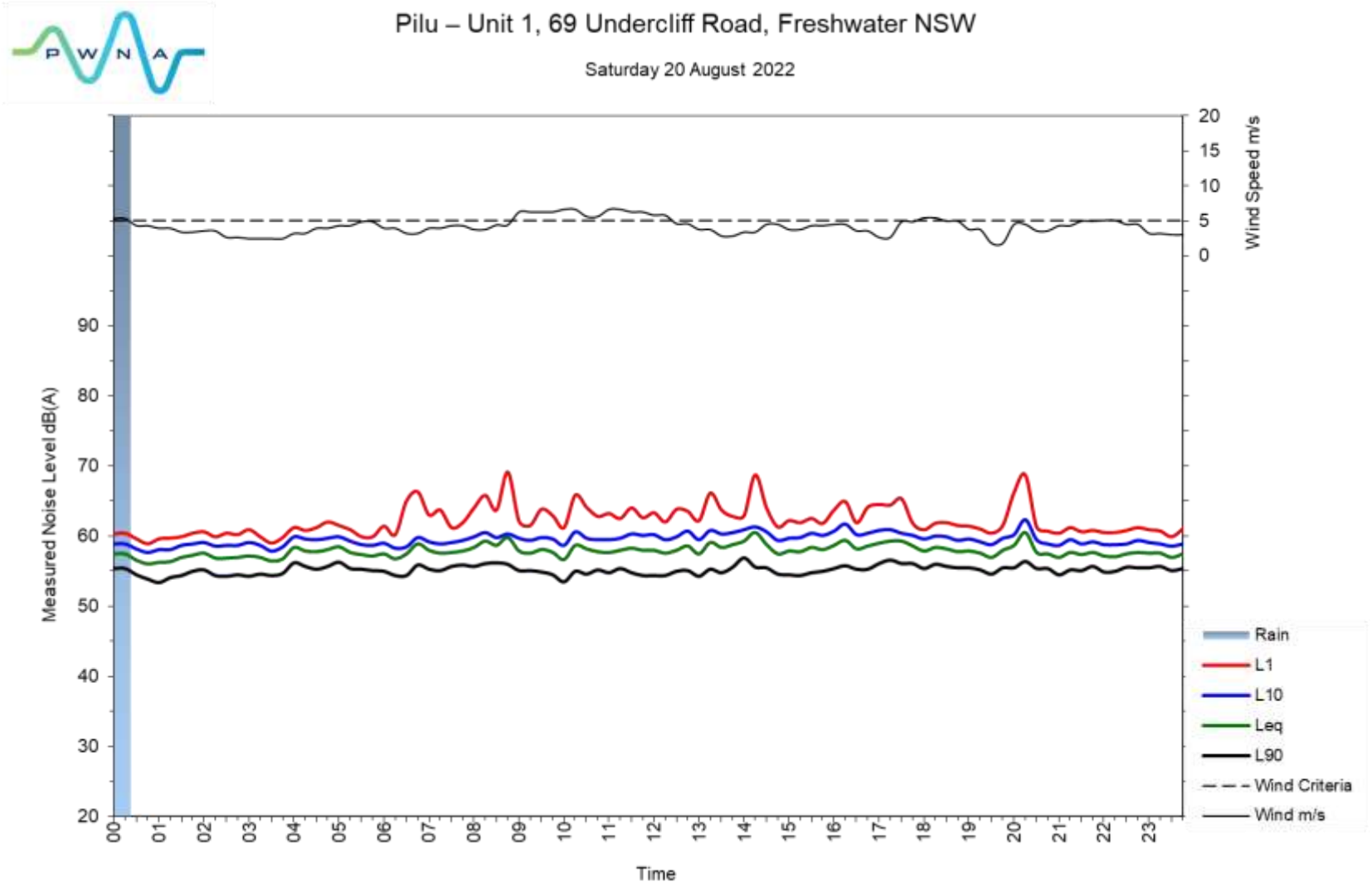
Figure 4 Unattended Noise Monitoring

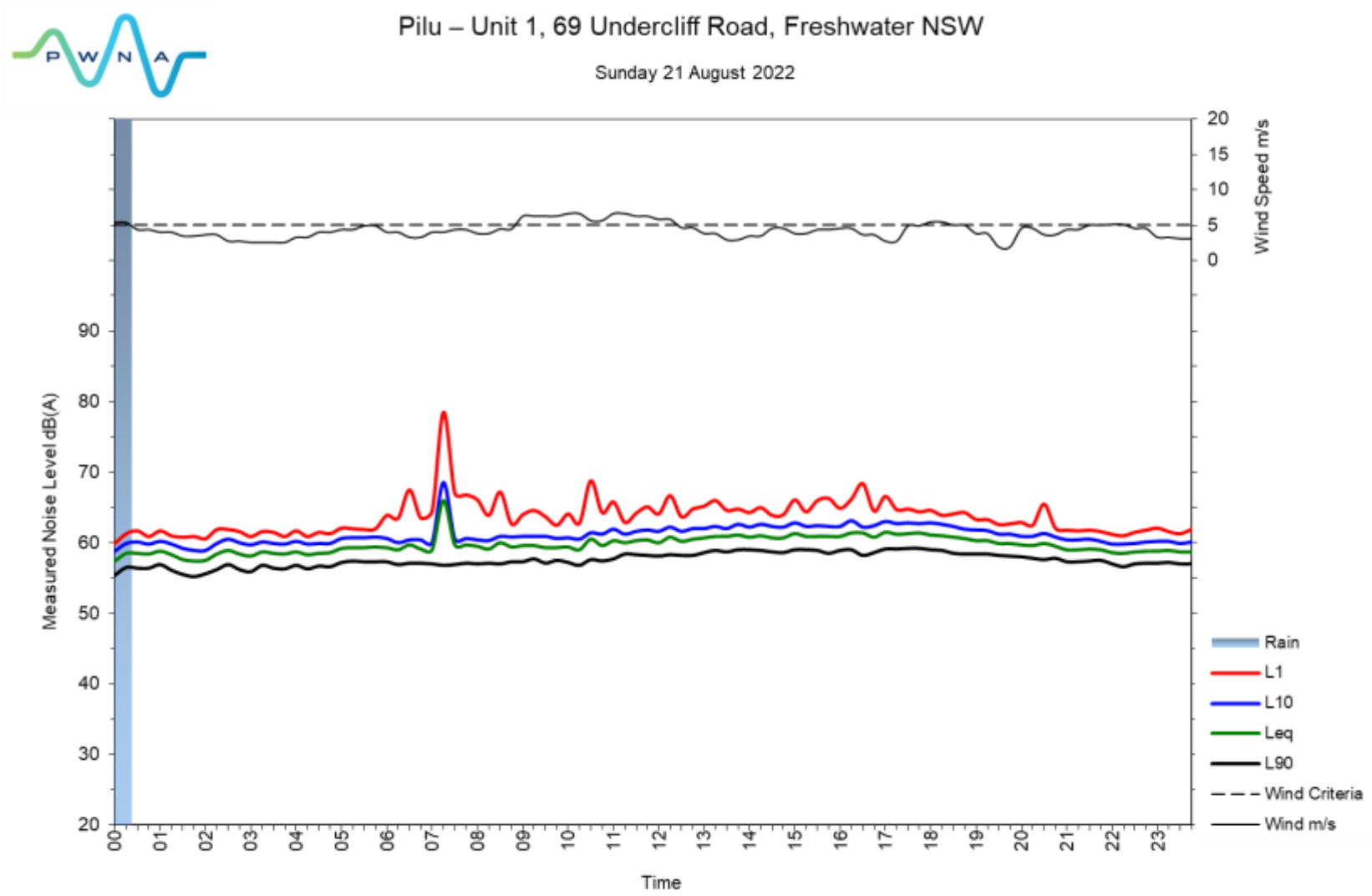

Pilu – Unit 1, 69 Undercliff Road, Freshwater NSW
Tuesday 16 August 2022
Measured Noise Level dB(A)
Wind Speed m/s
Time
Rain
L1
L10
Leq
L90
Wind Criteria
Wind m/s

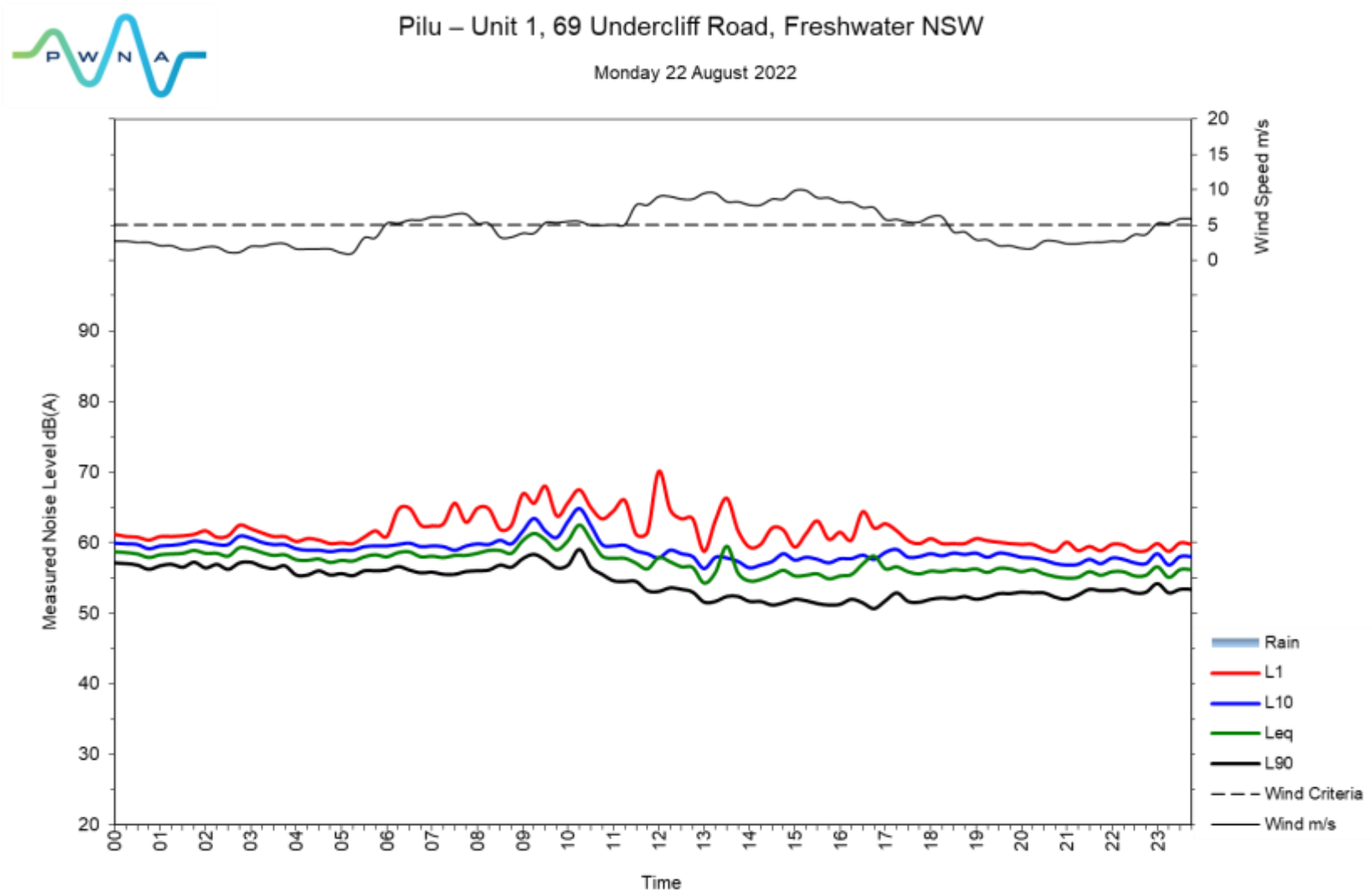

Pilu – Unit 1, 69 Undercliff Road, Freshwater NSW
Wednesday 17 August 2022
Measured Noise Level dB(A)
Wind Speed m/s
Time
Rain
L1
L10
Leq
L90
Wind Criteria
Wind m/s

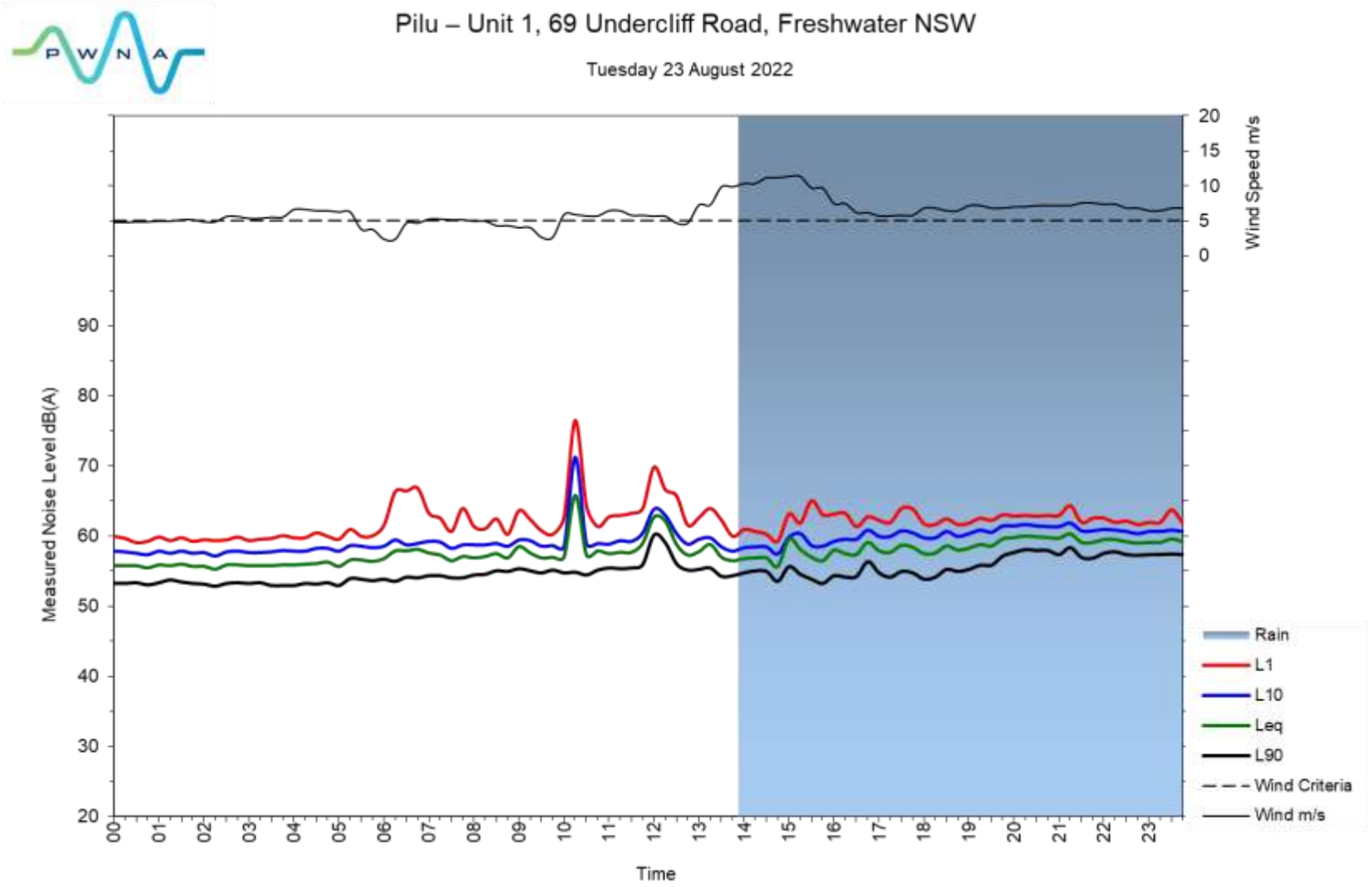

Pilu – Unit 1, 69 Undercliff Road, Freshwater NSW
Thursday 18 August 2022
Measured Noise Level dB(A)
Wind Speed m/s
Time
Rain
L1
L10
Leq
L90
Wind Criteria
Wind m/s

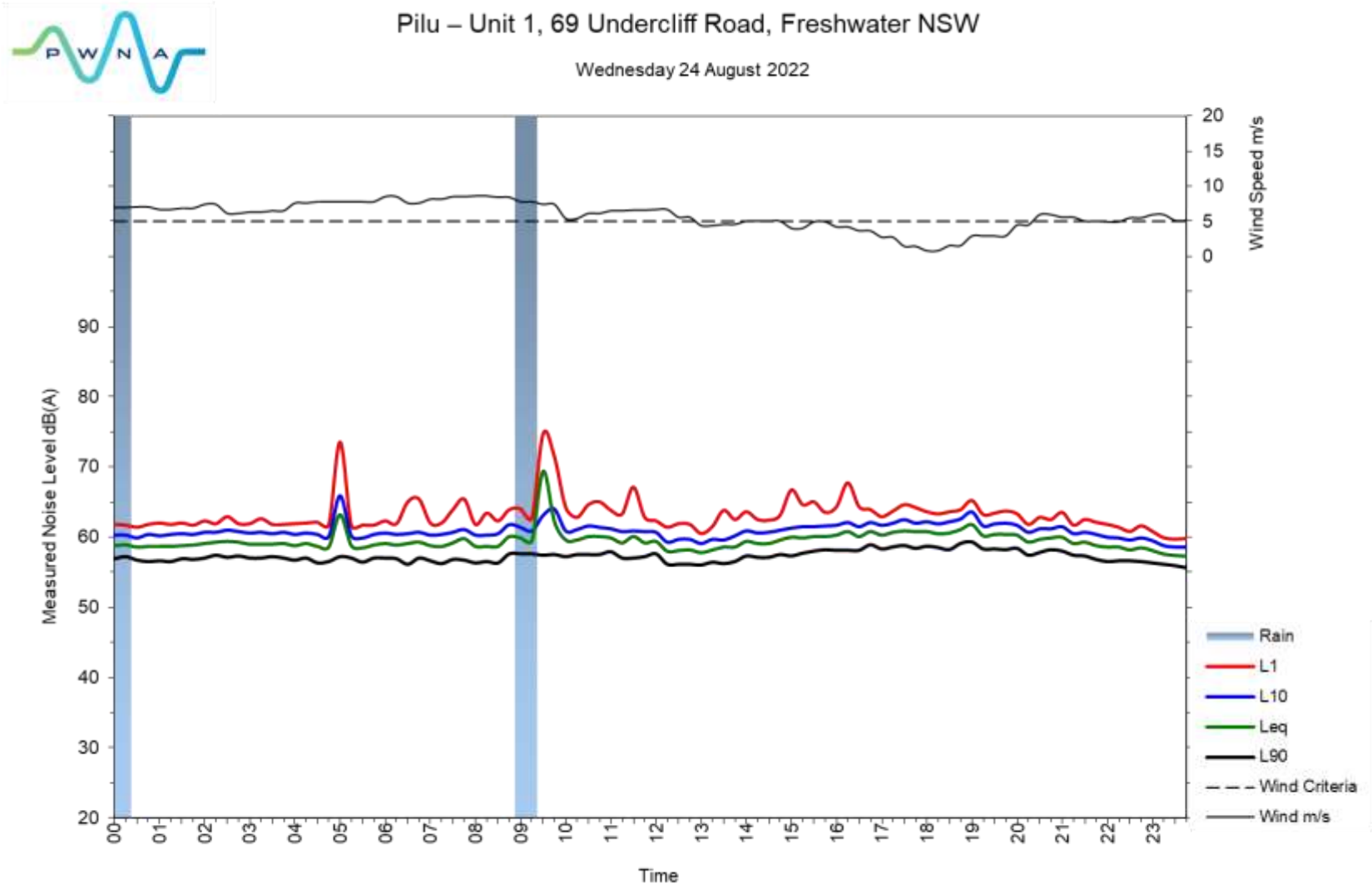

Pilu – Unit 1, 69 Undercliff Road, Freshwater NSW
Friday 19 August 2022
Measured Noise Level dB(A)
Wind Speed m/s
Time
Rain
L1
L10
Leq
L90
Wind Criteria
Wind m/s

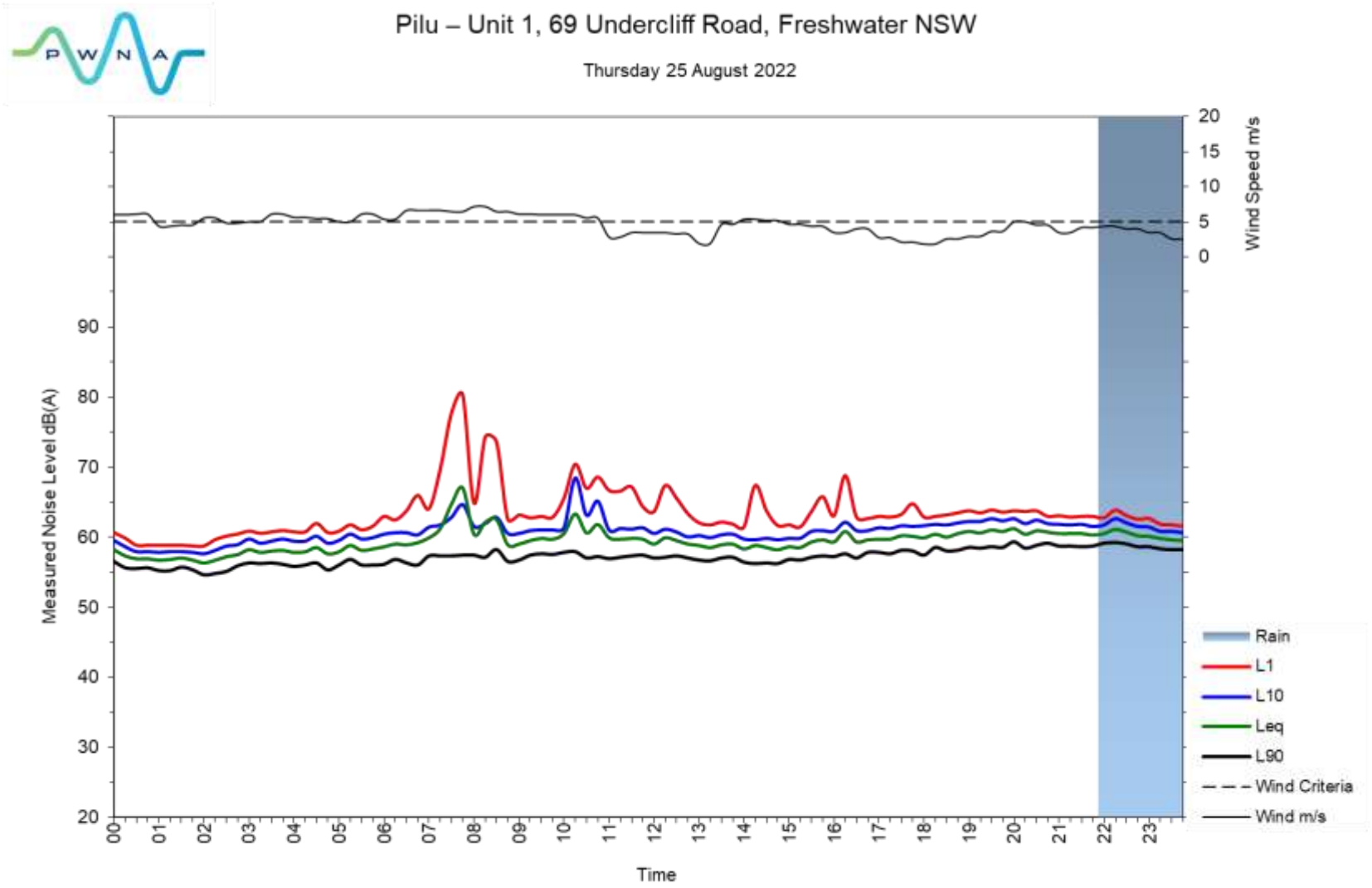

Pilu – Unit 1, 69 Undercliff Road, Freshwater NSW
Saturday 20 August 2022
Measured Noise Level dB(A)
Wind Speed m/s
Time
Rain
L1
L10
Leq
L90
Wind Criteria
Wind m/s

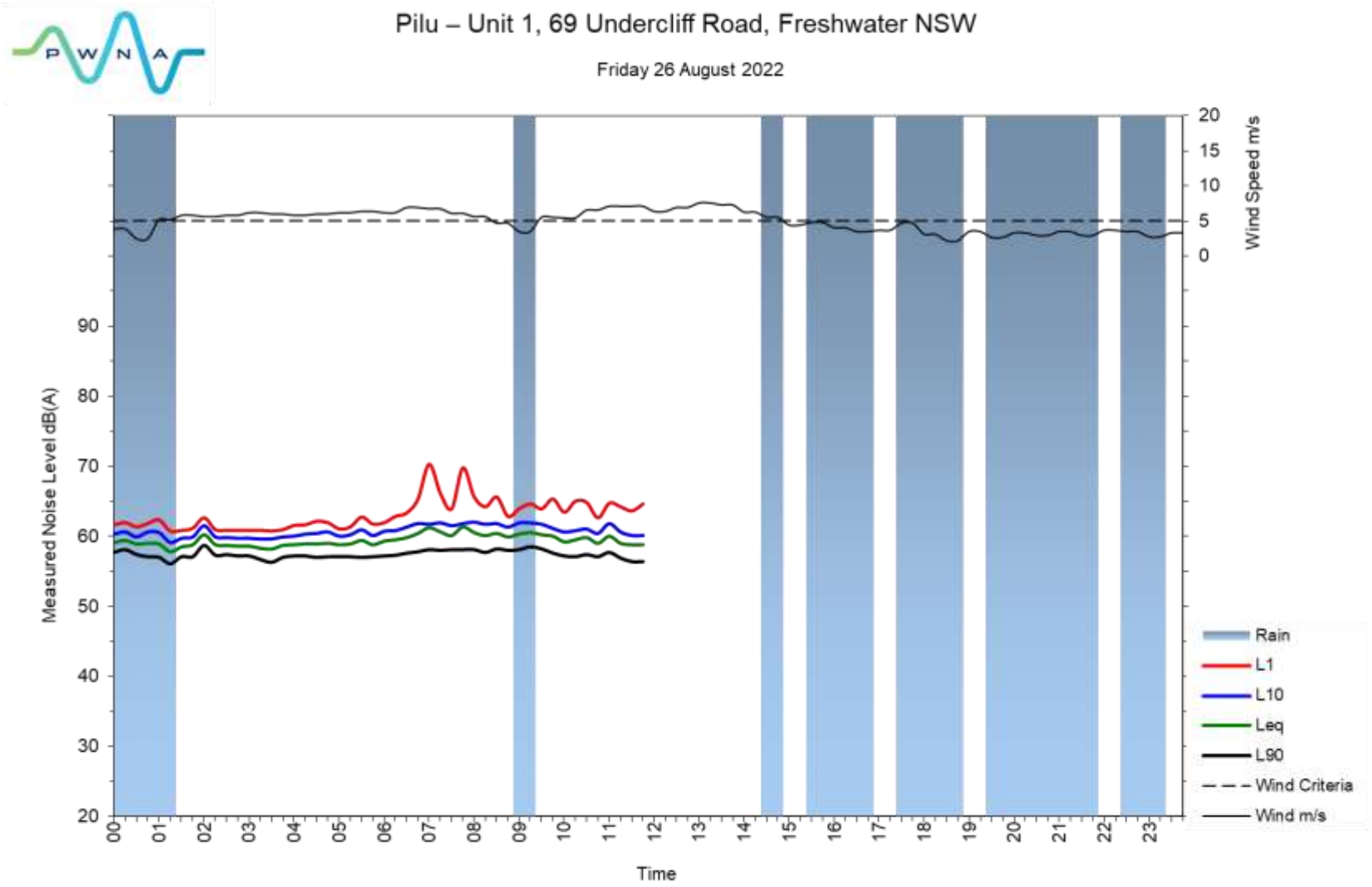

Pilu – Unit 1, 69 Undercliff Road, Freshwater NSW
Sunday 21 August 2022
Measured Noise Level dB(A)
Wind Speed m/s
Time
Rain
L1
L10
Leq
L90
Wind Criteria
Wind m/s


Pilu – Unit 1, 69 Undercliff Road, Freshwater NSW
Monday 22 August 2022
Measured Noise Level dB(A)
Wind Speed m/s
Time
Rain
L1
L10
Leq
L90
Wind Criteria
Wind m/s


Pilu – Unit 1, 69 Undercliff Road, Freshwater NSW
Tuesday 23 August 2022
Measured Noise Level dB(A)
Wind Speed m/s
Time
Rain
L1
L10
Leq
L90
Wind Criteria
Wind m/s


Pilu – Unit 1, 69 Undercliff Road, Freshwater NSW
Wednesday 24 August 2022
Measured Noise Level dB(A)
Wind Speed m/s
Time
Rain
L1
L10
Leq
L90
Wind Criteria
Wind m/s


Pilu – Unit 1, 69 Undercliff Road, Freshwater NSW
Thursday 25 August 2022
Measured Noise Level dB(A)
Wind Speed m/s
Time
Rain
L1
L10
Leq
L90
Wind Criteria
Wind m/s


Pilu – Unit 1, 69 Undercliff Road, Freshwater NSW
Friday 26 August 2022
Measured Noise Level dB(A)
Wind Speed m/s
Time
Rain
L1
L10
Leq
L90
Wind Criteria
Wind m/s