DA ACOUSTIC REPORT

Ulladulla Health One

ID: 11113 R01v2

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Prepared For:
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Association of Australian Acoustical Consultants

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This firm is a member of the Association of Australian Acoustical Consultants.

The work reported herein has been carried out in accordance with the terms of membership. We stress that the advice given herein is for acoustic purposes only, and that the relevant authorities should be consulted with regard to compliance with regulations governing areas other than acoustics.

LIST OF FIGURES

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1.0 INTRODUCTION

PKA Acoustic Consulting has been commissioned by Gran Associates to perform an acoustic assessment pertaining to the proposed Health One development at 82 South Street, Ulladulla. The purpose of this report is to present the results of the acoustic survey conducted and recommendations that must be implemented as part of the DA documentation to be submitted to the Shoalhaven City Council for approval.

2.0 SUMMARY

An acoustic assessment has been conducted in accordance with the acoustic requirements of the Shoalhaven City Council, the Noise Policy for Industry 2017 and other relevant Australian acoustic guidelines to assess noise breakout, traffic noise intrusion and set noise goals for the development and immediate surroundings.

Un-attended noise measurements were conducted on site to obtain ambient and traffic noise levels. A noise monitor was placed on site for a period of 7 days to measure the daytime and night time traffic noise levels. Based on the measurement results, noise goals have been established for future mechanical plant and equipment. Furthermore, glazing requirements have been established to comply with AS2107-2016 indoor design levels.

Providing our recommendations detailed in Section 6.0 are implemented, the proposed Health One development at 82 South Street, Ulladulla will comply with the acoustic requirements of the Shoalhaven City Council.

3.0 SITE DESCRIPTION

The site is located at 82 South Street, Ulladulla. The site is bound by Pacific Highway in the on the east and South Street to the north. The site is surrounded by commercial premises on sides except the east. To the east is the nearest and most sensitive residential receiver located at 84 South Street. The site location is shown below in Figure 3-1.

Figure 3-1 Site Location

4.0 NOISE CRITERIA

4.1 Noise Policy for Industry (2017)

Noise generated from mechanical noise from a commercial development is generally assessed against the requirements of *Industrial Noise Policy (2000)* which has been reviewed and superseded by the current *NSW EPA Noise Policy for Industry 2017 (NPfI)*.

The policy sets out two separate criteria to ensure environmental noise objectives are met. The first criterion considers intrusive noise to residential properties and the second is set to ensure the amenity of the land use is protected. The lower value of both criteria is considered to be the Project Noise Trigger Level, which is the limit of the $L_{Aeq\ 15min}$ noise level that must not be exceeded for the corresponding period of the day.

Amenity Criterion

To limit continuing increases in noise levels, the maximum ambient noise level within an area from commercial noise sources should not normally exceed the levels as specified in Table 2.2 of the policy for the specified time of the day. NSW EPA Noise Policy for Industry recommends the following Amenity Noise Levels for residential receiver premises.

Table 4-1 Noise Criteria - Amenity for receiver building types

Type of receiver	Time of day	Recommended Amenity Noise Level $L_{Aeq\ (period)}$ dB(A)
Residence (Suburban)	Day	55
	Evening	45
	Night	40
Commercial	When in use	65

To ensure that noise emission 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 development = recommended amenity noise level **minus 5 dB(A).**

To standardise the time periods for the intrusiveness and amenity noise levels, this policy assumes that the Amenity **$L_{Aeq,15min}$** will be taken to be equal to the **$L_{Aeq,\ period}$ + 3 decibels (dB).**

Intrusiveness Criterion

The intrusiveness of a stationary noise source may be considered acceptable if the average of the maximum A-weighted levels of noise, $L_{Aeq\ 15\ minute}$ from the source do not exceed by more than 5dB the Rating Background Level (RBL) measured in the absence of the source. This applies during all times of the day and night. There also exists an adjustment factor to be applied as per the character of the noise source. This includes factors such as tonal, fluctuating, low frequency, impulsive, intermittent etc. qualities of noise. The RBL is determined in accordance with Section 2.3 of the NSW EPA NPfI. The intrusiveness criterion is $L_{Aeq\ 15\ minute}$ < RBL+5.

4.2 Noise Criteria for Traffic Noise Intrusion

To ensure that traffic noise intrusion is adequately controlled, AS/NZS 2107:2016 Acoustics – Recommended Design Sound Levels and Reverberation Times provides the following design sound levels for different areas of occupancy in health buildings.

Table 4-2 AS2107:2016 Recommended Design Levels

Type of Occupancy/activity (Health Buildings)	**Design Sound Level ($L_{Aeq,t}$) range**
Corridors and lobby spaces	<50
Consulting rooms	40 to 45
Dining areas	40 to 45
Kitchens, sterilizing and service areas	<55
Nurses' stations	40 to 45
Office areas	35 to 45
Operating theatres	40 to 50
Patient lounge	40 to 45
Staffrooms	40 to 45
Surgeries/treatment/procedure rooms	40 to 45
Utility rooms	50 to 60

5.0 NOISE SURVEY AND PROJECT CRITERIA

Unattended noise monitoring was conducted on site between 5th April and 12th April 2018 to record the existing ambient and traffic noise levels. The noise monitor was programmed to store the L_n percentile noise levels for each 15-minute sampling period.

Measurements were made of L_{min}, L_{max}, L_{90}, and L_{eq} and were later retrieved for analysis. The position of the noise monitor is shown in Figure 3-1. The results and summary of the noise monitoring are listed in graphical form in Appendix B of this report.

5.1 Instrumentation

Noise measurements were conducted using the following equipment:

- Precision Sound Analyser NTI XL2 Type Approved Serial No. A2A-09351-E0.
- Precision Sound Analyser NTI XL2 Serial No. A2A-09467-E0.
- Sound analyser Acoustic Research Laboratory, Serial number 15-301-475.
- Sound analyser Acoustic Research Laboratory, Serial number 16-207-016.
- Sound calibrator B&K 4230, Serial number 11419.

The instruments were calibrated before and after the noise measurements and there were no adverse deviations between the two.

The analysers are type 1 and comply with AS IEC 61672.2-2004. The instruments carry traceable calibration certificates.

5.2 Ambient Noise Levels & Mechanical plant and Carpark noise goals

Table 5-1 below presents the ambient noise and NPfI criteria based on the measurement results of the ambient noise monitor deployed on site. The assessment periods are defined by the NSW NPfI are Daytime 7am to 6pm, Evening 6pm to 10pm and Night 10pm to 7am.

Table 5-1 NSW NPfI Project Noise Trigger Levels

All values in dB(A)

Receiver Type	Period	Measured RBL (L_{A90})	Acceptable Noise Levels $L_{Aeq\ (period)}$	NSW Noise Policy for Industry Criteria		Project Noise Trigger Levels $L_{Aeq15min}$
				Amenity $L_{Aeq15min}$	Intrusiveness* $L_{Aeq15min}$	
Residential (Suburban)	Day	45	55	53	50	**50**
	Evening	40	45	43	45	*43**
	Night	34	40	38	34	*38**
Commercial	When in use	As above	65	63	N/A	**63**

*It is understood that the proposed hours of operation are during the day. The evening and night time criteria is only listed for information purposes.

5.3 Traffic Noise Levels

The figure below presents the results of the noise survey conducted to measure the existing traffic noise levels on Pacific Highway impacting the proposed development.

Figure 5-1 Traffic Noise Levels from Pacific Highway at proposed architectural setback

		Existing Noise Levels dB				
		Leq 15hr 07:00 - 22:00 **Leq** Measured	**Leq 9hr** 22:00 - 07:00 **Leq** Measured	**L10 18hr** 07:00 - 00:00 **L10** Measured	**Day Leq 1hr** 07:00 - 22:00 **Leq 1hr** Measured	**Night Leq 1hr** 22:00 - 07:00 **Leq 1hr** Measured
Thursday	05-04-2018		60.0	66.8		65.2
Friday	06-04-2018	65.6	59.9	69.2	66.6	63.0
Saturday	07-04-2018	63.1	54.0	67.4	65.0	57.1
Sunday	08-04-2018	64.1	61.7	69.0	66.3	66.9
Monday	09-04-2018	66.5	61.0	70.3	69.4	66.0
Tuesday	10-04-2018	66.8	62.3	70.3	67.8	67.3
Wednesday	11-04-2018	65.1	57.9	69.5	67.4	62.0
Thursday	12-04-2018	65.9	62.7	70.5	68.3	66.9
Friday	13-04-2018			72.4		
Average Noise Level		**65**	**61**	**70**	**67**	**65**

For this assessment, the daytime Leq-1hr value is being considered to ensure a better acoustic quality within the indoor spaces of the health care centre.

6.0 RECOMMENDATIONS

All recommendations must be checked by respective assessing representatives to ensure compliance with other non-acoustic requirements.

1. *The acoustic systems shown in the descriptions is one that satisfies the acoustic requirements only. No representation is given that it is fit for any other purpose. The build-up must be checked and designed by others to verify that it complies with all necessary fire rating, structural, waterproofing, durability and any other non-acoustic requirements.*

Any additional construction or fixtures must be acoustically detailed to seal to the room and ceiling construction without derating the R_w ratings required in either instance

6.1 Traffic Noise Intrusion

Calculations have been carried out to specify the elements of the outer envelope of the building.

Figure 6-1 Reference Zones for Acoustic Requirements – Ground Floor

6.1.1 External Walls

The calculations indicate that the frontage facade should have a Weighted Sound Reduction index of R_w 45 for external walls in Zone A

Where brick construction is proposed, the above can be achieved readily with standard masonry construction such as concrete, standard brick veneer or brick cavity construction.

Where light-weight construction is proposed, the following minimum construction or equivalent will be required.

Zone A (R_w 45)

- External Cladding: min. 9mm Fibre Cement Sheeting, vapour barrier as required
- min. 90mm steel studs (cc 600mm)
- Insulation: 90mm glasswool (14 kg/m^3) or equivalent (higher rating if required by BASIX)
- Internal lining comprising of 13mm fire rated or moisture-rated plasterboard (minimum mass 10.5 kg/m^2).

Zone B & C – Standard Construction (no acoustic detailing required)

The above construction can be extended to Zone B & C if it is convenient for the construction to maintain uniformity within the building.

6.1.2 Roof

An R_w of 40 in Zones A and B is necessary for the construction to achieve the required acoustic performance. The following roof system or its equivalent can be used to meet the required R_w rating.

Zone A & B (R_w 40)

- Metal sheet roof
- Anticon Glass Wool Insulation minimum 50 mm thickness pulled tightly against the roof
- Minimum 90mm R3.5 glasswool insulation (minimum mass 11 kg/m^3) over acoustic ceiling
- Plasterboard ceiling comprising 13 mm standard or moisture-rated plasterboard (minimum mass per plasterboard layer of 8.5 kg/m^2)

Zone C can have standard roof construction and acoustic detailing will not be necessary. The above construction can be extended to Zone C if it is convenient for the construction to maintain uniformity within the building.

6.1.3 Eaves

Note that the external eaves lining must be acoustically treated for the sound insulation offered by the facade ceiling to maintain the required R_w rating.

- Option 1: Construct the external walls to extend to and seal against the underside of the roof.
- Option 2: Construct the eaves lining (including verandas) with 6 mm non-perforated cement sheet lining and 75 mm thickness polyester or glass wool insulation 11 kg/m^3 laid over the surface. Provide solid timber fascia panels. If using colorbond instead of timber, use 14kg/m^3 instead.

Other eaves details may be possible; These must be checked with a qualified acoustic consultant prior to construction.

6.1.4 Windows/Doors

The sound insulation rating (R_w) required for each window will vary from room to room and are shown below. A glazing schedule and exact dimensions of the elements are not available for the proposed development at this stage. Therefore, as a guideline, a general requirement of the acoustic performance of the glazing elements are presented below based on the traffic noise levels. These recommendations must be checked for each glazing element individually prior to construction during the later stages of the development when a glazing schedule is available.

The following Table 6-1 presents the glazing requirements.

Table 6-1 Glazing/Door R_w Requirements

Glazing Description Please refer to Figure 6-1 (on page 11) for zone references	Glazing Area	Minimum (R_w) Requirement	Minimum Thicknesses/Door Construction* *(Refer to note below)*
Zone A (Ground Floor)	less than $3m^2$	32	6.38mm lam
Zone A (Ground Floor)	greater than $3m^2$	34	10.38mm lam
Zone B (Ground Floor)	less than $3m^2$	28	5mm float
Zone B (Ground Floor)	greater than $3m^2$	32	6.38mm lam
Zone C (Ground Floor)	All	28	5mm float
Zone A All non – glazed external entry doors		32	Solid Core with acoustic seals
Zone B & C All non – glazed external entry doors		30	Solid Core with acoustic seals
All First Floor Glazing (Staff Areas)		26	4mm float

Note that the R_w rating is **required for the complete glazing and frame assembly. The glazing thicknesses (if specified below or on data sheets) will not necessarily meet the required R_w rating without an appropriate frame system. It will therefore be necessary to provide a window glass and frame system having a laboratory tested acoustic performance meeting the required values provided in Table 6-1 above. It is essential that the R_w performance of the intended system is verified to perform to the rating specified prior to installation.*

The window systems must be tested in accordance with the following:

- Appendix A Australian Window Association Industry Code of Practice Window and Door – Method of Acoustic Testing.
- Appendix B AS 1191 Acoustics – Method for laboratory measurement of airborne sound insulation of building elements.

All windows and doors with acoustic requirements **must be fitted with proper acoustic seals** such as **Q-LON** (or equivalent) around the top & bottom sliders and must be air tight. **Avoid brush seals**. Special attention must be given to the sliding doors & windows to have good quality acoustic seals all around them. Any airgap will drastically reduce the intended acoustic performance of the glazing.

The entire frame to the glazing must be sealed into the structural opening using acoustic mastics and backer rods. Normal weather proofing details do not necessarily provide the full acoustic insulation potential of the window system. The manufacturers' installation instructions for the correct acoustic sealing of the frame must be followed.

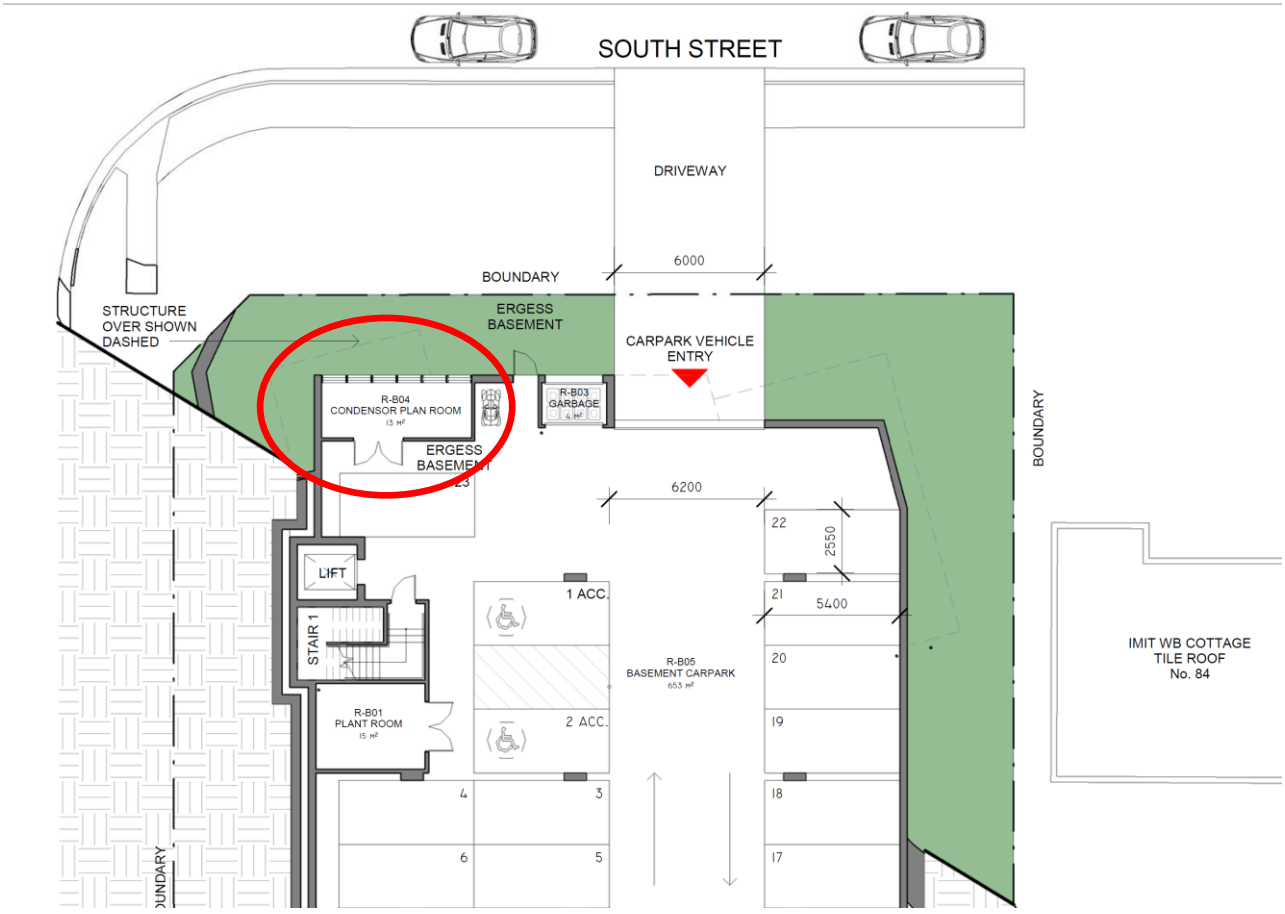
The details of the proposed window and door glazing system should be checked by an acoustic consultant prior to ordering and installation, together with laboratory test results demonstrating that the proposed systems will comply with the required acoustic performance.

Any changes to the window schedule including locations and sizes can change the acoustic recommendations. Please note all changes must be checked by an acoustic consultant.

6.2 Mechanical Plant & Equipment

PKA have coordinated with Gran Associates regarding mechanical plant location. We have determined that the condenser plant room is to be located in the basement on the northern façade facing South Street. This location faces away from the residential receiver located at 84 South St, and towards the existing commercial premises. This is acoustically suitable, and compliance can be achieved with minimal acoustic treatment.

As the selection and plant data is unavailable for the DA stage, all plant items, such as the basement condensers, rooftop plant, exhausts serving car parks and toilets, roller doors for access etc. must be designed to acoustically comply with the criteria established in Table 4.1 of this report.



APPENDIX A DRAWINGS USED TO PREPARE REPORT

This report was prepared using drawings provided by Gran Associates Australia Pty Ltd, Project No. A1810.

No.	Rev.	Title	Date
DA-000	C	Drawing List & Location Plan	17-10-2018
DA-001	C	Site Analysis Plan	17-10-2018
DA-010	B	Demolition Plan	12-09-2018
DA-100	C	Basement Floor Plan	17-10-2018
DA-101	C	Ground Floor Plan	17-10-2018
DA-102	C	First Floor Plan	17-10-2018
DA-103	C	Roof Plan	17-10-2018
DA-200	C	North Elevation	17-10-2018
DA-201	C	East Elevation	17-10-2018
DA-202	C	South Elevation	17-10-2018
DA-203	C	West Elevation	17-10-2018
DA-300	C	Section AA & BB	17-10-2018
DA-600	B	Areas Plan & Schedule	12-09-2018
DA-800	C	Materials Board	17-10-2018
DA-900	C	Perspective View 1	17-10-2018
DA-901	C	Perspective View 2	17-10-2018

APPENDIX B NOISE MEASUREMENTS (GRAPHICAL)

Ambient Noise Monitor

11113 Ulladulla Health One

PKA Acoustic Consulting

Project Address: 82 South Street, Ulladulla

Logger Location: Rear of 82 South Street, Ulladulla - shielded from traffic

		Background Noise Levels L_{A90} dB		
		Daytime 07:00 - 18:00 Measured	**Evening** 18:00 - 22:00 Measured	**Nighttime** 22:00 - 07:00 Measured
Thursday	05-04-2018	47.6	40.3	33.5
Friday	06-04-2018	44.0	39.2	31.4
Saturday	07-04-2018	42.5	39.5	31.2
Sunday	08-04-2018	43.1	38.6	37.2
Monday	09-04-2018	44.6	40.8	31.0
Tuesday	10-04-2018	44.6	40.4	38.8
Wednesday	11-04-2018	45.1	42.1	40.1
Thursday	12-04-2018	44.7	41.8	34.2
Friday	13-04-2018	44.8		
Rating Background Level (RBL)		**45**	**40**	**34**

		Existing Noise Levels L_{Aeq} dB			
		Daytime 07:00 - 18:00 Measured	**Evening** 18:00 - 22:00 Measured	**Nighttime** 22:00 - 07:00 Measured	**Sunday or Public Holiday?**
Thursday	05-04-2018		49.0	48.0	
Friday	06-04-2018	52.5	49.7	45.9	
Saturday	07-04-2018	51.4	48.6	43.5	
Sunday	08-04-2018	50.9	47.4	48.8	Y
Monday	09-04-2018	53.0	48.3	46.9	
Tuesday	10-04-2018	54.2	50.1	49.3	
Wednesday	11-04-2018	53.9	49.7	48.8	
Thursday	12-04-2018	52.6	49.1	48.2	
Friday	13-04-2018				
Average Noise Level (L_{Aeq})		**53**	**49**	**48**	

11113 Ulladulla Health One

Project Address: 82 South Street, Ulladulla

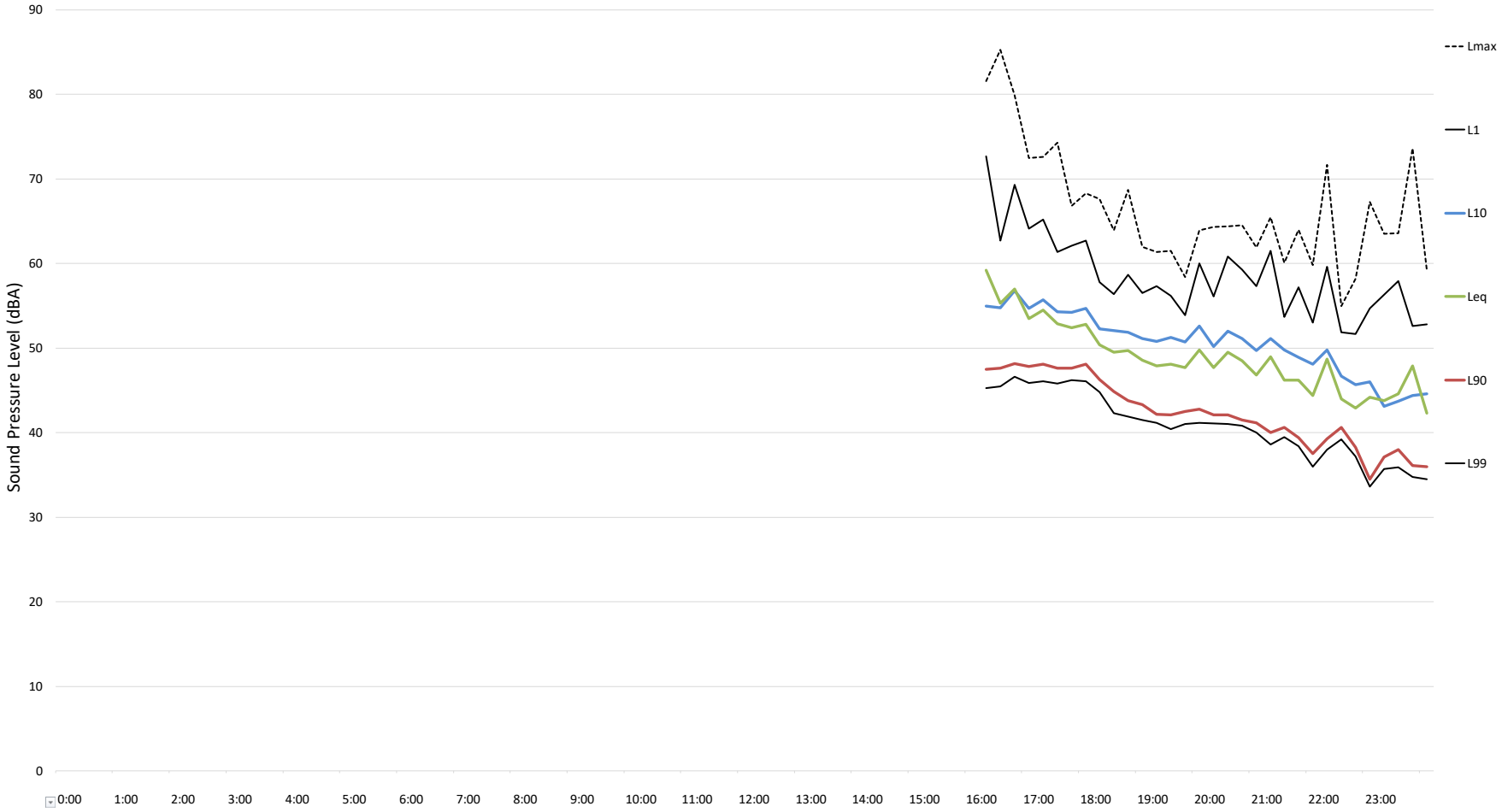
Logger Location: Rear of 82 South Street, Ulladulla - shielded from traffic

PKA Acoustic Consulting

	Daytime 07:00 - 18:00 Measured	Evening 18:00 - 22:00 Measured	Nighttime 22:00 - 07:00 Measured
L_{Aeq} dB		49.0	48.0
L_{A90} dB		40.3	33.5

05-04-2018 Thursday

Existing Ambient Noise Levels (dBA)



11113 Ulladulla Health One

Project Address: 82 South Street, Ulladulla

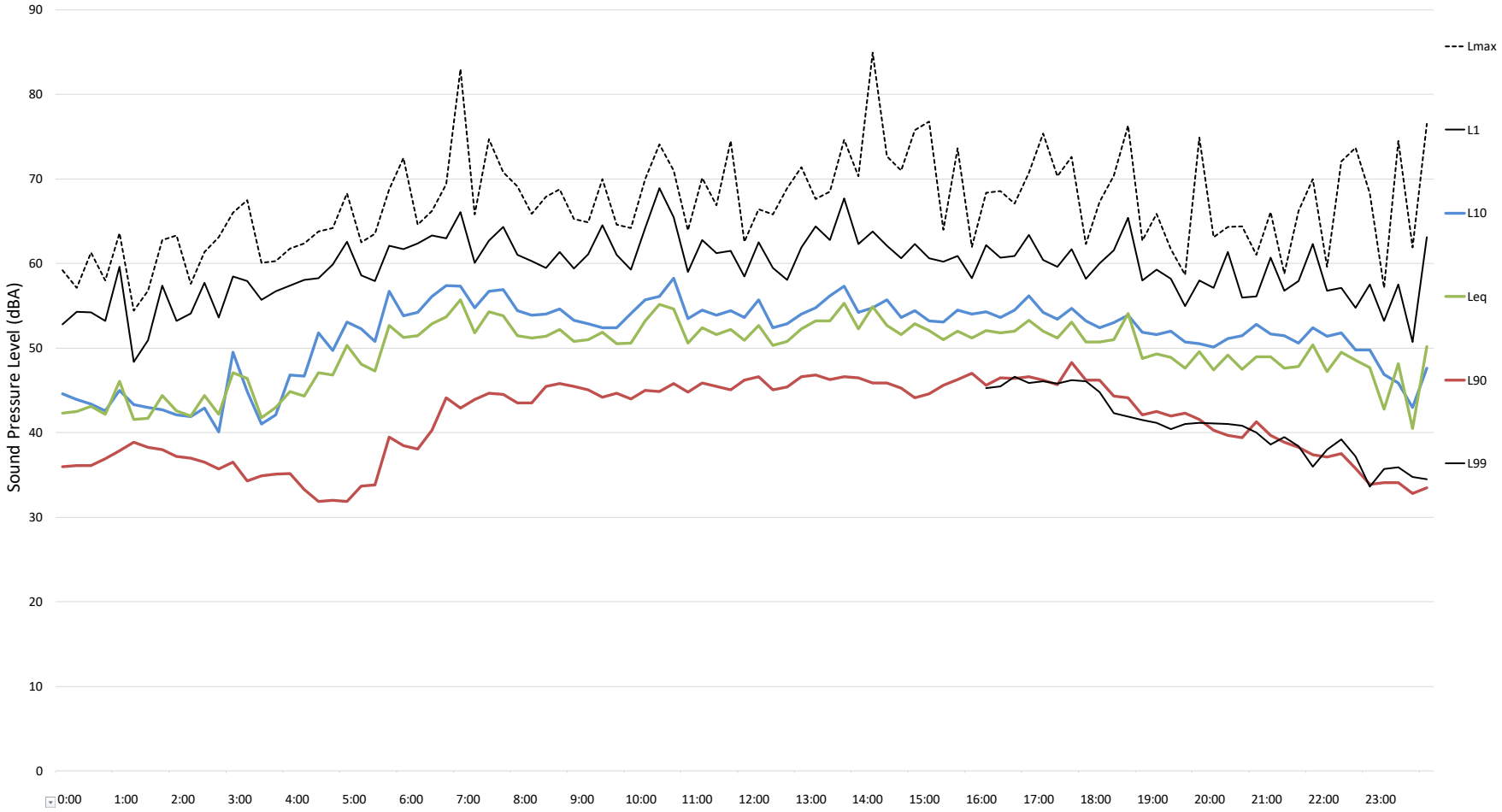
Logger Location: Rear of 82 South Street, Ulladulla - shielded from traffic

PKA Acoustic Consulting

	Daytime 07:00 - 18:00 Measured	Evening 18:00 - 22:00 Measured	Nighttime 22:00 - 07:00 Measured
L_{Aeq} dB	52.5	49.7	45.9
L_{A90} dB	44.0	39.2	31.4

06-04-2018 Friday

Existing Ambient Noise Levels (dBA)



11113 Ulladulla Health One

Project Address: 82 South Street, Ulladulla

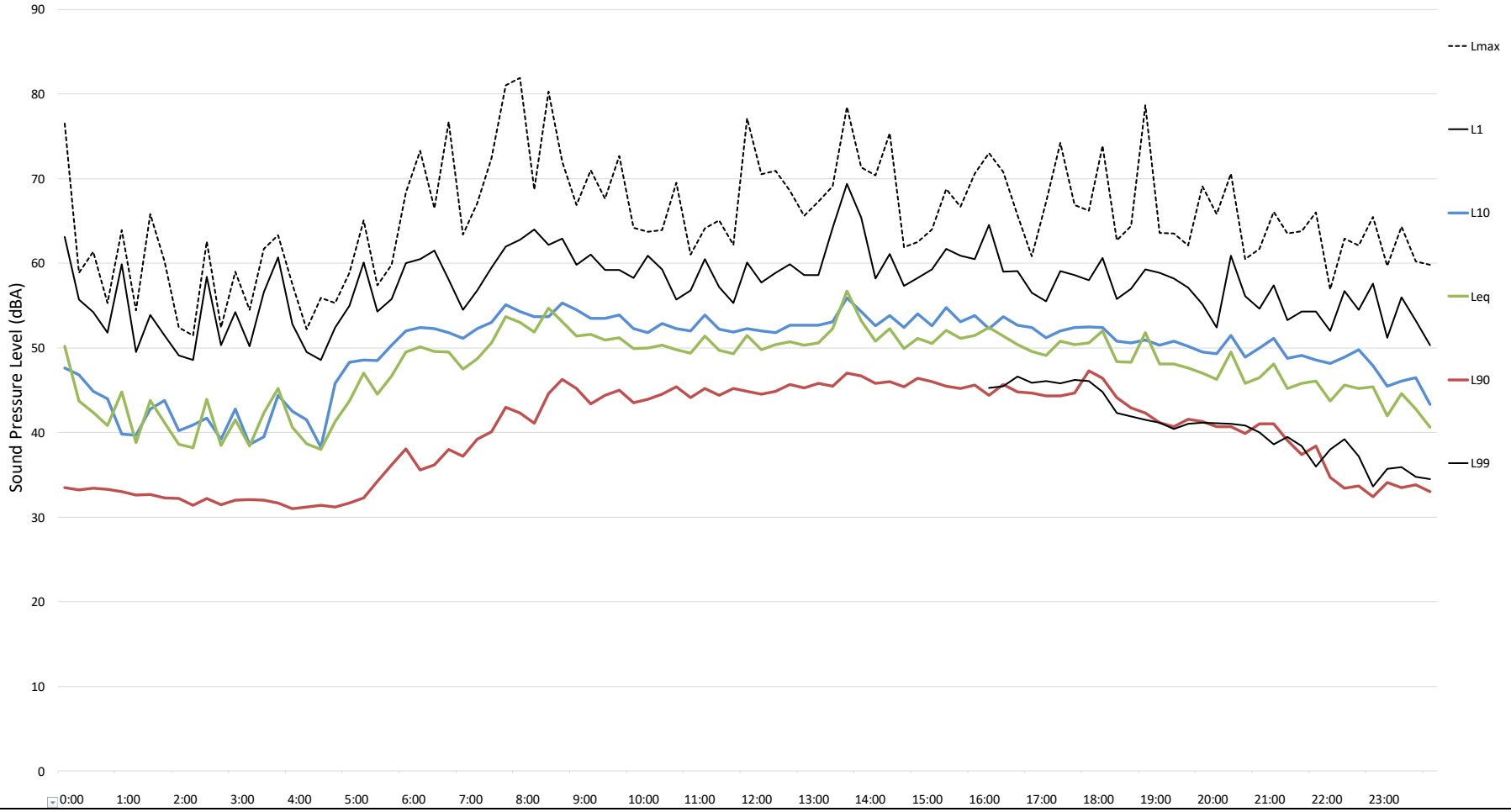
Logger Location: Rear of 82 South Street, Ulladulla - shielded from traffic

PKA Acoustic Consulting

	Daytime 07:00 - 18:00 Measured	Evening 18:00 - 22:00 Measured	Nighttime 22:00 - 07:00 Measured
L_{Aeq} dB	51.4	48.6	43.5
L_{A90} dB	42.5	39.5	31.2

07-04-2018 Saturday

Existing Ambient Noise Levels (dBA)



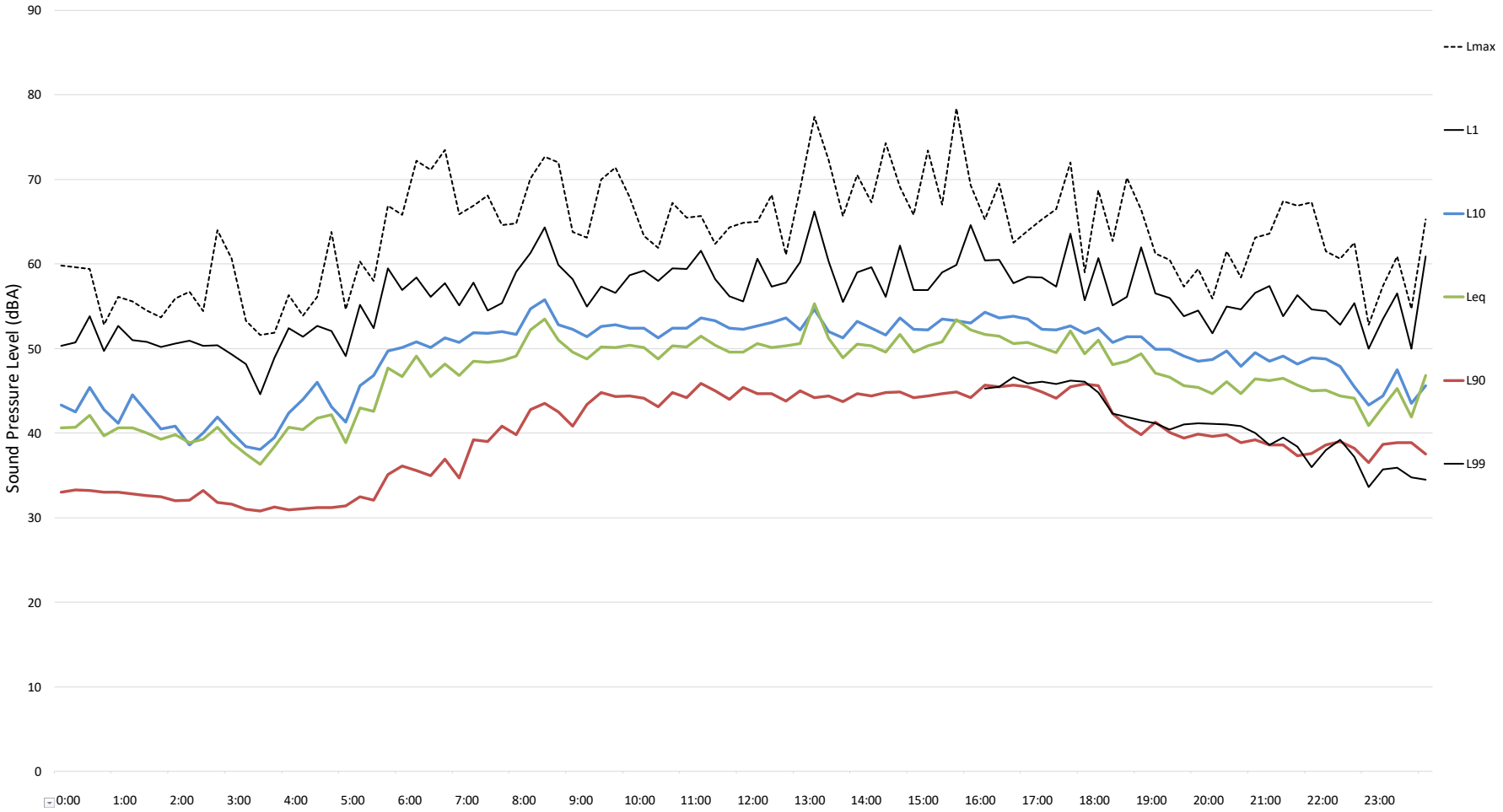
11113 Ulladulla Health One

PKA Acoustic Consulting

Project Address: 82 South Street, Ulladulla
Logger Location: Rear of 82 South Street, Ulladulla - shielded from traffic

	Daytime 08:00 - 18:00 Measured	Evening 18:00 - 22:00 Measured	Nighttime 22:00 - 08:00 Measured
L_{Aeq} dB	50.9	46.4	48.8
L_{A90} dB	43.1	38.6	37.2

08-04-2018 Sunday
Existing Ambient Noise Levels (dBA)



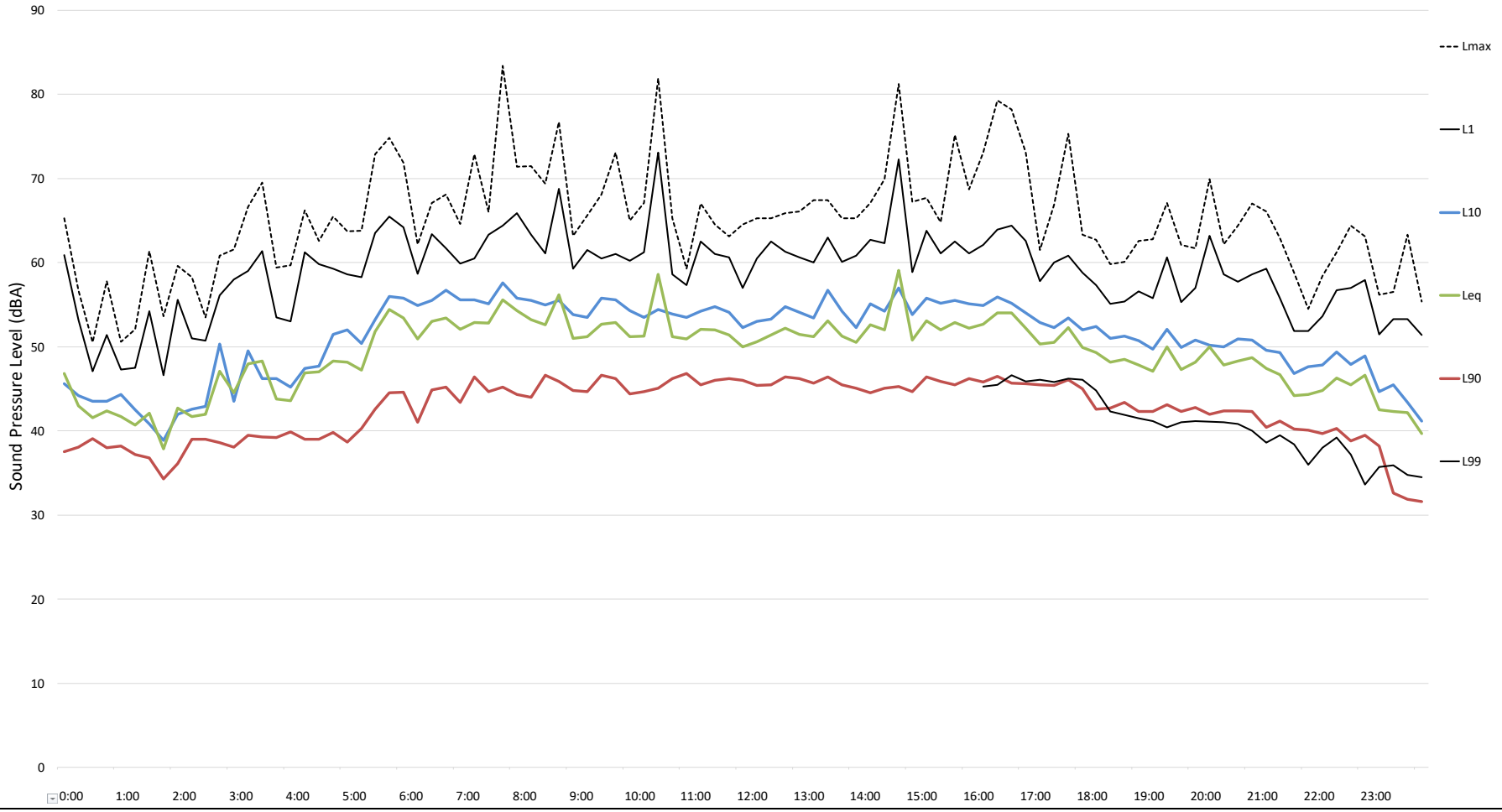
11113 Ulladulla Health One

Project Address: 82 South Street, Ulladulla
Logger Location: Rear of 82 South Street, Ulladulla - shielded from traffic

PKA Acoustic Consulting

	Daytime 07:00 - 18:00 Measured	Evening 18:00 - 22:00 Measured	Nighttime 22:00 - 07:00 Measured
L_{Aeq} dB	53.0	48.3	46.9
L_{A90} dB	44.6	40.8	31.0

09-04-2018 Monday
Existing Ambient Noise Levels (dBA)



11113 Ulladulla Health One

Project Address: 82 South Street, Ulladulla

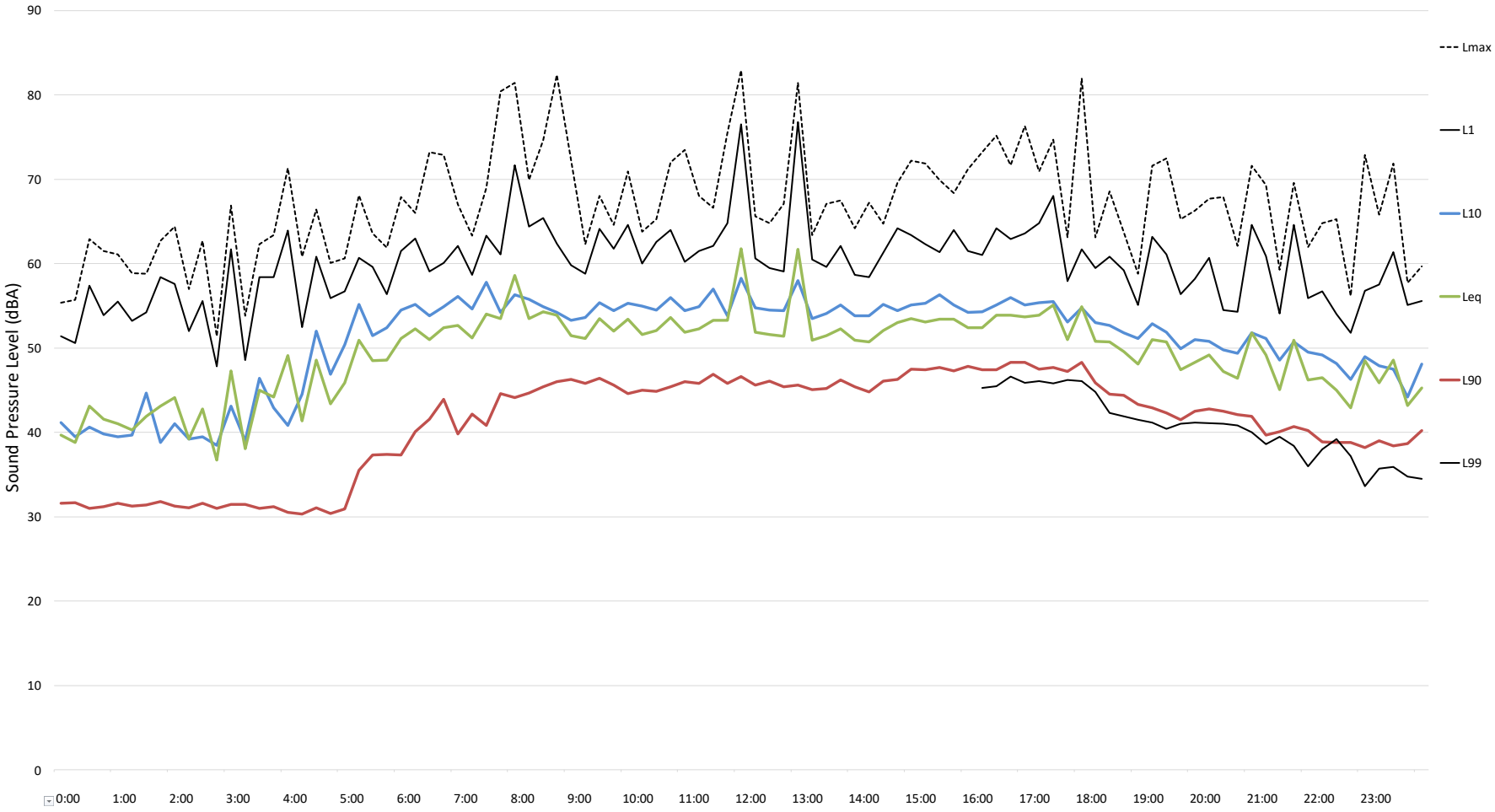
Logger Location: Rear of 82 South Street, Ulladulla - shielded from traffic

PKA Acoustic Consulting

	Daytime 07:00 - 18:00 Measured	Evening 18:00 - 22:00 Measured	Nighttime 22:00 - 07:00 Measured
L_{Aeq} dB	54.2	50.1	49.3
L_{A90} dB	44.6	40.4	38.8

10-04-2018 Tuesday

Existing Ambient Noise Levels (dBA)



11113 Ulladulla Health One

Project Address: 82 South Street, Ulladulla

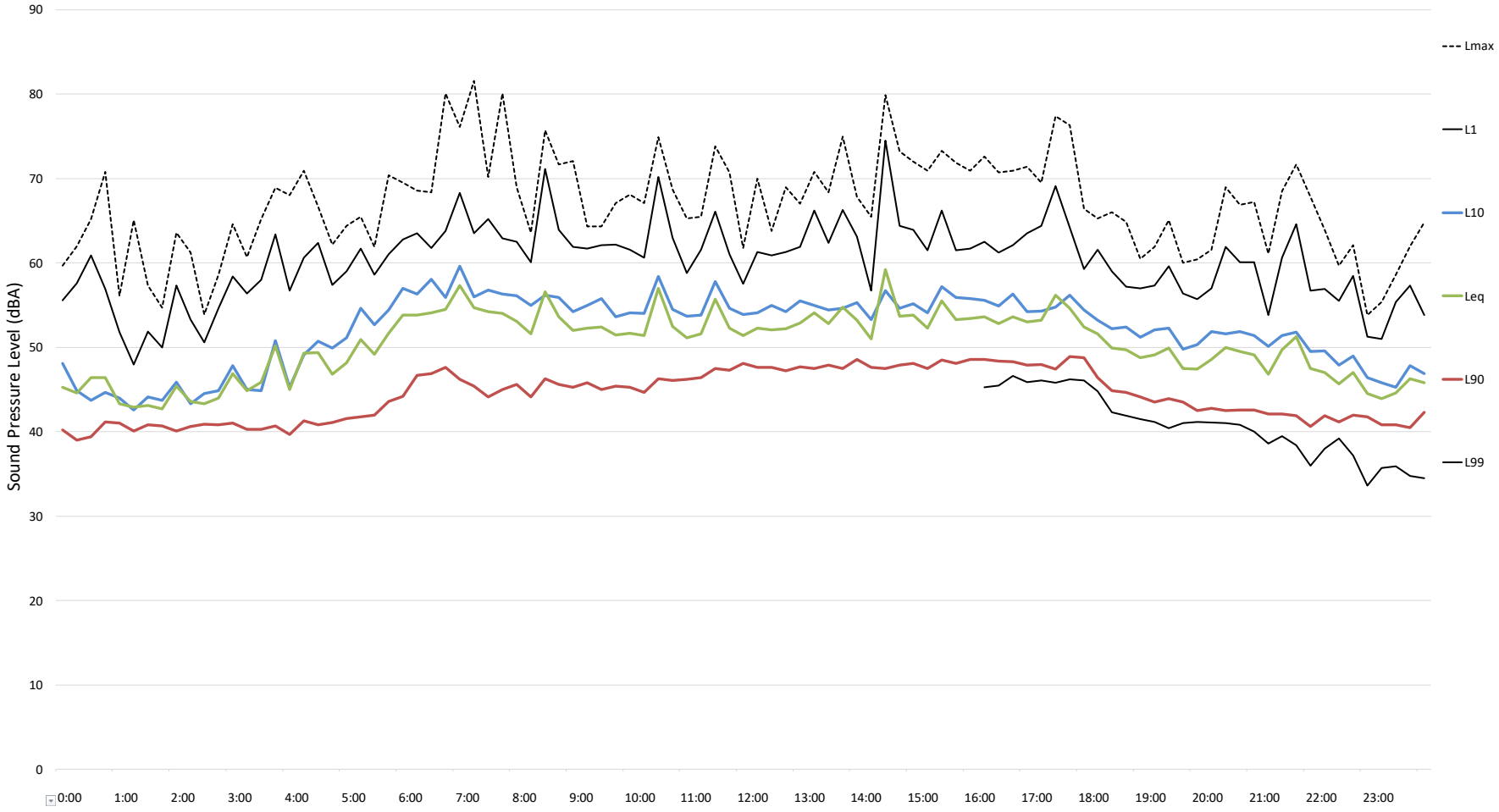
Logger Location: Rear of 82 South Street, Ulladulla - shielded from traffic

PKA Acoustic Consulting

	Daytime 07:00 - 18:00 Measured	Evening 18:00 - 22:00 Measured	Nighttime 22:00 - 07:00 Measured
L_{Aeq} dB	53.9	49.7	48.8
L_{A90} dB	45.1	42.1	40.1

11-04-2018 Wednesday

Existing Ambient Noise Levels (dBA)



11113 Ulladulla Health One

Project Address: 82 South Street, Ulladulla

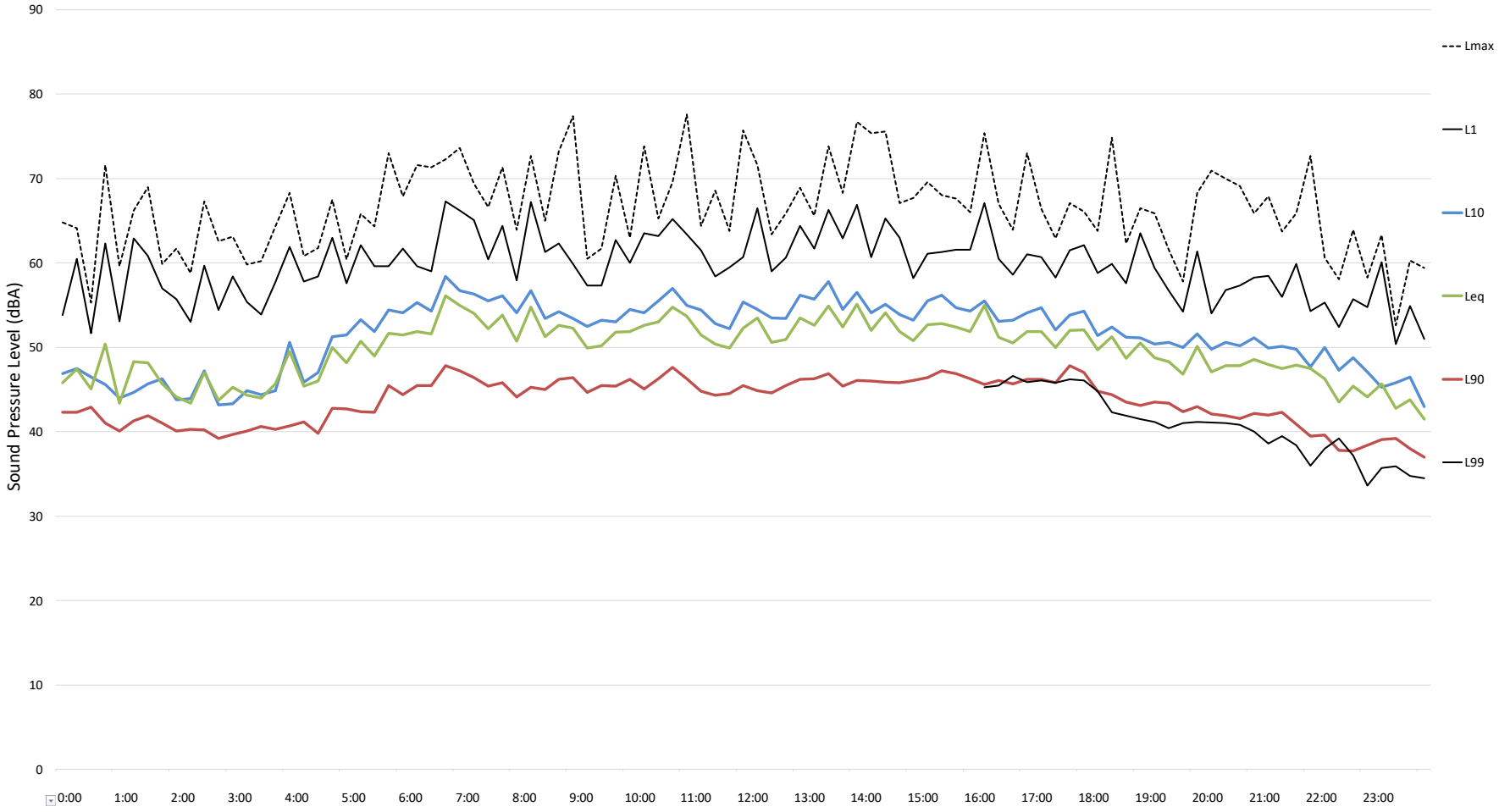
Logger Location: Rear of 82 South Street, Ulladulla - shielded from traffic

PKA Acoustic Consulting

	Daytime 07:00 - 18:00 Measured	Evening 18:00 - 22:00 Measured	Nighttime 22:00 - 07:00 Measured
L_{Aeq} dB	52.6	49.1	48.2
L_{A90} dB	44.7	41.8	34.2

12-04-2018 Thursday

Existing Ambient Noise Levels (dBA)



11113 Ulladulla Health One

Project Address: 82 South Street, Ulladulla

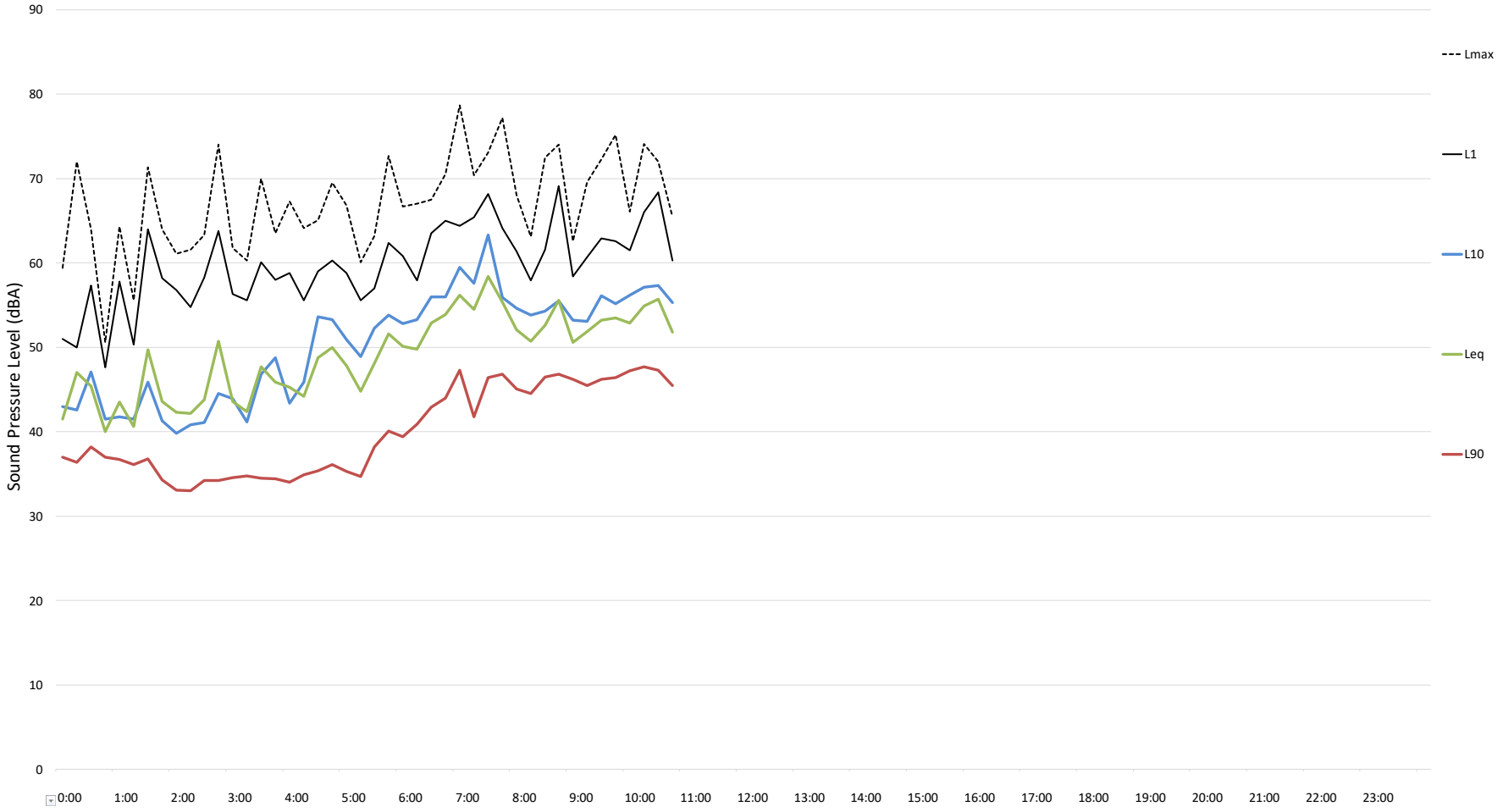
Logger Location: Rear of 82 South Street, Ulladulla - shielded from traffic

PKA Acoustic Consulting

	Daytime 07:00 - 18:00 Measured	Evening 18:00 - 22:00 Measured	Nighttime 22:00 - 07:00 Measured
L_{Aeq} dB			
L_{A90} dB			

13-04-2018 Friday

Existing Ambient Noise Levels (dBA)



Traffic Noise Monitor

11113 Ulladulla Health One

Project Address: 82 South Street, Ulladulla

Logger Location: At proposed setback facing Pacific Highway to measure traffic noise

Descriptor		Existing Noise Levels dB					Sunday or Public Holiday?
		Leq 15hr 07:00 - 22:00 **Leq** Measured	**Leq 9hr** 22:00 - 07:00 **Leq** Measured	**L10 18hr** 07:00 - 00:00 **L10** Measured	**Day Leq 1hr** 07:00 - 22:00 **Leq 1hr** Measured	**Night Leq 1hr** 22:00 - 07:00 **Leq 1hr** Measured	
Thursday	05-04-2018		60.0	66.8		65.2	
Friday	06-04-2018	65.6	59.9	69.2	66.6	63.0	
Saturday	07-04-2018	63.1	54.0	67.4	65.0	57.1	
Sunday	08-04-2018	64.1	61.7	69.0	66.3	66.9	Y
Monday	09-04-2018	66.5	61.0	70.3	69.4	66.0	
Tuesday	10-04-2018	66.8	62.3	70.3	67.8	67.3	
Wednesday	11-04-2018	65.1	57.9	69.5	67.4	62.0	
Thursday	12-04-2018	65.9	62.7	70.5	68.3	66.9	
Friday	13-04-2018			72.4			
Average Noise Level		**65**	**61**	**70**	**67**	**65**	

11113 Ulladulla Health One

Project Address: 82 South Street, Ulladulla

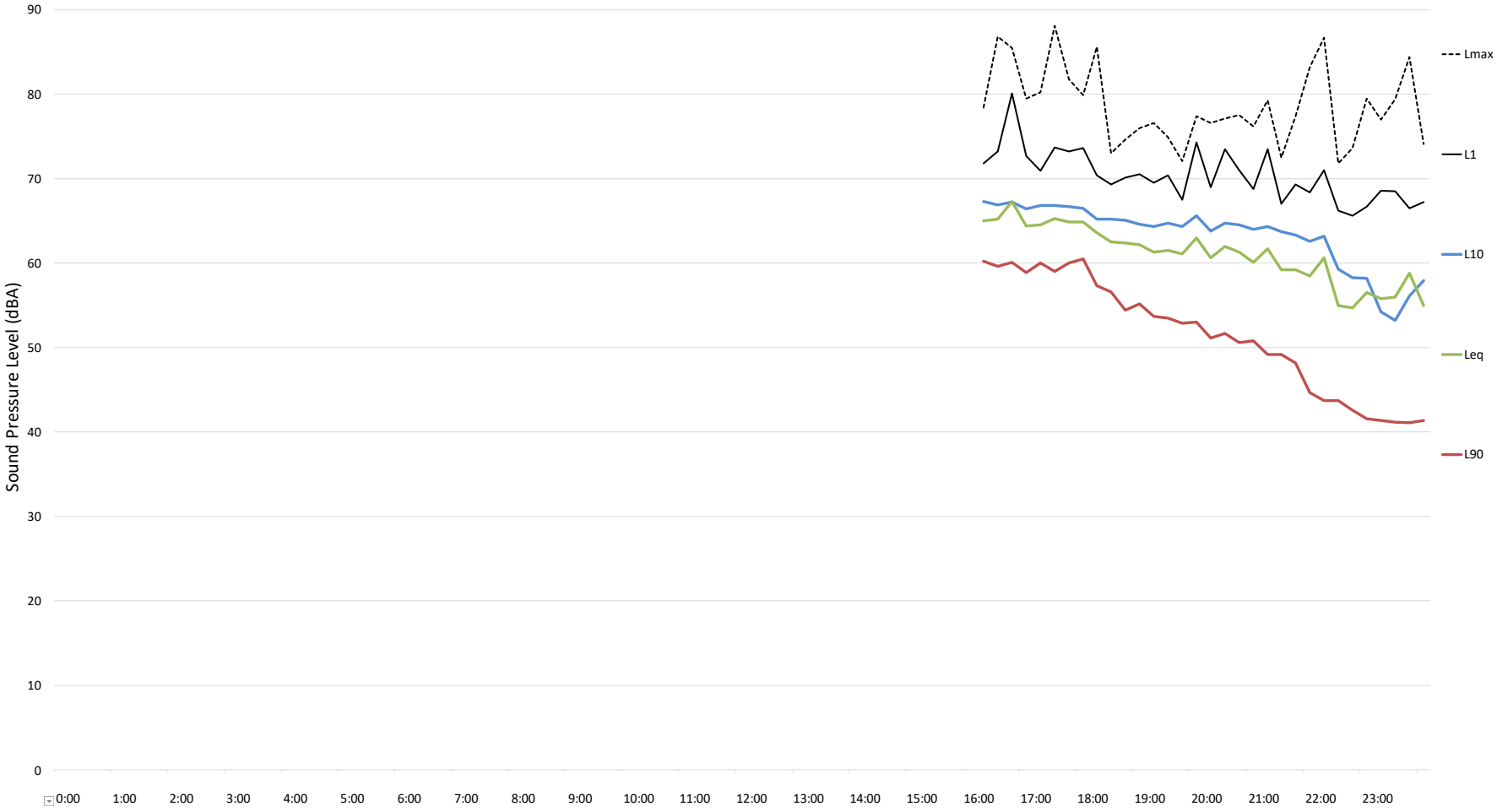
Logger Location: At proposed setback facing Pacific Highway to measure traffic noise

PKA Acoustic Consulting

	Daytime 07:00 - 18:00 Measured	Evening 18:00 - 22:00 Measured	Nighttime 22:00 - 07:00 Measured
L_{Aeq} dB		61.9	60.0
L_{A90} dB		49.2	40.3

05-04-2018 Thursday

Existing Ambient Noise Levels (dBA)



11113 Ulladulla Health One

PKA Acoustic Consulting

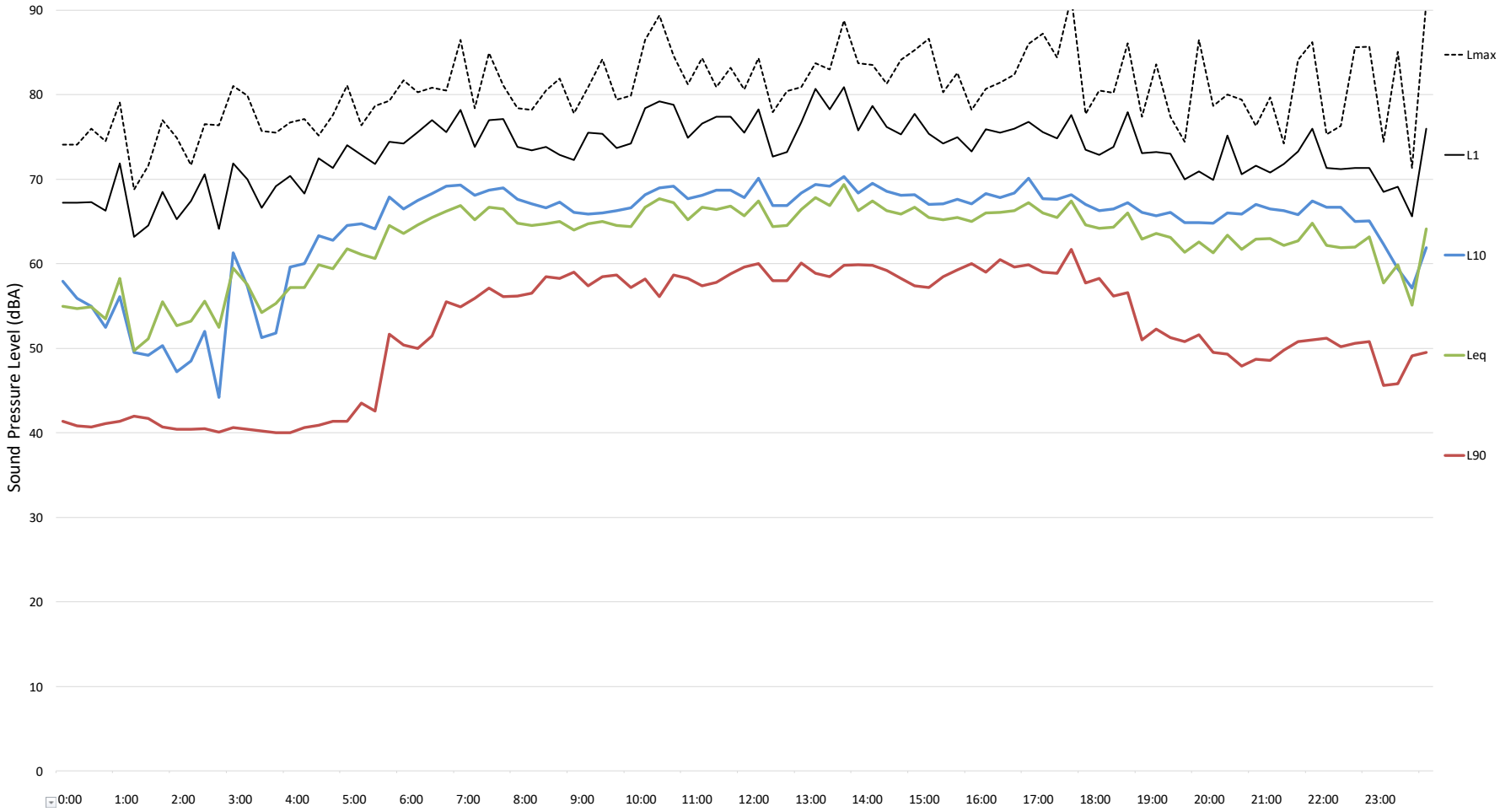
Project Address: 82 South Street, Ulladulla

Logger Location: At proposed setback facing Pacific Highway to measure traffic noise

	Daytime 07:00 - 18:00 Measured	Evening 18:00 - 22:00 Measured	Nighttime 22:00 - 07:00 Measured
L_{Aeq} dB	66.2	63.3	59.9
L_{A90} dB	56.3	48.7	42.9

06-04-2018 Friday

Existing Ambient Noise Levels (dBA)



11113 Ulladulla Health One

PKA Acoustic Consulting

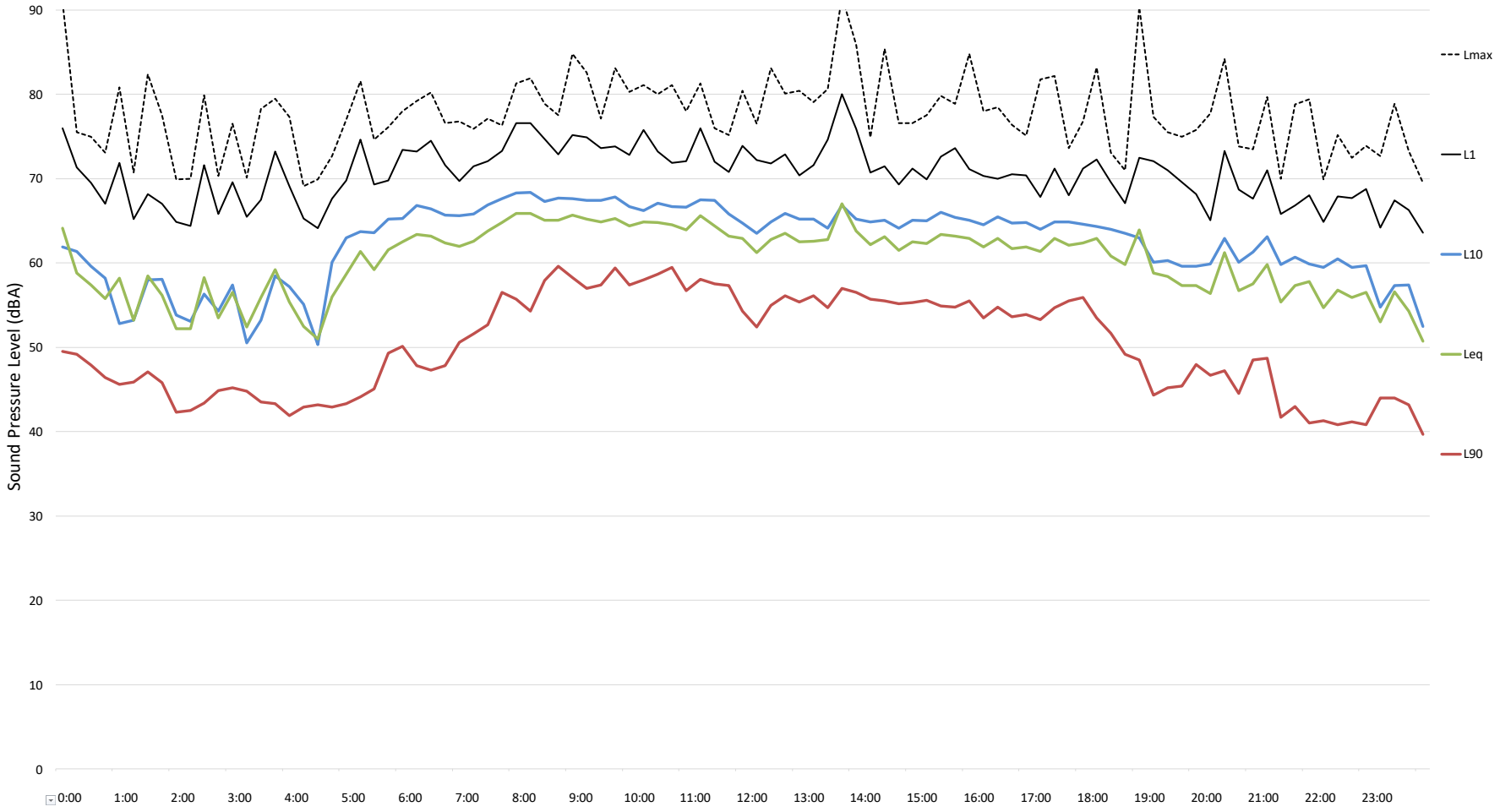
Project Address: 82 South Street, Ulladulla

Logger Location: At proposed setback facing Pacific Highway to measure traffic noise

	Daytime 07:00 - 18:00 Measured	Evening 18:00 - 22:00 Measured	Nighttime 22:00 - 07:00 Measured
L_{Aeq} dB	63.8	59.8	54.0
L_{A90} dB	53.4	43.7	38.7

07-04-2018 Saturday

Existing Ambient Noise Levels (dBA)



11113 Ulladulla Health One

PKA Acoustic Consulting

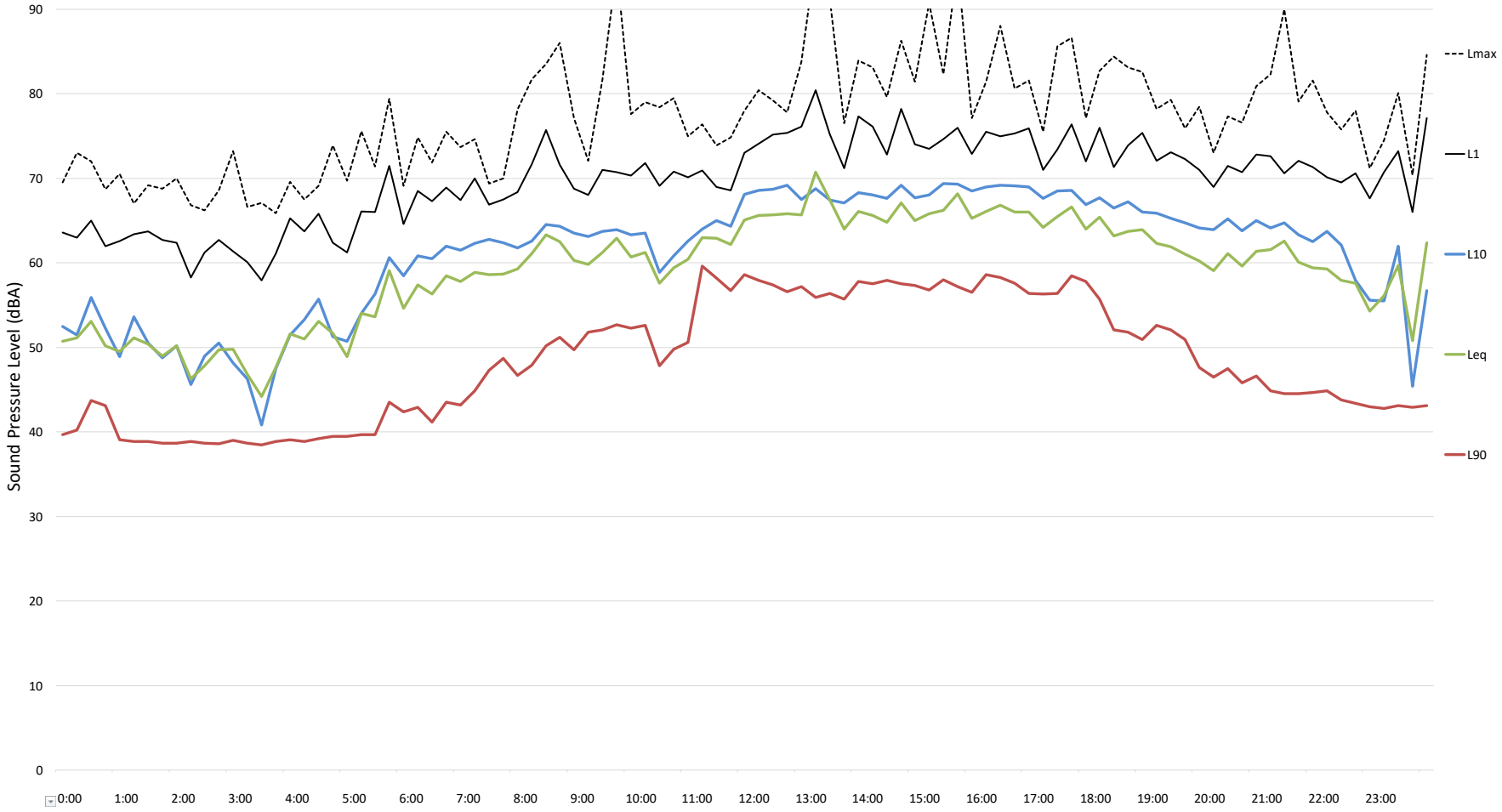
Project Address: 82 South Street, Ulladulla

Logger Location: At proposed setback facing Pacific Highway to measure traffic noise

	Daytime 08:00 - 18:00 Measured	Evening 18:00 - 22:00 Measured	Nighttime 22:00 - 08:00 Measured
L_{Aeq} dB	64.9	61.4	62.6
L_{A90} dB	49.8	44.7	41.9

08-04-2018 Sunday

Existing Ambient Noise Levels (dBA)



11113 Ulladulla Health One

PKA Acoustic Consulting

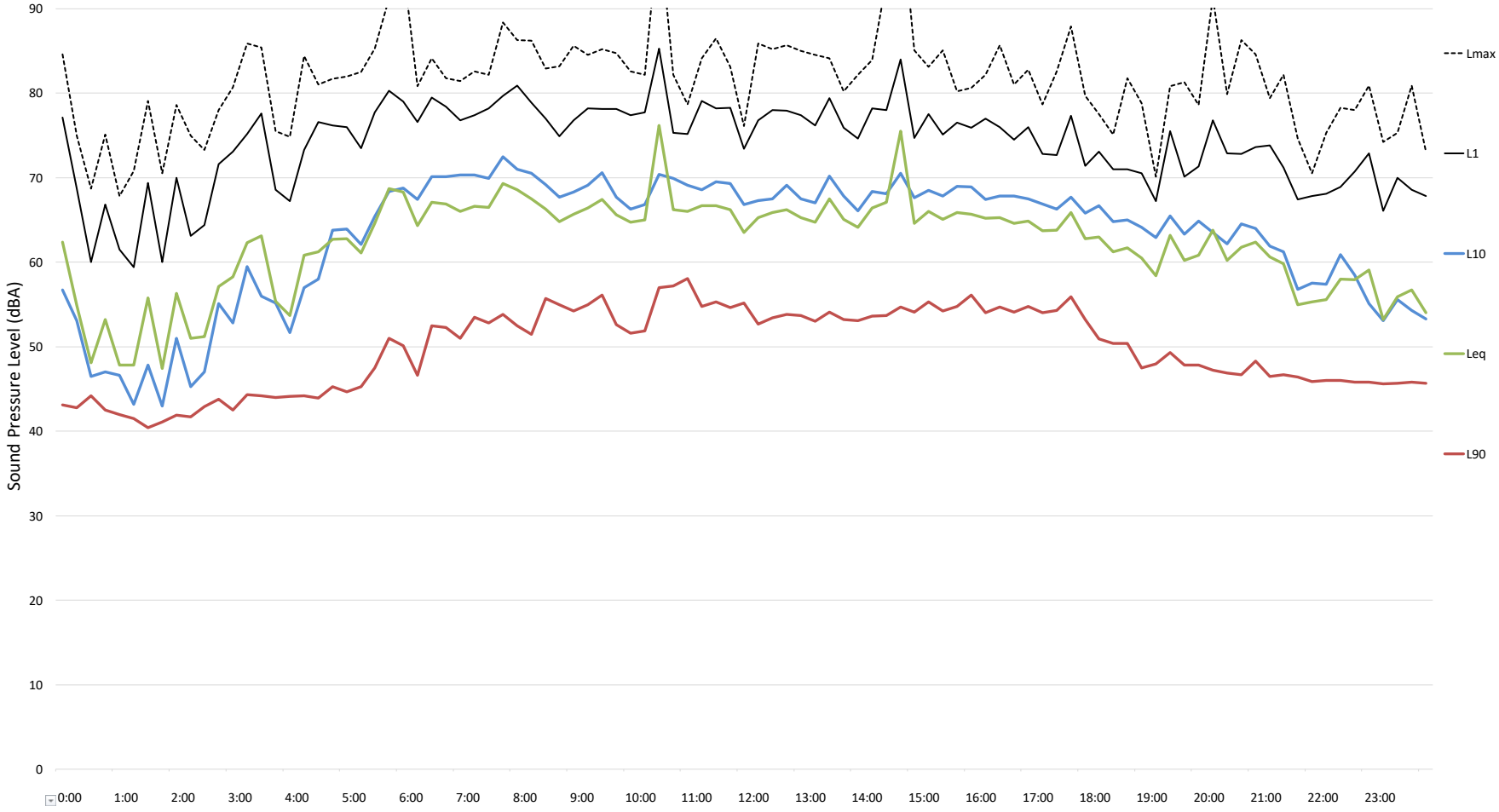
Project Address: 82 South Street, Ulladulla

Logger Location: At proposed setback facing Pacific Highway to measure traffic noise

	Daytime 07:00 - 18:00 Measured	Evening 18:00 - 22:00 Measured	Nighttime 22:00 - 07:00 Measured
L_{Aeq} dB	67.4	61.4	61.0
L_{A90} dB	52.5	46.6	41.2

09-04-2018 Monday

Existing Ambient Noise Levels (dBA)



11113 Ulladulla Health One

Project Address: 82 South Street, Ulladulla

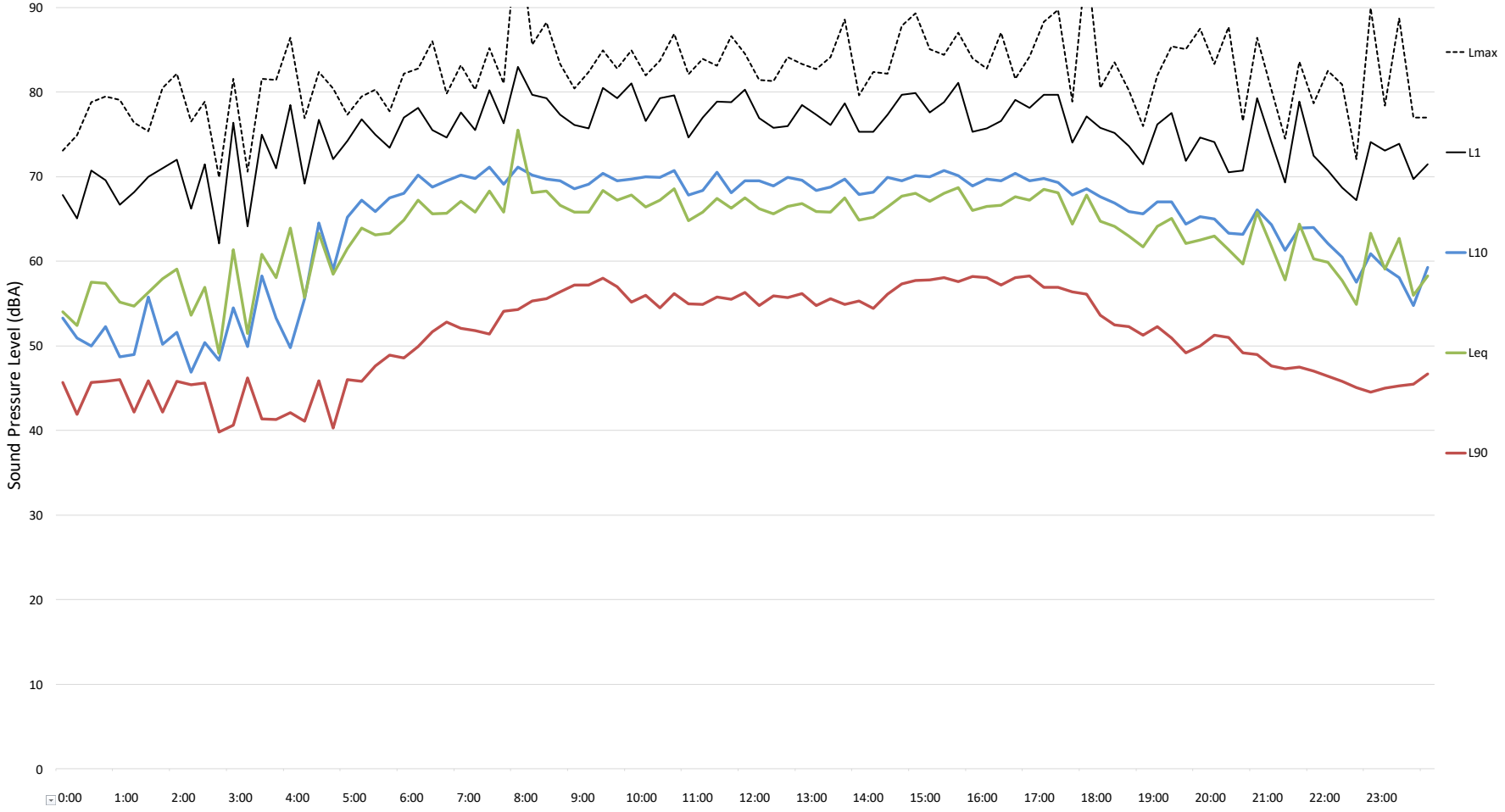
Logger Location: At proposed setback facing Pacific Highway to measure traffic noise

PKA Acoustic Consulting

	Daytime 07:00 - 18:00 Measured	Evening 18:00 - 22:00 Measured	Nighttime 22:00 - 07:00 Measured
L_{Aeq} dB	67.5	63.7	62.3
L_{A90} dB	54.3	47.6	45.2

10-04-2018 Tuesday

Existing Ambient Noise Levels (dBA)



11113 Ulladulla Health One

Project Address: 82 South Street, Ulladulla

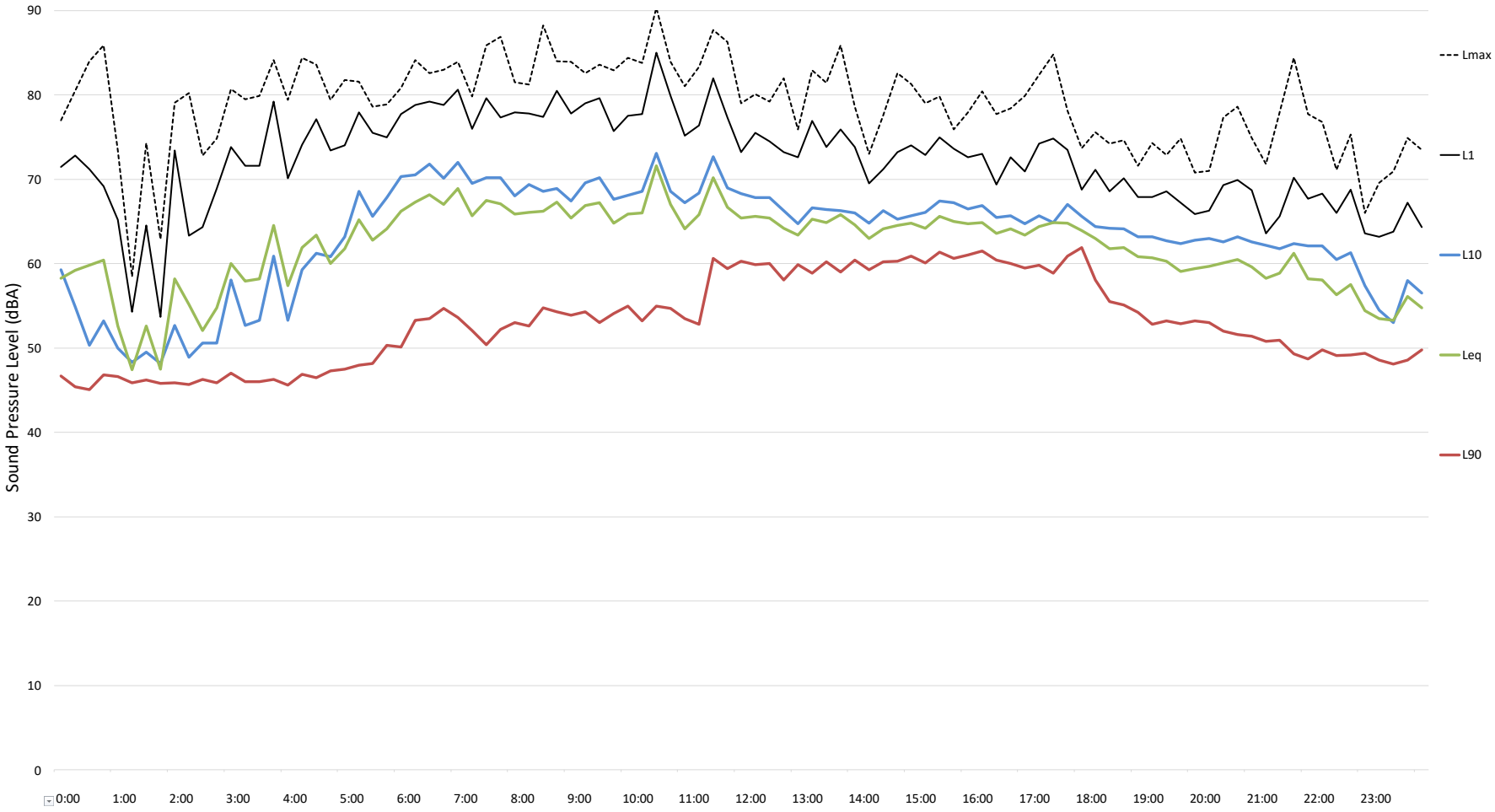
Logger Location: At proposed setback facing Pacific Highway to measure traffic noise

PKA Acoustic Consulting

	Daytime 07:00 - 18:00 Measured	Evening 18:00 - 22:00 Measured	Nighttime 22:00 - 07:00 Measured
L_{Aeq} dB	66.0	60.8	57.9
L_{A90} dB	52.9	50.9	48.0

11-04-2018 Wednesday

Existing Ambient Noise Levels (dBA)



11113 Ulladulla Health One

Project Address: 82 South Street, Ulladulla

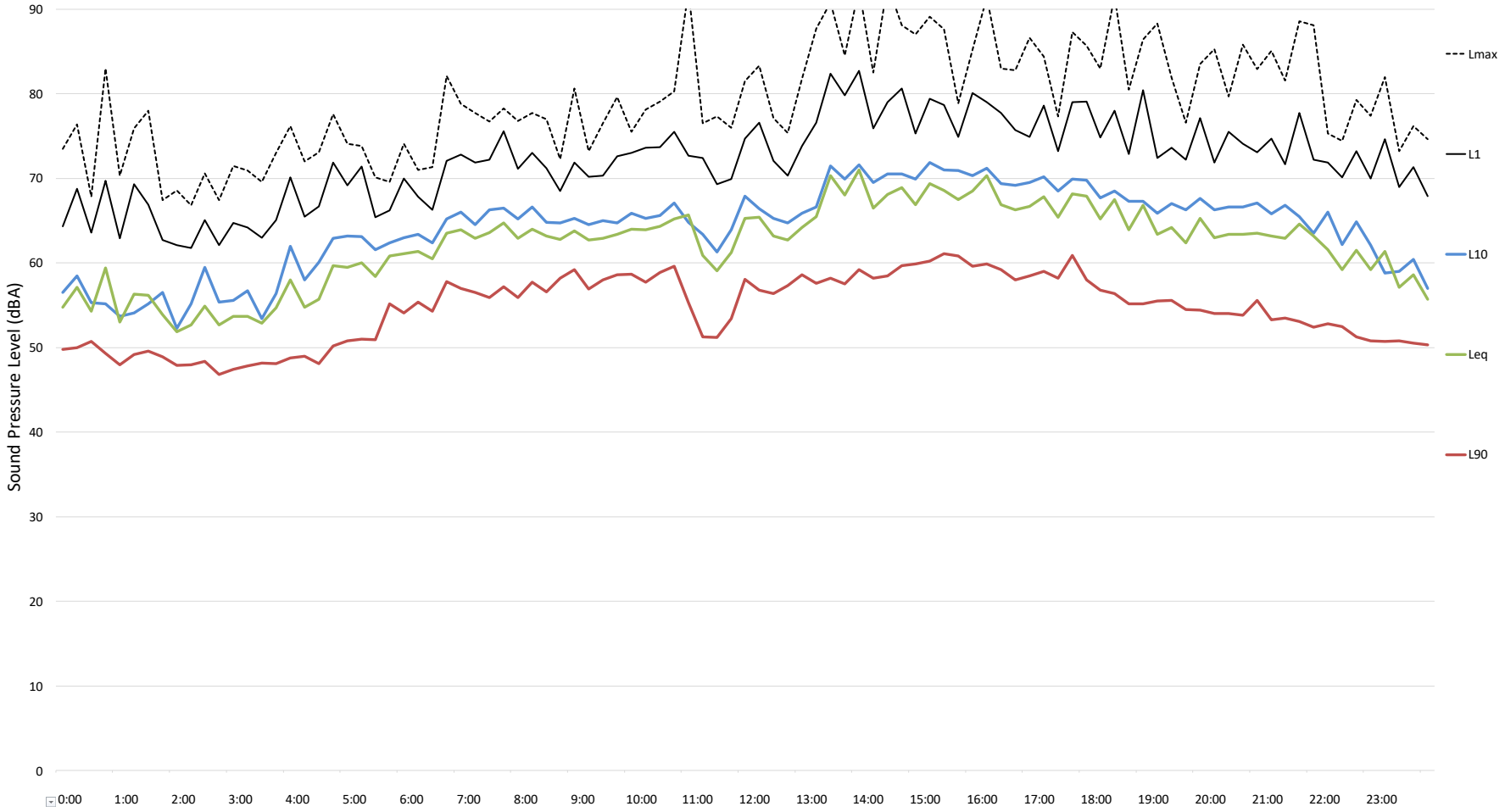
Logger Location: At proposed setback facing Pacific Highway to measure traffic noise

PKA Acoustic Consulting

	Daytime 07:00 - 18:00 Measured	Evening 18:00 - 22:00 Measured	Nighttime 22:00 - 07:00 Measured
L_{Aeq} dB	66.2	64.8	62.7
L_{A90} dB	55.9	53.4	49.0

12-04-2018 Thursday

Existing Ambient Noise Levels (dBA)



11113 Ulladulla Health One

Project Address: 82 South Street, Ulladulla

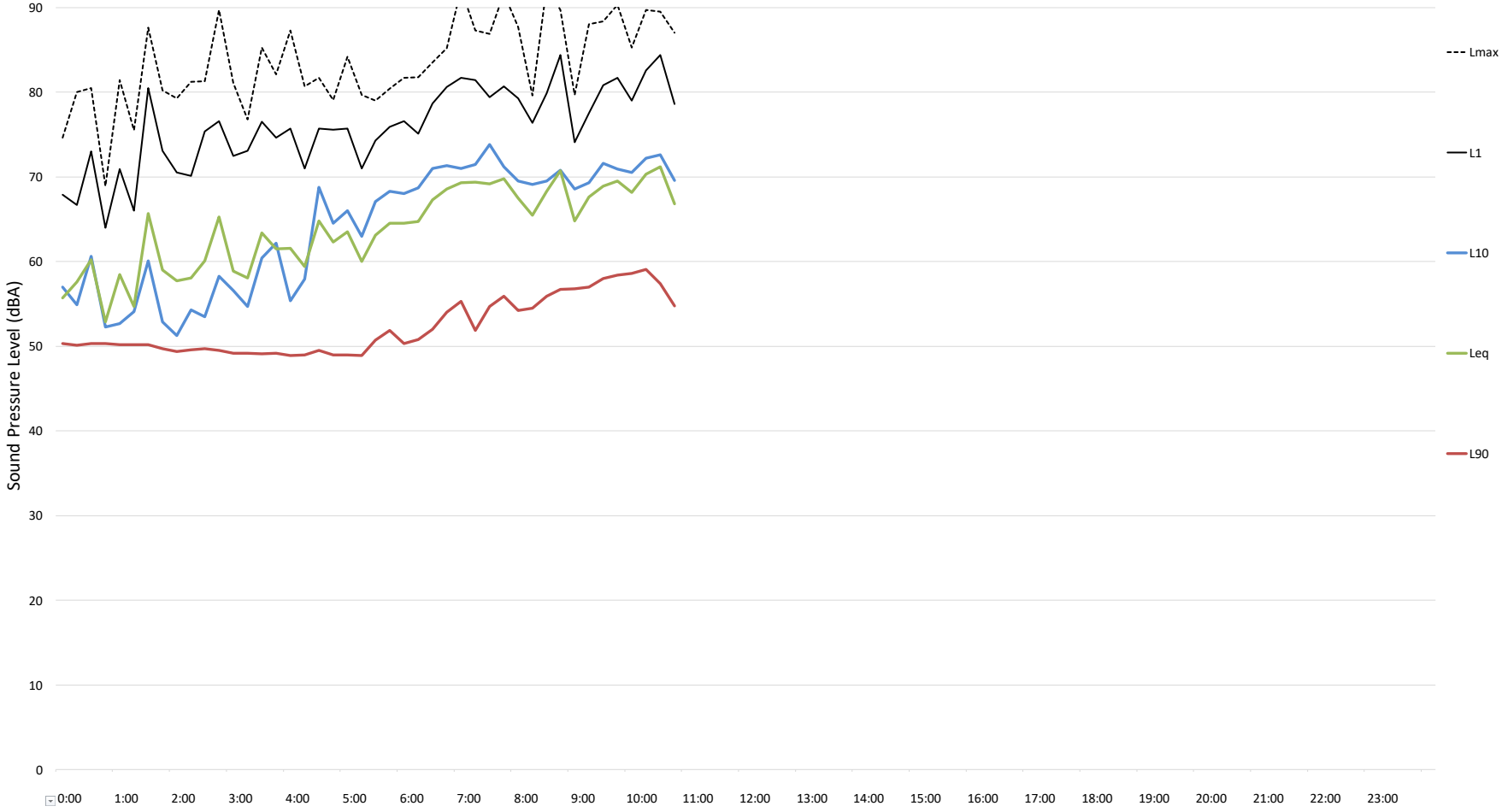
Logger Location: At proposed setback facing Pacific Highway to measure traffic noise

PKA Acoustic Consulting

	Daytime 07:00 - 18:00 Measured	Evening 18:00 - 22:00 Measured	Nighttime 22:00 - 07:00 Measured
L_{Aeq} dB			
L_{A90} dB			

13-04-2018 Friday

Existing Ambient Noise Levels (dBA)



PKA ACOUSTIC CONSULTING

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