



Ordinary Meeting of Council

28 September 2022

**UNDER SEPARATE COVER
ATTACHMENTS**

ITEM 9.7

**QUEANBEYAN-PALERANG REGIONAL COUNCIL
ORDINARY MEETING OF COUNCIL**

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QUEANBEYAN-PALERANG REGIONAL COUNCIL

Council Meeting Attachment

28 SEPTEMBER 2022

ITEM 9.7 EDWIN LAND PARKWAY NOISE ASSESSMENT

ATTACHMENT 1 ELP POST CONSTRUCTION NOISE REPORT 2020

POST-CONSTRUCTION NOISE ASSESSMENT

Edwin Land Parkway, Jerrabomberra

Prepared for:

Queanbeyan-Palerang Regional Council
PO Box 90
QUEANBEYAN NSW 2620



SLR Ref: 670.11066-R01
Version No: -v2.2
January 2020

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BASIS OF REPORT

This report has been prepared by SLR Consulting Australia Pty Ltd with all reasonable skill, care and diligence, and taking account of the timescale and resources allocated to it by agreement with Queanbeyan-Palerang Regional Council (the Client). Information reported herein is based on the interpretation of data collected, which has been accepted in good faith as being accurate and valid.

This report is for the exclusive use of the Client. No warranties or guarantees are expressed or should be inferred by any third parties. This report may not be relied upon by other parties without written consent from SLR

SLR disclaims any responsibility to the Client and others in respect of any matters outside the agreed scope of the work.

DOCUMENT CONTROL

Reference	Date	Prepared	Checked	Authorised
670.11066-R01-v2.2	13 January 2020	David Perry/Matthew Bryce	Matthew Bryce	Matthew Bryce
670.11066-R01-v2.1	18 December 2019	David Perry	Matthew Bryce	Matthew Bryce
670.11066-R01-v2.0	6 August 2019	David Perry	Matthew Bryce	Matthew Bryce
670.11066-R01-v1.0	25 July 2019	David Perry	Matthew Bryce	Matthew Bryce

EXECUTIVE SUMMARY

Post construction noise assessment of road noise emissions from the Edwin Land Parkway (ELP) in Queanbeyan, NSW is presented in this report (670.11066-R01-v2.0 20190806).

Road traffic noise levels have been considered in relation to criteria within the Roads and Maritime Service (RMS) *Road Noise Policy* (RNP).

The assessment shows that based on current traffic volumes, 13 properties are expected to experience road traffic noise levels higher than the RNP criteria during the daytime period, with 8 of those properties also likely to exceed the criteria during the night-time period, i.e. road noise at 5 properties would exceed the criteria during the daytime period only.

The assessment shows that based on projected future ELP traffic volumes for the Year 2022, 14 properties are expected to experience road traffic noise levels higher than the RNP criteria during the daytime period, with 9 of those properties also likely to exceed the criteria during the night-time period, i.e. road noise at 5 properties would exceed the criteria during the daytime period only.

The predicted noise levels at several properties were higher than the RNP criteria by a margin of less than 2 dBA, which is generally not considered as an exceedance. Those properties have not been included in the counts shown above.

Exceedances of up to 9 dBA were predicted at residences east of Stringybark Drive, generally at the upper floor of two-storey properties where direct line-of-sight to the road traffic occurs.

It may be reasonable and feasible to reduce road traffic noise to compliant levels by way of noise barriers at single-storey properties that are located close to each other.

A summary of exceedances with respect to the relevant NSW *Road Noise Policy* (RNP) criteria can be found in **Section 8**.

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1 Introduction

SLR Consulting Australia Pty Ltd (SLR) was commissioned by the Queanbeyan-Palerang Regional Council (QPRC) to undertake a post-construction noise assessment and develop a future years' model of the road noise impacts from Edwin Land Parkway (ELP) in Queanbeyan, NSW.

Previous noise assessments conducted by SLR in 2009 and 2013, concluded that noise levels from the ELP at adjacent properties were within the noise limits of the NSW *Road Noise Policy* (RNP).

It is understood that the QPRC has received complaints relating to road noise from occupants of those properties.

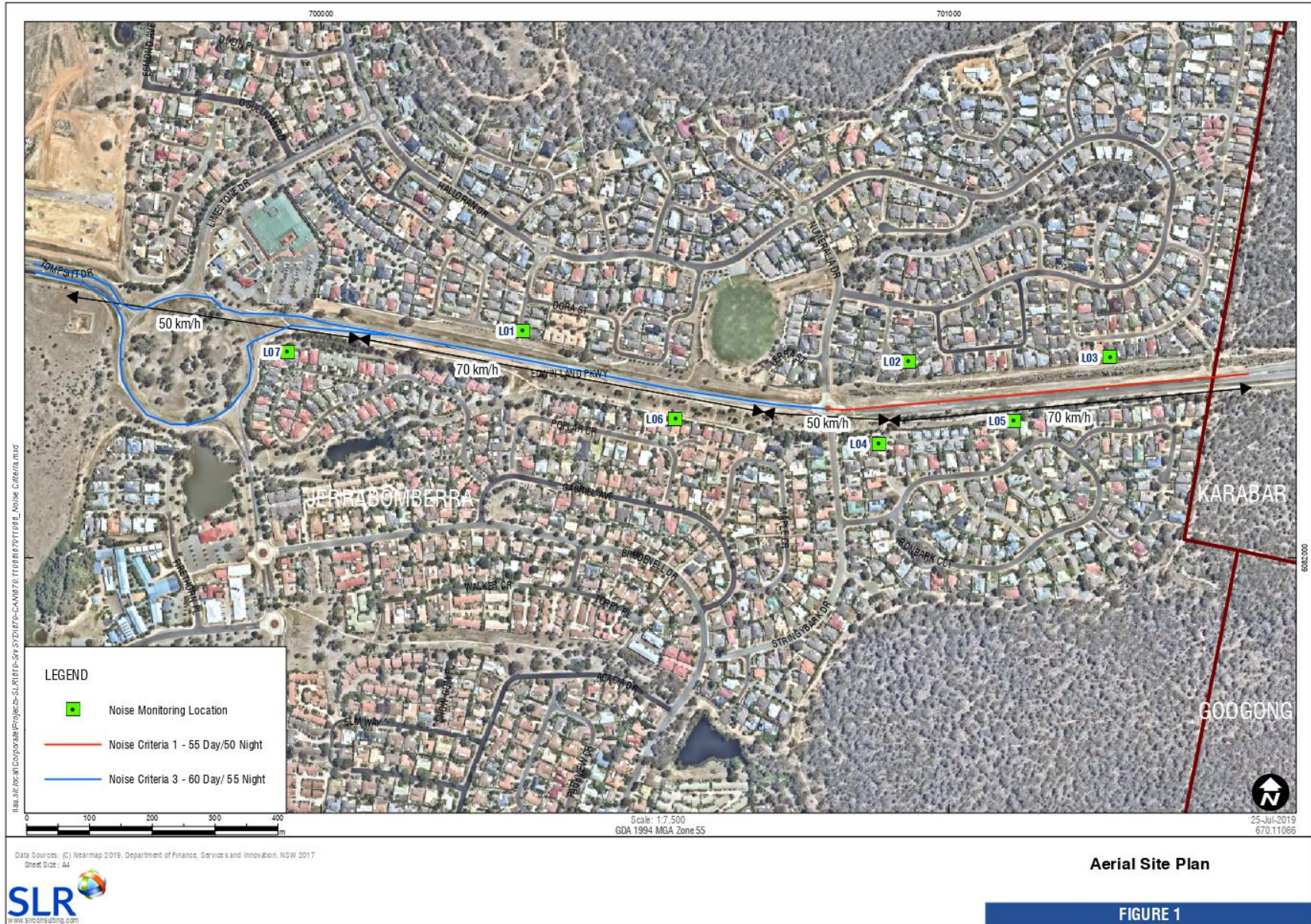
The purpose of this assessment was to determine if properties adjacent to ELP comply with the NSW Road Noise Policy for the current year, 2019 and also for the year 2022, which will be 10 years post-construction of the ELP.

A description of the acoustical terminology used in this report is provided in **Appendix A**.

2 Site Description

Edwin Land Parkway is a key sub-arterial road in the Queanbeyan road network that connects Queanbeyan to the suburb of Jerrabomberra and then on to Canberra, ACT. The extent of this assessment covers all properties adjacent to the ELP, the "Jerra Circle", and Tomsitt Drive as shown in **Figure 1**.

The ELP is a two-lane carriageway with speed limits ranging from 50 km/h to 70 km/h. The land use adjacent to the ELP is generally residential. It is understood that the ELP road surface is dense-graded asphalt (DGA).



3 Assessment Criteria

The NSW *Road Noise Policy* (RNP) provides assessment criteria for residential land uses for particular types of road categories.

The ELP is categorised as a sub-arterial road and the land use types and assessment criteria as described in the RNP applicable to the project area are shown in **Table 1**.

Table 1 RNP Assessment Criteria: Sub-Arterial Road

Section of ELP	Type of Project/Land use	Assessment Criteria	
		Day (7:00 am to 10:00 pm) dBA LAeq,(15hour)	Night (10:00 pm to 7:00 am) dBA LAeq,(9hour)
Tomsitt Drive to Stringybark Drive	Existing residences affected by additional traffic on existing road	60	55
East of Stringybark Drive	Existing residences affected by noise from a new road	55	50

4 Existing Noise Environment

4.1 Road Traffic Noise Survey and Monitoring Locations

Noise monitoring was conducted to establish the current road traffic noise levels at representative receptor locations with respect to the applicable RNP noise limits and also for noise model validation purposes.

Unattended monitoring was conducted between Saturday 16 February 2019 and Tuesday 12 March 2019 at the seven (7) locations shown in **Figure 1**.

Monitoring locations were selected to represent the residences exposed to noise from the ELP.

The monitoring was conducted using noise “loggers” programmed to record A-weighted, fast response noise levels in terms of the LAeq parameter in continuous 15-minute intervals.

The noise loggers were placed one metre from the most exposed facade of the dwelling. Details of the noise loggers and monitoring periods are shown in **Table 2**.

Table 2 Unattended Noise Monitoring Equipment Details

Location	Address	Logger Type	Serial No.	Monitoring Period
L01	11 Unwin Avenue, Jerrabomberra	ARL 316	16-203-508	16 February 2019 – 1 March 2019
L02	9 Coora Place, Jerrabomberra	ARL 316	16-306-044	16 February 2019 – 1 March 2019
L03	24 Pannamena Crescent, Jerrabomberra	SVAN 957	20665	1 March 2019 – 12 March 2019
L04	15 Burgan Grove, Jerrabomberra	SVAN 957	20665	16 February 2019 – 1 March 2019
L05	4 Bluebell Glen, Jerrabomberra	SVAN 957	20668	16 February 2019 – 1 March 2019
L06	1 Birch Way, Jerrabomberra	SVAN 957	20664	1 March 2019 – 12 March 2019
L07	72 Rosewood Glen, Jerrabomberra	SVAN 957	21887	1 March 2019 – 12 March 2019

All items of acoustic instrumentation were designed to comply with Australian Standard AS IEC 61672.1-2004 *Electroacoustics-Sound level meters-Specifications* and AS IEC 60942 2004 *Electroacoustics – Sound calibrators* and carried appropriate and current NATA calibration certificate.

Reference field checks of the logger calibration were performed prior to and following the monitoring, with the drift in calibration not exceeding ± 1 dB. Calibration was performed with a G.R.A.S Class 1 Calibrator (serial number 279049) or a Brüel & Kjær Type 4231 Calibrator (serial number 2412472).

4.2 Noise Monitoring Results

The logger results were analysed in accordance to obtain the daily noise levels for the day and night periods as presented in **Table 3**. The monitoring results are presented in the form of daily statistical noise plots in **Appendix B**.

SLR obtained weather data from the Bureau of Meteorology (BOM) automated weather station located at Canberra Airport (Station ID: 070351, Lat: -35.31, Lon: 149.20) for the period of noise monitoring.

The weather during the survey was generally dry with calm to light winds. Such conditions would be considered suitable for the purpose of conducting long-term noise measurements in the context of the RNP. Any data affected by adverse weather conditions including wind in excess of 5 m/s and rain exceeding 0.5 mm, has been removed.

Additionally, periods identified with extraneous noise are identified on the charts and have been excluded from the analysis.

Table 3 Measured Road Traffic Noise Levels

Location	Address	Measured Noise Level	
		Day (7:00 am to 10:00 pm) dBA LAeq,(15hour)	Night (10:00 pm to 7:00 am) dBA LAeq,(9hour)
L01	11 Unwin Avenue, Jerrabomberra	53.4	49.0
L02	9 Coora Place, Jerrabomberra	52.9	46.1
L03	24 Pannamena Crescent, Jerrabomberra	46.5	40.0
L04	15 Burgan Grove, Jerrabomberra	50.3	44.2
L05	4 Bluebell Glen, Jerrabomberra	50.0	44.8
L06	1 Birch Way, Jerrabomberra	52.3	45.7
L07	72 Rosewood Glen, Jerrabomberra	49.6	41.9

5 Existing Road Traffic Volumes

A traffic counting survey was undertaken concurrently with the noise monitoring survey to establish the number and composition of vehicles utilising the ELP. The traffic data will be used to validate the noise modelling results and for extrapolation of the future traffic volumes.

The traffic count data used for validation has been summarised in **Table 4** along with the traffic composition in terms of light vehicles and heavy vehicles.

Table 4 Traffic Data used for Noise Model Verification

Traffic Counter Location	2019 Average Daily Vehicle Traffic Count				Traffic Speed, km/h
	Day		Night		
	Light Vehicle	Heavy Vehicle	Light Vehicle	Heavy Vehicle	
ELP Jerra roundabout – Stringybark/Numeralia Drive	6,691	464	628	43	70
ELP Stringybark/Numeralia Drive - Cooma Road	7,655	503	635	51	70
Tomsitt Drive (East Bound) Jerra roundabout – ELP	8,041	384	524	31	50
Tomsitt Drive West Bound ELP to Jerra roundabout	7,965	398	941	37	50

6 Road Traffic Noise Model Validation

6.1 Modelling Methodology

Noise modelling of the study area was carried out using the Calculation of Road Traffic Noise (CoRTN) prediction algorithms incorporated in SoundPLAN (Version 8). The model was based on the earlier model established by SLR for the previous assessments.

The modelling incorporates traffic volume and composition (percentage of light and heavy vehicles), type of road surface, vehicle speed, road gradient, reflections off significant structures, noise reduction due to ground absorption or shielding from physical noise barriers.

The output of CoRTN, which in terms of the LA10 noise level, was modified to calculate the relevant daytime LAeq(15hour) and night-time LAeq(9hour) road traffic noise levels at the noise sensitive receivers, as required by the RNP.

As is required in road traffic noise assessments in NSW, the traffic noise source line as modelled in SoundPLAN has also been modified to incorporate four effective noise source lines for each carriageway. This is to account for the light vehicles and the three distinct noise emission points associated with heavy vehicles (representing the tyres, engine and the exhaust, each with different noise emission levels and different heights).

The noise modelling parameters used in the model validation are detailed in **Table 5**.

Table 5 Operational Noise Model Inputs and Parameters

Input Parameter	Source of Data
Ground topography	The noise model includes a 'digital ground model' which is an accurate 3D representation of the terrain in the operational study area. The ground model was made from LIDAR point cloud data.
Buildings	Buildings can provide screening to more distant locations which is dependent on the building height. The buildings were generated from a combination of LIDAR, aerial photography and site inspections. The heights of buildings were determined from LIDAR point cloud data.
Traffic volumes	Existing traffic volumes were counted at the same time as the ambient noise monitoring was completed. This data was used to model the existing situation and validate the 2019 road traffic noise model. Refer to Section 5 .
Source heights and source correction	Vehicles generally emit road traffic noise at four source heights. These are represented in the noise model by the following: <ul style="list-style-type: none"> • Cars (at 0.5 m height with a source correction of 0.0 dBA) • Truck tyres (at 0.5 m height with a source correction of -5.4 dBA) • Truck engines (at 1.5 m height with a source correction of -2.4 dBA) • Truck exhausts (at 3.6 m height with a source correction of -8.5 dBA)
Road surface type	CoRTN applies an adjustment according to the type of road surface. The source corrections applicable for the roads within the project model are: <ul style="list-style-type: none"> • Tomsitt Drive to Stringybark Drive – 7 mm chip seal, +2.0 dBA • East of Stringybark Drive – Dense graded asphalt, 0.0 dBA
Ground absorption	Noise levels at receivers can be influenced by the type of ground between the source of noise and the receiver. Soft ground such as vegetation can reduce noise to a greater degree than hard ground such as concrete or road surfaces. A ground absorption factor of 0.5 has been used in the noise model.
General adjustments	The model also includes an adjustment of -3 dBA to the CoRTN predicted levels which are in terms of the LA10, to establish the road traffic noise level in terms of the LAeq parameter.

6.2 Noise Model Validation

Validation of the noise model was undertaken by comparing the calculated ELP noise levels from the model (incorporating the inputs described above) against the noise monitoring results at the validation sites (L01, L02, L04, and L05).

The calculation locations in the noise model were positioned to represent the location and height of the noise logger and microphone at the monitoring locations. The calculated road traffic noise levels are shown in **Table 6** together with the measured road traffic noise levels.

Table 6 Model Validation based on Measured and Modelled Road Traffic Noise Levels

Location	Road Traffic Noise Level					
	Daytime, dBA LAeq(15hour)			Night-time, dBA LAeq(9hour)		
	Measured	Predicted	Difference	Measured	Predicted	Difference
L01	53.4	55.0	1.6	49.0	47.1	-1.9
L02	52.9	54.8	1.9	46.1	47.5	1.4
L03	50.3	51.9	1.6	44.2	44.6	0.4
L04	50.0	51.7	1.7	44.8	44.5	-0.3
	Median		1.7	Median		0.4

The Roads and Maritime Services Model Validation Guideline notes that noise prediction modelling has some accuracy limitations and will commonly produce acceptable errors of approximately 2 dBA. It is common and appropriate to adopt that value to determine the validation, or otherwise, of the noise modelling results.

The noise model predictions are within +/- 2 dBA of the measured noise levels at all logger locations and therefore the noise model would be considered validated.

7 Road Traffic Noise Modelling

The validated noise model was modified to incorporate the following scenarios to predict road traffic noise levels at the receptors adjacent to the ELP:

- 'Existing' scenario – the existing road traffic volumes for the year 2019
- 'Future' scenario – the projected road traffic volumes for the year 2022

Traffic volumes for the 'Future' scenario are projected by applying a 3% per year increase to the existing traffic volumes and are summarised below in **Table 7**.

Table 7 Projected Traffic Data used for 'Future' 2022

Traffic Counter Location	2022 Average Daily Vehicle Traffic Count				Traffic Speed, km/h
	Day		Night		
	Light Vehicle	Heavy Vehicle	Light Vehicle	Heavy Vehicle	
ELP – Jerra roundabout to Stringybark/Numeralia Drive	7,311	507	686	47	70
ELP – Stringybark/Numeralia Drive to Cooma Road	8,365	550	694	56	70
Tomsitt Drive (East Bound (Jerra roundabout – ELP))	8,787	420	573	34	50
Tomsitt Drive West Bound (ELP to Jerra roundabout)	8,704	435	1,028	40	50

8 Noise Modelling Results

Detailed results of the predicted noise levels for the 'Existing' (Year 2019) and 'Future' (Year 2022) scenarios are presented in **Appendix C** and **Appendix D** for the two sections of ELP considered, ie Tomsitt Drive to Stringybark Drive and East of Stringybark Drive, respectively.

The predicted noise levels have also been presented as noise contour maps in **Appendix E** and **Appendix F** for Tomsitt Drive to Stringybark Drive and East of Stringybark Drive, respectively.

A summary of the noise modelling results in terms of the number of properties where the RNP criteria was exceeded for the 'Existing' and 'Future' scenarios is presented in **Table 8**.

Table 8 Summary of Results: Number of Properties with Road Noise Levels above RNP Criteria

Road Segment	Number of Properties with Exceedances ¹			
	Existing – 2019		Future – 2022	
	Daytime	Night-time	Daytime	Night-time
Tomsitt Drive to Stringybark Drive	5 (2)	1 (4)	5 (2)	2 (3)
East of Stringybark Drive	8 (4)	7 (0)	9 (5)	7 (0)
Total	13 (6)	8 (4)	14 (7)	9 (3)

1. The number of properties where the road traffic noise level was predicted to exceed the criteria by 2 dBA or less is shown in brackets. Such an exceedance is not considered an "exceedance".

Analysis of the results indicates that many of the exceedances were by less than 2 dBA, which in terms of noticeability and modelling acceptable error limitations, would generally be considered negligible. The RNP also considers such exceedances as negligible.

The highest exceedance was estimated to be 9 dBA, which tended to occur at double-storey properties, where the floor height enables direct line-of-sight with the road. More exceedances were predicted at dwellings east of Stringybark Drive where the lower "new road" criteria applied (as per the original road traffic noise assessment).

Many of the exceedances were predicted at receptors in groups or close to each other, meaning that the use of noise barriers to reduce road traffic noise may be reasonable and feasible.

9 Conclusion

SLR was engaged by the QPRC to undertake a post-construction noise assessment of the Edwin Land Parkway (ELP) in Queanbeyan, NSW.

The assessment involved:

- undertaking monitoring of the existing Year 2019 road traffic noise at several residential locations along the ELP alignment;
- updating the road traffic noise model utilised for earlier assessments conducted by SLR in 2009 and 2013 to include Year 2019 road traffic volumes;
- using the updated road traffic noise model to predict noise from traffic on the ELP in the Year 2022;

-
- establish the road traffic noise levels at the residential receptors nearest to the ELP alignment; and
 - provide the number of residences where the current year and year 2022 traffic noise level would exceed the traffic noise criteria.

The assessment indicated that the Year 2022 road traffic noise levels may exceed the RNP road traffic noise criteria at approximately 33 properties. Many of those exceedances (approximately 10), may be by a margin of less than 2 dBA. Some exceedances of up to 8 dBA were predicted, generally at the upper floor of two-storey properties where direct line-of-sight to the road traffic occurs.

It may be reasonable and feasible to reduce road traffic noise to compliant levels by way of noise barriers at single-storey properties that are located close to each other.

APPENDIX A

Acoustic Terminology

1. Sound Level or Noise Level

The terms ‘sound’ and ‘noise’ are almost interchangeable, except that ‘noise’ often refers to unwanted sound.

Sound (or noise) consists of minute fluctuations in atmospheric pressure. The human ear responds to changes in sound pressure over a very wide range with the loudest sound pressure to which the human ear can respond being ten million times greater than the softest. The decibel (abbreviated as dB) scale reduces this ratio to a more manageable size by the use of logarithms.

The symbols SPL, L or LP are commonly used to represent Sound Pressure Level. The symbol LA represents A-weighted Sound Pressure Level. The standard reference unit for Sound Pressure Levels expressed in decibels is 2×10^{-5} Pa.

2. ‘A’ Weighted Sound Pressure Level

The overall level of a sound is usually expressed in terms of dBA, which is measured using a sound level meter with an ‘A-weighting’ filter. This is an electronic filter having a frequency response corresponding approximately to that of human hearing.

People’s hearing is most sensitive to sounds at mid-frequencies (500 Hz to 4,000 Hz), and less sensitive at lower and higher frequencies. Different sources having the same dBA level generally sound about equally loud.

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 to 5 dB change corresponds to a small but noticeable change in loudness. A 10 dB change corresponds to an approximate doubling or halving in loudness. The table below lists examples of typical noise levels.

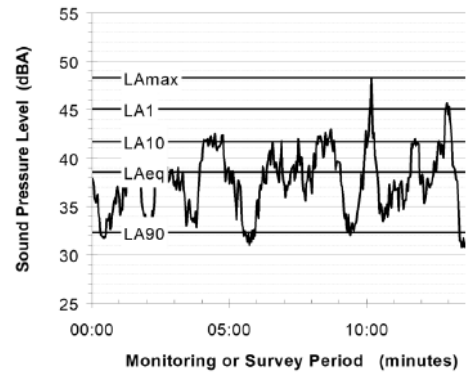
Sound Pressure Level (dBA)	Typical Source	Subjective Evaluation
130	Threshold of pain	Intolerable
120	Heavy rock concert	Extremely noisy
110	Grinding on steel	
100	Loud car horn at 3 m	Very noisy
90	Construction site with pneumatic hammering	
80	Kerbside of busy street	Loud
70	Loud radio or television	
60	Department store	Moderate to quiet
50	General Office	
40	Inside private office	Quiet to very quiet
30	Inside bedroom	
20	Recording studio	Almost silent

Other weightings (eg B, C and D) are less commonly used than A-weighting. Sound Levels measured without any weighting are referred to as ‘linear’, and the units are expressed as dB(lin) or dB.

3. Statistical Noise Levels

Sounds that vary in level over time, such as road traffic noise and most community noise, are commonly described in terms of the statistical exceedance levels LAN, where LAN is the A-weighted sound pressure level exceeded for N% of a given measurement period. For example, the LA1 is the noise level exceeded for 1% of the time, LA10 the noise level exceeded for 10% of the time, and so on.

The following figure presents a hypothetical 15 minute noise survey, illustrating various common statistical indices of interest.



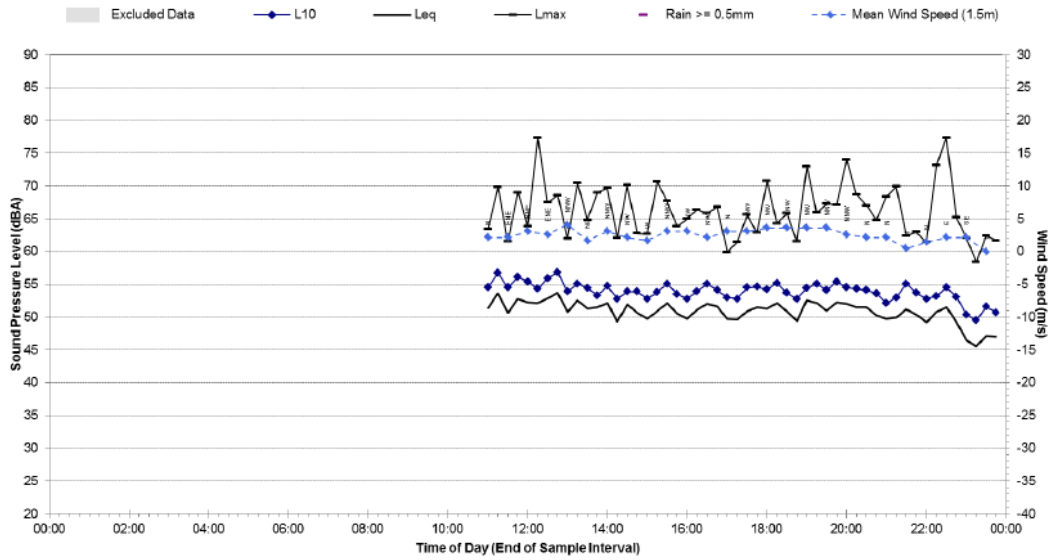
Of particular relevance, are:

- LA1 The noise level exceeded for 1% of the 15 minute interval.
- LA10 The noise level exceeded for 10% of the 15 minute interval. This is commonly referred to as the average maximum noise level.
- LA90 The noise level exceeded for 90% of the sample period. This noise level is described as the average minimum background sound level (in the absence of the source under consideration), or simply the background level.
- LAeq The A-weighted equivalent noise level (basically, the average noise level). It is defined as the steady sound level that contains the same amount of acoustical energy as the corresponding time-varying sound.

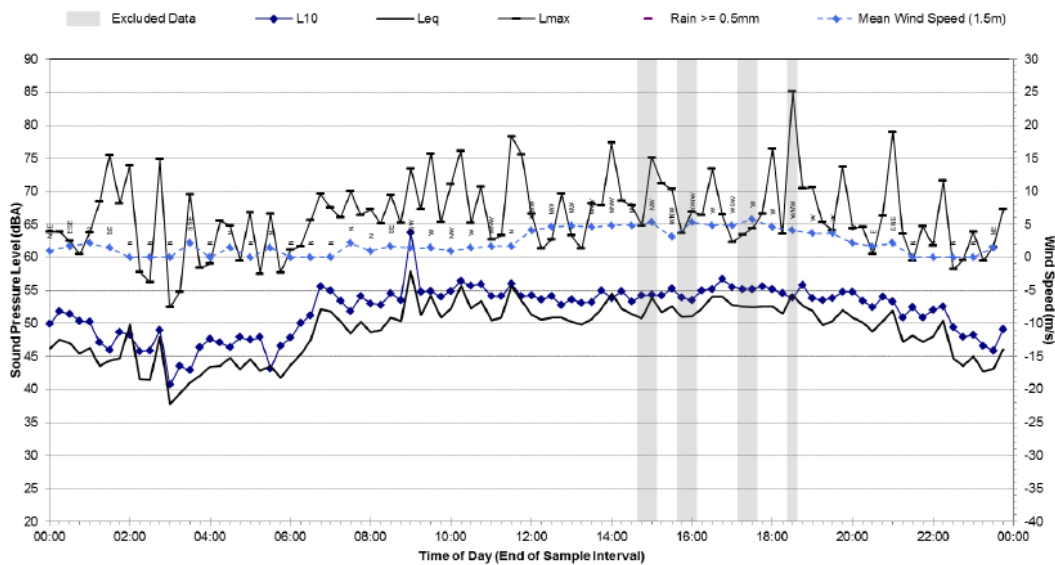
APPENDIX B

Road Traffic Noise Monitoring Results

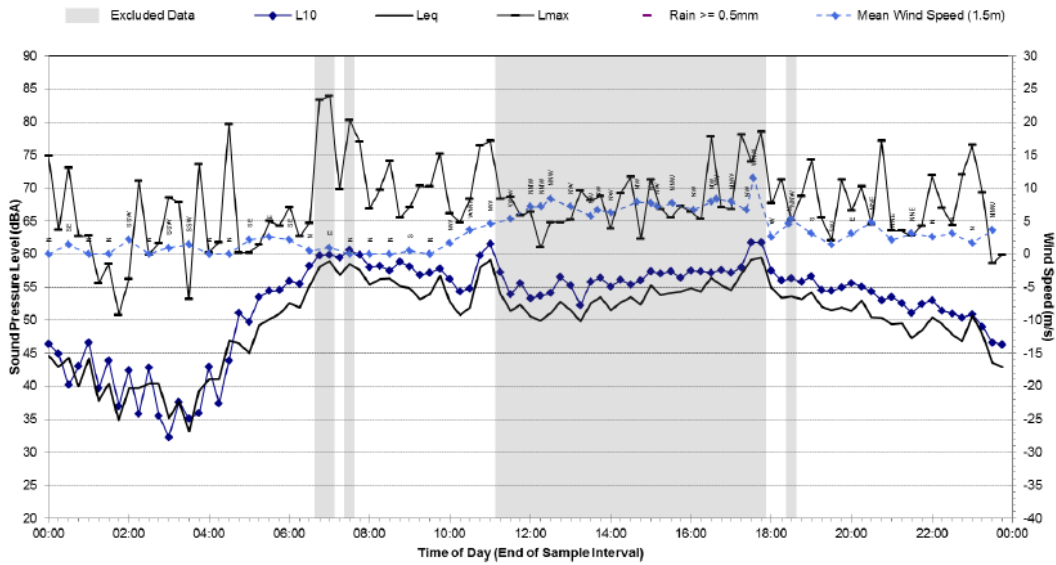
Statistical Ambient Noise Levels L01 - 11 Unwin St, Jerrabomberra - Saturday, 16 February 2019



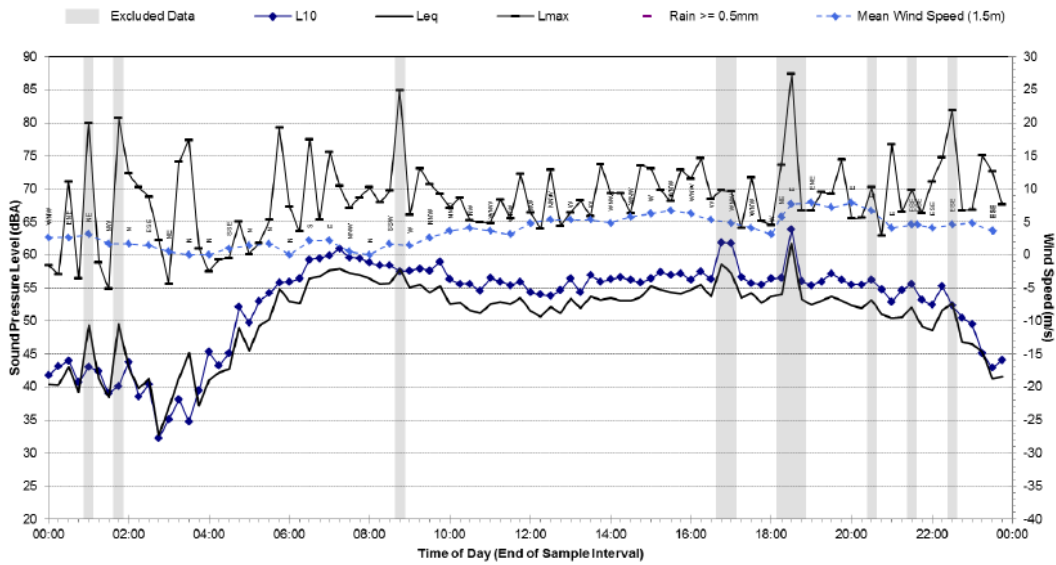
Statistical Ambient Noise Levels L01 - 11 Unwin St, Jerrabomberra - Sunday, 17 February 2019



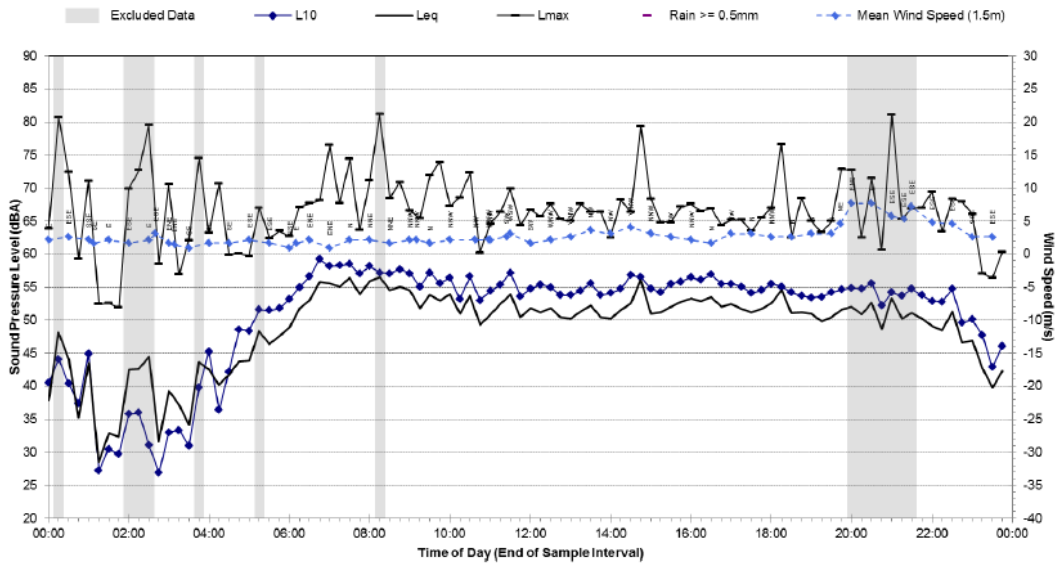
Statistical Ambient Noise Levels
L01 - 11 Unwin St, Jerrabomberra - Monday, 18 February 2019



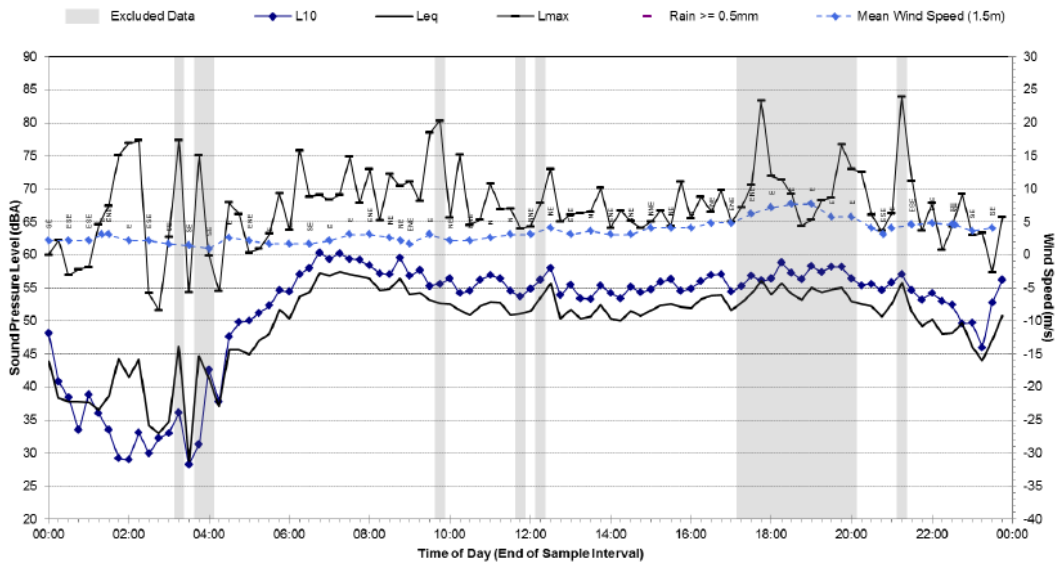
Statistical Ambient Noise Levels
L01 - 11 Unwin St, Jerrabomberra - Tuesday, 19 February 2019



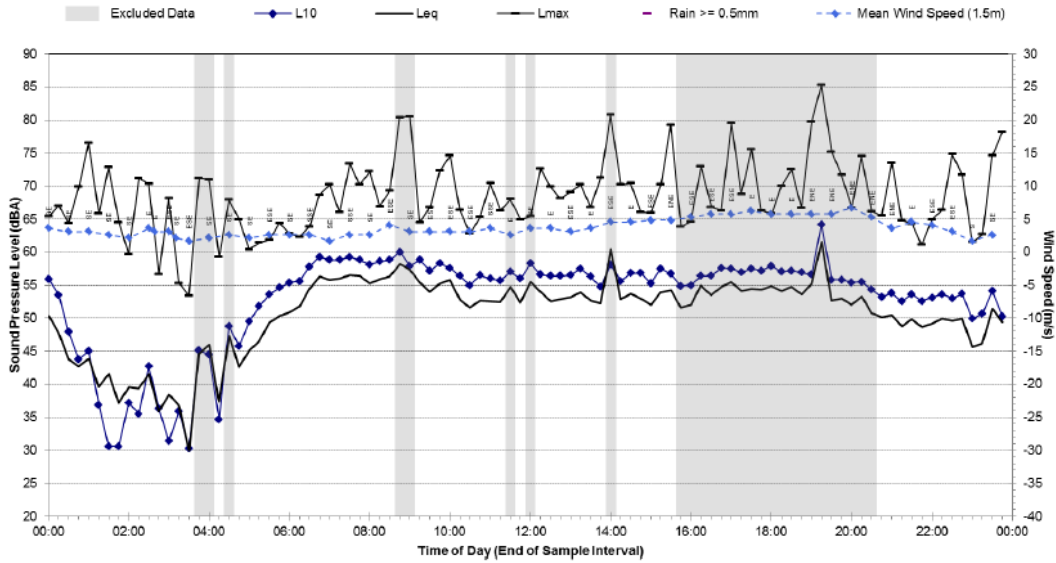
Statistical Ambient Noise Levels L01 - 11 Unwin St, Jerrabomberra - Wednesday, 20 February 2019



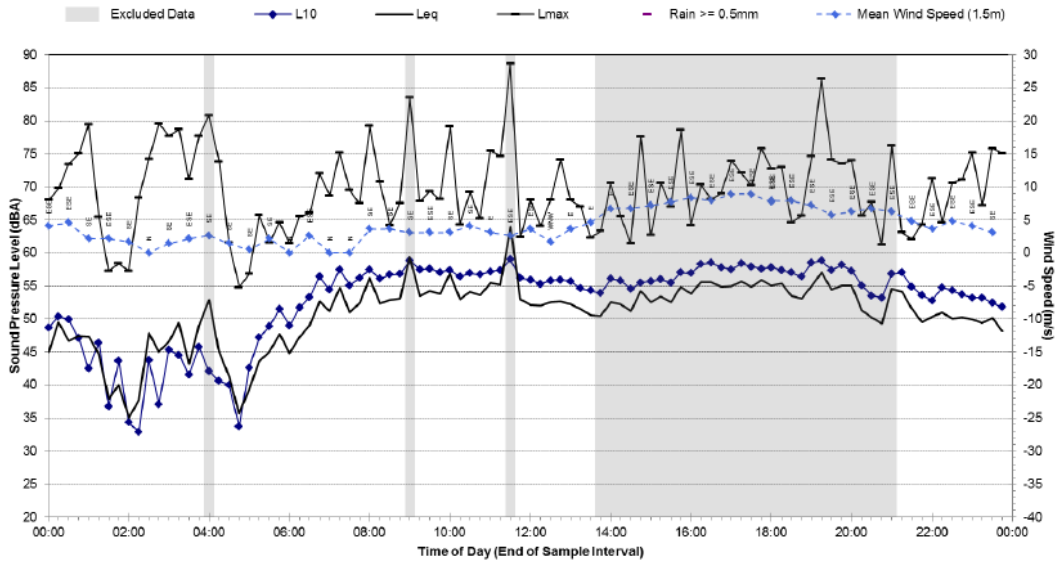
Statistical Ambient Noise Levels L01 - 11 Unwin St, Jerrabomberra - Thursday, 21 February 2019



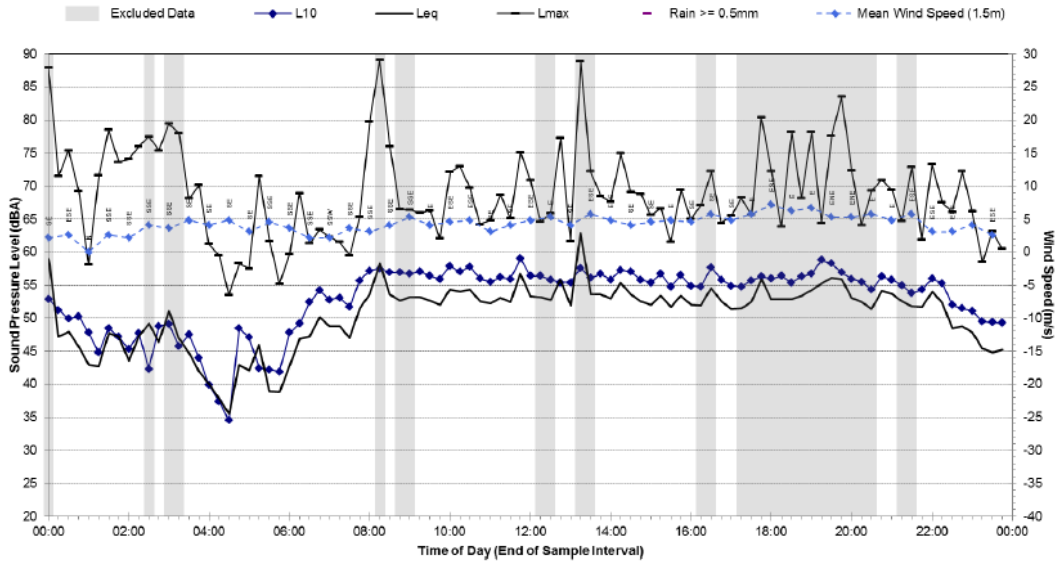
Statistical Ambient Noise Levels
 L01 - 11 Unwin St, Jerrabomberra - Friday, 22 February 2019



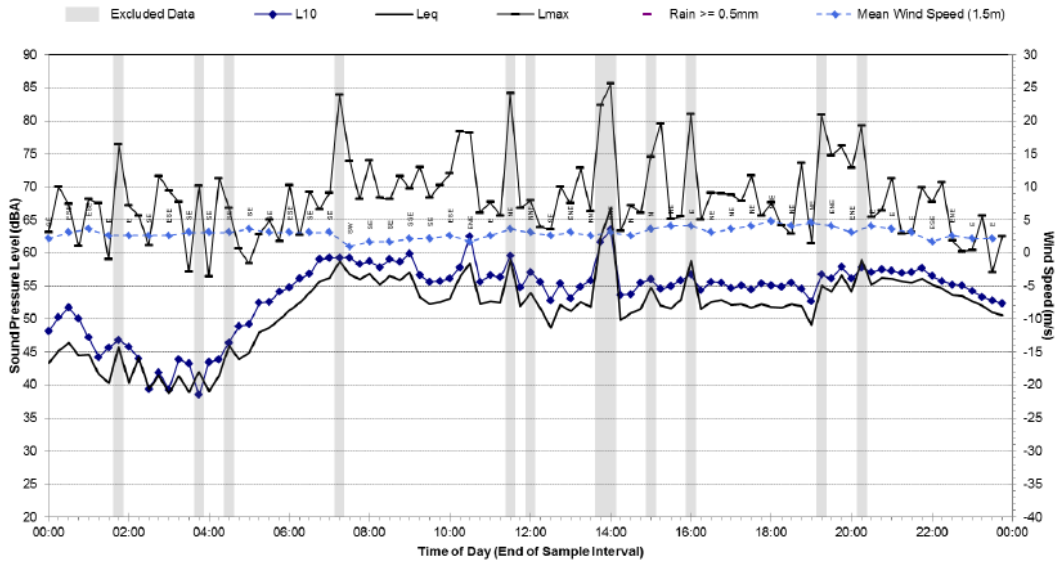
Statistical Ambient Noise Levels
 L01 - 11 Unwin St, Jerrabomberra - Saturday, 23 February 2019



Statistical Ambient Noise Levels L01 - 11 Unwin St, Jerrabomberra - Sunday, 24 February 2019

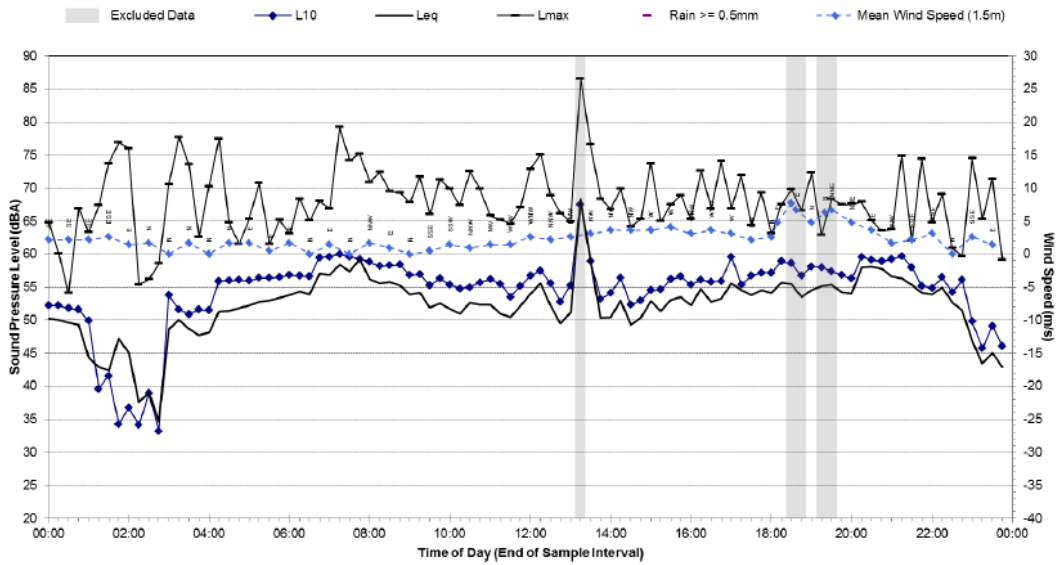


Statistical Ambient Noise Levels L01 - 11 Unwin St, Jerrabomberra - Monday, 25 February 2019



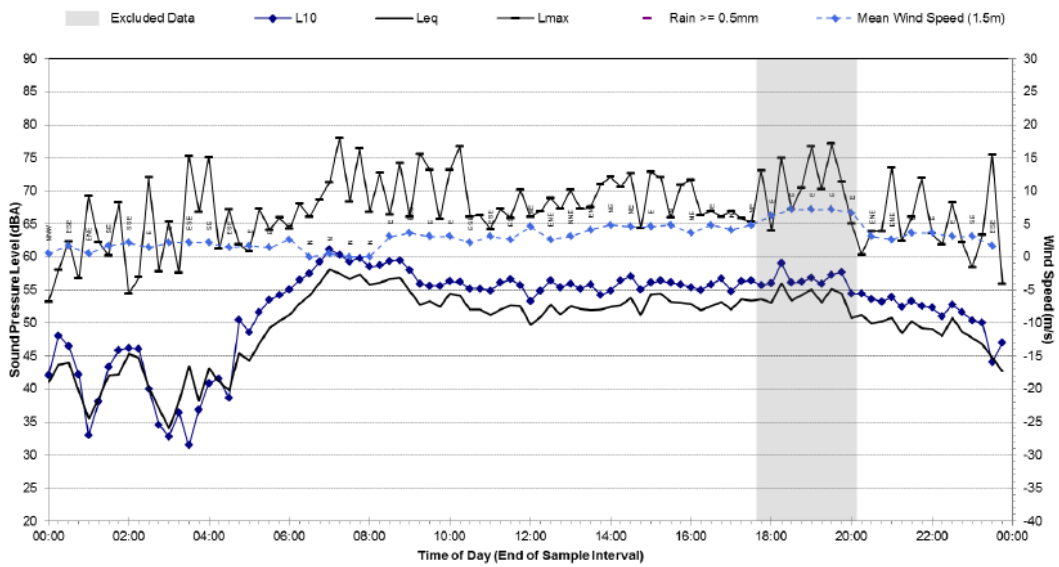
Statistical Ambient Noise Levels

L01 - 11 Unwin St, Jerrabomberra - Tuesday, 26 February 2019

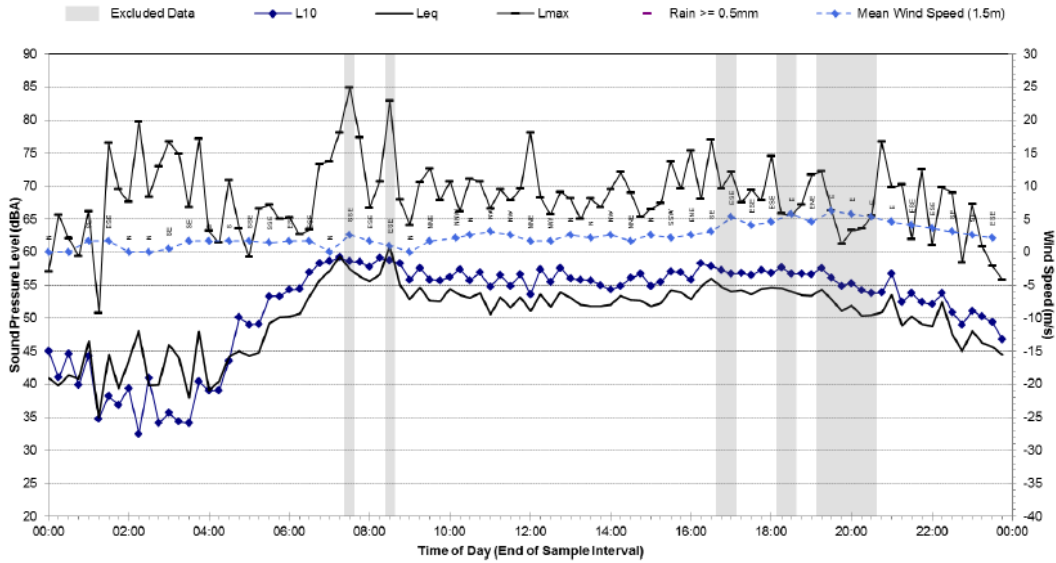


Statistical Ambient Noise Levels

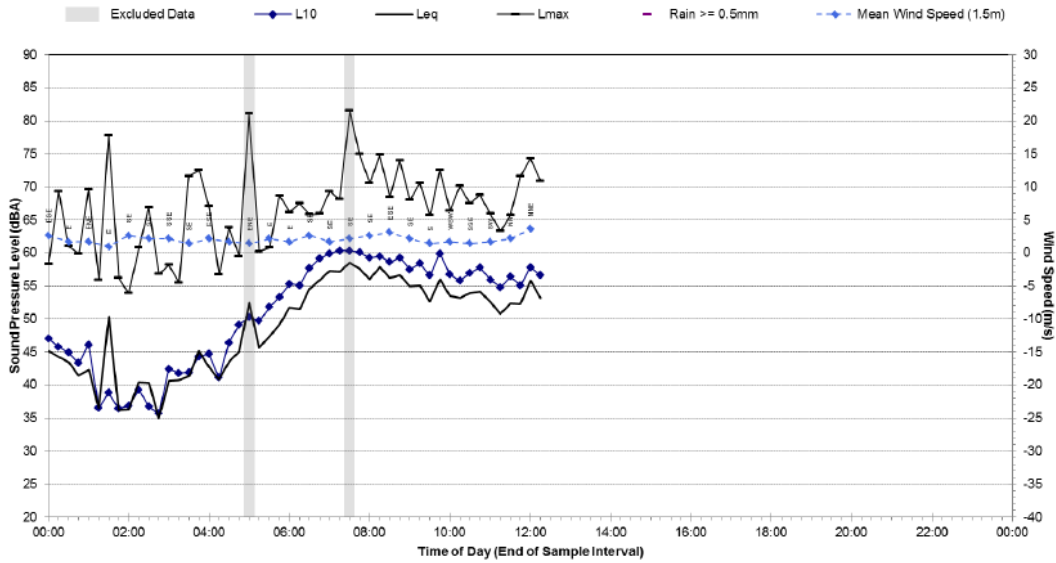
L01 - 11 Unwin St, Jerrabomberra - Wednesday, 27 February 2019



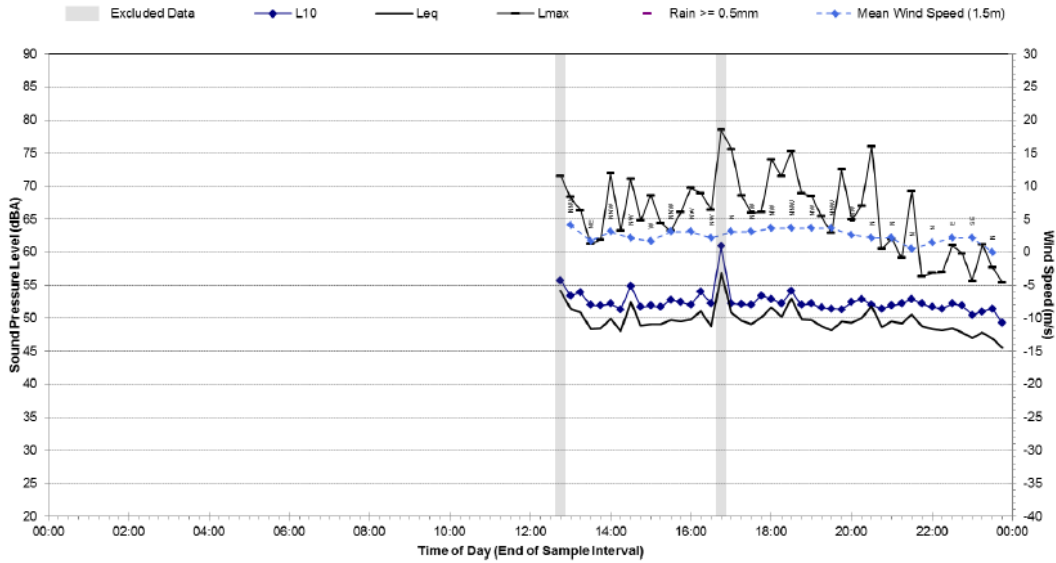
Statistical Ambient Noise Levels
 L01 - 11 Unwin St, Jerrabomberra - Thursday, 28 February 2019



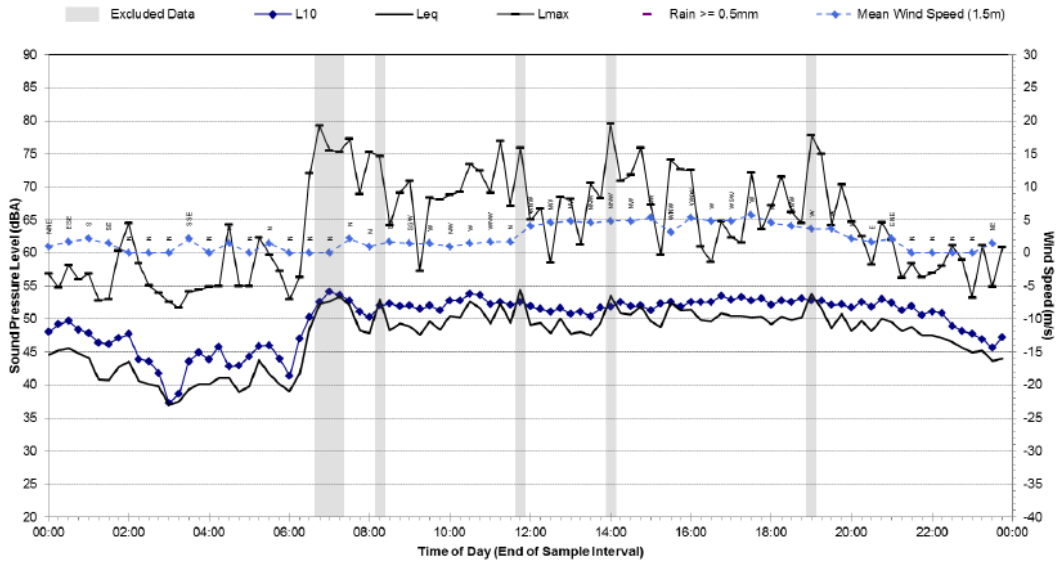
Statistical Ambient Noise Levels
 L01 - 11 Unwin St, Jerrabomberra - Friday, 1 March 2019



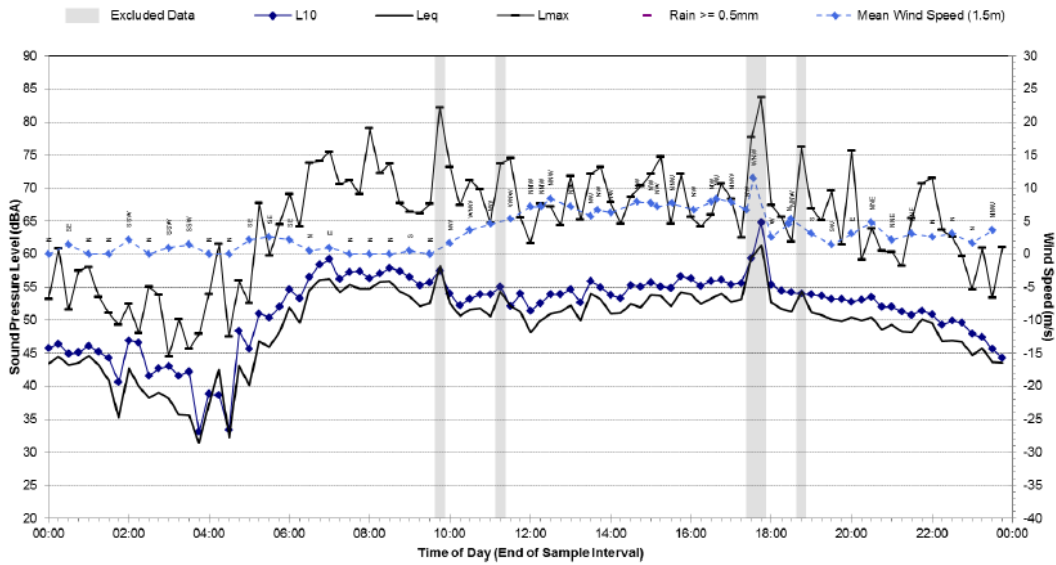
Statistical Ambient Noise Levels
L02 - 9 Coora Place, Jerrabomberra - Saturday, 16 February 2019



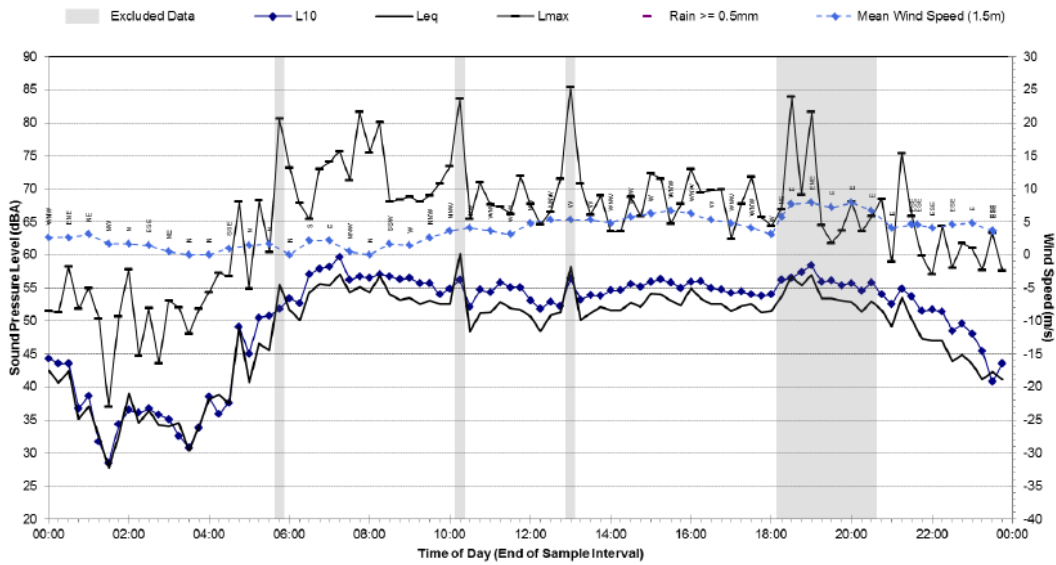
Statistical Ambient Noise Levels
L02 - 9 Coora Place, Jerrabomberra - Sunday, 17 February 2019



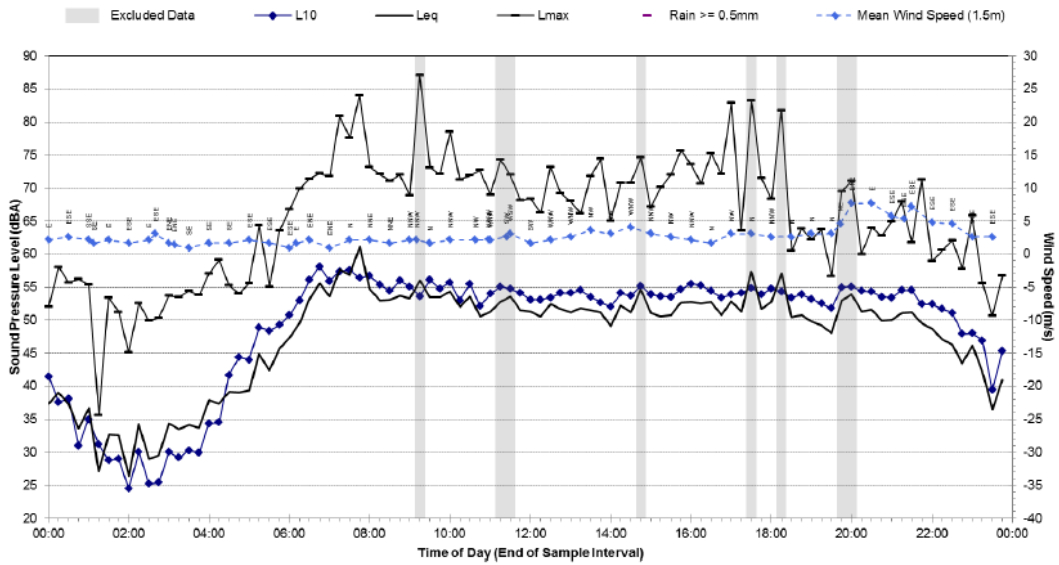
Statistical Ambient Noise Levels L02 - 9 Coora Place, Jerrabomberra - Monday, 18 February 2019



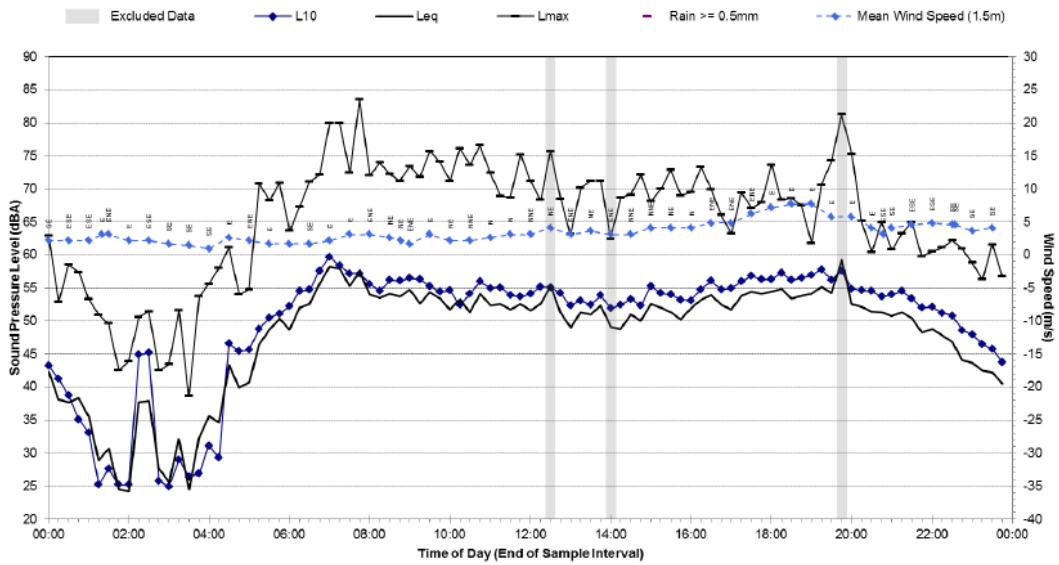
Statistical Ambient Noise Levels L02 - 9 Coora Place, Jerrabomberra - Tuesday, 19 February 2019



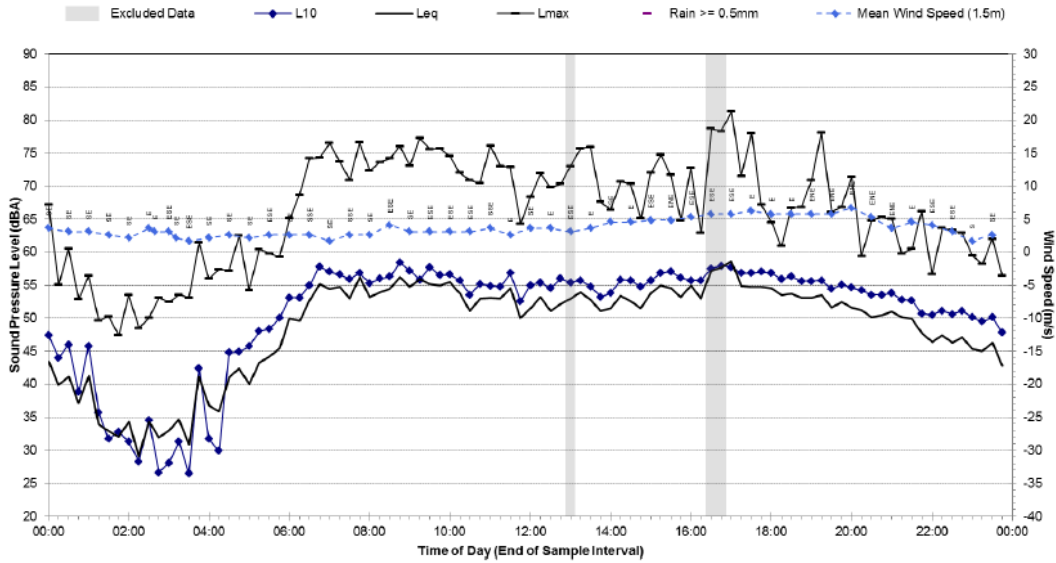
Statistical Ambient Noise Levels
L02 - 9 Coora Place, Jerrabomberra - Wednesday, 20 February 2019



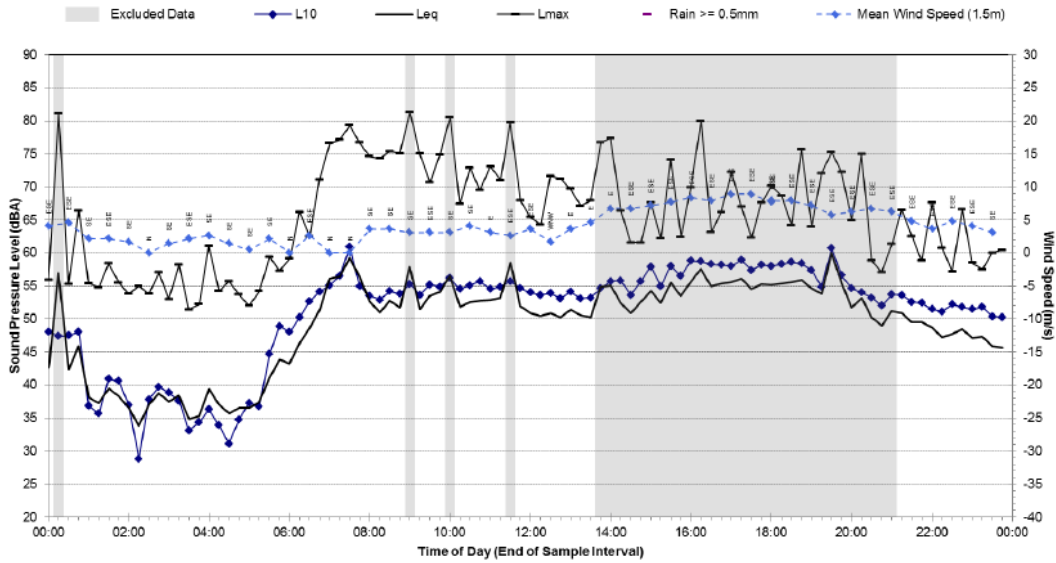
Statistical Ambient Noise Levels
L02 - 9 Coora Place, Jerrabomberra - Thursday, 21 February 2019



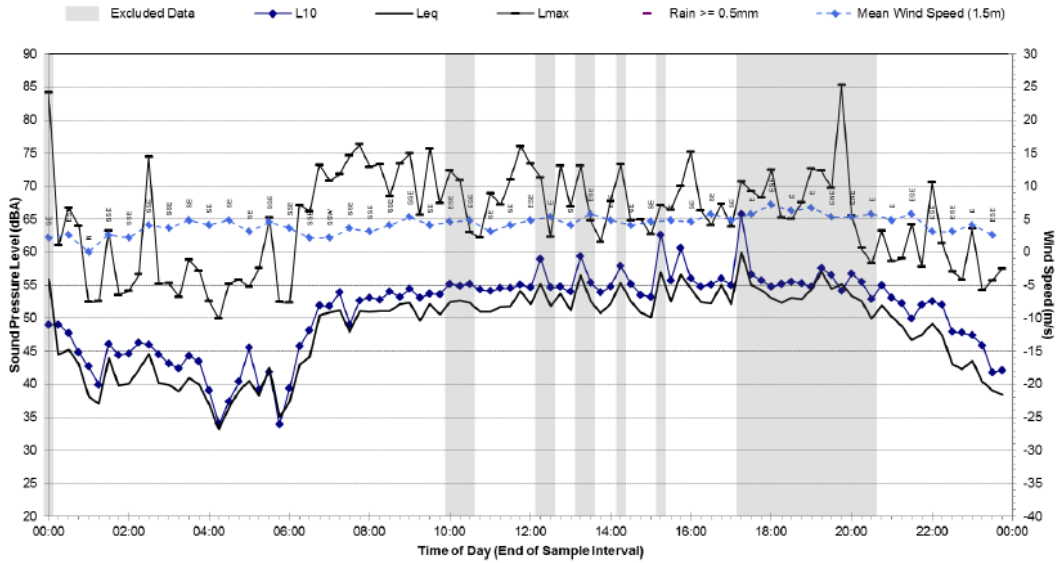
Statistical Ambient Noise Levels L02 - 9 Coora Place, Jerrabomberra - Friday, 22 February 2019



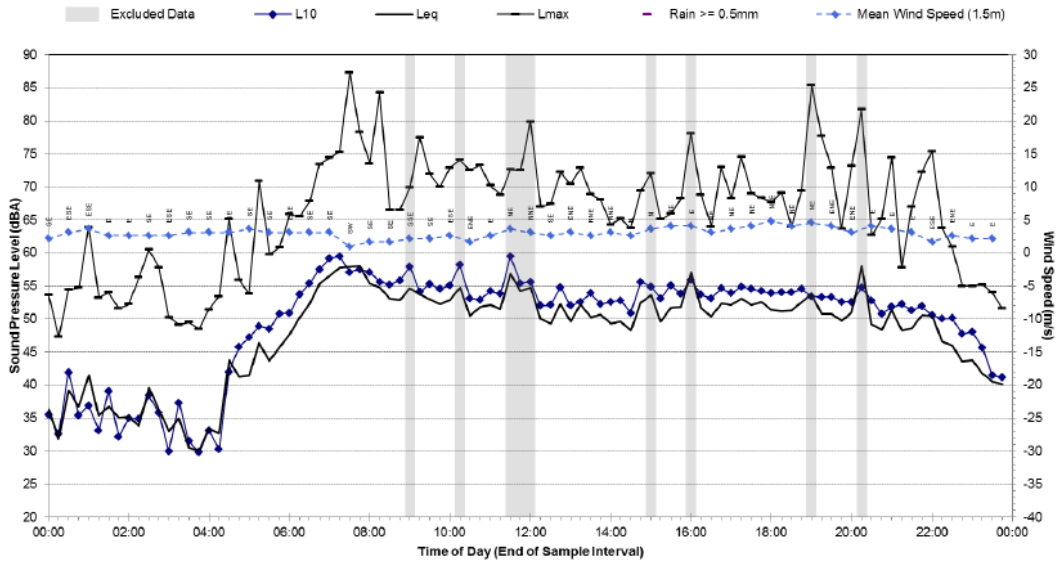
Statistical Ambient Noise Levels L02 - 9 Coora Place, Jerrabomberra - Saturday, 23 February 2019



Statistical Ambient Noise Levels
L02 - 9 Coora Place, Jerrabomberra - Sunday, 24 February 2019

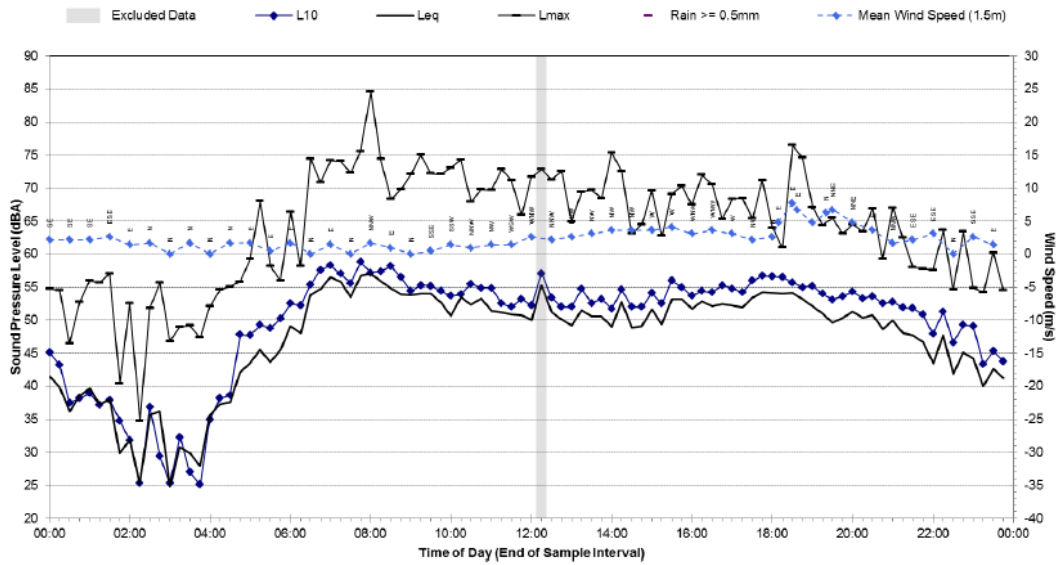


Statistical Ambient Noise Levels
L02 - 9 Coora Place, Jerrabomberra - Monday, 25 February 2019



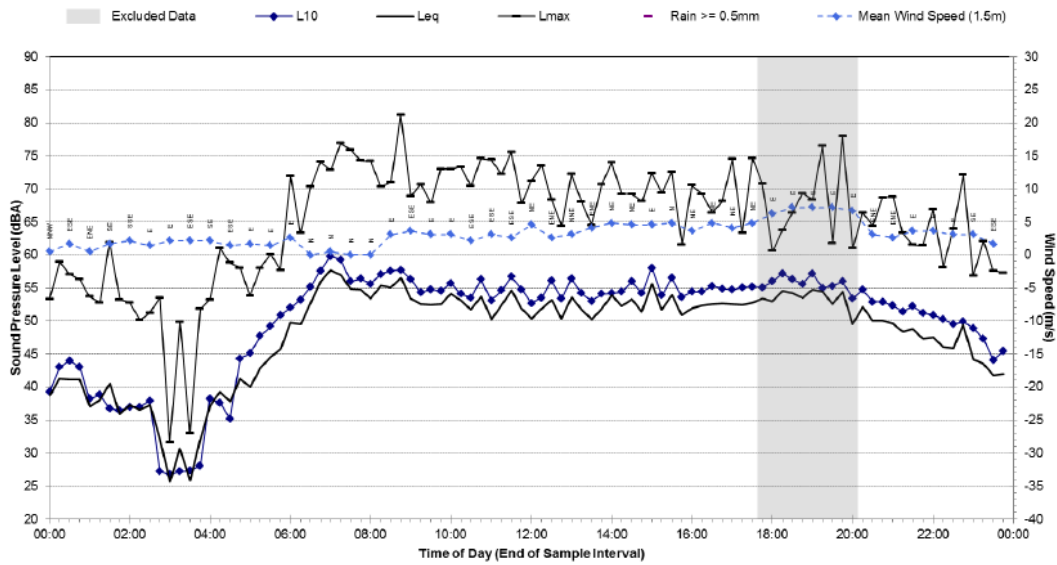
Statistical Ambient Noise Levels

L02 - 9 Coora Place, Jerrabomberra - Tuesday, 26 February 2019

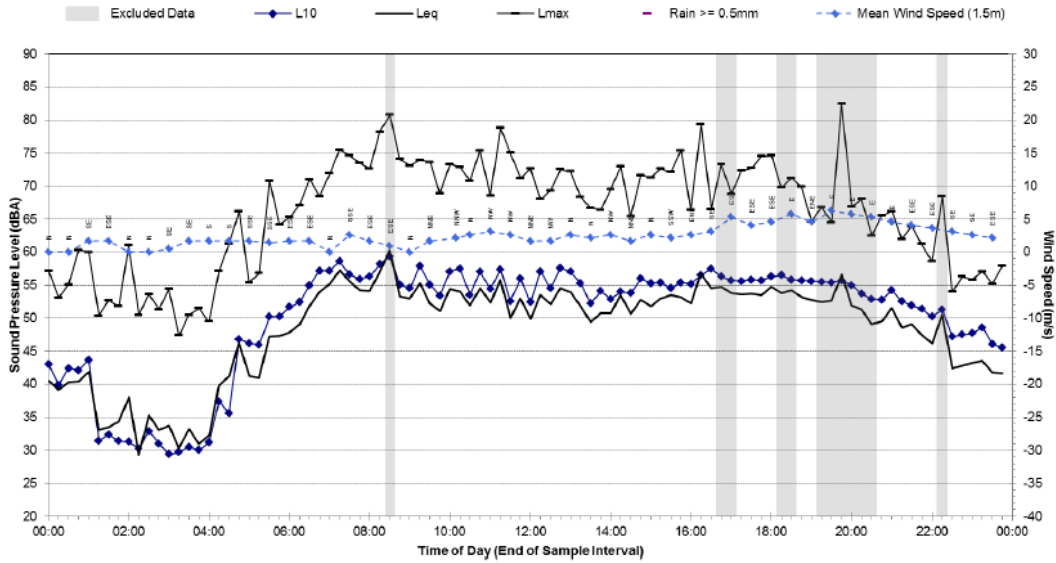


Statistical Ambient Noise Levels

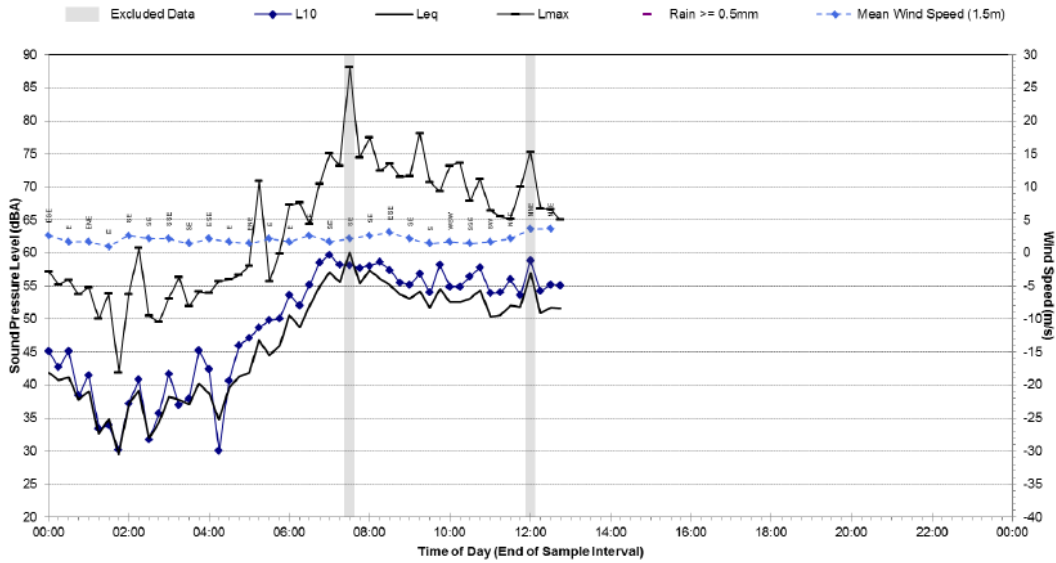
L02 - 9 Coora Place, Jerrabomberra - Wednesday, 27 February 2019



Statistical Ambient Noise Levels
L02 - 9 Coora Place, Jerrabomberra - Thursday, 28 February 2019

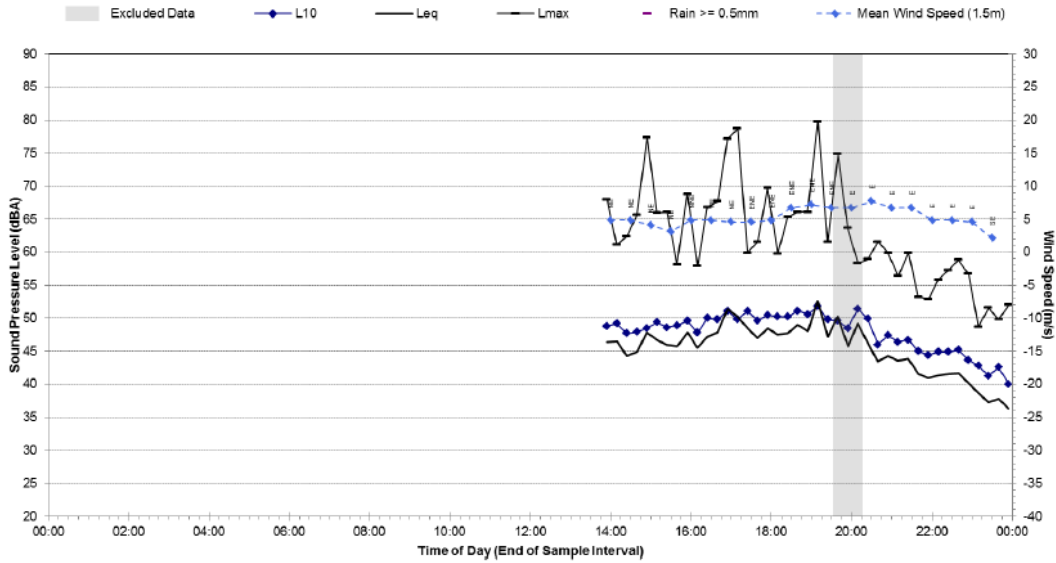


Statistical Ambient Noise Levels
L02 - 9 Coora Place, Jerrabomberra - Friday, 1 March 2019



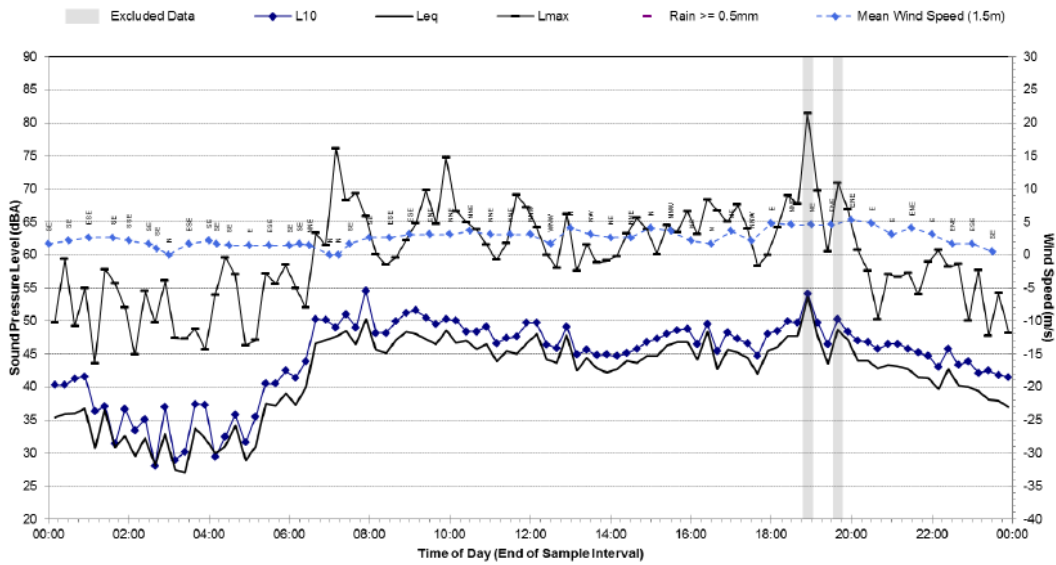
Statistical Ambient Noise Levels

L03 - 24 Pannamena Crescent, Jerrabomberra - Friday, 1 March 2019

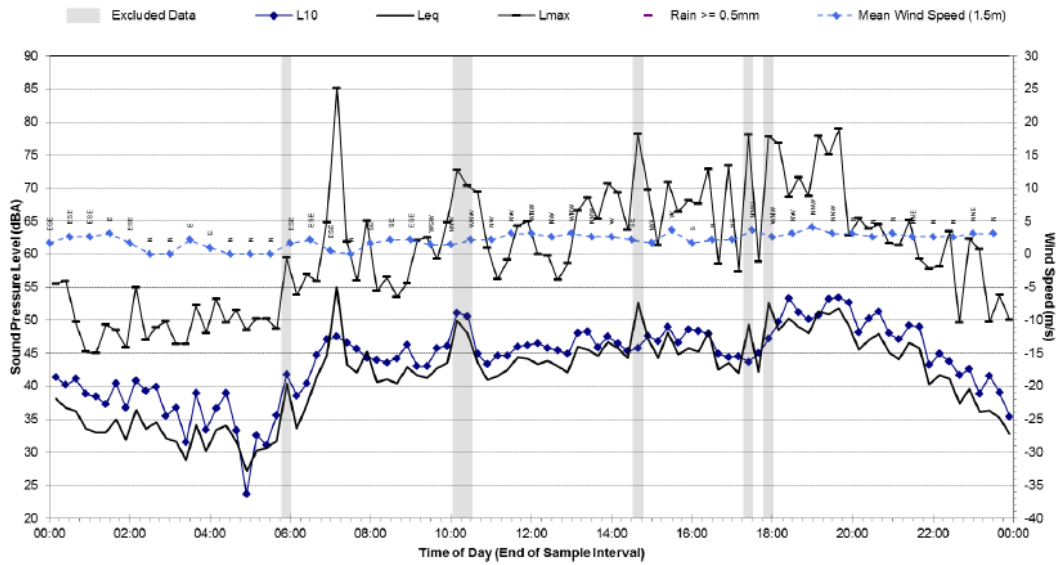


Statistical Ambient Noise Levels

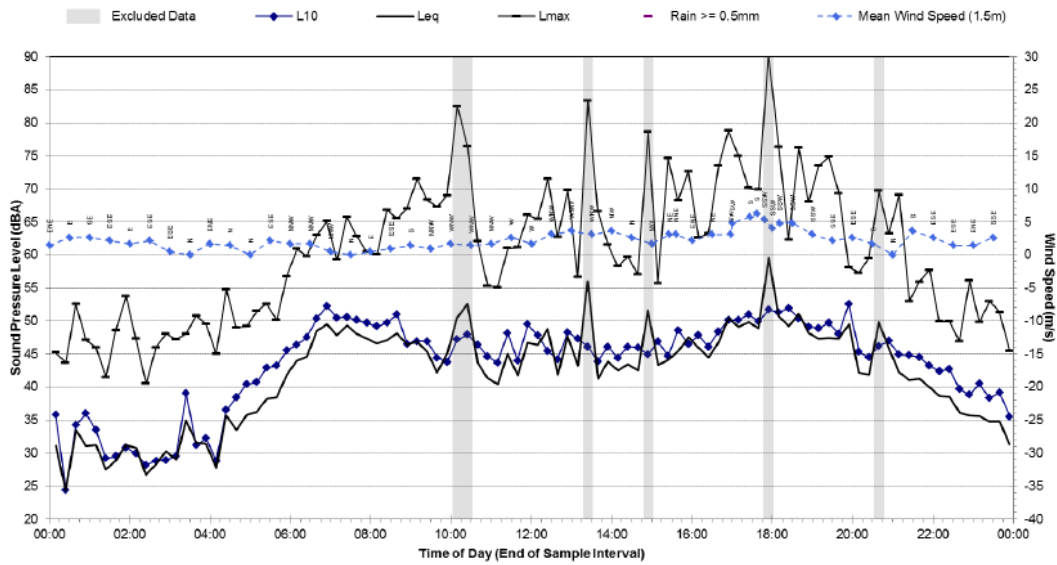
L03 - 24 Pannamena Crescent, Jerrabomberra - Saturday, 2 March 2019



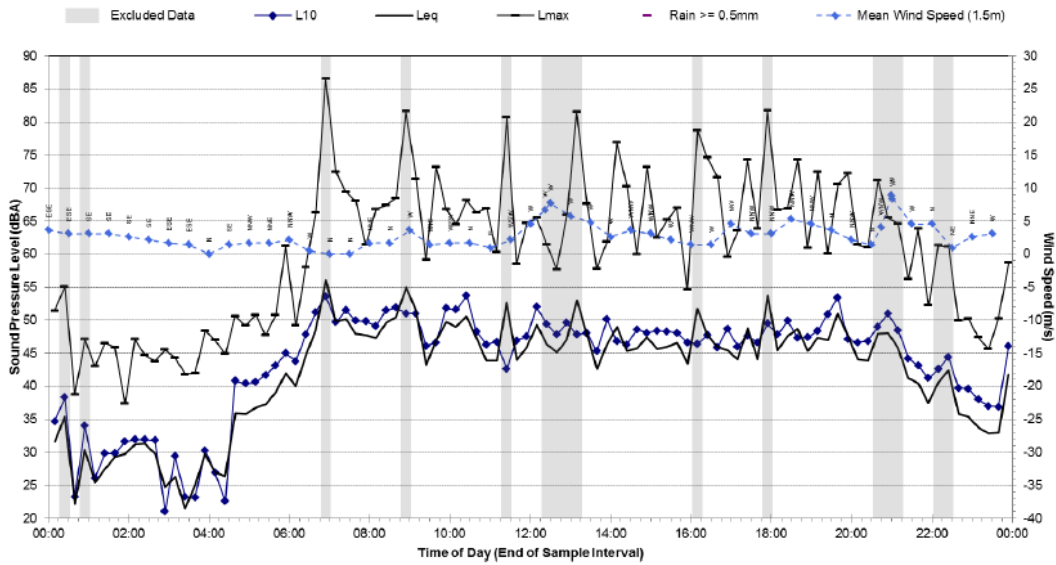
Statistical Ambient Noise Levels L03 - 24 Pannamena Crescent, Jerrabomberra - Sunday, 3 March 2019



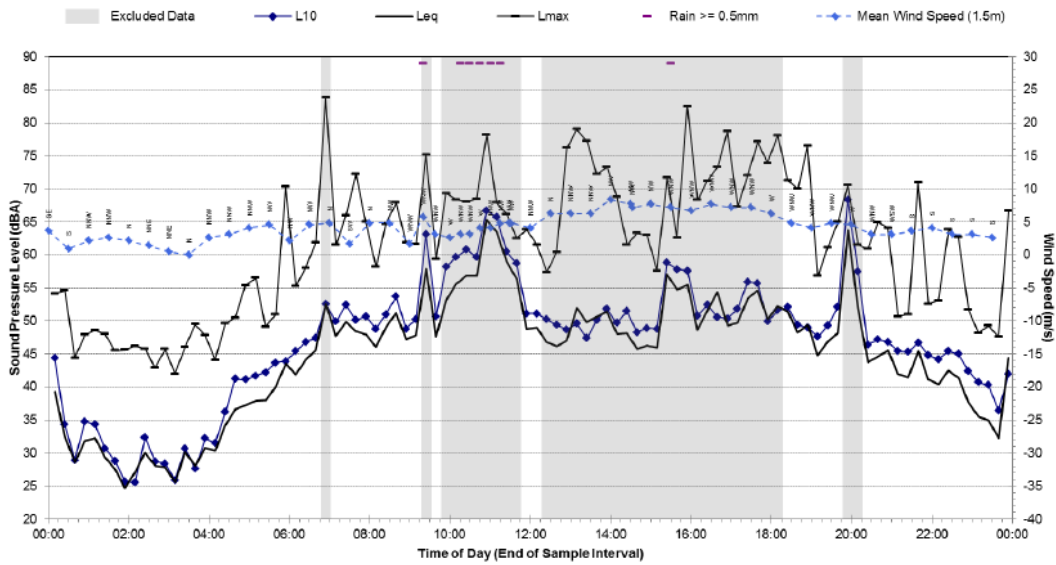
Statistical Ambient Noise Levels L03 - 24 Pannamena Crescent, Jerrabomberra - Monday, 4 March 2019



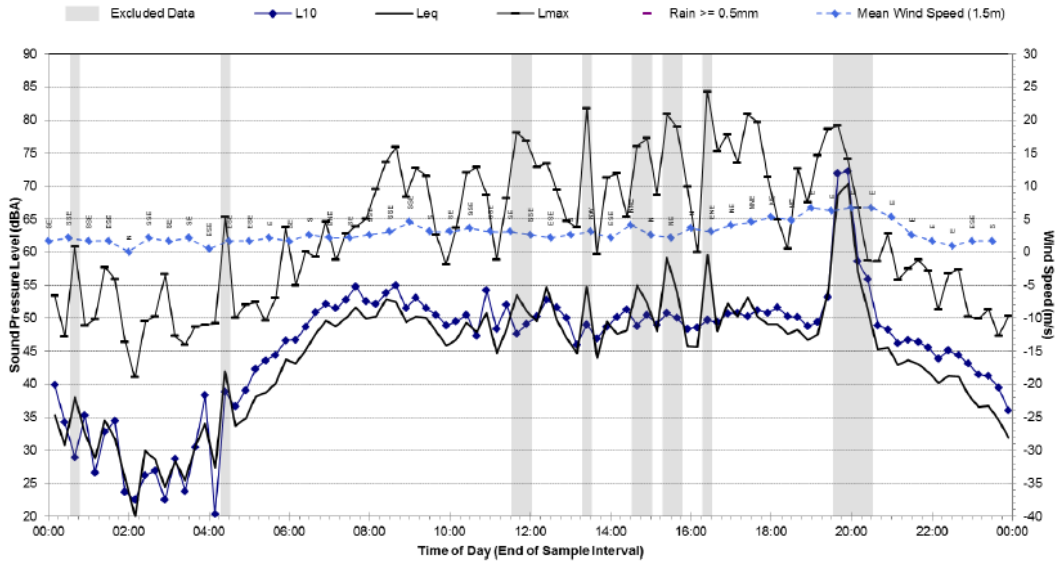
Statistical Ambient Noise Levels
L03 - 24 Pannamena Crescent, Jerrabomberra - Tuesday, 5 March 2019



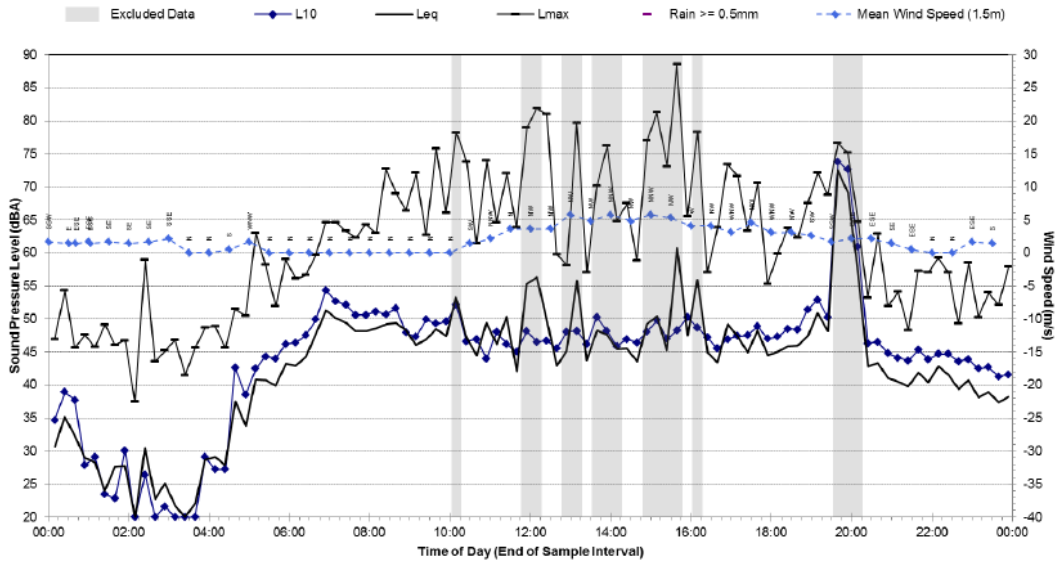
Statistical Ambient Noise Levels
L03 - 24 Pannamena Crescent, Jerrabomberra - Wednesday, 6 March 2019



Statistical Ambient Noise Levels L03 - 24 Pannamena Crescent, Jerrabomberra - Thursday, 7 March 2019

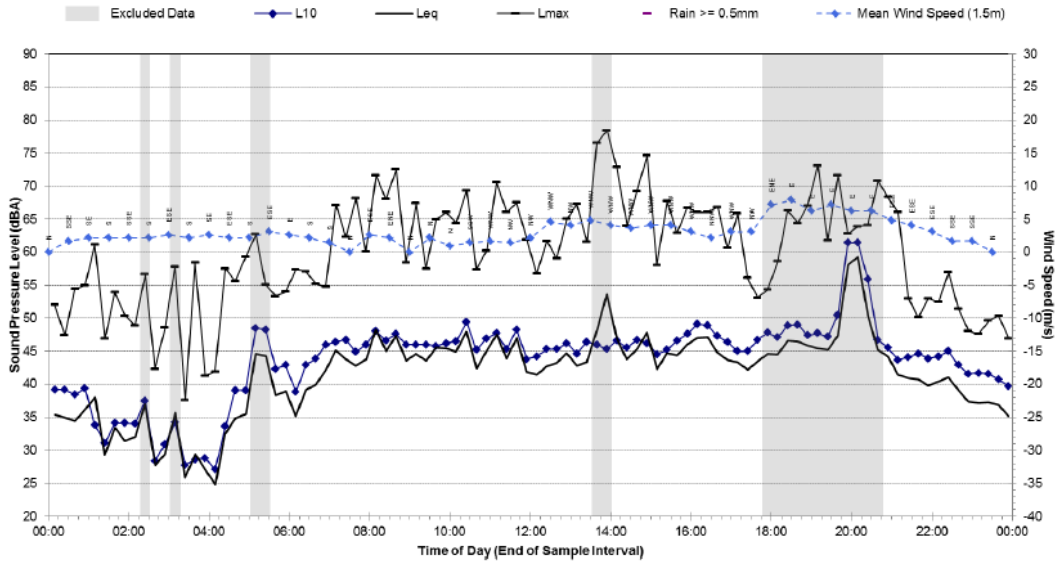


Statistical Ambient Noise Levels L03 - 24 Pannamena Crescent, Jerrabomberra - Friday, 8 March 2019



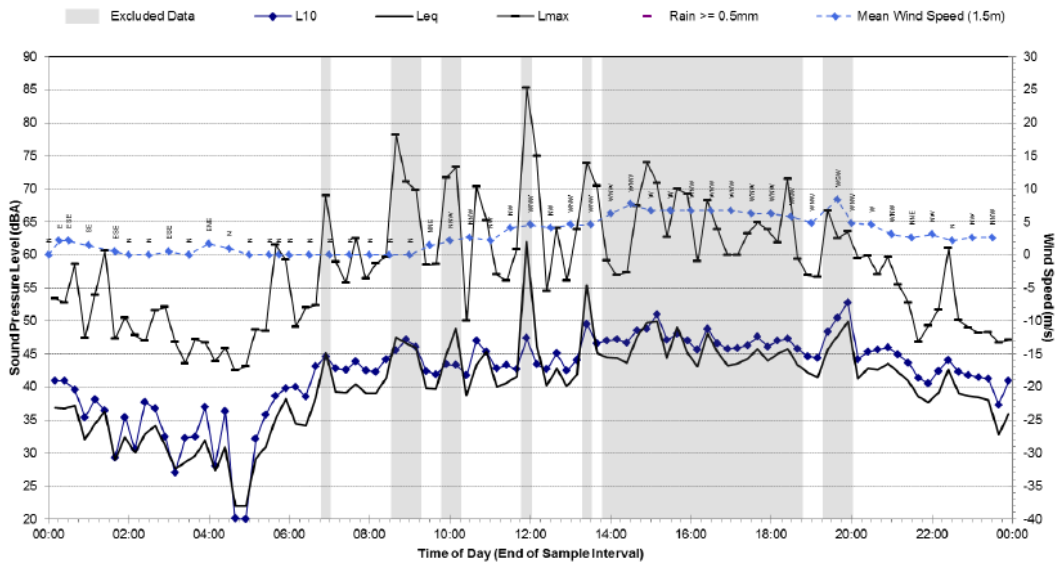
Statistical Ambient Noise Levels

L03 - 24 Pannamena Crescent, Jerrabomberra - Saturday, 9 March 2019

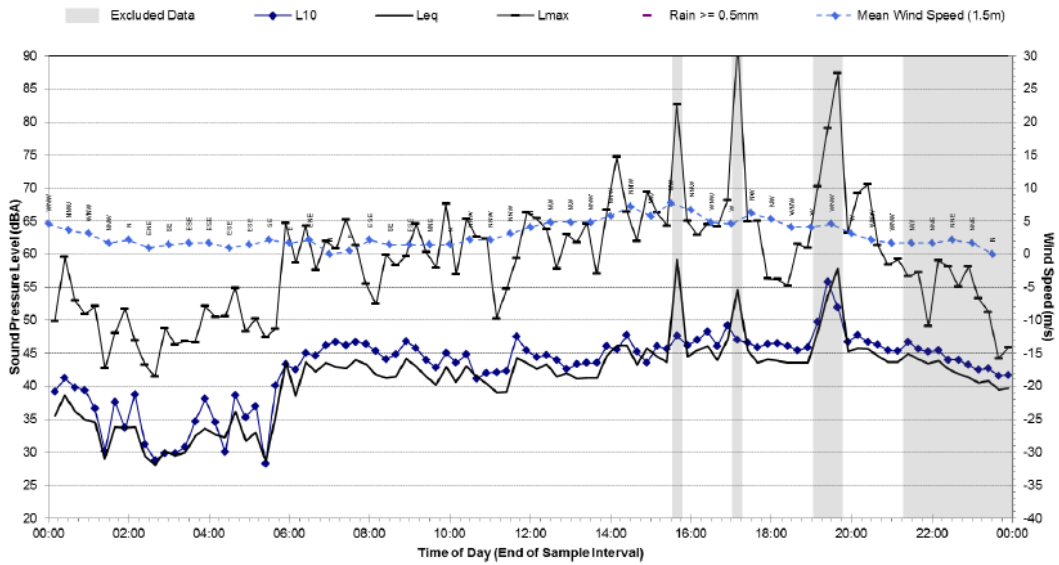


Statistical Ambient Noise Levels

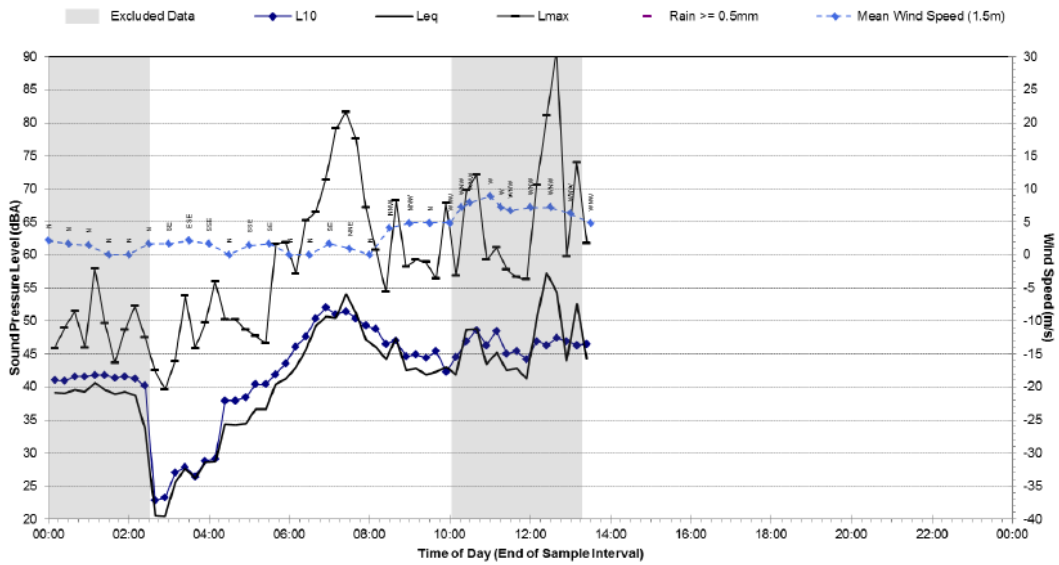
L03 - 24 Pannamena Crescent, Jerrabomberra - Sunday, 10 March 2019



Statistical Ambient Noise Levels L03 - 24 Pannamena Crescent, Jerrabomberra - Monday, 11 March 2019

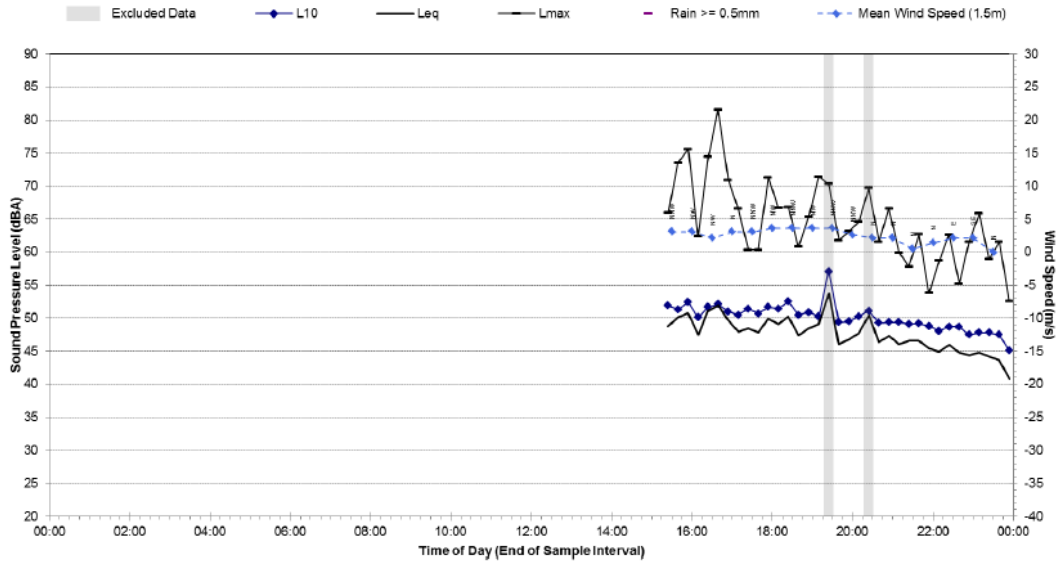


Statistical Ambient Noise Levels L03 - 24 Pannamena Crescent, Jerrabomberra - Tuesday, 12 March 2019



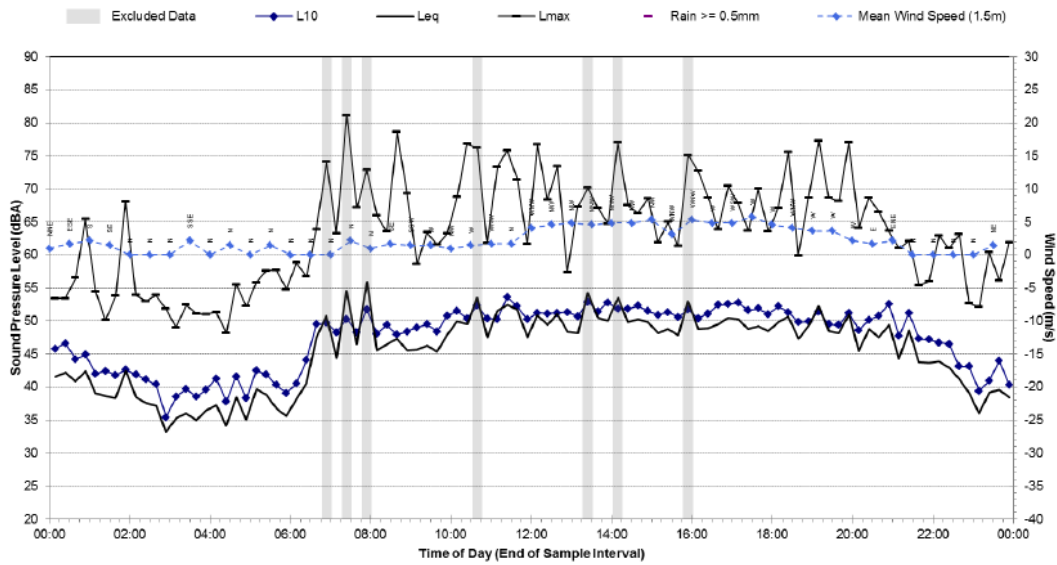
Statistical Ambient Noise Levels

L04 - 15 Burgan Grove, Jerrabomberra - Saturday, 16 February 2019

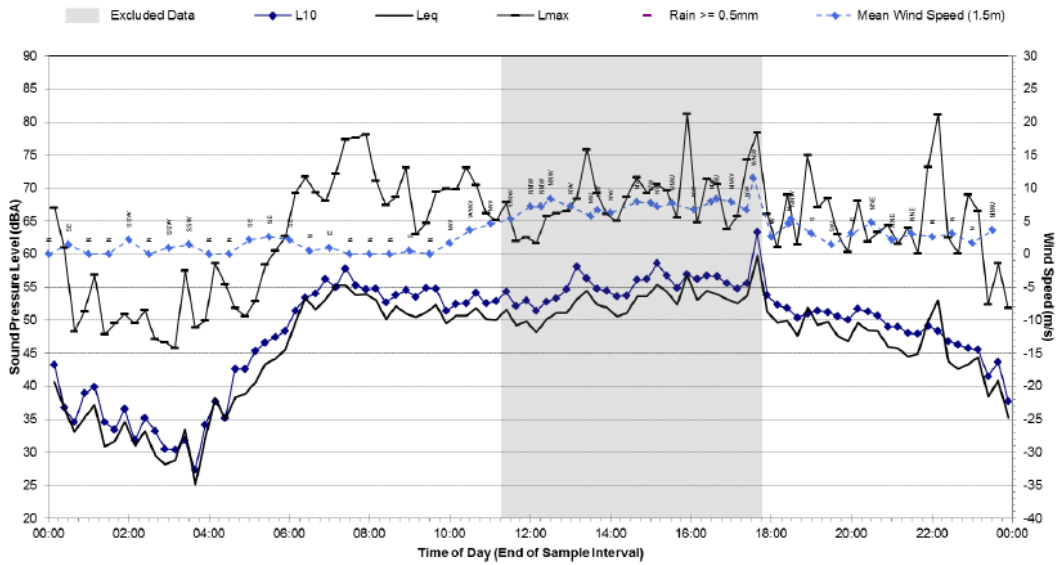


Statistical Ambient Noise Levels

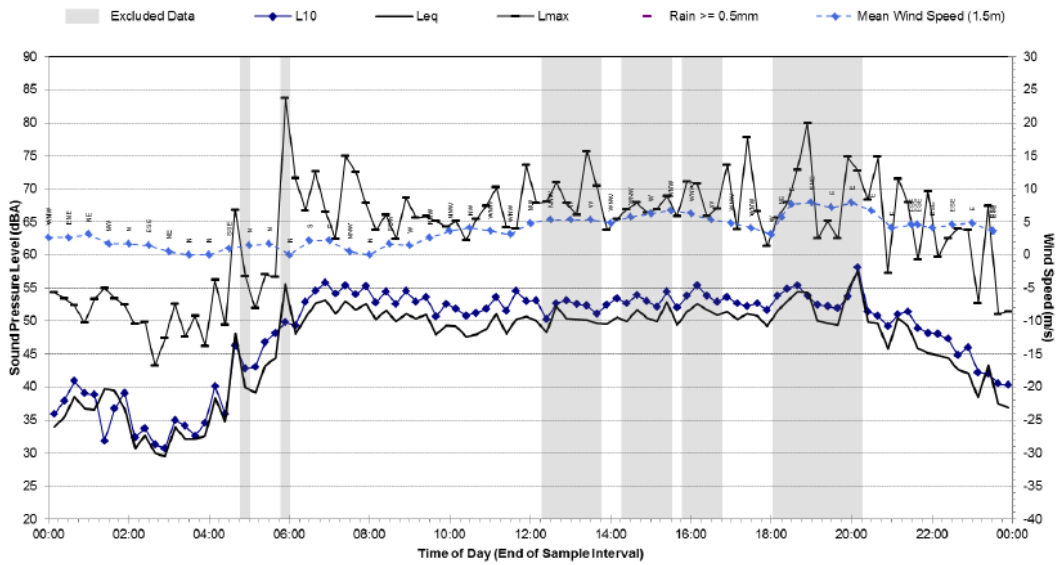
L04 - 15 Burgan Grove, Jerrabomberra - Sunday, 17 February 2019



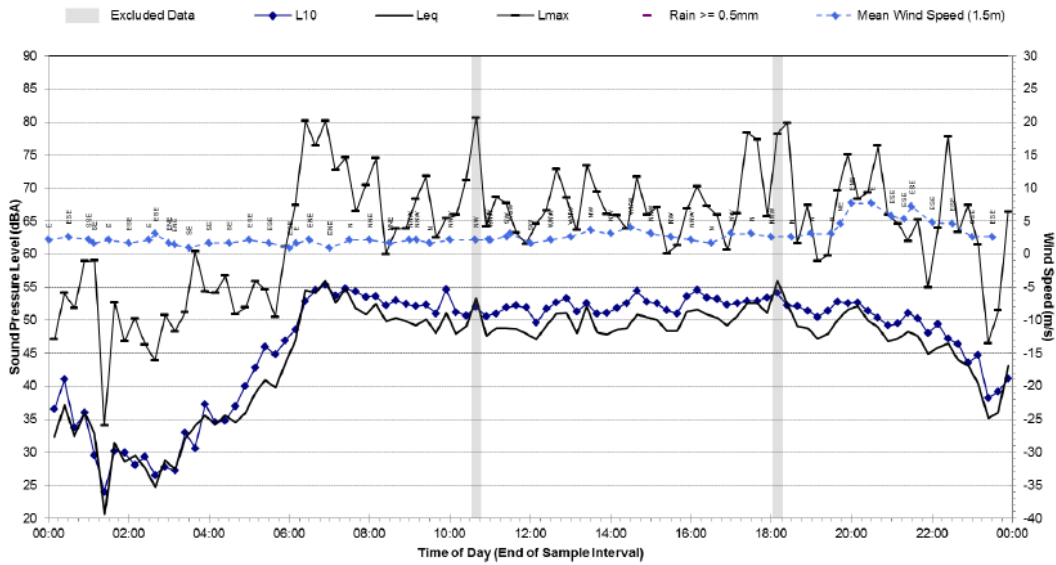
Statistical Ambient Noise Levels L04 - 15 Burgan Grove, Jerrabomberra - Monday, 18 February 2019



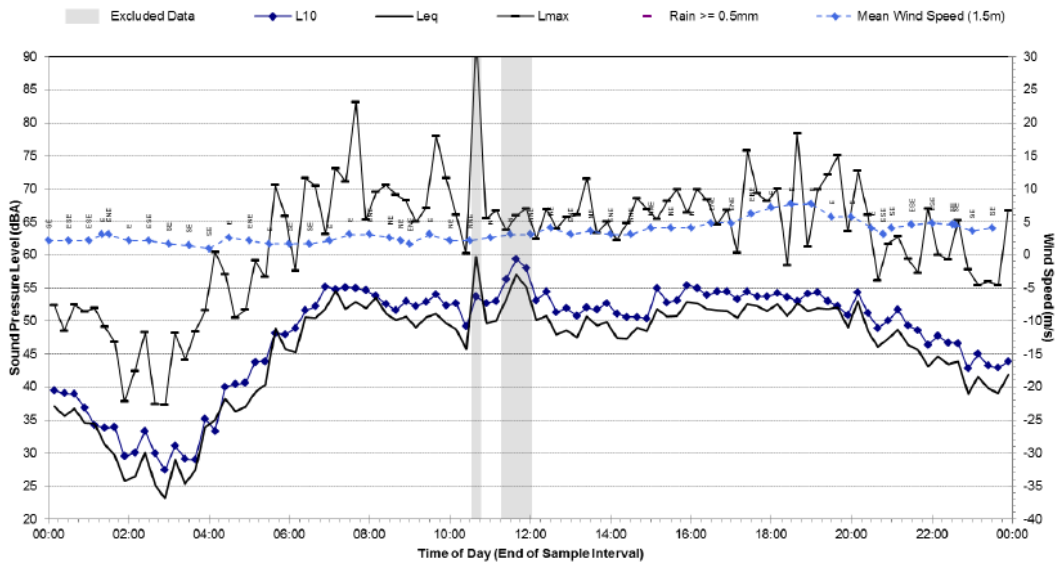
Statistical Ambient Noise Levels L04 - 15 Burgan Grove, Jerrabomberra - Tuesday, 19 February 2019



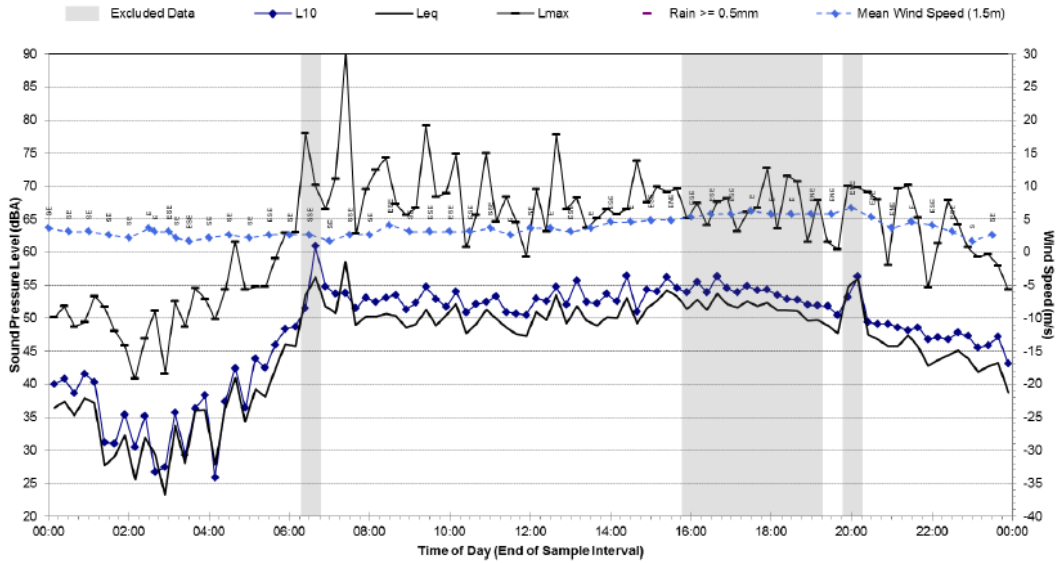
Statistical Ambient Noise Levels
L04 - 15 Burgan Grove, Jerrabomberra - Wednesday, 20 February 2019



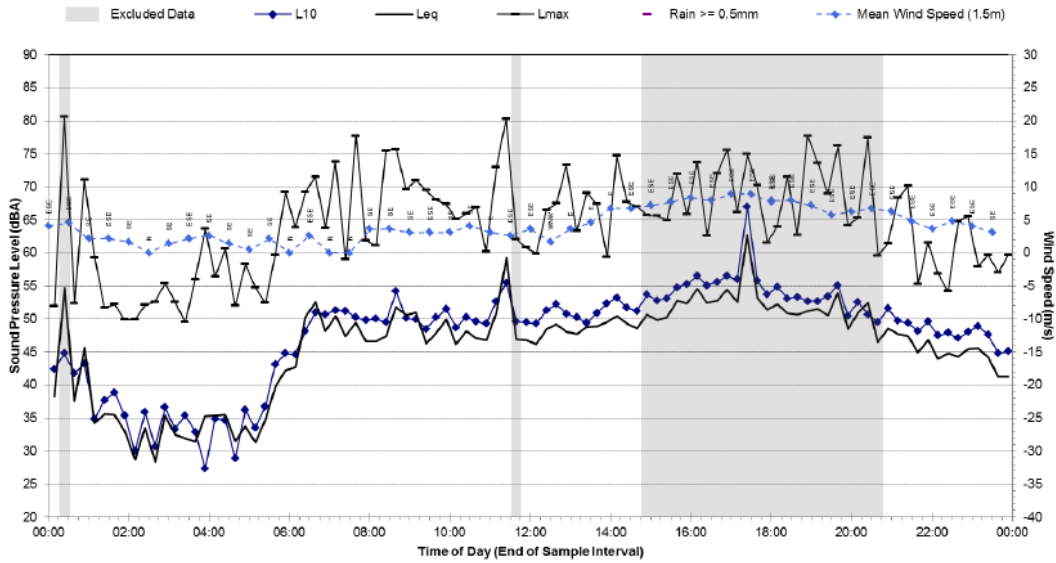
Statistical Ambient Noise Levels
L04 - 15 Burgan Grove, Jerrabomberra - Thursday, 21 February 2019



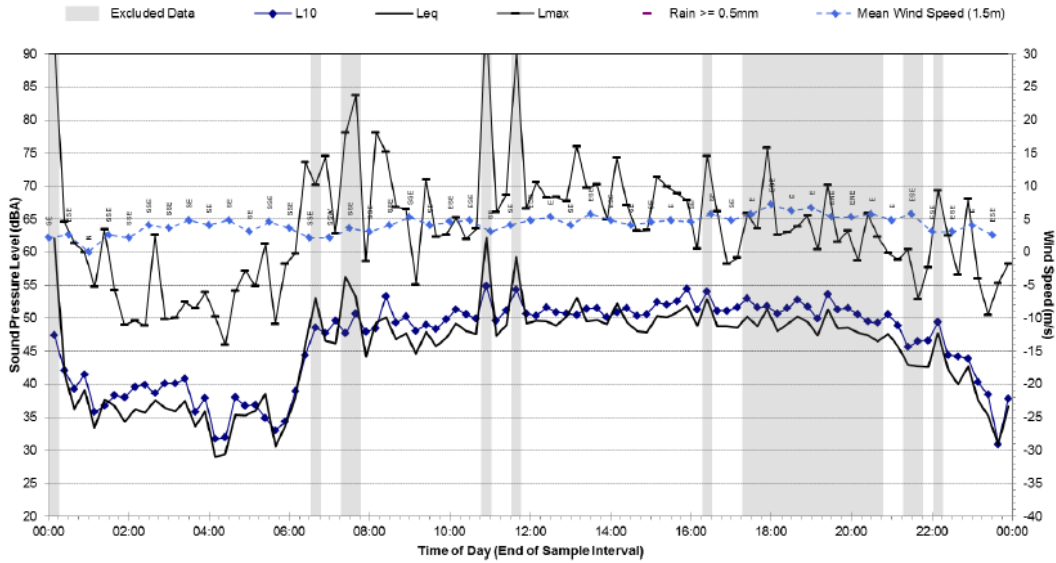
Statistical Ambient Noise Levels
L04 - 15 Burgan Grove, Jerrabomberra - Friday, 22 February 2019



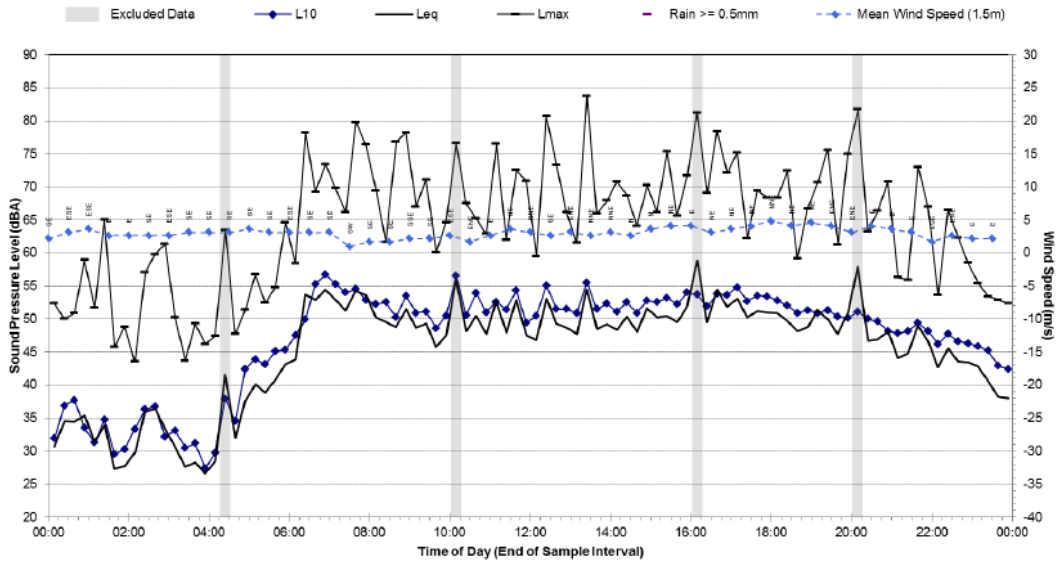
Statistical Ambient Noise Levels
L04 - 15 Burgan Grove, Jerrabomberra - Saturday, 23 February 2019



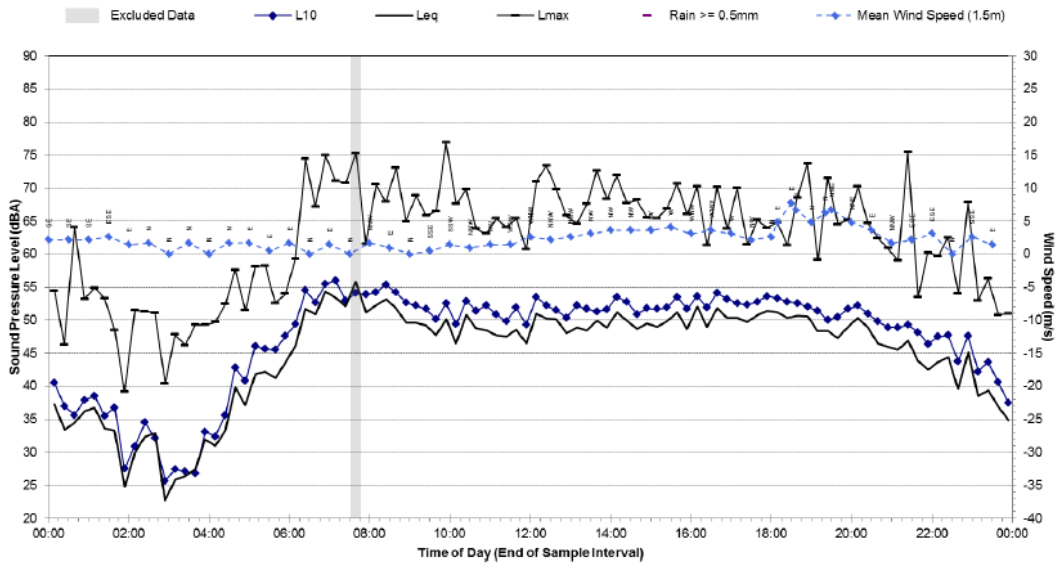
Statistical Ambient Noise Levels L04 - 15 Burgan Grove, Jerrabomberra - Sunday, 24 February 2019



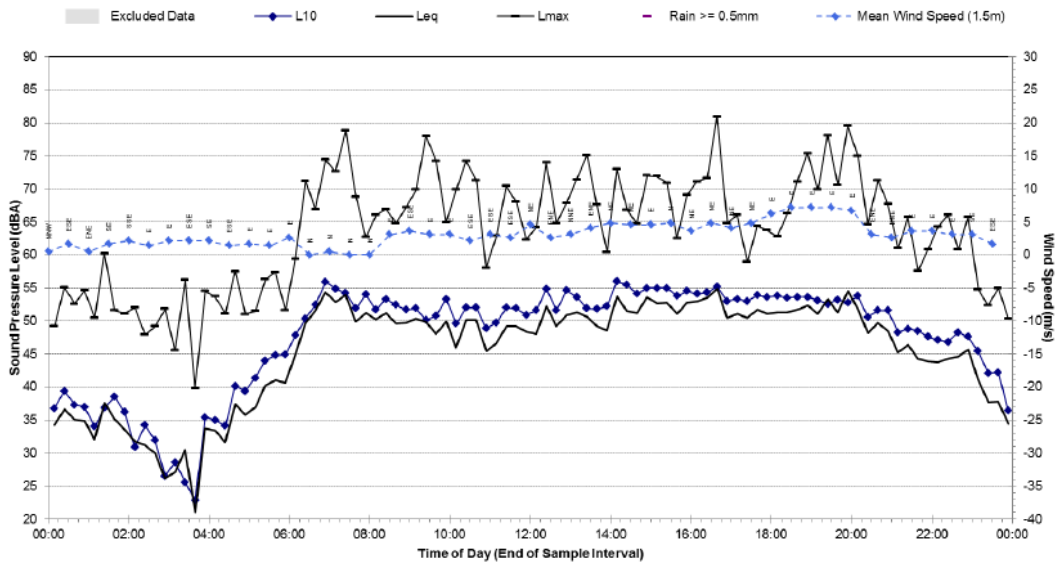
Statistical Ambient Noise Levels L04 - 15 Burgan Grove, Jerrabomberra - Monday, 25 February 2019



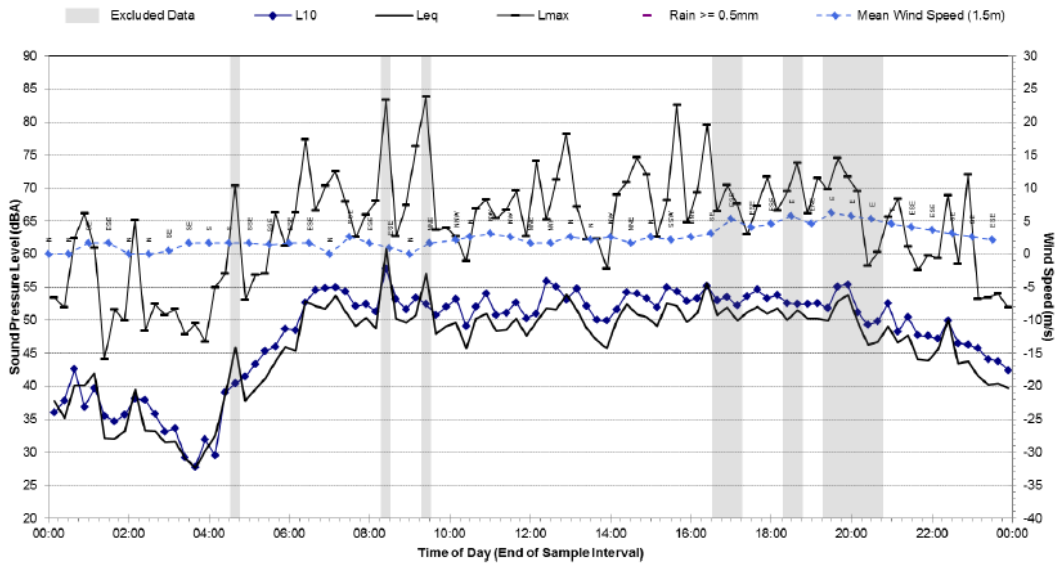
Statistical Ambient Noise Levels
L04 - 15 Burgan Grove, Jerrabomberra - Tuesday, 26 February 2019



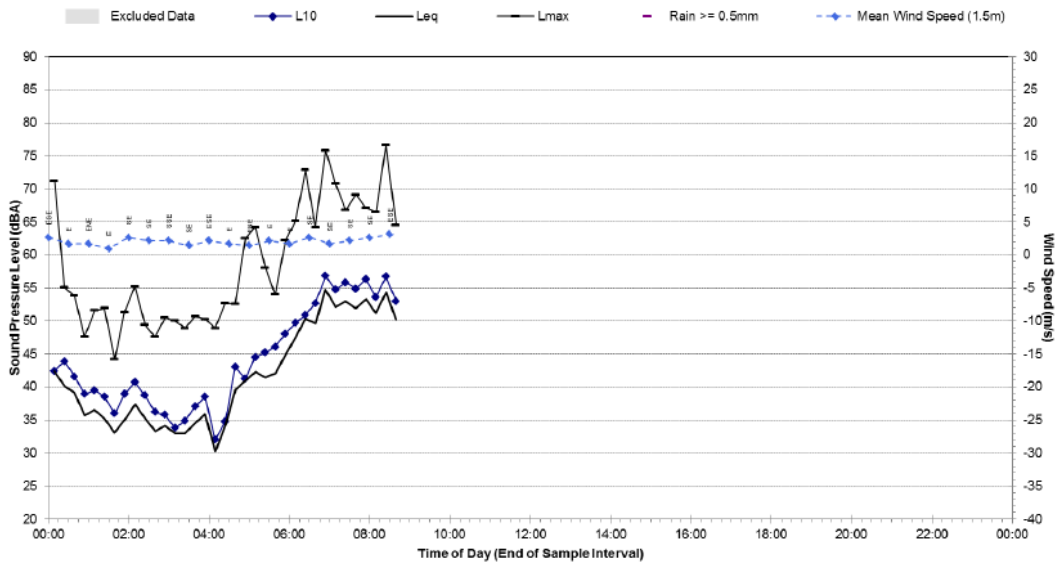
Statistical Ambient Noise Levels
L04 - 15 Burgan Grove, Jerrabomberra - Wednesday, 27 February 2019



Statistical Ambient Noise Levels L04 - 15 Burgan Grove, Jerrabomberra - Thursday, 28 February 2019

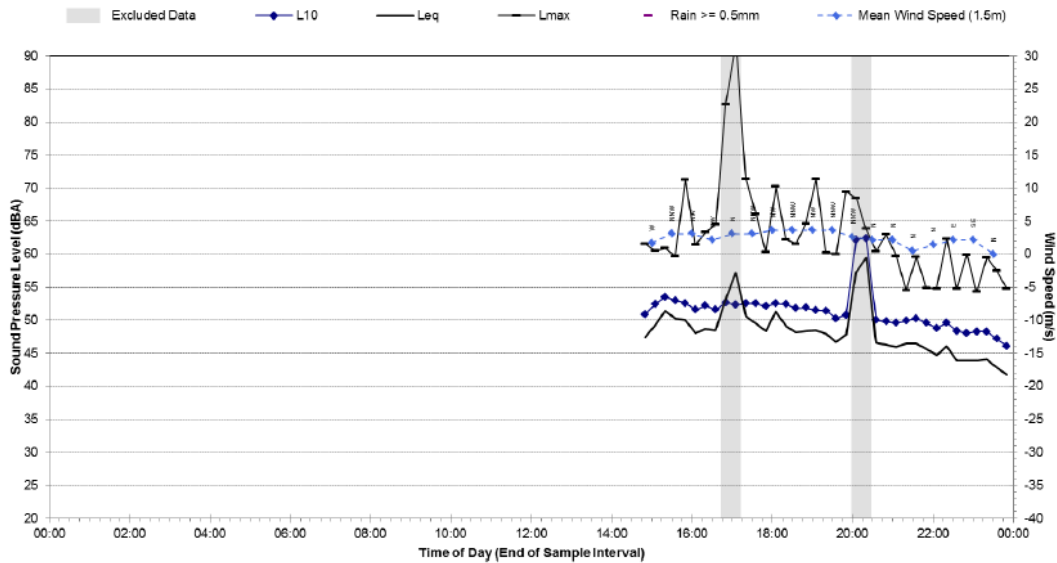


Statistical Ambient Noise Levels L04 - 15 Burgan Grove, Jerrabomberra - Friday, 1 March 2019



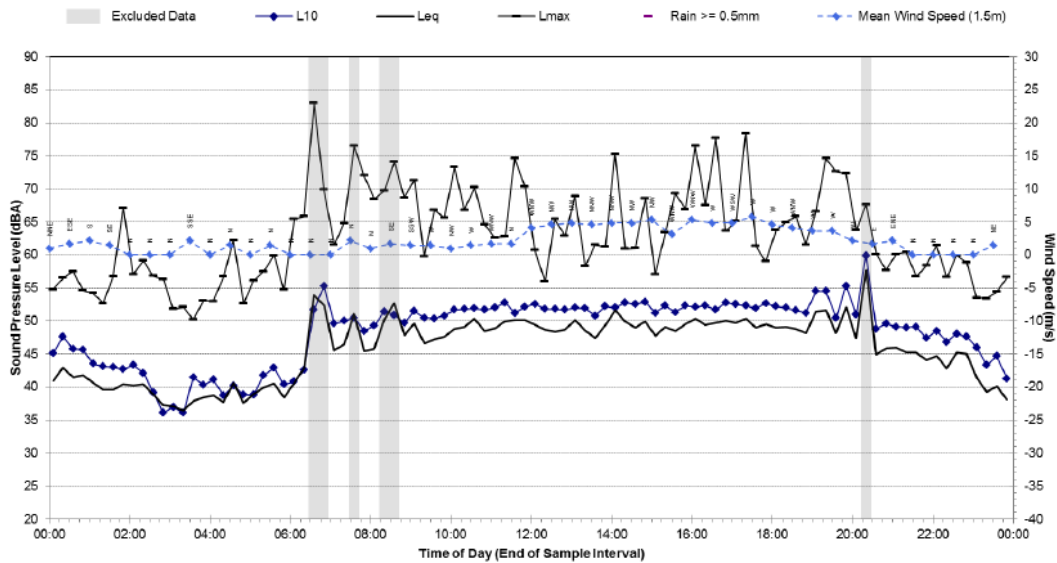
Statistical Ambient Noise Levels

L05 - 4 Bluebell Glen, Jerrabomberra - Saturday, 16 February 2019

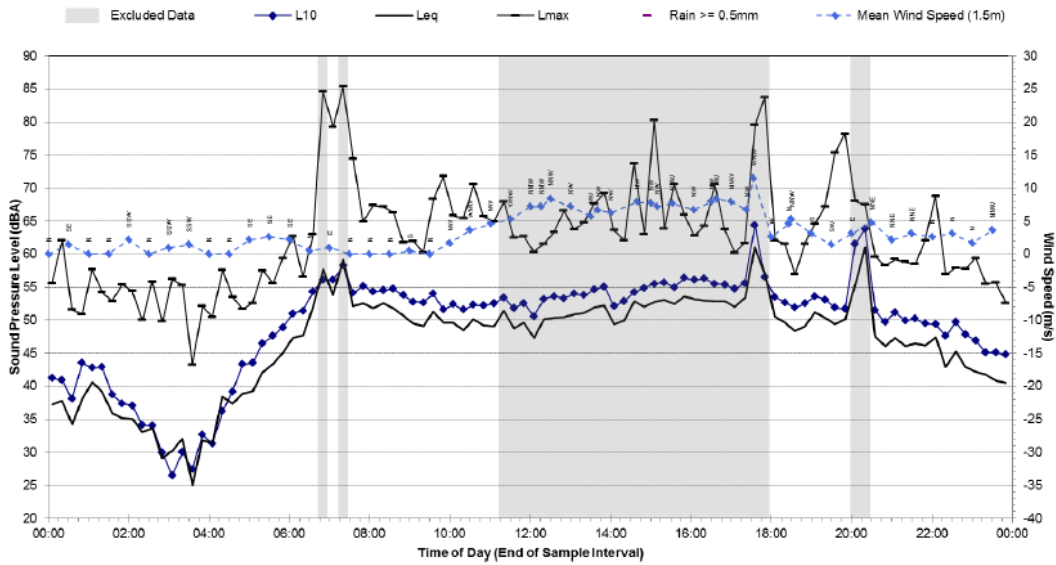


Statistical Ambient Noise Levels

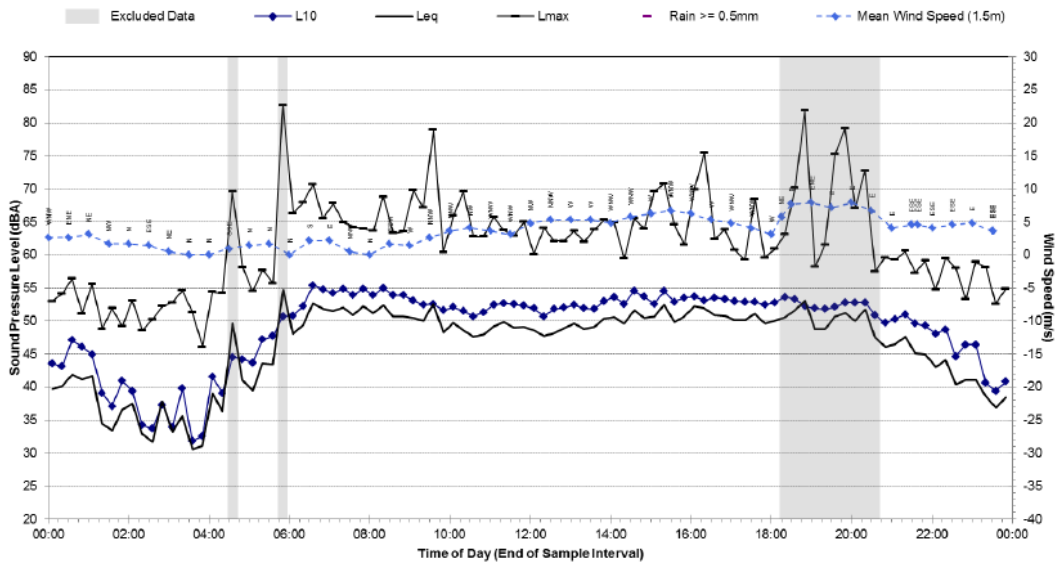
L05 - 4 Bluebell Glen, Jerrabomberra - Sunday, 17 February 2019



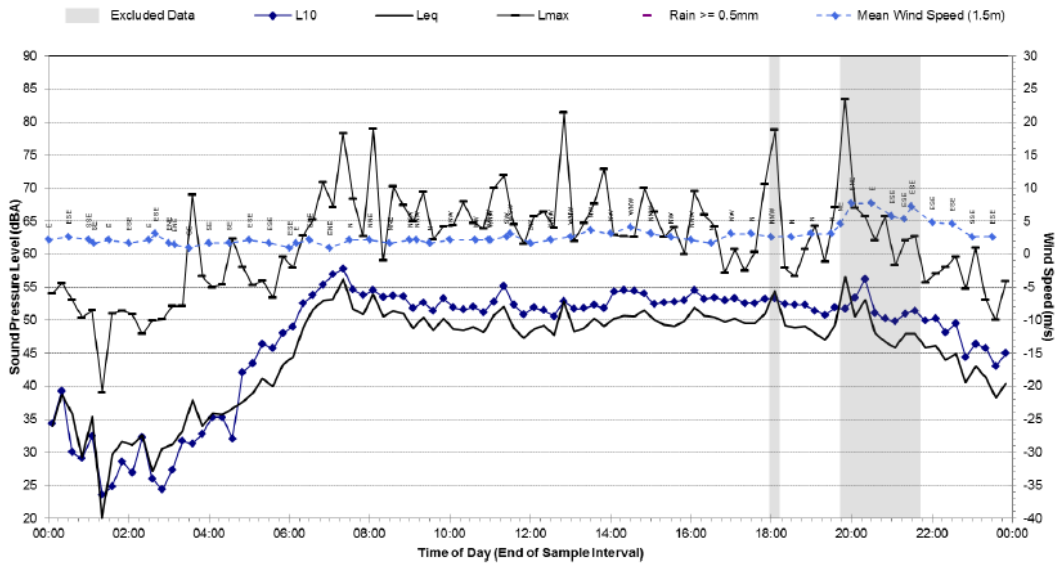
Statistical Ambient Noise Levels
L05 - 4 Bluebell Glen, Jerrabomberra - Monday, 18 February 2019



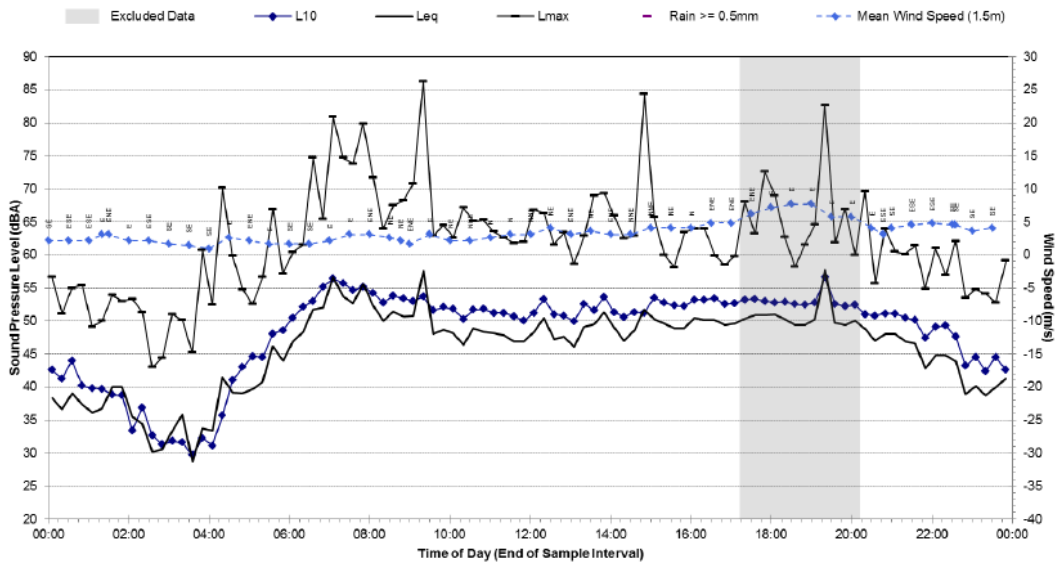
Statistical Ambient Noise Levels
L05 - 4 Bluebell Glen, Jerrabomberra - Tuesday, 19 February 2019



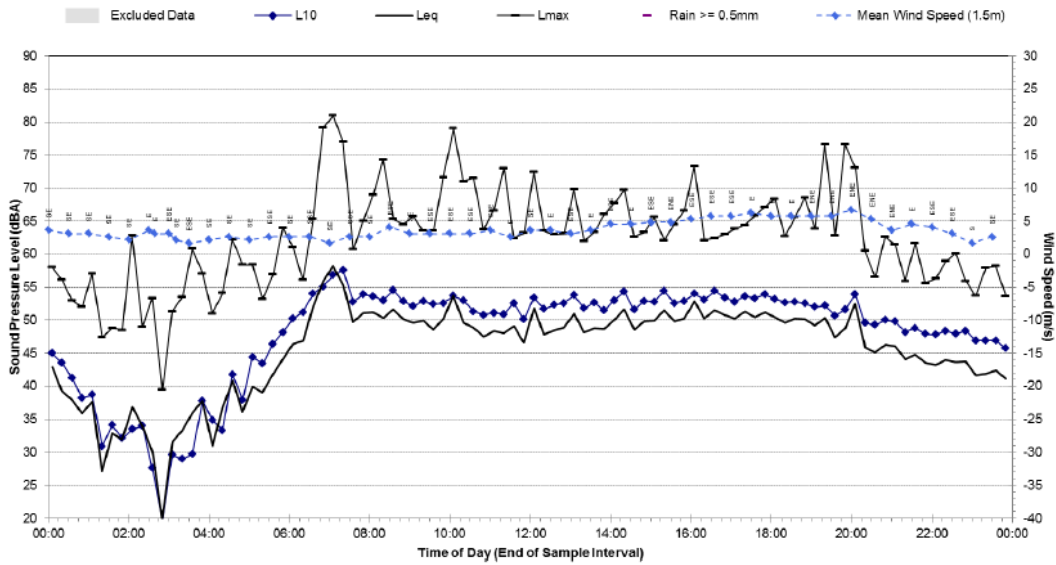
Statistical Ambient Noise Levels
L05 - 4 Bluebell Glen, Jerrabomberra - Wednesday, 20 February 2019



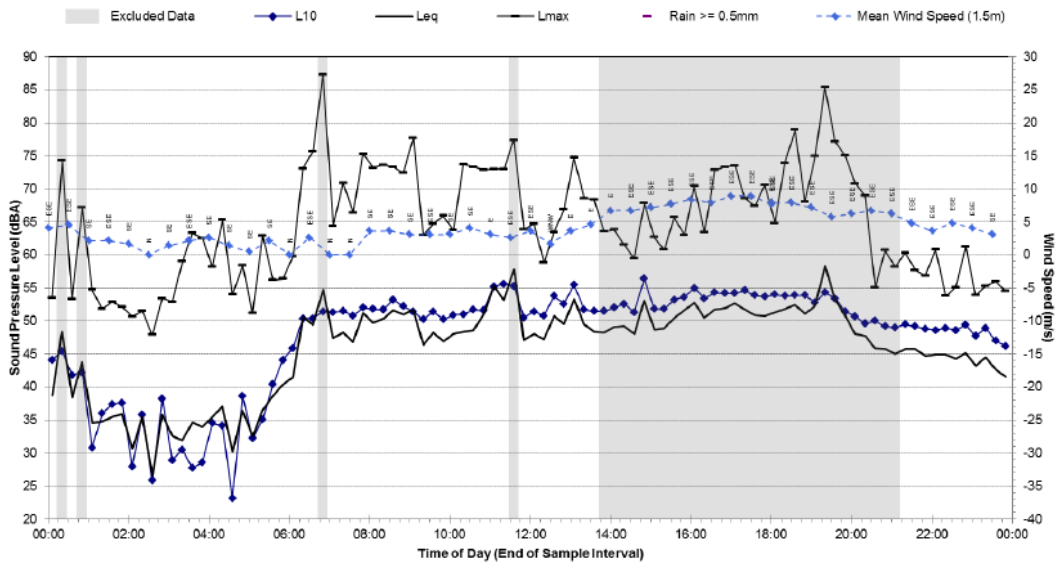
Statistical Ambient Noise Levels
L05 - 4 Bluebell Glen, Jerrabomberra - Thursday, 21 February 2019



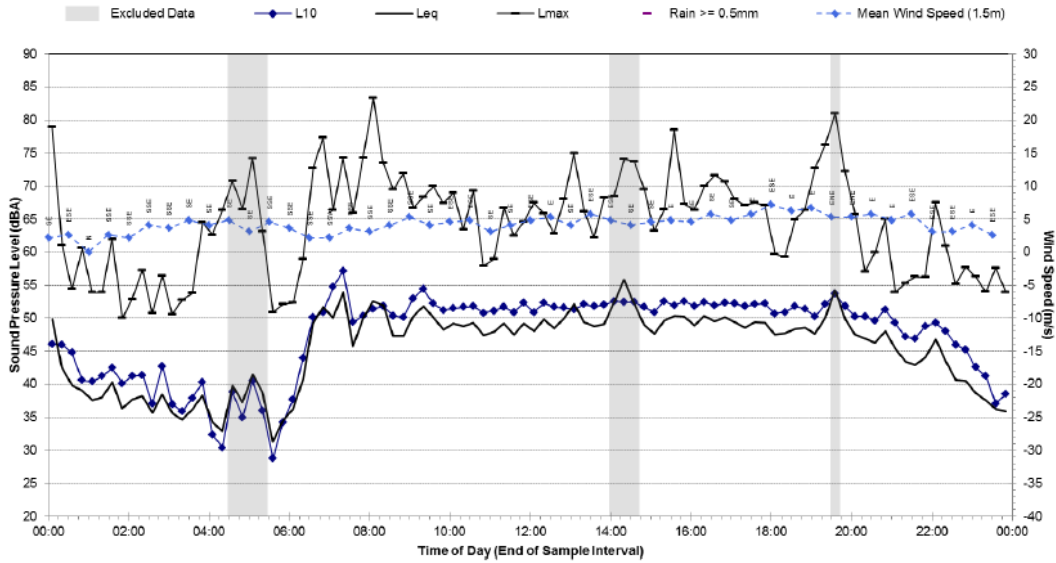
Statistical Ambient Noise Levels L05 - 4 Bluebell Glen, Jerrabomberra - Friday, 22 February 2019



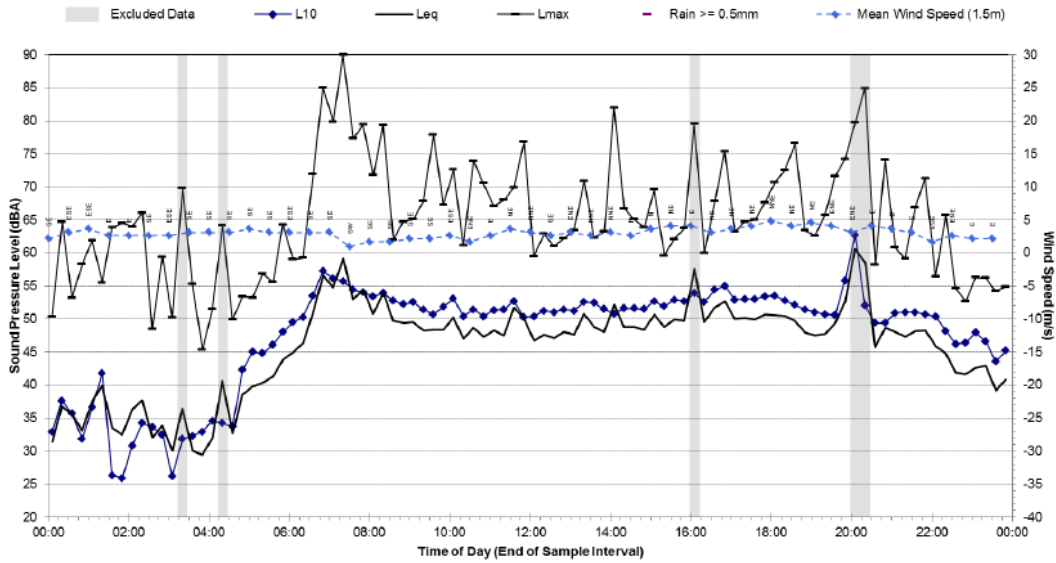
Statistical Ambient Noise Levels L05 - 4 Bluebell Glen, Jerrabomberra - Saturday, 23 February 2019



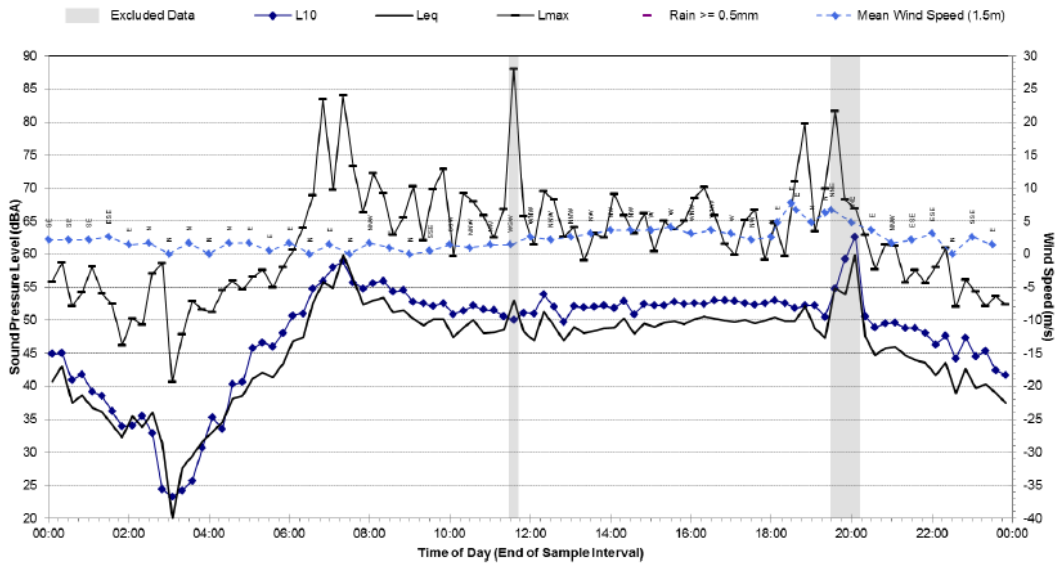
Statistical Ambient Noise Levels L05 - 4 Bluebell Glen, Jerrabomberra - Sunday, 24 February 2019



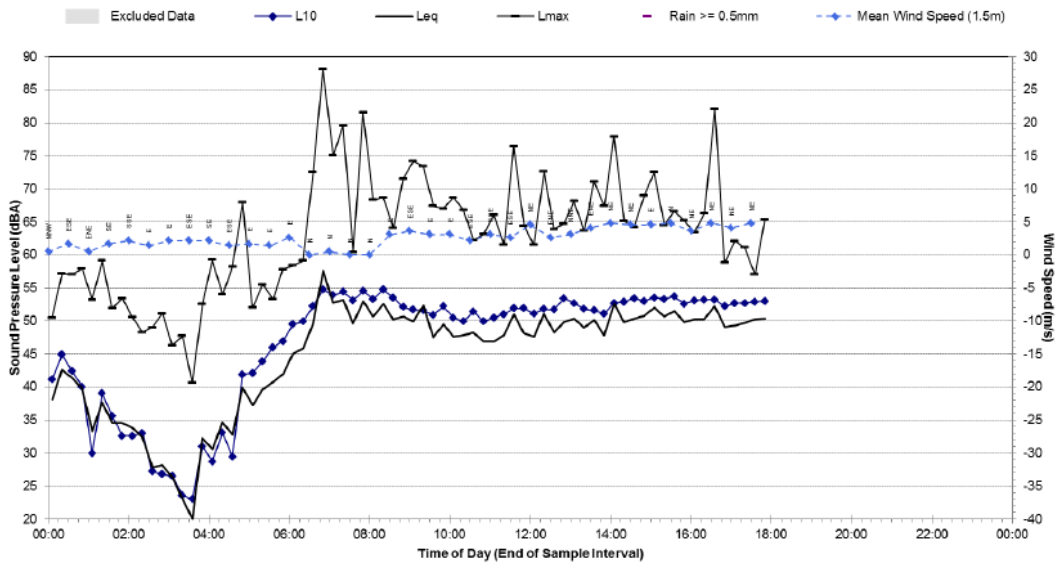
Statistical Ambient Noise Levels L05 - 4 Bluebell Glen, Jerrabomberra - Monday, 25 February 2019



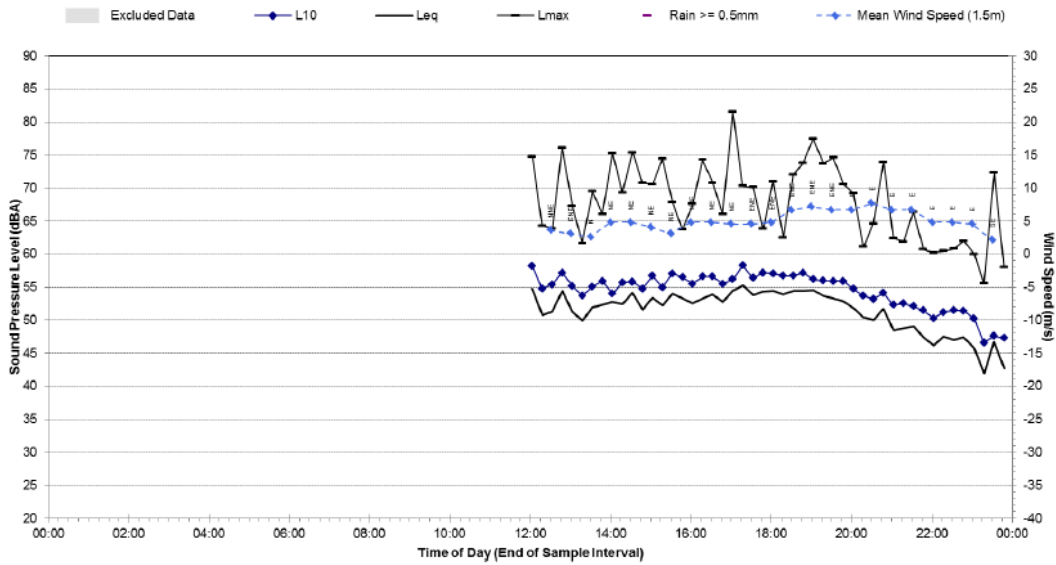
Statistical Ambient Noise Levels
 L05 - 4 Bluebell Glen, Jerrabomberra - Tuesday, 26 February 2019



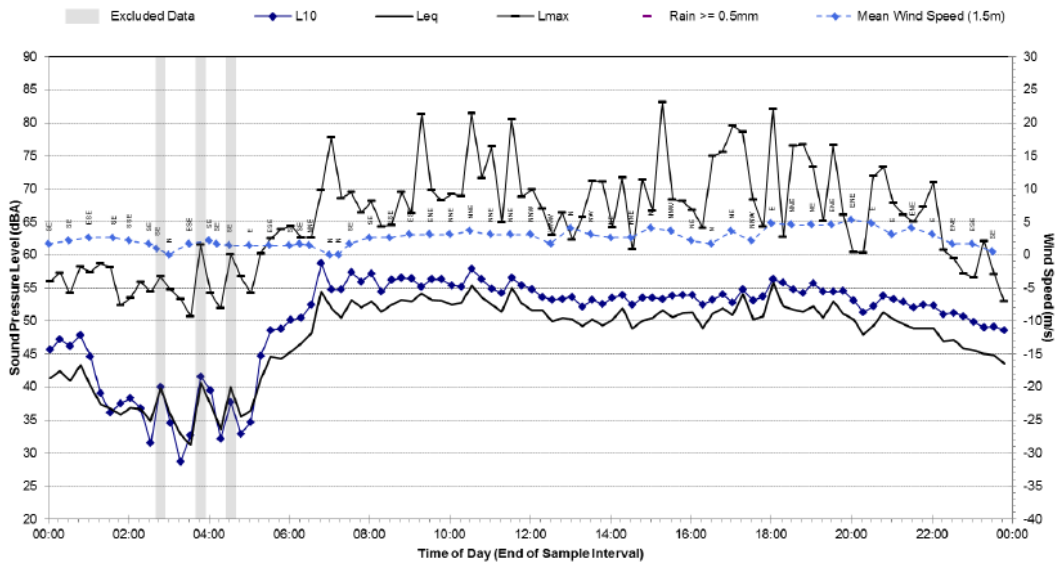
Statistical Ambient Noise Levels
 L05 - 4 Bluebell Glen, Jerrabomberra - Wednesday, 27 February 2019



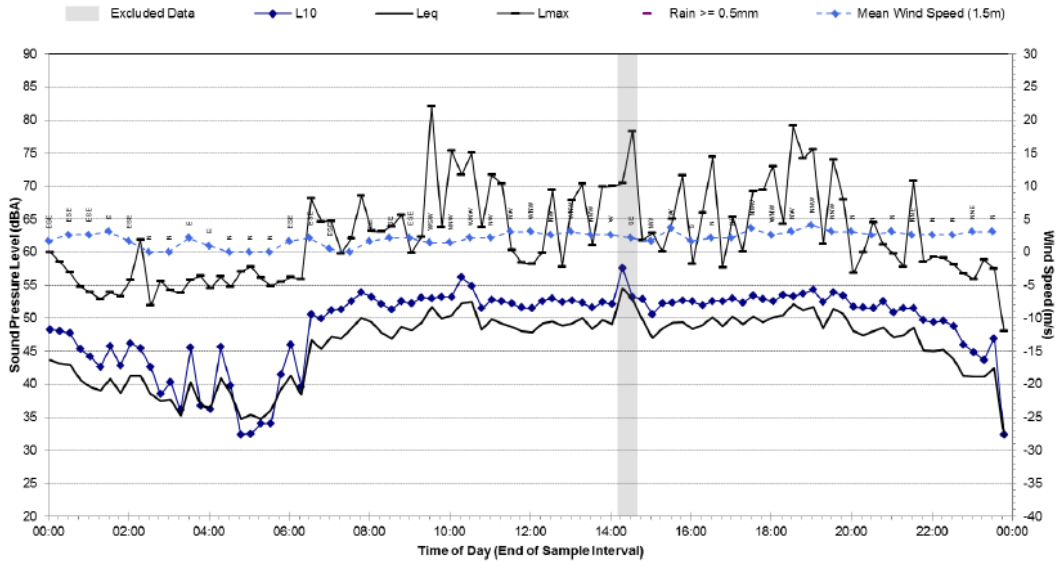
Statistical Ambient Noise Levels
L06 - 1 Birch Way, Jerrabomberra - Friday, 1 March 2019



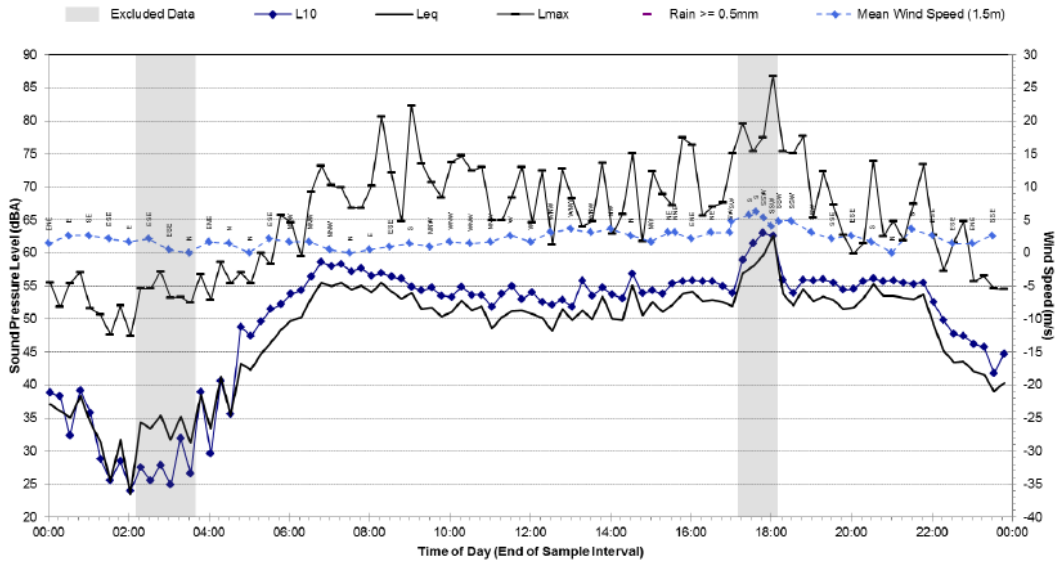
Statistical Ambient Noise Levels
L06 - 1 Birch Way, Jerrabomberra - Saturday, 2 March 2019



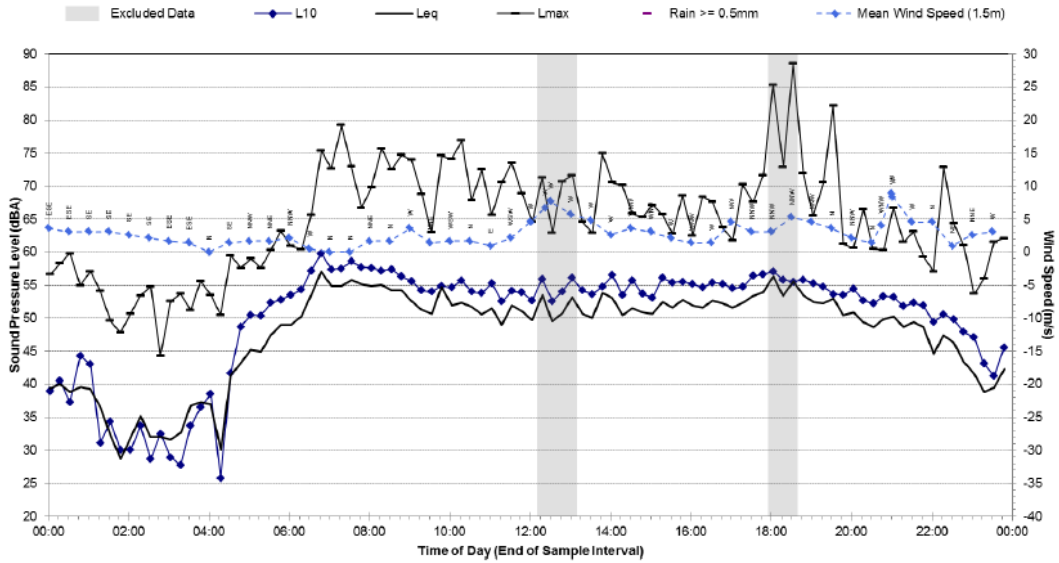
Statistical Ambient Noise Levels
 L06 - 1 Birch Way, Jerrabomberra - Sunday, 3 March 2019



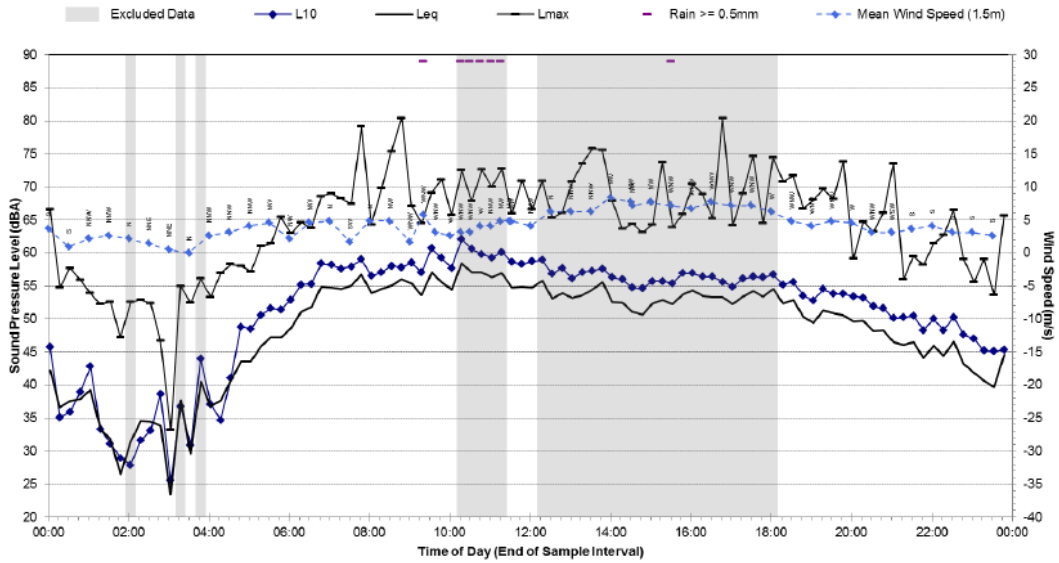
Statistical Ambient Noise Levels
 L06 - 1 Birch Way, Jerrabomberra - Monday, 4 March 2019



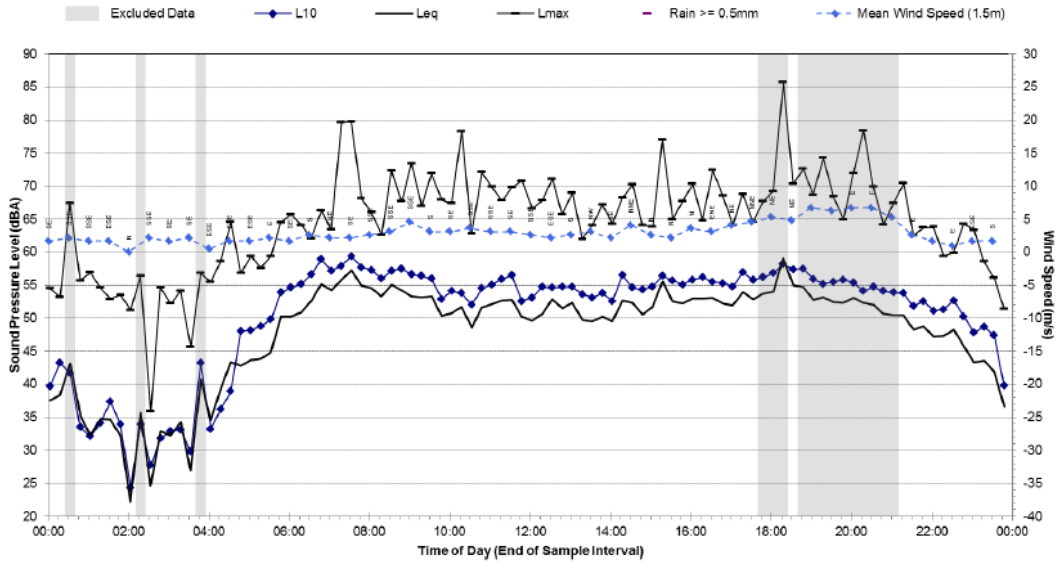
Statistical Ambient Noise Levels L06 - 1 Birch Way, Jerrabomberra - Tuesday, 5 March 2019



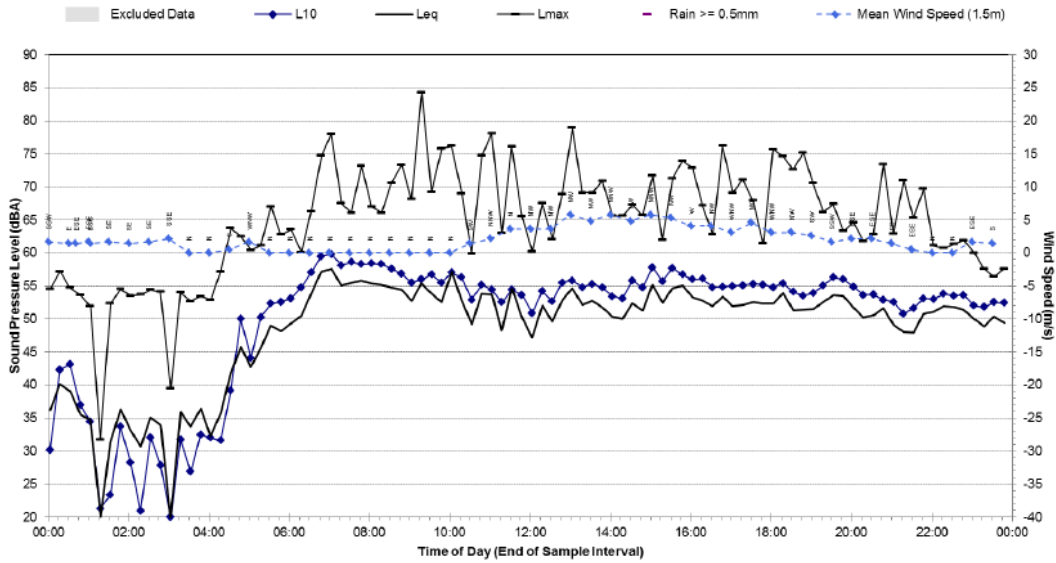
Statistical Ambient Noise Levels L06 - 1 Birch Way, Jerrabomberra - Wednesday, 6 March 2019



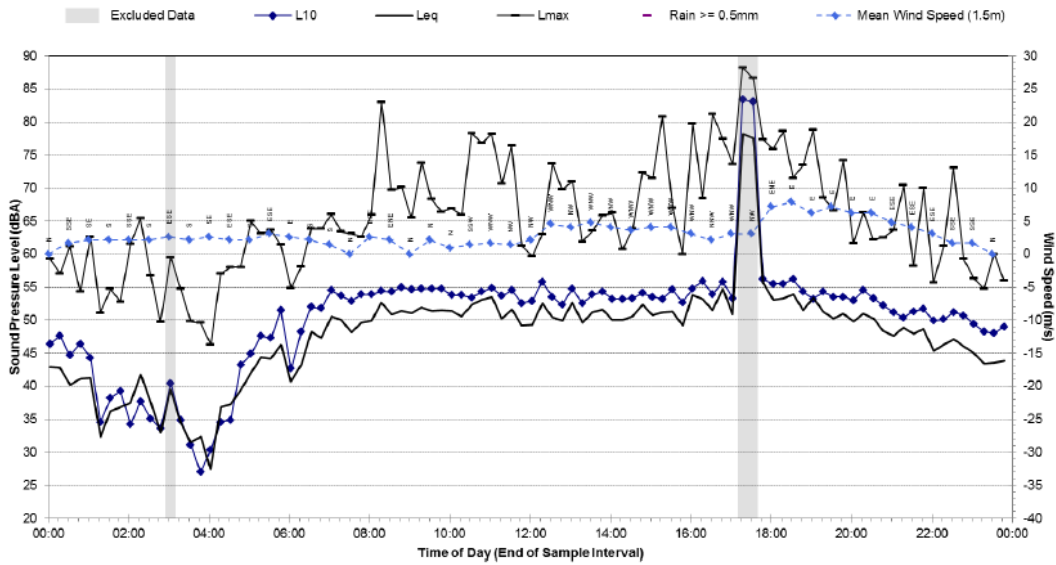
Statistical Ambient Noise Levels L06 - 1 Birch Way, Jerrabomberra - Thursday, 7 March 2019



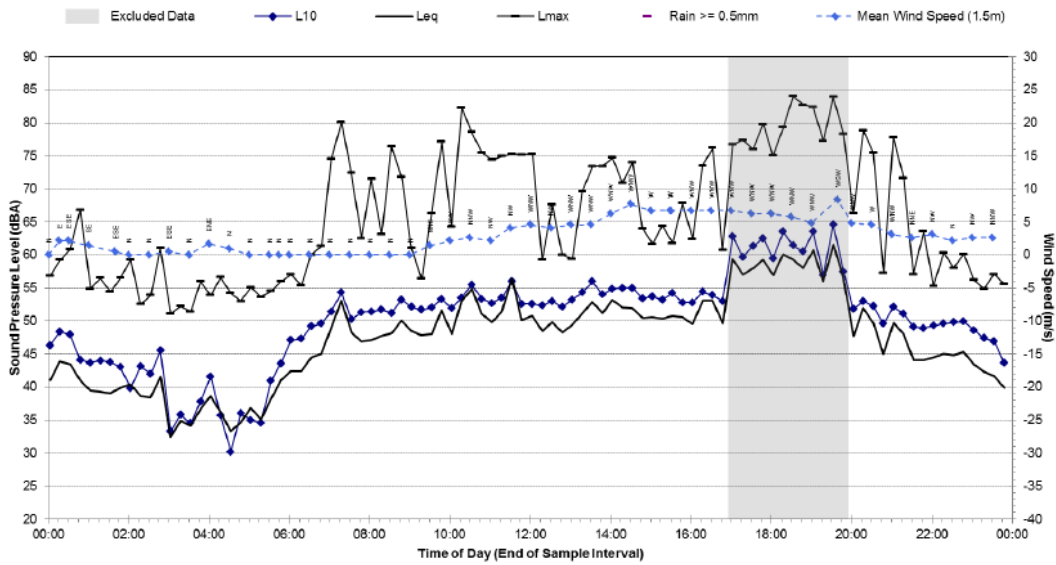
Statistical Ambient Noise Levels L06 - 1 Birch Way, Jerrabomberra - Friday, 8 March 2019



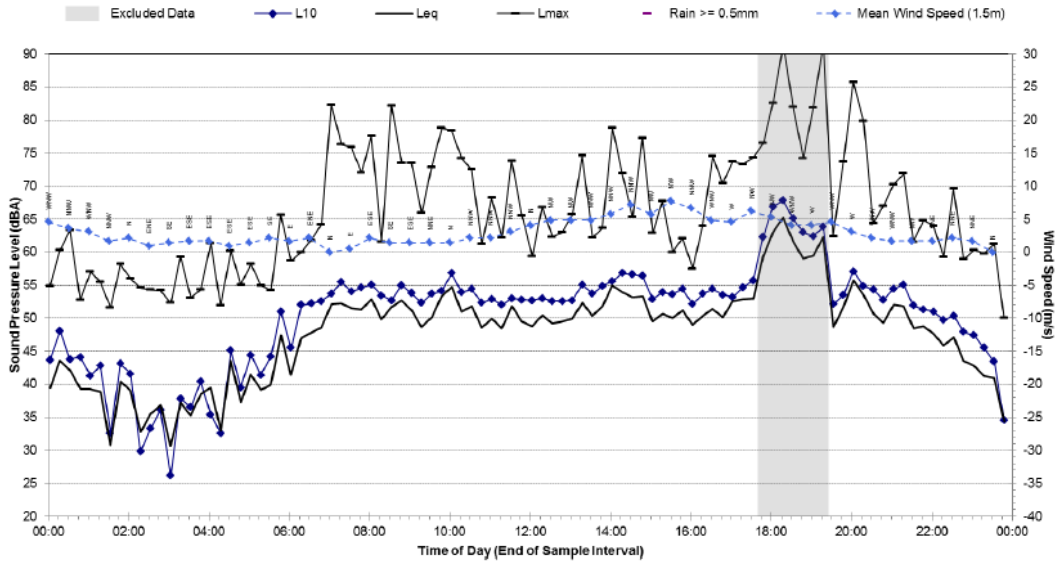
Statistical Ambient Noise Levels L06 - 1 Birch Way, Jerrabomberra - Saturday, 9 March 2019



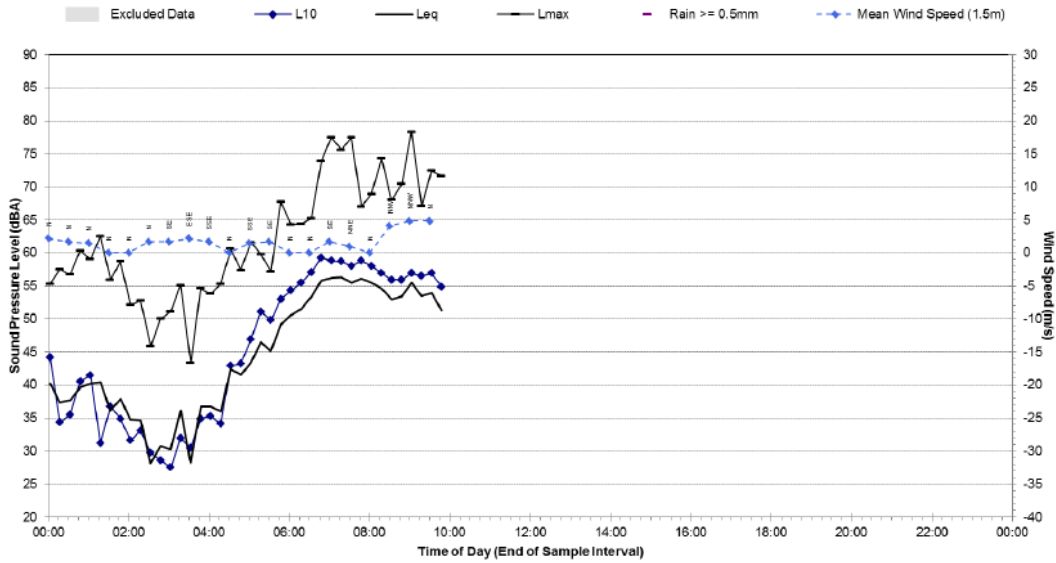
Statistical Ambient Noise Levels L06 - 1 Birch Way, Jerrabomberra - Sunday, 10 March 2019



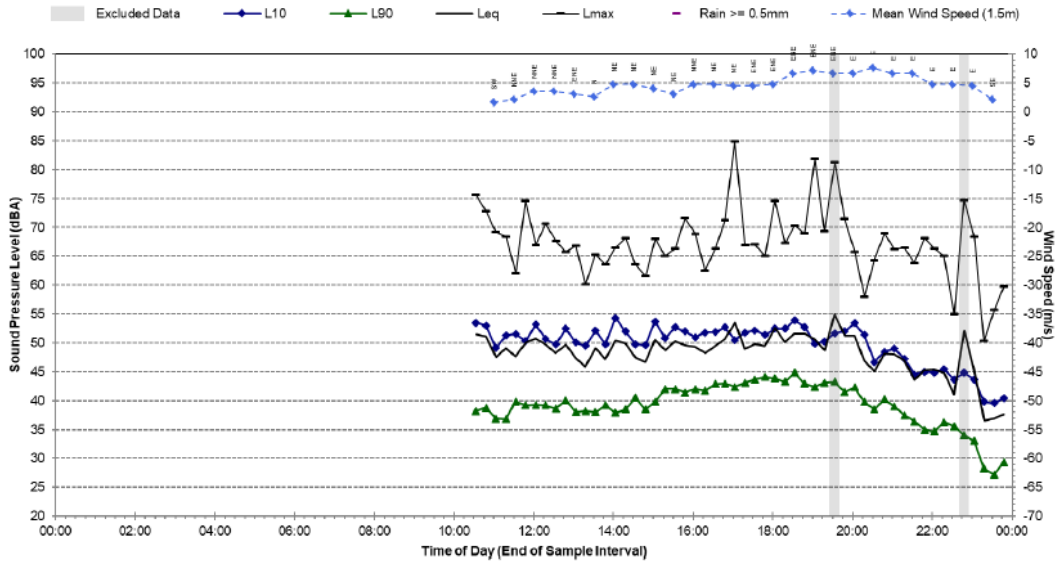
Statistical Ambient Noise Levels
L06 - 1 Birch Way, Jerrabomberra - Monday, 11 March 2019



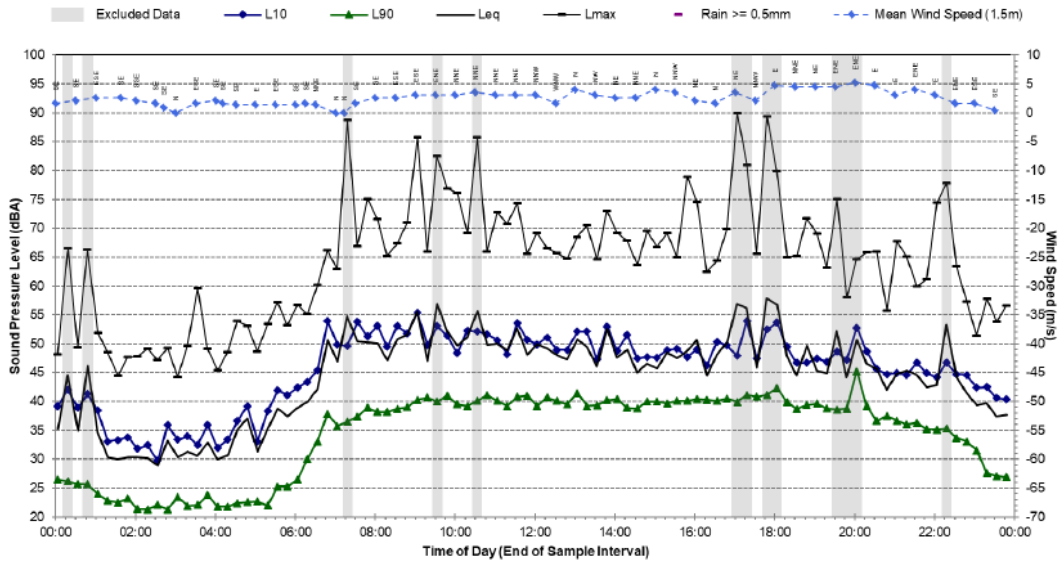
Statistical Ambient Noise Levels
L06 - 1 Birch Way, Jerrabomberra - Tuesday, 12 March 2019



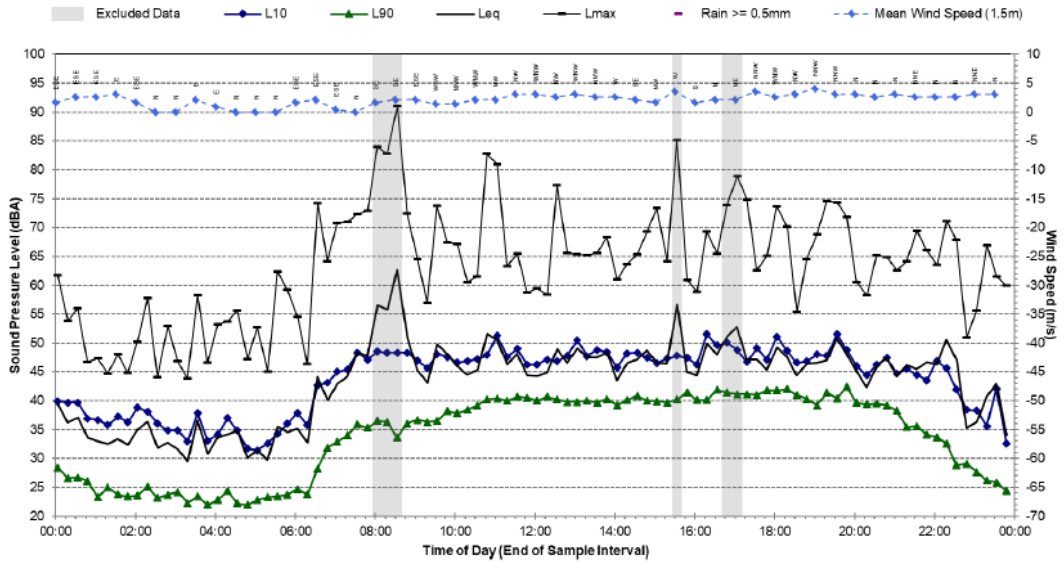
Statistical Ambient Noise Levels L07 72 Rosewood Glen - Friday, 1 March 2019



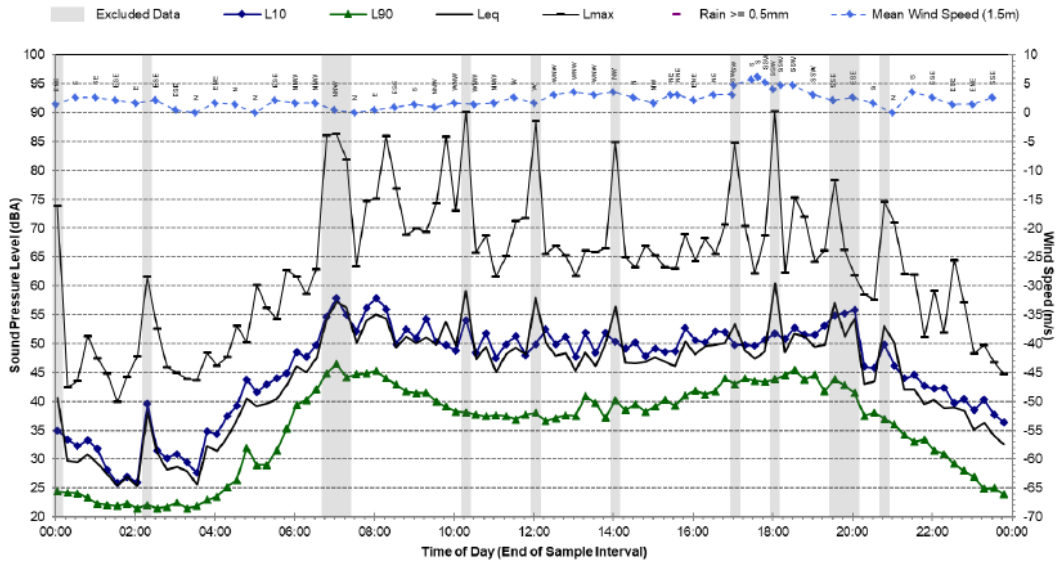
Statistical Ambient Noise Levels L07 72 Rosewood Glen - Saturday, 2 March 2019



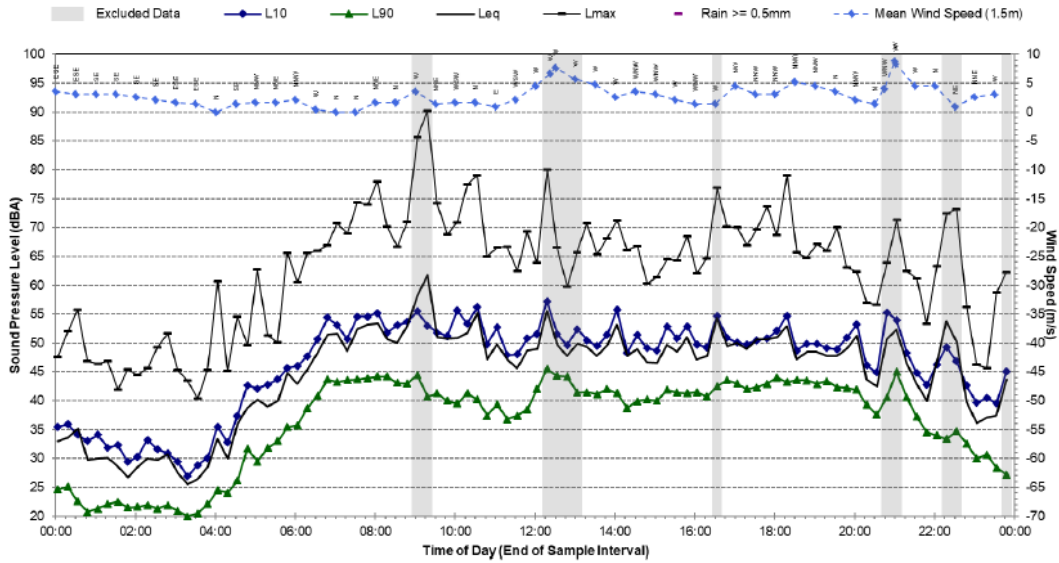
Statistical Ambient Noise Levels L07 72 Rosewood Glen - Sunday, 3 March 2019



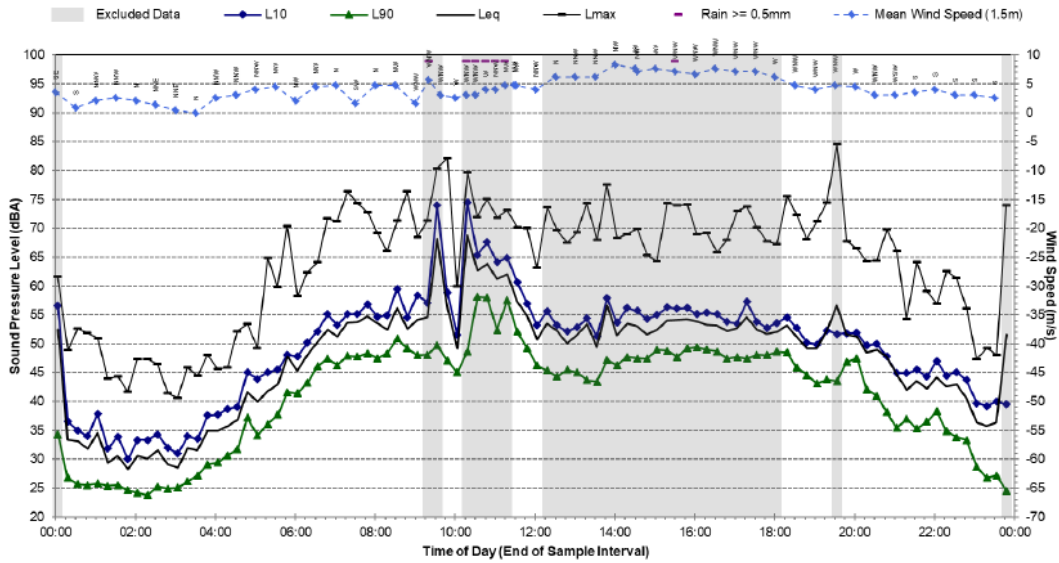
Statistical Ambient Noise Levels L07 72 Rosewood Glen - Monday, 4 March 2019



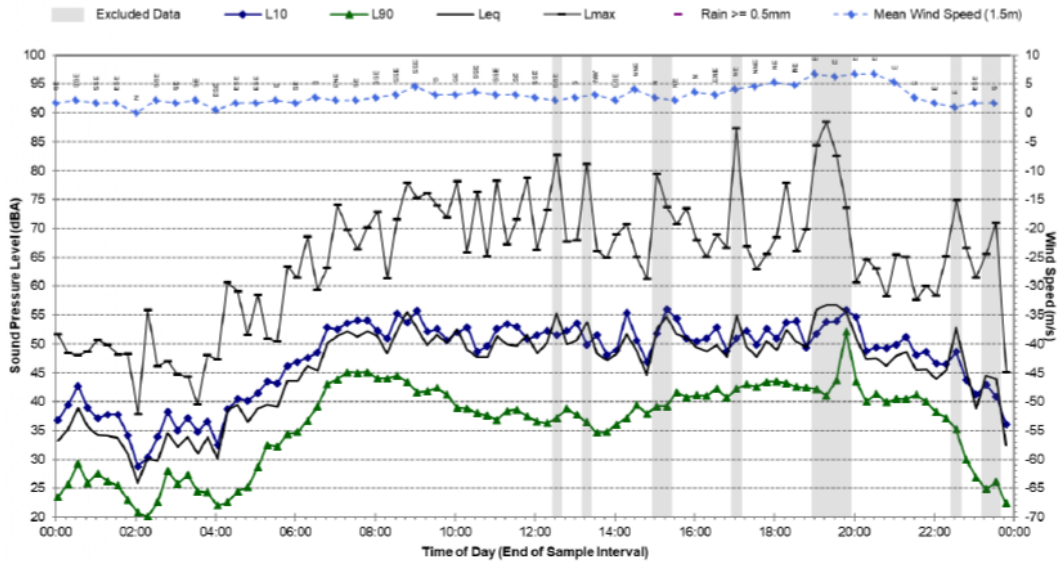
Statistical Ambient Noise Levels L07 72 Rosewood Glen - Tuesday, 5 March 2019



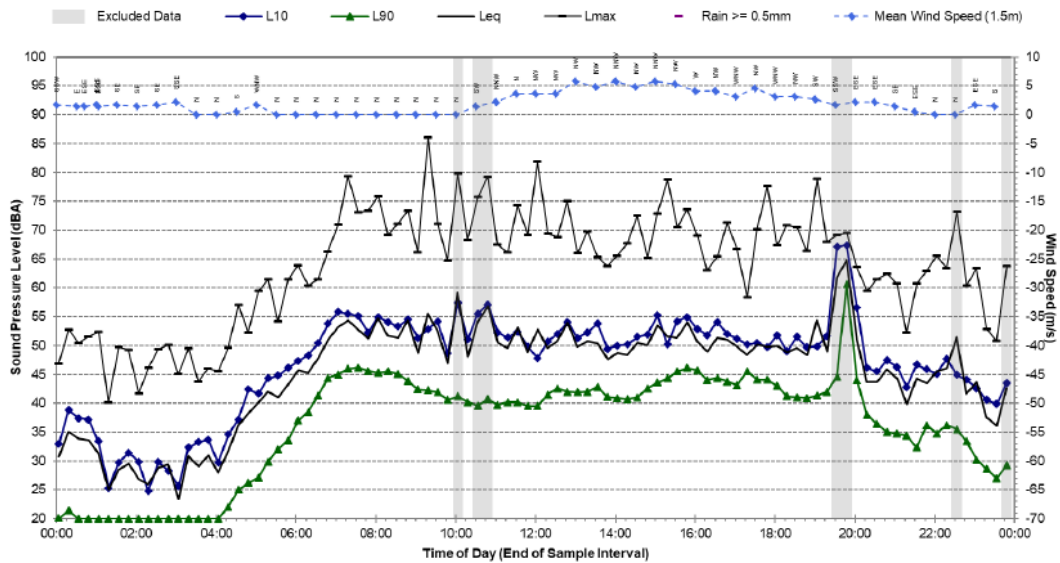
Statistical Ambient Noise Levels L07 72 Rosewood Glen - Wednesday, 6 March 2019



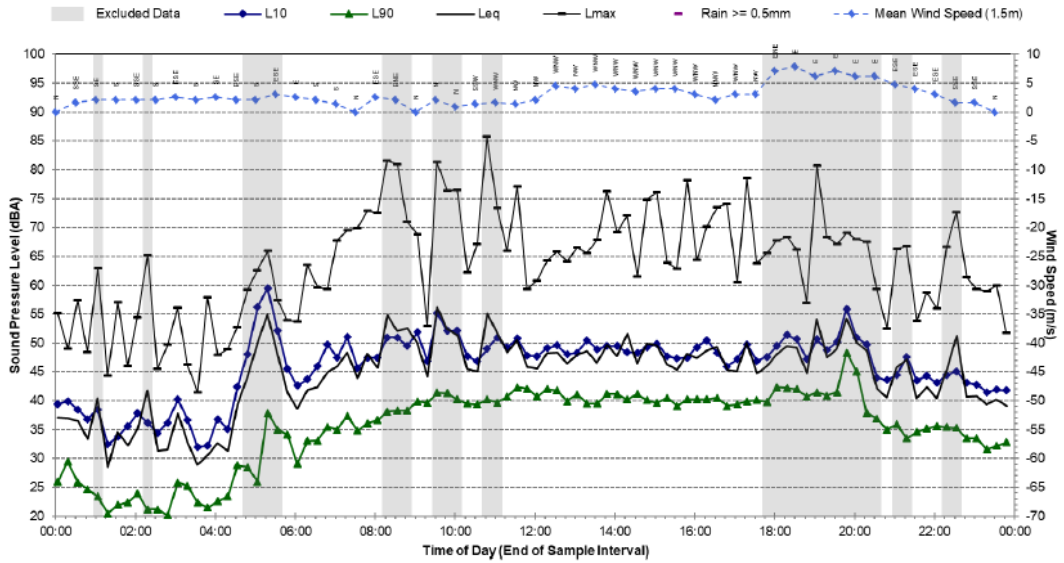
Statistical Ambient Noise Levels L07 72 Rosewood Glen - Thursday, 7 March 2019



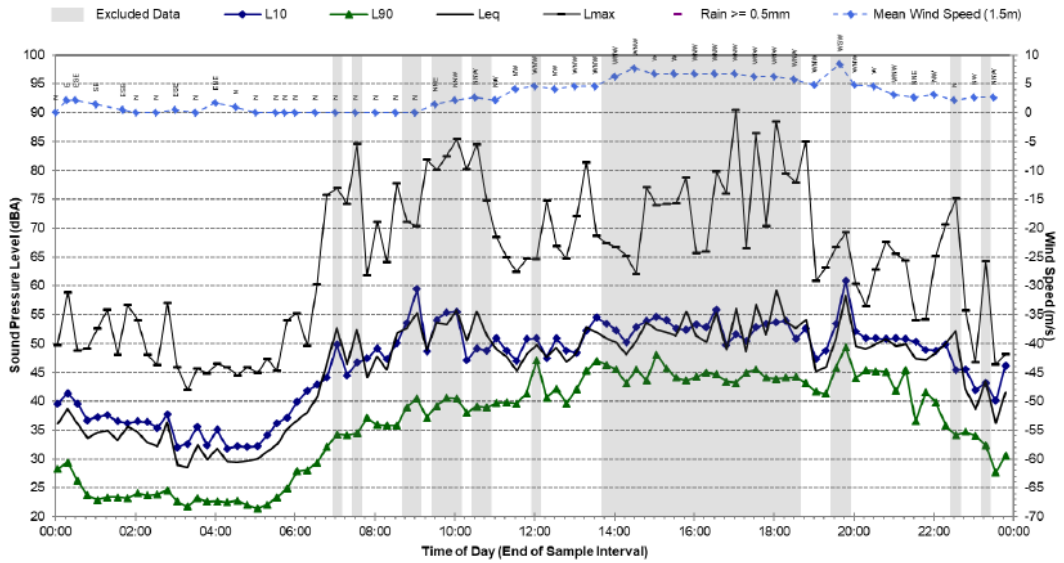
Statistical Ambient Noise Levels L07 72 Rosewood Glen - Friday, 8 March 2019



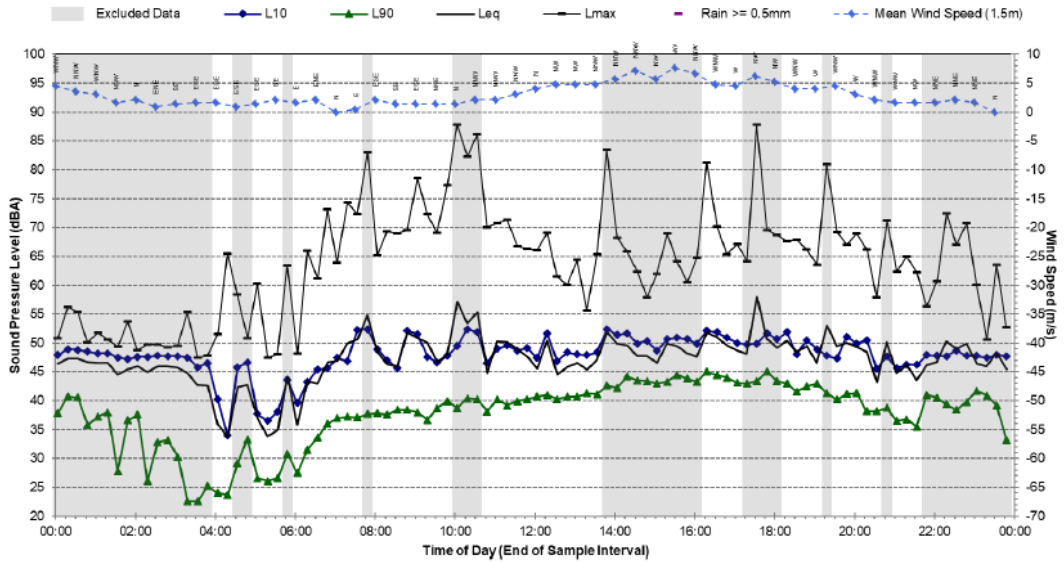
Statistical Ambient Noise Levels L07 72 Rosewood Glen - Saturday, 9 March 2019



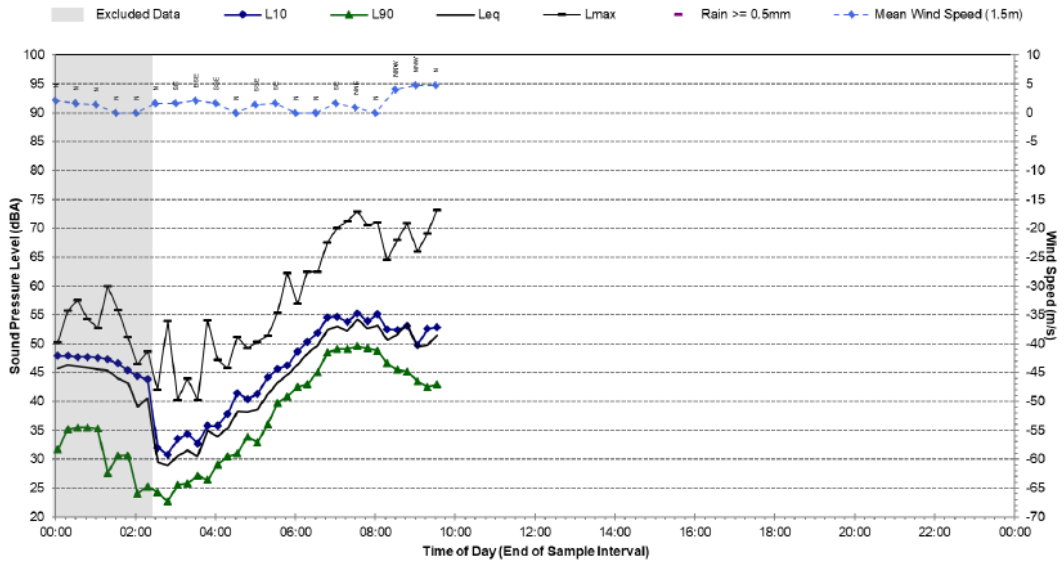
Statistical Ambient Noise Levels L07 72 Rosewood Glen - Sunday, 10 March 2019



Statistical Ambient Noise Levels L07 72 Rosewood Glen - Monday, 11 March 2019



Statistical Ambient Noise Levels L07 72 Rosewood Glen - Tuesday, 12 March 2019



APPENDIX C

Road Traffic Noise Modelling Results Tomsitt Drive to Stringybark Drive

9.7 Edwin Land Parkway Noise Assessment
Attachment 1 - ELP Post Construction Noise Report 2020 (Continued)

Receptor			Road Traffic Noise Level, dBA L _{Aeq}							
			Year 2019				Year 2022			
			Predicted Noise Level		RNP Limit and Excess		Predicted Noise Level		RNP Limit and Excess	
No	Street	Floor	Day	Night	Day 60 dBA	Night 55 dBA	Day	Night	Day 60 dBA	Night 55 dBA
1	Birch Way	1	58	51			59	51		
3	Birch Way	1	57	50			58	50		
5	Birch Way	1	58	51			59	52		
7	Birch Way	1	56	49			56	49		
9	Birch Way	1	56	48			56	49		
11	Birch Way	1	56	48			56	49		
13	Birch Way	1	56	49			56	49		
15	Birch Way	1	57	50			58	50		
41	Bluestone Gardens	1	55	48			55	48		
43	Bluestone Gardens	1	56	49			57	49		
45	Bluestone Gardens	1	59	51			59	52		
47	Bluestone Gardens	1	58	50			58	51		
49	Bluestone Gardens	1	56	49			56	49		
51	Bluestone Gardens	1	57	49			57	50		
53	Bluestone Gardens	1	57	49			57	50		
55	Bluestone Gardens	1	57	50			58	50		
57	Bluestone Gardens	1	58	50			58	50		
59	Bluestone Gardens	1	55	48			56	48		
14	Dora Street	1	57	49			57	50		
15	Dora Street	1	58	50			58	51		
16	Dora Street	1	57	50			58	50		
19	Dora Street	1	57	50			57	50		
31	Dora Street East	1	57	50			58	51		
25	Firethorn Place	1	59	51			60	53		
27	Firethorn Place	1	59	52			60	53		
29	Firethorn Place	1	58	51			59	52		
31	Firethorn Place	1	57	49			57	51		
1	Lerra Street ¹	1	58	51			59	51		
3	Lerra Street	1	60	53			60	53		
7	Lerra Street	1	61	54	< 2 dB		62	54	< 2 dB	
23	Franklin Court	1	56	48			57	49		
25	Franklin Court	1	59	50			59	51		
29	Franklin Court	1	56	48			57	49		
31	Franklin Court	1	56	48			56	49		
30	Maple Crescent	1	55	47			55	48		
32	Maple Crescent	1	57	50			57	50		
34	Maple Crescent	1	57	50			58	50		
9	Poplar Crescent	1	58	51			59	51		
11	Poplar Crescent	1	58	51			58	51		
13	Poplar Crescent	1	58	51			58	51		
15	Poplar Crescent	1	58	51			58	51		

Receptor			Road Traffic Noise Level, dBA L _{Aeq}							
			Year 2019				Year 2022			
			Predicted Noise Level		RNP Limit and Excess		Predicted Noise Level		RNP Limit and Excess	
No	Street	Floor	Day	Night	Day 60 dBA	Night 55 dBA	Day	Night	Day 60 dBA	Night 55 dBA
17	Poplar Crescent	1	57	50			57	50		
19	Poplar Crescent	1	56	49			57	50		
21	Poplar Crescent	1	56	49			57	49		
23	Poplar Crescent	1	56	49			57	49		
25	Poplar Crescent	1	55	48			56	48		
27	Poplar Crescent	1	57	50			58	50		
15	Rosewood Glen	1	55	48			56	49		
17	Rosewood Glen	1	53	46			54	47		
19	Rosewood Glen	1	55	47			55	48		
21	Rosewood Glen	1	54	47			55	47		
23	Rosewood Glen	1	55	48			55	48		
25	Rosewood Glen	1	56	48			56	49		
27	Rosewood Glen	1	57	49			57	50		
31	Rosewood Glen	1	55	47			55	48		
33	Rosewood Glen	1	56	48			56	49		
56	Rosewood Glen	1	59	52			60	53		
56	Rosewood Glen	1	56	48			56	49		
58	Rosewood Glen	1	61	54	< 2 dB		61	55	< 2 dB	
60	Rosewood Glen	1	63	56	3	< 2 dB	63	56	3	< 2 dB
62	Rosewood Glen	1	64	56	4	< 2 dB	64	57	4	< 2 dB
64	Rosewood Glen	1	64	57	4	< 2 dB	65	57	5	2
66	Rosewood Glen	1	65	57	5	2	65	58	5	3
68	Rosewood Glen	1	63	56	3	< 2 dB	63	56	3	< 2 dB
70	Rosewood Glen	1	54	46			54	47		
72	Rosewood Glen	1	56	48			56	49		
74	Rosewood Glen	1	56	49			57	49		
76	Rosewood Glen	1	57	49			57	50		
78	Rosewood Glen	1	57	49			57	50		
90	Rosewood Glen	1	55	48			55	48		
92	Rosewood Glen	1	55	48			56	48		
43	Stringybark Drive	1	55	47			55	48		
11	Unwin Avenue	1	55	48			55	48		
12	Unwin Avenue	1	55	48			56	48		
14	Unwin Avenue	1	55	48			55	48		
17	Unwin Avenue	1	55	47			55	48		
18	Unwin Avenue	1	55	48			56	48		
20	Unwin Avenue	1	55	48			55	48		

1. Described as 20 Numeralia Drive on some mapping systems

APPENDIX D

Road Traffic Noise Modelling Results East of Stringybark Drive

9.7 Edwin Land Parkway Noise Assessment
Attachment 1 - ELP Post Construction Noise Report 2020 (Continued)

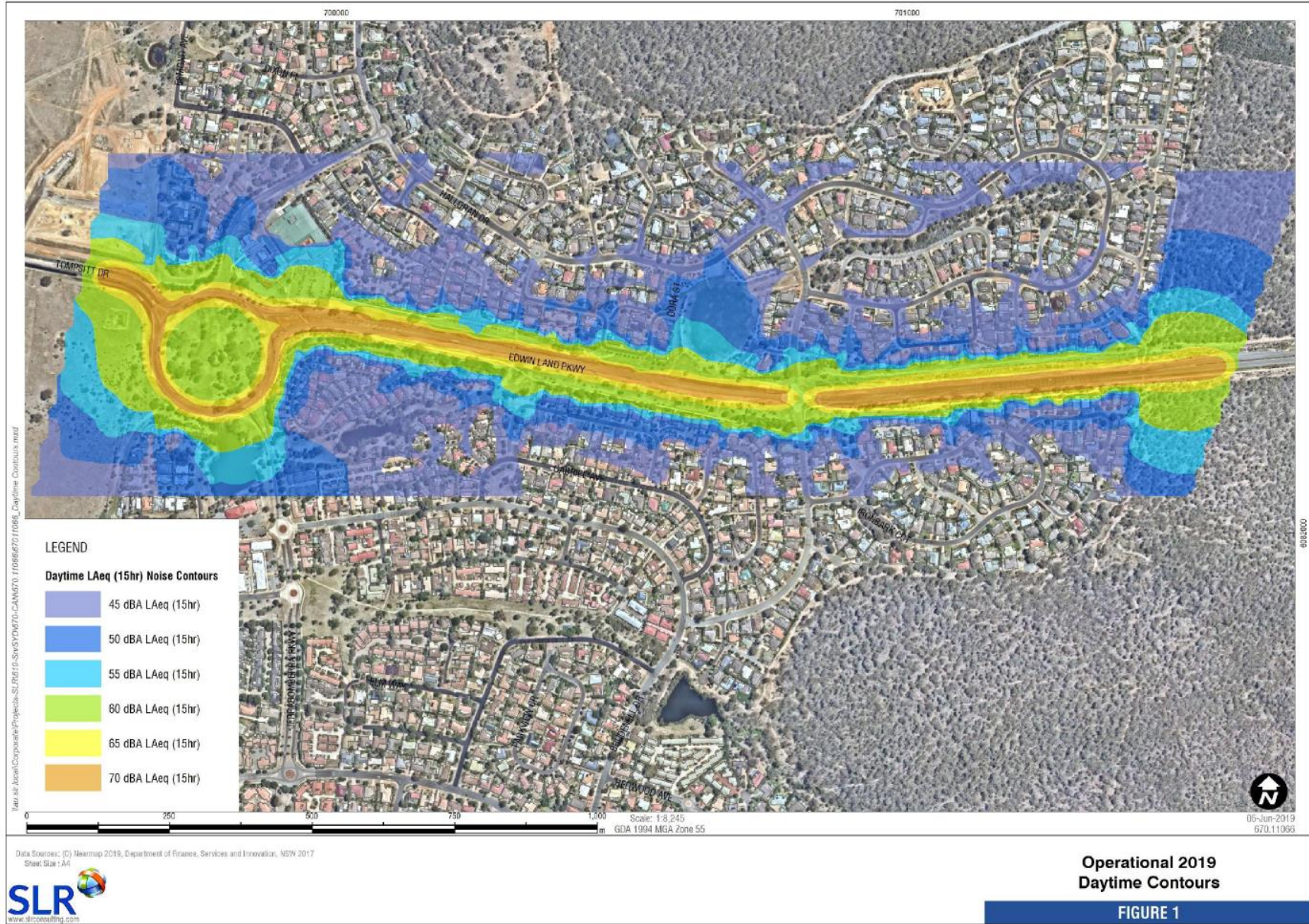
Receptor			Road Traffic Noise Level, dBA L_{Aeq}							
			Year 2019				Year 2022			
			Predicted Noise Level		RNP Limit and Excess		Predicted Noise Level		RNP Limit and Excess	
No	Street	Floor	Day	Night	Day 55 dBA	Night 50 dBA	Day	Night	Day 55 dBA	Night 50 dBA
3	Adina Court	1	56	49	< 2 dB		56	49	< 2 dB	
4	Bluebell Glen	1	52	45			52	45		
5	Bluebell Glen	1	51	44			52	44		
		2	62	55	7	5	62	55	7	5
8	Burgan Grove	1	51	43			51	44		
11	Burgan Grove	1	51	44			52	45		
13	Burgan Grove	1	52	45			52	45		
3/15	Ironbark Circuit	1	50	42			50	43		
		2	64	56	9	6	64	57	9	7
4/15	Ironbark Circuit	1	51	44			51	44		
		2	63	56	8	6	63	56	8	6
5/15	Ironbark Circuit	1	50	42			50	43		
		2	64	56	9	6	64	57	9	7
6/15	Ironbark Circuit	1	50	42			50	43		
		2	64	56	9	6	64	57	9	7
7/15	Ironbark Circuit	1	52	44			52	45		
		2	64	57	9	7	64	57	9	7
8/15	Ironbark Circuit	1	49	42			49	42		
		2	64	57	9	7	64	57	9	7
9A/B	Coora Place	1	55	48			55	48		
13	Coora Place	1	54	47			55	48		
15	Coora Place	1	55	47			55	48		
29	Ironbark Circuit	1	53	46			53	46		
31	Ironbark Circuit	1	53	46			53	46		
33	Ironbark Circuit	1	52	45			53	45		
3	Macadamia Close	1	51	44			51	44		
5	Macadamia Close	1	51	44			52	45		
7	Macadamia Close	1	50	43			51	43		
9	Macadamia Close	1	49	42			50	42		
11	Macadamia Close	1	50	43			50	43		
13	Macadamia Close	1	51	44			52	45		
15	Macadamia Close	1	50	42			50	43		
17	Macadamia Close	1	52	44			52	45		
19	Macadamia Close	1	51	44			52	45		
21	Macadamia Close	1	52	45			52	45		
23	Macadamia Close	1	53	45			53	46		
25	Macadamia Close	1	52	45			52	45		
27	Macadamia Close	1	52	45			52	45		
14	Pannamena Crescent	1	55	47			55	48		
16	Pannamena Crescent	1	54	47			55	47		
18	Pannamena Crescent	1	54	47			55	47		

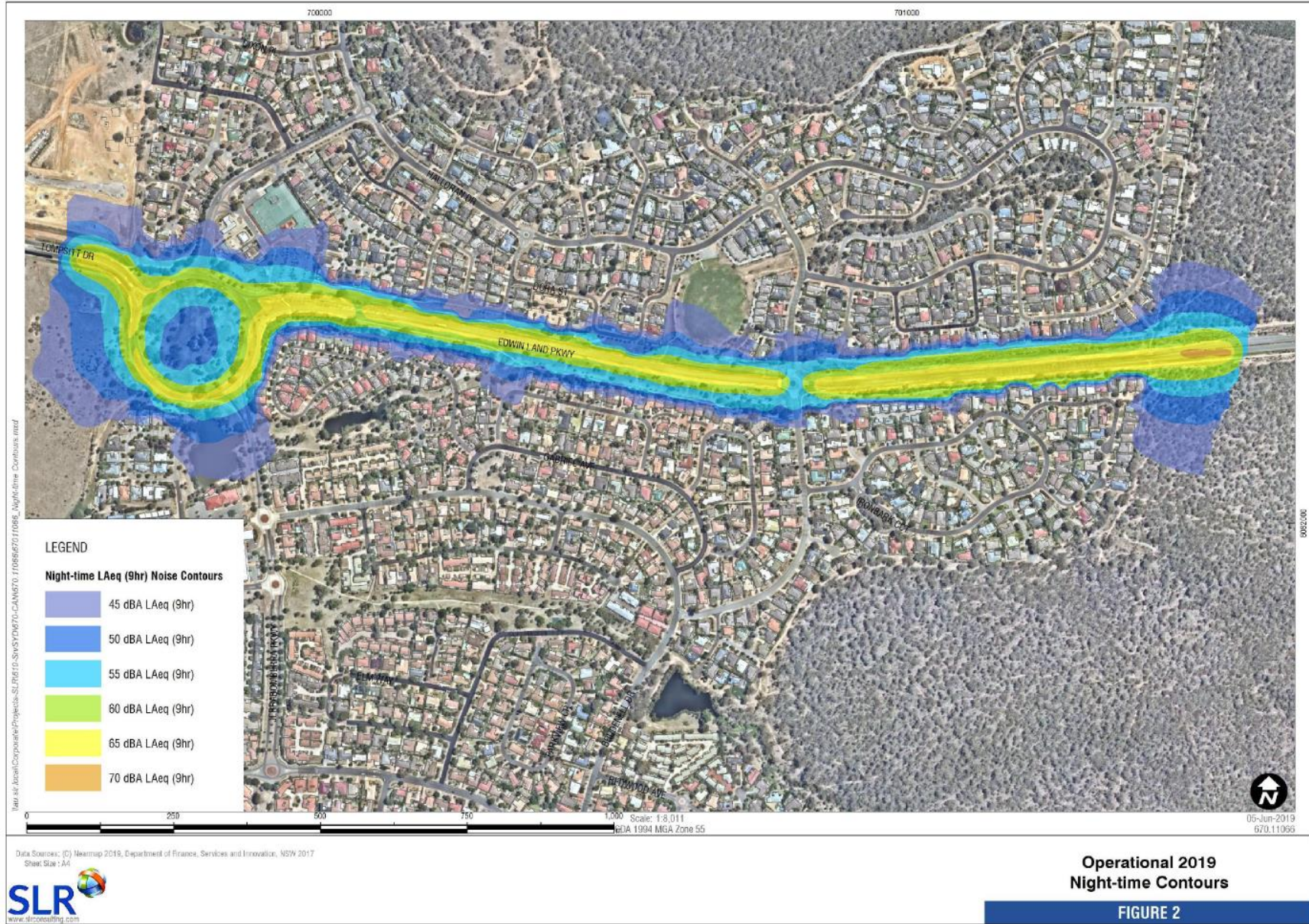
9.7 Edwin Land Parkway Noise Assessment
Attachment 1 - ELP Post Construction Noise Report 2020 (Continued)

Receptor			Road Traffic Noise Level, dBA L_{Aeq}							
			Year 2019				Year 2022			
			Predicted Noise Level		RNP Limit and Excess		Predicted Noise Level		RNP Limit and Excess	
No	Street	Floor	Day	Night	Day 55 dBA	Night 50 dBA	Day	Night	Day 55 dBA	Night 50 dBA
20	Pannamena Crescent	1	55	47			55	48		
22	Pannamena Crescent	1	53	45			53	46		
24	Pannamena Crescent	1	53	46			53	46		
26	Pannamena Crescent	1	54	47			55	48		
28	Pannamena Crescent	1	57	50	2		58	50	3	
30	Pannamena Crescent	1	54	47			55	48		
32	Pannamena Crescent	1	53	46			53	46		
34	Pannamena Crescent	1	55	48			55	48		
36	Pannamena Crescent	1	57	50	< 2 dB		57	50	2	
44	Stringybark Drive	1	49	42			50	42		
10	Tooronga Crescent	1	54	47			54	47		
12	Tooronga Crescent	1	54	47			54	47		
14	Tooronga Crescent	1	55	48			56	49	< 2 dB	
16	Tooronga Crescent	1	55	48			56	49	< 2 dB	
18	Tooronga Crescent	1	55	47			55	48		
20	Tooronga Crescent	1	56	49	< 2 dB		56	49	< 2 dB	
22	Tooronga Crescent	1	56	49	< 2 dB		57	49	< 2 dB	
24	Tooronga Crescent	1	55	48			55	48		
28	Tooronga Crescent	1	55	48			55	48		
30	Tooronga Crescent	1	53	46			54	47		
32	Tooronga Crescent	1	53	45			53	46		

APPENDIX E

Road Traffic Noise Contours

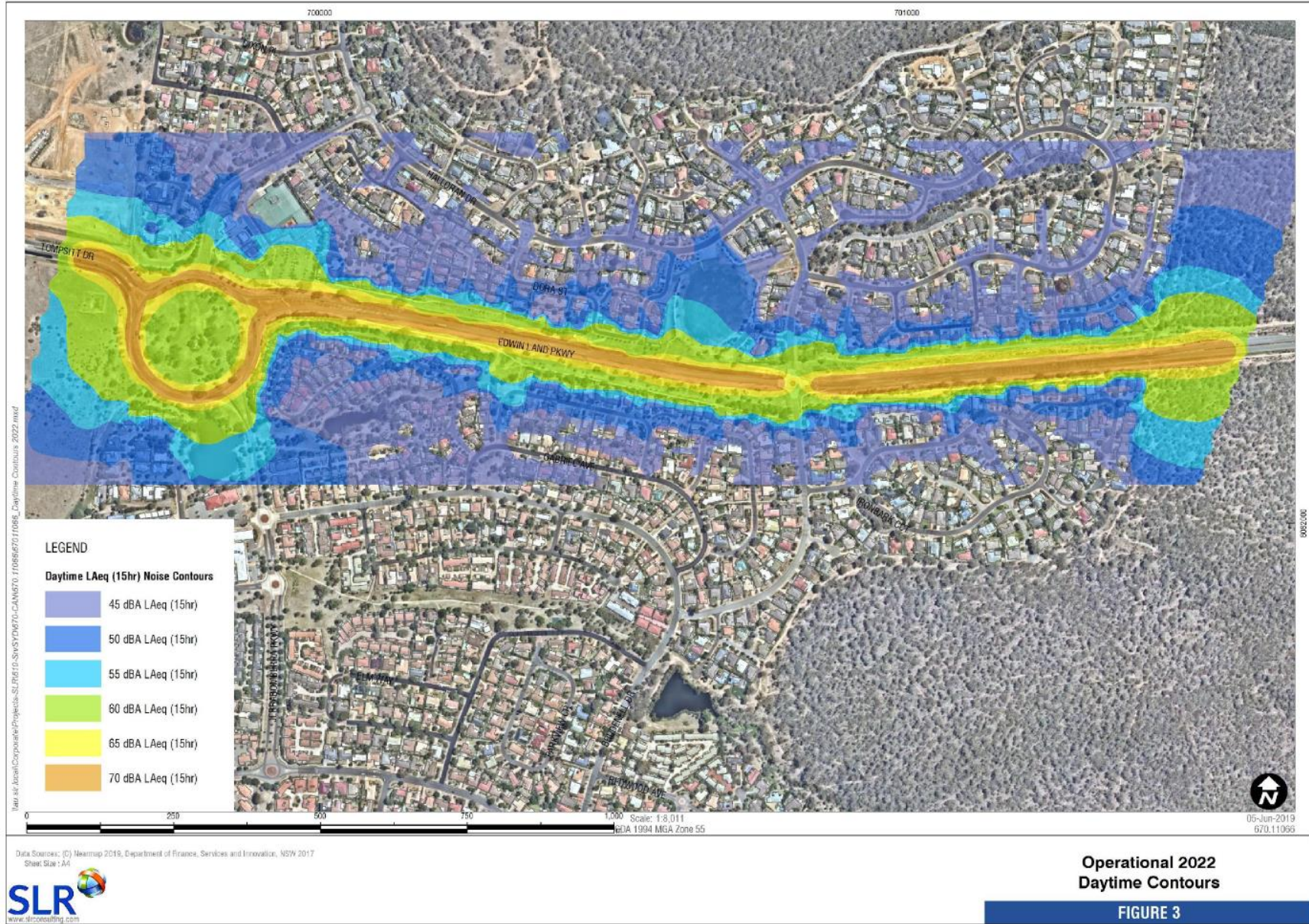


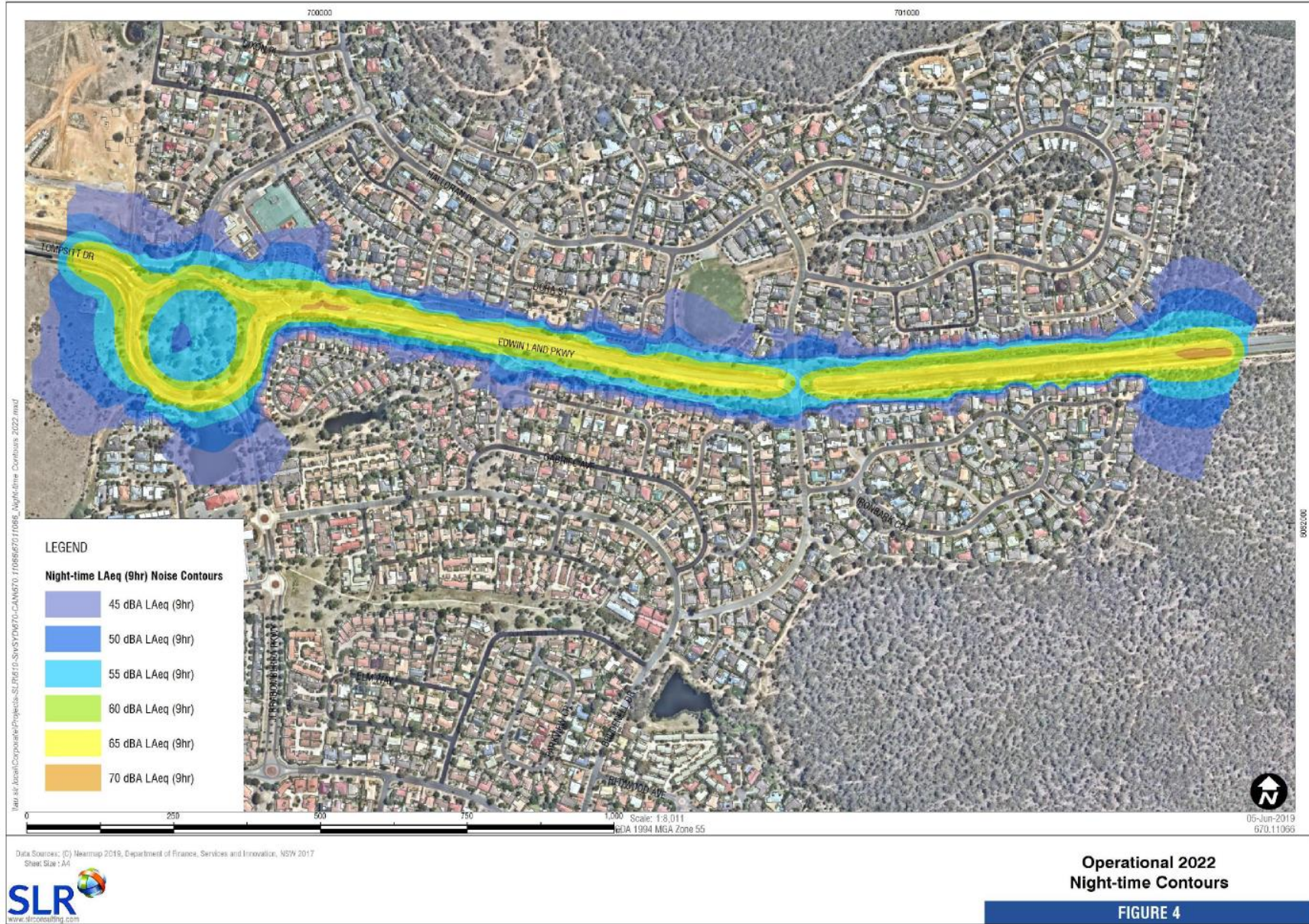


APPENDIX F

Road Traffic Noise Contours

Future – Year 2022





**Operational 2022
 Night-time Contours**
FIGURE 4

ASIA PACIFIC OFFICES

BRISBANE

Level 2, 15 Astor Terrace
Spring Hill QLD 4000
Australia
T: +61 7 3858 4800
F: +61 7 3858 4801

CANBERRA

GPO Box 410
Canberra ACT 2600
Australia
T: +61 2 6287 0800
F: +61 2 9427 8200

DARWIN

5 Foelsche Street
Darwin NT 0800
Australia
T: +61 8 8998 0100
F: +61 2 9427 8200

GOLD COAST

Ground Floor, 194 Varsity Parade
Varsity Lakes QLD 4227
Australia
M: +61 438 763 516

MACKAY

21 River Street
Mackay QLD 4740
Australia
T: +61 7 3181 3300

MELBOURNE

Suite 2, 2 Domville Avenue
Hawthorn VIC 3122
Australia
T: +61 3 9249 9400
F: +61 3 9249 9499

NEWCASTLE

10 Kings Road
New Lambton NSW 2305
Australia
T: +61 2 4037 3200
F: +61 2 4037 3201

PERTH

Ground Floor, 503 Murray Street
Perth WA 6000
Australia
T: +61 8 9422 5900
F: +61 8 9422 5901

SYDNEY

2 Lincoln Street
Lane Cove NSW 2066
Australia
T: +61 2 9427 8100
F: +61 2 9427 8200

TOWNSVILLE

Level 1, 514 Sturt Street
Townsville QLD 4810
Australia
T: +61 7 4722 8000
F: +61 7 4722 8001

AUCKLAND

68 Beach Road
Auckland 1010
New Zealand
T: +64 27 441 7849

NELSON

6/A Cambridge Street
Richmond, Nelson 7020
New Zealand
T: +64 274 898 628

QUEANBEYAN-PALERANG REGIONAL COUNCIL

Council Meeting Attachment

28 SEPTEMBER 2022

ITEM 9.7 EDWIN LAND PARKWAY NOISE ASSESSMENT

ATTACHMENT 2 ELP ROSEWOOD GLEN NOISE MEMO



Memorandum

To:	Eli Ramsland	At:	Queanbeyan-Palerang Regional Council
From:	Joshua Ridgway	At:	SLR Consulting Australia Pty Ltd
Date:	18 February 2022	Ref:	670.11066-M01-v1.0-20220218.docx
Subject:	Edwin Land Parkway, Jerrabomberra Post-Construction Noise Assessment Addendum to Traffic Speed Variation		

Dear Eli,

SLR Consulting Australia Pty Ltd (SLR) has been requested by Queanbeyan-Palerang Regional Council (Council) to update the noise model for the post-construction traffic speed variation for Edwin Land Parkway, Jerrabomberra, with the following changes:

- Extension of the modelled rear fence-line in the vicinity of 56 to 68 Rosewood Glen.
- Splitting the receiver building for 78-88 Rosewood Glen into individual residences.

This memorandum presents the results of the noise model update and forms an addendum to the post-construction traffic speed variation noise assessment report (SLR Report *670.11066-R02-v1.3-20200113*, dated 13 January 2020).

Extension of Modelled Rear Fence-line

The rear fence-line of residences on Rosewood Glen was previously modelled adjacent to Edwin Land Parkway, extending to 70 Rosewood Glen at the western end, with an assumed height of 1.8 m.

Council has requested for the modelled rear fence-line to be extended to the full extent of the existing fence adjacent to Jerra Circle. The existing fence in this area is assumed to be 1.8 m in height, consistent with the previously modelled fence-line.

The extent of the previously modelled fence-line and the updated modelled fence-line is shown in **Figure 1**.

It is noted that the updated fence-line is an existing fence that was not included in the noise model. This is not a proposed new fence.

Figure 1 Update to Modelled Fence-line



Note 1: The updated modelled fence-line is an existing fence that was not included in the noise model. This is not a proposed new fence.
Note 2: The numbers in the figure are the street numbers for these residences on Rosewood Glen.

Splitting Receiver Building for 78-88 Rosewood Glen

The multi-residence building located at 78-88 Rosewood Glen was previously modelled as a single building and the predicted noise level reported as 78 Rosewood Glen.

Council has requested for this receiver to be split into the individual residences, ie 78, 80, 82, 84, 86 and 88 Rosewood Glen.

The locations of these individual residences are shown in **Figure 1** with their street numbers labelled.

Predicted Operational Road Traffic Noise Levels

The operational noise model for the post-construction traffic speed variation was updated with the changes detailed above. All other model inputs are consistent with that assessment and have not been modified.

The predicted operational road traffic noise levels for the Year 2022 scenario with the above changes are detailed in **Table 1**.

Table 1 Predicted Operational Road Traffic Noise Levels

Receiver			Year 2022 Predicted Road Traffic Noise Level, dBA		RNP Criteria and Exceedance, dBA	
No	Street	Floor	Day LAeq(15hour)	Night LAeq(9hour)	Day 60 dBA	Night 55 dBA
56	Rosewood Glen	1	54	47	-	-
58	Rosewood Glen	1	56	49	-	-
60	Rosewood Glen	1	56	49	-	-
62	Rosewood Glen	1	57	50	-	-
64	Rosewood Glen	1	58	50	-	-
66	Rosewood Glen	1	58	50	-	-
68	Rosewood Glen	1	58	51	-	-
70	Rosewood Glen	1	54	47	-	-
72	Rosewood Glen	1	56	49	-	-
74	Rosewood Glen	1	57	50	-	-
76	Rosewood Glen	1	57	50	-	-
78	Rosewood Glen	1	58	50	-	-
80	Rosewood Glen	1	57	50	-	-
82	Rosewood Glen	1	57	50	-	-
84	Rosewood Glen	1	57	49	-	-
86	Rosewood Glen	1	56	49	-	-
88	Rosewood Glen	1	56	48	-	-
90	Rosewood Glen	1	56	48	-	-

Note 1: Receiver locations not listed in the above table are out of the scope of this memorandum and have not been assessed.

The above changes to the noise model result in compliance with the RNP criteria at the receivers detailed in **Table 1** during both the daytime and night-time periods.

I trust this information is sufficient for your requirements. Please do not hesitate to contact me if you have any queries or require anything further.

Yours Sincerely



JOSHUA RIDGWAY
Senior Consultant

Checked/
Authorised by: MB

QUEANBEYAN-PALERANG REGIONAL COUNCIL

Council Meeting Attachment

28 SEPTEMBER 2022

ITEM 9.7 EDWIN LAND PARKWAY NOISE ASSESSMENT

ATTACHMENT 3 ELP PROPERTY TREATMENT REPORT 2022

Queanbeyan-Palerang Regional Council

JUNE 2022

Edwin Land Parkway Road Noise Assessment



Question today
Imagine tomorrow
Create for the future



Edwin Land Parkway Road Noise Assessment

Queanbeyan-Palerang Regional Council

WSP
Level 2, 121 Marcus Clarke Street
Canberra ACT 2601
PO Box 1551
Canberra ACT 2600

Tel: +61 2 6201 9600
Fax: +61 2 6201 9666
wsp.com

REV	DATE	DETAILS
0	28/03/2022	Issue
1	28/06/2022	Revised issue

	NAME	DATE	SIGNATURE
Prepared by:	Linnea Eriksson	28/06/2022	
Reviewed and approved by:	Zhang Lai	28/06/2022	

WSP acknowledges that every project we work on takes place on First Peoples lands. We recognise Aboriginal and Torres Strait Islander Peoples as the first scientists and engineers and pay our respects to Elders past and present.

This document may contain confidential and legally privileged information, neither of which are intended to be waived, and must be used only for its intended purpose. Any unauthorised copying, dissemination or use in any form or by any means other than by the addressee, is strictly prohibited. If you have received this document in error or by any means other than as authorised addressee, please notify us immediately and we will arrange for its return to us.

PS125932-ACO-REP-01 Rev1

June 2022



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List of appendices

Appendix A Property details

Executive summary

WSP has been engaged by Queanbeyan-Palerang Regional Council to conduct an acoustic assessment of a number of properties along Edwin Land Parkway. It is understood the investigation is required as a result of recommendations for the Post Construction Noise Assessment for Edwin Land Parkway, assessing traffic growth in the area, and proposed traffic variations.

Properties selected for noise assessment has been agreed with client and is based on properties predicted to exceed external noise level criteria in the post-construction noise assessment carried out by SLR Consulting.

The acoustic assessment provided in this report can be broken down in the following three parts:

- 1 Field assessments of properties and specifically the estimated road noise reduction through building envelope of existing buildings
- 2 Prediction and assessment of internal noise levels of identified properties
- 3 Recommendations on acoustic treatment that would/could apply to these properties

The focus of noise assessments carried out by WSP was to determine the road noise reduction of the facades and to make observations. The noise reduction of the façade was measured in broad accordance with *AS 1055-2018* and *AS 2702-1984*, presented in Section 3.3. During field visits observations were made regarding the façade construction, fence and room layout, presented in Appendix A.

Predictions have been made for internal noise level based on the façade assessment and predicted external noise level from the post-construction noise assessment carried out by SLR. Internal noise levels were assessed against noise criteria outlined in *AS 2107* and NSW guideline and excess determined.

Noise mitigation options in the form of quieter road pavement (most preferred) and noise barrier are typically considered feasible and reasonable to be considered if they benefit four or more closely spaced exceeding receivers. Where possible these options should be considered further. Based on information provided by QPRC, it is understood that the section of Edwin Land Parkway east of Stringybark Drive has (or will have) open graded asphalt installed. This is considered to be quieter road pavement type if properly maintained with an expected additional noise benefit of about 2 dB.

Based on observations made on site and determined excess of noise criteria the following recommendations have been made:

- It is noted that compliance to the external road noise criteria is reliant on suitable fence/ noise barrier structures on several residential properties' boundaries (e.g. Rosewood Glen). These structures should be further assessed to ensure that they are suitably sound insulating and capable of providing the modelled acoustic benefit (e.g. sufficient mass, lapped and capped fence, generally gap-free). Property details in Appendix A might serve as guidance.
- From WSP's measurements, existing building envelope constructions of the identified buildings are expected capable to provide sufficient road noise reduction to achieve the established internal noise targets.
- Mechanical fresh air ventilation (that does not compromise sound insulation through the building envelope and that meet Building Code of Australia requirements) should be explored for the identified isolated properties where external noise levels remain in exceedance of the external road noise criteria.

1 Introduction

WSP Australia Pty Ltd (WSP) has been engaged by Queanbeyan-Palerang Regional Council to conduct an acoustic assessment of several properties along Edwin Land Parkway. It is understood the investigation is required as a result of properties identified to exceed the relevant traffic noise criteria in previous noise assessments.

The acoustic assessment provided in this report can be broken down in the following three parts:

- 1 Field assessments of properties and specifically the road noise reductions achievable by identified existing buildings
- 2 Prediction and assessment of internal noise levels of identified properties
- 3 Recommendations on possible property treatment options that would/could apply to these properties

Noise mitigation in the form of quieter road pavement and noise barriers are typically preferred over property treatment. Property treatment is recommended to be considered the last resort in specific circumstances (e.g. isolated exceeding properties).

Assessed properties have been identified in the post-construction noise assessment carried out by SLR Consulting has been summarised in Table 1.1.

Table 1.1 Summary of identified properties and predicted exceedances (dB) of the NSW Road Noise Policy for the Year 2022

RECEPTOR	CURRENT SPEED ZONE (2022, NEW ROAD)		POTENTIAL SPEED ZONE INCREASE TO 80 KM/H	
	DAY	NIGHT	DAY	NIGHT
3/15 Ironbark Circuit (First Level)	9	6	10	8
4/15 Ironbark Circuit (First Level)	8	6	9	7
5/15 Ironbark Circuit (First Level)	9	6	10	8
6/15 Ironbark Circuit (First Level)	9	6	10	8
7/15 Ironbark Circuit (First Level)	9	7	10	8
8/15 Ironbark Circuit (First Level)	9	7	10	8
5 Bluebell Glen (Level 1)	7	5	8	6
28 Pannamena Crescent (Ground Level)	-	3	3	3
36 Pannamena Crescent (Ground Level)	-	-	3	3

The post-construction noise assessment by SLR are outlined in more detail in Section 1.1. WSP's assessment has been focused on the assessment of current speed zone (outlined in Section 1.1.1).

Exceedances of 2 dBA or less were considered as negligible by the Road Noise Policy and have therefore been excluded in the scope of this assessment by WSP.

1.1 Previous studies – Post-construction noise assessment

Outlined in this Section are the identified properties from SLR's post-construction noise assessments of Edwin Land Parkway in Jerrabomberra for the Queanbeyan-Palerang Regional Council. Two assessments have been carried out for:

- Current speed limit
- Potential speed limit increased to 80 km/h

To identify the noise affected properties the road noise traffic levels have been considered in relation to the external noise criteria within the *NSW Road Noise Policy*.

1.1.1 Assessment of current speed zone

SLR carried out a post-construction noise assessment at Edwin Land Parkway (Ref: 670.11066-R01 version 2.2, published January 2020). Based on *NSW Road Noise Policy*, residences predicted to exceed the external noise criteria were identified at Edwin Land Parkway. The properties predicted to exceed criteria for year 2022 are:

- Townhouses at 3-8/15 Ironbark Circuit (First Level)
- 5 Bluebell Glen (First Level)
- 28 Pannamena Crescent (Ground Level)

Comment on identified property on Pannamena Crescent

The identified property on Pannamena Crescent was not identified in treatment map provided by Queanbeyan-Palerang Regional Council and WSP has therefore not performed any tests at this property, a discussion regarding this property is however provided in Section 3.4.

Comment on properties on Rosewood Glen

It should also be noted that the following properties on Rosewood Glen were identified in the SLR reports published January 2020 to exceed the criteria:

- 60, 62, 64, 66 and 68 Rosewood Glen (Ground Level)

However, a subsequent SLR memo (ref: 670.11066-M01-v1.0-20220218.docx, date 18 February 2022) concludes there are no exceedances at these properties after the model was updated to include sound insulating barriers along the rear property boundary line at the height of up to 1.8 metres tall. The memo presents updated noise modelling results for which the noise model has been updated to include the existing rear fence-line in the vicinity of 56 to 68 Rosewood Glen. For informative purposes only, property details for Rosewood Glen have been included in Appendix A of this report.

1.1.2 Assessment of potential increase of speed zone to 80 km/h

SLR carried out a post-construction noise assessment due to the traffic speed variation at Edwin Land Parkway (Ref: 670.11066-R02 version 1.3, published January 2020). The assessment investigated increasing the traffic speed on the Edwin Land Parkway, Cooma Street and Old Cooma Road to 80 km/h. Increasing the speed to 80 km/h was predicted to increase the traffic noise level by approximately 1 dBA. Based on *NSW Road Noise Policy* residences predicted to exceed the external noise criteria were identified at Edwin Land Parkway. The properties predicted to exceed criteria with the increased speed zone for year 2022 are:

- Townhouses at 3-8/15 Ironbark Circuit (First Level)
- 5 Bluebell Glen (First Level)
- 28 and 36 Pannamena Crescent (Ground Level)

2 Noise Criteria

External and internal noise criteria are outlined in this Section of the report. Focus will be on the internal criteria, but external noise criteria are presented for context.

2.1 External road noise criteria

The *NSW Road Noise Policy* published 2011 (RNP) provides assessment criteria for residential land uses for different types of road categories. Edwin Land Parkway has been assessed as a sub-arterial road in accordance with the following categories:

- Redeveloped, or with additional traffic on, existing sub-arterial road
- New road

Relevant criteria for this assessment are presented in Table 2.1.

Table 2.1 Relevant external noise assessment criteria from RNP Table 3

TYPE OF PROJECT / LAND USE	ASSESSMENT CRITERIA	
	DAY ⁽¹⁾ , dBA L _{Aeq,15-h}	NIGHT ⁽¹⁾ , dBA L _{Aeq,9-h}
Existing residences affected by noise from redeveloped of, or additional traffic on, existing road	60	55
Existing residences affected by noise from new road	55	50

(1) Hours for daytime criteria: 7 am to 10 pm. Hours for night time criteria: 10 pm to 7 am

When selecting reasonable mitigation measures consideration may be given to:

- Noise impacts
 - Internal noise goals for certain rooms
 - The amount by which the criteria are exceeded, exceedances by up to 2 dB represents a minor impact considered negligible by the RNP
- Noise mitigation benefits:
 - Noise mitigation options in the form of quieter road pavement (most preferred) and noise barrier are typically considered feasible and reasonable to be considered if they benefit four or more closely spaced exceeding receivers. Where possible these options should be considered further.
 - Due to the expected environmental, visual and cost impact, the option of implementing noise barriers or mounds is not likely considered feasible and reasonable if they do not achieve a minimum noise reduction of 5 dB.
 - If noise mitigation in the form of noise barriers and quieter road pavement are considered not feasible and reasonable, considerations can subsequently be given to mitigating noise through providing appropriate internal ambient noise levels.

2.2 Internal noise criteria

2.2.1 AS 2107

Australian Standard *Acoustics – Recommended design sound levels and reverberation times for building interiors* (AS/NZS 2107:2016) recommends internal sound levels dependent on occupancy and activity as presented in Table 2.2.

Table 2.2 AS/NZS 2107:2016 recommended design sound level for Residential buildings (Table 1)

TYPE OF OCCUPANCY	TYPE OF ACTIVITY	DESIGN SOUND LEVEL (L _{Aeq,t}) RANGE
Houses and apartments in the inner city areas or entertainment districts or near major roads	Sleeping areas (night time)	35 to 40 dB
	Living areas	35 to 45 dB

2.2.2 NSW Development near rail corridors and busy roads interim guideline

The NSW Department of Planning *Development near rail corridors and busy roads – interim guideline* published December 2008 (NSW guideline) assists in reducing health impact on sensitive adjacent development. The guideline establishes noise levels that are not to be exceeded within residential properties, as presented in Table 2.3.

Table 2.3 NSW Interim guideline maximum noise levels for residential buildings (Table 3.1)

TYPE OF USE	MAXIMUM SOUND LEVEL (L _{Aeq,t})
Bedroom	35 dB ⁽¹⁾
Other areas within building (other than garage, kitchen, bathroom or hallway)	40 dB

(1) Only applicable night time: 10pm to 7 am

3 Noise assessment

Properties selected for noise assessment has been agreed with client and is based on properties predicted to exceed external noise level criteria in the post-construction noise assessment carried out by SLR, see Section 1.1.

3.1 Personnel

WSP staff undertaking the survey are suitably qualified to undertake this assessment. Individuals are members of the Australian Acoustical Society with experience of sound insulation design.

WSP is a member firm of the Association of Australasian Acoustical Consultants.

3.2 Methodology – Façade assessment

Measurements were made in accordance with *AS 1055-2018 Acoustics – Description and measurement of environmental noise* and *AS 2702-1948 Acoustic Methods of Measurement of Road Traffic Noise*.

Measurements were carried out in one-third octave bands from 20 Hz to 20 kHz. Equipment used during measurements are summarised in Table 3.1. Field calibrations were performed at the start and end of each test and no significant drift was noted (± 0.5 dB).

Table 3.1 Field equipment

EQUIPMENT	MANUFACTURER	MAKE	SERIAL NO	CALIBRATION DUE
Type 1 Sound Level Meter	ARL	Ngara S-pack	878179	18/12/2022
Type 1 Sound Level Meter	ARL	Ngara S-pack	878043	10/02/2023
Field calibrator	Rion	NC-74	34315156	08/04/2022

To estimate the possible road noise reduction achievable by the façade, external and internal road sound pressure level measurements are undertaken and then subtracted from each other.

For the external measurements, the microphones were placed at 1.2 to 1.5 metres above floor level of the level of interest. Microphone has been placed centrally at the façade, and when applicable at the centre of relevant glazing. Microphone has been placed as close as practicable to 1 metre from the façade.

Measurements taken inside building have been placed 1.2 to 1.5 metres above floor, at least 1 meter away from major reflecting surfaces (walls), and centrally in room. Due to the size of the rooms one measurement per room has been deemed sufficient.

Operator has been present for entire duration of measurement and meteorological conditions has been judged to have low influence on data (wind speed below 5 m/s, no periods of rain, no significant temperature fluctuations etc.).

3.3 Results

Possible road noise reduction provided by the façade are presented in Table 3.2. Details of each test location are outlined in Appendix A, including site location, room layout, façade construction, and fence.

It should be noted that internal sound pressure level measurements at 8/15 Ironbark was affected by an internal household noise source which could not be filtered out in post-processing, and it was the only available habitable room facing the road. The noise from the road was still clearly dominant but the relatively high internal background noise has limited the road noise reduction presented in Table 3.2. In absence of the internal noise source the result would likely be in line with 5/15 Ironbark Circuit since house facades facing the road were observed to be near identical.

Table 3.2 Road noise reduction through façade

RECEIVER ADDRESS	LEVEL	ROAD NOISE REDUCTION, dBA L _{Aeq}	COMMENT
Unit 5, 15 Ironbark Circuit	First Level	- 32	Façade facing road includes two operable windows
Unit 8, 15 Ironbark Circuit (based on Unit 5 measurements)	First Level	- 32	Façade facing road includes two operable windows. Internal sound pressure level measurements affected by internal household noise sources.
5 Bluebell Glen	First Level	- 29	Façade facing road includes two windows, one operable

Predictions for internal noise levels and corresponding compliance with criteria are presented in Table 3.3. Predictions for the internal noise level are based on the external noise levels predicted by SLR (see Section 1.1) and the measured road noise reduction presented in Table 3.2.

Table 3.3 Predicted internal noise level and noise excess

RECEIVER ADDRESS (LEVEL)	EXTERNAL NOISE LEVELS, dBA L _{Aeq} (SEE SECTION 1.1)		PREDICTED INTERNAL NOISE LEVEL, dBA L _{Aeq}		NOISE LIMIT AND EXCESS, dBA			
	DAY, L _{Aeq} , 15hr	NIGHT, L _{Aeq} , 9hr	DAY, L _{Aeq} , 15hr	NIGHT, L _{Aeq} , 9hr	LIVING AREA (DAY)		SLEEPING AREA (NIGHT)	
					AS 2107 (45 dBA)	NSW GUIDELINE (40 dBA)	AS 2107 (40 dBA)	NSW GUIDELINE (35 dBA)
Unit 5, 15 Ironbark Circuit (L1)	65	58	33	26	No exceedance	N/a	N/a	N/a
Unit 8, 15 Ironbark Circuit (L1)	65	58	33	26	No exceedance	N/a	N/a	N/a
5 Bluebell Glen (L1)	63	56	34	27	No exceedance	N/a	N/a	N/a

- (1) Result is limited by an internal household noise source, as mentioned previously in Section 3.3. In absence of this internal noise source, internal noise levels would be expected to be achieved.

3.4 Summary and discussion

As seen in Table 3.3, all assessed properties are predicted to achieve the internal noise levels with glazing closed.

As mentioned in Section 1.1.1 ground level of one property at Pannamena Crescent (No 38) was identified as exceeding the external noise criteria in the SLR post-construction noise assessment. In addition, if the speed zone would be increased to 80 km/h a second property at Pannamena Crescent (No 28) is also predicted to exceed the noise limit. Exceedance at both properties at Year 2022 is 3 dB over RNP daytime criteria for “New Road”.

No measurements have been performed at properties along Pannamena crescent but based on a visual inspection the properties seem to have similar façade constructions as some of the inspected properties with brick veneer or concrete façade, and single glazed windows. The worst performing façade in Table 3.2 achieved a noise reduction of -22 dBA with windows closed. Assuming that the road noise reduction performance in the building envelope is similar, the internal noise levels of the properties at Pannamena Crescent would comply with the internal noise criteria outlined in Section 2.2.

It can be concluded by the above that the building envelope for the identified properties are typically capable of providing a sufficient level of noise reduction with glazing closed. This has been measured and reported in Table 3.2 and Table 3.3.

4 Recommendations and discussions

4.1 Ironbark Circuit

The noise assessment results discussed in Section 3.3 for Ironbark Circuit receivers are based on a dense-graded asphalt pavement type. Based on information provided by QPRC, it is however understood that the section of Edwin Land Parkway east of Stringybark Drive has (or will have) open graded asphalt installed. This is considered to be quieter road pavement type if properly maintained with an expected additional noise benefit of about 2 dB. This will help reduce the level of external noise exceedances currently reported. With open graded asphalt, the external noise levels remain approximately 8 dB and 6 dB in exceedance of the day and night time criteria respectively.

With regard to potential use of noise barriers, due to the significant structure necessary to provide sufficient shielding for the exceeding level one receivers, this is not considered to be a feasible option.

Therefore, noise mitigation in the form of property treatment is recommended to be considered to address the residual exceedances. Further discussions are provided in Section 4.3.

4.2 Other properties (Pannamena Crescent, Bluebell Crescent)

As the remaining exceeding properties are generally isolated (i.e. not four or more adjoining exceeding properties) noise barriers are not likely to be considered feasible and reasonable.

Therefore, noise mitigation in the form of property treatment is also recommended considered. Further discussions are provided in Section 4.3.

4.3 Property treatment

From WSP's measurements, existing building envelope constructions of the identified buildings are expected capable to provide sufficient noise reduction to achieve the established internal noise targets.

The option of providing mechanical fresh air ventilation that meets Building Code of Australia requirements is therefore recommended. Such ventilation system should be designed carefully so that sound insulation in the building envelope is not compromised. Based on the measured results, other forms of modifications to the buildings do not appear to be necessary (e.g. glazing upgrade).

Based on a limited research undertaken by WSP, possible ventilation system options that can provide a level of fresh air ventilation are listed below (subject to further review for BCA compliance if necessary):

- Acoustica Aeropac: <https://www.acoustica.com.au/product/aeropac/>
- Soundscoop <https://www.passivent.com/app/uploads/2022/01/SoundScoop%C2%AE-Brochure.pdf>
- Renson Invisivent <https://www.renson.eu/qd-qb/producten-zoeken/ventilatie/raamverluchtingen/roosters-op-het-raam/invisivent-ut>
- Silence air: <https://silenceair.com/>
- Ventient: <https://proctorgroup.com.au/ventient-2/why-ventient/>

5 Conclusion

WSP has been engaged by Queanbeyan-Palerang Regional Council to conduct an acoustic assessment of several properties along Edwin Land Parkway. It is understood the investigation is required as a result of recommendations from the Post Construction Noise Assessment for Edwin Land Parkway, assessing traffic growth in the area, and proposed speed variations.

Properties selected for noise assessment has been agreed with client and is based on properties predicted to exceed external noise level criteria in the post-construction noise assessments carried out by SLR, see Section 1.1.

The focus of noise assessments carried out by WSP was to determine the road noise reduction provided by the existing building envelope and to make relevant observations. The road noise reduction of the façade was assessed in accordance with *AS 1055-2018* and *AS 2702-1984*, presented in Section 3.3. During field visits, observations were made regarding the façade construction, fence and room layout, presented in Appendix A.

Predictions have been made for internal noise level based on the façade assessment and predicted external noise level from the post-construction noise assessment carried out by SLR. Internal noise levels were assessed against noise criteria outlined in *AS2107* and relevant NSW guidelines.

It is concluded that for all assessed properties the building envelope is capable of providing sufficient levels of noise reduction with glazing closed. As such, the design of the ventilation for these rooms should be such that occupants can leave windows/doors closed if desired.

Based on observations made on site and the determined excess of noise criteria the following recommendations have been made:

- For the properties at 15 Ironbark Circuit, with quieter road pavement (open graded asphalt) already implemented and noise barriers considered not feasible and reasonable, noise mitigation in the form of property treatment (outlined in Section 4.3) is recommended considered to address the residual exceedances of the external noise criteria.
- The exceeding properties on Pannamena Crescent and Bluebell Glen are generally isolated, therefore noise barriers are not likely to be considered feasible and reasonable. Noise mitigation in the form of property treatment is recommended to be considered, outlined in Section 4.3.
- It is noted that compliance to the external road noise criteria is reliant on suitable fence/ noise barrier structures on several residential properties' boundaries (e.g. Rosewood Glen). These structures should be further assessed to ensure that they are suitably sound insulating and capable of providing the modelled acoustic benefit (e.g. sufficient mass, lapped and capped fence, generally gap-free). Observations reported in Appendix A might serve as guidance.