POST-CONSTRUCTION NOISE ASSESSMENT

Edwin Land Parkway, Jerrabomberra

Prepared for:

Queanbeyan-Palerang Regional Council
PO Box 90
QUEANBEYAN NSW 2620

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BASIS OF REPORT

DOCUMENT CONTROL

Reference	Date	Prepared	Checked	Authorised
670.11066-R01-v2.2	13 January 2020	David Perry/Matthew Bryce	Matthew Bryce	Matthew Bryce
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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 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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DOCUMENT REFERENCES

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APPENDICES

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.

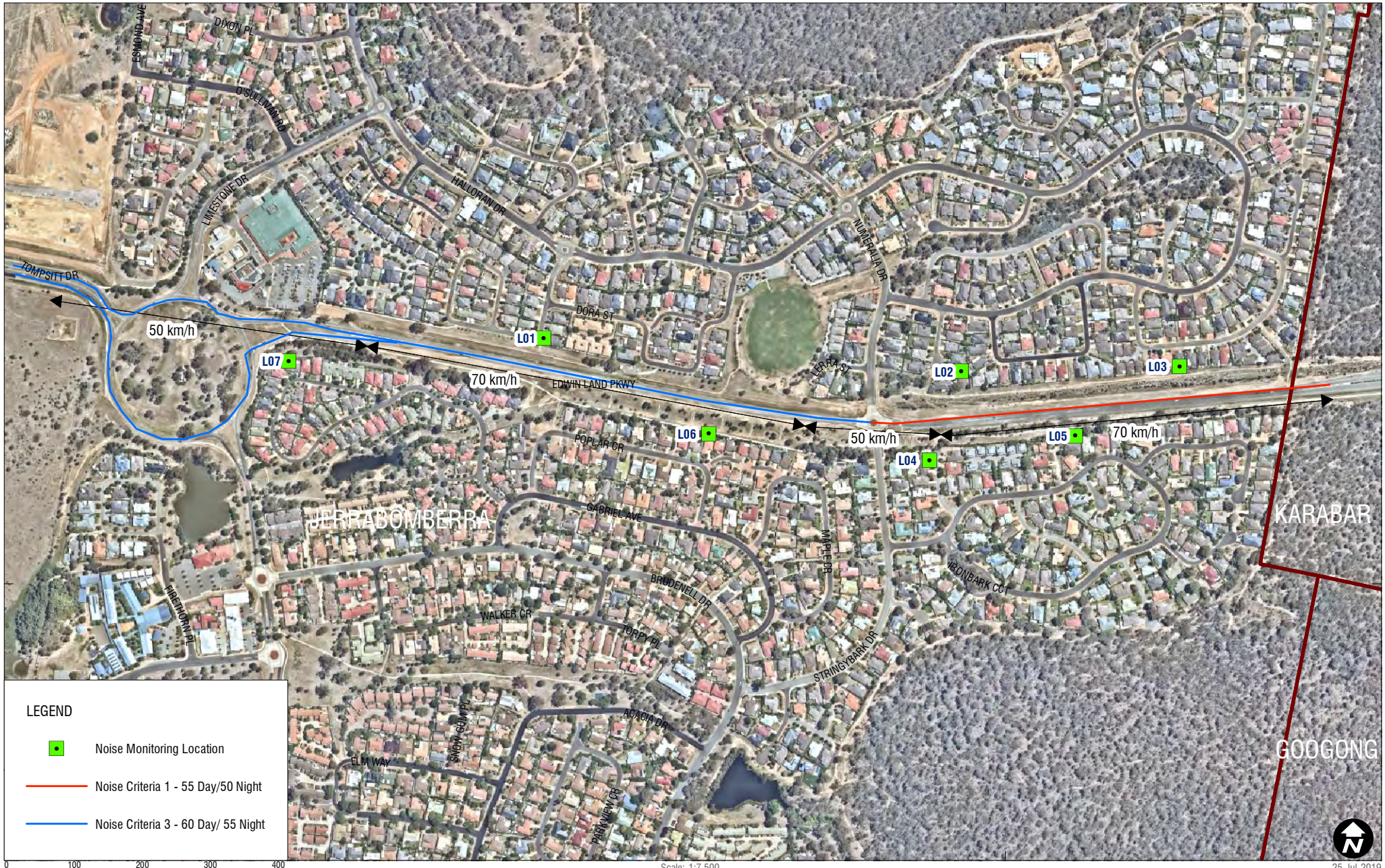
The purpose of this assessment was to determine if properties adjacent to ELP comply with the NSW Road Noise Policy for the current year, 2019 and also for the year 2022, which will be 10 years post-construction of the ELP.

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 Tompsitt 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).



Data Sources: (C) Nearmap 2019, Department of Finance, Services and Innovation, NSW 2017
Sheet Size : A4

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Aerial Site Plan

FIGURE 1

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 $L_{Aeq,(15hour)}$	Night (10:00 pm to 7:00 am) dBA $L_{Aeq,(9hour)}$
Tompsitt 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 L_{Aeq} 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 $L_{Aeq,(15hour)}$	Night (10:00 pm to 7:00 am) dBA $L_{Aeq,(9hour)}$
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
Tompsitt Drive (East Bound) Jerra roundabout – ELP	8,041	384	524	31	50
Tompsitt 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 L_{A10} noise level, was modified to calculate the relevant daytime $L_{Aeq(15hour)}$ and night-time $L_{Aeq(9hour)}$ 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: • 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: • Tompsitt 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 L_{A10}, to establish the road traffic noise level in terms of the L_{Aeq} 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 $L_{Aeq(15hour)}$			Night-time, dBA $L_{Aeq(9hour)}$		
	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
Tompsitt Drive (East Bound (Jerra roundabout – ELP)	8,787	420	573	34	50
Tompsitt 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 Tompsitt 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 Tompsitt 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
Tompsitt 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.

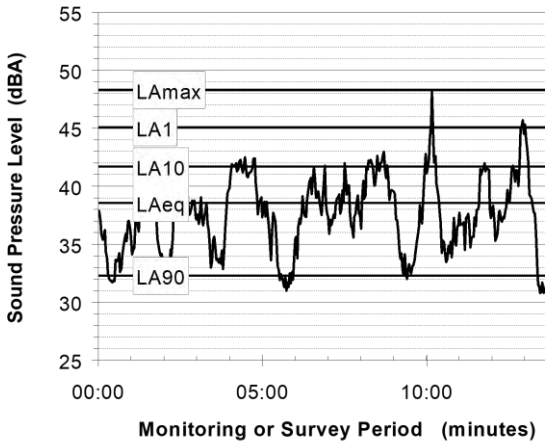
Sound Pressure Level (dBA)	Typical Source	Subjective Evaluation
130	Threshold of pain	Intolerable
120	Heavy rock concert	Extremely noisy
110	Grinding on steel	
100	Loud car horn at 3 m	Very noisy
90	Construction site with pneumatic hammering	
80	Kerbside of busy street	Loud
70	Loud radio or television	
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 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.

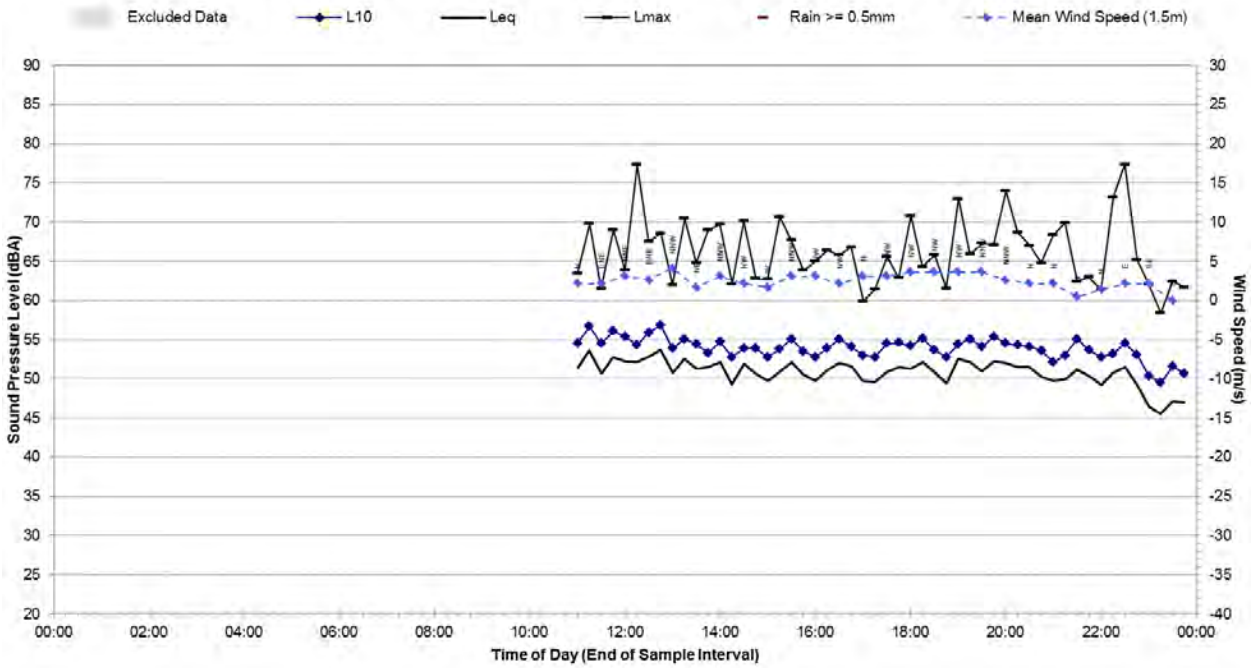
LAeq The A-weighted equivalent noise level (basically, the average noise level). It is defined as the steady sound level that contains the same amount of acoustical energy as the corresponding time-varying sound.

APPENDIX B

Road Traffic Noise Monitoring Results

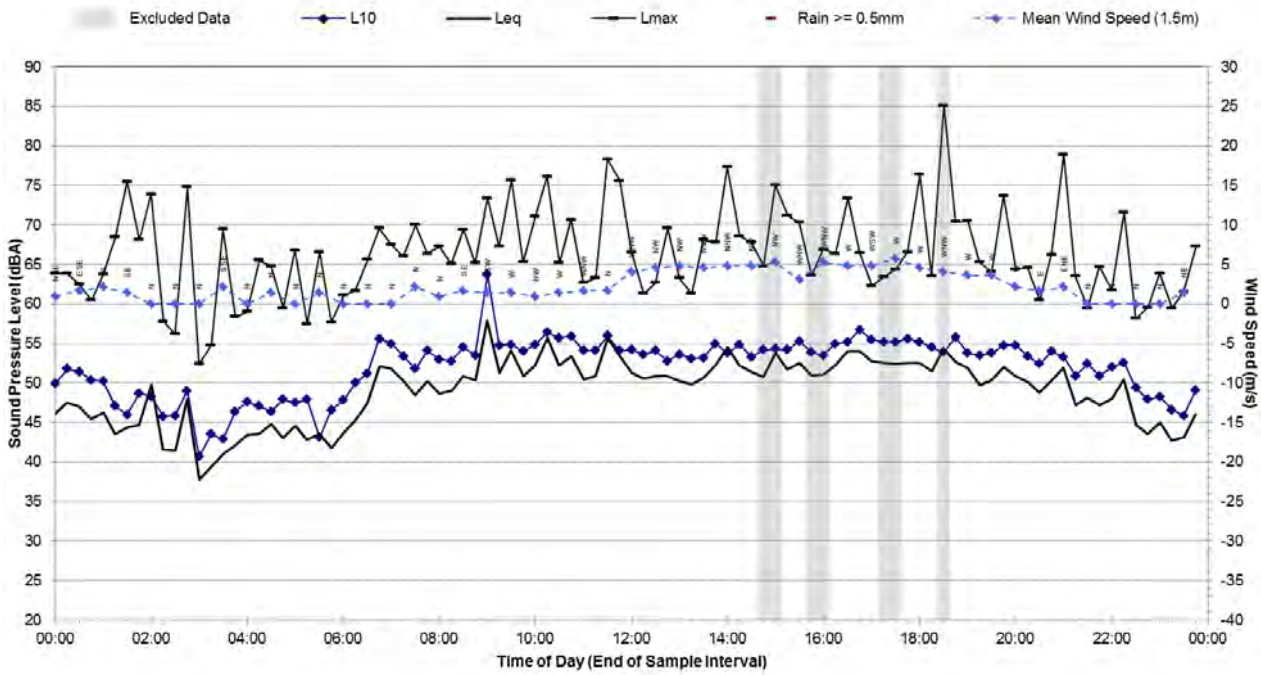
Statistical Ambient Noise Levels

L01 - 11 Unwin St, Jerrabomberra - Saturday, 16 February 2019



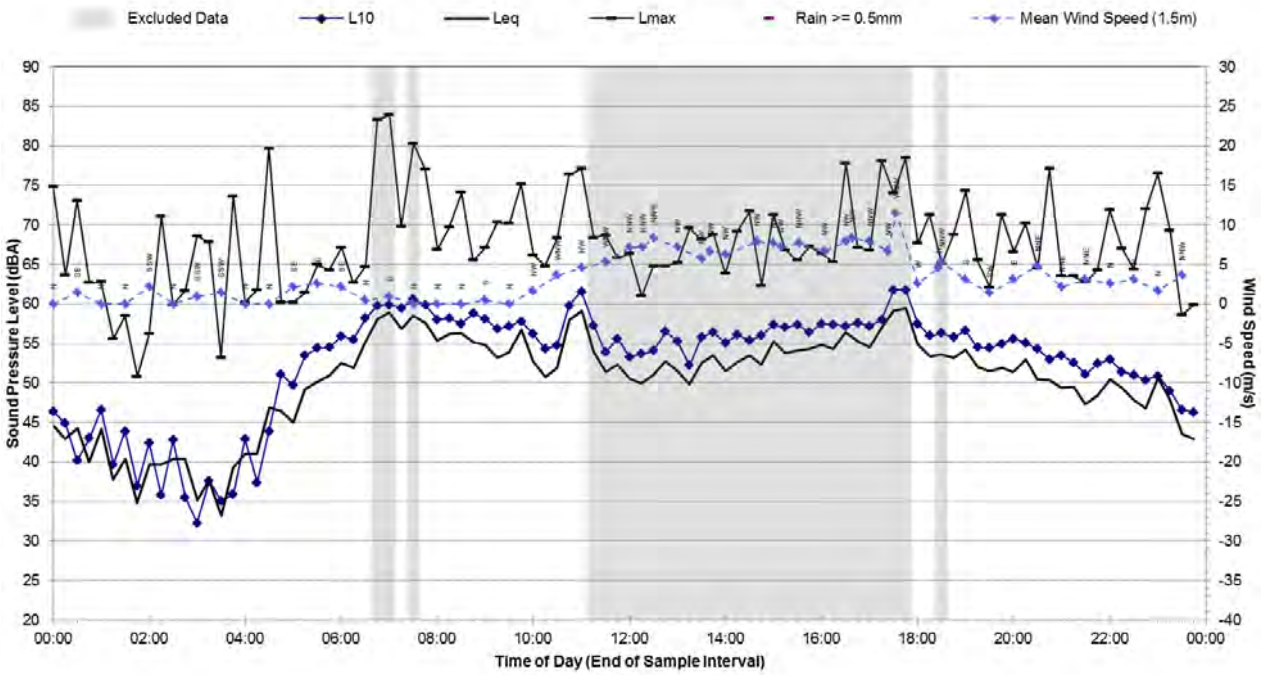
Statistical Ambient Noise Levels

L01 - 11 Unwin St, Jerrabomberra - Sunday, 17 February 2019



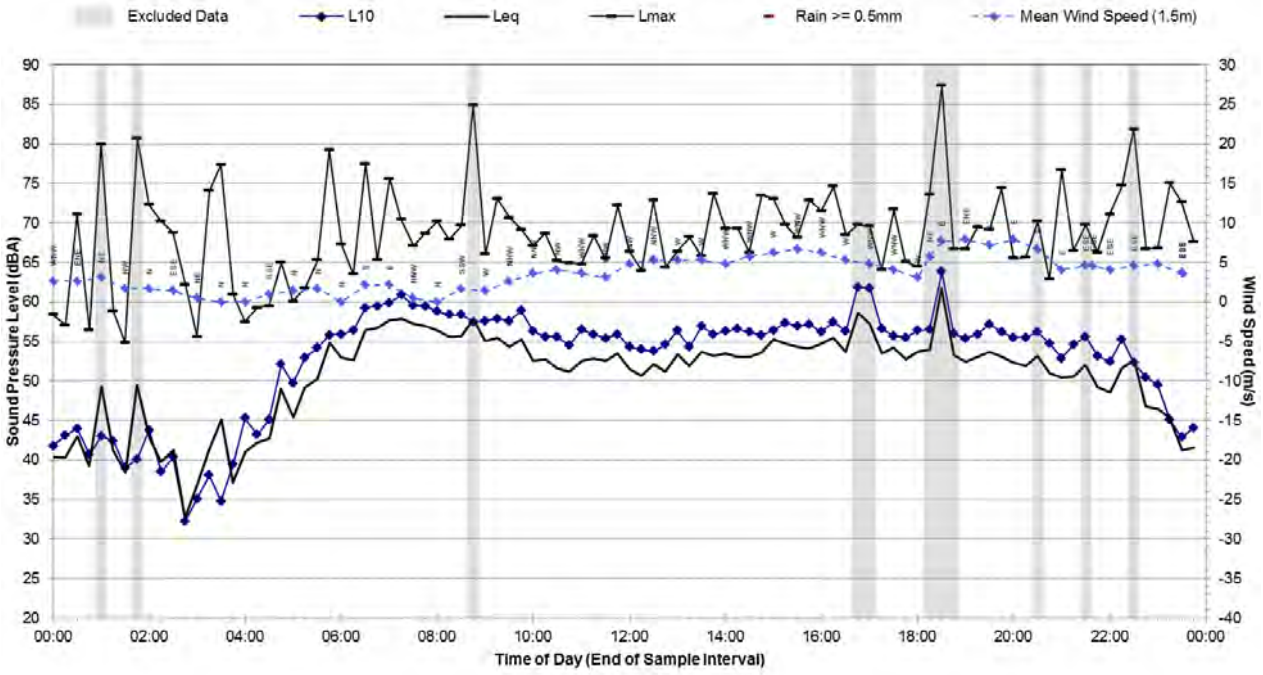
Statistical Ambient Noise Levels

L01 - 11 Unwin St, Jerrabomberra - Monday, 18 February 2019



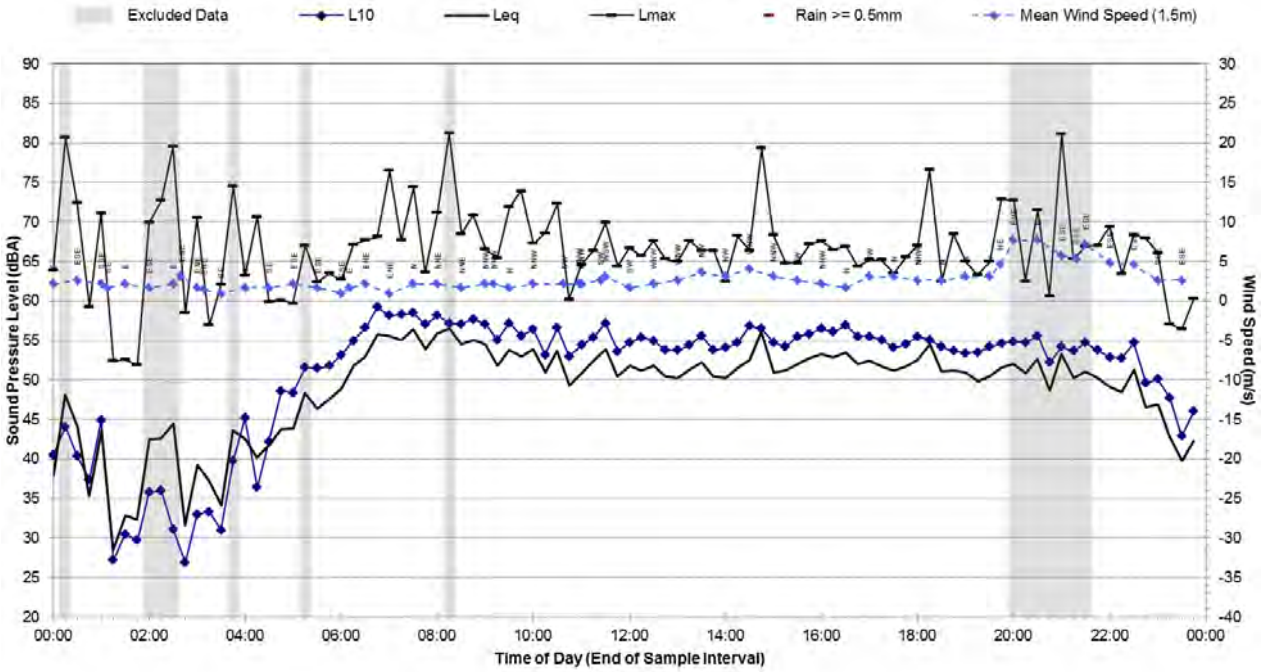
Statistical Ambient Noise Levels

L01 - 11 Unwin St, Jerrabomberra - Tuesday, 19 February 2019



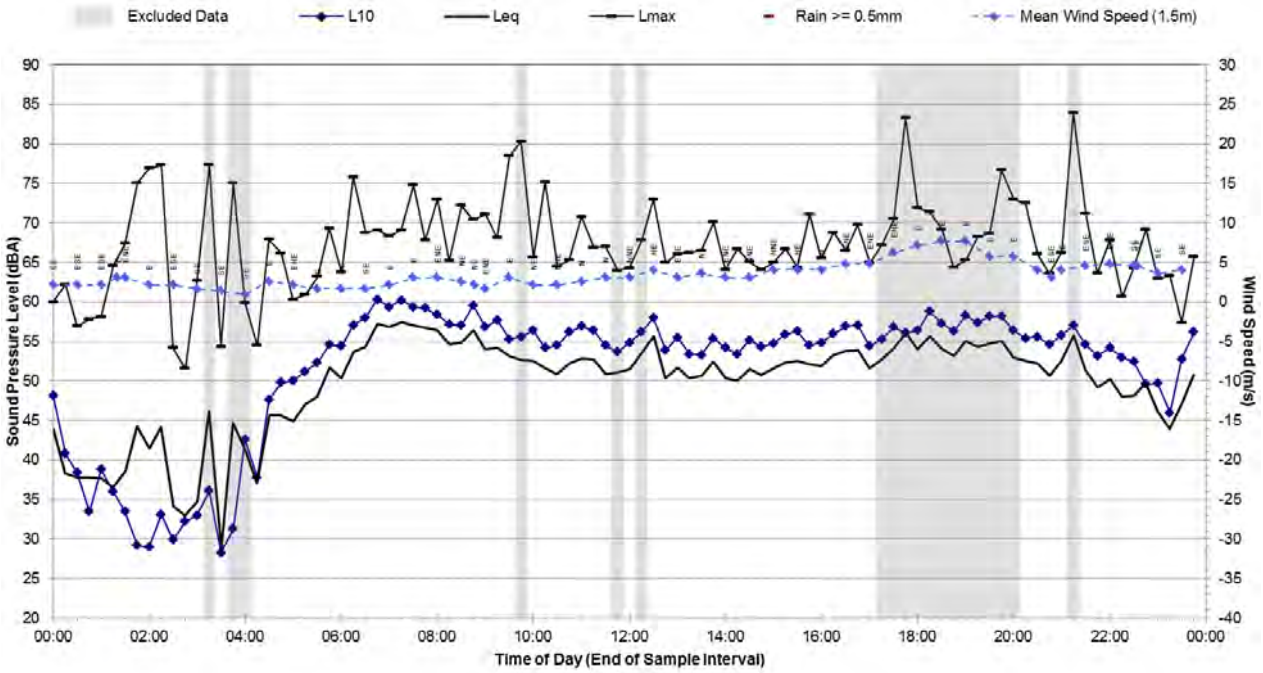
Statistical Ambient Noise Levels

L01 - 11 Unwin St, Jerrabomberra - Wednesday, 20 February 2019



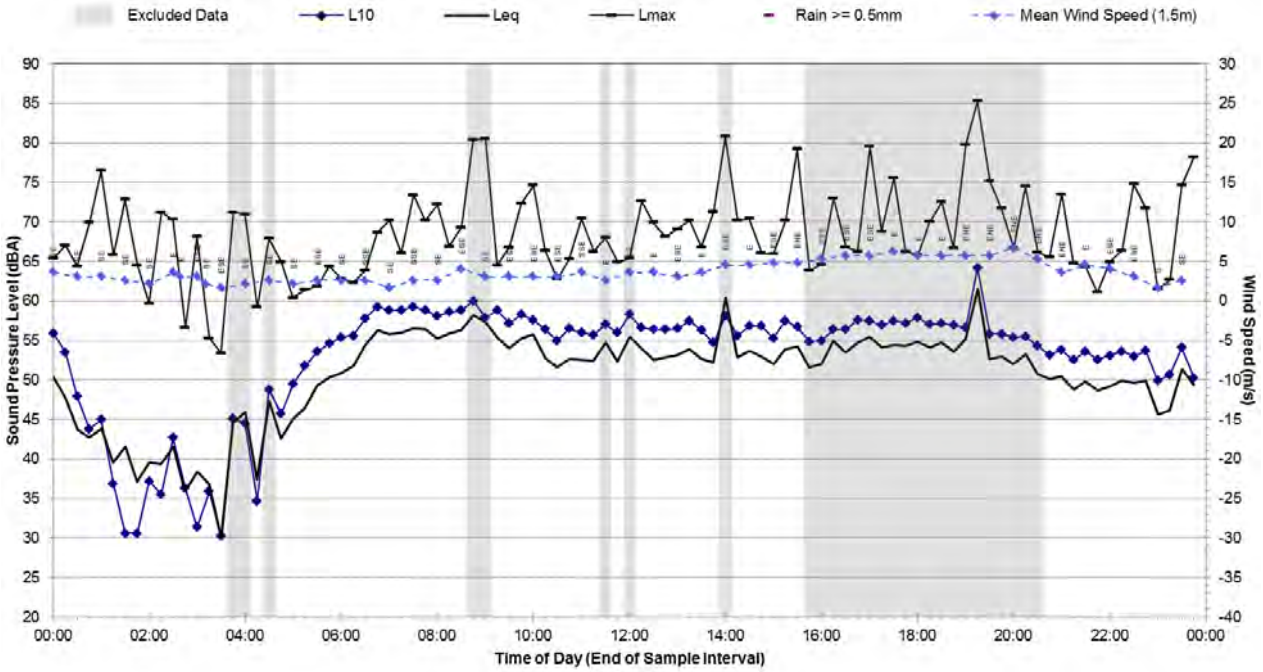
Statistical Ambient Noise Levels

L01 - 11 Unwin St, Jerrabomberra - Thursday, 21 February 2019



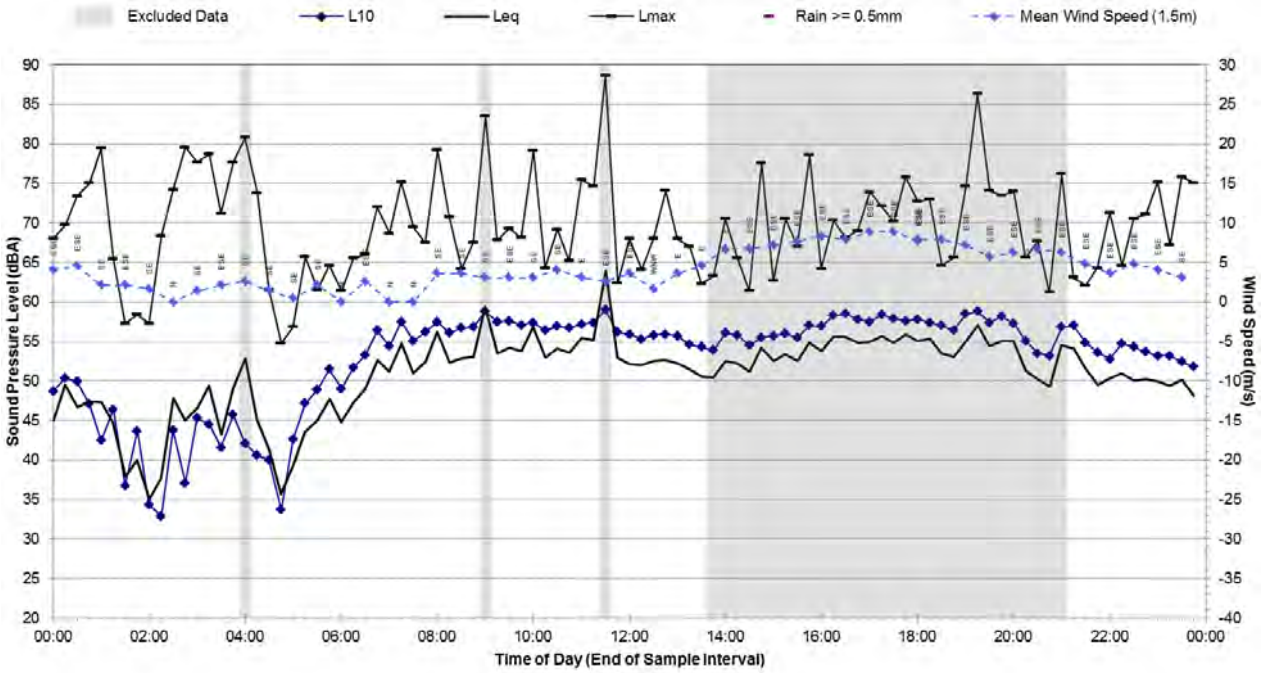
Statistical Ambient Noise Levels

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

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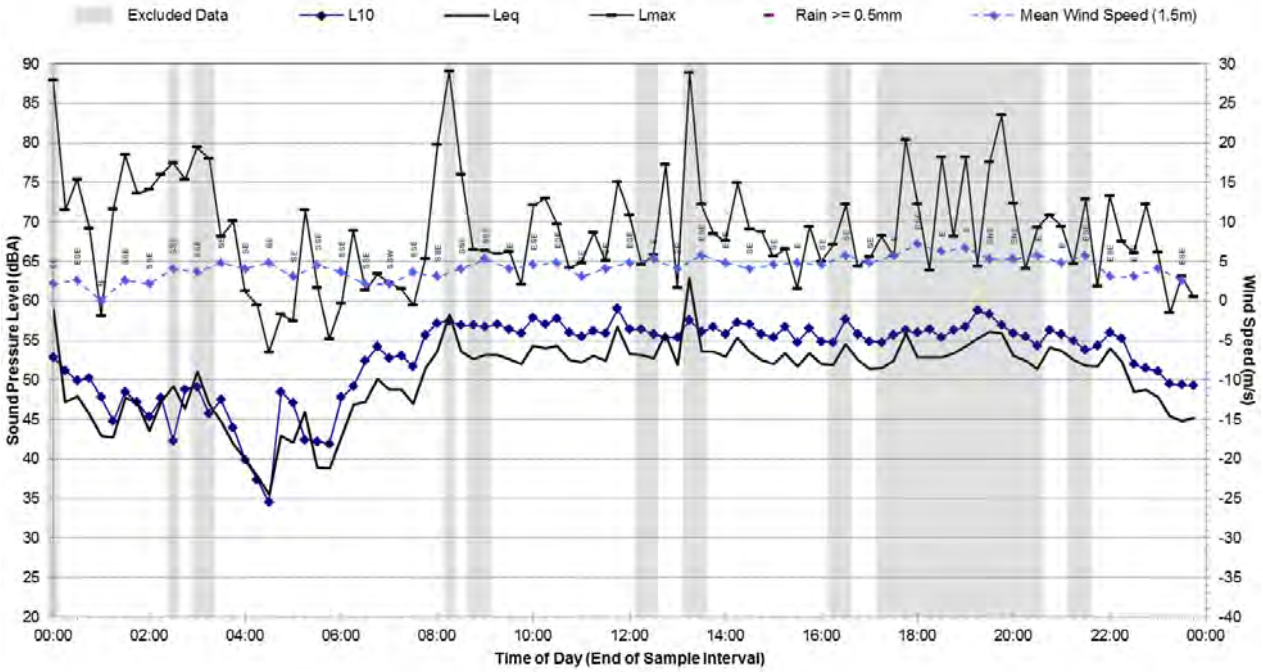
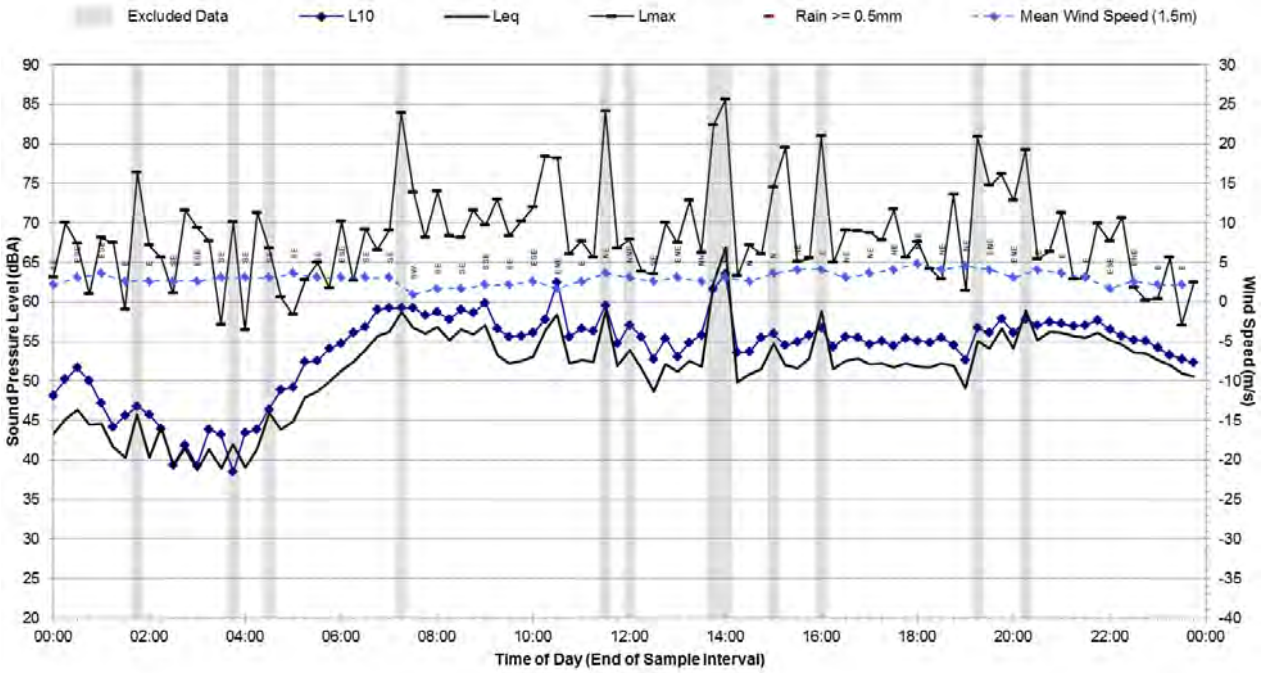


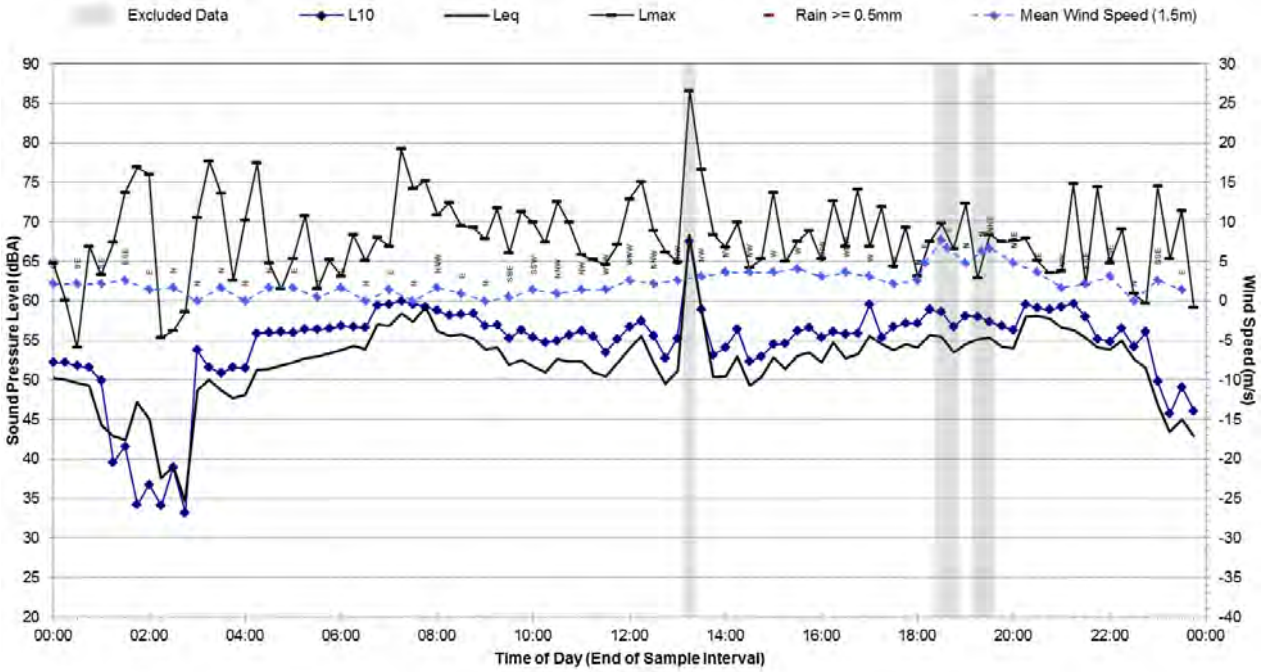
Statistical Ambient Noise Levels

L01 - 11 Unwin St, Jerrabomberra - Monday, 25 February 2019



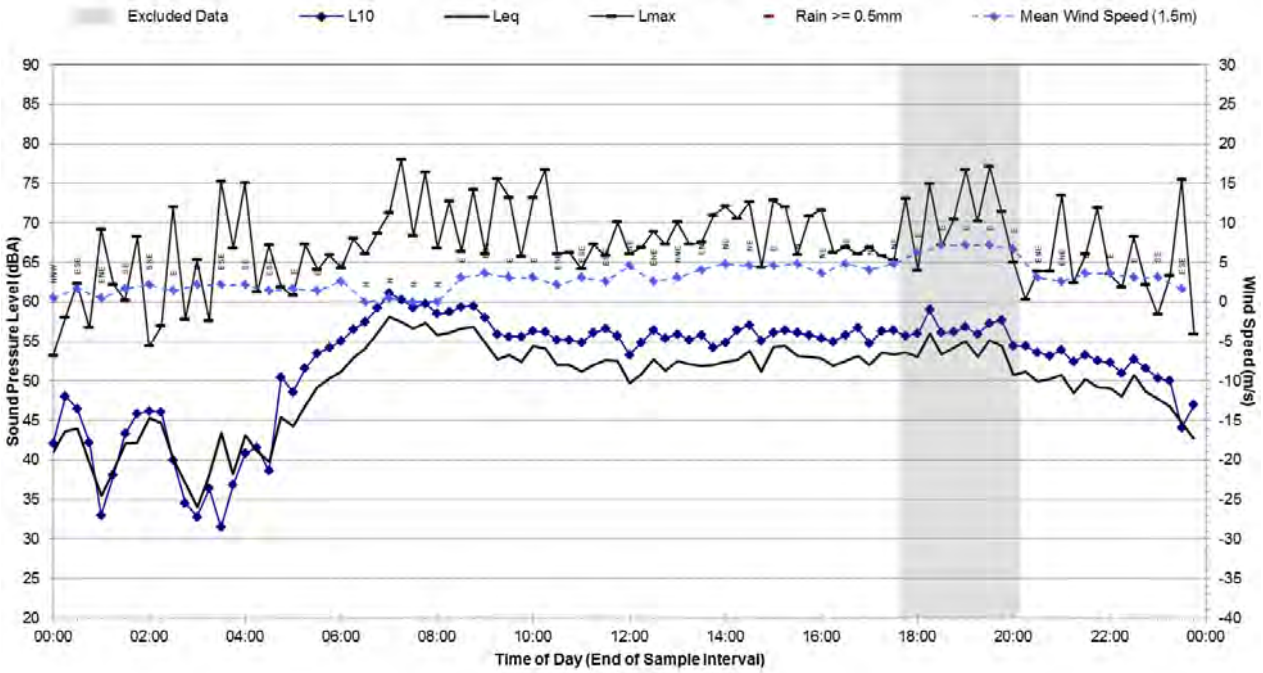
Statistical Ambient Noise Levels

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



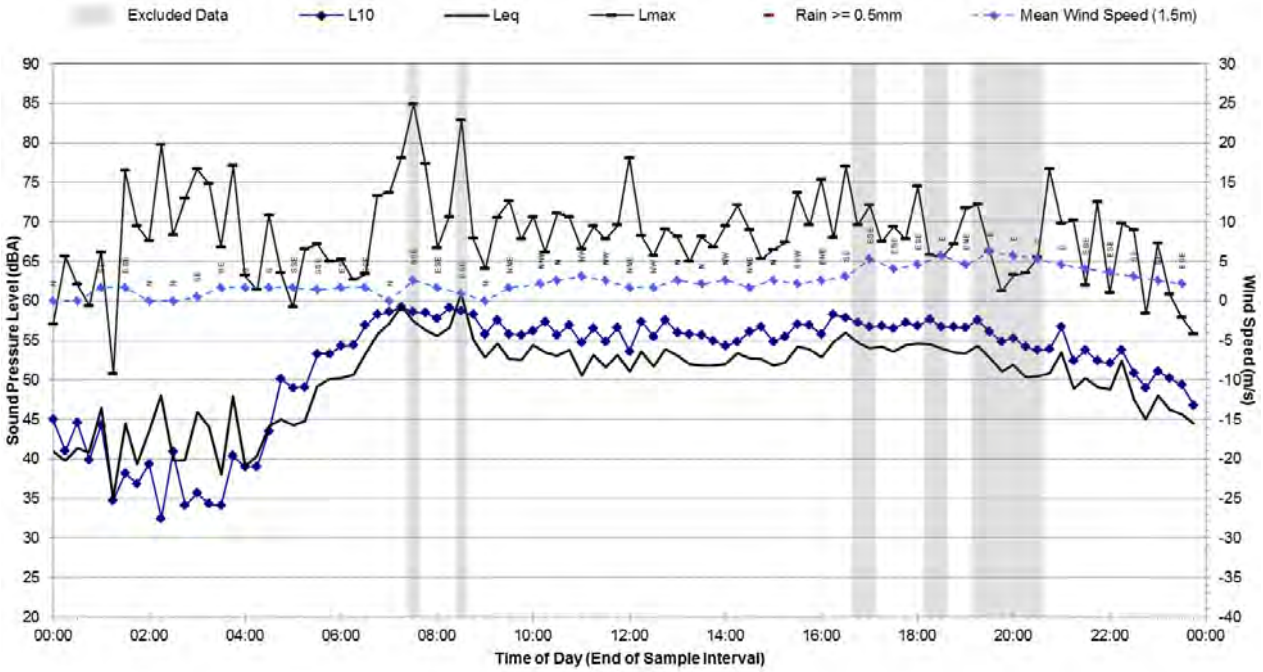
Statistical Ambient Noise Levels

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



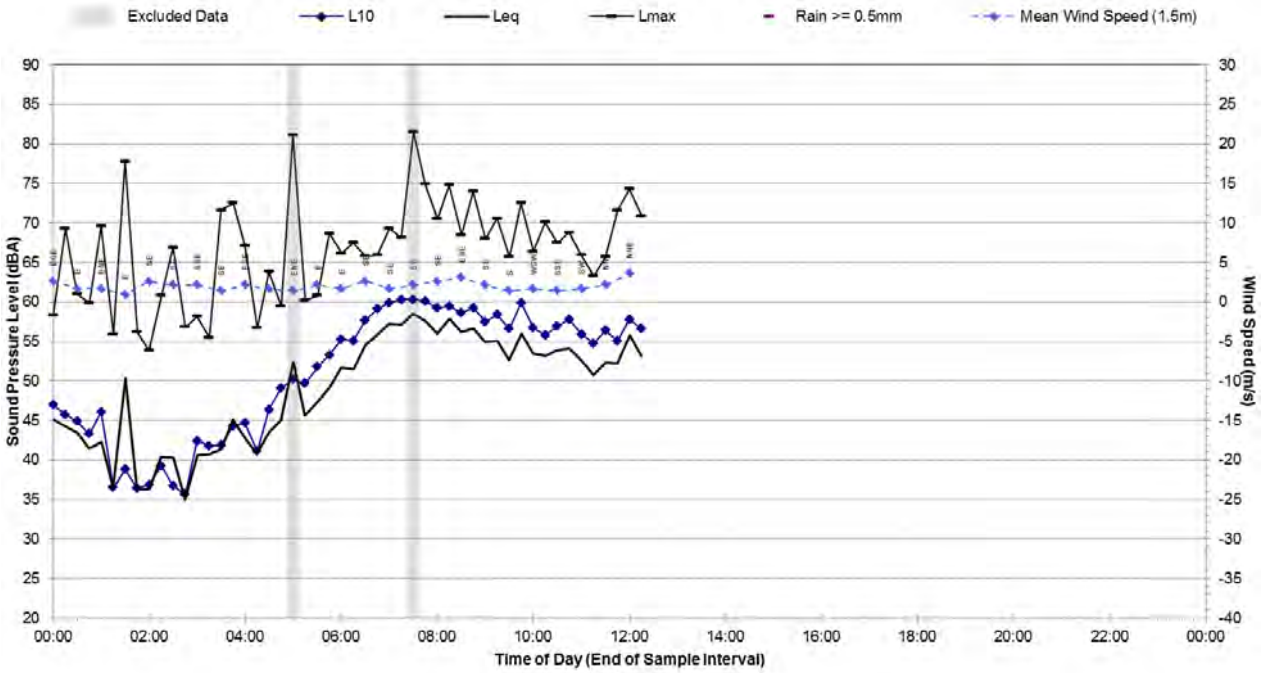
Statistical Ambient Noise Levels

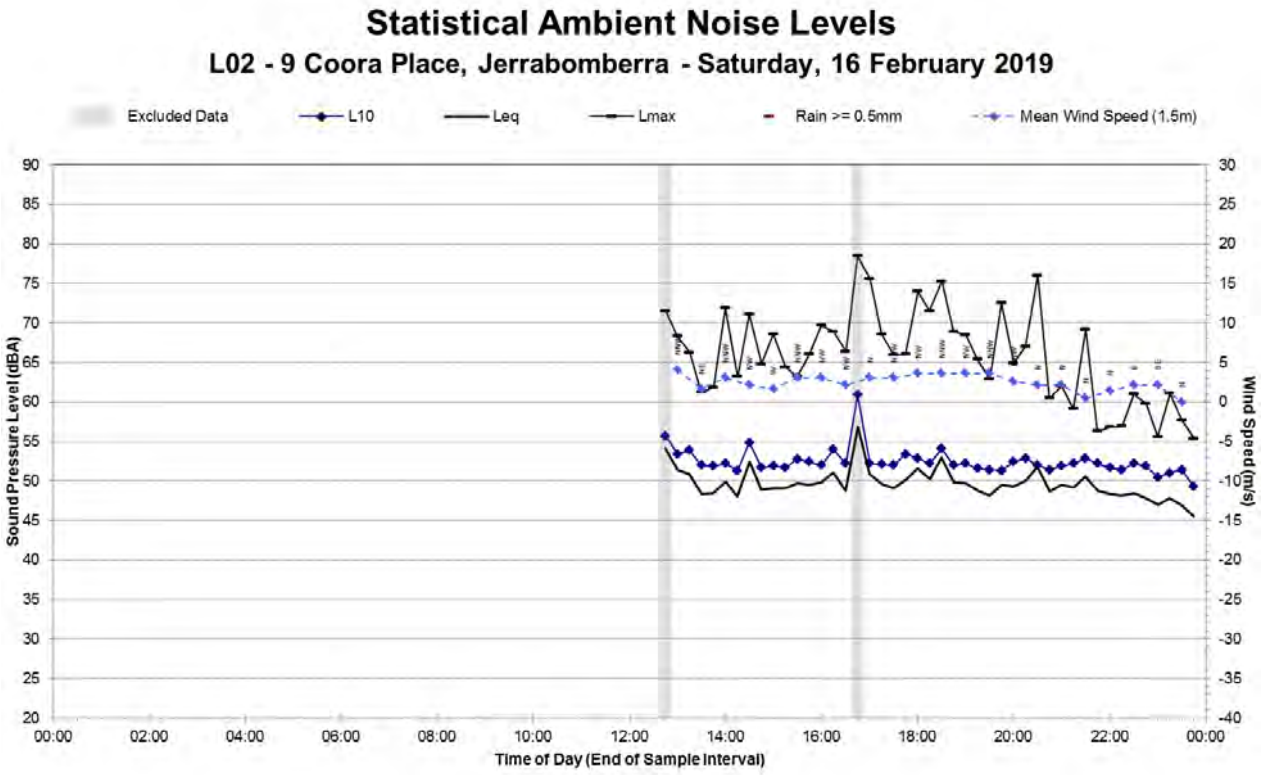
L01 - 11 Unwin St, Jerrabomberra - Thursday, 28 February 2019

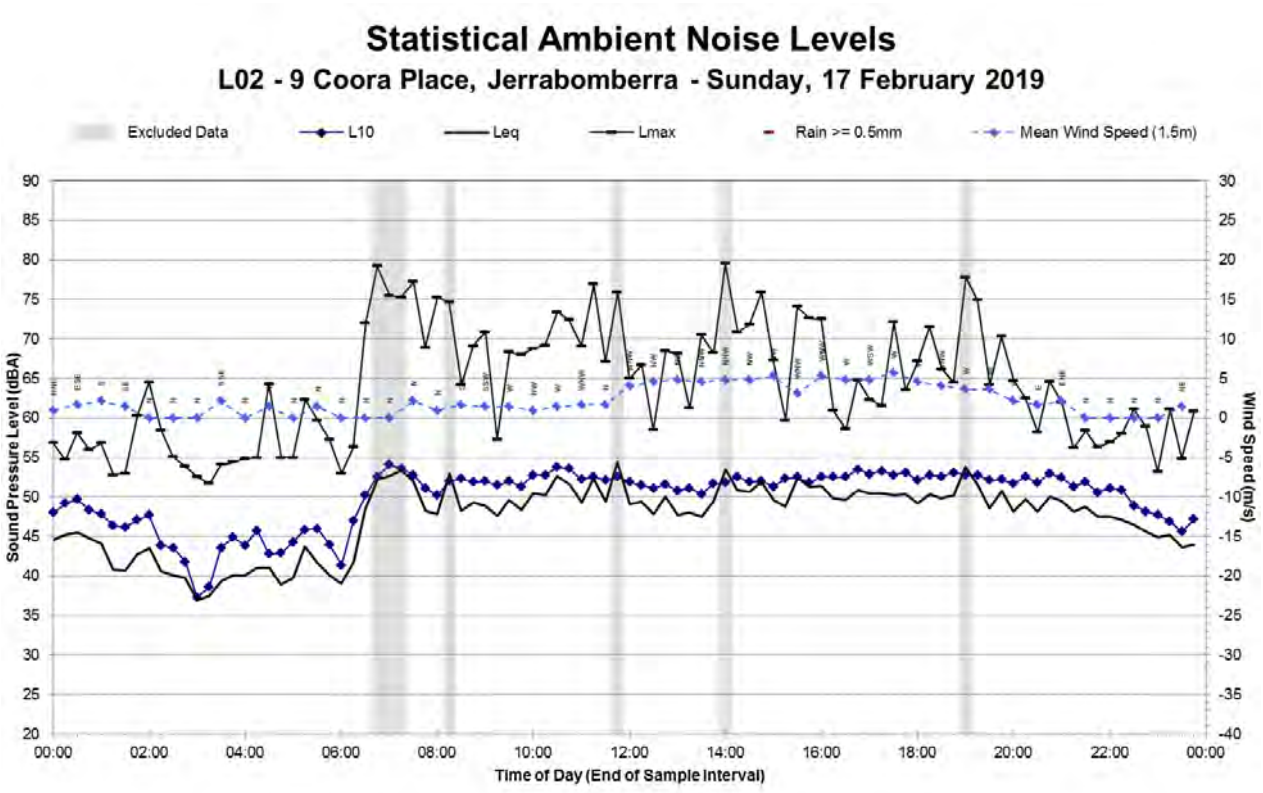


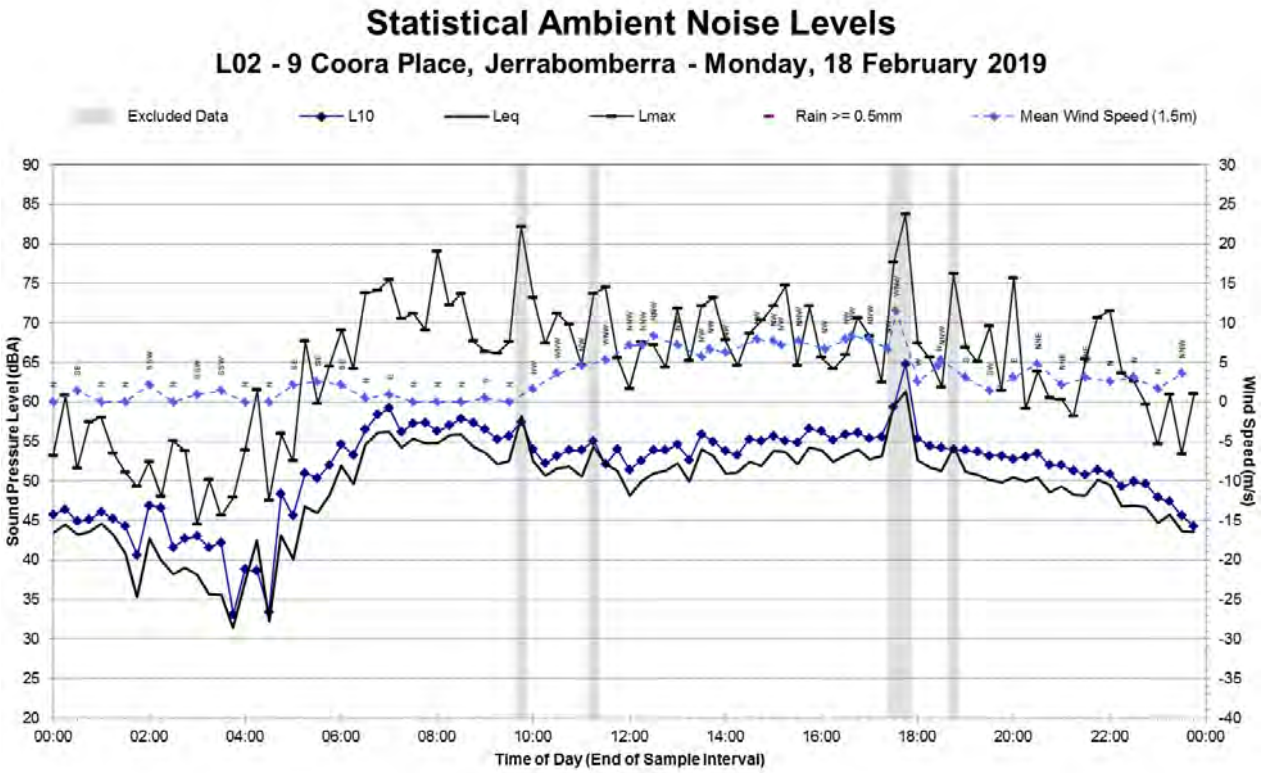
Statistical Ambient Noise Levels

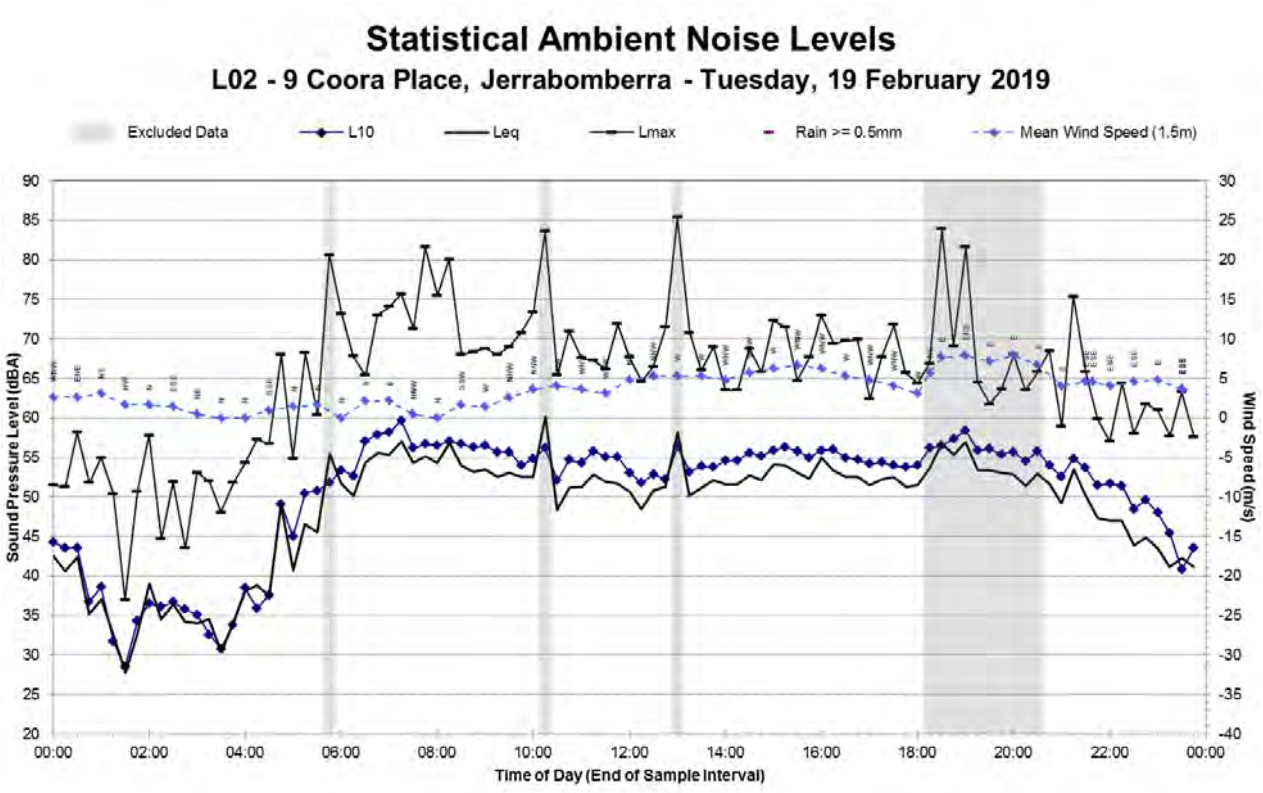
L01 - 11 Unwin St, Jerrabomberra - Friday, 1 March 2019

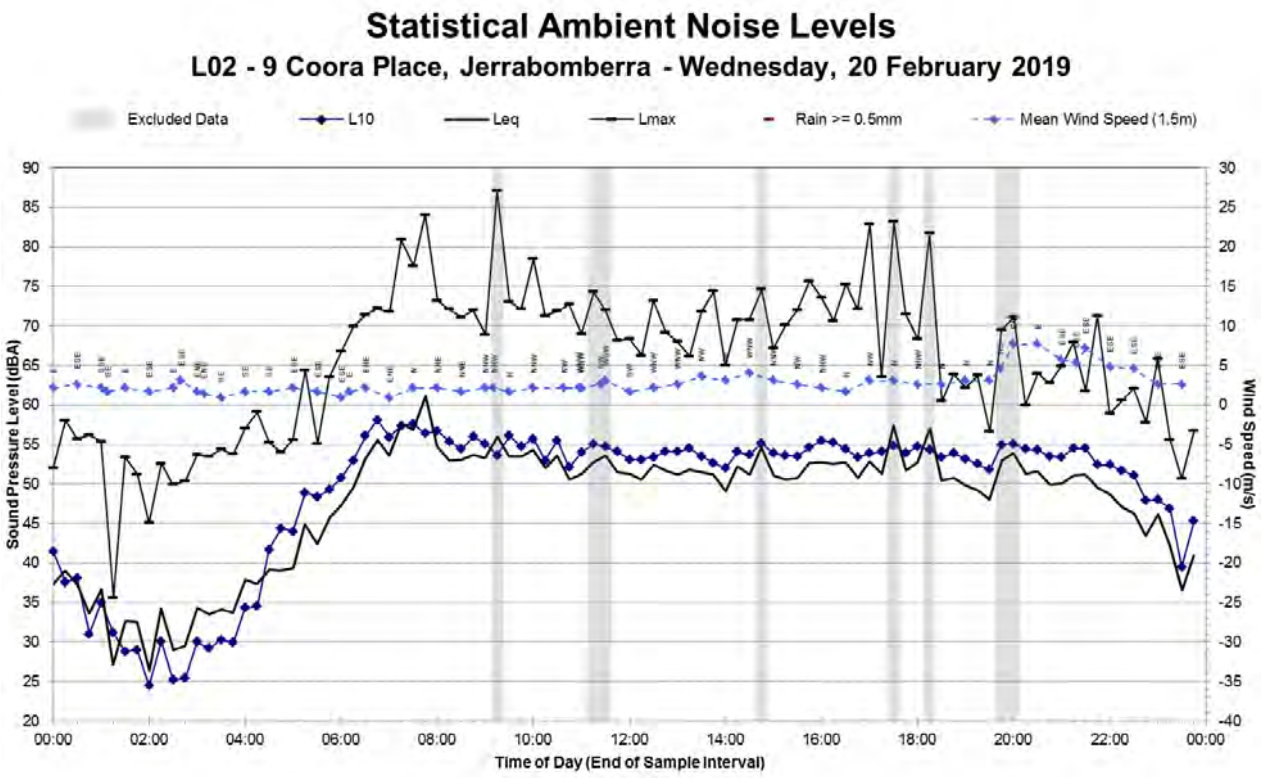


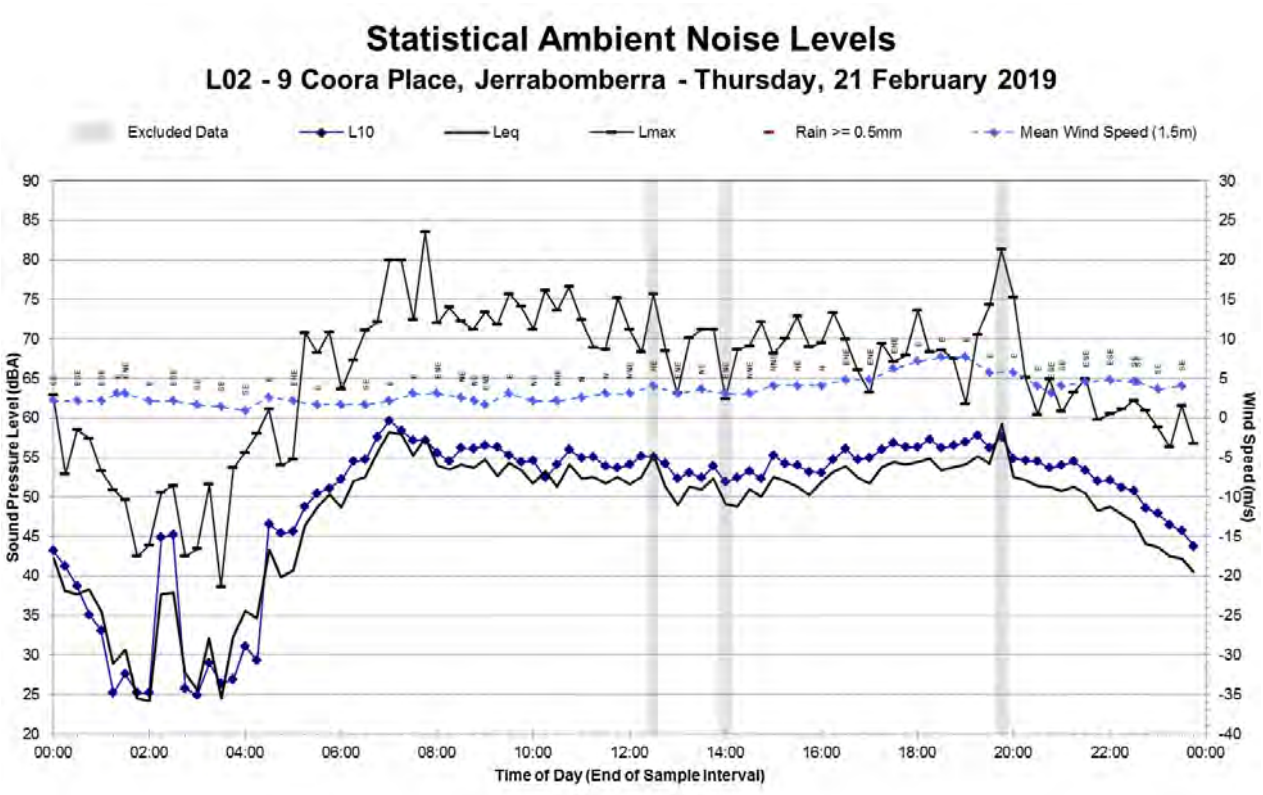

Statistical Ambient Noise Levels
L02 - 9 Coora Place, Jerrabomberra - Saturday, 16 February 2019
Excluded Data
L10
Leq
Lmax
Rain >= 0.5mm
Mean Wind Speed (1.5m)
Sound Pressure Level (dBA)
Wind Speed (m/s)
Time of Day (End of Sample Interval)

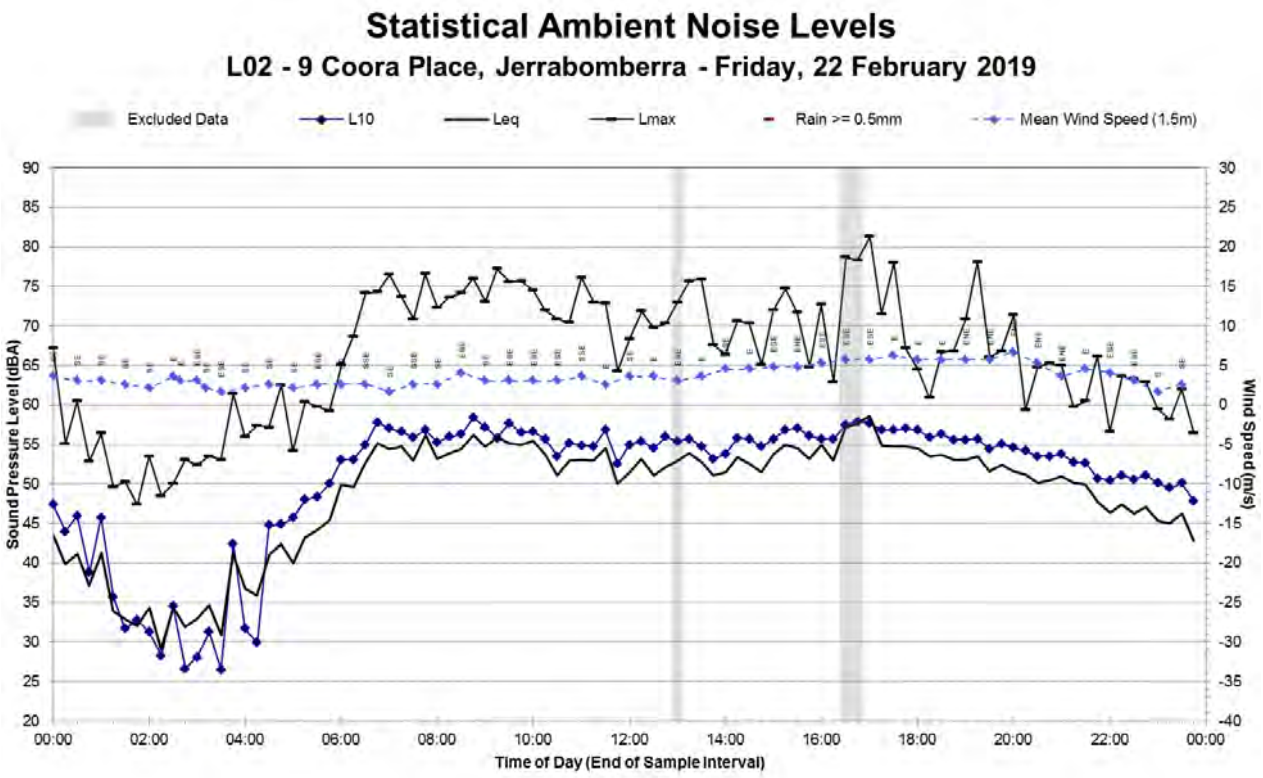

Statistical Ambient Noise Levels
L02 - 9 Coora Place, Jerrabomberra - Sunday, 17 February 2019
Excluded Data
L10
Leq
Lmax
Rain >= 0.5mm
Mean Wind Speed (1.5m)
Sound Pressure Level (dBA)
Wind Speed (m/s)
Time of Day (End of Sample Interval)

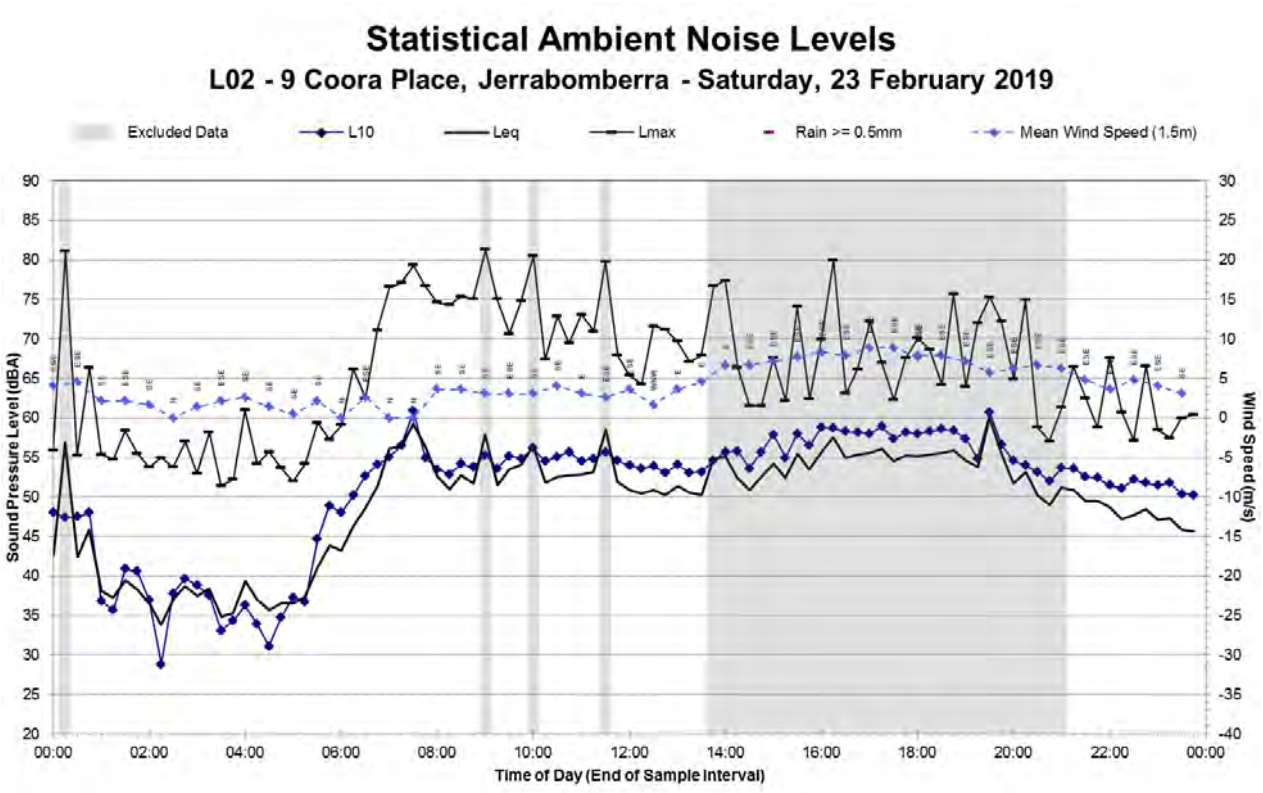

Statistical Ambient Noise Levels
L02 - 9 Coora Place, Jerrabomberra - Monday, 18 February 2019
Excluded Data
L10
Leq
Lmax
Rain >= 0.5mm
Mean Wind Speed (1.5m)
Sound Pressure Level (dBA)
Wind Speed (m/s)
Time of Day (End of Sample Interval)

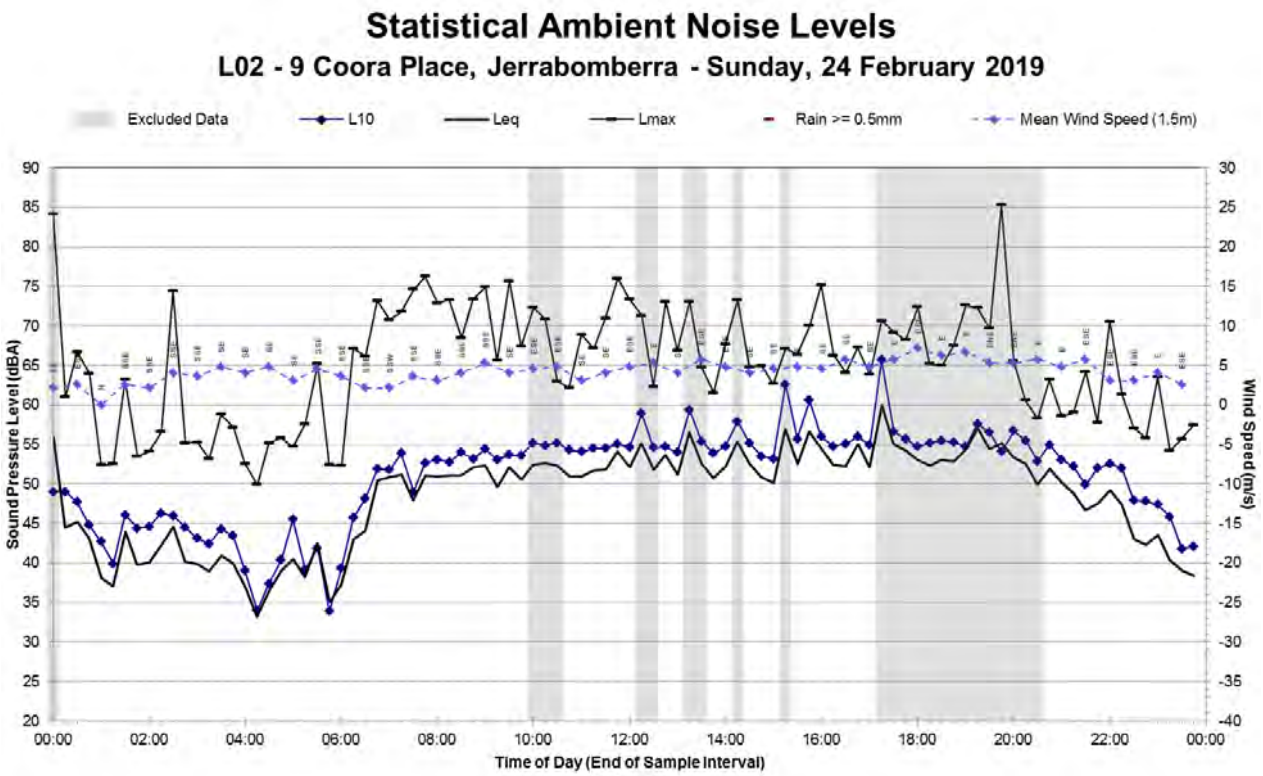

Statistical Ambient Noise Levels
L02 - 9 Coora Place, Jerrabomberra - Tuesday, 19 February 2019
Excluded Data
L10
Leq
Lmax
Rain >= 0.5mm
Mean Wind Speed (1.5m)
Sound Pressure Level (dBA)
Wind Speed (m/s)
Time of Day (End of Sample Interval)

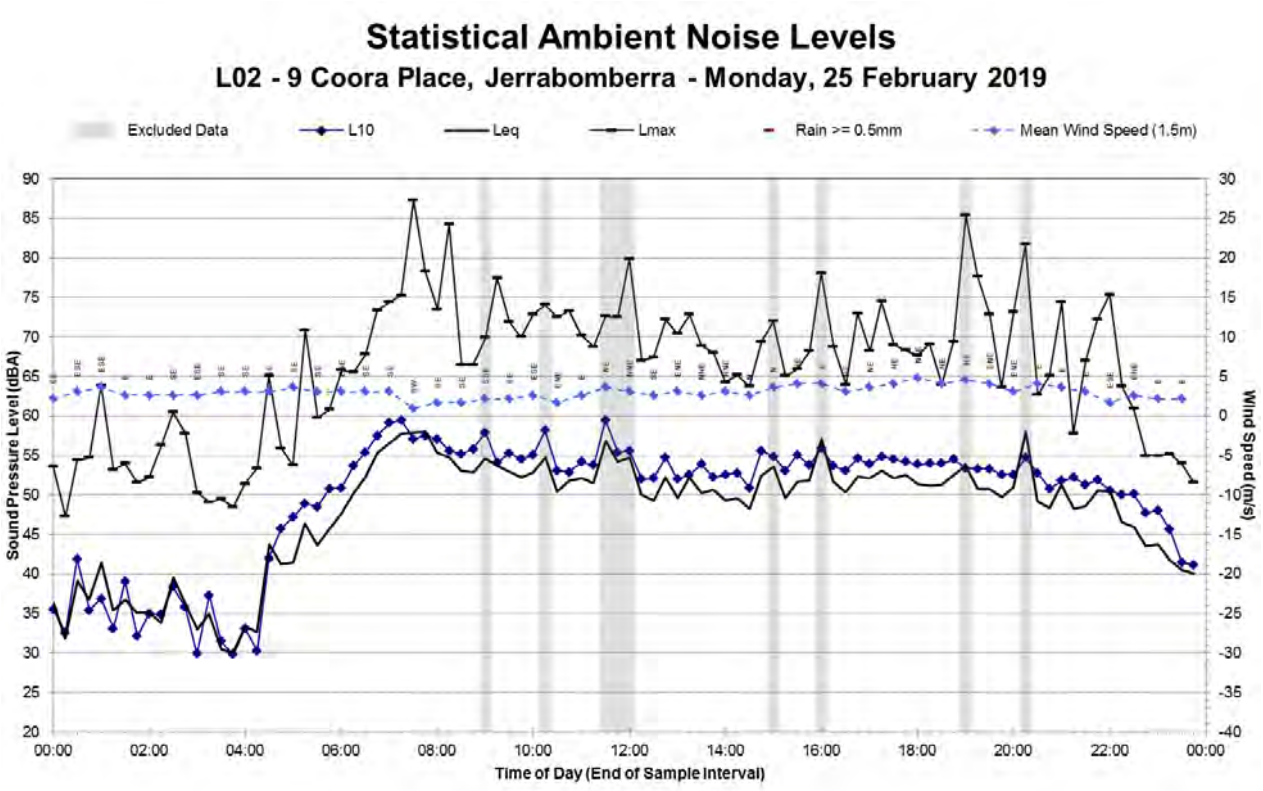

Statistical Ambient Noise Levels
L02 - 9 Coora Place, Jerrabomberra - Wednesday, 20 February 2019
Excluded Data
L10
Leq
Lmax
Rain >= 0.5mm
Mean Wind Speed (1.5m)
Sound Pressure Level (dBA)
Wind Speed (m/s)
Time of Day (End of Sample Interval)


Statistical Ambient Noise Levels
L02 - 9 Coora Place, Jerrabomberra - Thursday, 21 February 2019
Excluded Data
L10
Leq
Lmax
Rain >= 0.5mm
Mean Wind Speed (1.5m)
Sound Pressure Level (dBA)
Wind Speed (m/s)
Time of Day (End of Sample Interval)


Statistical Ambient Noise Levels
L02 - 9 Coora Place, Jerrabomberra - Friday, 22 February 2019
Excluded Data
L10
Leq
Lmax
Rain >= 0.5mm
Mean Wind Speed (1.5m)
Sound Pressure Level (dBA)
Wind Speed (m/s)
Time of Day (End of Sample Interval)

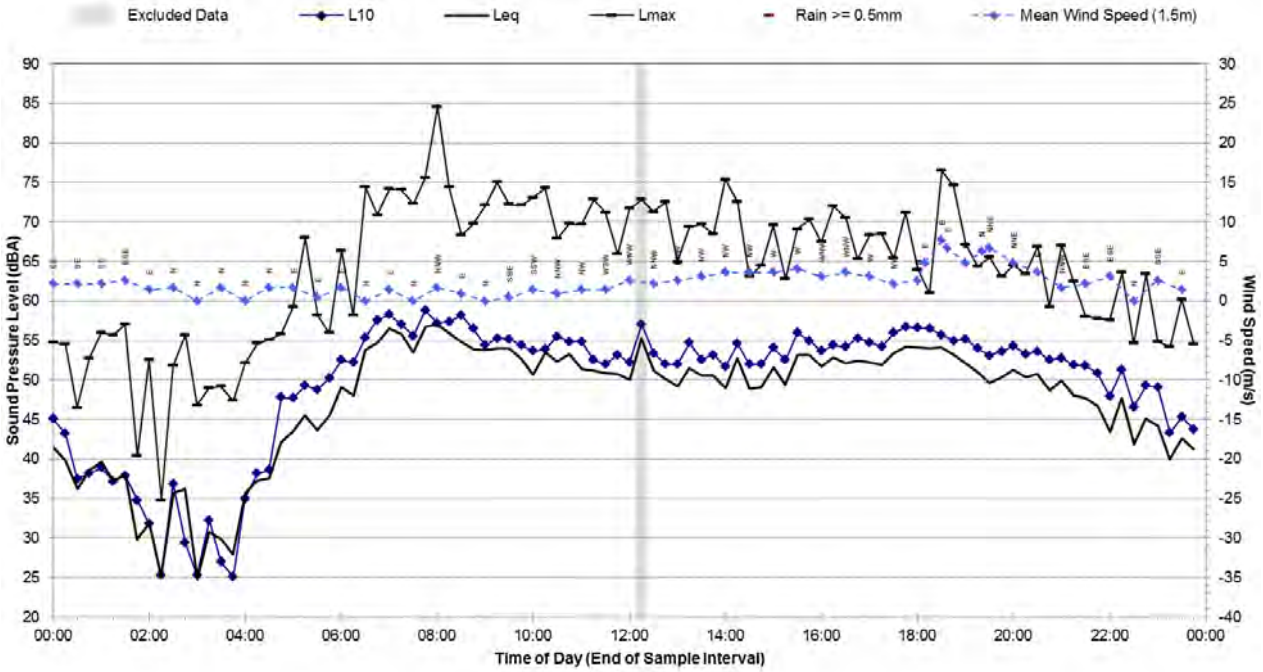

Statistical Ambient Noise Levels
L02 - 9 Coora Place, Jerrabomberra - Saturday, 23 February 2019
Excluded Data
L10
Leq
Lmax
Rain >= 0.5mm
Mean Wind Speed (1.5m)
Sound Pressure Level (dBA)
Wind Speed (m/s)
Time of Day (End of Sample Interval)


Statistical Ambient Noise Levels
L02 - 9 Coora Place, Jerrabomberra - Sunday, 24 February 2019
Excluded Data
L10
Leq
Lmax
Rain >= 0.5mm
Mean Wind Speed (1.5m)
Sound Pressure Level (dBA)
Wind Speed (m/s)
Time of Day (End of Sample Interval)


Statistical Ambient Noise Levels
L02 - 9 Coora Place, Jerrabomberra - Monday, 25 February 2019
Excluded Data
L10
Leq
Lmax
Rain >= 0.5mm
Mean Wind Speed (1.5m)
Sound Pressure Level (dBA)
Wind Speed (m/s)
Time of Day (End of Sample Interval)

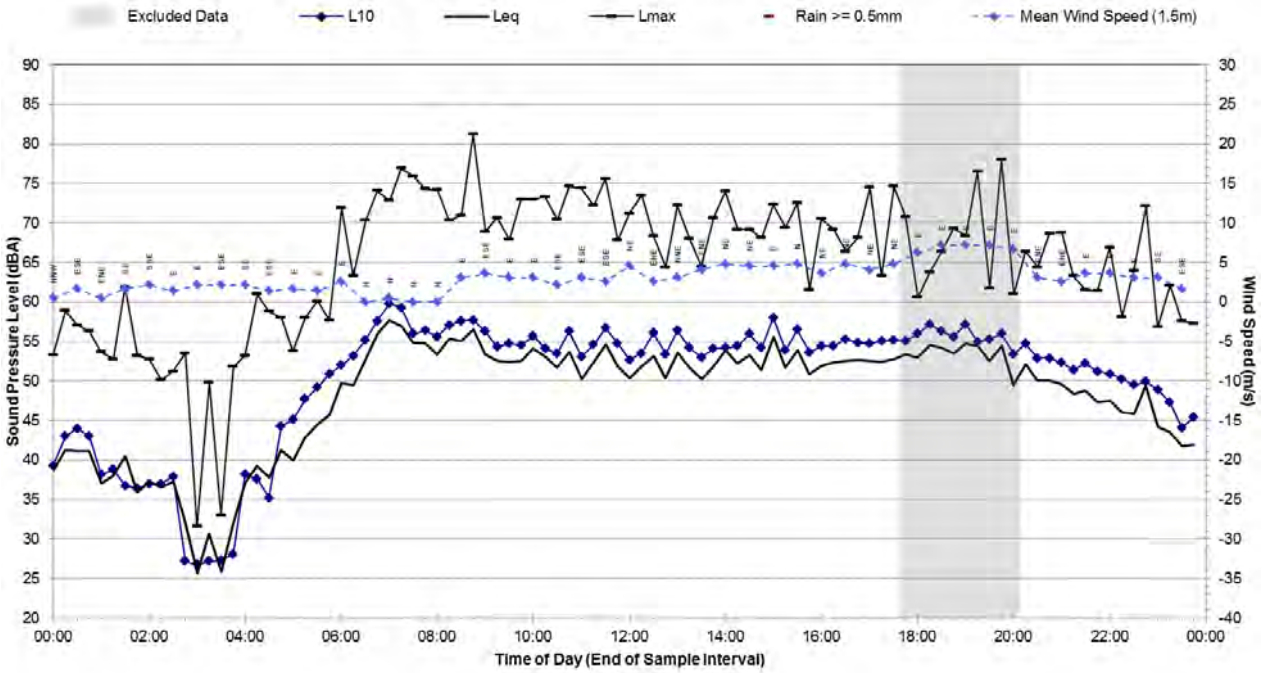
Statistical Ambient Noise Levels

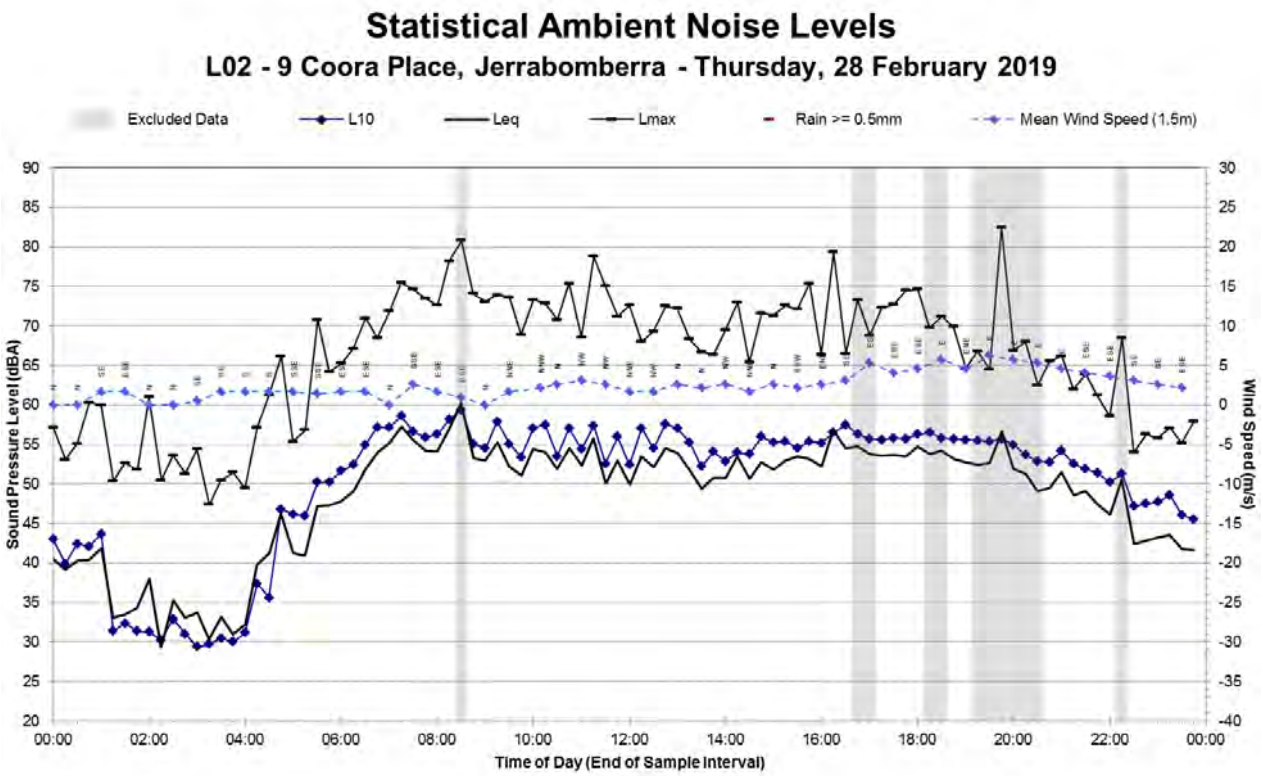
L02 - 9 Coora Place, Jerrabomberra - Tuesday, 26 February 2019

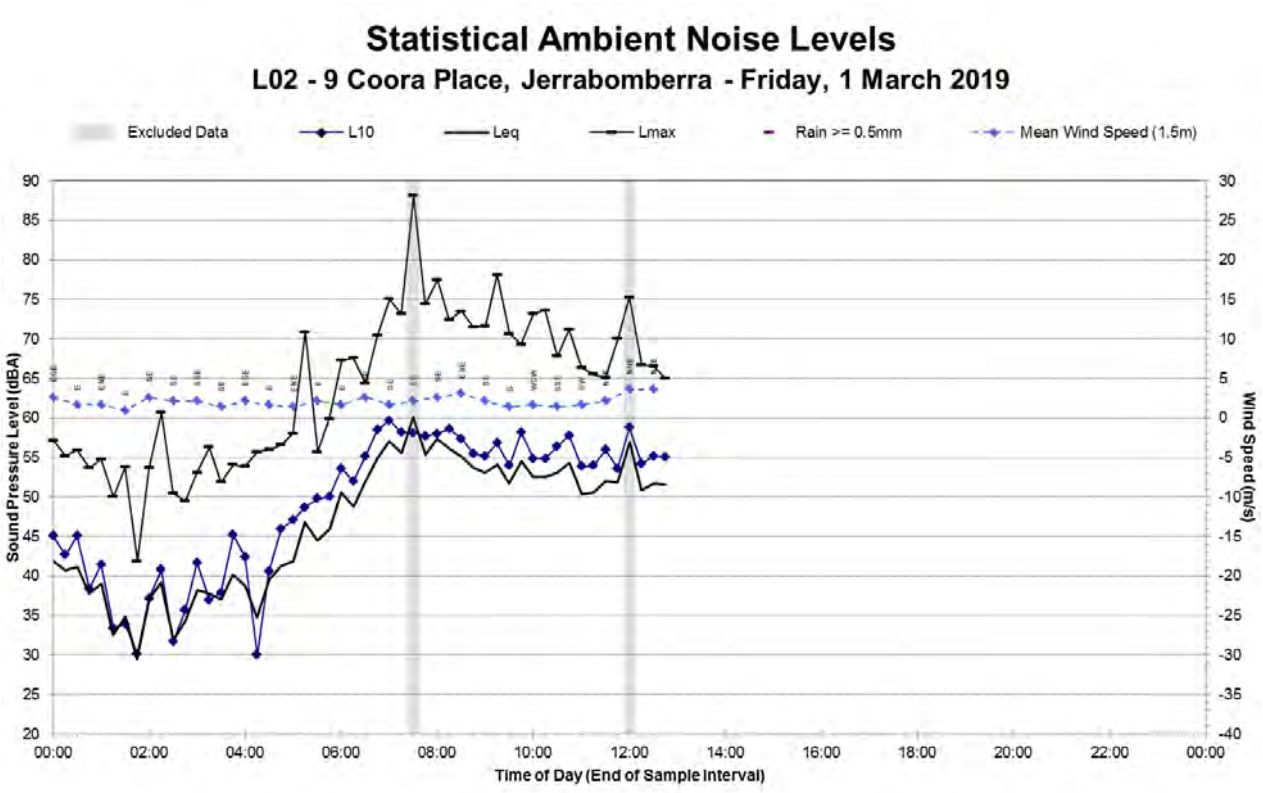


Statistical Ambient Noise Levels

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

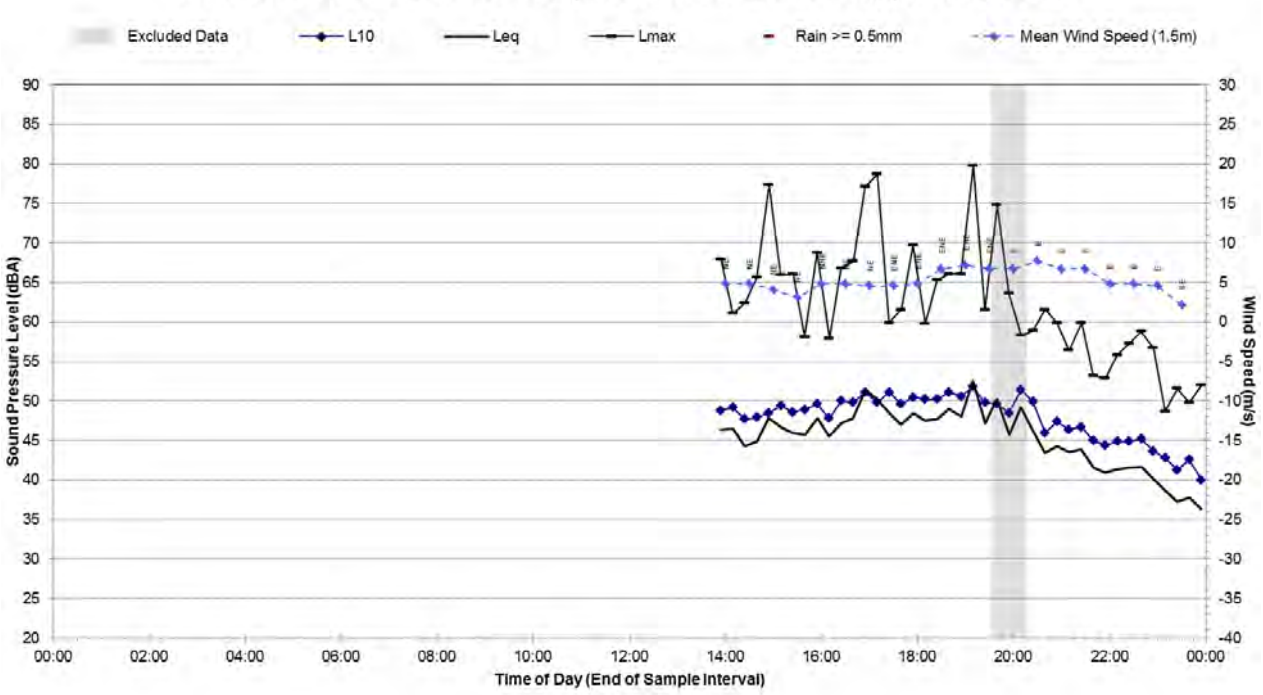



Statistical Ambient Noise Levels
L02 - 9 Coora Place, Jerrabomberra - Thursday, 28 February 2019
Excluded Data
L10
Leq
Lmax
Rain >= 0.5mm
Mean Wind Speed (1.5m)
Sound Pressure Level (dBA)
Wind Speed (m/s)
Time of Day (End of Sample Interval)


Statistical Ambient Noise Levels
L02 - 9 Coora Place, Jerrabomberra - Friday, 1 March 2019
Excluded Data
L10
Leq
Lmax
Rain >= 0.5mm
Mean Wind Speed (1.5m)
Sound Pressure Level (dBA)
Wind Speed (m/s)
Time of Day (End of Sample Interval)

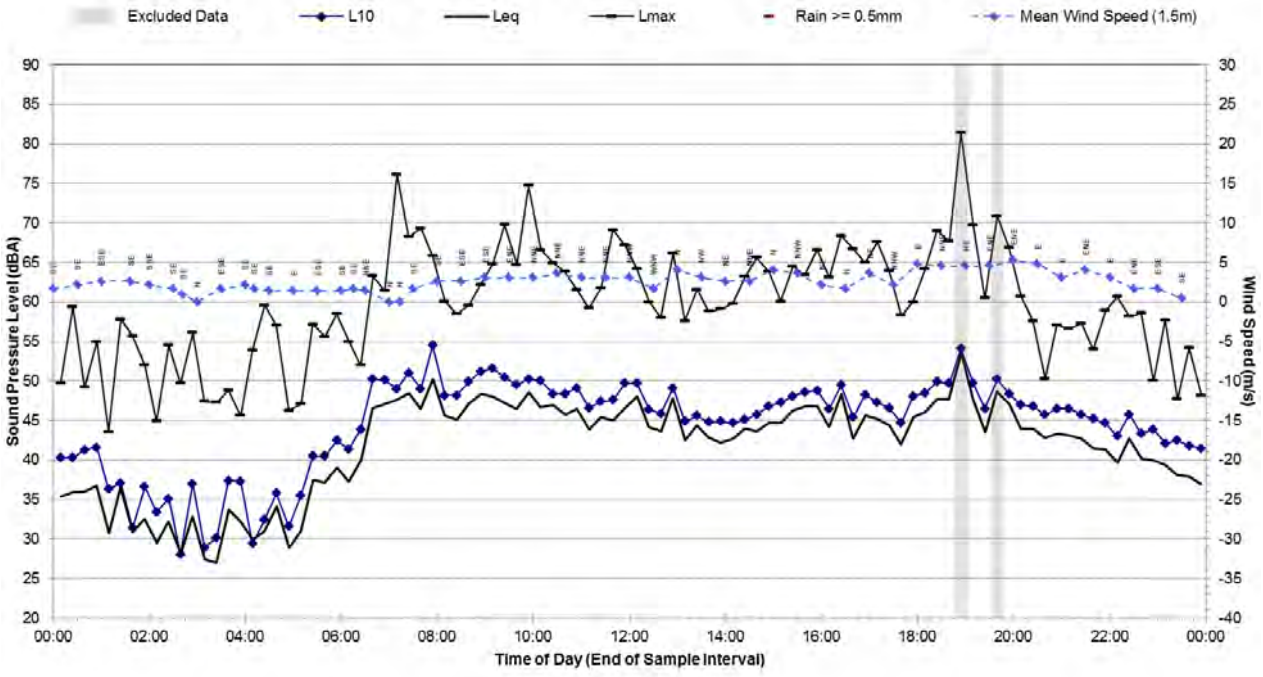
Statistical Ambient Noise Levels

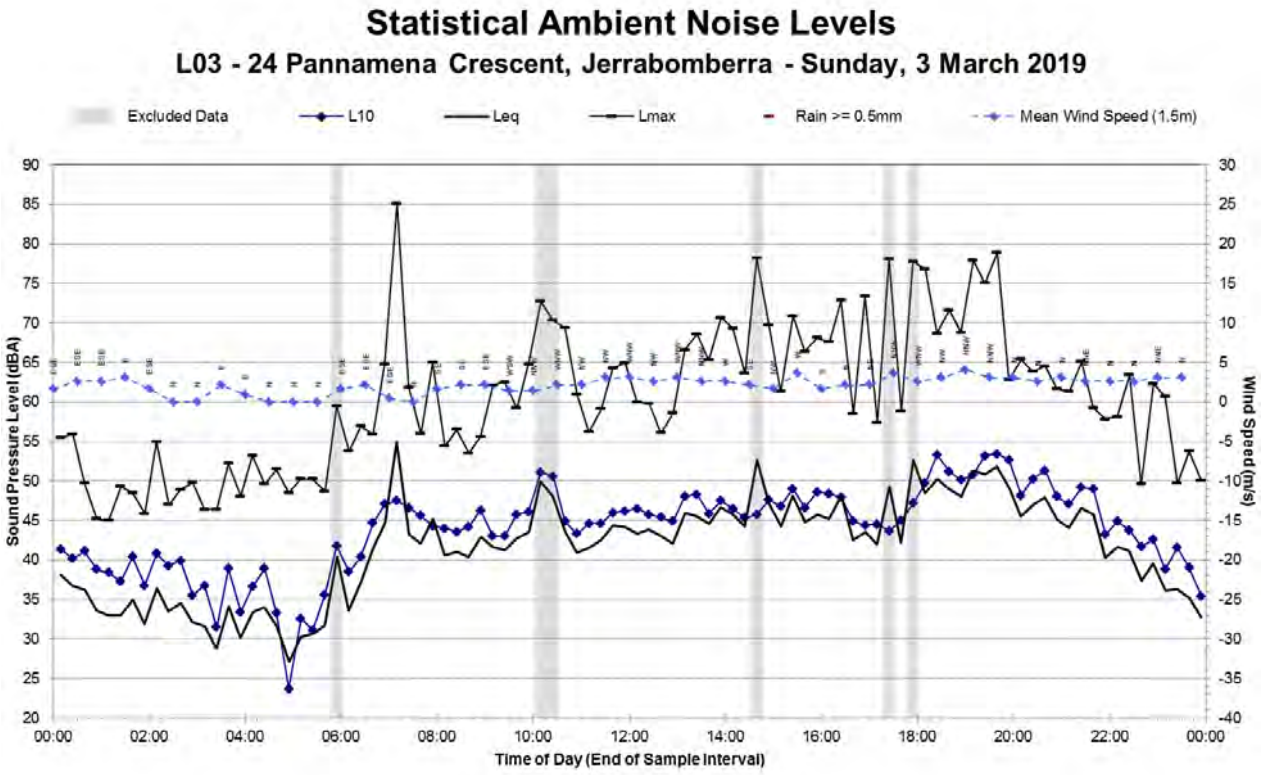
L03 - 24 Pannamena Crescent, Jerrabomberra - Friday, 1 March 2019

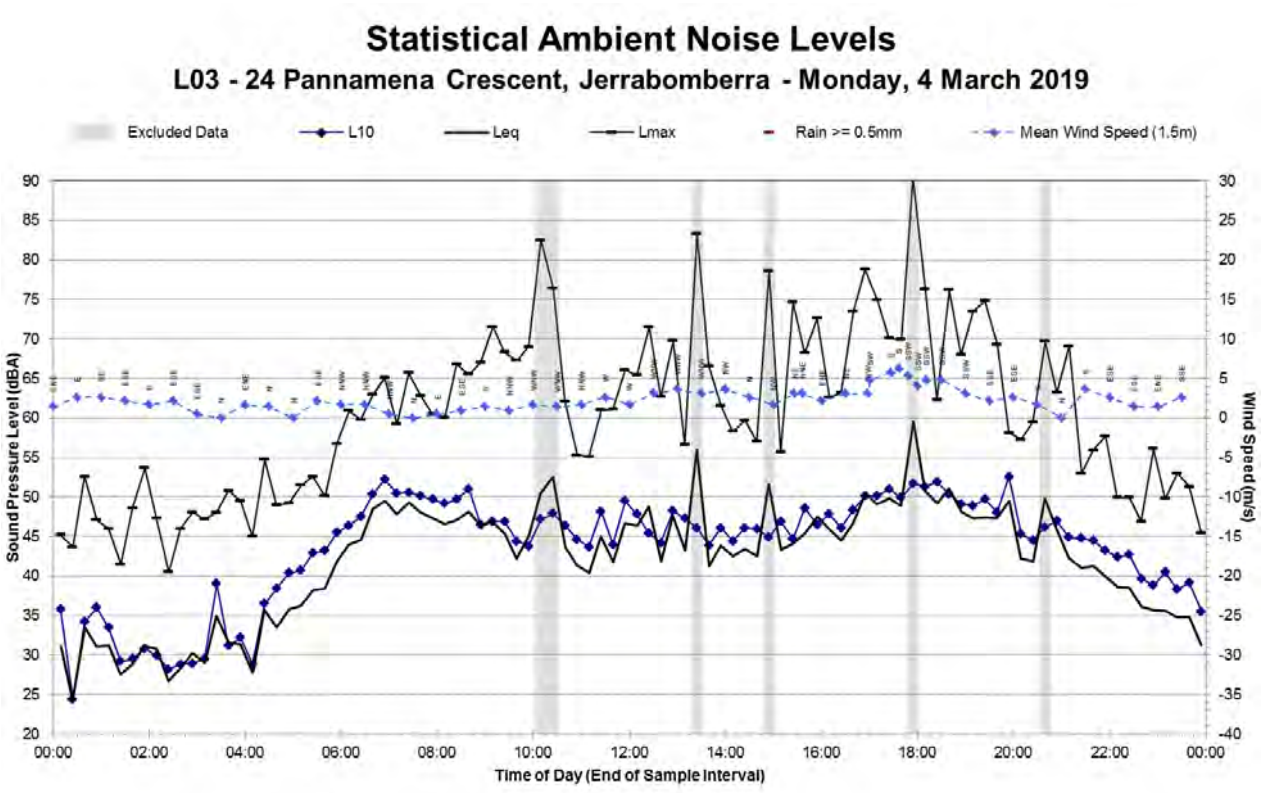


Statistical Ambient Noise Levels

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

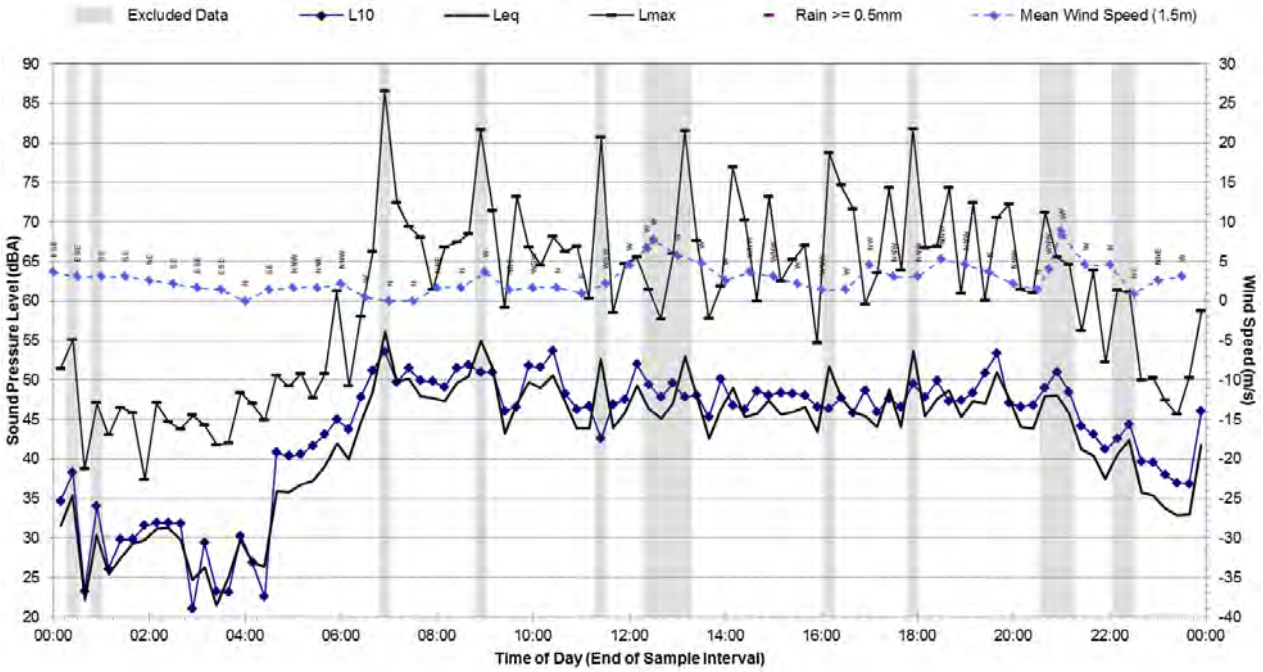



Statistical Ambient Noise Levels
L03 - 24 Pannamena Crescent, Jerrabomberra - Sunday, 3 March 2019
Excluded Data
L10
Leq
Lmax
Rain >= 0.5mm
Mean Wind Speed (1.5m)
Sound Pressure Level (dBA)
Wind Speed (m/s)
Time of Day (End of Sample Interval)


Statistical Ambient Noise Levels
L03 - 24 Pannamena Crescent, Jerrabomberra - Monday, 4 March 2019
Excluded Data
L10
Leq
Lmax
Rain >= 0.5mm
Mean Wind Speed (1.5m)
Sound Pressure Level (dBA)
Wind Speed (m/s)
Time of Day (End of Sample Interval)

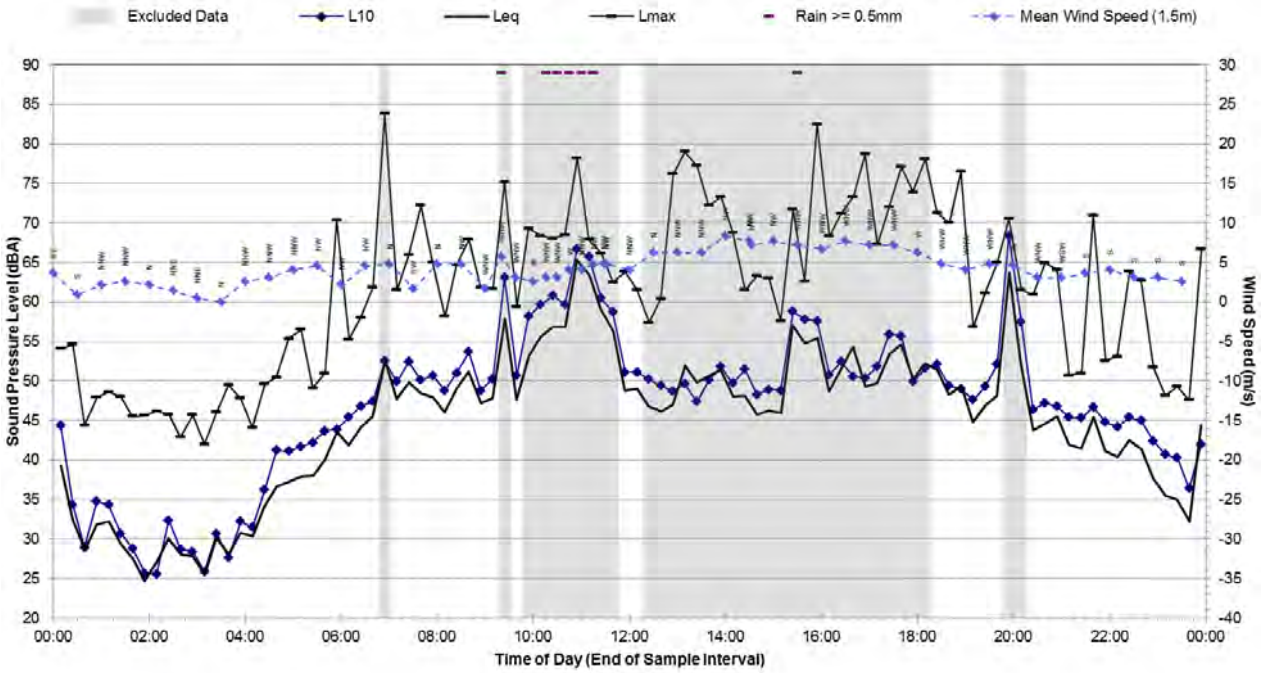
Statistical Ambient Noise Levels

L03 - 24 Pannamena Crescent, Jerrabomberra - Tuesday, 5 March 2019



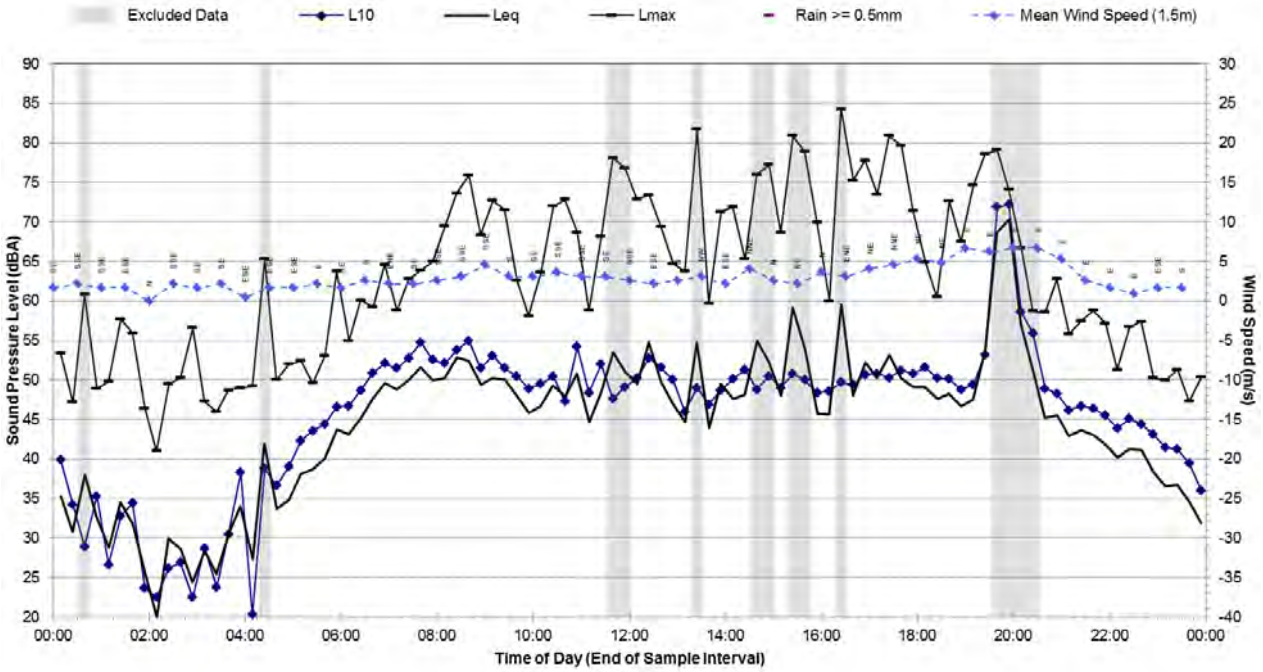
Statistical Ambient Noise Levels

L03 - 24 Pannamena Crescent, Jerrabomberra - Wednesday, 6 March 2019



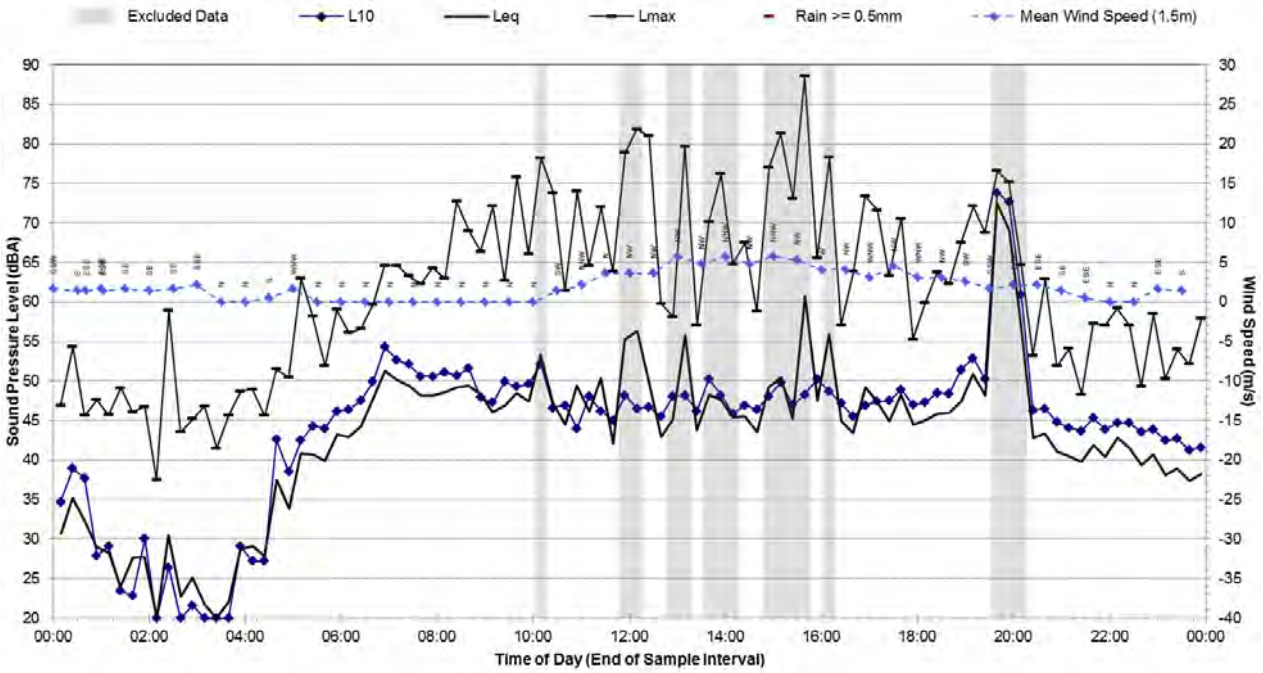
Statistical Ambient Noise Levels

L03 - 24 Pannamena Crescent, Jerrabomberra - Thursday, 7 March 2019



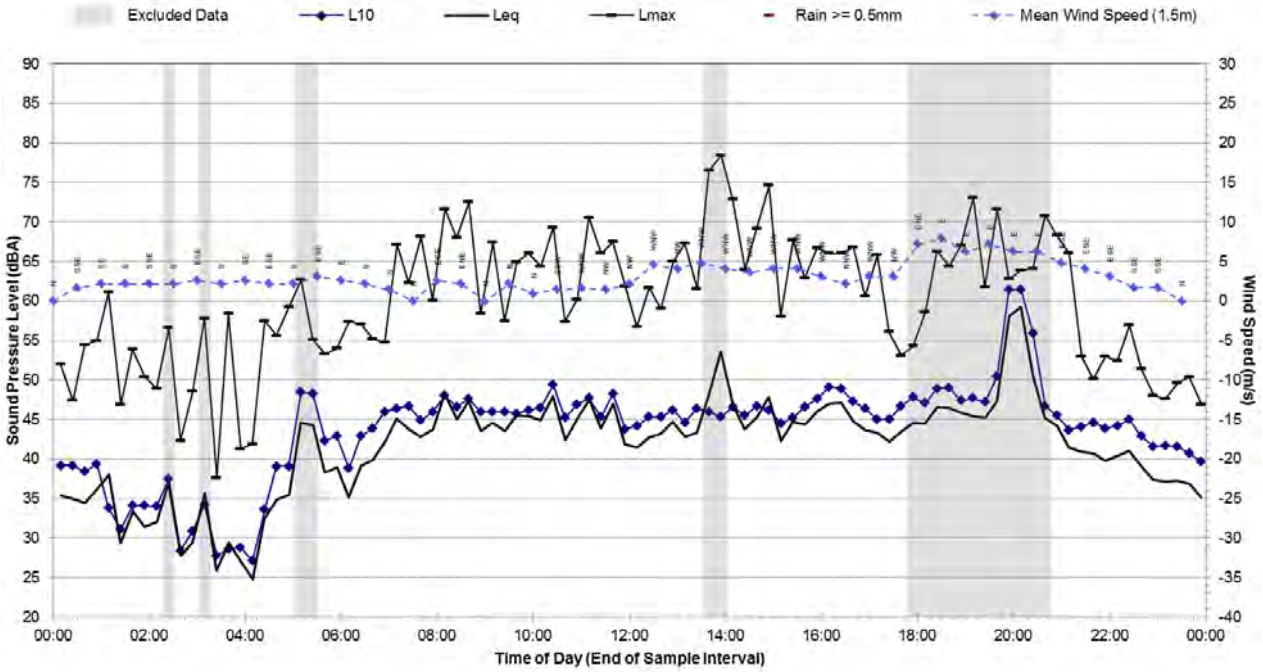
Statistical Ambient Noise Levels

L03 - 24 Pannamena Crescent, Jerrabomberra - Friday, 8 March 2019



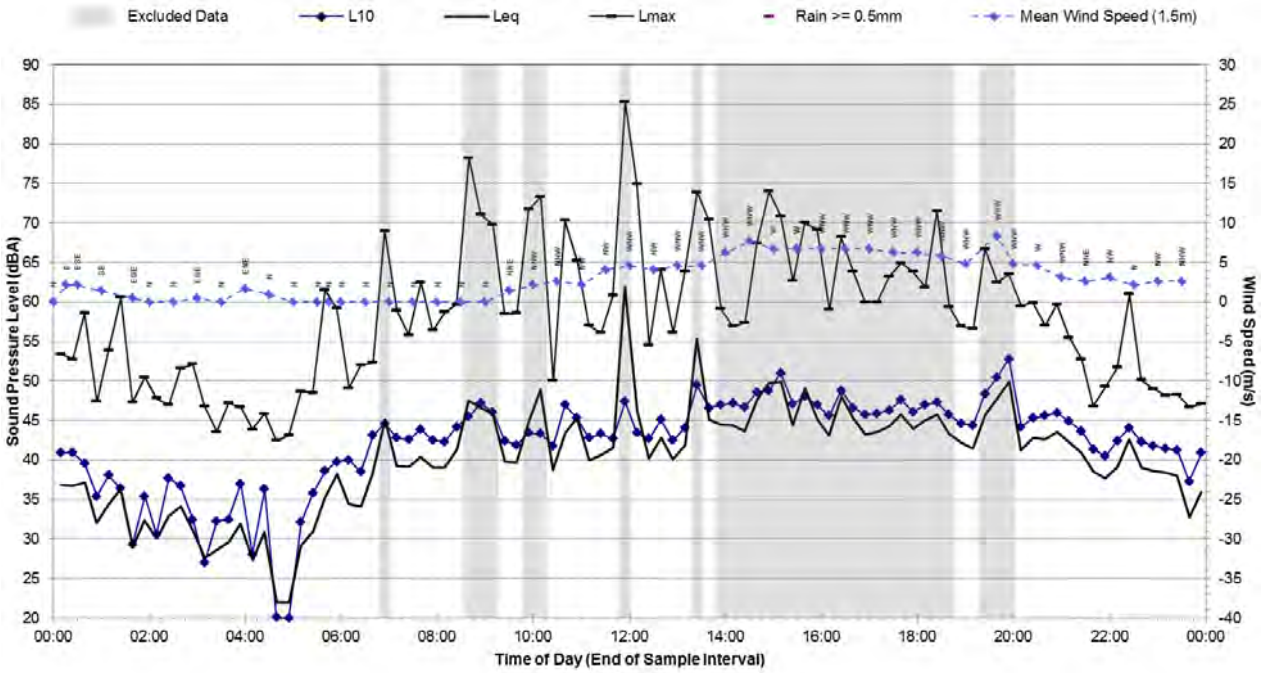
Statistical Ambient Noise Levels

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



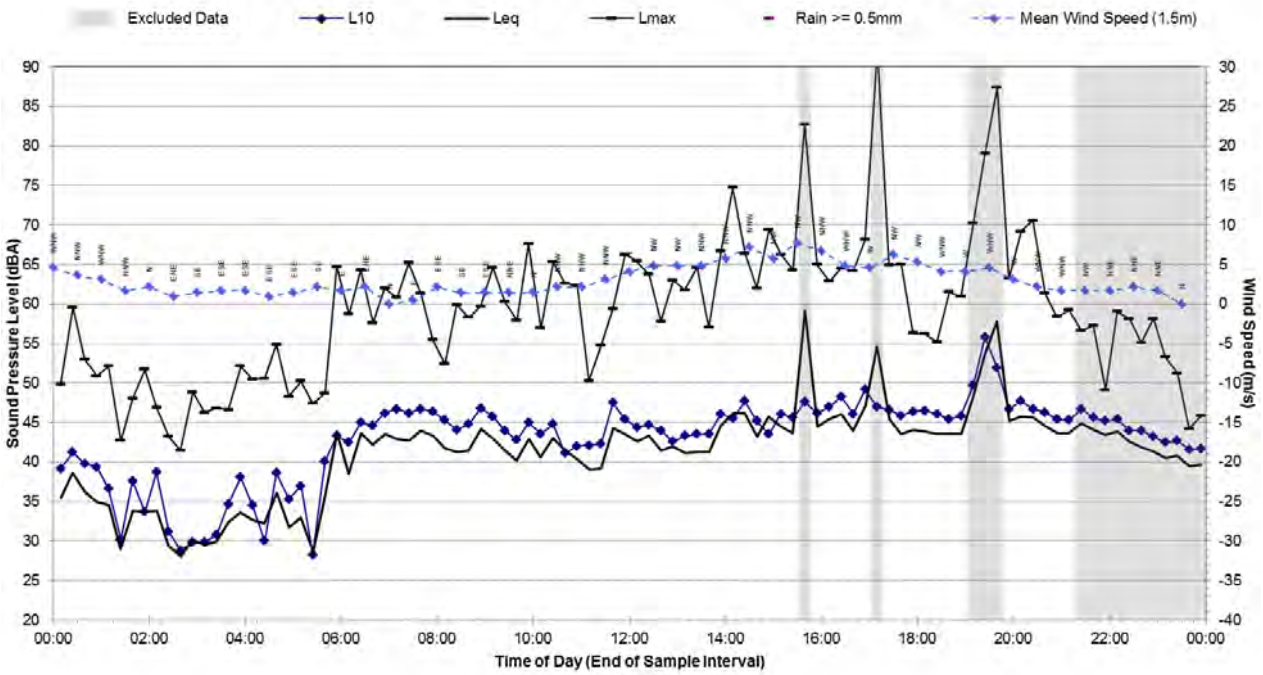
Statistical Ambient Noise Levels

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



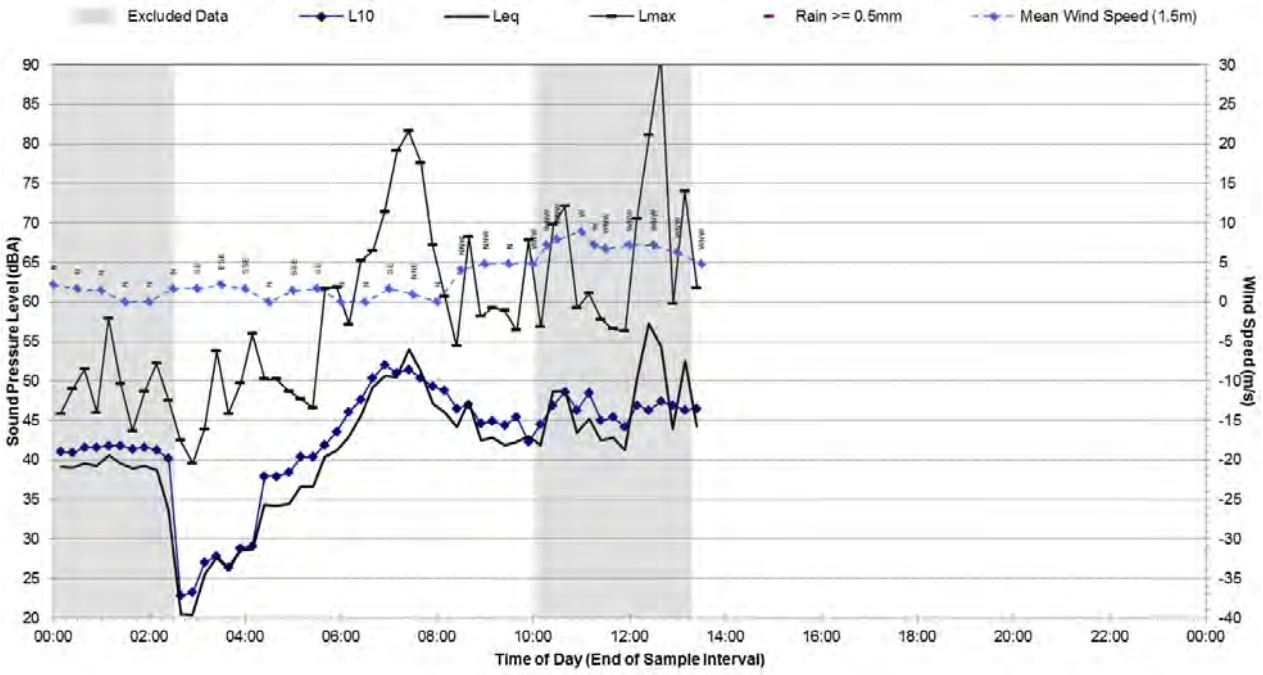
Statistical Ambient Noise Levels

L03 - 24 Pannamena Crescent, Jerrabomberra - Monday, 11 March 2019



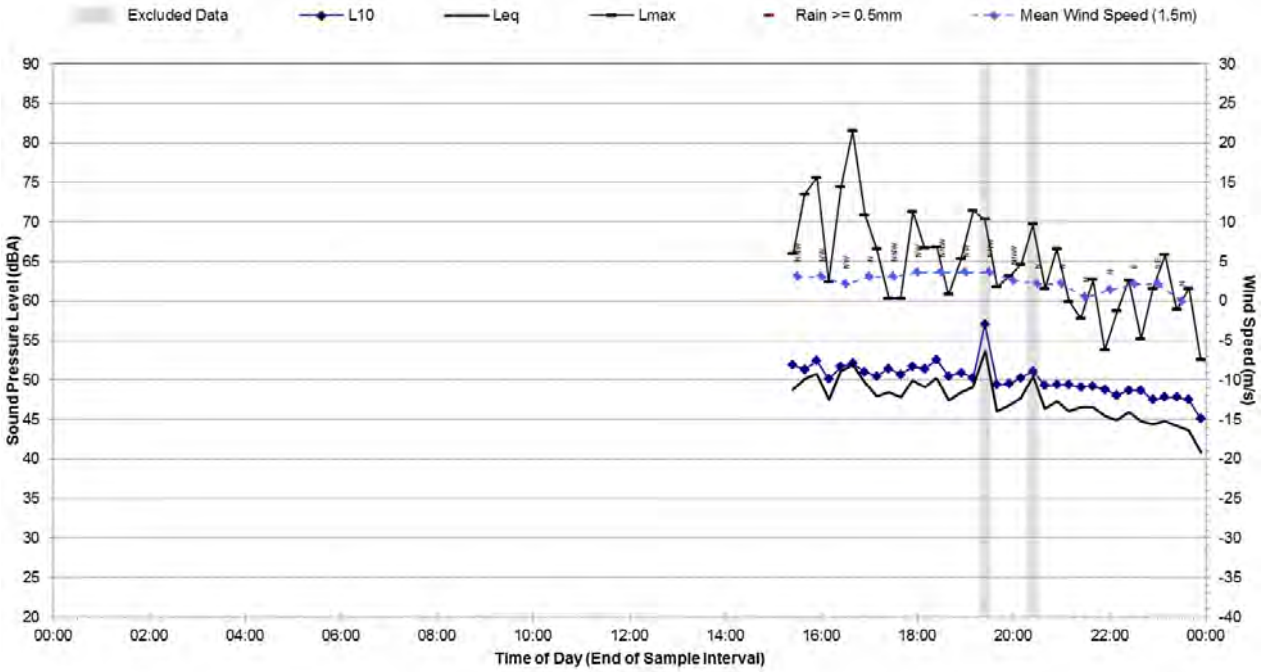
Statistical Ambient Noise Levels

L03 - 24 Pannamena Crescent, Jerrabomberra - Tuesday, 12 March 2019



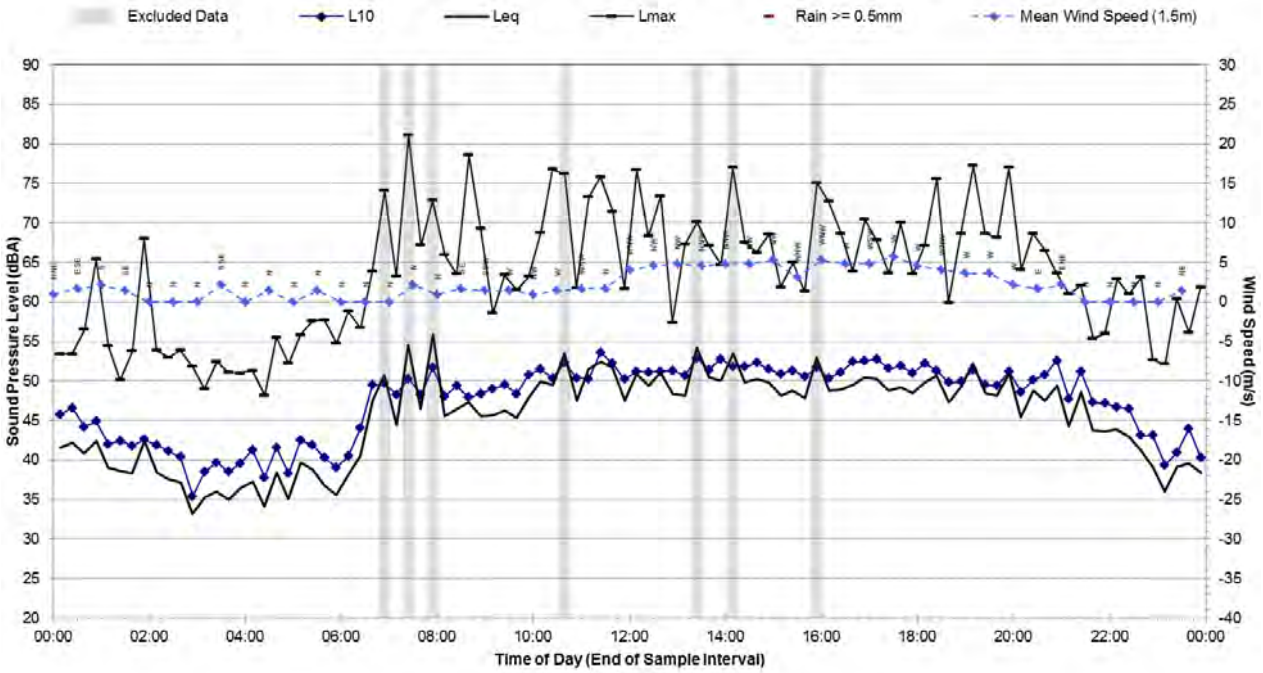
Statistical Ambient Noise Levels

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



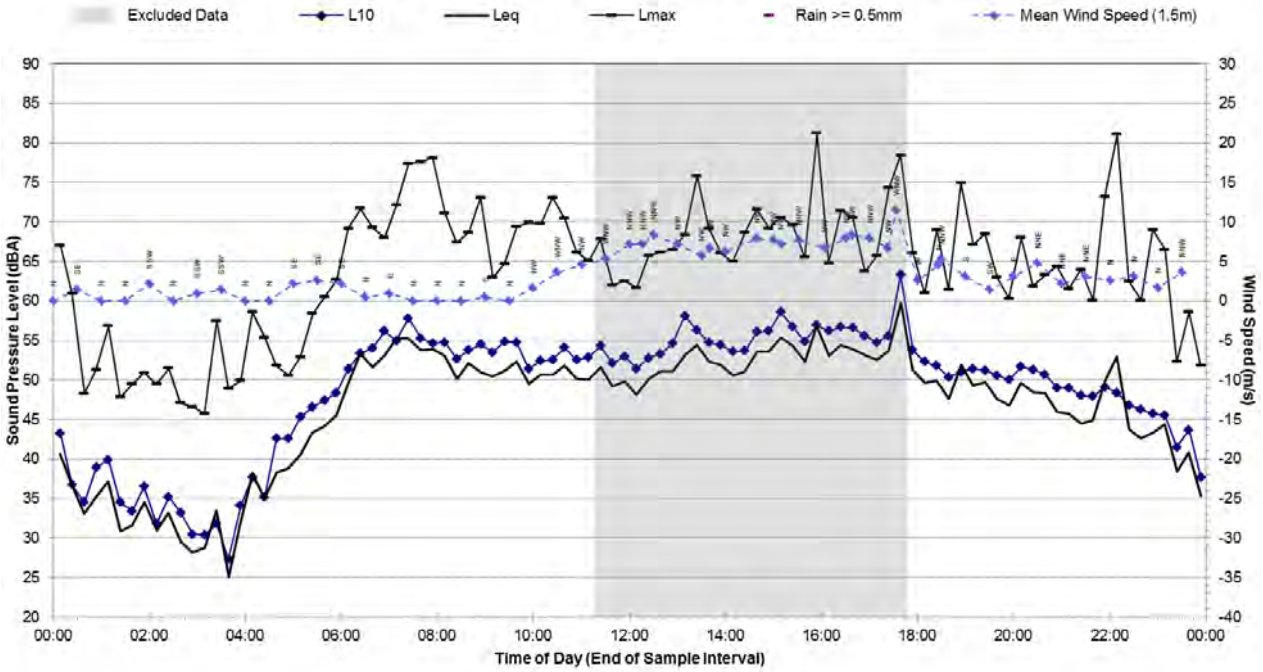
Statistical Ambient Noise Levels

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



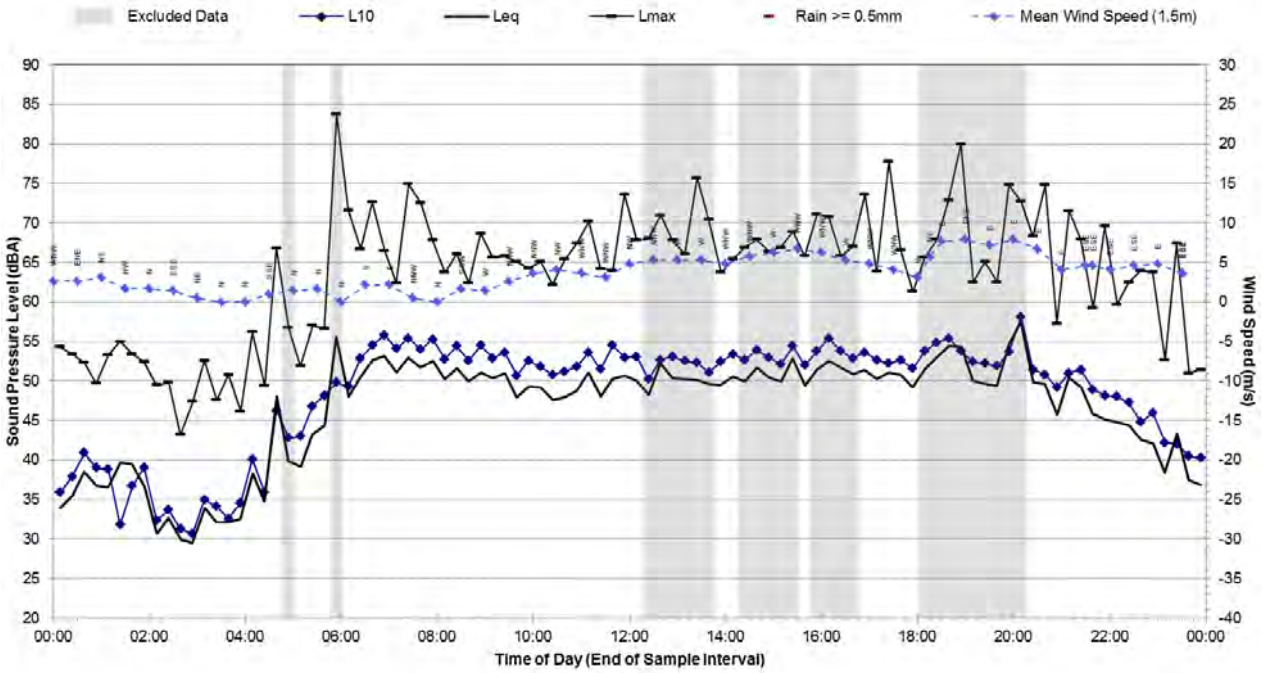
Statistical Ambient Noise Levels

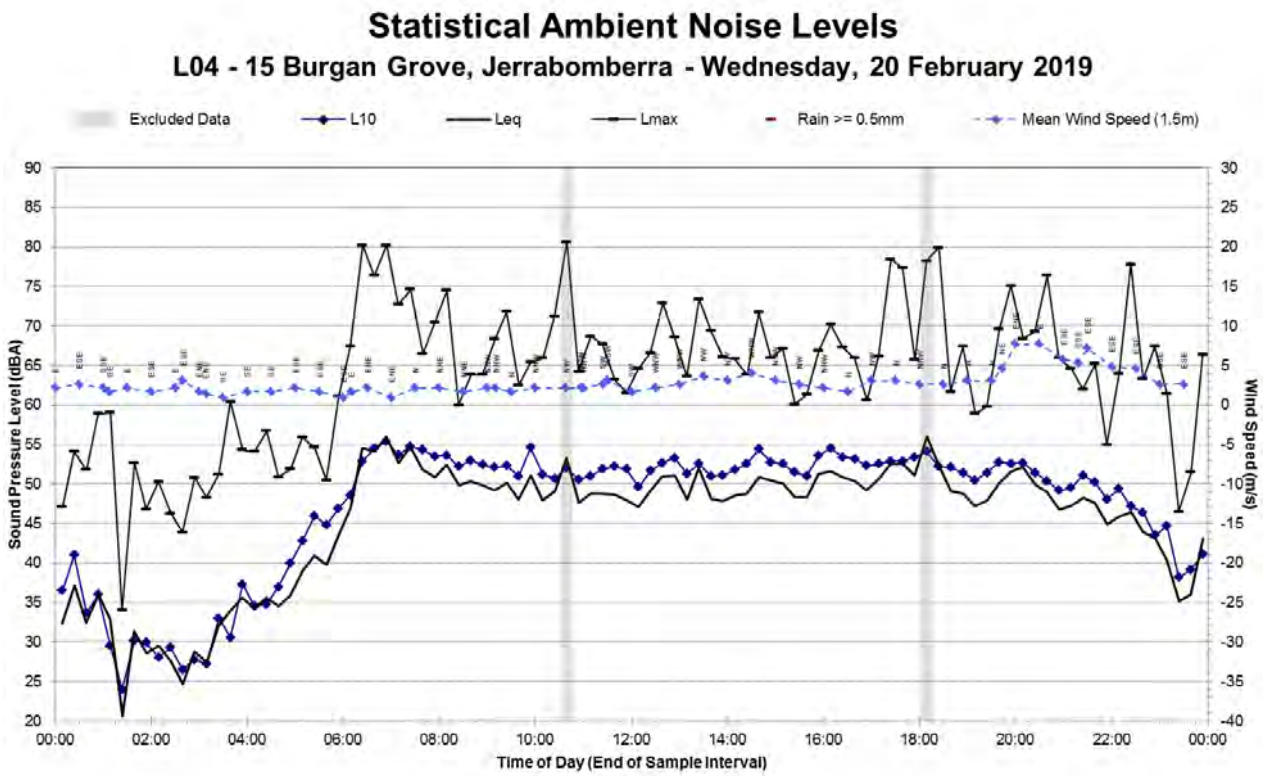
L04 - 15 Burgan Grove, Jerrabomberra - Monday, 18 February 2019

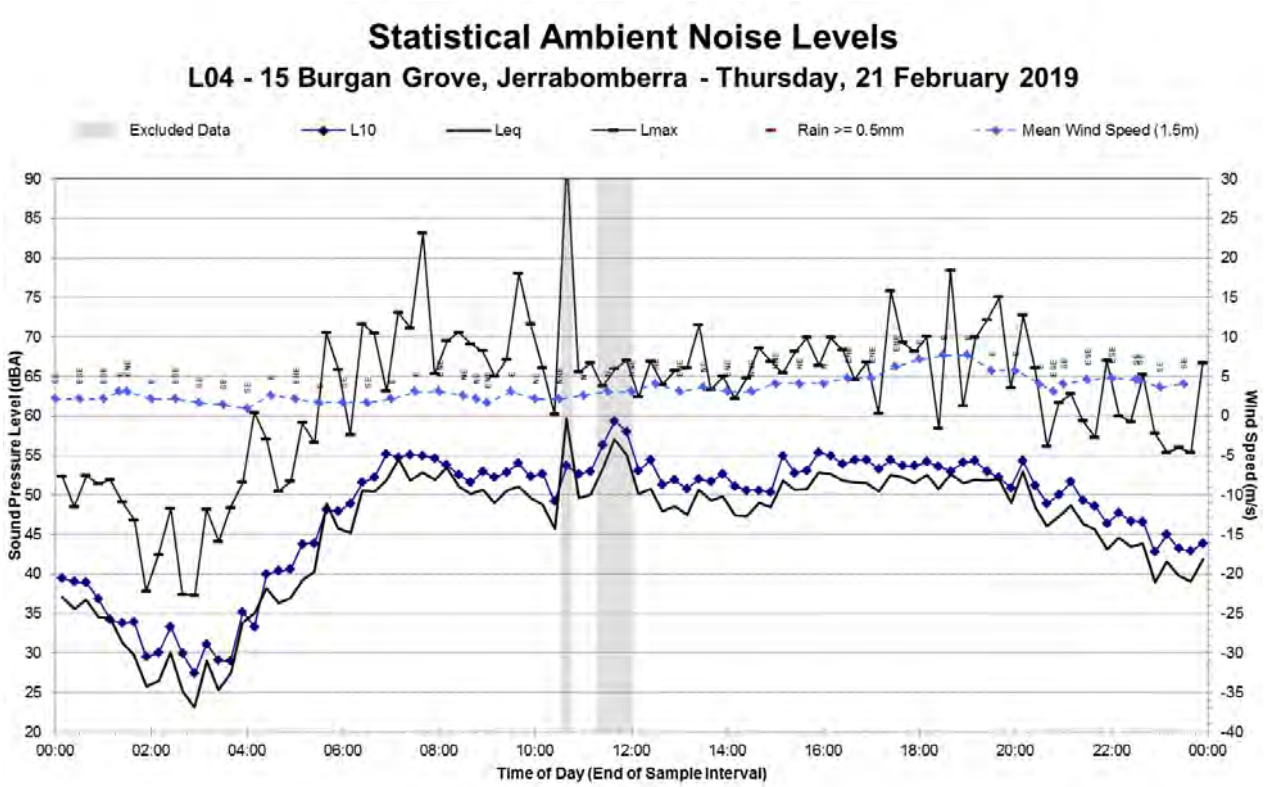


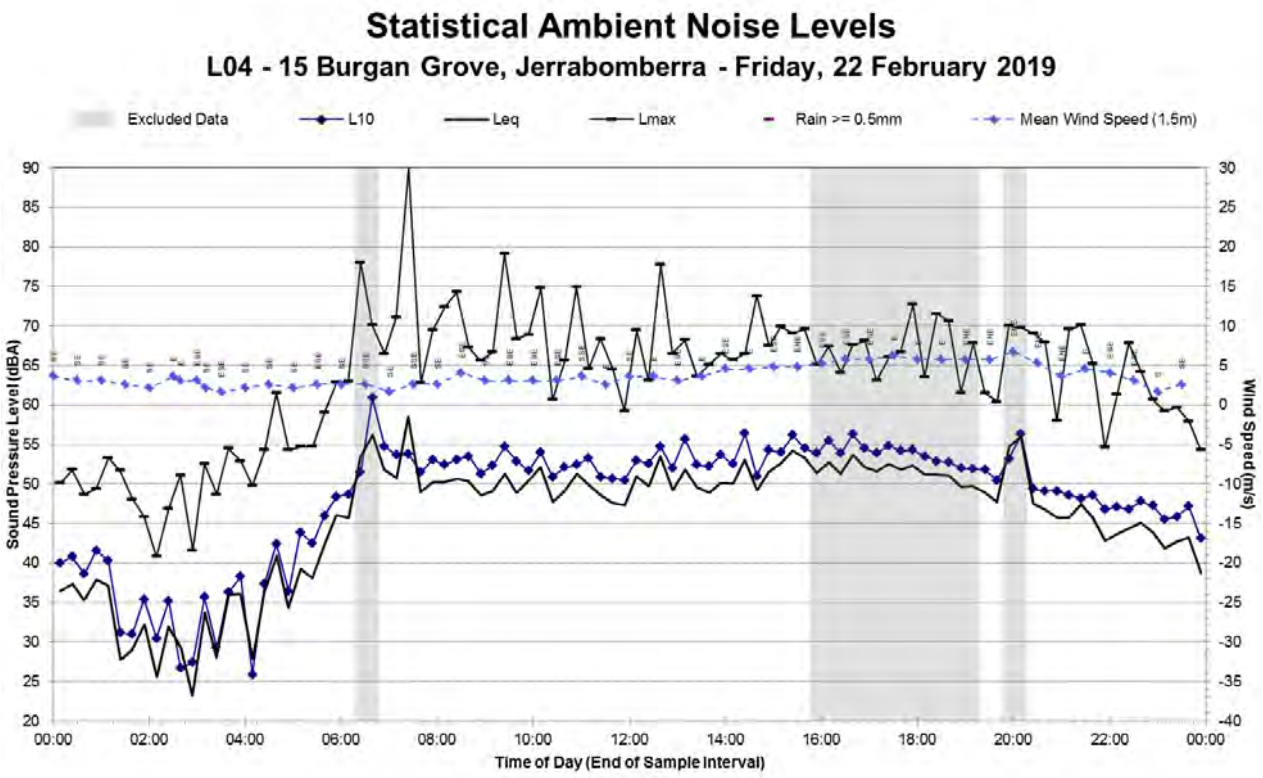
Statistical Ambient Noise Levels

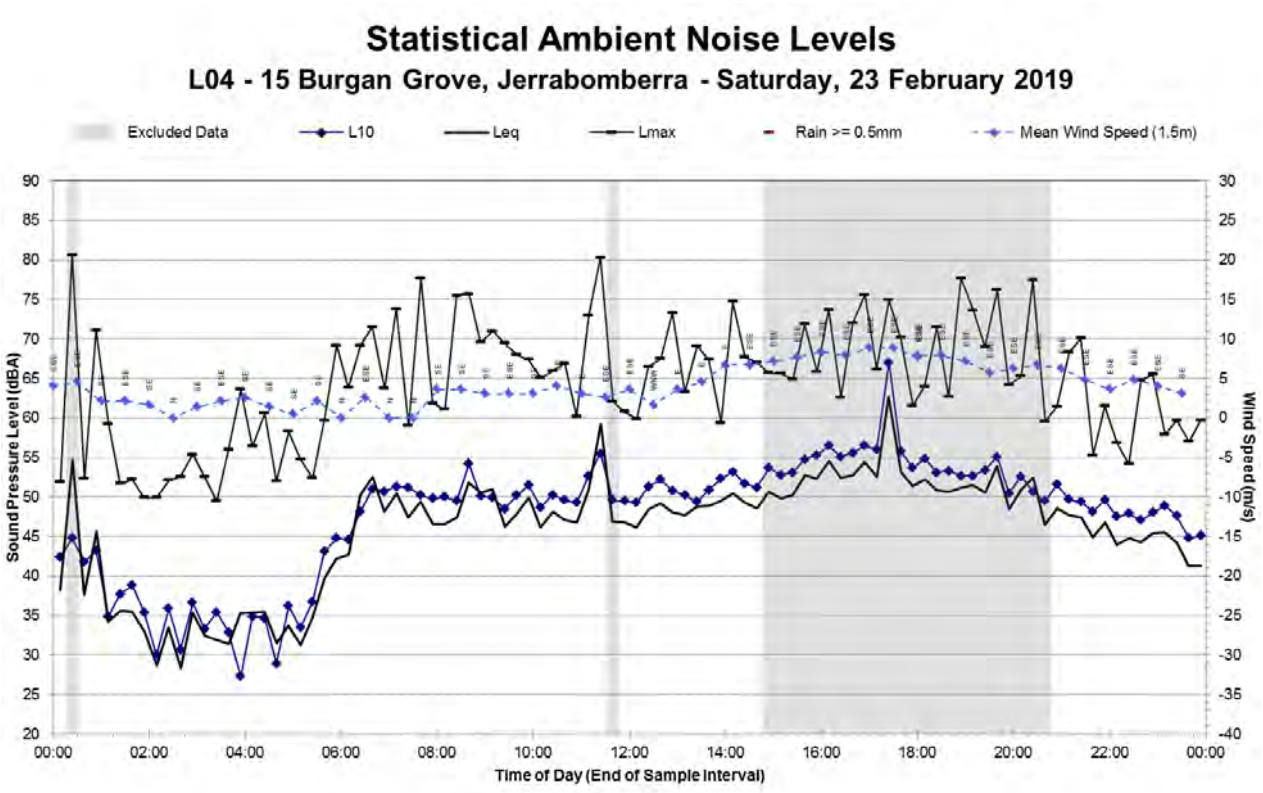
L04 - 15 Burgan Grove, Jerrabomberra - Tuesday, 19 February 2019




Statistical Ambient Noise Levels
L04 - 15 Burgan Grove, Jerrabomberra - Wednesday, 20 February 2019
Excluded Data
L10
Leq
Lmax
Rain >= 0.5mm
Mean Wind Speed (1.5m)
Sound Pressure Level (dBA)
Wind Speed (m/s)
Time of Day (End of Sample Interval)

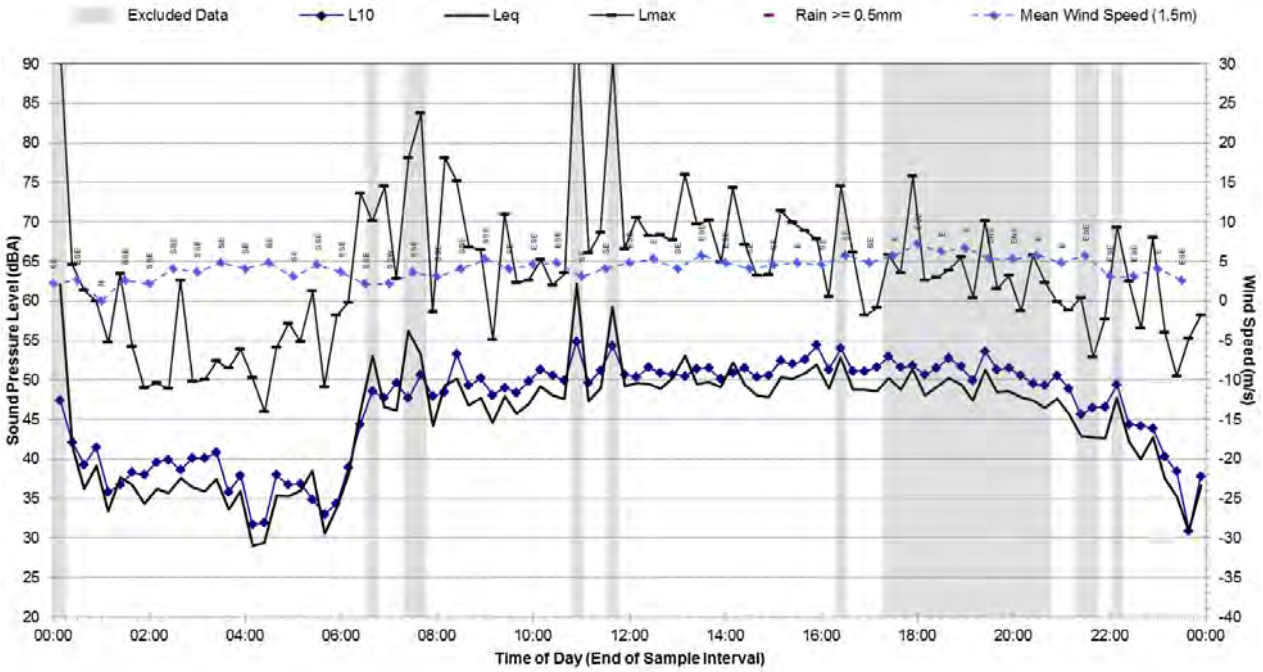

Statistical Ambient Noise Levels
L04 - 15 Burgan Grove, Jerrabomberra - Thursday, 21 February 2019
Excluded Data
L10
Leq
Lmax
Rain >= 0.5mm
Mean Wind Speed (1.5m)
Sound Pressure Level (dBA)
Wind Speed (m/s)
Time of Day (End of Sample Interval)


Statistical Ambient Noise Levels
L04 - 15 Burgan Grove, Jerrabomberra - Friday, 22 February 2019
Excluded Data
L10
Leq
Lmax
Rain >= 0.5mm
Mean Wind Speed (1.5m)
Sound Pressure Level (dBA)
Wind Speed (m/s)
Time of Day (End of Sample Interval)


Statistical Ambient Noise Levels
L04 - 15 Burgan Grove, Jerrabomberra - Saturday, 23 February 2019
Excluded Data
L10
Leq
Lmax
Rain >= 0.5mm
Mean Wind Speed (1.5m)
Sound Pressure Level (dBA)
Wind Speed (m/s)
Time of Day (End of Sample Interval)

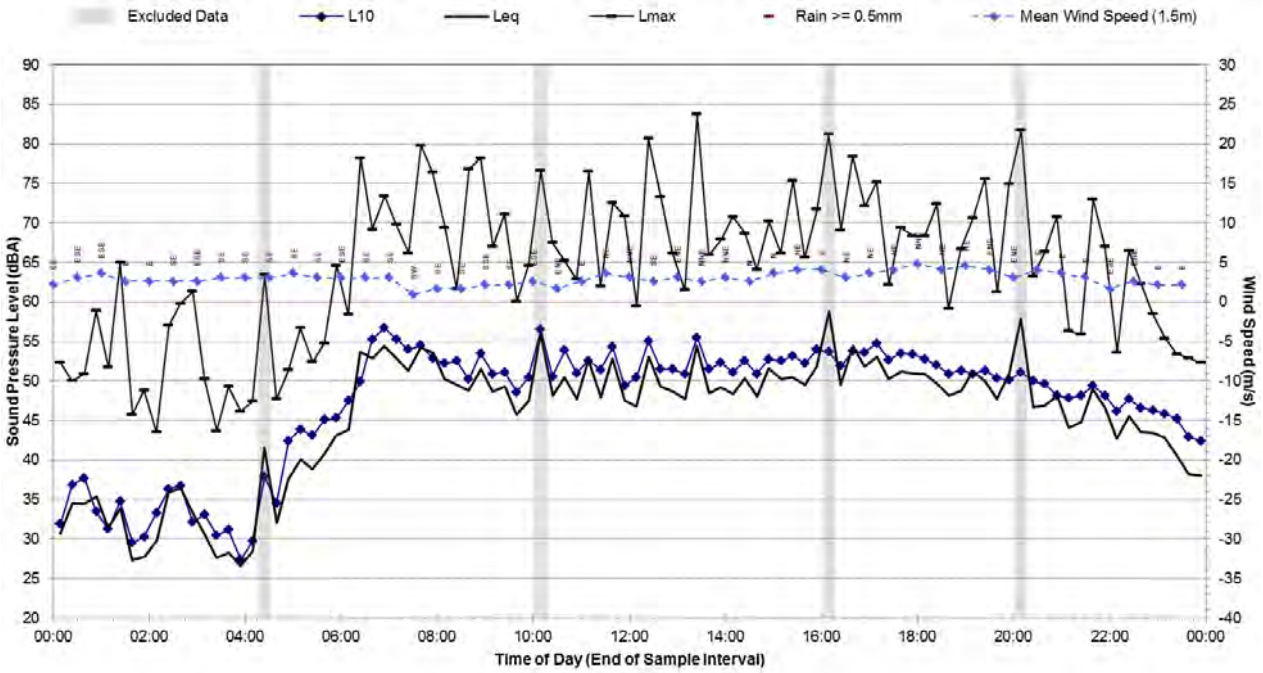
Statistical Ambient Noise Levels

L04 - 15 Burgan Grove, Jerrabomberra - Sunday, 24 February 2019



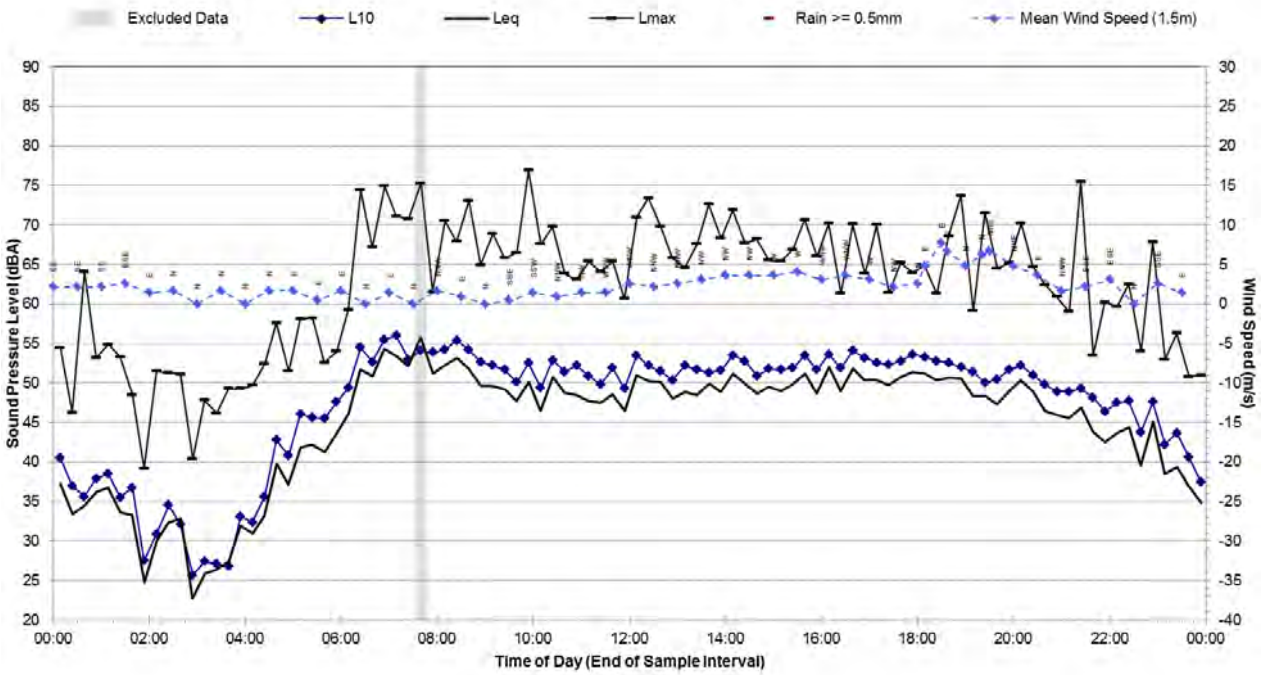
Statistical Ambient Noise Levels

L04 - 15 Burgan Grove, Jerrabomberra - Monday, 25 February 2019



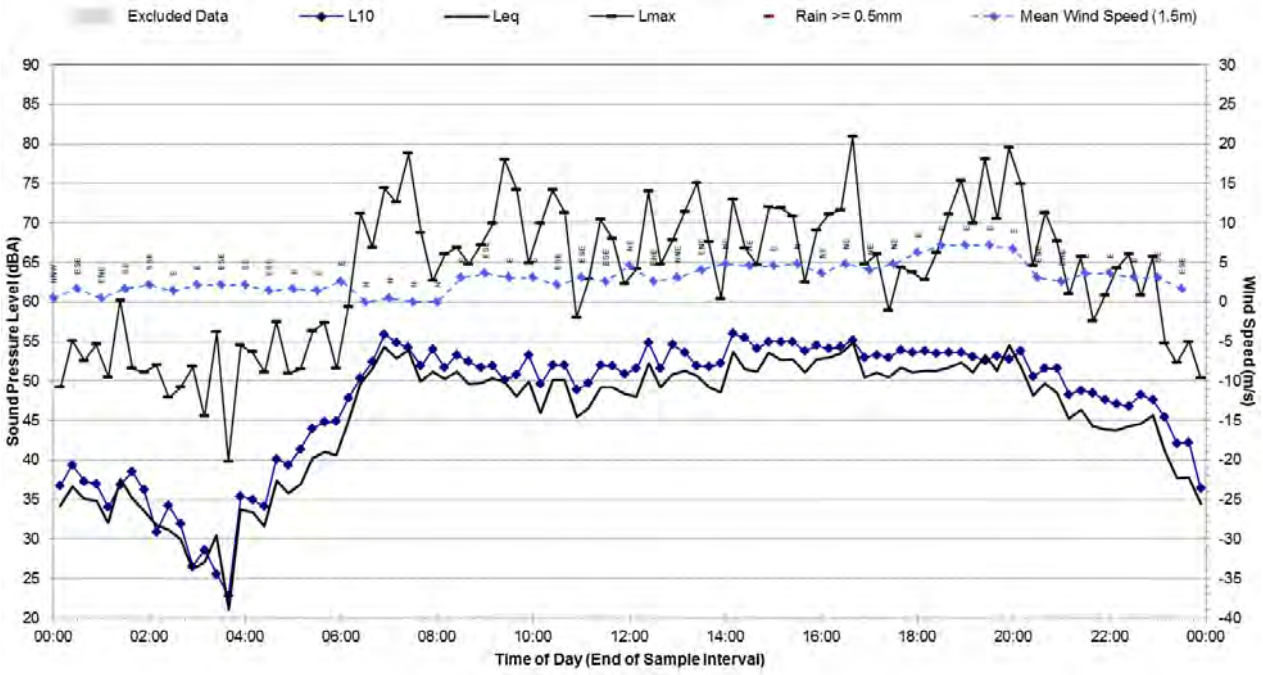
Statistical Ambient Noise Levels

L04 - 15 Burgan Grove, Jerrabomberra - Tuesday, 26 February 2019



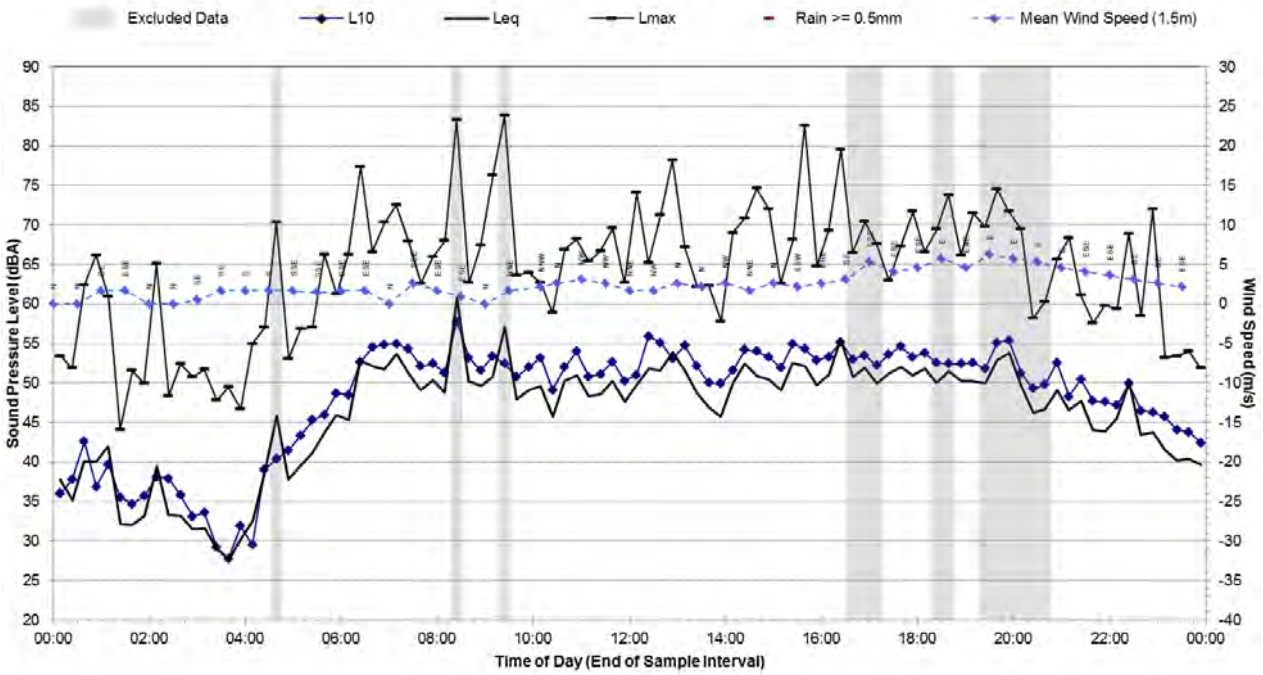
Statistical Ambient Noise Levels

L04 - 15 Burgan Grove, Jerrabomberra - Wednesday, 27 February 2019



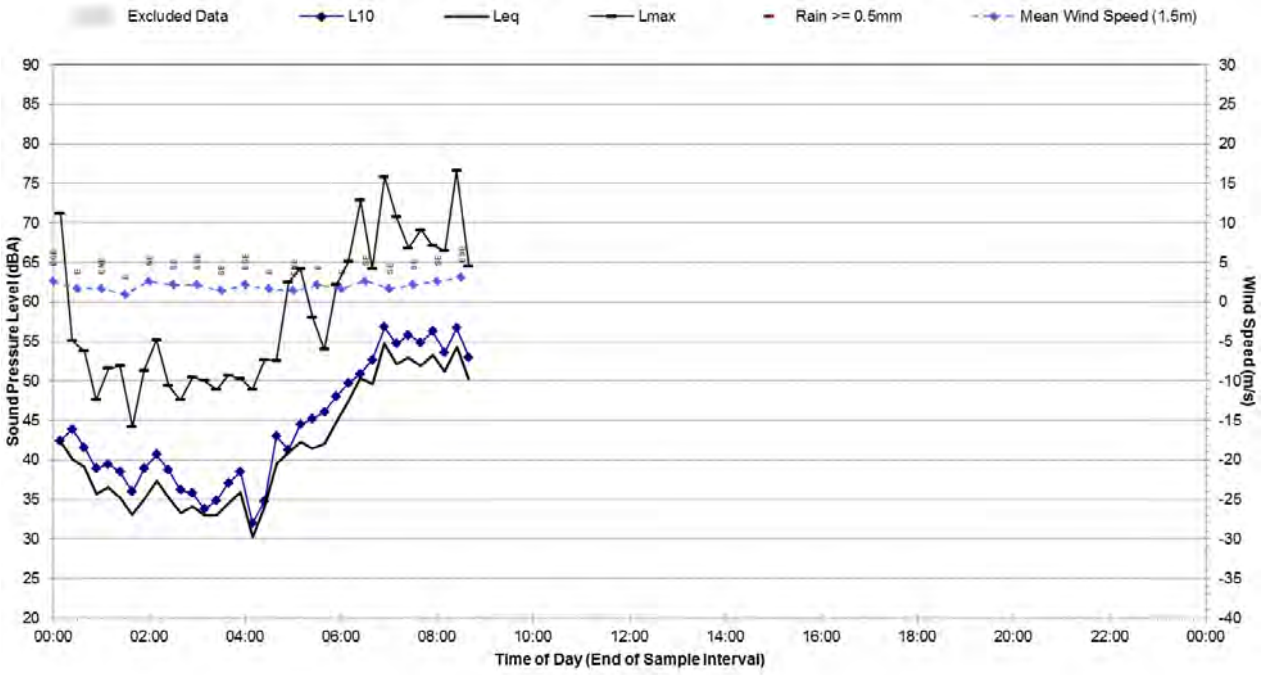
Statistical Ambient Noise Levels

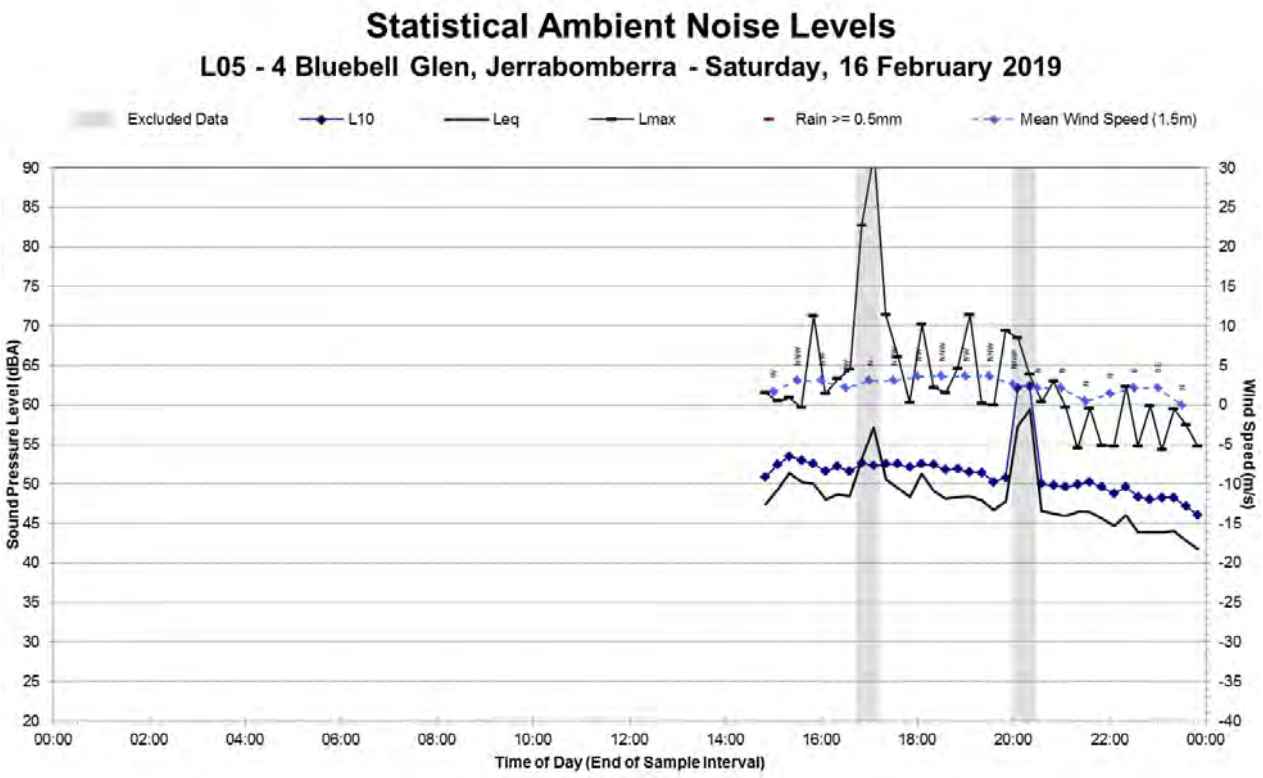
L04 - 15 Burgan Grove, Jerrabomberra - Thursday, 28 February 2019

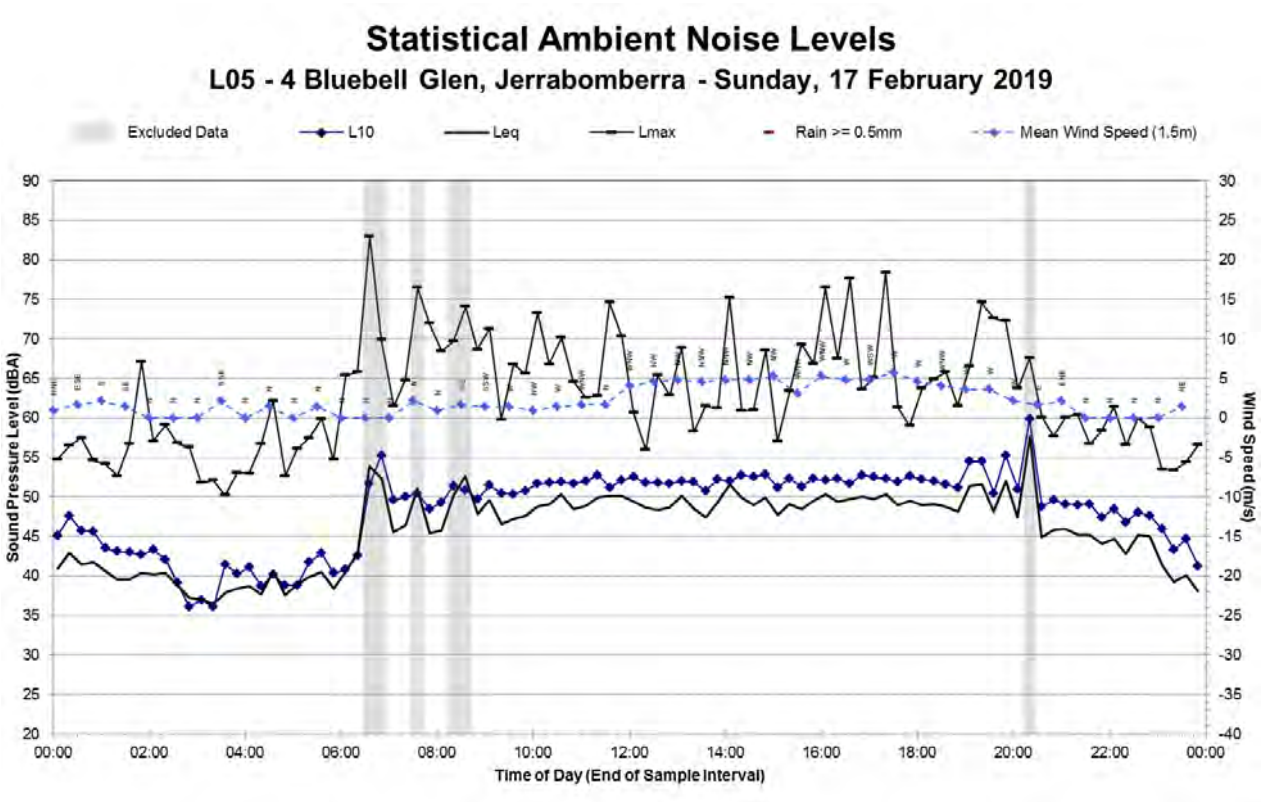


Statistical Ambient Noise Levels

L04 - 15 Burgan Grove, Jerrabomberra - Friday, 1 March 2019

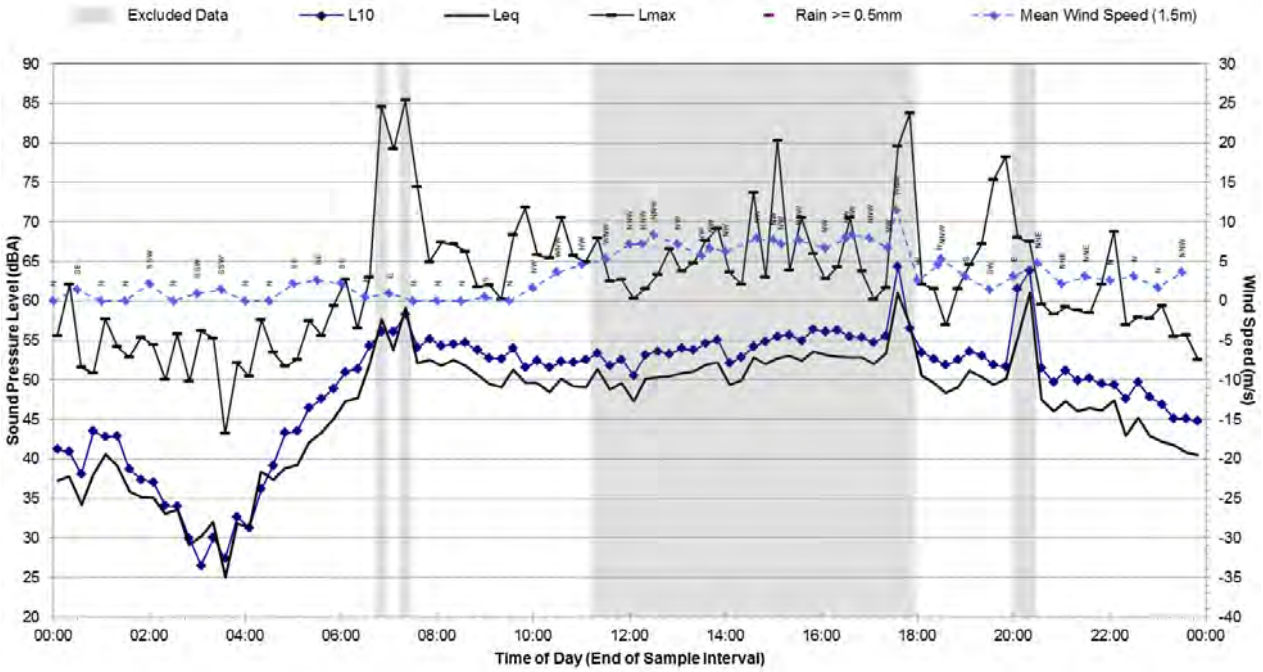



Statistical Ambient Noise Levels
L05 - 4 Bluebell Glen, Jerrabomberra - Saturday, 16 February 2019
Excluded Data
L10
Leq
Lmax
Rain >= 0.5mm
Mean Wind Speed (1.5m)
Sound Pressure Level (dBA)
Wind Speed (m/s)
Time of Day (End of Sample Interval)


Statistical Ambient Noise Levels
L05 - 4 Bluebell Glen, Jerrabomberra - Sunday, 17 February 2019
Excluded Data
L10
Leq
Lmax
Rain >= 0.5mm
Mean Wind Speed (1.5m)
Sound Pressure Level (dBA)
Wind Speed (m/s)
Time of Day (End of Sample Interval)

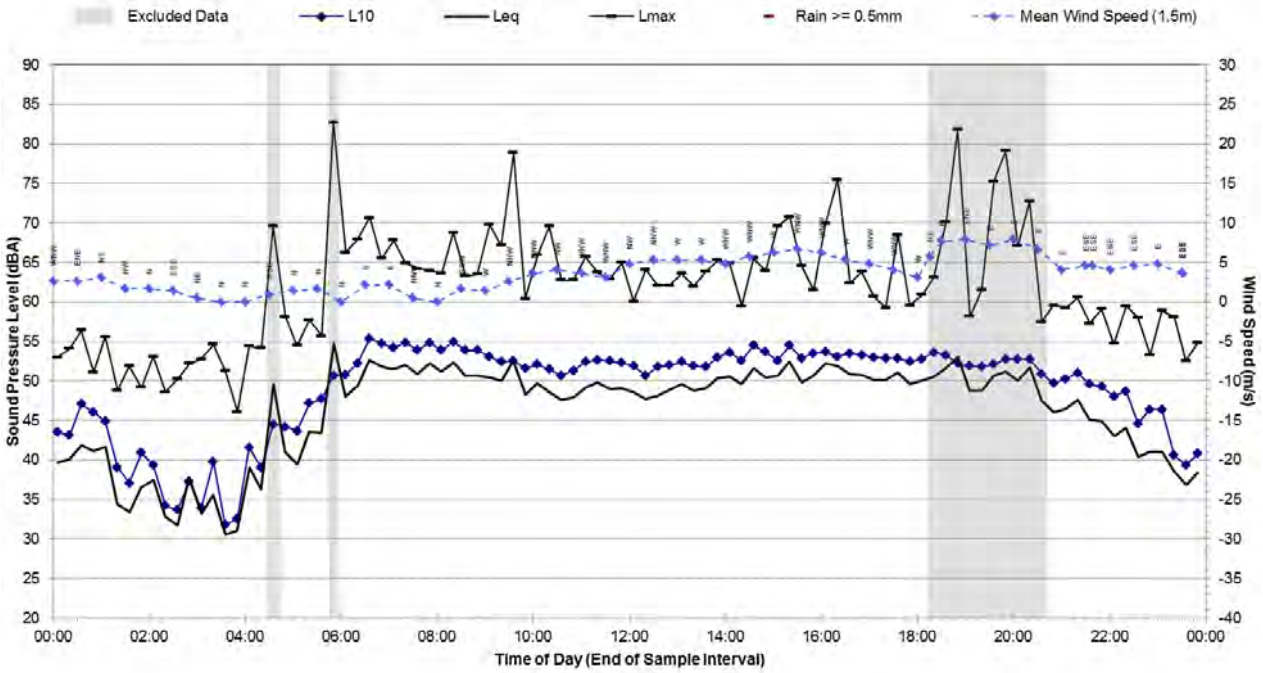
Statistical Ambient Noise Levels

L05 - 4 Bluebell Glen, Jerrabomberra - Monday, 18 February 2019



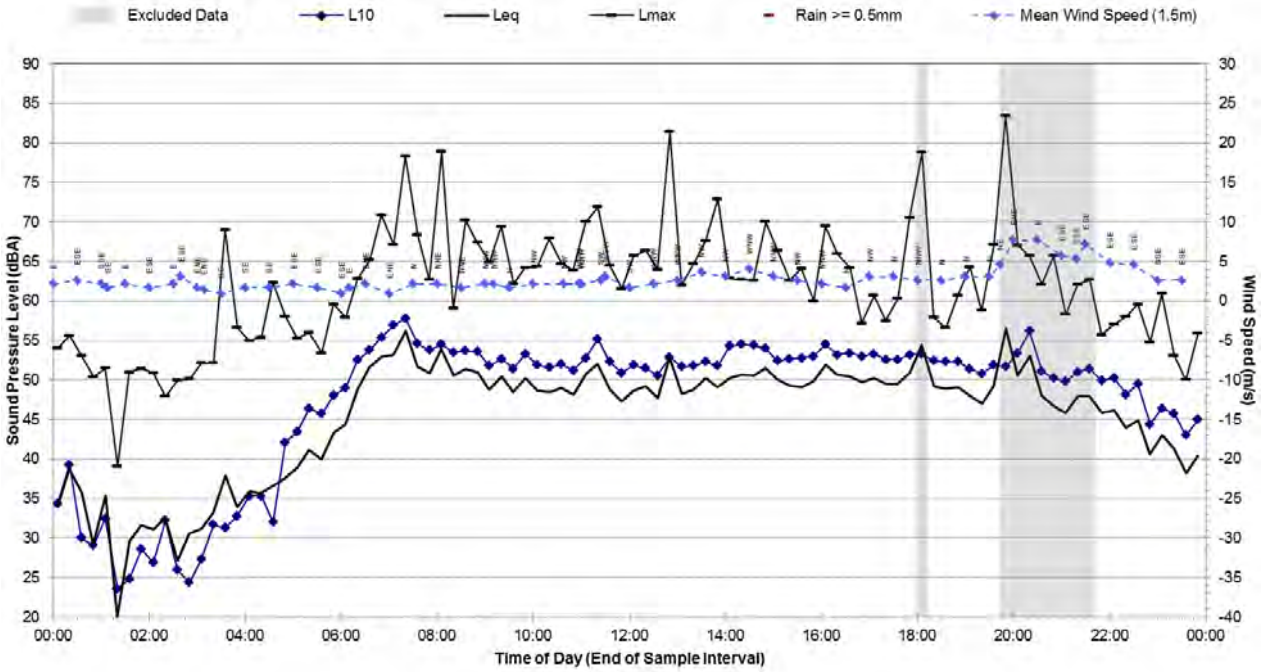
Statistical Ambient Noise Levels

L05 - 4 Bluebell Glen, Jerrabomberra - Tuesday, 19 February 2019



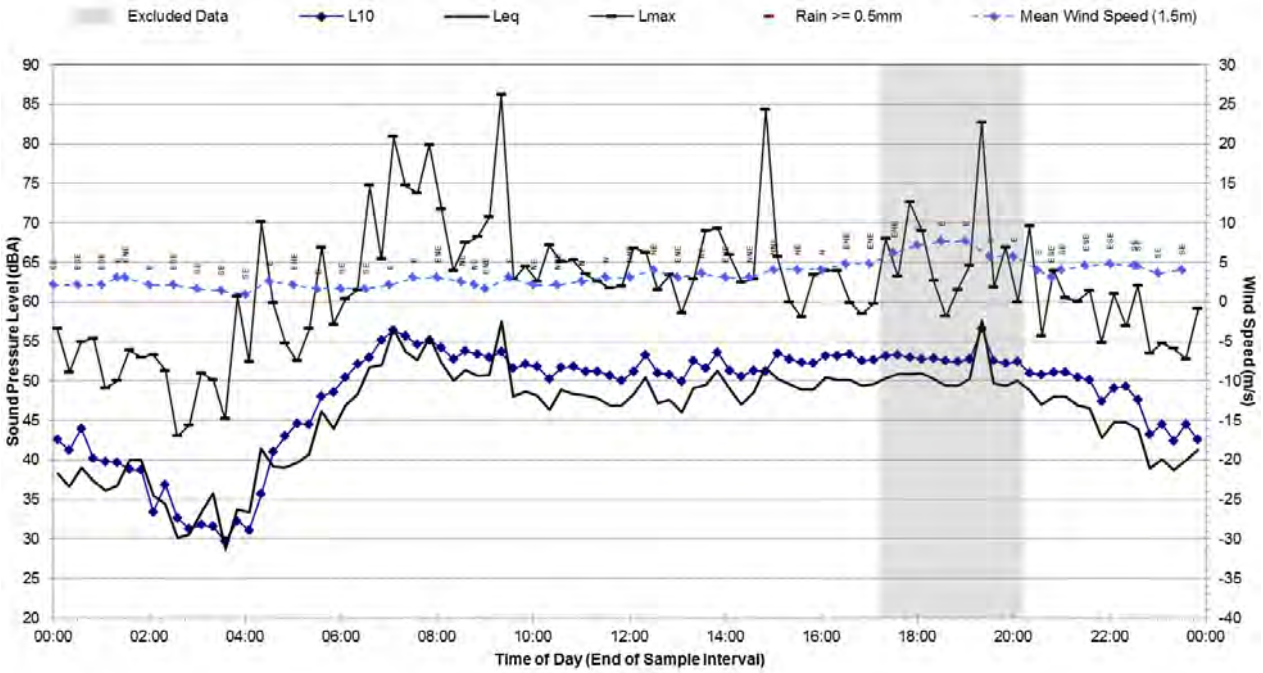
Statistical Ambient Noise Levels

L05 - 4 Bluebell Glen, Jerrabomberra - Wednesday, 20 February 2019



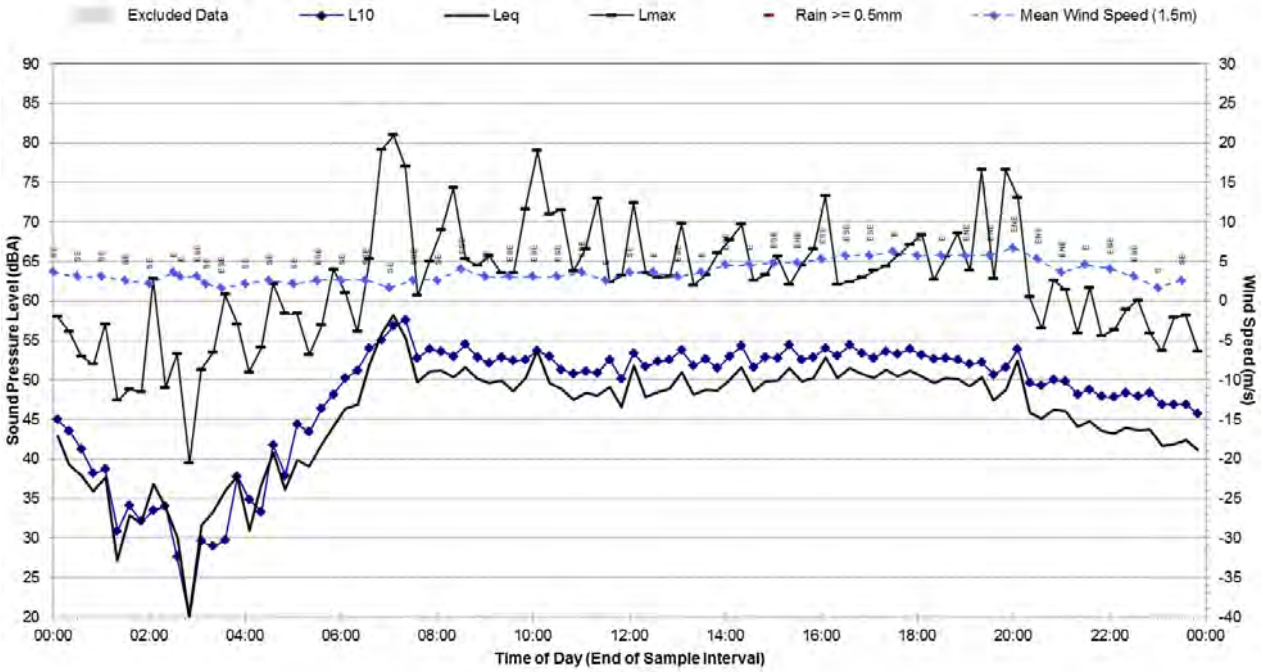
Statistical Ambient Noise Levels

L05 - 4 Bluebell Glen, Jerrabomberra - Thursday, 21 February 2019



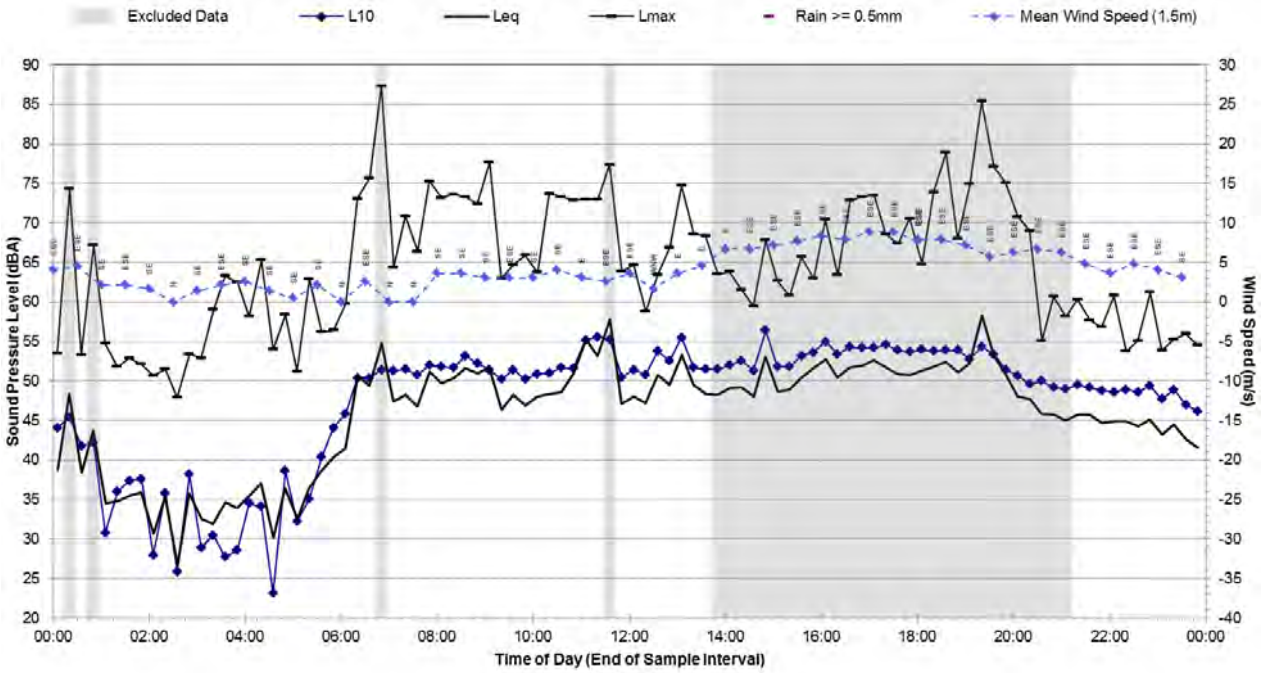
Statistical Ambient Noise Levels

L05 - 4 Bluebell Glen, Jerrabomberra - Friday, 22 February 2019



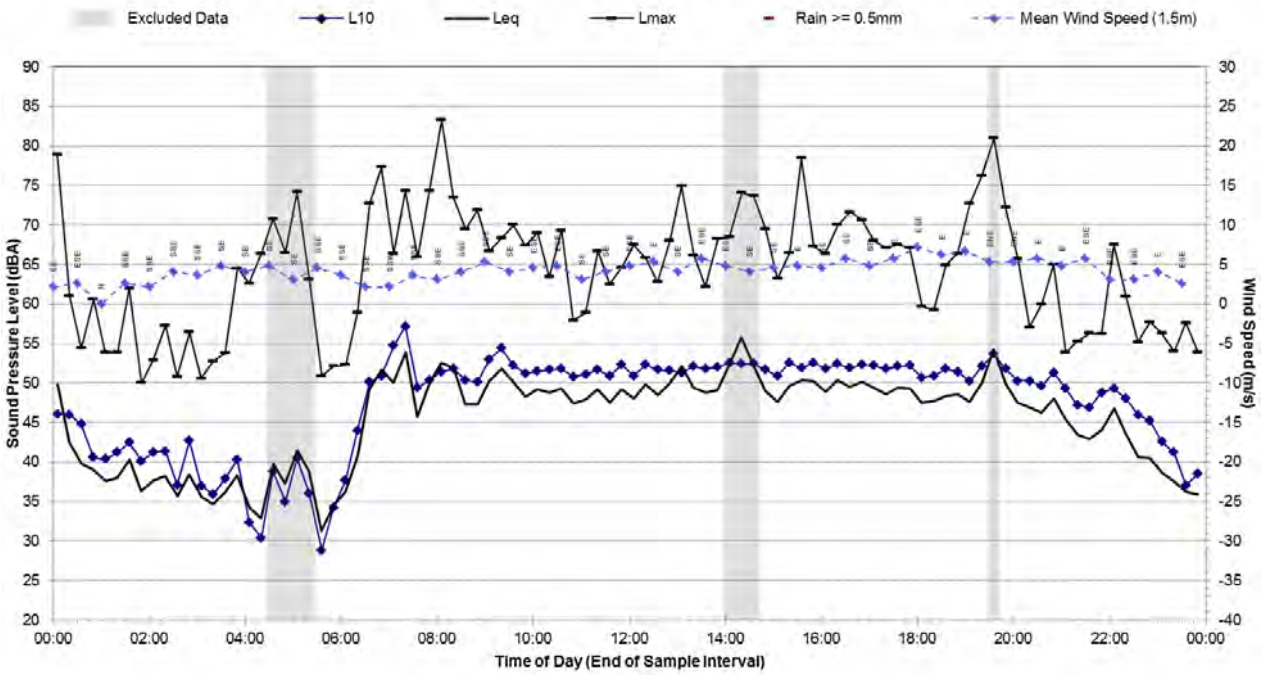
Statistical Ambient Noise Levels

L05 - 4 Bluebell Glen, Jerrabomberra - Saturday, 23 February 2019



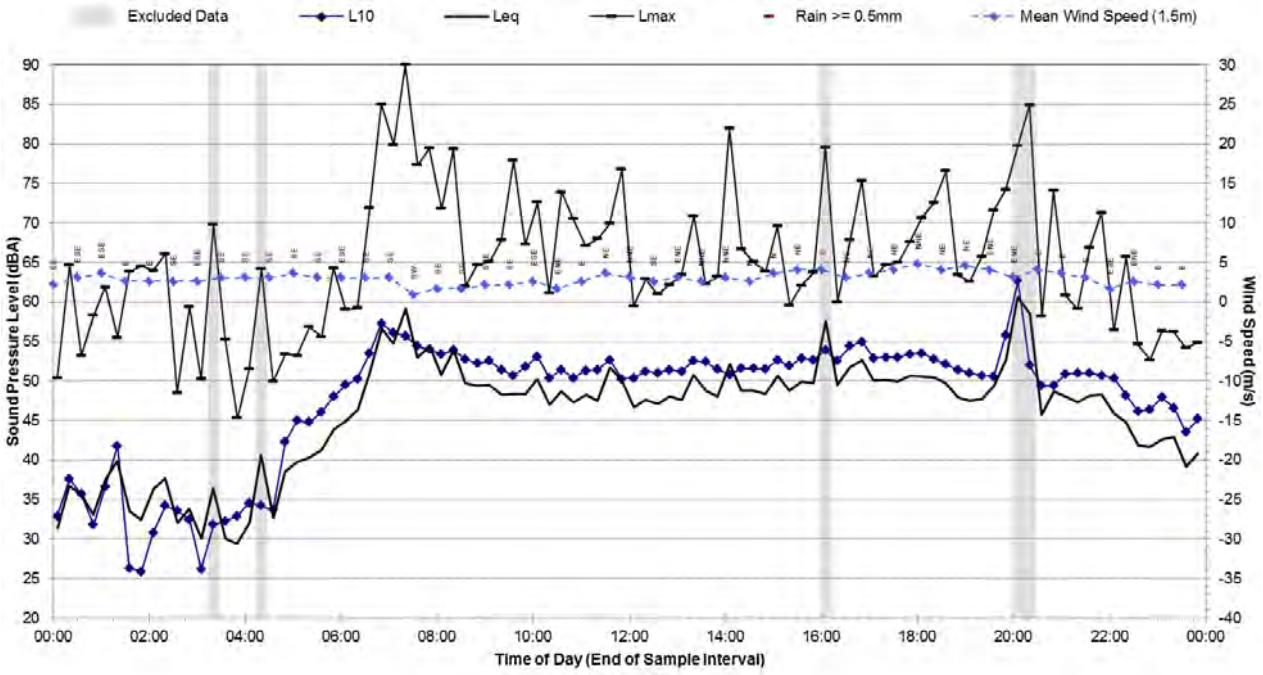
Statistical Ambient Noise Levels

L05 - 4 Bluebell Glen, Jerrabomberra - Sunday, 24 February 2019



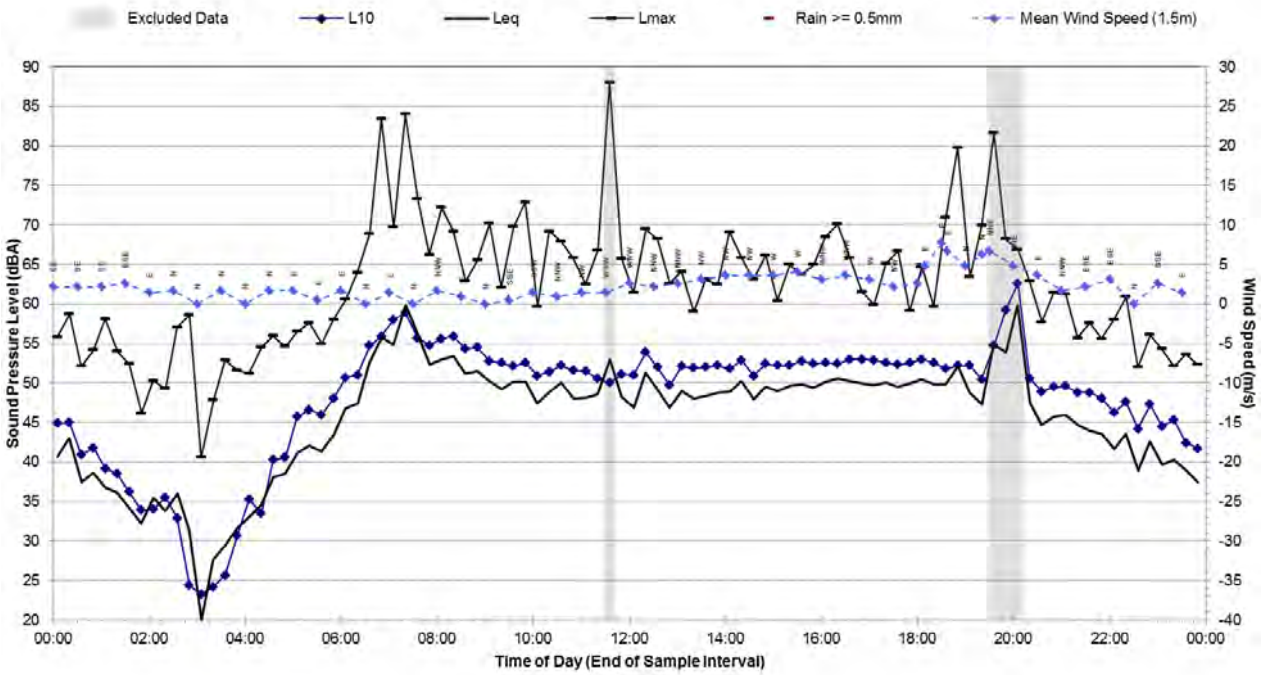
Statistical Ambient Noise Levels

L05 - 4 Bluebell Glen, Jerrabomberra - Monday, 25 February 2019



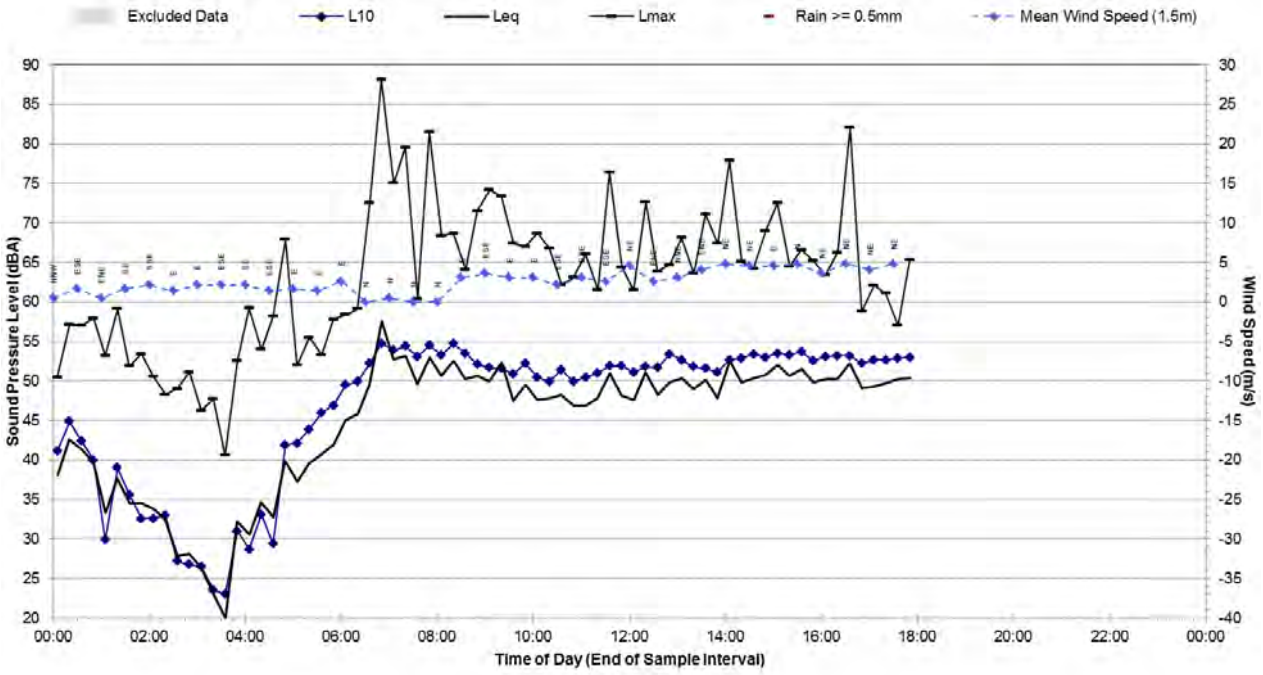
Statistical Ambient Noise Levels

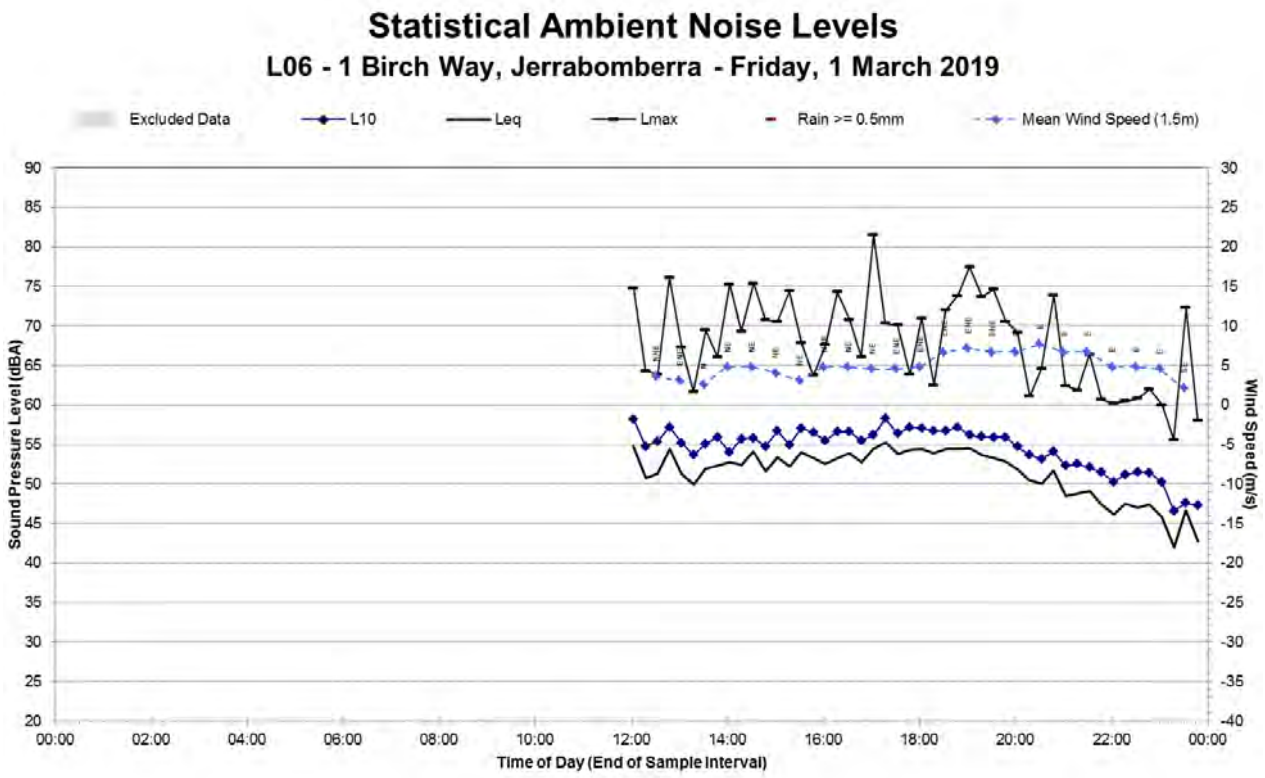
L05 - 4 Bluebell Glen, Jerrabomberra - Tuesday, 26 February 2019

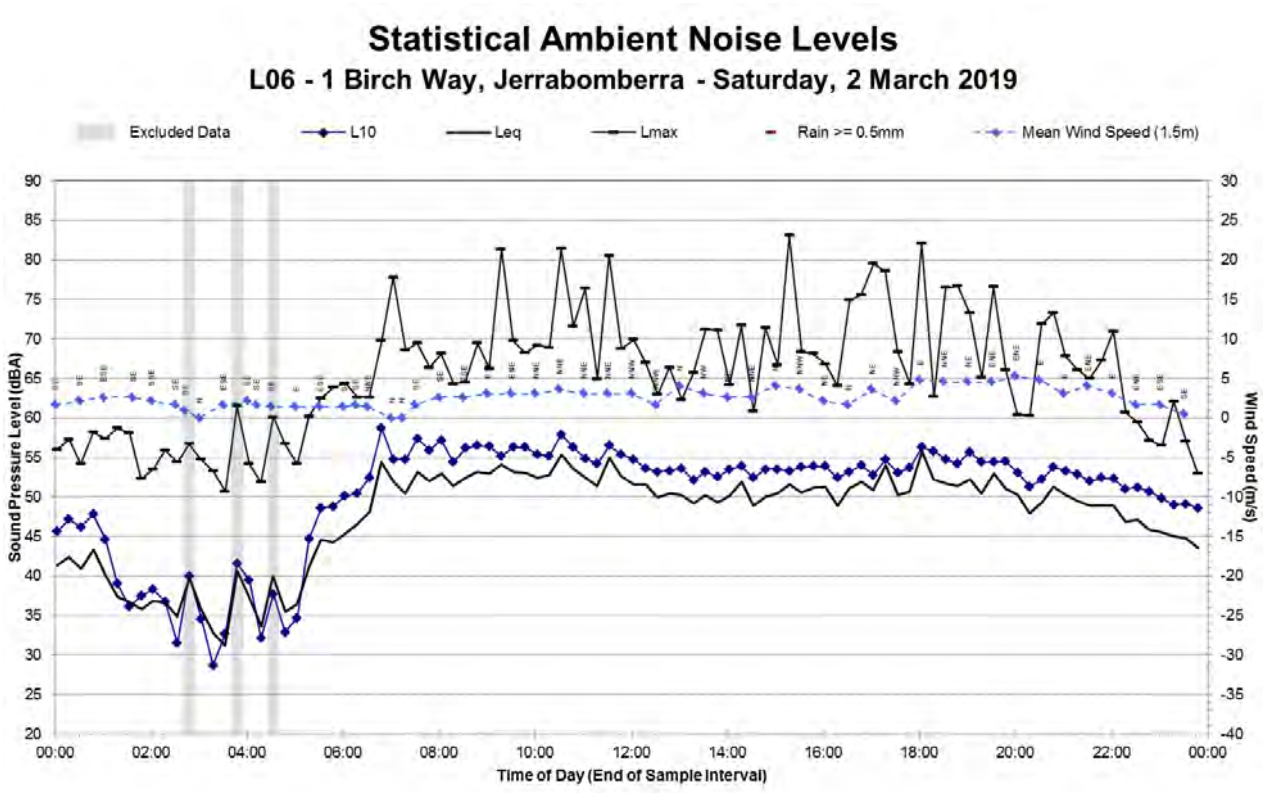


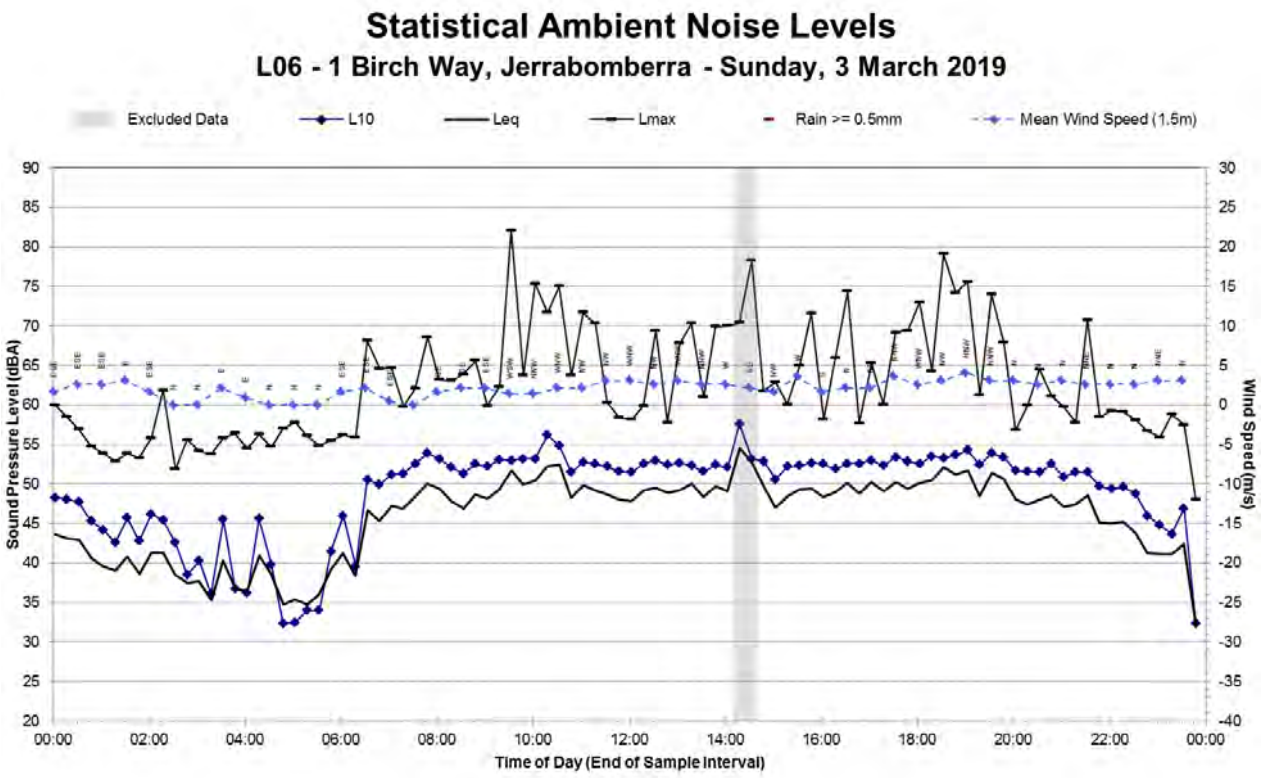
Statistical Ambient Noise Levels

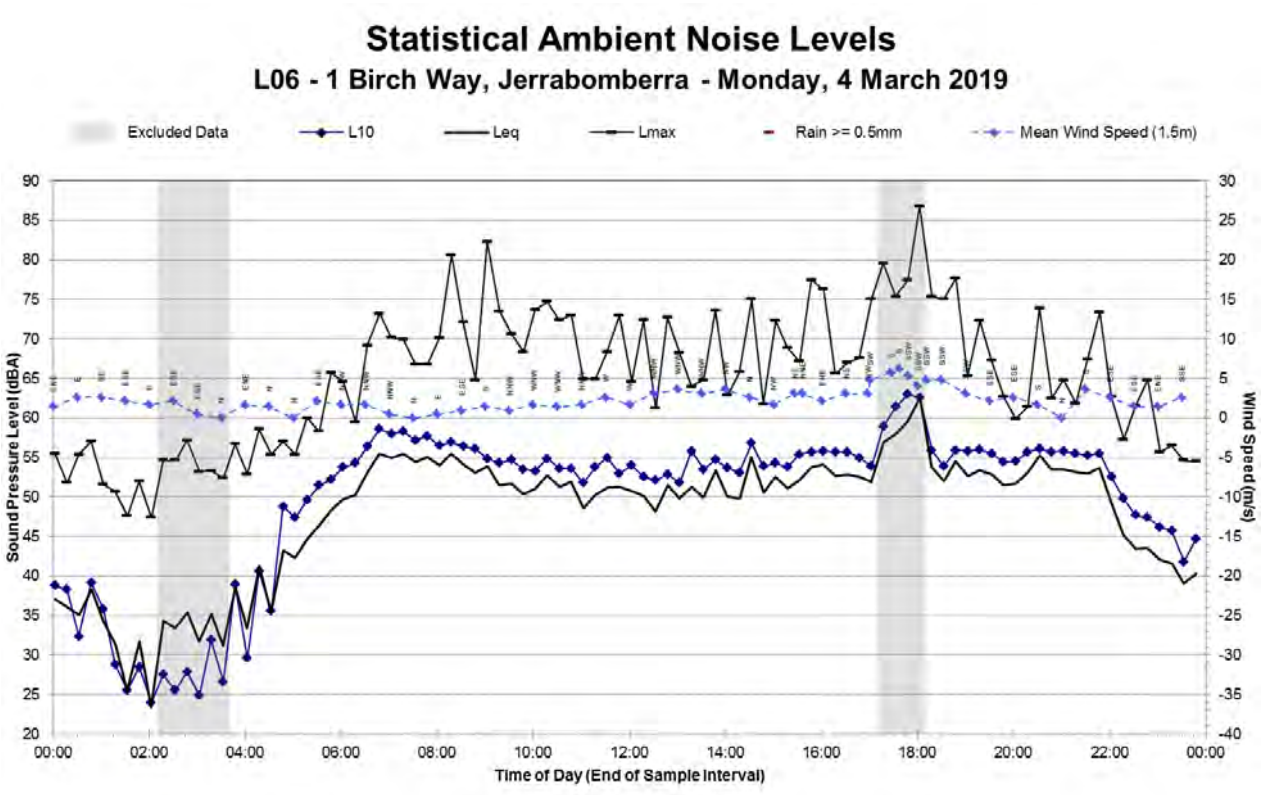
L05 - 4 Bluebell Glen, Jerrabomberra - Wednesday, 27 February 2019

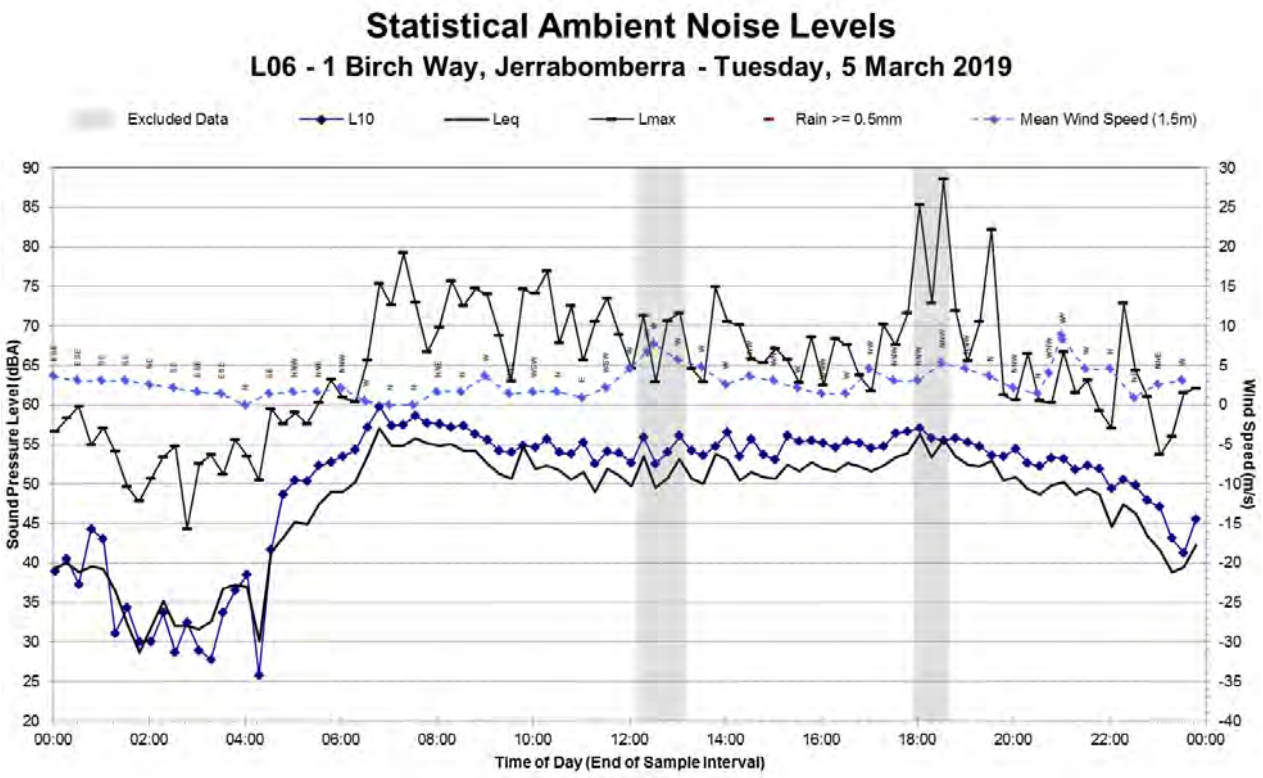


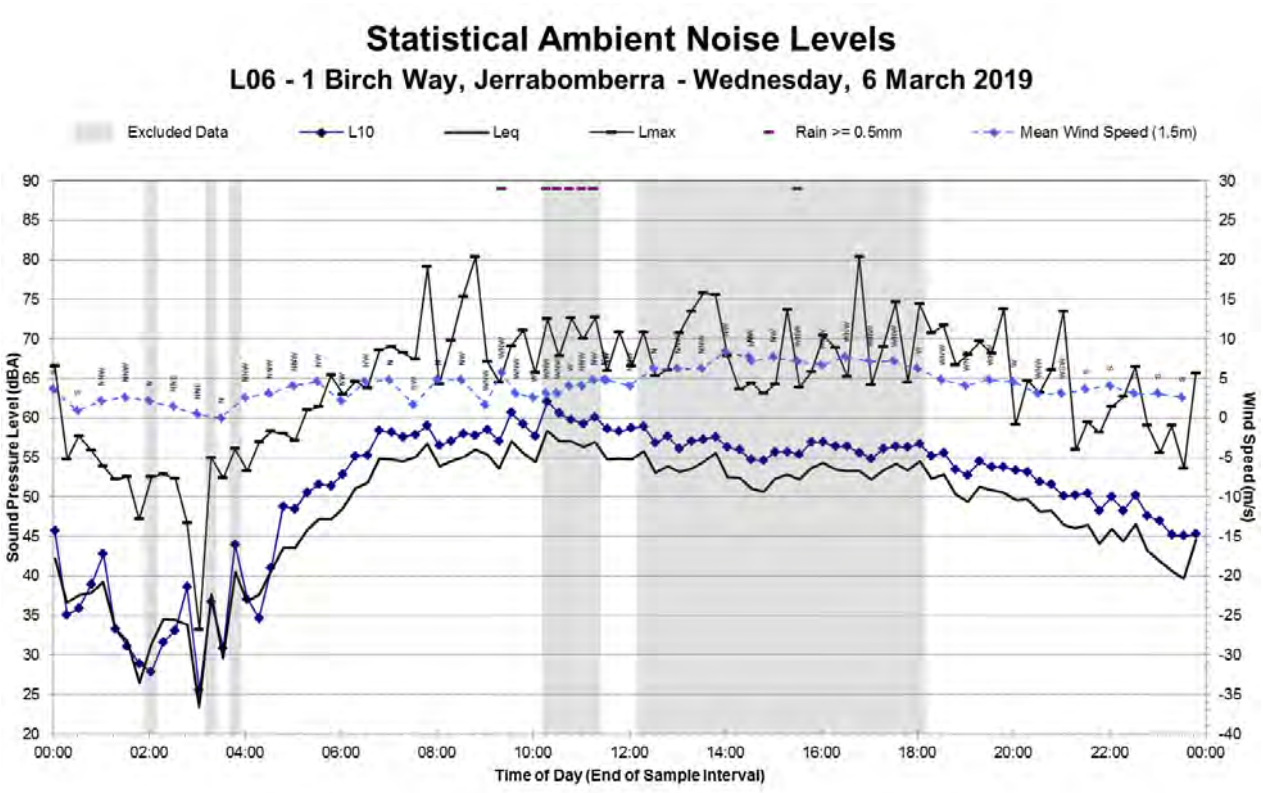

Statistical Ambient Noise Levels
L06 - 1 Birch Way, Jerrabomberra - Friday, 1 March 2019
Excluded Data
L10
Leq
Lmax
Rain >= 0.5mm
Mean Wind Speed (1.5m)
Sound Pressure Level (dBA)
Wind Speed (m/s)
Time of Day (End of Sample Interval)


Statistical Ambient Noise Levels
L06 - 1 Birch Way, Jerrabomberra - Saturday, 2 March 2019
Excluded Data
L10
Leq
Lmax
Rain >= 0.5mm
Mean Wind Speed (1.5m)
Sound Pressure Level (dBA)
Wind Speed (m/s)
Time of Day (End of Sample Interval)


Statistical Ambient Noise Levels
L06 - 1 Birch Way, Jerrabomberra - Sunday, 3 March 2019
Excluded Data
L10
Leq
Lmax
Rain >= 0.5mm
Mean Wind Speed (1.5m)
Sound Pressure Level (dBA)
Wind Speed (m/s)
Time of Day (End of Sample Interval)

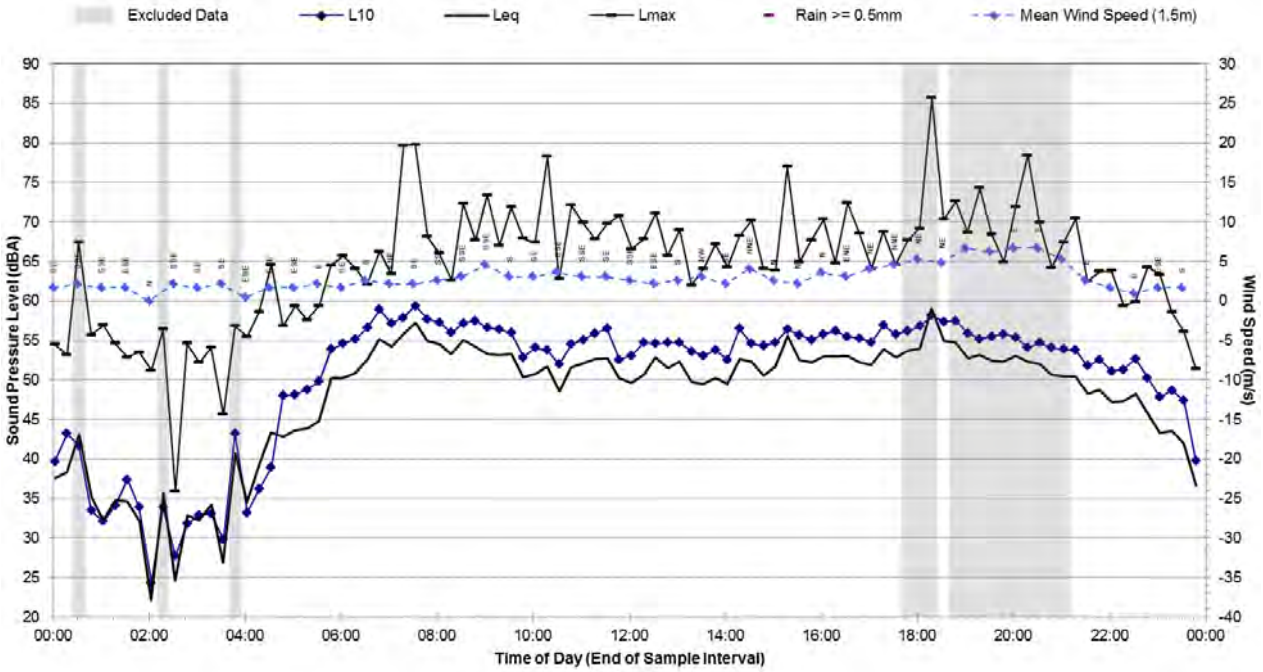

Statistical Ambient Noise Levels
L06 - 1 Birch Way, Jerrabomberra - Monday, 4 March 2019
Excluded Data
L10
Leq
Lmax
Rain >= 0.5mm
Mean Wind Speed (1.5m)
Sound Pressure Level (dBA)
Wind Speed (m/s)
Time of Day (End of Sample Interval)


Statistical Ambient Noise Levels
L06 - 1 Birch Way, Jerrabomberra - Tuesday, 5 March 2019
Excluded Data
L10
Leq
Lmax
Rain >= 0.5mm
Mean Wind Speed (1.5m)
Sound Pressure Level (dBA)
Wind Speed (m/s)
Time of Day (End of Sample Interval)


Statistical Ambient Noise Levels
L06 - 1 Birch Way, Jerrabomberra - Wednesday, 6 March 2019
Excluded Data
L10
Leq
Lmax
Rain >= 0.5mm
Mean Wind Speed (1.5m)
Sound Pressure Level (dBA)
Wind Speed (m/s)
Time of Day (End of Sample Interval)

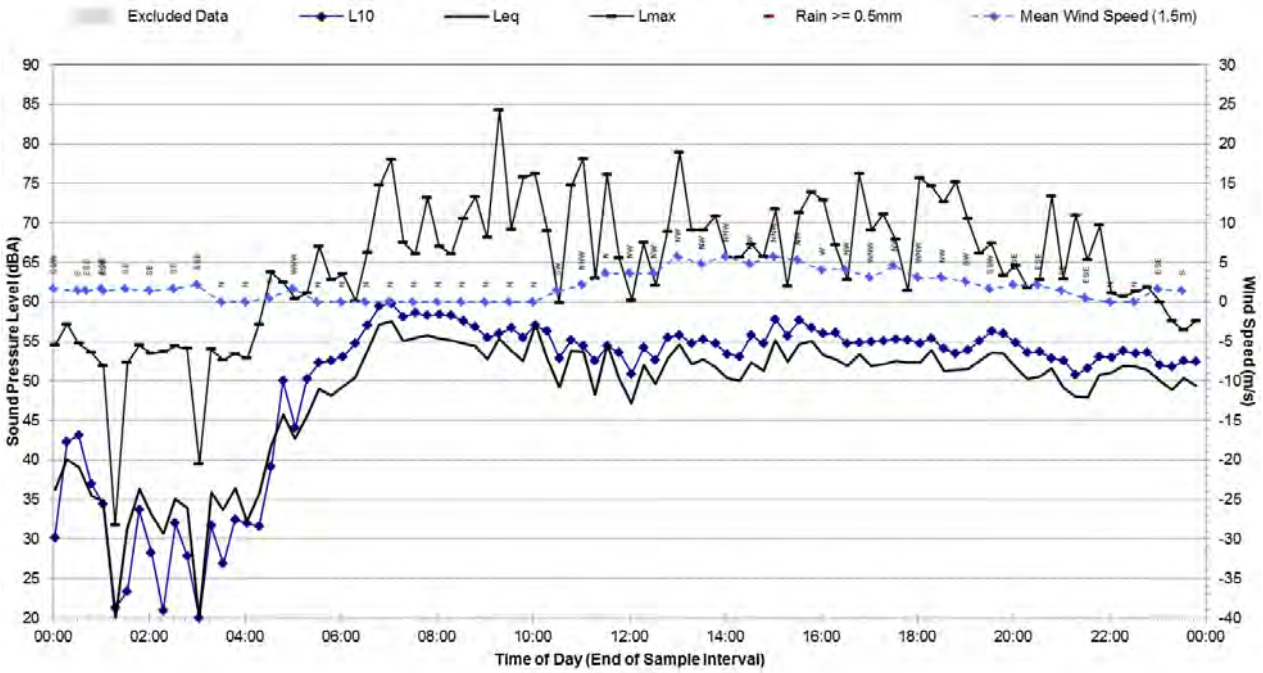
Statistical Ambient Noise Levels

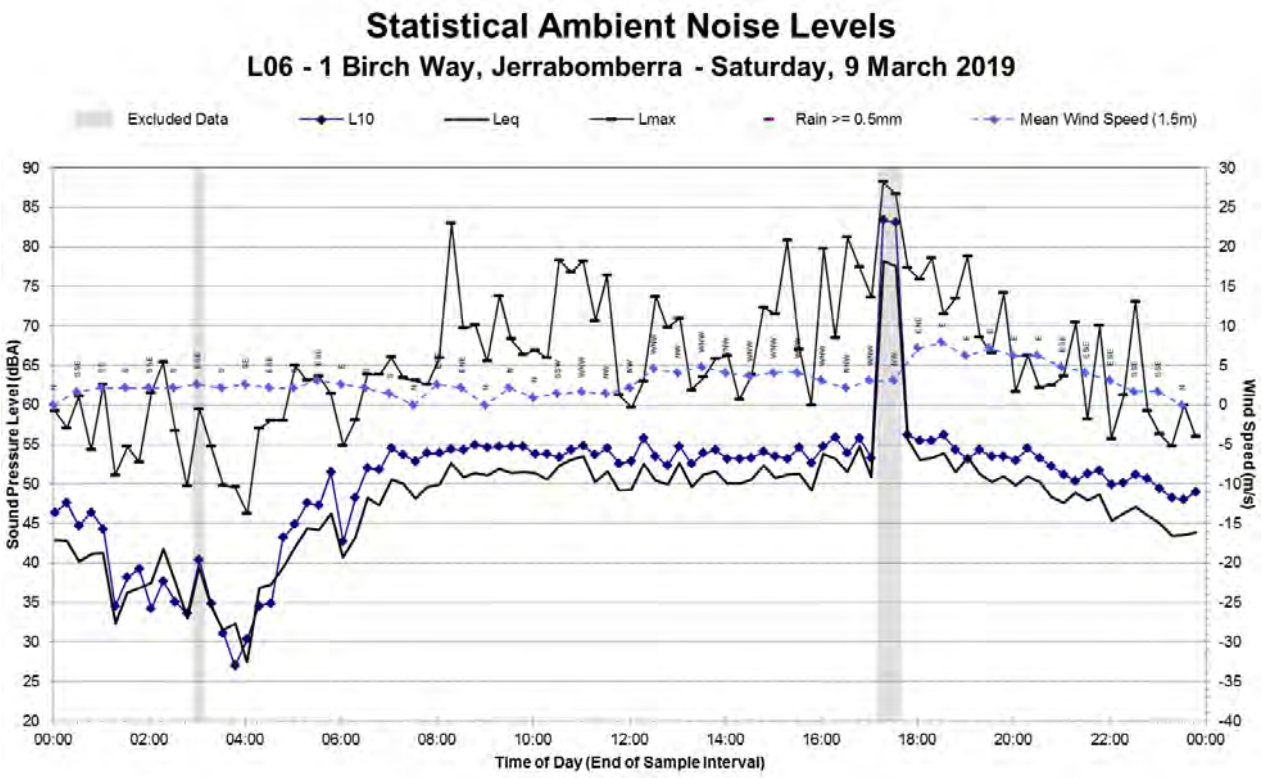
L06 - 1 Birch Way, Jerrabomberra - Thursday, 7 March 2019

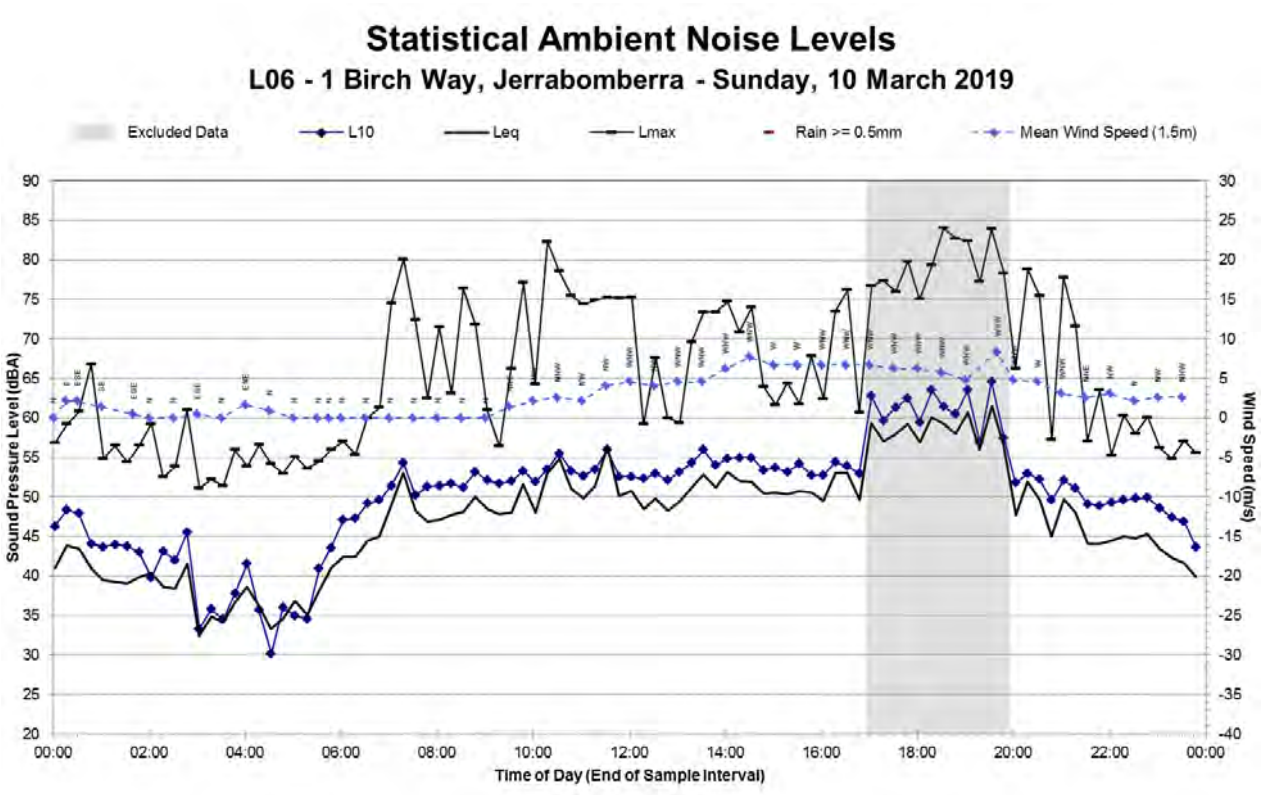


Statistical Ambient Noise Levels

L06 - 1 Birch Way, Jerrabomberra - Friday, 8 March 2019

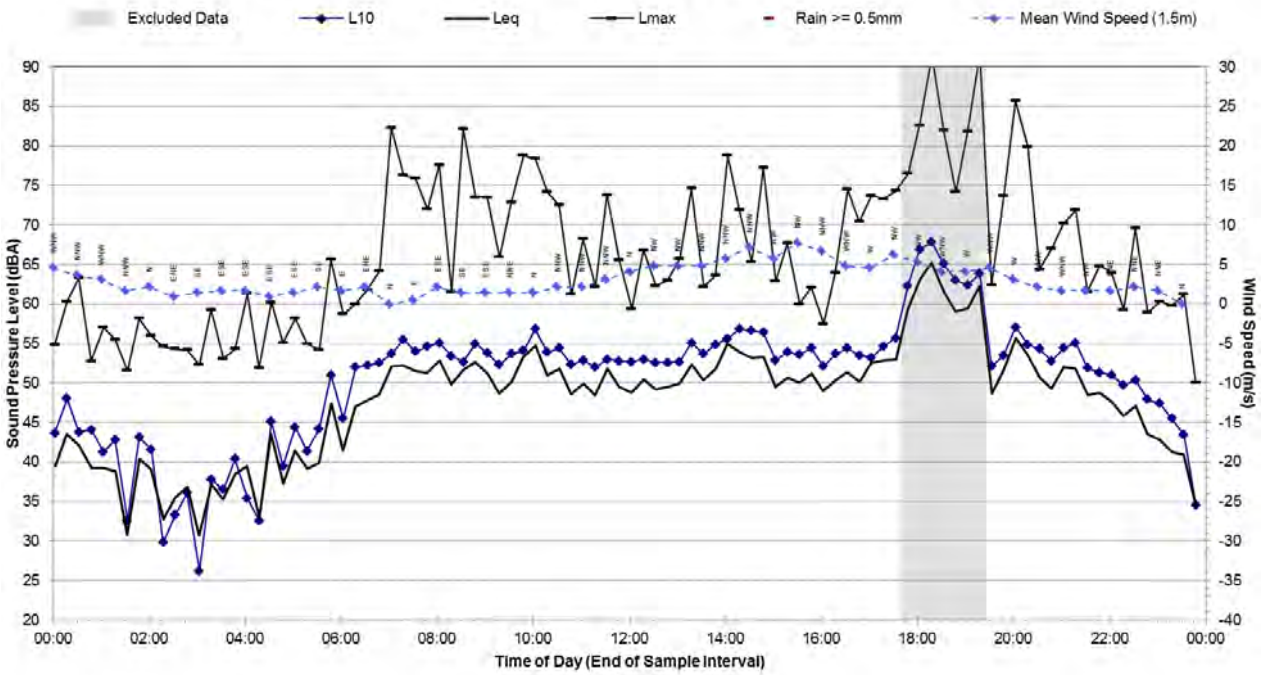



Statistical Ambient Noise Levels
L06 - 1 Birch Way, Jerrabomberra - Saturday, 9 March 2019
Excluded Data
L10
Leq
Lmax
Rain >= 0.5mm
Mean Wind Speed (1.5m)
Sound Pressure Level (dBA)
Wind Speed (m/s)
Time of Day (End of Sample Interval)


Statistical Ambient Noise Levels
L06 - 1 Birch Way, Jerrabomberra - Sunday, 10 March 2019
Excluded Data
L10
Leq
Lmax
Rain >= 0.5mm
Mean Wind Speed (1.5m)
Sound Pressure Level (dBA)
Wind Speed (m/s)
Time of Day (End of Sample Interval)

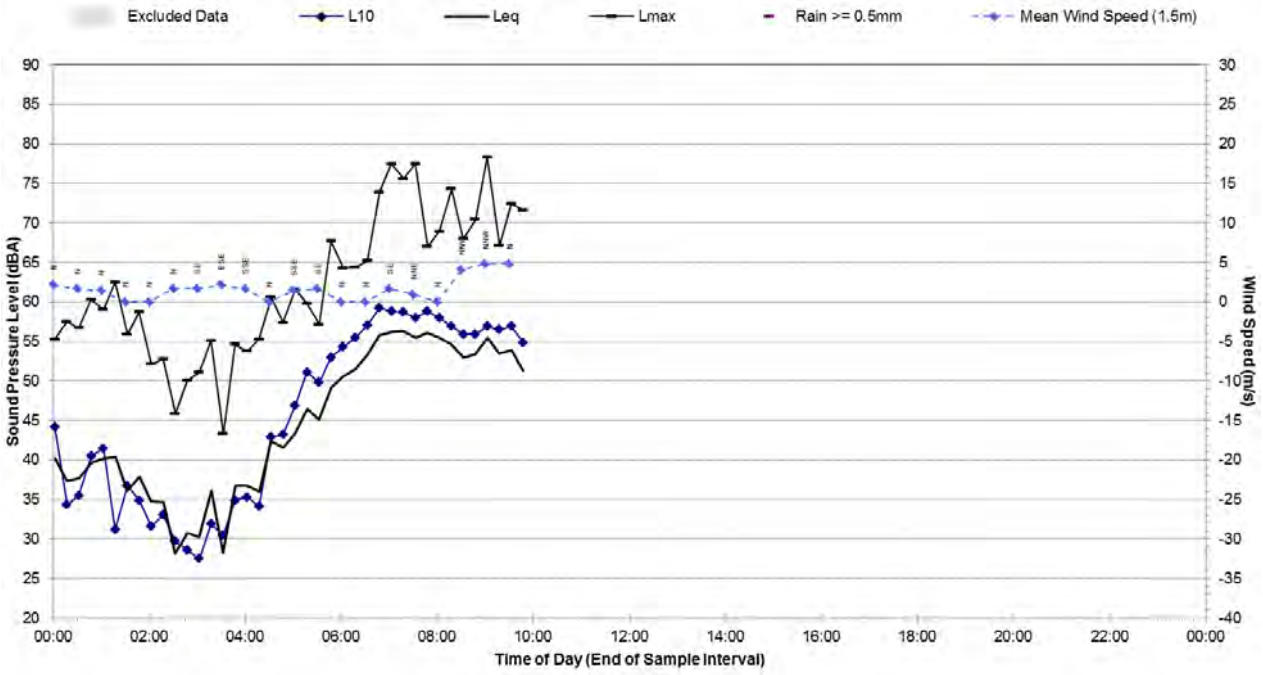
Statistical Ambient Noise Levels

L06 - 1 Birch Way, Jerrabomberra - Monday, 11 March 2019



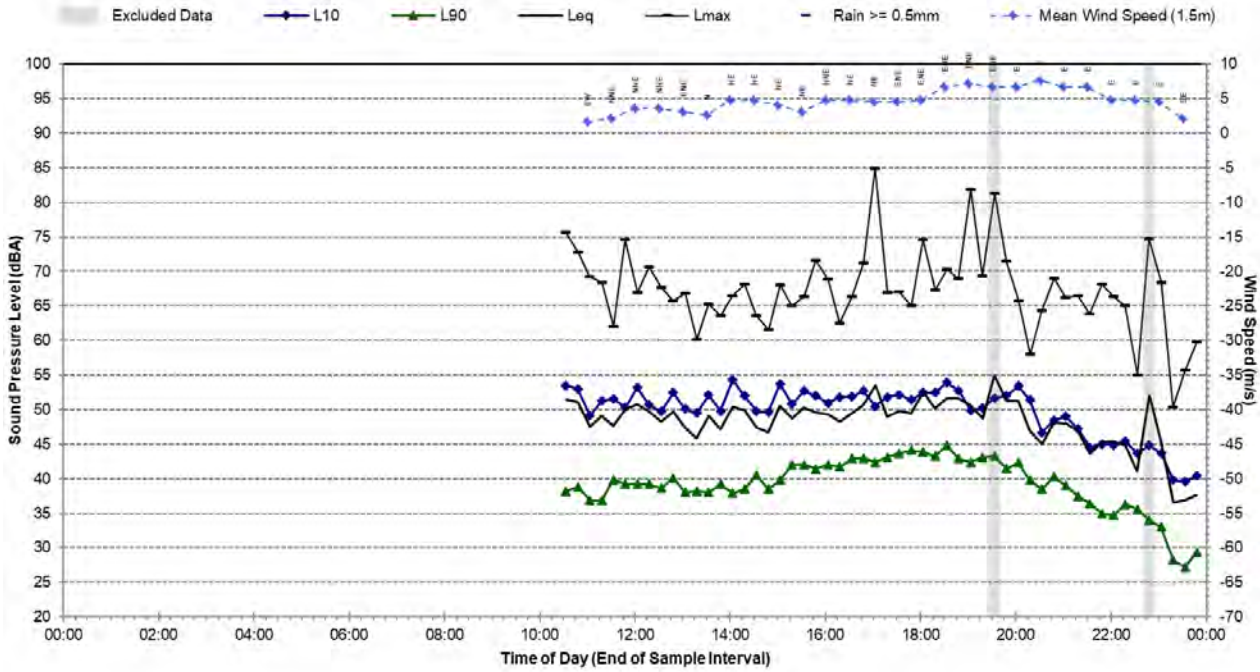
Statistical Ambient Noise Levels

L06 - 1 Birch Way, Jerrabomberra - Tuesday, 12 March 2019



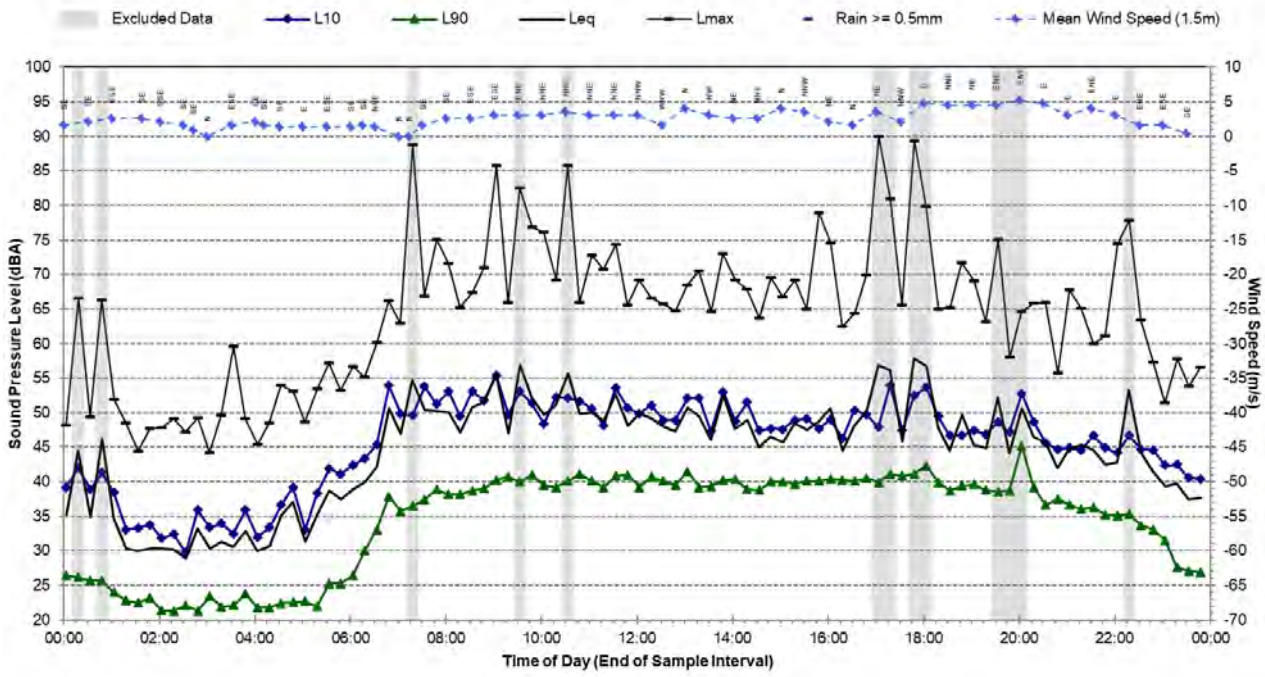
Statistical Ambient Noise Levels

L07 72 Rosewood Glen - Friday, 1 March 2019



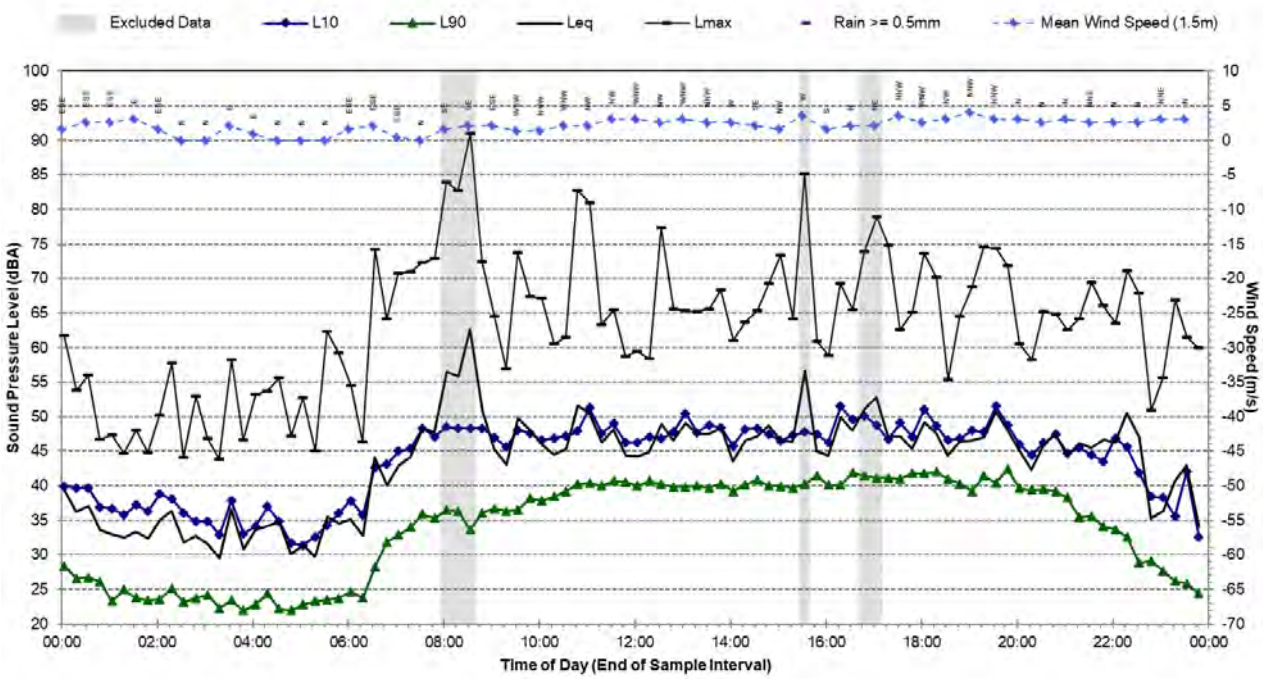
Statistical Ambient Noise Levels

L07 72 Rosewood Glen - Saturday, 2 March 2019



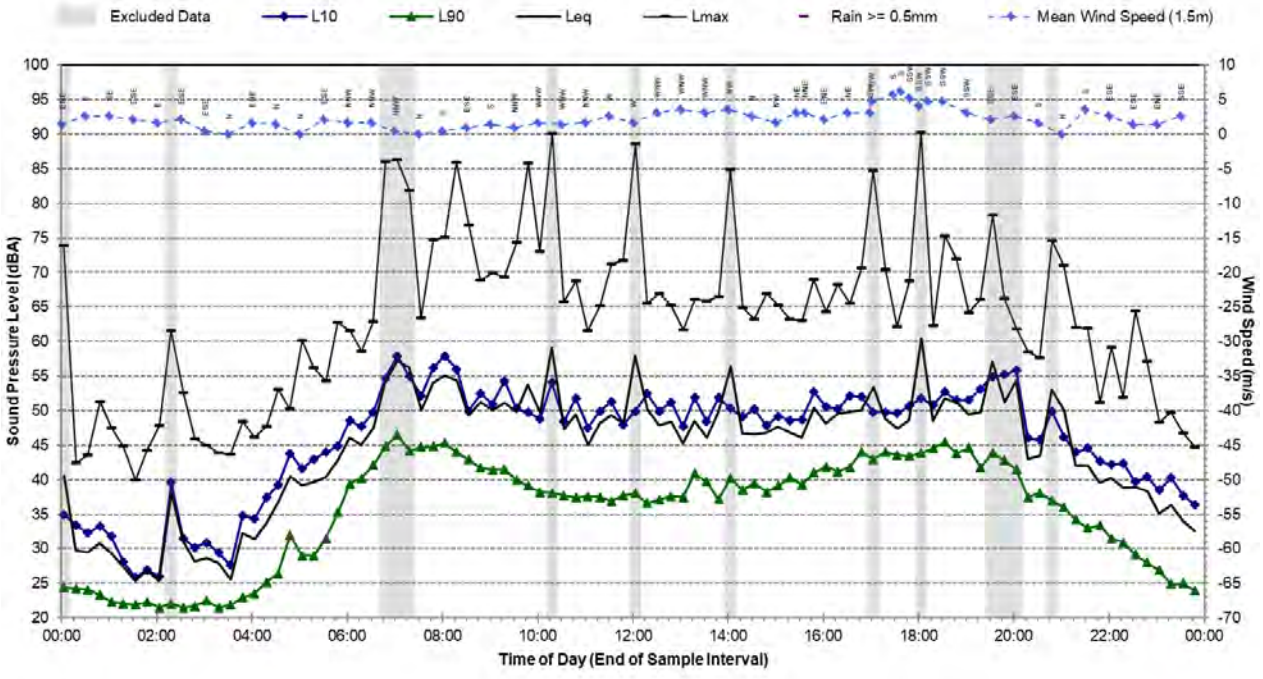
Statistical Ambient Noise Levels

L07 72 Rosewood Glen - Sunday, 3 March 2019



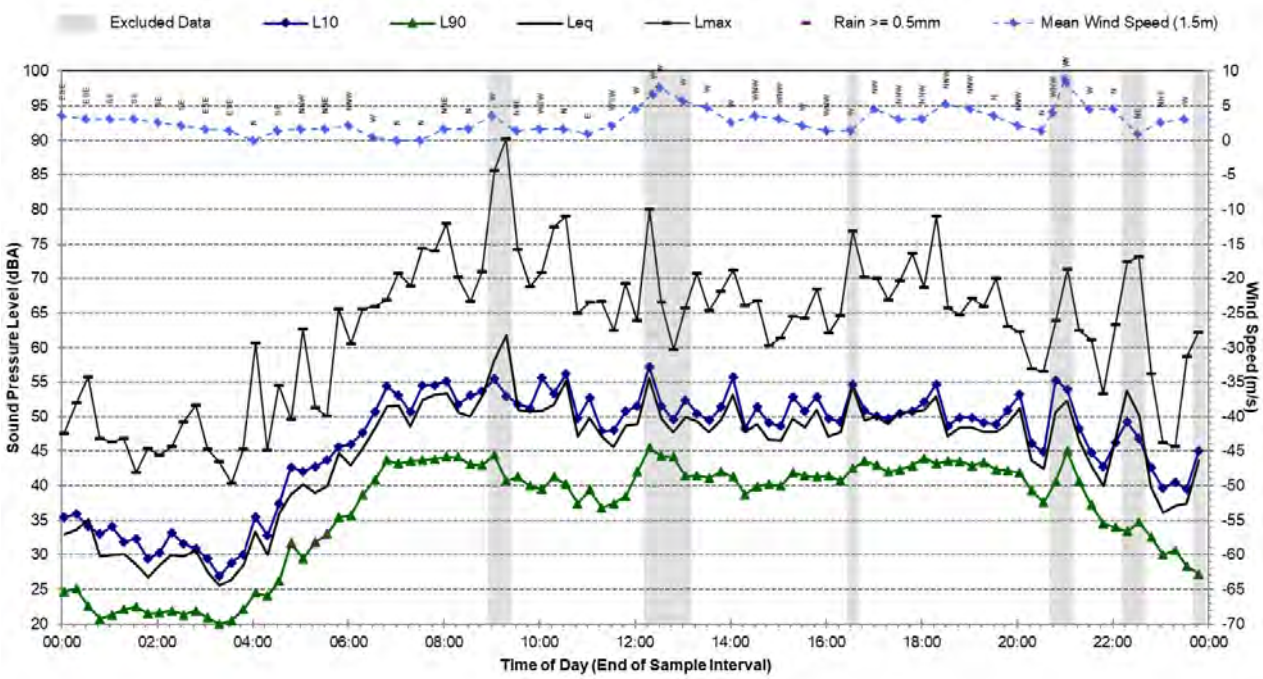
Statistical Ambient Noise Levels

L07 72 Rosewood Glen - Monday, 4 March 2019



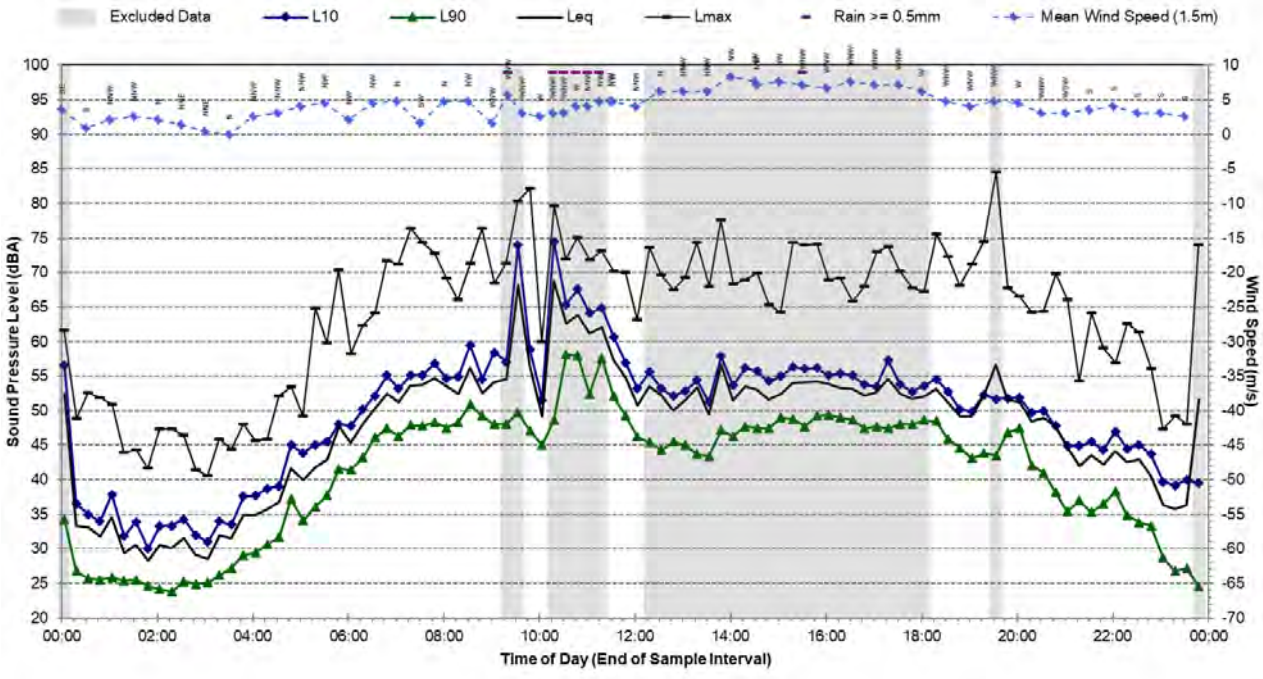
Statistical Ambient Noise Levels

L07 72 Rosewood Glen - Tuesday, 5 March 2019



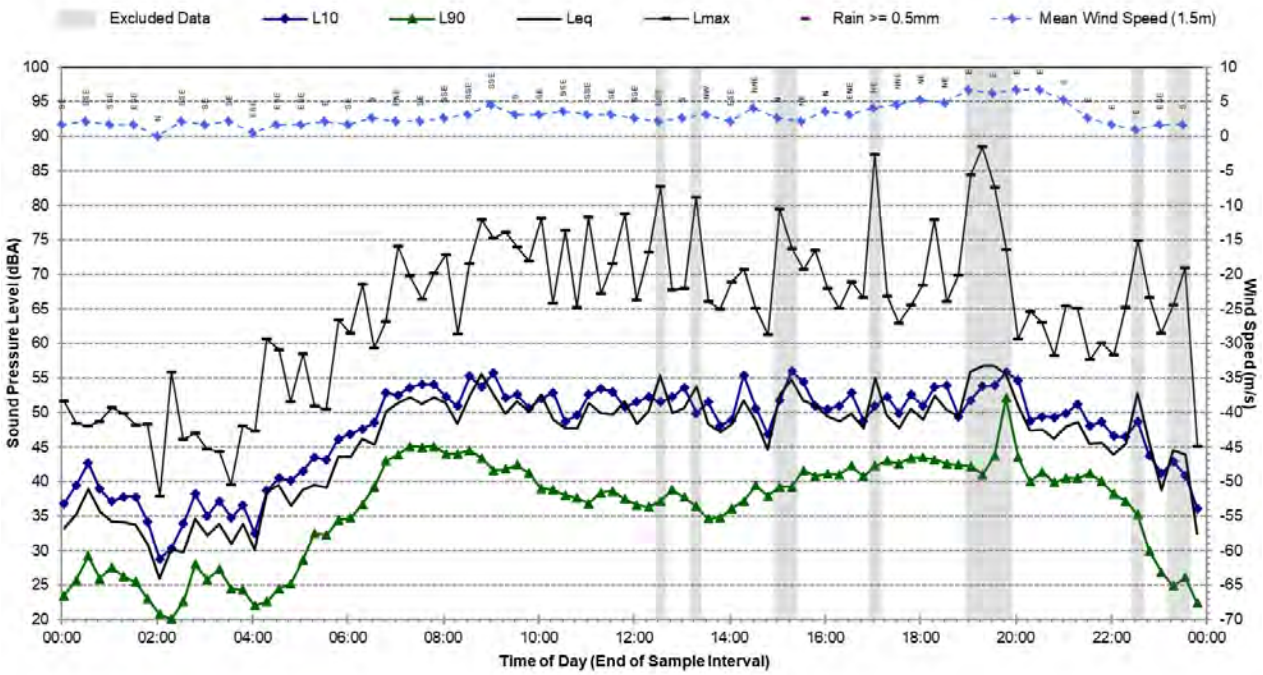
Statistical Ambient Noise Levels

L07 72 Rosewood Glen - Wednesday, 6 March 2019



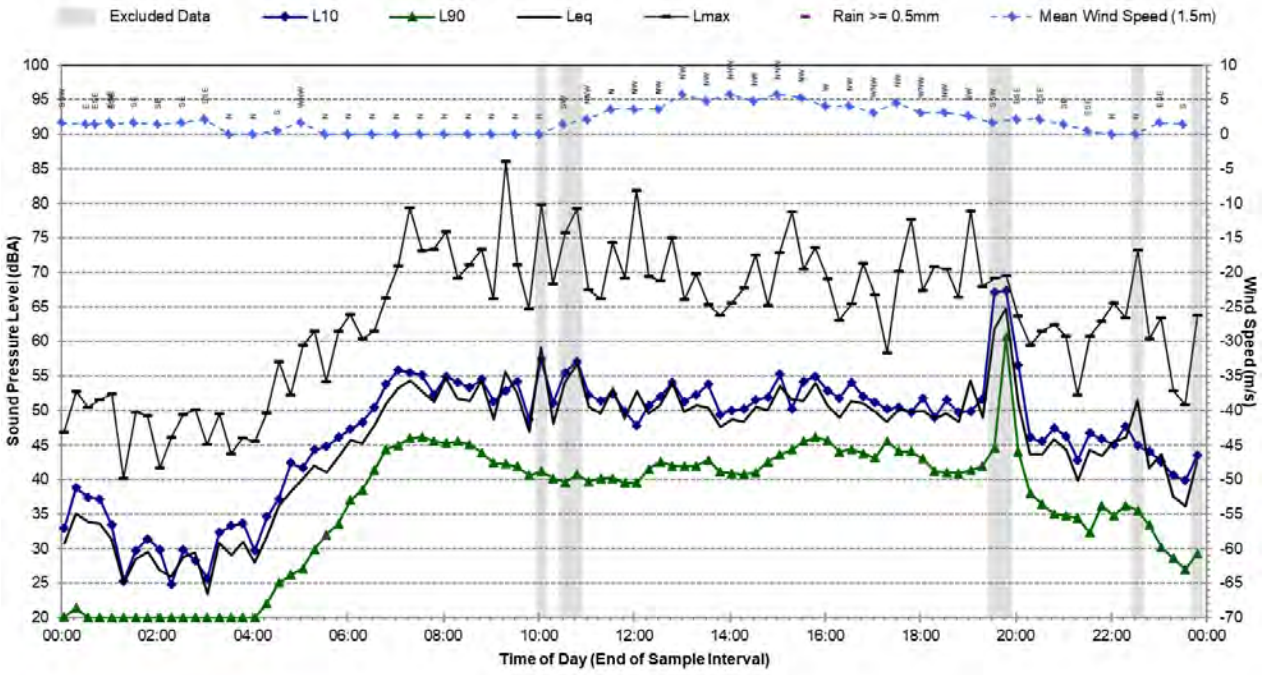
Statistical Ambient Noise Levels

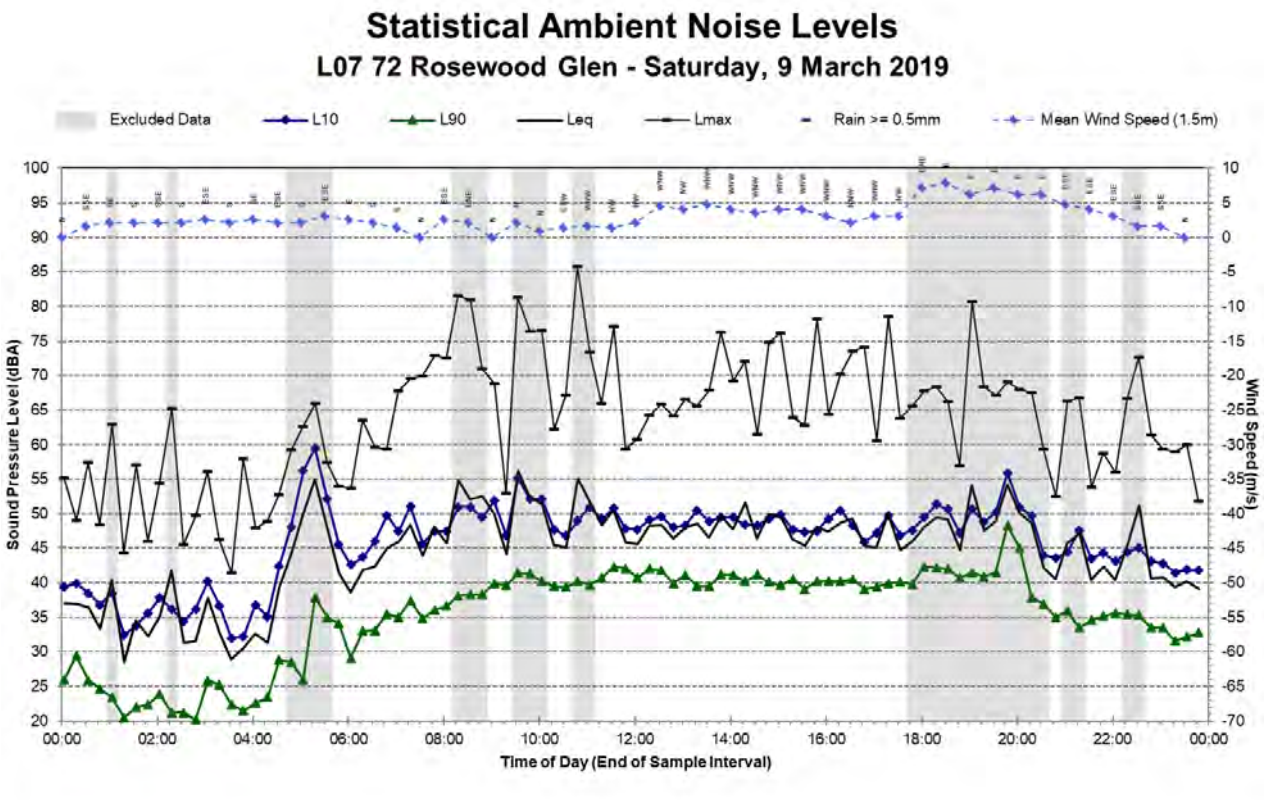
L07 72 Rosewood Glen - Thursday, 7 March 2019

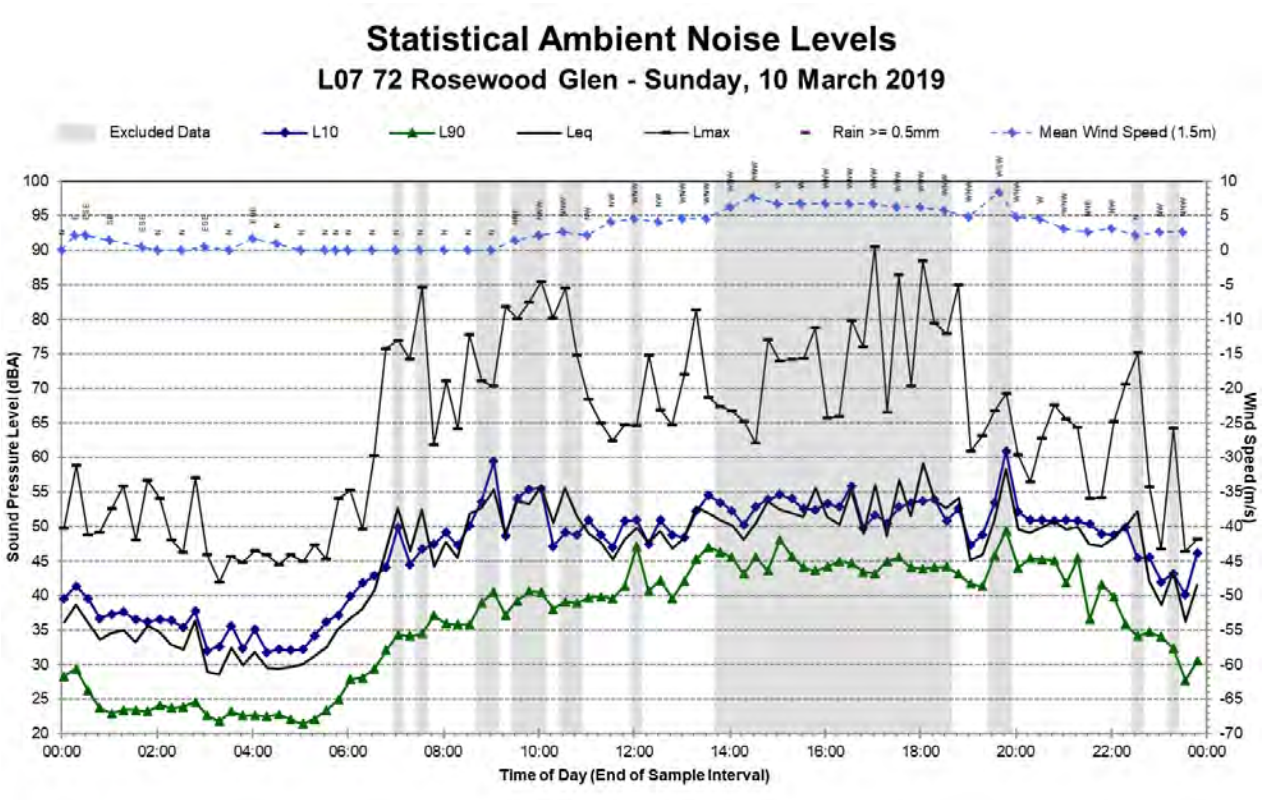


Statistical Ambient Noise Levels

L07 72 Rosewood Glen - Friday, 8 March 2019

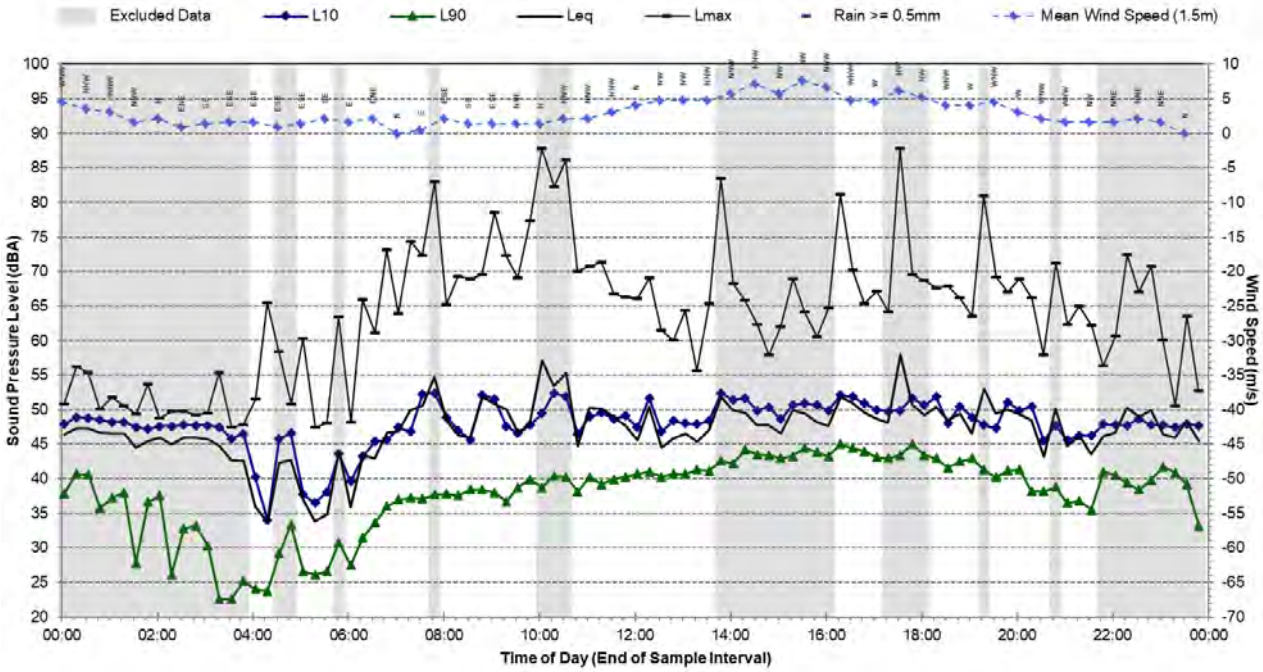



Statistical Ambient Noise Levels
L07 72 Rosewood Glen - Saturday, 9 March 2019
Excluded Data
L10
L90
Leq
Lmax
Rain >= 0.5mm
Mean Wind Speed (1.5m)
Sound Pressure Level (dBA)
Wind Speed (m/s)
Time of Day (End of Sample Interval)


Statistical Ambient Noise Levels
L07 72 Rosewood Glen - Sunday, 10 March 2019
Excluded Data
L10
L90
Leq
Lmax
Rain >= 0.5mm
Mean Wind Speed (1.5m)
Sound Pressure Level (dBA)
Wind Speed (m/s)
Time of Day (End of Sample Interval)

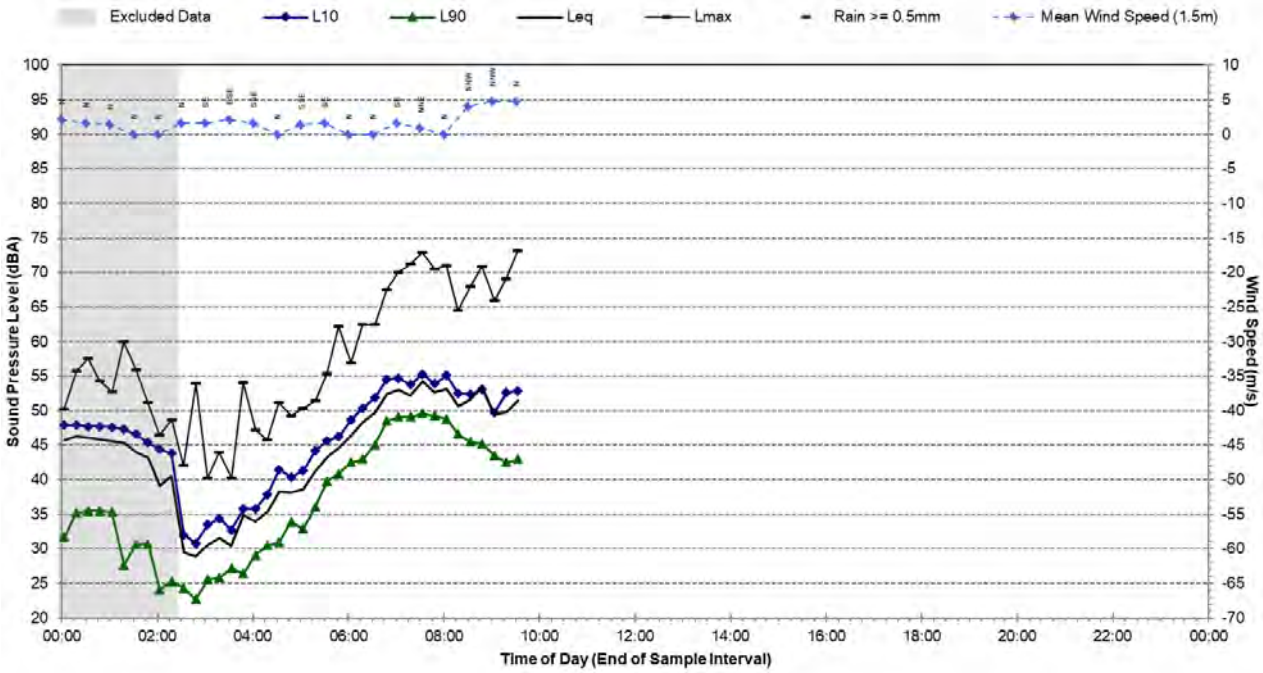
Statistical Ambient Noise Levels

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

Tompsitt Drive to Stringybark Drive

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

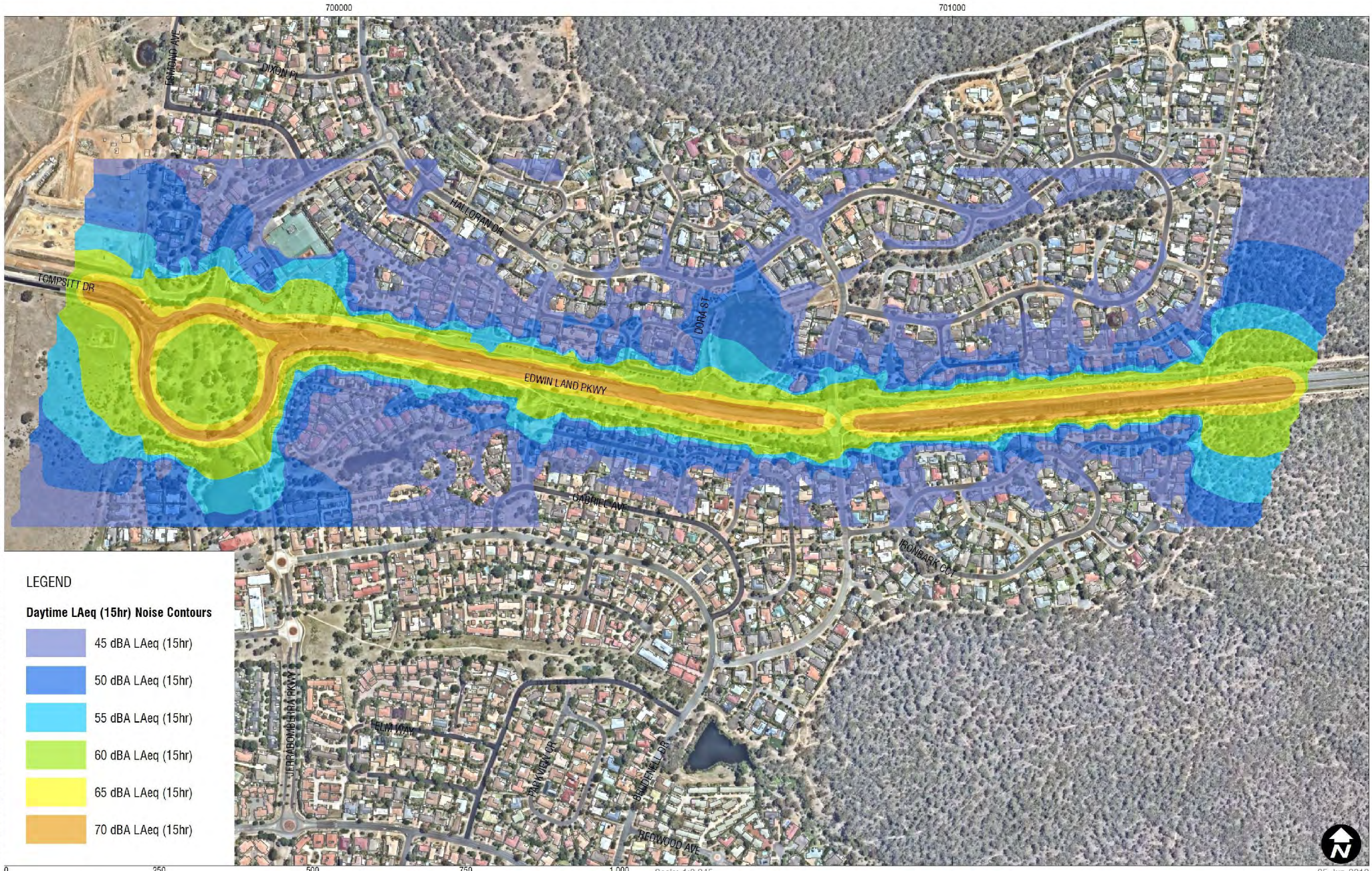
East of Stringybark Drive

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		

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



Data Sources: (C) Nearmap 2019, Department of Finance, Services and Innovation, NSW 2017
Sheet Size : A4

SLR
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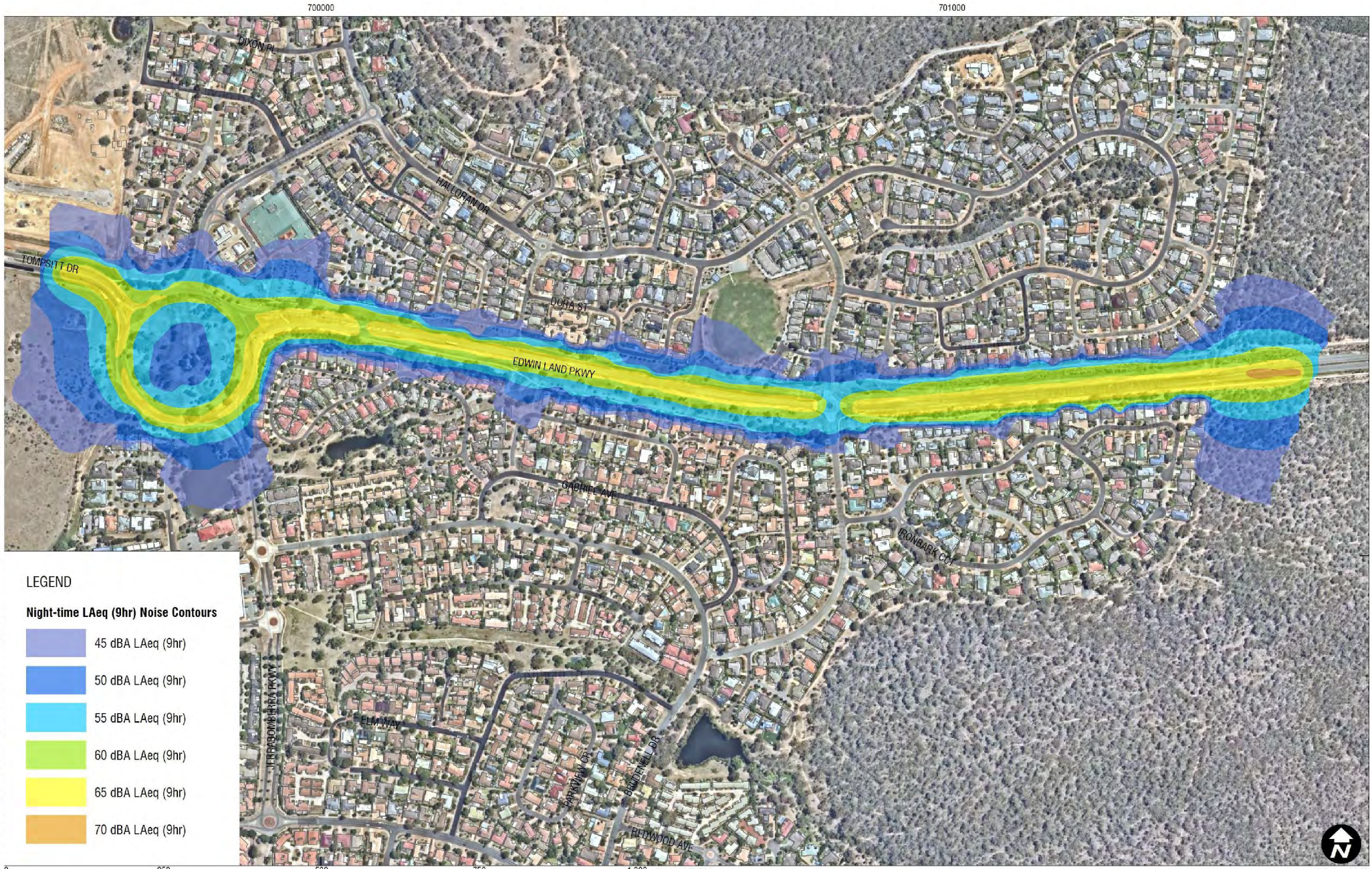
Operational 2019
Daytime Contours

FIGURE 1



Data Sources: (C) Nearmap 2019, Department of Finance, Services and Innovation, NSW 2017
Sheet Size : A4

SLR
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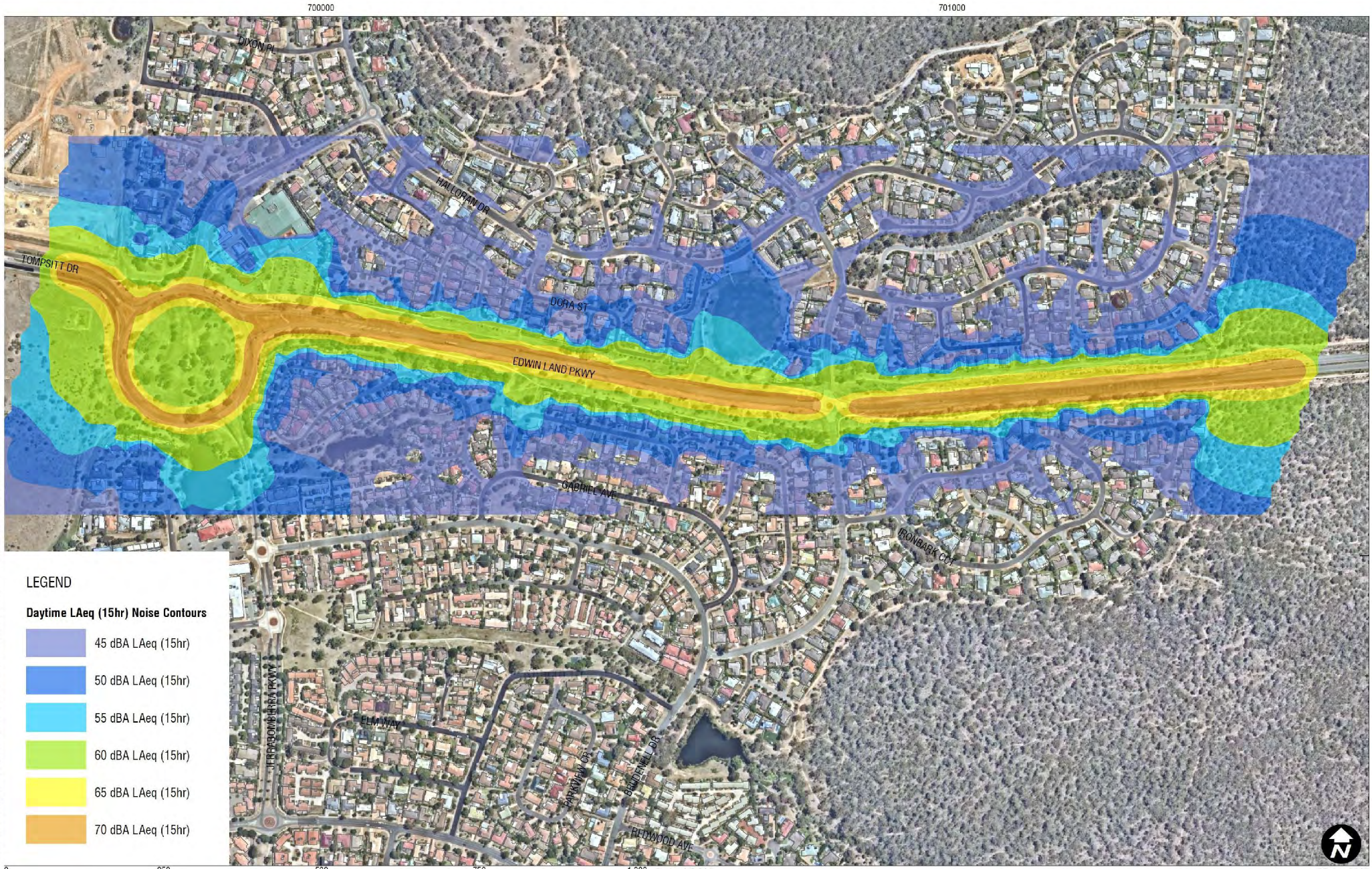
Operational 2019
Night-time Contours

FIGURE 2

APPENDIX F

Road Traffic Noise Contours

Future – Year 2022



\\au.slr.local\Corporate\Projects-SLR\610-SvSYD\670-CAN\670.11066\67011066_Daytime Contours 2022.mxd

Data Sources: (C) Nearmap 2019, Department of Finance, Services and Innovation, NSW 2017
Sheet Size : A4

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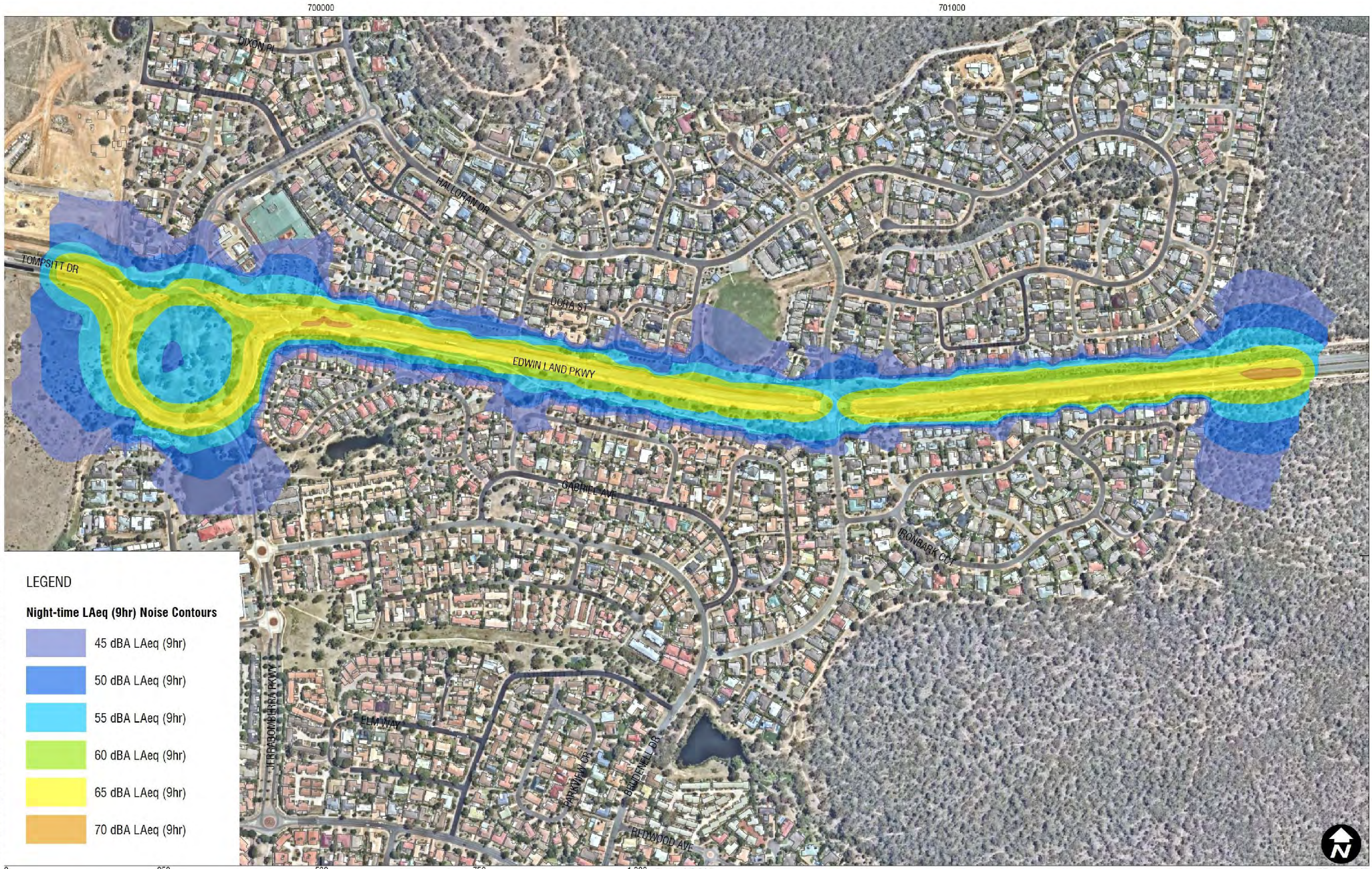
Operational 2022 Daytime Contours

FIGURE 3



Data Sources: (C) Nearmap 2019, Department of Finance, Services and Innovation, NSW 2017
Sheet Size : A4

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Operational 2022 Night-time Contours

FIGURE 4

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