

DICKER DATA

238-258 CAPTAIN COOK DRIVE, KURNELL

NOISE IMPACT ASSESSMENT

FEBRUARY 2018



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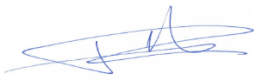
238-258 Captain Cook Drive, Kurnell
Noise impact assessment

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EXECUTIVE SUMMARY

An acoustic assessment of a proposed development at 238-258 Captain Cook Drive, Kurnell, has been conducted by WSP as required for State Significant Development (SSD) application 8662. The development will include construction of a warehouse and distribution centre for the storage and distribution of electronic goods, and associated office and car parking space. Access to the site will be via Captain Cook Drive.

Acoustic criteria for the development is taken from:

- Secretary's Environmental Assessment Requirements (SEARs) for SSD 8662, issued 18 January 2018
- NSW EPA Noise Policy for Industry
- NSW Department of Environment, Climate Change and Water (DECCW) Road Noise Policy
- Australian Standard AS2107:2016 – Recommended Design Sound Levels and Reverberation Times for Building Interiors

Noise from mechanical plant will be controlled to meet noise criteria developed in accordance with the NSW Noise Policy for Industry. Controls such as selection of quiet equipment, physical attenuation controls, carefully selected locations and barriers will be considered for mechanical equipment. Car movements on and off the site at the access points, including delivery vehicles using the loading dock, are expected to comply with NPfI criteria.

Noise ingress to offices and the cafe will be controlled to meet recommended design levels given in AS2107:2016. An indicative façade performance of 22 dB $R_w + C_{tr}$ is recommended for the offices, and 17 dB $R_w + C_{tr}$ for the café. Actual façade construction will be reviewed as the design progresses.

1 INTRODUCTION

WSP has been appointed by Dicker Data Pty Ltd to provide acoustic consultancy services for a proposed warehouse and distribution centre development at 238-258 Captain Cook Drive, Kurnell. The purpose of this report is to provide a noise impact assessment in support of State Significant Development application 8662, issued January 2018.

The noise impact assessment has been conducted based on the architectural package by WMK Architecture, issue A dated 3 May 2018.

1.1 SITE AND PROJECT DESCRIPTION

The project site is located at 238-258 Captain Cook Drive, Kurnell, legally identified as Lot 2 in DP 1088703 and Lot 1 in DP 225973. The site will be used as a warehouse and distribution centre for electronic goods, and will include associated office space and car parking.

An overview of the site is given in Figure 1.1.

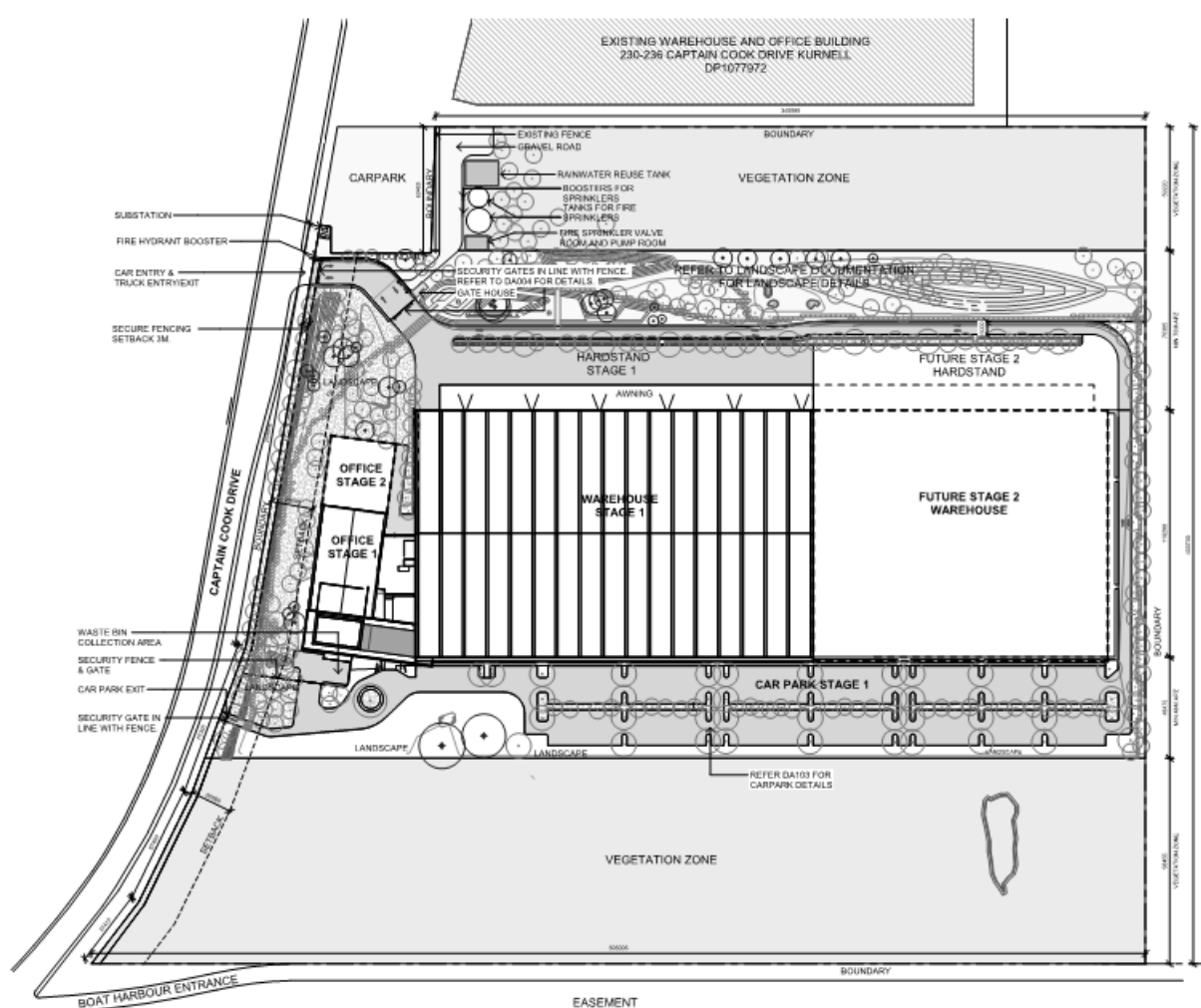


Figure 1.1 Site overview

The proposed development is within an industrial area and is adjacent to industrial receivers along Captain Cook Drive and Sir Joseph Banks Drive. The nearest residential receivers are approximately 730 m to 975 m to the north, along Tasman Street and Horning Street. An aerial overview of the site is given in Figure 1.2 with the nearest receivers listed in Table 1.1.



Source: NSW SIX Maps

Figure 1.2 Aerial overview

Table 1.1 Nearest sensitive receivers

RECEIVER ID	LOCATION	TYPE	APPROXIMATE DISTANCE, METRES
R1	Residences along Tasman St, southern side	Residential	840
R2	Residences along Tasman St, west of Dampier St	Residential	882
R3	Residences on Dampier St	Residential	939
R4	Residences along Tasman St, east of Dampier St	Residential	974
R5	Residences on Horning St	Residential	728
I1	Clerke Place industrial receivers	Industrial	114
I2	10-16 and 18-28 Sir Joseph Banks Dr	Industrial	411
I3	Sydney Desalination Plant	Industrial	110
I4	30-168 Sir Joseph Banks Dr	Industrial	404

RECEIVER ID	LOCATION	TYPE	APPROXIMATE DISTANCE, METRES
I5	260B Captain Cook Dr	Industrial	111
I6	262-274 Captain Cook Dr	Industrial	183
I7	Industrial receivers on Tasman St and Horning St	Industrial	733

2 SITE SURVEY

Unattended background monitoring was conducted by WSP from 21 November to 5 December 2017 to assess the existing background noise levels at the nearest sensitive receivers, and traffic noise levels at the development site.

2.1 NOISE MEASUREMENTS

Unattended noise logging was conducted at two locations (depicted in Figure 1.2):

- NM01: 92 Bridges Street. This measurement location is representative of the nearest residential receivers and was selected to measure background noise levels. No existing industrial noise from sources on Tasman Street or Captain Cook Drive was audible at this location.
- NM02: 230 Captain Cook Drive, on the existing Dicker Data site. This measurement location was selected to measure the existing traffic noise levels on Captain Cook Drive. Moving traffic on Captain Cook Drive was dominant, with natural sounds audible when no traffic was present.

2.1.1 EQUIPMENT AND MEASUREMENT APPROACH

The unattended noise survey was conducted with reference to the NSW Noise Policy for Industry (NPfI), Road Noise Policy (RNP) and AS1055.1 “Acoustics – Description and measurement of environmental noise Part 1: General Procedures.”

The microphone for each noise logger was located in a free-field position at least 3.5m away from reflecting walls and was at a height of 1.2m from the ground.

The sound level meter was field-calibrated using a Rion NC-73 acoustic calibrator both before and after noise measurements to monitor drifts in calibration. No drifts in excess of 1 dBA were noted throughout the monitoring exercise. The sound level meter and calibrator were in current National Association of Testing Authorities (NATA) calibration at the time of use. Serial numbers and laboratory calibration due dates are shown below in Table 2.1.

Table 2.1 Equipment details

EQUIPMENT DESCRIPTION	MANUFACTURER AND TYPE NO.	SERIAL NO.	CALIBRATION DUE DATE
Sound level meter	ARL EL-316	16-306-008	23/10/2019
Preamplifier	Rion NH17	28408	23/10/2019
Microphone	Rion UC 53A	321711	23/10/2019
Sound level meter	Svan 958A	36659	13/01/2018
Preamplifier	Svan SV12L	47642	13/01/2018
Microphone	Svan 7052E	47642	13/01/2018
Calibrator	Rion NC-73	11248294	10/07/2018

2.1.2 RESULTS

Results from the unattended noise monitoring are given in Table 2.2 in accordance with NPfI time periods. Ambient noise levels during the RNP-defined time periods are given for location NM02 in Table 2.3.

Table 2.2 Noise logging results

	RATING BACKGROUND LEVEL dBA RBL			AMBIENT NOISE LEVEL dBA L _{eq} period		
	Day 7:00am- 6:00pm	Evening 6:00pm- 10:00pm	Night 10:00pm- 7:00am	Day 7:00am- 6:00pm	Evening 6:00pm- 10:00pm	Night 10:00pm- 7:00am
NM01	38	36	32	57	56	50
NM02	40	45	43	59	60	59

Table 2.3 Measurement results, ambient noise levels (RNP time periods)

	AMBIENT NOISE LEVEL dBA L _{eq} period	
	Day 7:00am-10:00pm	Night 10:00pm-7:00am
NM02	59	59

Note: free-field levels

3 ACOUSTIC CRITERIA

Development approval criteria are determined by local council requirements, state policies and guideline documents. This section presents the noise criteria applicable to the proposed redevelopment. Relevant policies and guidelines for this development site are summarised in Table 3.1.

Table 3.1 Applicable policies and guidelines

ASSESSMENT	APPLICABLE POLICIES AND GUIDELINES	RELEVANT ASPECTS OF DEVELOPMENT
Industrial noise emissions	NSW EPA Noise Policy for Industry	Noise from sources building services plant associated with the development Loading dock activities which may produce noise Noise emissions from vehicular movements on the site, including car parking
Road traffic noise emissions	NSW DECCW Road Noise Policy	Noise from additional traffic on public road generated by the development
Noise ingress	Australian Standard AS2107:2016	Internal noise level within office
Construction noise and vibration	NSW EPA Interim Construction Noise Guideline NSW EPA Assessing Vibration: a technical guideline	Noise and vibration during construction

3.1 INDUSTRIAL NOISE EMISSIONS

The following section provides an overview of the relevant acoustic criteria applicable to the proposed development based on the requirements of the NSW Noise Policy for Industry 2017 (NSW NPfI). It is noted that the NPfI replaced the NSW Industrial Noise Policy (NSW INP) 2000 effective as of Friday 27 October 2017.

3.1.1 OVERVIEW

The NSW NPfI prescribes methods for determining the statutory environmental noise limits that apply to existing noise sensitive receivers (i.e. residences) with regard to noise due to individual noise sources only.

The assessment procedure for industrial noise sources has three components:

- Controlling intrusive noise impacts in the short term for residences
- Maintaining noise level amenity for particular land uses for residences and other land uses
- Assessment of sleep disturbance for residences

In assessing the noise impact of industrial sources, all three components must be considered for residential receivers. In most cases, only one (i.e. the more stringent) will form the project-noise trigger level for the industrial source under

assessment. Intrusive noise criteria are not determined for commercial or industrial receivers, only an amenity criterion is applicable to these receivers.

As the warehouse will not be operating at night, the sleep disturbance criteria does not need to be assessed and will not be discussed further in this report.

3.1.2 TIME PERIODS

Time periods defined by the NSW NPfI are presented in Table 3.2.

Table 3.2 NSW NPfI Time Periods

TIME PERIOD	TIME
Day	7am to 6pm Monday to Saturday 8am to 6pm Sundays and public holidays
Evening	6pm to 10pm all days
Night	All other times

3.1.3 PROJECT INTRUSIVENESS NOISE LEVEL

With regard to the assessment of intrusive noise due to industrial sources, the NSW NPfI states:

The intrusiveness of an industrial noise source may generally be considered acceptable if the level of noise from the source (represented by the L_{Aeq} descriptor), measured over a 15-minute period, does not exceed the background noise level by more than 5 dB when beyond a minimum threshold.

The intrusiveness criterion for residential receivers prescribed in the NSW NPfI may be summarised as:

$$L_{Aeq\ 15\ min} \leq \text{Rating Background Level (L}_{A90}) + 5\ \text{dBA}$$

Based on the background noise level measured at location NM01 (representative of the nearest residential receivers) during the day, evening and night periods, the RBL and intrusiveness criterion has been established for the proposed development in accordance with the NSW NPfI.

3.1.4 PROJECT AMENITY NOISE LEVELS

To limit continuing increases in noise levels, the ambient noise level within an area from all industrial noise sources should not normally exceed the acceptable noise levels prescribed in the NSW NPfI. To ensure new and existing industrial noise is controlled, the project amenity criteria is calculated as follows:

$$\text{Project amenity criteria (L}_{eq\ \text{period}}) = \text{recommended amenity noise level minus 5 dBA}$$

The nearest residences are classified as suburban, as the area was observed to have intermittent local traffic and limited commerce and industry. The relevant amenity criteria established in accordance with the NSW NPfI are presented in Table 3.3.

Table 3.3 Recommended Amenity (L_{eq}) noise levels from industrial noise sources

TYPE OF RECEIVER	INDICATIVE NOISE AMENITY AREA	TIME OF DAY	RECOMMENDED AMENITY NOISE LEVEL, dBA $L_{eq, period}$	PROJECT SPECIFIC AMENITY NOISE LEVEL, dBA $L_{eq, period}$
Residential	Suburban	Day	55	50
		Evening	45	40
		Night	40	35
Industrial	Industrial	When in use	70	65

To standardise the time periods for the intrusive and amenity noise criteria, the NPfI states that a correction of +3 dBA is to be applied to the project specific amenity criteria. This correction accounts for the difference between noise levels averaged over an assessment period (i.e. day, evening, night) and those averaged over a 15 minute period.

3.1.5 SUMMARY OF CRITERIA

Table 3.4 summarises the Intrusiveness and Amenity noise levels and the resulting the Project Noise Trigger Levels (PTNL) calculated in accordance with the NSW NPfI.

Table 3.4 Summary of NSW Noise Policy for Industry Project Noise Trigger Levels (PTNL)

RECEIVER TYPE	PERIOD	RBL dBA	INTRUSIVE CRITERIA dBA $L_{eq, 15min}$	AMBIENT NOISE dBA $L_{eq, period}$	AMENITY CRITERIA dBA $L_{eq, 15min}$ ¹	PTNL dBA $L_{eq, 15min}$
Residential	Day	38	43	57	53	43
	Evening	36	41	56	49 ²	41
	Night	32	37	50	43 ²	37
Industrial	When in use	-	-	59	68	68

- (1) Includes a +3 dBA correction to account for the change of averaging period, i.e. from $L_{eq, period}$ to $L_{eq, 15min}$ (as per Section 2.2 of the NSW NPfI)
- (2) The resultant project amenity noise level (refer to Table 3.3) is 10 dB or more lower than the existing industrial noise level. In this case the project amenity noise levels can be set at 10 dB below existing industrial noise levels (as per note 3 of Section 2.4 of the NSW NPfI)

3.2 ROAD NOISE POLICY

The Road Noise Policy (RNP) is used to assess noise from additional traffic on public road generated by the development. For traffic generating developments, the RNP states:

For existing residences and other sensitive land uses affected by additional traffic on existing roads generated by land use developments, any increase in the total traffic noise level should be limited to 2 dB above that of the corresponding 'no build option.'

In addition, the RNP provides an assessment noise level applicable to traffic generating developments. Table 3.5 presents the relevant criteria relevant to residences affected by arterial roads. Note that the criteria applies to façade-corrected noise levels.

Table 3.5 Excerpt from RNP Table 3, road traffic noise assessment criteria for residential land uses

ROAD CATEGORY	TYPE OF PROJECT/LAND USE	ASSESSMENT CRITERIA	
		DAY (7.00AM-10.00PM)	NIGHT (10.00PM-7.00AM)
Freeway/arterial/sub-arterial roads	Existing residences affected by additional traffic on existing freeways/arterial/sub-arterial roads generated by land use developments	L _{eq} 15 hour 60 dBA (external)	L _{eq} 9 hour 55 dBA (external)

In summary, the site specific assessment criteria are where the development causes an increase in road traffic noise of more than 2 dBA and the noise levels in Table 3.5 are exceeded.

3.3 NOISE INGRESS

Captain Cook Drive is situated to the north west of the development and is considered the primary noise source adjacent to the development. Other noise sources include natural sounds such as local fauna and trees rustling.

Australian Standard AS2107:2016 provides internal noise levels which can be used as a target for spaces such as offices and cafeterias. Table 3.6 provides a summary of the relevant internal noise levels.

Table 3.6 AS 2107 internal noise levels

OCCUPANCY/ACTIVITY TYPE GIVEN IN AS2107:2016	RELEVANT SPACE	RECOMMENDED DESIGN SOUND LEVEL, dBA L _{EQ} 15MIN	
		Satisfactory	Maximum
Open plan office	Level 1 office areas	40	45
Cafeteria	Ground floor café	45	50

The noise goals for spaces within the development are summarised below in Table 3.7, and is based on the 'satisfactory' recommended design sound levels outlined in AS 2107.

Table 3.7 Internal noise goals

USAGE	APPLICABLE TIME PERIOD	INTERNAL NOISE CRITERIA dBA L _{EQ} 15MIN
Open plan office	When in use	40
Café	When in use	45

4 ASSESSMENT

This section outlines the assessment of the proposed redevelopment against the established development criteria in Section 3.

4.1 INDUSTRIAL NOISE

The primary sources of industrial noise are identified as follows:

- Light and heavy vehicles entering and exiting the site
- Rooftop mechanical plant

4.1.1 VEHICLE MOVEMENTS WITHIN THE SITE

To assess vehicle movements on site, a worst-case prediction of noise emissions has been undertaken. Similar to existing operations, the site will be in use between the hours of 7 am and 6 pm. These times fall within the day period defined in the NSW NPfI. Therefore, this assessment will apply against the NSW NPfI daytime criteria detailed in Section 3.1.5.

The traffic impact assessment prepared for the project by Ason Group (reference 0406r01v1, prepared 11/12/2017), assumes a total of 200 vehicle movements during a peak hour period. Of those 200 movements, 12 are heavy vehicles using the loading dock. As a worst-case assumption, all movements have been taken to occur during a 15 minute period. However, it should be noted that it is considered unlikely that all vehicles travelling to and from the site during a peak hour period would occur during a single 15 minute period.

The following noise sources and sound power levels have been considered:

- Light vehicles (188 movements)
 - Car accelerating, one event per movement, 98 dBA for 1.5 s
 - Car travelling through car park, one event per movement, 90 dBA SWL for 10 s
 - Car door slam, one event per movement, 93 dBA for 0.5 s
- Heavy vehicles (12 movements)
 - Truck travelling within site, one event per movement, 108 dBA SWL for 30 s
 - Reversing beeper, one event per movement, 100 dBA SWL for 30 s
 - Truck door slam, one event per movement, 93 dBA SWL for 0.5 s

Electric forklifts operating on the site have not been included in this assessment as the noise from vehicle movements is expected to be the dominant source.

Based on the assumed sound power levels and accounting for geometric spreading, the noise from vehicular activity on the project site is predicted to be 40 dBA $L_{eq\ 15min}$ at the nearest residential receiver (R5, 728m from the site). This is below the day and evening trigger levels given in Section 3.1.5. The predicted level at the nearest industrial receiver (I3, 110m from the site) is 56 dBA $L_{eq\ 15min}$ which is below the trigger level of 68 dBA $L_{eq\ 15min}$.

It should be noted that the predicted level is a worst-case level. Barrier attenuation from obstacles on and around the site has not been considered, and peak hour traffic volumes have been assumed to occur within a single 15 minute period. For this reason, it is considered highly unlikely that loading dock and car park operations will result in elevated industrial noise levels at nearby sensitive receivers.

4.1.2 MECHANICAL PLANT

Mechanical plant items are proposed to be located on the office rooftop. Noise emissions associated with the operations of the mechanical equipment are to be determined under guidance contained in the NSW NPfI. Mechanical services noise will be designed to not exceed noise criteria outlined in Section 3.1.5 of this report.

During the design process, the following typical noise control treatments may be applied to the mechanical design to ensure compliance with the established NPfI criteria;

- Attenuators
- Quiet unit selections
- Consideration to location of units
- Timed systems
- Acoustic barriers

4.1.3 SUMMARY

Noise from vehicle movements on the site is expected to remain below the day and evening criteria levels. Mechanical plant will be designed to ensure the cumulative noise impact from the site remains below the criteria levels given in Section 3.1.5 of this report.

4.2 ROAD TRAFFIC NOISE

The RNP requires noise generated by additional traffic on existing roads to be limited to 2dB above that of the corresponding 'no build option'. Where the road geometry, speed limit and heavy vehicle percentage remains constant, an increase of 60% or more is required for road noise levels to increase by 2 dBA or more.

Receivers along Captain Cook Drive are predominantly industrial in nature, and are not considered a sensitive receiver in the RNP. The nearest sensitive receiver to road noise is located at 7 Cable Street, Greenhills Beach, a residential receiver approximately 4.7 km from the project site along Captain Cook Drive.

The project's traffic impact assessment indicates that the site's AM peak will experience a net increase of +107 vehicles (total 200 vehicles), and +101 vehicles in the site's PM peak (total 200 vehicles). Captain Cook Drive currently experiences traffic volumes in the order of 550 and 700 vehicles per hour in the AM and PM peak hours, respectively. As a percentage, the proposed development is expected to generate a 14-20% increase in traffic volume during the AM and PM peak. Outside of peak times, the existing hourly traffic volumes on Captain Cook Drive range between approximately 250 and 750 vehicles per hour. Site traffic generation is currently in the order of 20-40 vehicles per hour, which is approximately 5-8% of the traffic flow.

Based on the available information, it is predicted that the road traffic on Captain Cook Drive will not increase by more than 60% due to the development. Therefore, it is considered that the development will not result in a traffic noise increase of greater than 2 dBA at the nearest sensitive receiver, and compliance with the RNP will be achieved.

4.2.1 CONSTRUCTION TRAFFIC

At this stage, construction traffic has not been predicted as details of staging and methodology are not yet available. However, the traffic impact assessment states that "the construction traffic volumes are expected to be lower than the volumes anticipated for the proposed development once it becomes operational." As the operational traffic is predicted to not result in a road traffic noise increase of greater than 2 dBA, it is also expected that the construction traffic will not exceed the RNP criteria.

4.3 CONSTRUCTION NOISE

Noise and vibration from construction activities will be controlled to meet the requirements given in the Interim Construction Noise Guideline (ICNG). The Managing Contractor is key to the provision of a Construction Noise and Vibration Management Plan (CNVMP). Since the Managing Contractor will not be appointed until a later stage of the design it is recommended that a CNVMP is produced after appointment and prior to construction commencement.

Typically, the following construction practices and mitigation measures may be used within this plan to ensure the above noise and vibration requirements are met throughout the process:

- Undertaking all work during standard hours unless specific out-of-hours are undertaken by way of special agreements due to safety concerns or limiting traffic disruption, etc.
- Providing hoarding as a manner of noise screening
- Providing localised screening to particularly noisy equipment and processes
- Limiting the duration for the use of various processes or equipment.

It is also recommended that community consultation and complaint handling processes are implemented by the managing contractor. These could include:

- Engaging the local community (regular meetings, mailbox drops, etc.)
- Providing a complaints hotline to quickly manage complaints
- Provide council with a nominated contact person for all complaints
- Display the nominated contact person's details on public information boards.

4.4 NOISE INGRESS

Noise ingress to the office areas to achieve the internal ambient noise goals set out in Section 3.3 are determined by the external noise incident on the façade and the construction of the façade.

Acoustic calculations have been performed based on internal room dimensions shown in the current architectural design package and assuming a worst-case scenario of a façade with 100% glazing. The minimum required overall façade sound insulation performance are:

- **22 dB $R_w + C_{tr}$** for office spaces
- **17 dB $R_w + C_{tr}$** for the cafe

These performances are easily achievable using standard construction materials.

Detailed modelling during detailed design phase can further optimise the glazing requirements and selections based on the elevation of the façade and/or the relative heights of the façade sections to the street level.

Other factors such as thermal and structural requirements, and the inclusion of operable walls or other openings, will need to be considered in the final façade glazing design.

5 CONCLUSION

WSP has conducted an acoustic assessment of the proposed development at 238-258 Captain Cook Drive, Kurnell. The warehouse and associated office space will be used for storage and distribution of electronic goods.

Background noise measurements were conducted between 21 November and 5 December 2017 to determine environmental noise criteria for the development, in accordance with the NSW Noise Policy for Industry. Mechanical services will be designed to meet these criteria levels. Noise from loading dock activities and car park movements are predicted to comply with industrial noise criteria.

Road traffic is not expected to increase by more than 60% due to the development and as such, road traffic noise criteria from the NSW Road Noise Policy will be met.

The façade design will consider target internal noise levels as recommended by AS2107:2016. Ambient noise levels were measured during the unattended monitoring and were used to determine a required façade noise reduction level.

Based on the assessments presented in this report, the proposed development is determined to be capable of complying with established development criteria.

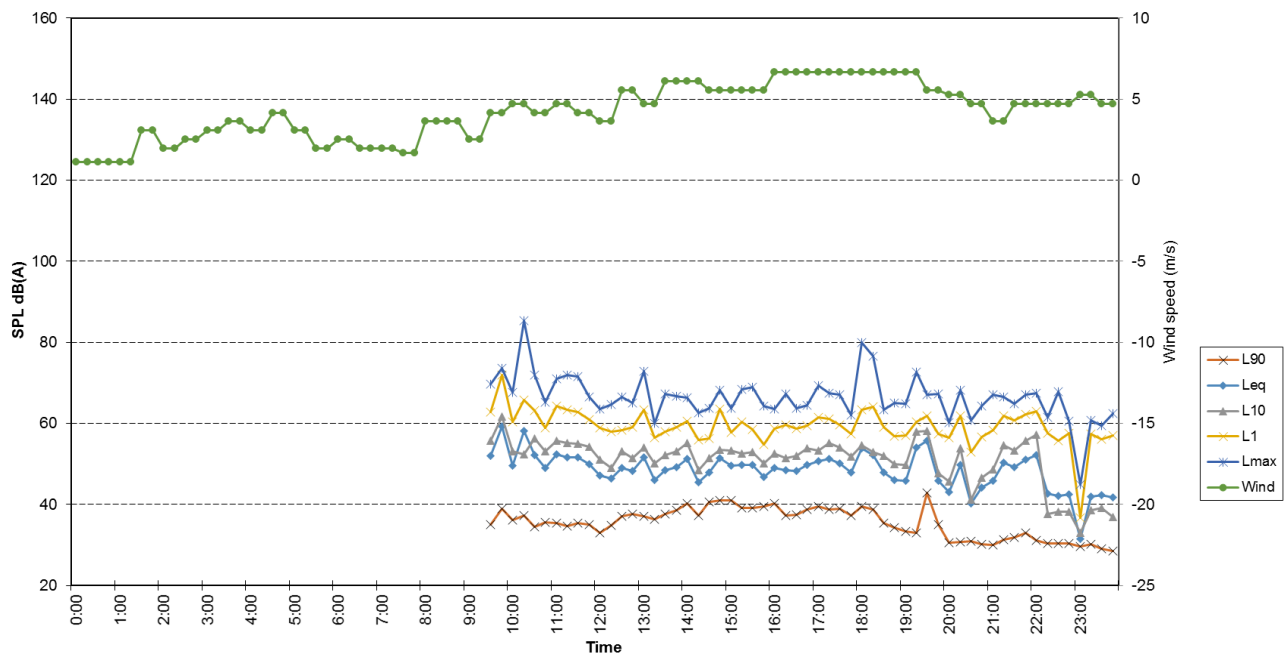
APPENDIX A

NOISE MEASUREMENT RESULTS

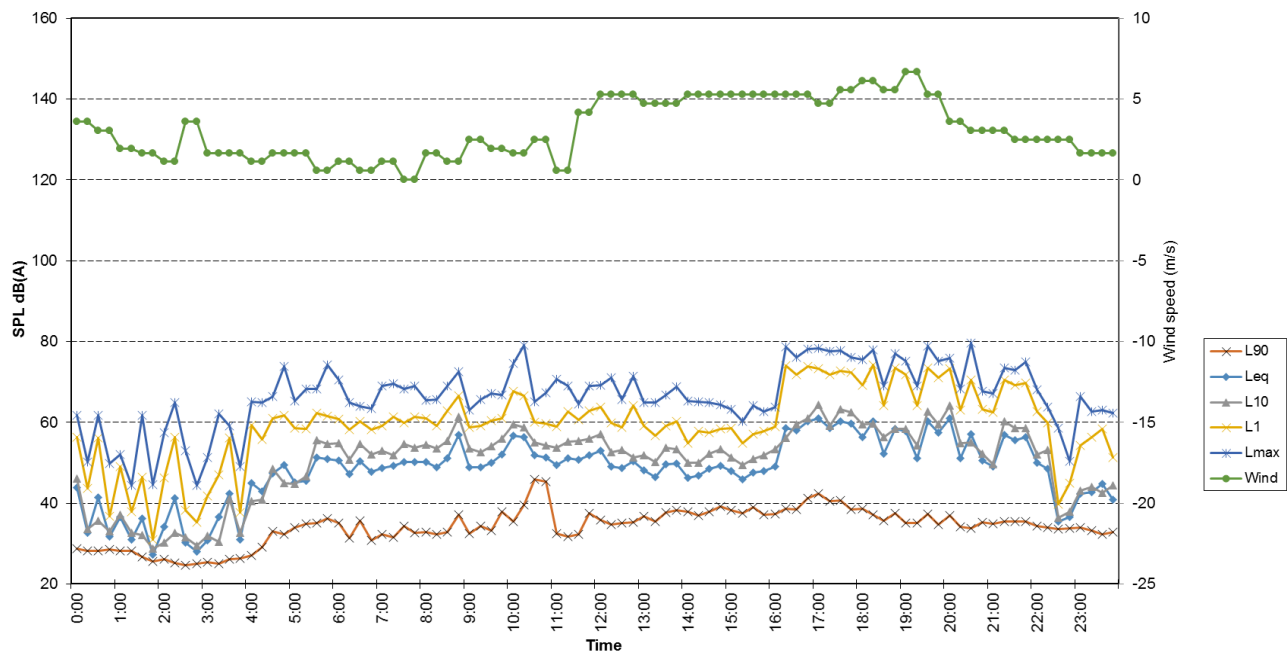


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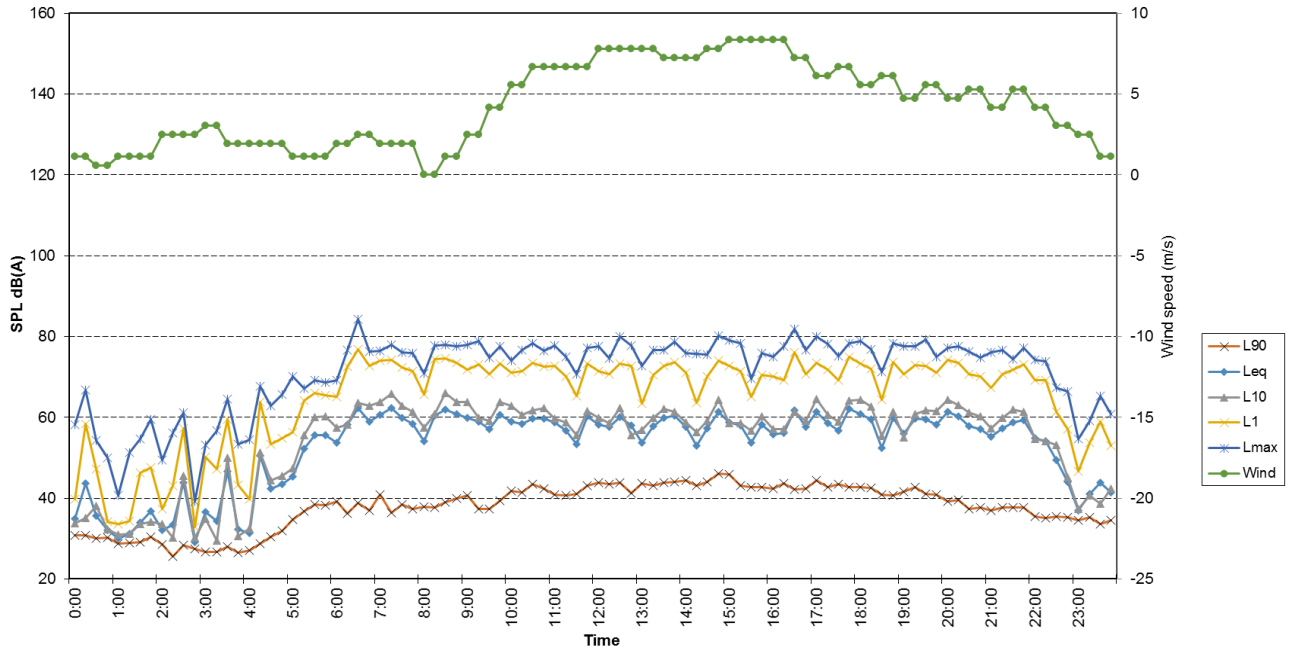
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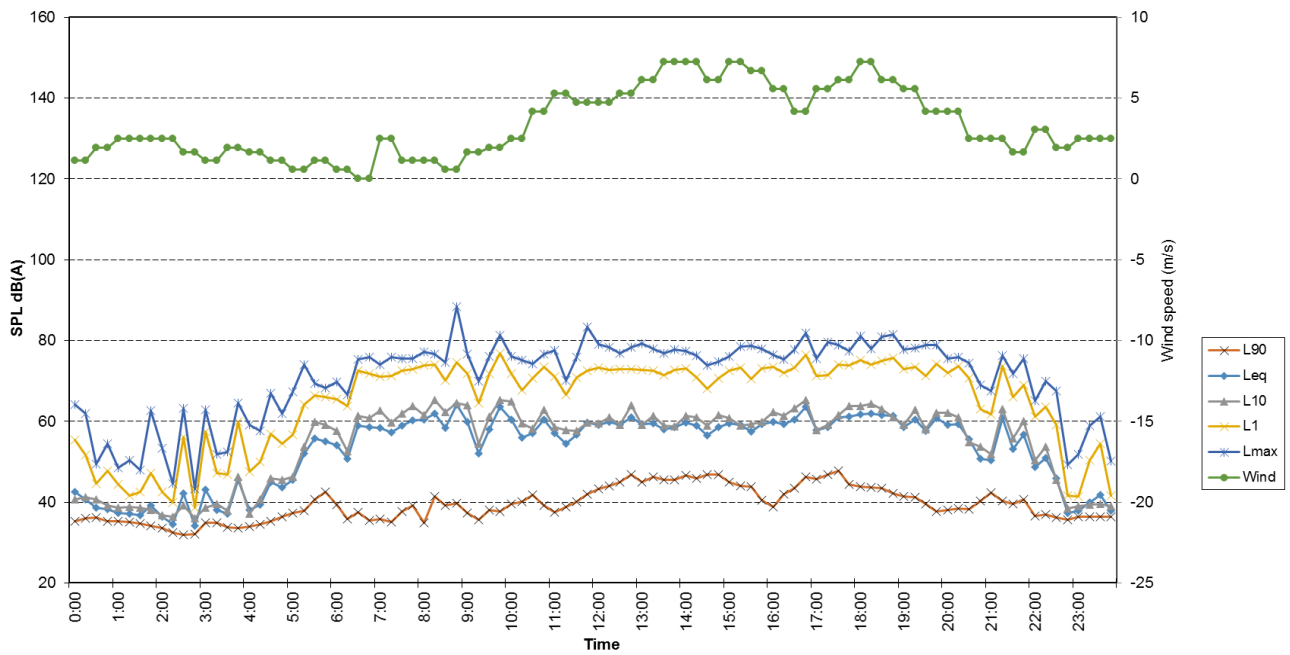
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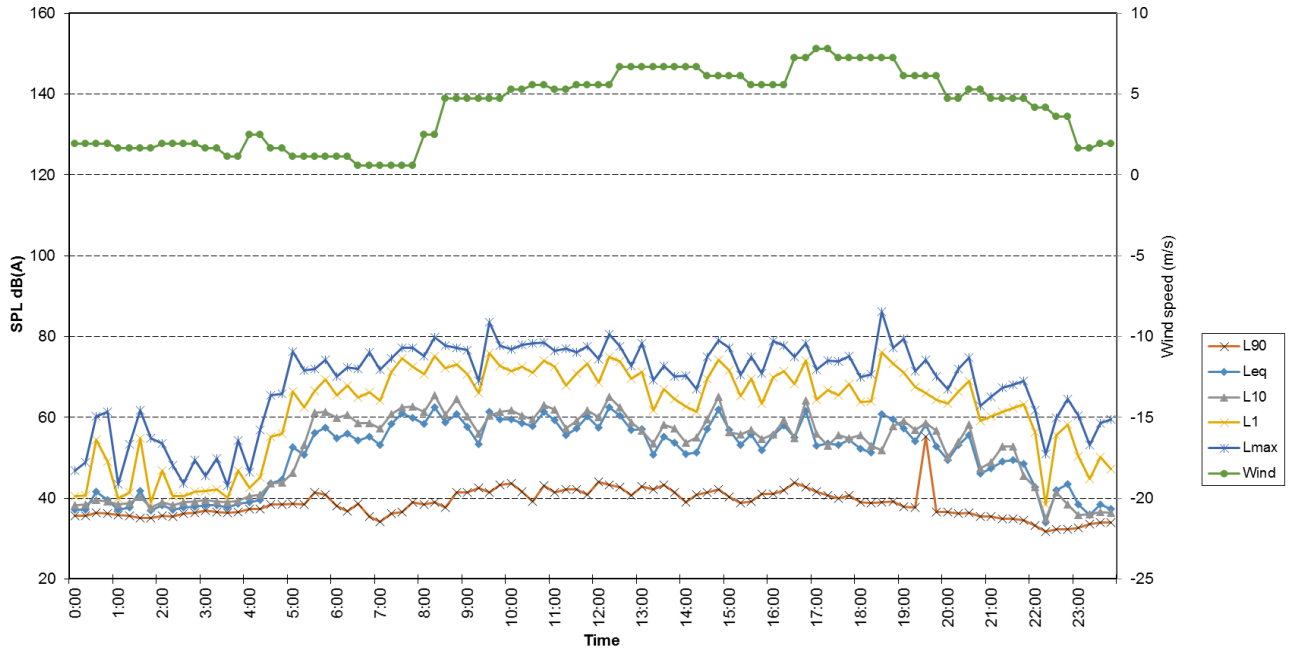
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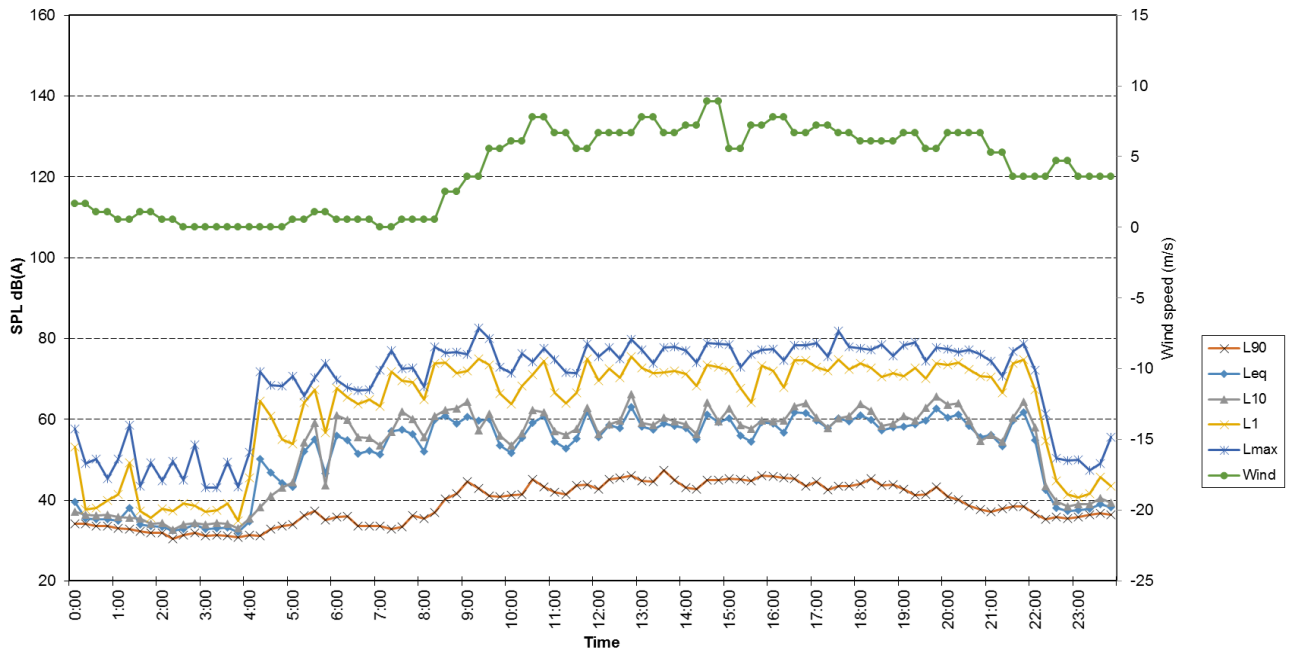
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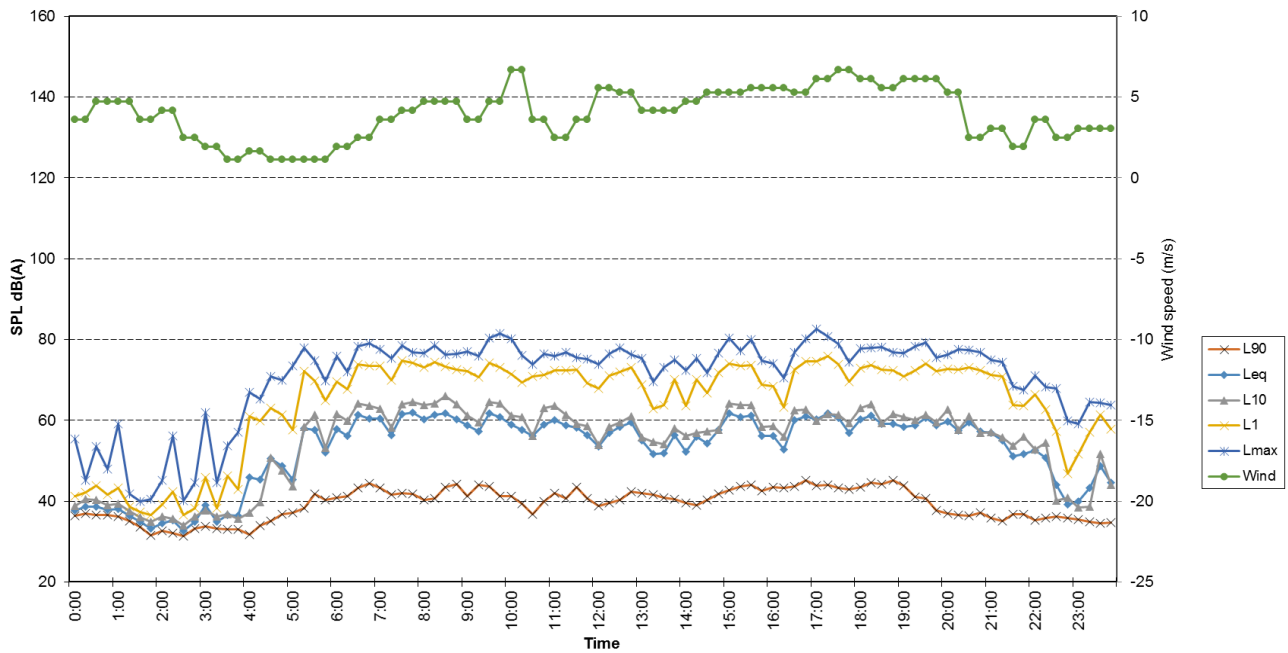
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Measured Noise Levels - Saturday 25/11/2017



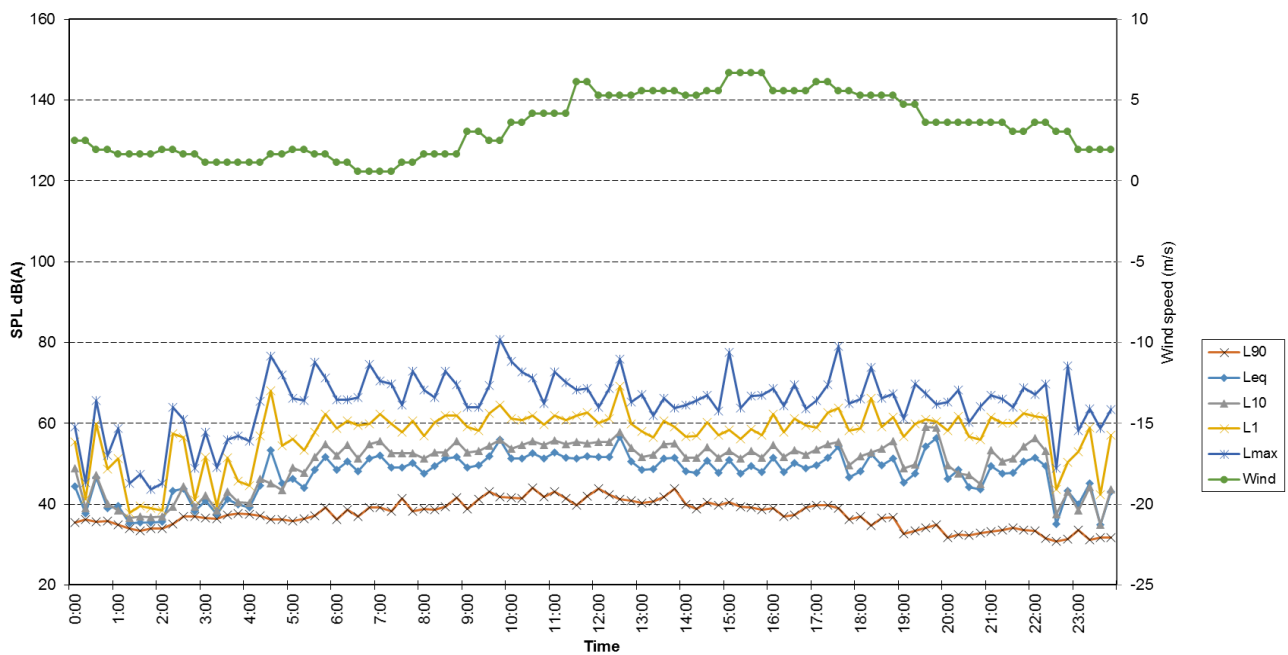
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Measured Noise Levels - Sunday 26/11/2017



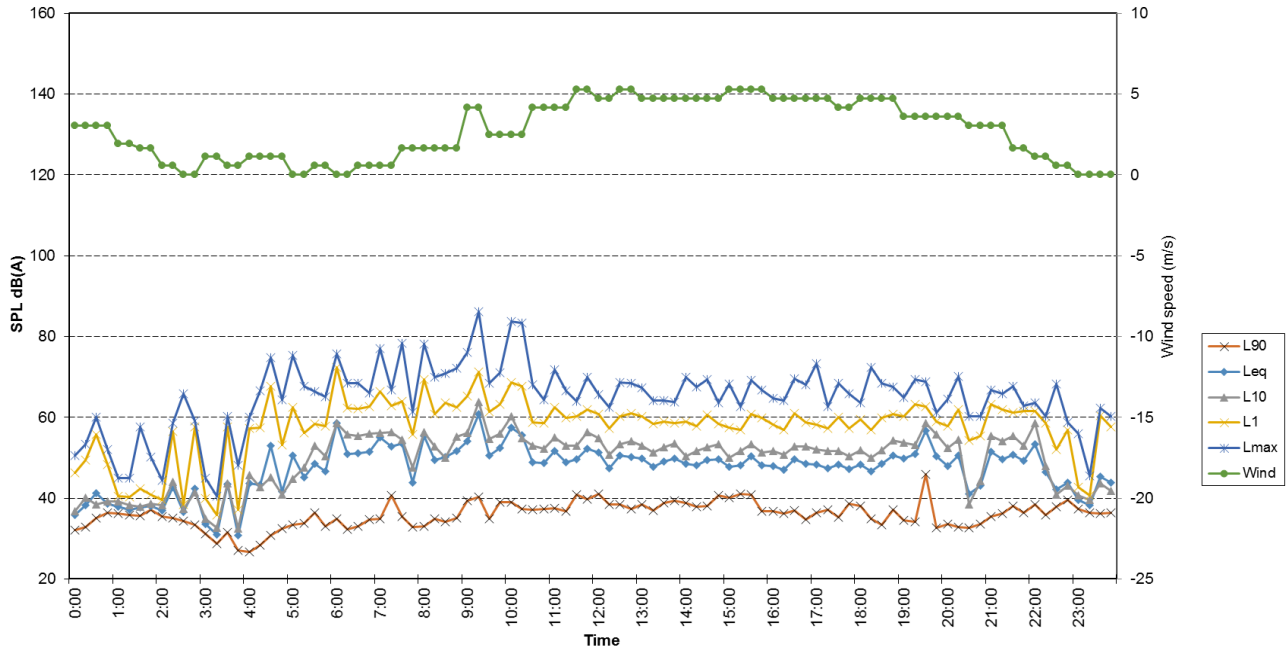
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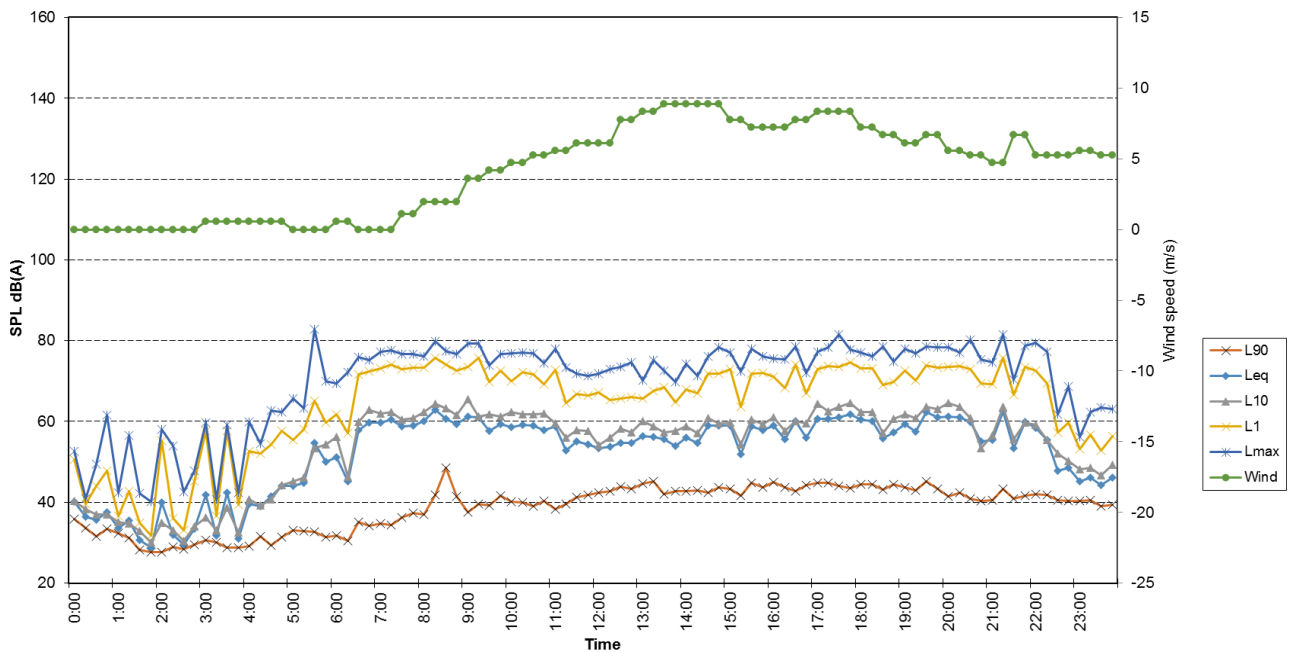
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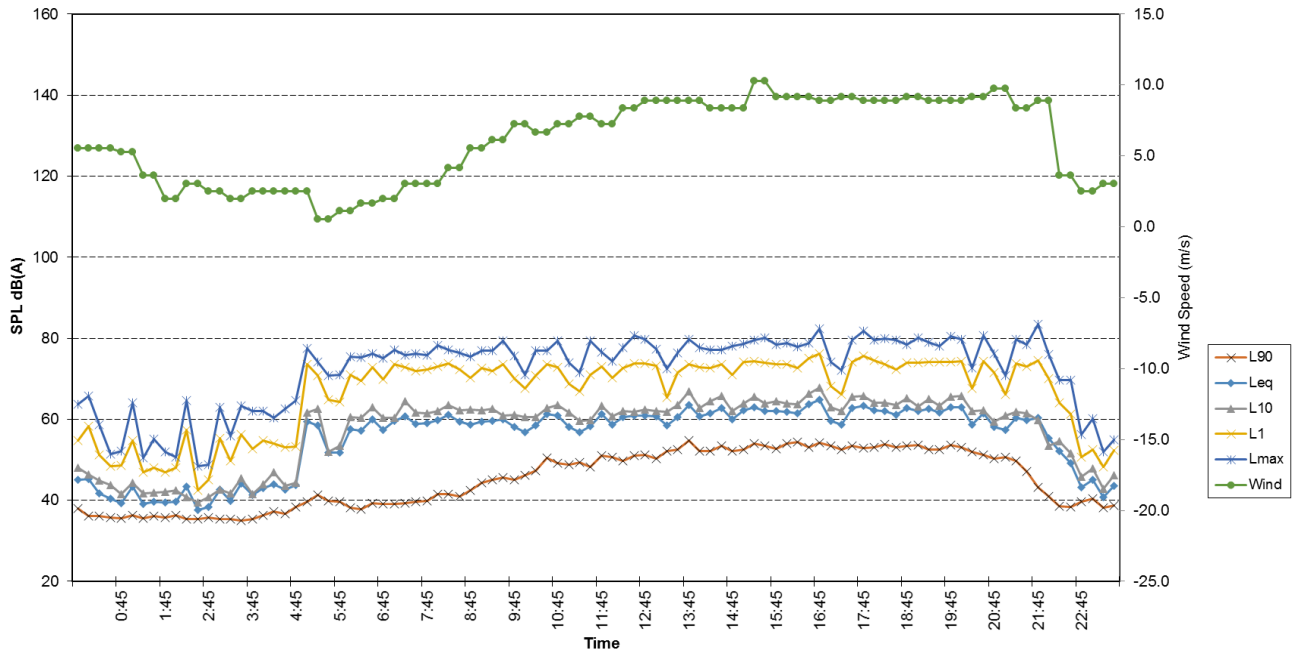
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Location - NM01
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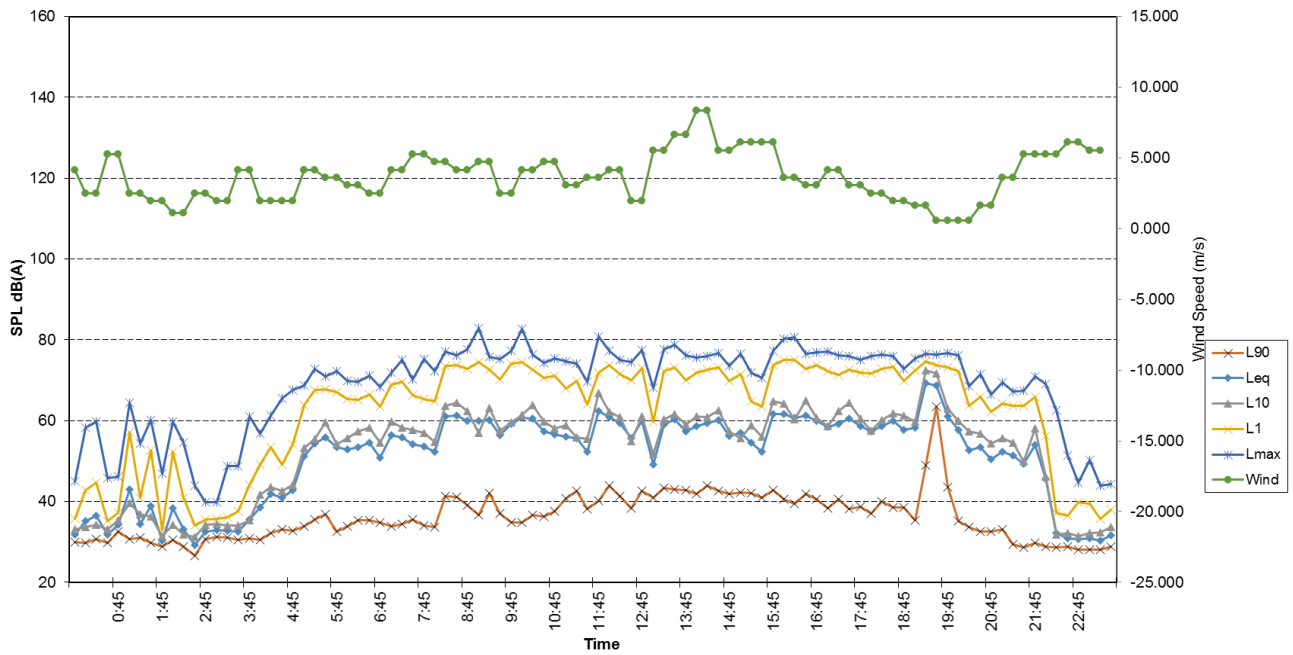
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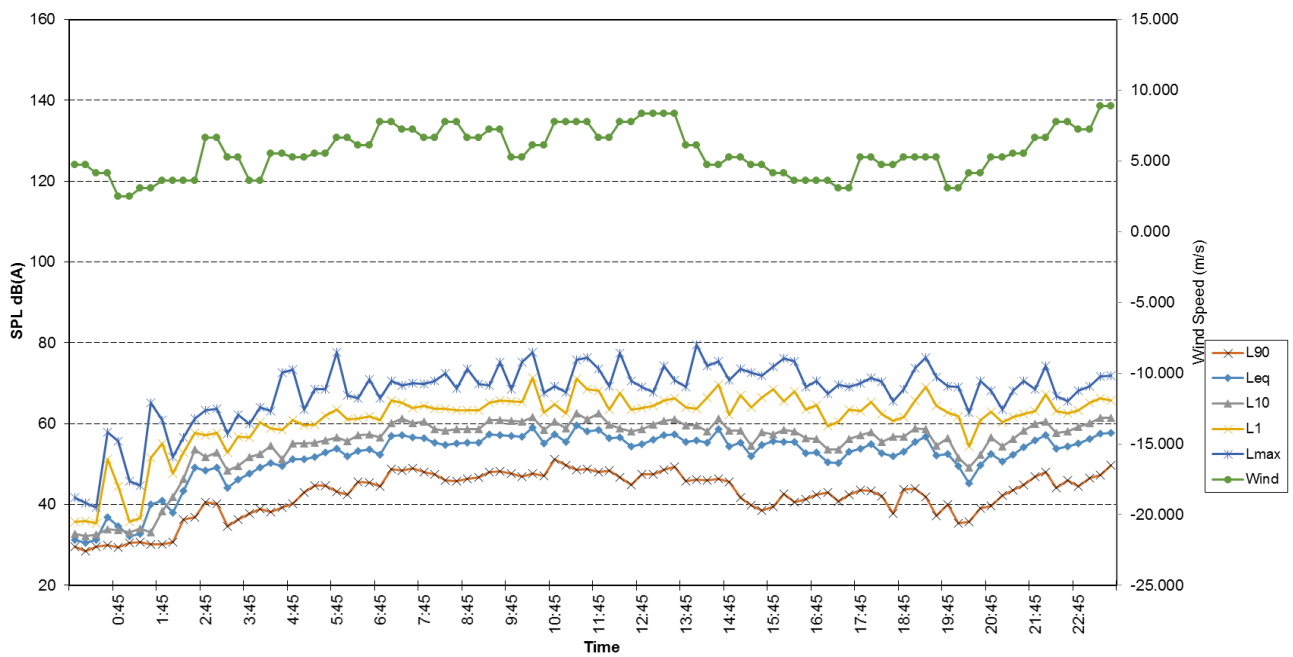
Location - NM01
Measured Noise Levels - Saturday 02/12/2017



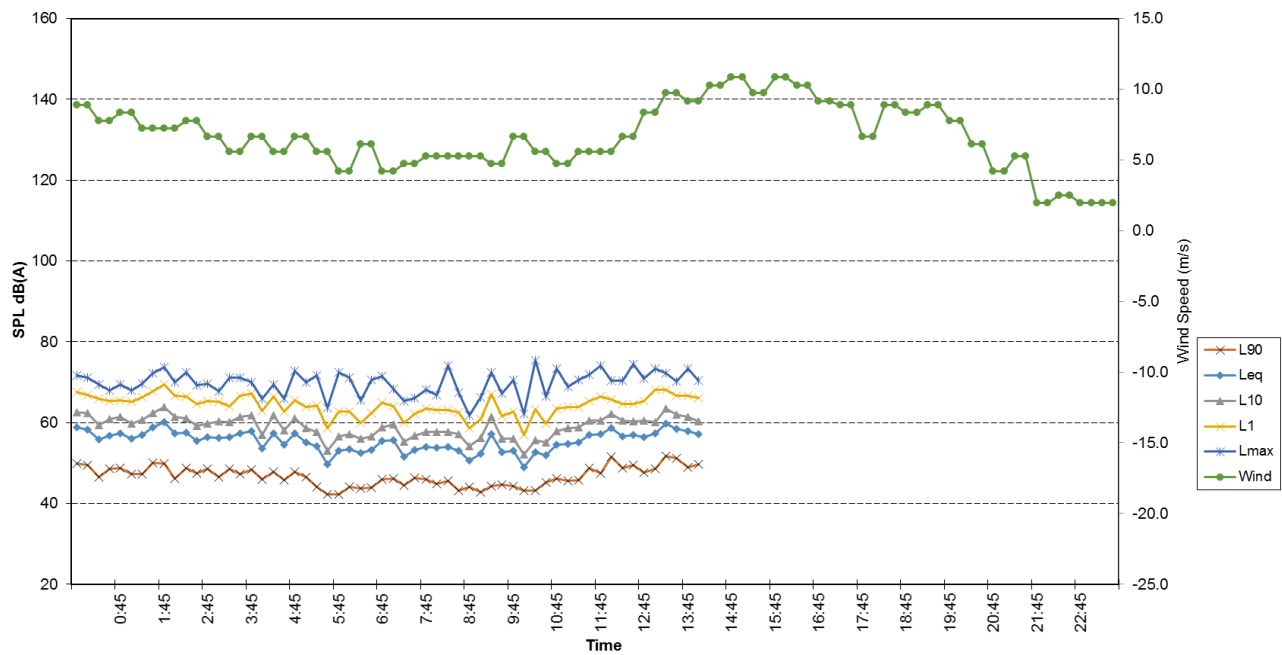
Location - NM01
Measured Noise Levels - Sunday 03/12/2017



Location - NM01
Measured Noise Levels - Monday 04/12/2017

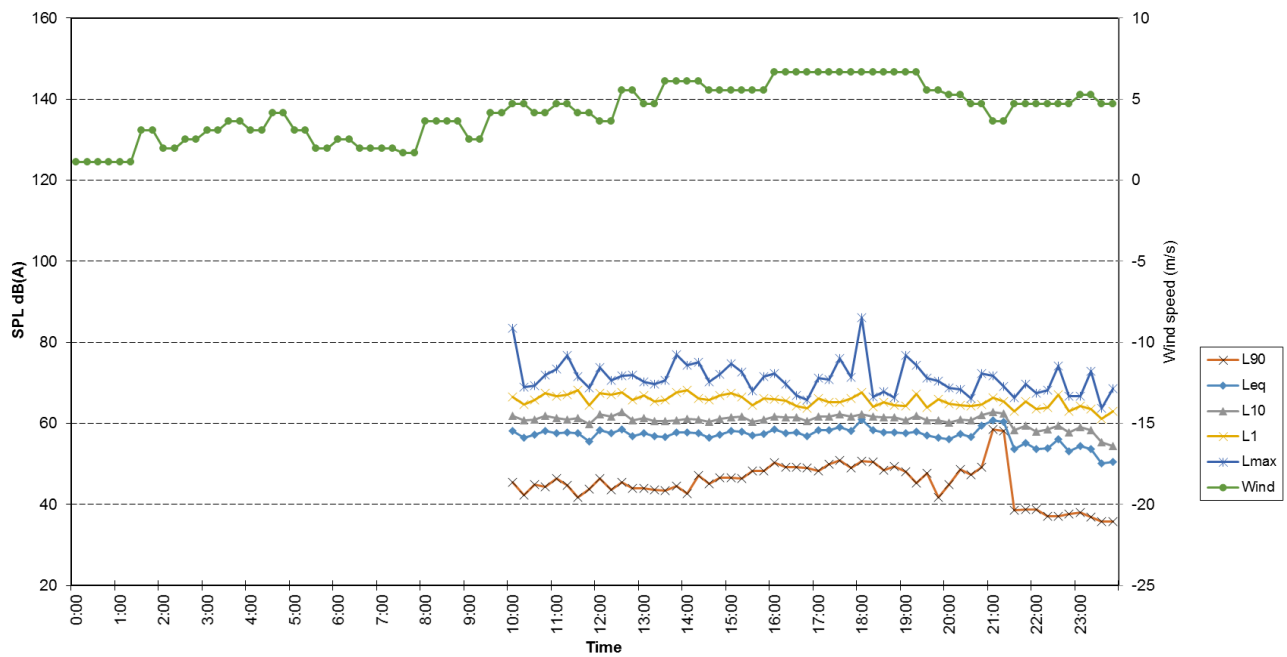


Location - NM01
 Measured Noise Levels - Tuesday 05/12/2017

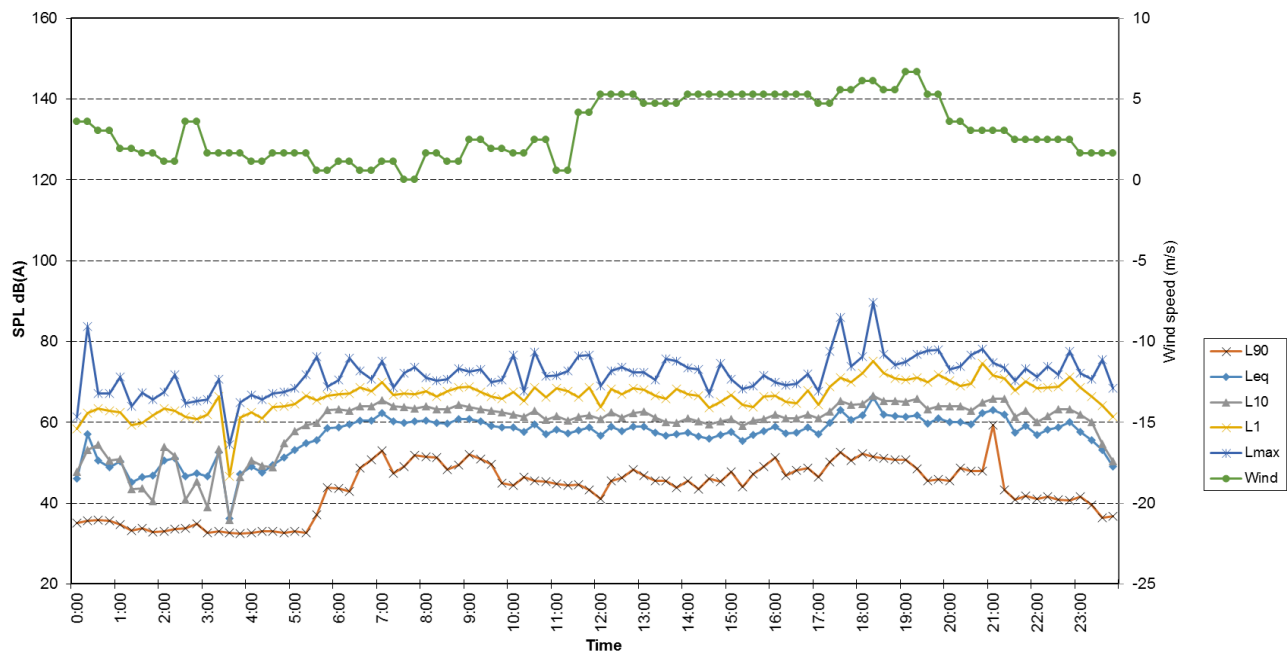


Location NM02

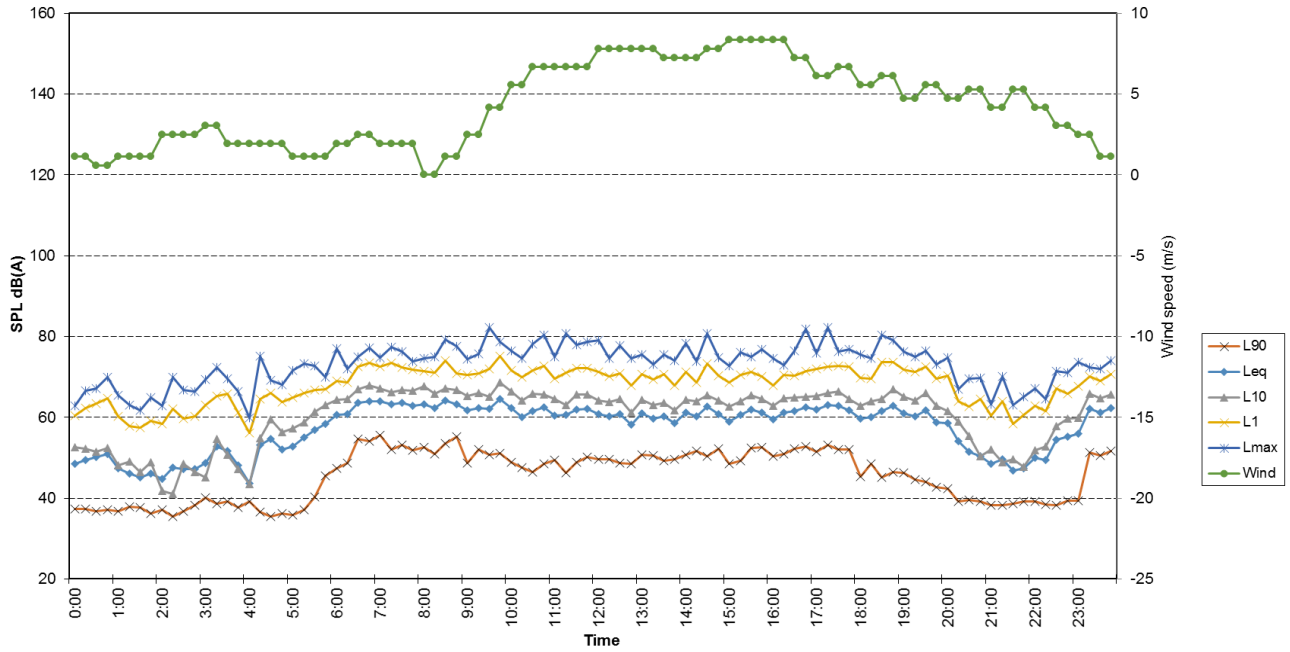
Location - NM02
Measured Noise Levels - Tuesday 21/11/2017



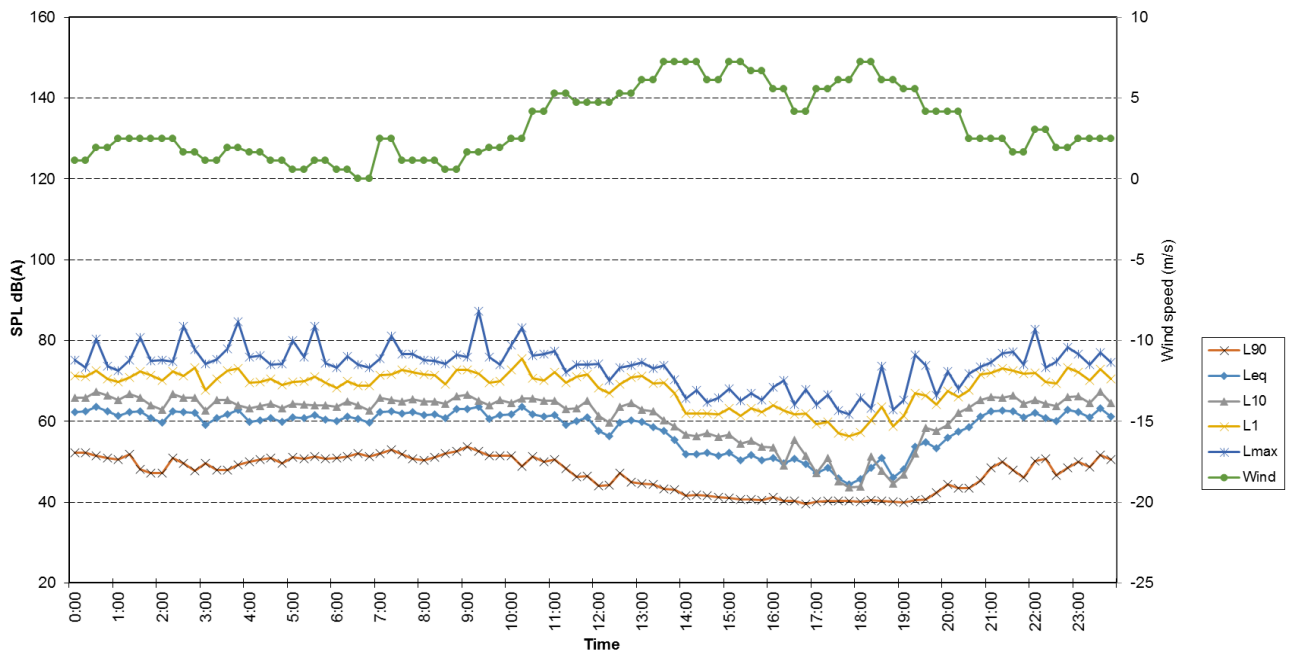
Location - NM02
Measured Noise Levels - Wednesday 22/11/2017



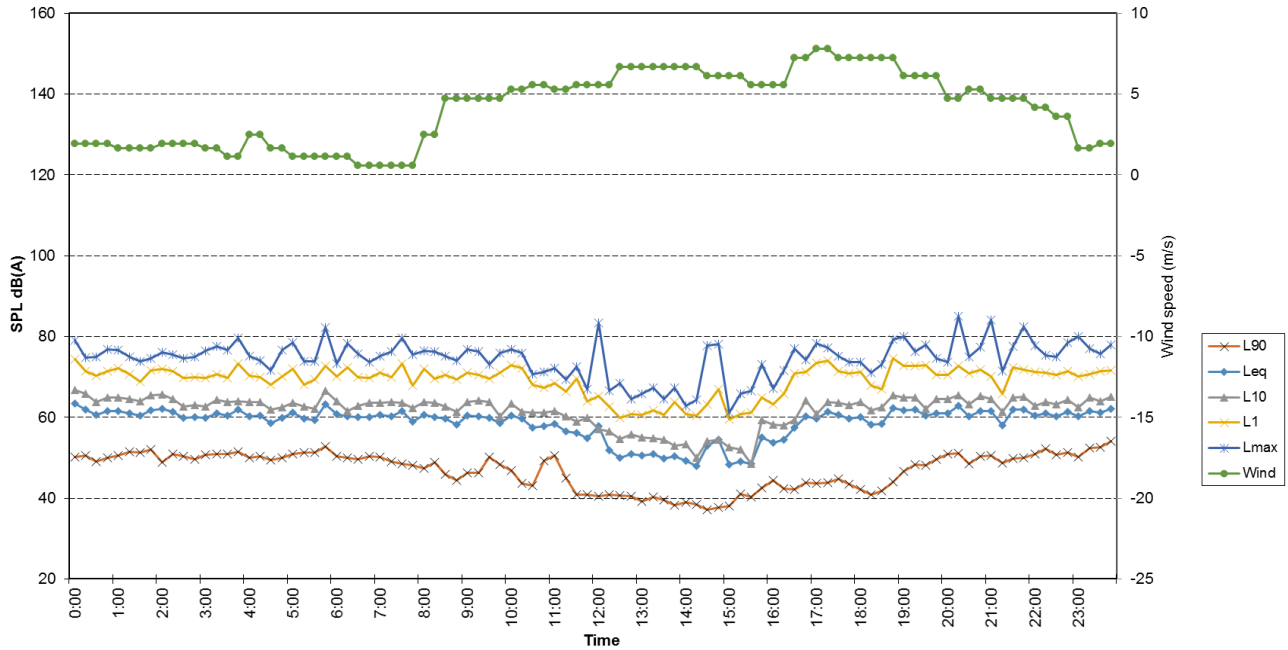
Location - NM02
Measured Noise Levels - Thursday 23/11/2017



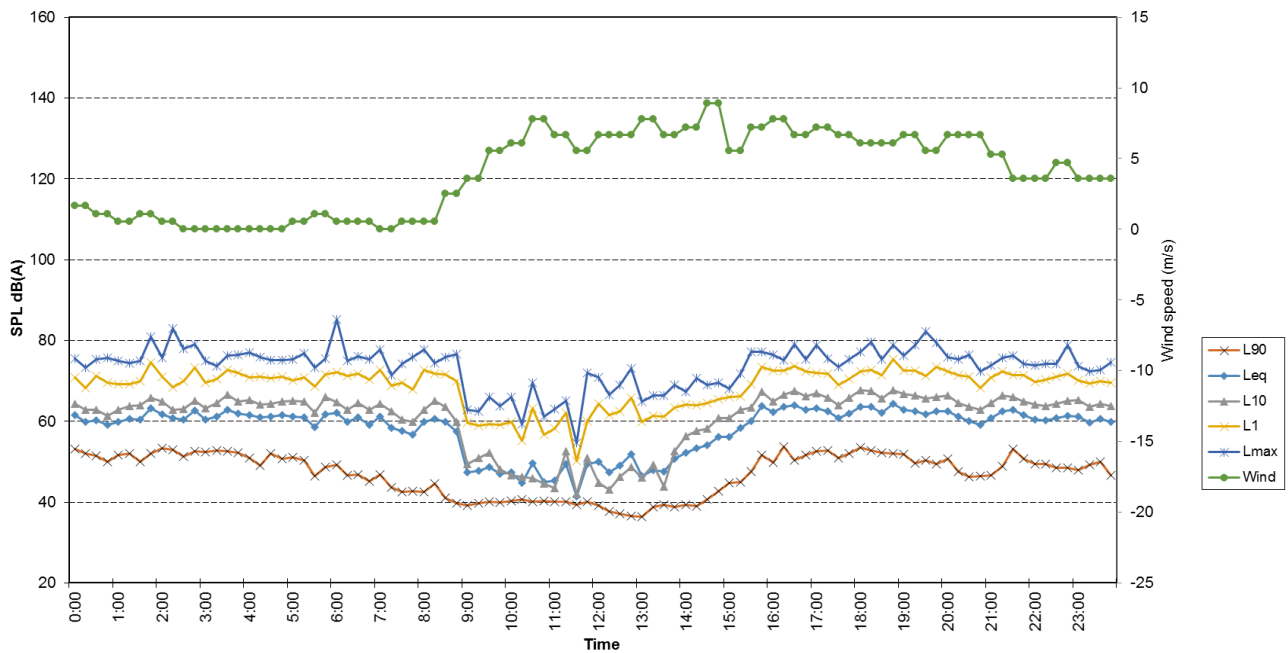
Location - NM02
Measured Noise Levels - Friday 24/11/2017



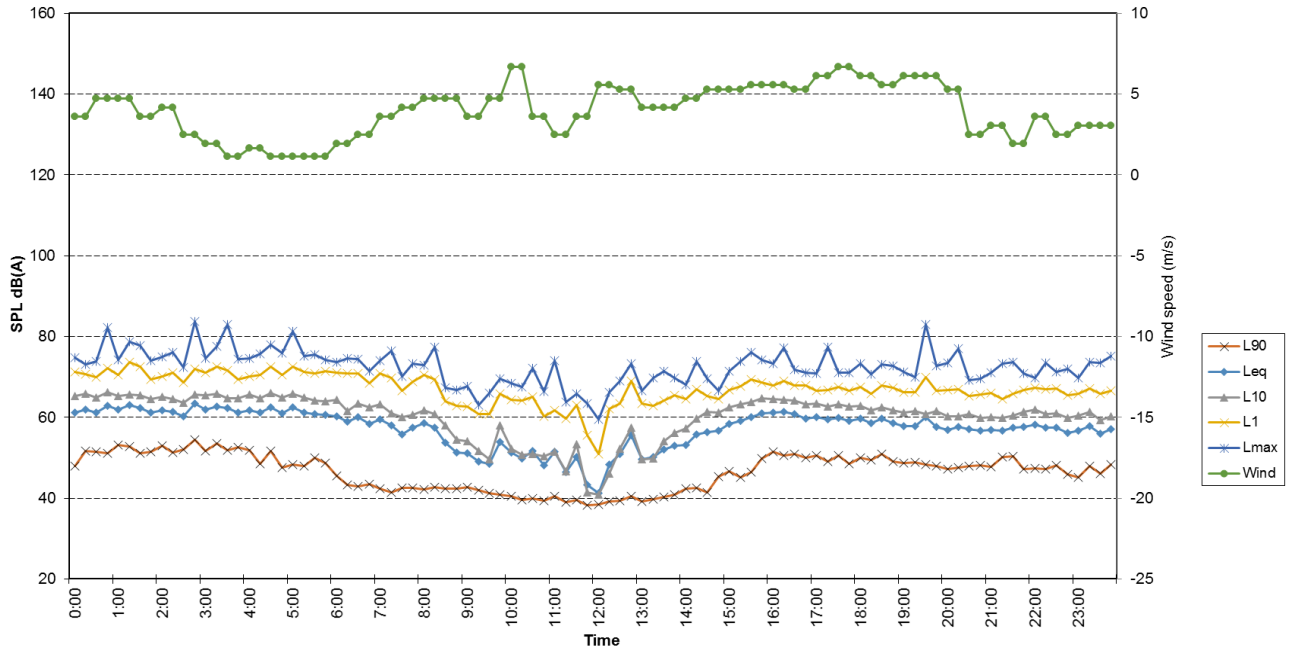
Location - NM02
Measured Noise Levels - Saturday 25/11/2017



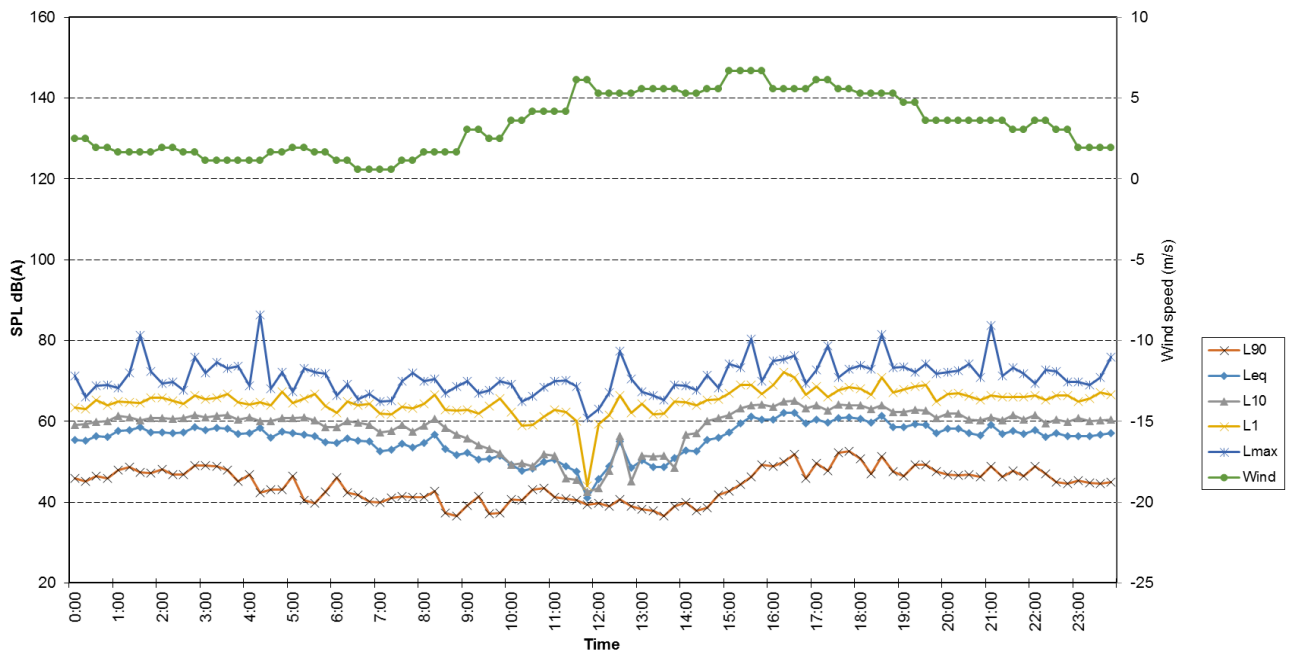
Location - NM02
Measured Noise Levels - Sunday 26/11/2017



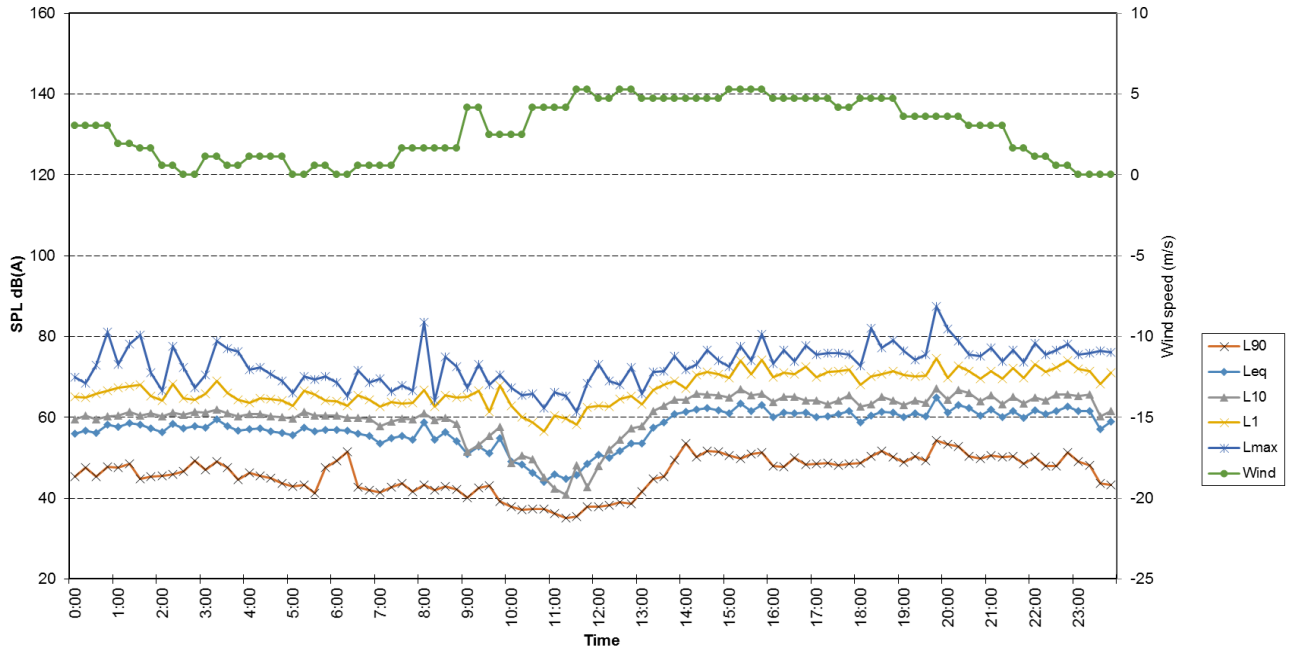
Location - NM02
Measured Noise Levels - Monday 27/11/2017



Location - NM02
Measured Noise Levels - Tuesday 28/11/2017



Location - NM02
Measured Noise Levels - Wednesday 29/11/2017



Location - NM02
Measured Noise Levels - Thursday 30/11/2017

