



REPORT 220734R1

Revision 2

Mechanical Plant Noise Impact Assessment
Nerang Park Poultry
45 - 60 Gilston Road, Nerang QLD

PREPARED FOR:
Hopegate Pty Ltd
T/A Nerang Park Poultry

5 September 2023



Mechanical Plant Noise Impact Assessment

Nerang Park Poultry

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1 INTRODUCTION

Rodney Stevens Acoustics Pty Ltd (here forth referred to as RSA) has been engaged by Nerang Park Poultry to prepare a Mechanical Noise Impact Assessment for the mechanical plant servicing the Nerang Park Poultry processing plant at 45-60 Gilston Road, Nerang QLD in response to a Pre-Enforcement Letter from the Department of Environment and Science.

This report details the results of attended noise readings conducted as background readings and cumulative impacts at the most affected residential receivers. The report also details the near field measurements of the mechanical plants at the processing plant and based on this data, a noise model has been developed.

Revision 2 of this report has been updated as a response to the *Notice requesting further information* as provided by the *Department of Environment and Science* dated 15 June 2023. Section C and items 12 to 22 requires further information in relation to the revision 1 of this acoustic report. In summary, version 2 of this report has been updated to include:

- Additional noise sources at the plant including the operation of forklifts, truck (movements and idling) and collection of offal.
- Background noise monitoring conducted at revised three locations (as discussed and approved by DES). The locations include 30 Onslow Street (front yard), 29 Mandarin Court (rear of the residential premises) and 22 Kotara Street (boundary of the plant and reserve).
- Revised noise modelling to include the additional noise sources.
- Revised noise control measures to account for the updated background noise logging and additional noise sources.

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

2 DEVELOPMENT

2.1 Development Site

The site is a poultry processing plant located at 45-60 Gilston Road, Nerang. The development site is bounded by adjoining residential receivers to the south, west and to the east. There are a number of sensitive receivers surrounding the proposed plant. This assessment focuses on the worst and only affected direction; south east, and towards residences on Tyson Circuit, Onslow Street and Kotara Street. Figure 2-1 shows an aerial image of the site area, the surrounding residential environment.

From a detailed site inspection of the processing plant and the location of complainants, the residences in Tyson Circuit are the worst affected and if noise levels were within legal guidelines at this location, then noise levels would be acceptable at all other residential locations.



Figure 2-1 Site Location



Image Courtesy of Google Maps 2023

3 NOISE SURVEY

3.1 Attended Noise Monitoring – May 2023

Attended noise measurements were carried out on 15th May 2023 (between 10:30am and 12:30pm) and 24th May 2023 (between 4:00 am and 6:00 am) at the locations shown in figure 2-1. Cumulative measurements were taken during 'normal' operation of the plant.

As the plant could not be shut down for the background readings, therefore the background readings were conducted at the locations that is not influenced by the operation of the plant. The background environment including the typical acoustic environment of the area including noise from the local traffic and the Pacific Highway.

A Svantek 959 Type I Sound Level Meter (S/N 12916) was used to conduct all the noise measurements. The meter calibration setting was reference checked at the start and end of the monitoring period with a Svan SV36 (S/N 116299) sound level calibrator. No significant drift was detected. Weather conditions were fine, temperature was 21°C, and wind speed was 0 m/s and coming from the southwest.

Noise measurements were conducted in accordance with Australian Standard AS1055 1997 *Acoustics – Description & Measurement of Environmental Noise - Part 1: General procedures* and the Queensland Department of Environment and Science (DES) Noise Measurement Manual (2020). Field calibration was checked before and after each measurement occasion with no significant drift (± 0.5 dB) observed.



Table 3-1 Operational Noise Measurements

Location	Noise Source	Descriptor - dB(A) L _{Aeq}	Comments
On the roof	2 x Cooling Towers	L _{Aeq} (30secs) 71 at 12m	Continual
	1 x Ice crusher	L _{Aeq} (30secs) 73 at 7m	Continual
	2 x Compressor	L _{Aeq} (30secs) 80 at 1m	Continual
	3 x Feather pump	L _{Aeq} (30secs) 64 at 1m	Fluctuating
	2 x Fresh air	L _{Aeq} (30secs) 68 at 1m	Continual
	6 x Cool room fans	L _{Aeq} (30secs) 68 at 1m	Continual
	6 x Odour Fans (live birds)	L _p 69 at 1m (manufacturer data)	Continual
Ground	Generator	L _{Aeq} (30secs) 81 at 1m	Continual
	Trident Fans	L _{Aeq} (30secs) 65 at 1m	Continual
	Killings	L _{Aeq} (30secs) 68 at 1m	Intermittent
Cumulative Location 1	Day: Plant operating 'normal'	L _{Aeq} (contribution) 61	Plant operating normally and audible at this location. Road traffic from the motorway also audible.
	Night: Plant operating 'normal'	L _{Aeq} (contribution) 48	Plant operating normally and audible at this location. Road traffic from the motorway also audible.
Cumulative Location 2	Day: Plant operating 'normal'	L _{Aeq} (contribution) 50	Plant operating normally and audible at this location. Road traffic from the motorway also audible.
	Night: Plant operating 'normal'	L _{Aeq} (contribution) 44	Plant operating normally and audible at this location. Road traffic from the motorway also audible.
Cumulative Location 3	Day: Plant operating 'normal'	L _{Aeq} (contribution) 61	Plant operating normally and inaudible at this location. Road traffic from the motorway also audible.
	Night: Plant operating 'normal'	L _{Aeq} (contribution) 59	Plant operating normally and inaudible at this location. Road traffic from the motorway also audible.



Table 3-2 Background Measurements

Location	Time	Descriptor - dB(A) L _{Aeq}	Comments
Background Location 1	Day (11:55 am to 12:10 pm)	L _{Aeq} 57	Influenced mainly by local road traffic, Motorway and no influence from the plant
		L _{A1} 60	
		L _{A10} 59	
		L _{A90} 54	
	Night (4:05 am to 4:20 am)	L _{Aeq} 51	Influenced mainly by local road traffic, Motorway and no influence from the plant
		L _{A1} 57	
		L _{A10} 52	
		L _{A90} 48	
Background Location 2	Day (12:15 pm to 12:30 pm)	L _{Aeq} 54	Influenced mainly by local road traffic, Motorway and no influence from the plant
		L _{A1} 59	
		L _{A10} 55	
		L _{A90} 51	
	Night (4:52 am to 5:07 am)	L _{Aeq} 49	Influenced mainly by local road traffic, Motorway and no influence from the plant
		L _{A1} 51	
		L _{A10} 50	
		L _{A90} 47	
Background Location 3	Day (12:32 am to 12:47 pm)	L _{Aeq} 66	Influenced mainly by local road traffic and no influence from the plant
		L _{A1} 73	
		L _{A10} 69	
		L _{A90} 52	
	Night (5:17 am to 5:32 am)	L _{Aeq} 65	Influenced mainly by local road traffic and no influence from the plant
		L _{A1} 76	
		L _{A10} 68	
		L _{A90} 50	

Figures below present the location of the background readings.

Figure 3-1 Background Measurement at Background Location 1



Figure 3-2 Background Measurement at Background Location 2



Figure 3-3 Background Measurement at Background Location 3



3.2 Noise Survey – August 2023

Attended and Unattended noise measurements were conducted on site and at the nearest residential receiver in accordance with Australian Standard AS1055 1997 *Acoustics – Description & Measurement of Environmental Noise - Part 1: General procedures* and the Queensland Department of Environment and Science (DES) Noise Measurement Manual (2020).

3.2.1 Attended Noise Survey

Additional attended noise monitoring were carried out on site on 23rd August 2023. The noise survey included the noise measurements of the truck movements, forklift movements, DAF and the Ammonia Plant.

A Svantek 959 Type I Sound Level Meter (S/N 12916) was used to conduct all the noise measurements. The meter calibration setting was reference checked at the start and end of the monitoring period with a Svan SV36 (S/N 116299) sound level calibrator. No significant drift was detected. Weather conditions were fine, temperature was 24°C, and wind speed was 0 m/s.

The table below shows all the noise sources as identified in May 2023 and August 2023 readings. The details of the unattended logging is provided in the sections to follow.



Table 3-3 Operational Noise Measurements

Location	Noise Source	Descriptor - dB(A) L _{Aeq}	Comments
On the roof	2 x Cooling Towers	L _{Aeq} (30secs) 71 at 12m	Continual
	1 x Ice crusher	L _{Aeq} (30secs) 73 at 7m	Continual
	2 x Compressor	L _{Aeq} (30secs) 80 at 1m	Continual
	3 x Feather pump	L _{Aeq} (30secs) 64 at 1m	Fluctuating
	2 x Fresh air	L _{Aeq} (30secs) 68 at 1m	Continual
	6 x Cool room fans	L _{Aeq} (30secs) 68 at 1m	Continual
	8 x Odour Fans (live birds)	L _p 69 at 1m (manufacturer data)	Continual
	Ammonia Plant	L _{Aeq} (30secs) 68 at 1m	Continual
Ground	Generator	L _{Aeq} (30secs) 81 at 1m	Continual
	Trident Fans	L _{Aeq} (30secs) 65 at 1m	Continual
	Killings	L _{Aeq} (30secs) 68 at 1m	Intermittent
	Dog trailer (Dog and trailer passby at 5 km/h)	L _{Aeq} (30secs) 84 at 1.5m	Continual (0.5 – 1.0min duration)
	Semi-Trailer – Idle	L _{Aeq} (30secs) 79 at 1.5m	Continual
	Semi-Trailer – reversing (with reserve alarm)	L _{Aeq} (30secs) 75 at 2m	Continual
	Semi-Trailer – passby at 5km/h	L _{Aeq} (30secs) 73 at 1.5m	Continual (2.0min duration)
	Forklift – moving with full pallet	L _{Aeq} (30secs) 77 at 1.5m	Continual



		Forklift – unloading and reversing	$L_{Aeq(30secs)}$ 75 at 1.5m	Continual
Cumulative Location 1 (May 2023)	Day: Plant operating 'normal'	$L_{Aeq(contribution)}$ 61	Plant operating normally and audible at this location. Road traffic from the motorway also audible.	
	Night: Plant operating 'normal'	$L_{Aeq(contribution)}$ 48	Plant operating normally and audible at this location. Road traffic from the motorway also audible.	
Cumulative Location 2 (May 2023)	Day: Plant operating 'normal'	$L_{Aeq(contribution)}$ 50	Plant operating normally and audible at this location. Road traffic from the motorway also audible.	
	Night: Plant operating 'normal'	$L_{Aeq(contribution)}$ 44	Plant operating normally and audible at this location. Road traffic from the motorway also audible.	
Cumulative Location 3 (May 2023)	Day: Plant operating 'normal'	$L_{Aeq(contribution)}$ 61	Plant operating normally and inaudible at this location. Road traffic from the motorway also audible.	
	Night: Plant operating 'normal'	$L_{Aeq(contribution)}$ 59	Plant operating normally and inaudible at this location. Road traffic from the motorway also audible.	

3.2.2 Unattended Noise Logging

In order to characterise the existing acoustical environment of the area, unattended noise monitoring was conducted between Wednesday 23rd August and Friday 1st September 2023 at the logging locations shown in Figure 2-1.

The noise monitoring at these locations are representative of the ambient noise of the area. The logger locations included:

- NL1: This logger was installed on the front yard of No. 30 Onslow Street. Due to the safety of the device, the logger was chained to the eastern fence. Figure below shows the location of the logger.

Figure 3-4 NL1 Logger Location



- NL2: This logger was installed in the backyard of No. 29 Mandarin Court. The logger was chained to the back fence and on the side of the plant. This configuration was setup as the residential premises had dogs which could damage the logger. As the logger was installed on the boundary of the residential premises and the plant, there will be no difference in the ambient noise levels inside the backyard and this location. Figure below shows the location of the logger.

Figure 3-5 NL2 Logger Location



- NL3: This logger was installed on Kotara Street. The logger was installed across the road from No. 22 Kotara Street. The logger was installed on the plants side of the fence as indicated in Figure 2-1 This location was selected due to security concerns. Figure below shows the location of the logger.

Figure 3-6 NL3 Logger Location



Logger location was selected with consideration to other noise sources which may influence readings, security issues for noise monitoring equipment and gaining permission for access from other landowners.

Instrumentation for the survey comprised of three ARL Ngara environmental noise loggers (serial numbers 878079, 8780C7 and 8780B0) fitted with microphone windshields. Calibration of the loggers was checked prior to and following measurements. Drift in calibration did not exceed ± 0.5 dB(A). All equipment carried appropriate and current NATA (or manufacturer) calibration certificates. Measured data did not contain any adverse weather conditions upon consultation with historical weather reports provided by the Bureau of Meteorology.

The logger determines L_{A1} , L_{A10} , L_{A90} and L_{Aeq} levels of the ambient noise. L_{A1} , L_{A10} , L_{A90} are the levels exceeded for 1%, 10% and 90% of the sample time respectively (see Glossary for definitions in Appendix A). Detailed results at the monitoring location are presented in graphical format in Appendix B. The graphs show measured values of L_{A1} , L_{A10} , L_{A90} and L_{Aeq} for each 15-minute monitoring period.

In order to establish the appropriate noise criteria, background noise levels at the three locations. The background readings below were established where the noise from the plant was not operational. These levels were established as advised from the plant that all the plants and equipment were off. The plants and equipment, particularly the rooftop cooling fans, were shut down for the duration of the below measurements. As these fans service the storage facility for the chicken, it was impractical for the fans to be shut down for longer than 30 minutes.



Table 3-4 Measured Baseline Noise Levels Corresponding to Defined DES Periods

Location	Measurement Descriptor	Measured Noise Level – dB(A) re 20 µPa		
		Daytime (Sat 26/8/ 9 am – 9:15 am	Evening n/a	Night-time (Sun 27/8) 5 am – 5:15 am
NL1: 30 Onslow Street	L _{Aeq}	51	n/a	42
	L _{A90}	46	n/a	40
NL2: 29 Mandarin Court	L _{Aeq}	53	n/a	41
	L _{A90}	45	n/a	35
NL3: Kotara Street	L _{Aeq}	54	n/a	45
	L _{A90}	50	n/a	43

L_{Aeq} Equivalent continuous (energy average) A-weighted sound pressure level. It is defined as the steady sound level that contains the same amount of acoustic energy as the corresponding time-varying sound.

L_{A90} Noise level present for 90% of time (background level). The average minimum background sound level (in the absence of the source under consideration).

4 NOISE CRITERIA - ASSESSMENT

4.1 Department of Environmental Science (DES) - Environmental Protection Policy 2019

The environmental values for the acoustic environment as specified in the Part 6 of the Environmental Protection (Noise) Policy 2019 include the following as relevant to sensitive receptors (dwellings):

6 Environmental values

The environmental values to be enhanced or protected under this policy are—

- (a) the qualities of the acoustic environment that are conducive to protecting the health and biodiversity of ecosystems; and*
- (b) the qualities of the acoustic environment that are conducive to human health and wellbeing, including by ensuring a suitable acoustic environment for individuals to do any of the following—*
 - (i) sleep;*
 - (ii) study or learn;*
 - (iii) be involved in recreation, including relaxation and conversation;*

The Environmental Protection (Noise) Policy 2019 specifies acoustic quality objectives in Schedule 1 that are stated to be prescribed for enhancing or protecting the environmental values at sensitive receptors. The relevant acoustic quality objectives for dwellings that, if reasonable in the circumstances, are applied for the protection of environmental values relating to health and wellbeing are presented in Table 4-1.



Table 4-1 Acoustic Quality Objectives - Environmental Protection (Noise) Policy 2019

Sensitive Receptor	Time of day L_{Aeq}	Acoustic quality objectives (measured at the receptor) dB(A)			Environmental value
		$L_{Aeq, adj, 1hr}$	$L_{A10, adj, 1hr}$	$L_{A1, adj, 1hr}$	
Residential (outdoors)	Daytime and Evening	50	55	65	Health and Wellbeing

Experience of RSA in the assessment of industry noise demonstrates the L_{Aeq} acoustic descriptor is more stringent than the $LA1$ and $LA10$. On this basis, this assessment has focussed on the more stringent L_{Aeq} acoustic descriptor.

Part 9 of the Environmental Protection (Noise) Policy 2019 states the management intent for noise from an activity that may affect an environmental value, including minimisation of background noise creep.

(2) To the extent it is reasonable to do so, noise must be dealt with in a way that ensures— (a) the noise does not have any adverse effect, or potential adverse effect, on an environmental value under this policy; and

(b) background creep in an area or place is prevented or minimised.

Contemporary noise criteria schemes consider the intrusiveness of time-varying noise from an activity based upon the L_{Aeq} , adjusted, T statistical noise parameter on a 'background plus excess' basis. The Guideline - Noise control - Planning for noise control (DEHP, 2015) applies a specific noise level criterion based upon an allowable 3 dB(A) $L_{Aeq, 1hr}$ excess above the Rating Background Level for the night period.

4.1.1 Summary of Project Noise Criteria

Having defined the area type, the processed results of the unattended noise monitoring have been used to determine project specific project trigger noise levels presented in Table 4-2. These project trigger noise levels are nominated for the purpose of assessing potential noise impacts from the existing facility.

Table 4-2 Project Noise Criteria

Sensitive Receptor	Time of day L_{Aeq}	Adopted Noise Criteria - dB(A)	
		$L_{Aeq, adj, 1hr}$	
Residential (Outdoors) NL1: Onslow St & Tyson Ct	Daytime - 7am to 6pm	50	
	Evening - 6pm to 10pm	n/a	
	Night-time - 10pm to 7am	43	
Residential (Outdoors) NL2: Mandarin Ct	Daytime - 7am to 6pm	50	
	Evening - 6pm to 10pm	n/a	
	Night-time - 10pm to 7am	38	
Residential (Outdoors) NL3: Kotara St	Daytime - 7am to 6pm	50	
	Evening - 6pm to 10pm	n/a	
	Night-time - 10pm to 7am	46	



5 NOISE IMPACT ASSESSMENT

5.1 Hours of Operation

The premises currently operates as follows:

Monday to Friday from 5:45 am to 2:00 pm.

Note that the first kill starts from 5:45 am. It is at this time that the mechanical plants start operating. However, the cooling fans on the rooftop operate all the time.

5.2 Truck Movements and Mechanical Plant Summary

At present, the trucks arrive on site prior to the start of the killings. The trucks enter the premises from Gilston Road and travel through the weigh bridge through the gates and to the killing shed area. From here the trucks do not operate.

At the first killing, the fans start operating and shut down at 2:00 pm. The only fans that are operational are the cool room fans located on the roof.

A list of all the mechanical plants along with the measured noise levels are presented in Table 3-1.

5.3 3D Model Scenario – Normal Operation

Noise modelling for the site that been undertaken utilising the Soundplan 8.2 acoustic modelling package that uses ISO 9613 Acoustics – Attenuation of sound during propagation outdoors (ISO, 1996) algorithm.

To predict the noise levels, noise data in Table 3-1 and

Table 5-1 Noise Modelling Parameters/Assumptions

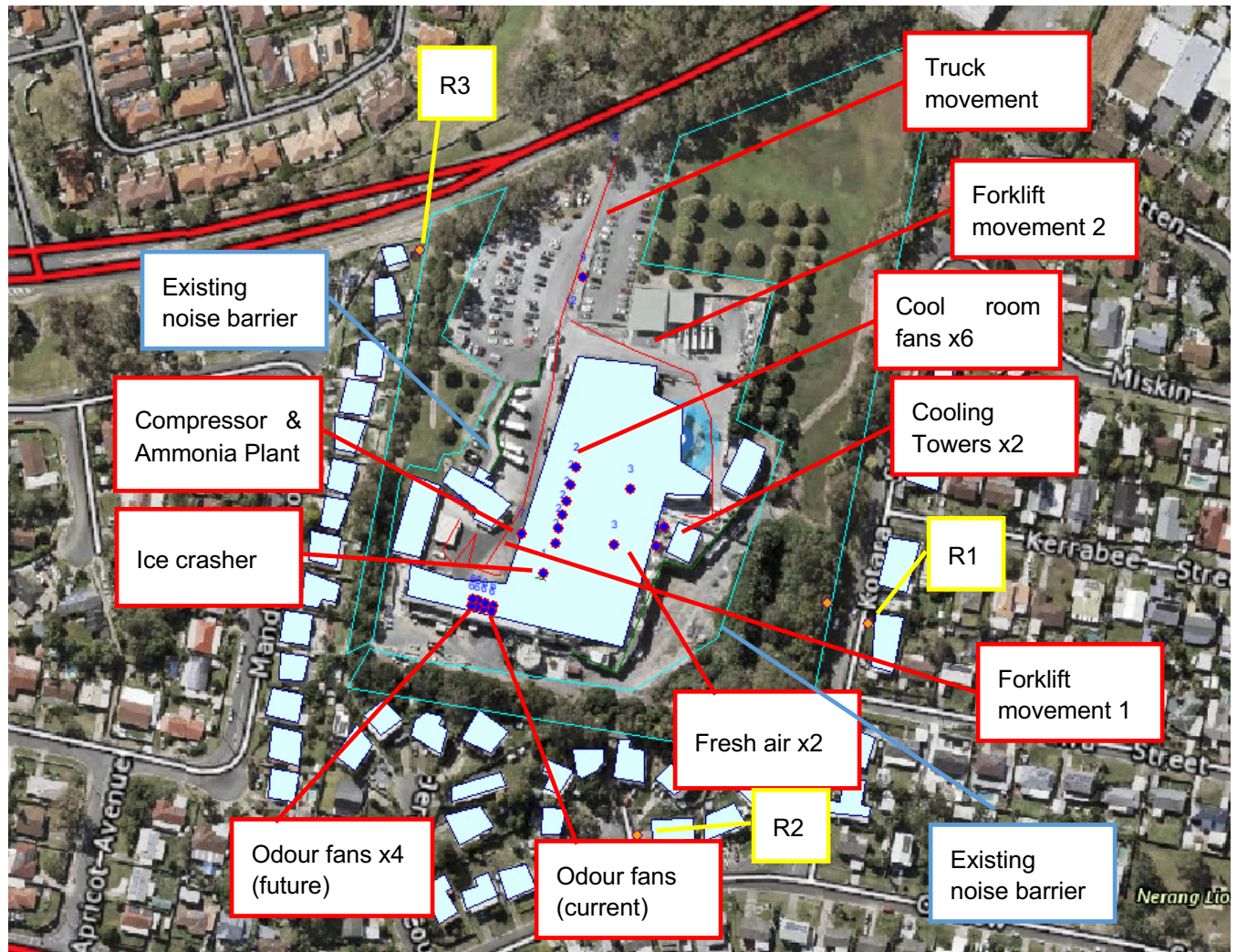
Modelling Parameters	
Noise Propagation Algorithm	ISO9613
Wind Direction	Calm
Ground Absorption Coefficient (no paved areas)	0.75
Receivers and Contour Maps Height	1.5 m
Temperature and Humidity	20°C – 80%

The noise modelling takes into consideration the sound power level of the proposed site operations, activities and equipment, and applies adjustments for attenuation from geometric spreading, acoustic shielding from intervening ground topography, ground effect, meteorological effects and atmospheric absorption.

The main contributors to the noise impact the surrounding residences are the mechanical plants and equipment located on the roof. There is shielding from the existing barriers to attenuate the noise from the trucks and the forklift movements.

Figure below presents the noise model layout along with the noise sources and the current noise barriers.

Figure 5-1 Noise Sources Locations



Predictive resultant noise levels have been calculated for all mechanical plant items. Noise emissions at the nearest residential receivers are presented in the table below. The predicted noise calculations take into account the following:

Night time operation (5:45am to 7am):

- 1 semi trailer entering the site from Gilston Road. The truck traveling along the “Truck Movement” path as indicative in Figure 5-1. The truck idling on the weigh bridge for 60 seconds.
- Forklift unloading/loading the trailer (Forklift movement 1)
- All mechanical plants on the ground level and rooftop in full operation.
- Noise levels as per Table 3-3.
- Noise impact to the nearest receptors as indicated in Figure 5-1.

Daytime operation (7am to 2pm):

- 1 semi trailer entering the site from Gilston Road. The truck traveling along the “Truck Movement” path as indicative in Figure 5-1. The truck idling on the weigh bridge for 60 seconds.



- Forklift unloading/loading the trailer (Forklift movement 1)
- Forklift conducting site activities (Forklift movement 1 & 2)
- All mechanical plants on the ground level and rooftop in full operation.
- Collection of Offal by Dog+Trailer truck. Truck traveling along the “Truck Movement” path.
- Noise levels as per Table 3-3.
- Noise impact to the nearest receptors as indicated in Figure 5-1.

5.3.1 Predicted Noise Levels

Based on the operation noise impact assessment, the following noise levels have been calculated at the nearby residential receptors.

Table 5-2 Predicted Noise Impact Levels

Sensitive Receptor	Time of day	Noise Criteria - dB(A)	Predicted Noise Impact - dB(A)	Complies?
		$L_{Aeq, adj, 15min}$	$L_{Aeq, adj, 15min}$	
R1	Day	50	52	No
R2		50	49	Yes
R3		50	32	Yes
R1	Night	43	52	No
R2		38	49	No
R3		46	32	Yes

These predicted levels are consistent with the measured cumulative noise levels. The noise impact to residents show exceedance to the noise criteria. Further noise control measures are recommended to be installed on site. The above noise map is presented in Appendix B

5.4 3D Model Scenario – Normal Operation with Treatment

From the above predicted and measured noise levels, there is exceedance at the receiver located at R1 which is located at R1 receiver by 9dB and R2 receiver by 11 dB.

In order to reduce the noise impact at the residential receiver, further noise treatment is recommended. These measures are presented in Section 6 below.

When incorporating the noise control measures into the noise model, the following noise impact can be expected.

Table 5-3 Predicted Noise Impact Levels

Sensitive Receptor	Time of day	Noise Criteria - dB(A)	Predicted Noise Impact - dB(A)	Complies?
		$L_{Aeq, adj, 15min}$	$L_{Aeq, adj, 15min}$	
R1	Day	50	43	Yes
R2		50	36	Yes
R3		50	38	Yes



R1	Night	43	43	Yes
R2		38	36	Yes
R3		46	38	Yes

Based on the installation of the noise control measures, compliance can be achieved at the impacted noise receptors.

The above noise map is presented in Appendix B.

6 RECOMMENDATIONS

The following noise control measures are recommended to be installed at the factory in order to achieve acoustic compliance.

6.1 Odour Fan – Noise Barrier

A noise barrier is recommended to be installed around the odour fans located on the roof for the live killing area. The acoustic barrier to provide the adequate noise attenuation, the construction material of the barriers must have a surface density of 10-15 kg/m² and be free from holes and gaps. Some suitable materials include:

- 25 mm thick plywood timber panelling
- 9 mm thick fibre cement sheet
- 75mm thick Hebel Powerpanel
- Flexishield acoustic panel
- Any other approved material which meets the above surface density specification

All barriers must be free of gaps and penetrations and it is particularly important to ensure that the gap at the bottom of the barrier is minimised as far as practicable. The base of the barriers should be well sealed at the junction where the barrier meets the floor, but still be designed to allow proper water drainage.

The location of the barrier is as below:

Figure 6-1 Odour Fan Barrier



6.2 Odour Fan – Silencer

The odour fans are to have silencers installed on the outtake fan. The silencers are to be compatible with the manufacturer recommended airflow and static pressure requirements. As the additional odour fans have not been selected yet, specific silencer details cannot be determined. For the purposes of this NIA, a reduction of 12dB has been assumed. Prior to the purchase of any new odour fan, the acoustic performance and the appropriate silencer should be determined by a qualified acoustic consultant.

6.3 Cool towers – Treatment

The main contributor to the noise impact are the 2 cooling towers located near the western boundary of the site. The fans located in the cooling towers are located above the existing barrier and therefore have a direct line of sight with the receivers on Kotara Street.

In order to attenuate the noise from the fans, a 3m barrier is recommended to be installed around the top of the cooling towers. The following figure provides an indicative location on the treatment option.

Figure 6-2 Cooling Tower Treatment



6.4 POM Recommendations

The facility is recommended to update the Plan of Management to include:

- Trucks are not to idle while loading/unloading, on the weight bridge and/or anywhere on site.
- Trucks are not permitted to use horns unless in an emergency.
- Trucks are not permitted to use compression break while on site.
- Forklifts to be fitted with squawker reversing alarms.



7 CONCLUSION

A noise impact assessment has been conducted in relation to the operation of the existing mechanical plant servicing the Nerang Park Poultry plant at 45 - 60 Gilston Road, Nerang QLD 4211.

Based on the noise survey and the predicted model for the site, there are exceedances at the receivers on Kotara Street and Tyson Court. Further noise control measures have been presented in Section 6 of this report to enable the site to operate in an acoustically compliant manner.

Approved: -

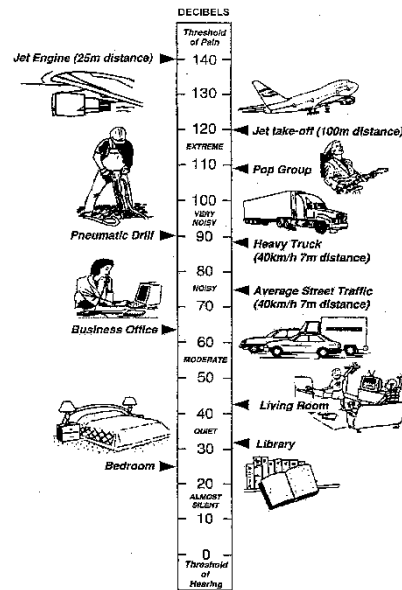
Rodney Stevens
Manager/Principal



Appendix A – Acoustic Terminology

A-weighted sound pressure	The human ear is not equally sensitive to sound at different frequencies. People are more sensitive to sound in the range of 1 to 4 kHz (1000 – 4000 vibrations per second) and less sensitive to lower and higher frequency sound. During noise measurement an electronic ' <i>A-weighting</i> ' frequency filter is applied to the measured sound level <i>dB(A)</i> to account for these sensitivities. Other frequency weightings (B, C and D) are less commonly used. Sound measured without a filter is denoted as linear weighted <i>dB(linear)</i> .
Ambient noise	The total noise in a given situation, inclusive of all noise source contributions in the near and far field.
Community annoyance	<p>Includes noise annoyance due to:</p> <ul style="list-style-type: none">■ character of the noise (e.g. sound pressure level, tonality, impulsiveness, low-frequency content)■ character of the environment (e.g. very quiet suburban, suburban, urban, near industry)■ miscellaneous circumstances (e.g. noise avoidance possibilities, cognitive noise, unpleasant associations) <p>human activity being interrupted (e.g. sleep, communicating, reading, working, listening to radio/TV, recreation).</p>
Compliance	The process of checking that source noise levels meet with the noise limits in a statutory context.
Cumulative noise level	The total level of noise from all sources.
Extraneous noise	Noise resulting from activities that are not typical to the area. Atypical activities may include construction, and traffic generated by holiday periods and by special events such as concerts or sporting events. Normal daily traffic is not considered to be extraneous.
Feasible and reasonable measures	<p>Feasibility relates to engineering considerations and what is practical to build; reasonableness relates to the application of judgement in arriving at a decision, considering the following factors:</p> <p>Noise mitigation benefits (amount of noise reduction provided, number of people protected).</p> <p>Cost of mitigation (cost of mitigation versus benefit provided).</p> <p>Community views (aesthetic impacts and community wishes).</p> <p>Noise levels for affected land uses (existing and future levels, and changes in noise levels).</p>
Impulsiveness	Impulsive noise is noise with a high peak of short duration or a sequence of these peaks. Impulsive noise is also considered annoying.

Low frequency	Noise containing major components in the low-frequency range (20 to 250 Hz) of the frequency spectrum.
Noise criteria	The general set of non-mandatory noise levels for protecting against intrusive noise (for example, background noise plus 5 dB) and loss of amenity (e.g. noise levels for various land use).
Noise level (goal)	A noise level that should be adopted for planning purposes as the highest acceptable noise level for the specific area, land use and time of day.
Noise limits	Enforceable noise levels that appear in conditions on consents and licences. The noise limits are based on achievable noise levels, which the proponent has predicted can be met during the environmental assessment. Exceedance of the noise limits can result in the requirement for either the development of noise management plans or legal action.
Performance-based goals	Goals specified in terms of the outcomes/performance to be achieved, but not in terms of the means of achieving them.
Rating Background Level (RBL)	The rating background level is the overall single figure background level representing each day, evening and night time period. The rating background level is the 10 th percentile min L _{A90} noise level measured over all day, evening and night time monitoring periods.
Receptor	The noise-sensitive land use at which noise from a development can be heard.
Sleep disturbance	Awakenings and disturbance of sleep stages.
Sound and decibels (dB)	<p>Sound (or noise) is caused by minute changes in atmospheric pressure that are detected by the human ear. The ratio between the quietest noise audible and that which should cause permanent hearing damage is a million times the change in sound pressure. To simplify this range the sound pressures are logarithmically converted to decibels from a reference level of 2×10^{-5} Pa.</p> <p>The picture below indicates typical noise levels from common noise sources.</p>



dB is the abbreviation for decibel – a unit of sound measurement. It is equivalent to 10 times the logarithm (to base 10) of the ratio of a given sound pressure to a reference pressure.

Sound power Level (SWL)

The sound power level of a noise source is the sound energy emitted by the source. Notated as SWL, sound power levels are typically presented in $dB(A)$.

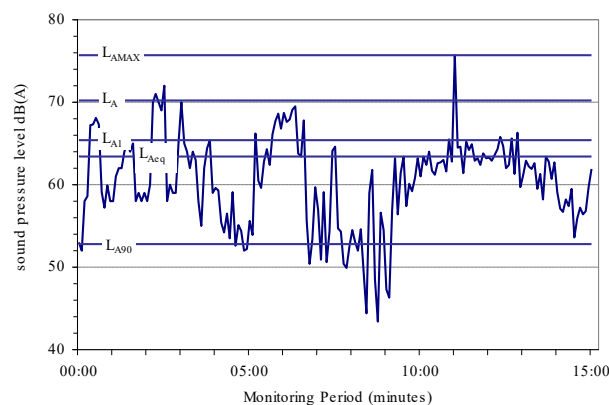
Sound Pressure Level (SPL)

The level of noise, usually expressed as SPL in $dB(A)$, as measured by a standard sound level meter with a pressure microphone. The sound pressure level in $dB(A)$ gives a close indication of the subjective loudness of the noise.

Statistic noise levels

Noise levels varying over time (e.g. community noise, traffic noise, construction noise) are described in terms of the statistical exceedance level.

A hypothetical example of A weighted noise levels over a 15-minute measurement period is indicated in the following figure:



Key descriptors:

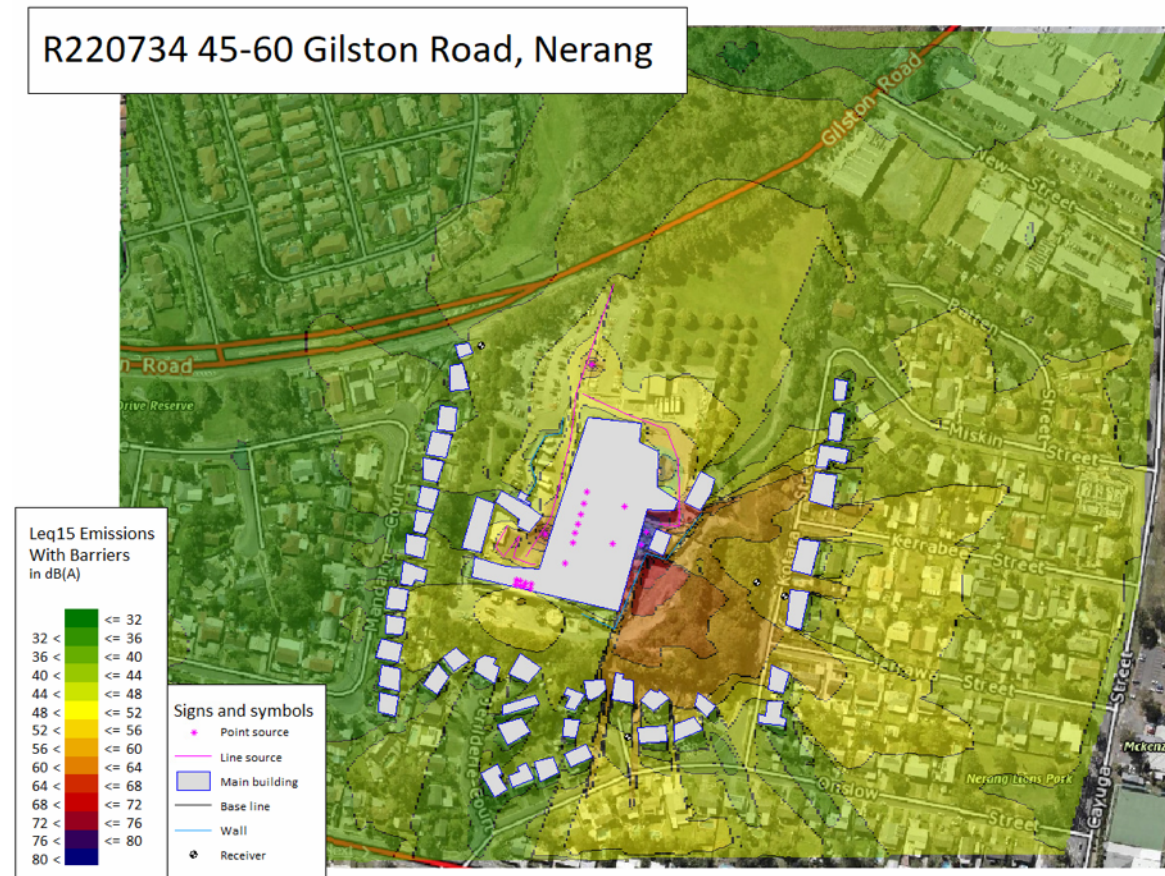


	<p>L_{Amax} Maximum recorded noise level.</p> <p>L_{A1} The noise level exceeded for 1% of the 15 minute interval.</p> <p>L_{A10} Noise level present for 10% of the 15-minute interval. Commonly referred to the average maximum noise level.</p> <p>L_{Aeq} Equivalent continuous (energy average) A-weighted sound pressure level. It is defined as the steady sound level that contains the same amount of acoustic energy as the corresponding time-varying sound.</p> <p>L_{A90} Noise level exceeded for 90% of time (background level). The average minimum background sound level (in the absence of the source under consideration).</p>
Threshold	<p>The lowest sound pressure level that produces a detectable response (in an instrument/person).</p>
Tonality	<p>Tonal noise contains one or more prominent tones (and characterised by a distinct frequency components) and is considered more annoying. A 2 to 5 dB(A) penalty is typically applied to noise sources with tonal characteristics</p>



Appendix B – Predicted Noise Maps

No Treatment





With Treatment

R220734 45-60 Gilston Road, Nerang



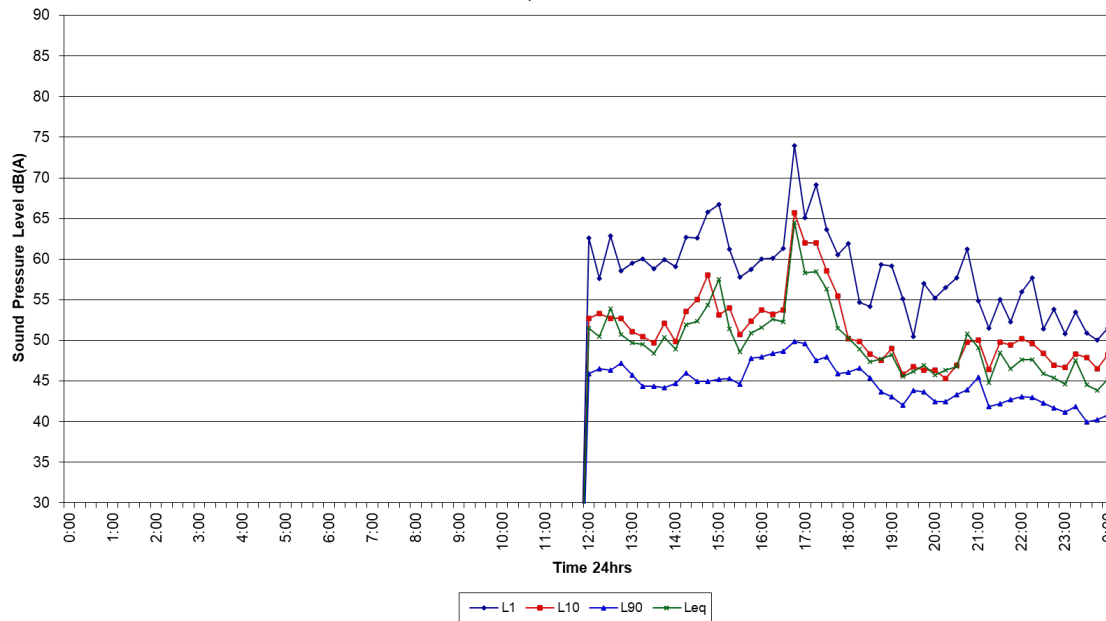


Appendix C – Unattended Background Noise Logging

Background Noise Logging

NL1 - 30 Onslow Street

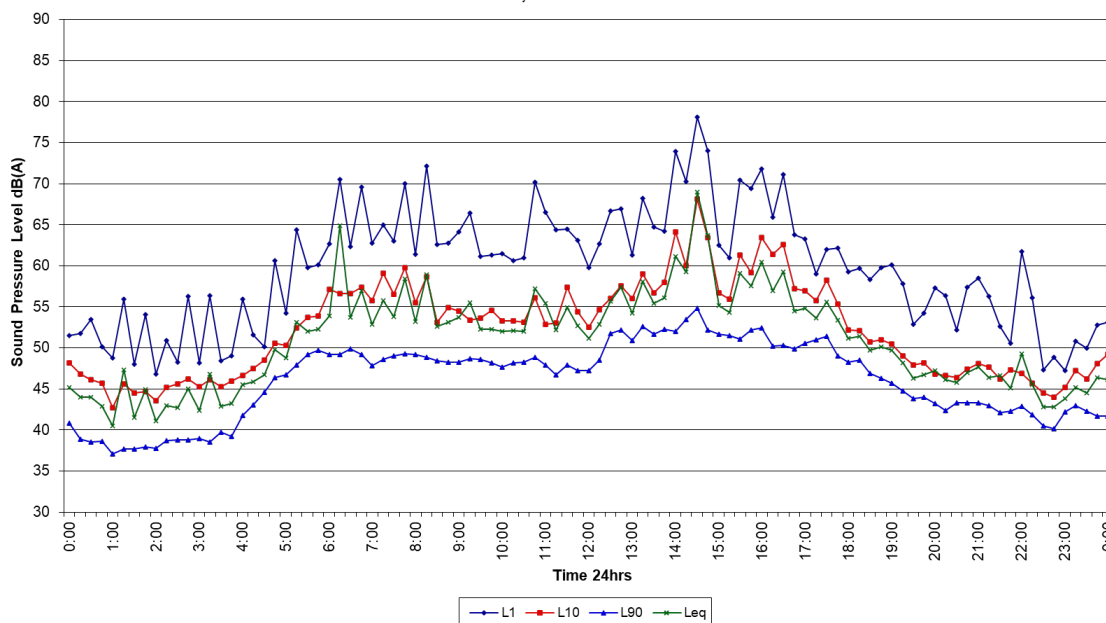
Wednesday 23/08/2023



Background Noise Logging

NL1 - 30 Onslow Street

Thursday 24/08/2023

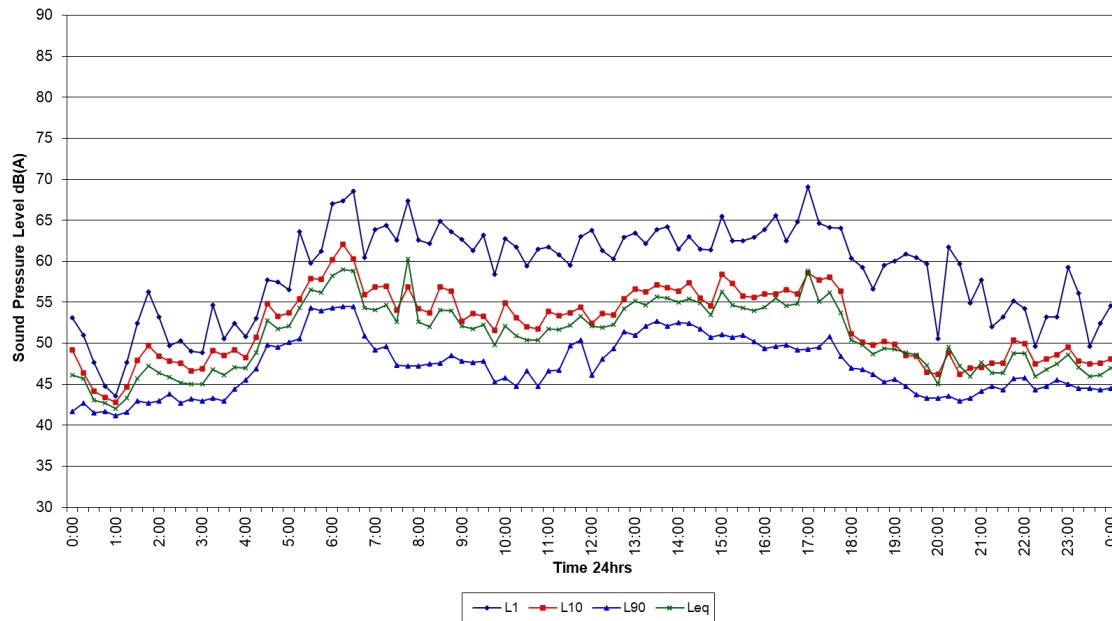




Background Noise Logging

NL1 - 30 Onslow Street

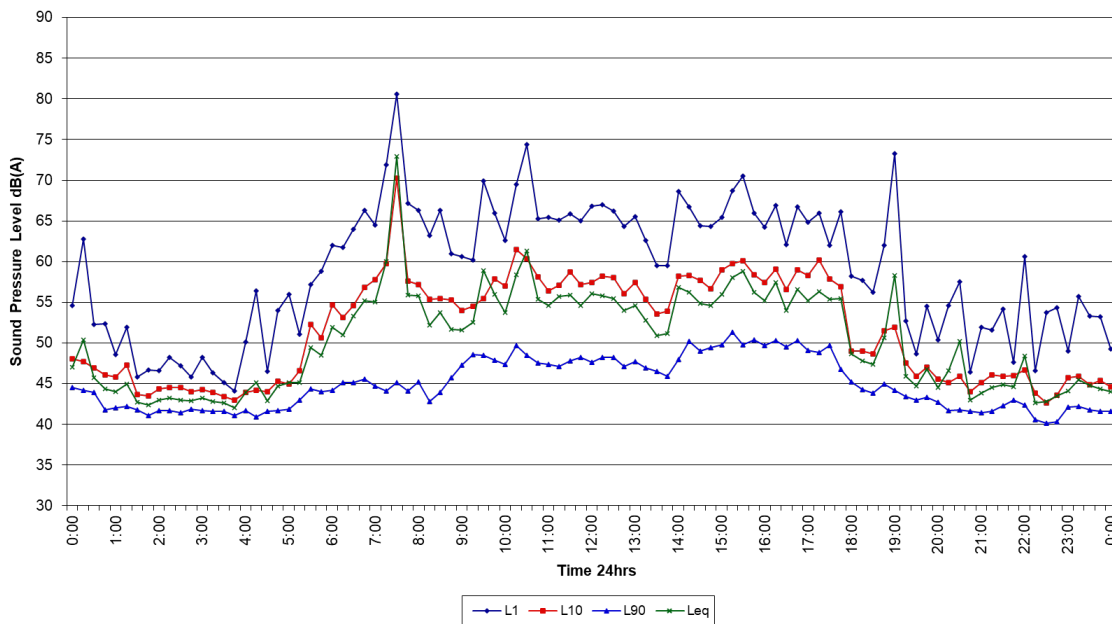
Friday 25/08/2023



Background Noise Logging

NL1 - 30 Onslow Street

Saturday 26/08/2023

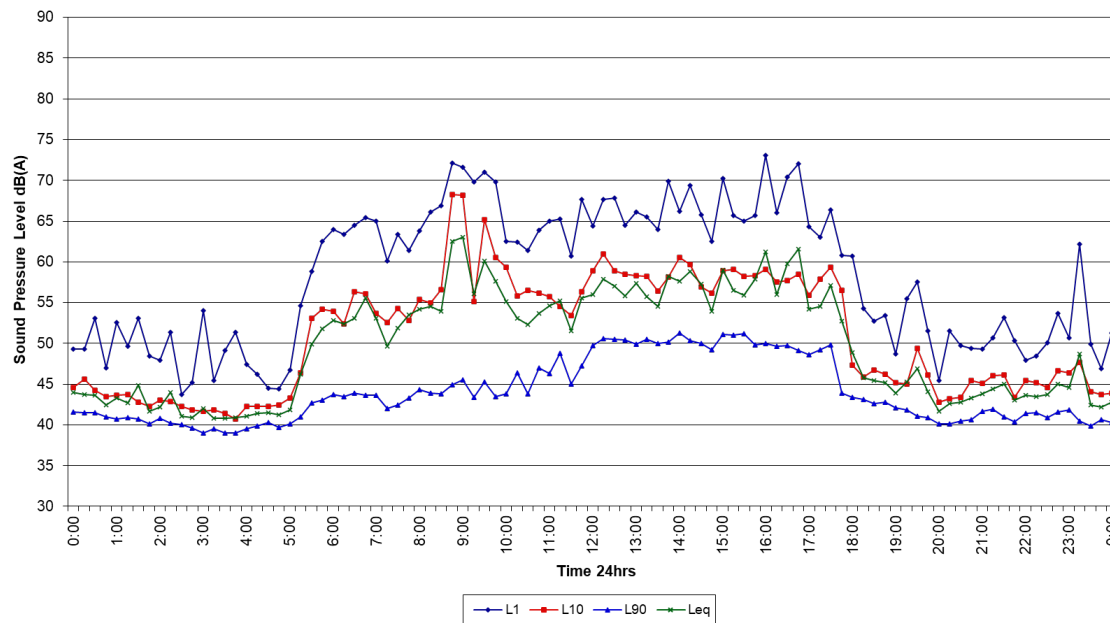




Background Noise Logging

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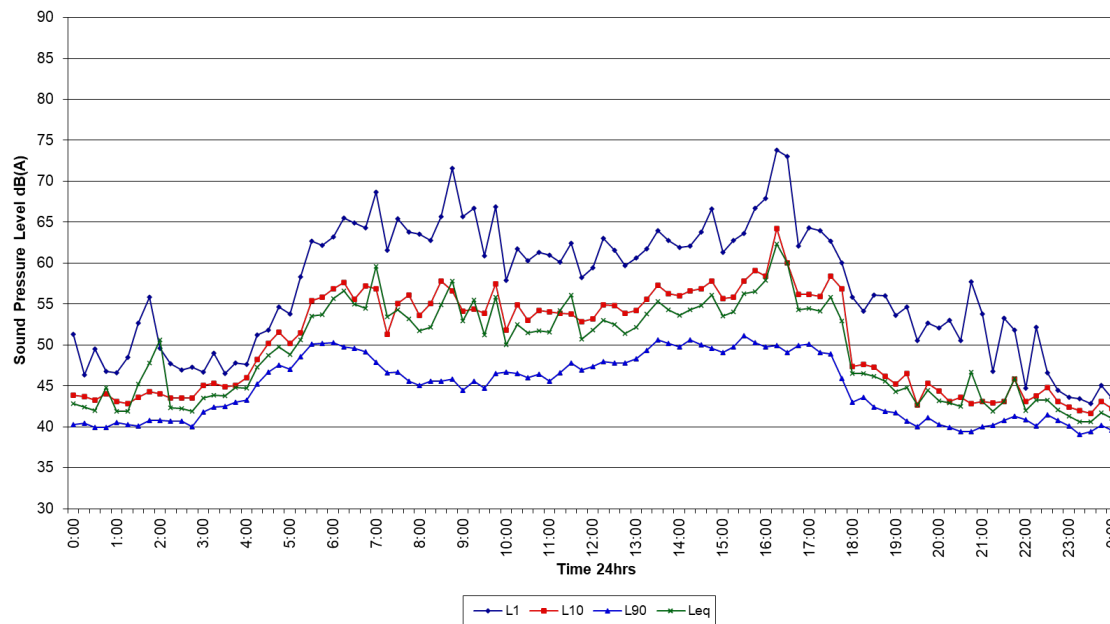
Sunday 27/08/2023



Background Noise Logging

NL1 - 30 Onslow Street

Monday 28/08/2023

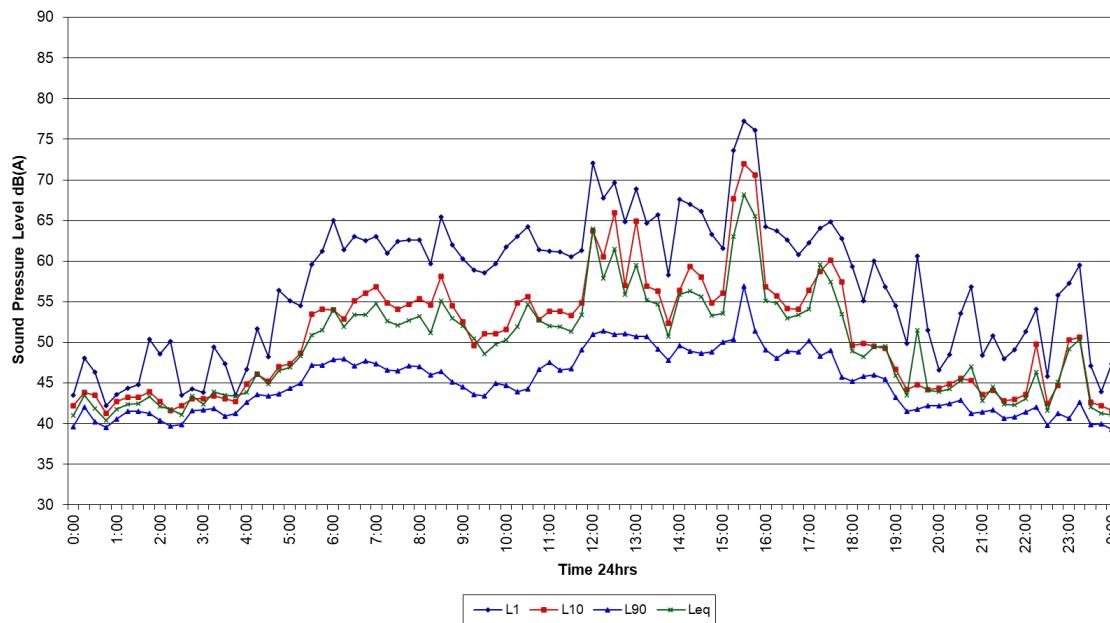




Background Noise Logging

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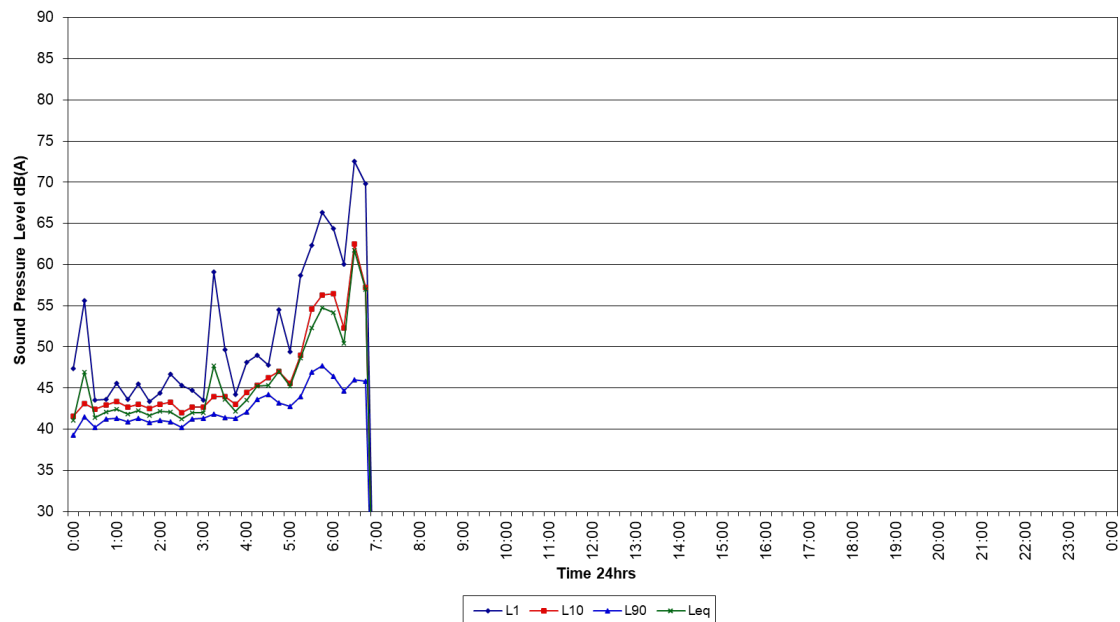
Tuesday 29/08/2023



Background Noise Logging

NL1 - 30 Onslow Street

Wednesday 30/08/2023

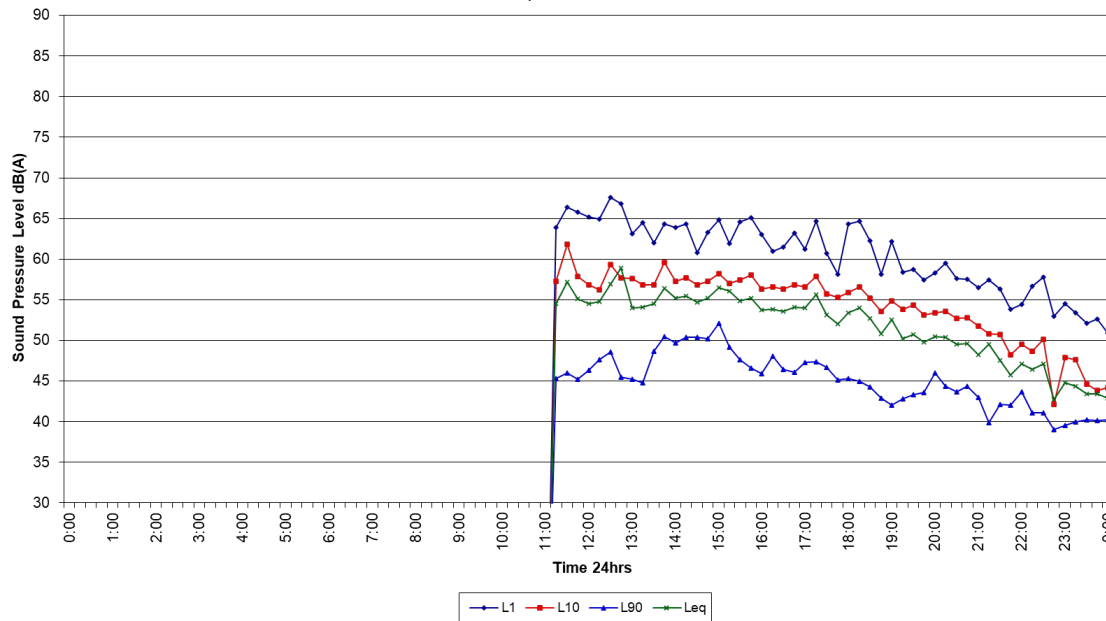




Background Noise Logging

NL2 - 29 Mandarin Court

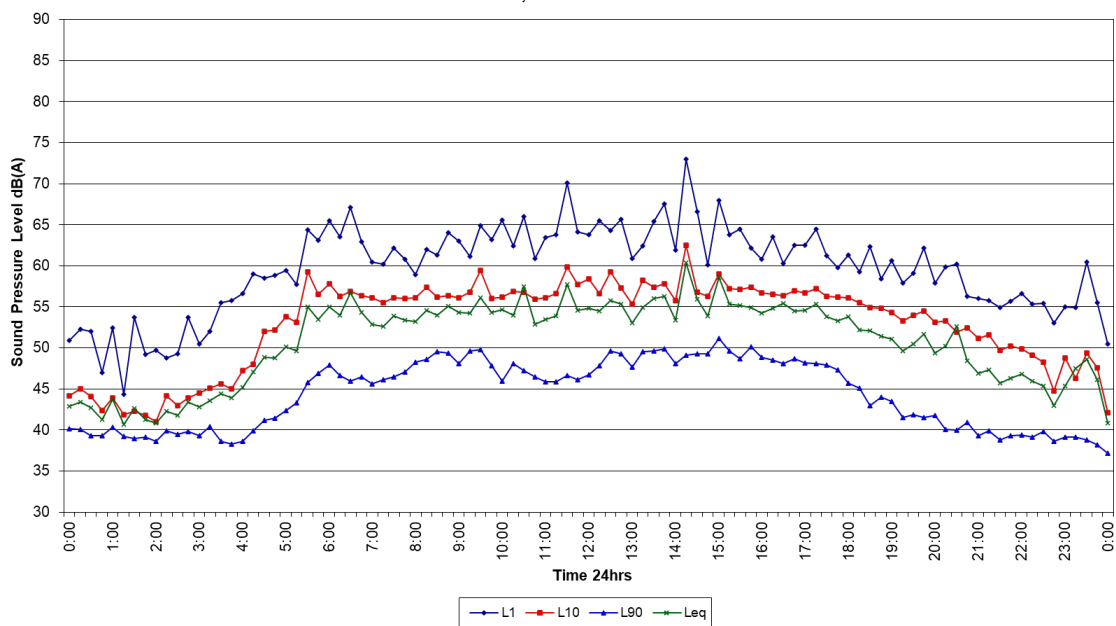
Wednesday 23/08/2023



Background Noise Logging

NL2 - 29 Mandarin Court

Thursday 24/08/2023

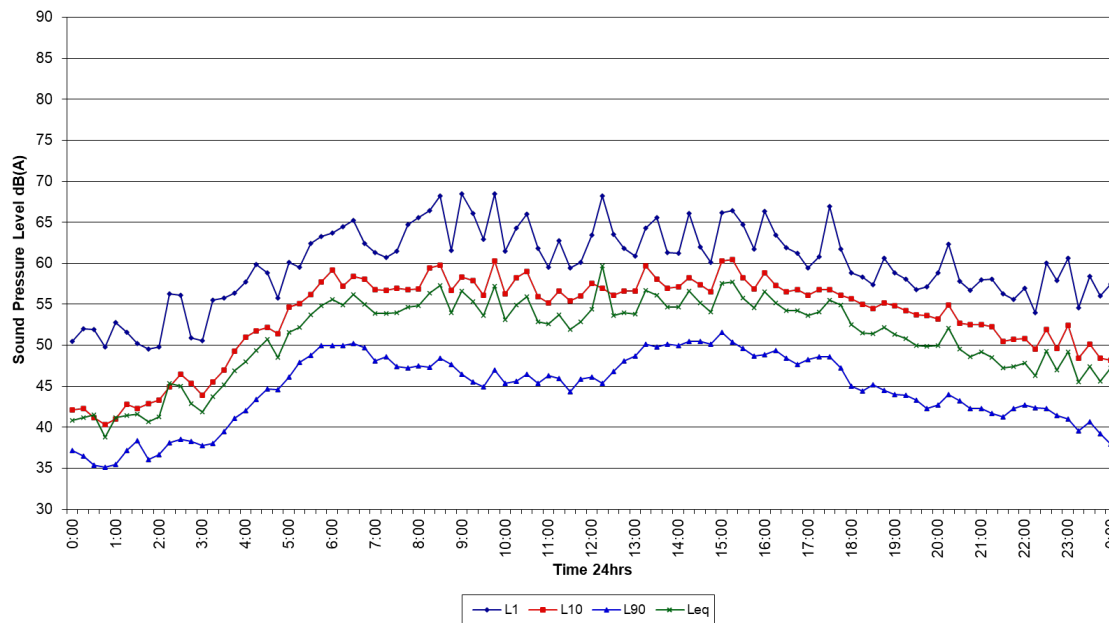




Background Noise Logging

NL2 - 29 Mandarin Court

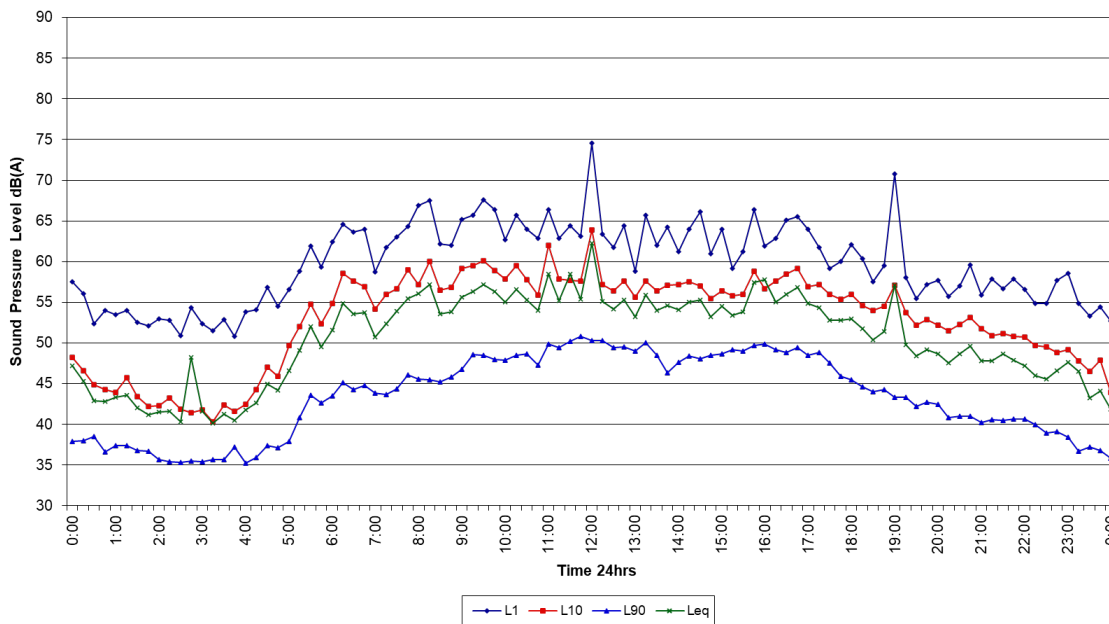
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Background Noise Logging

NL2 - 29 Mandarin Court

Saturday 26/08/2023

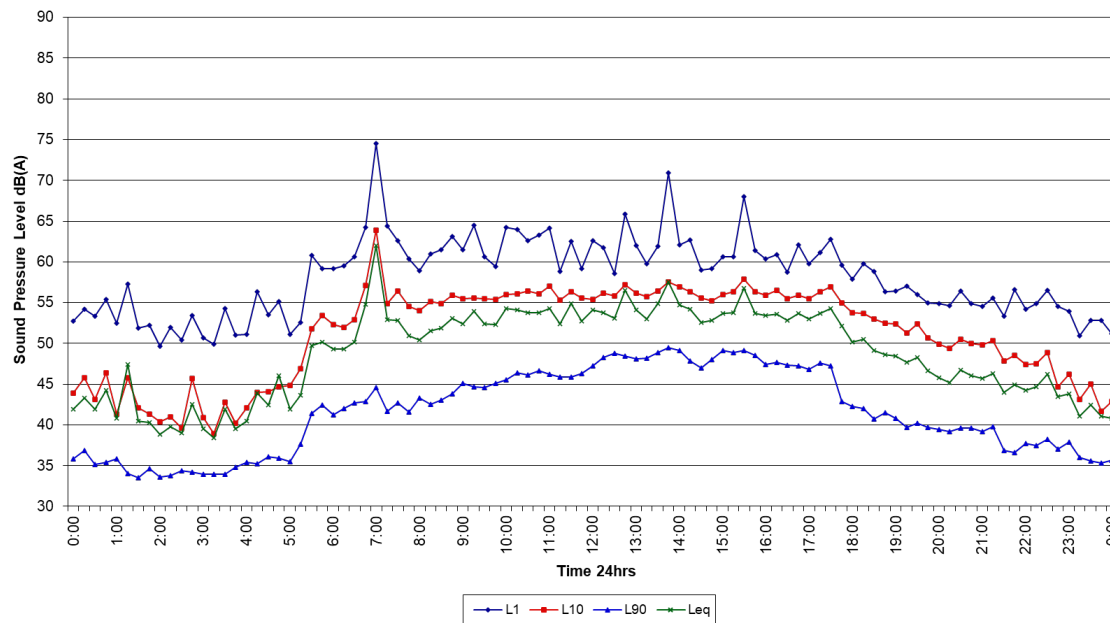




Background Noise Logging

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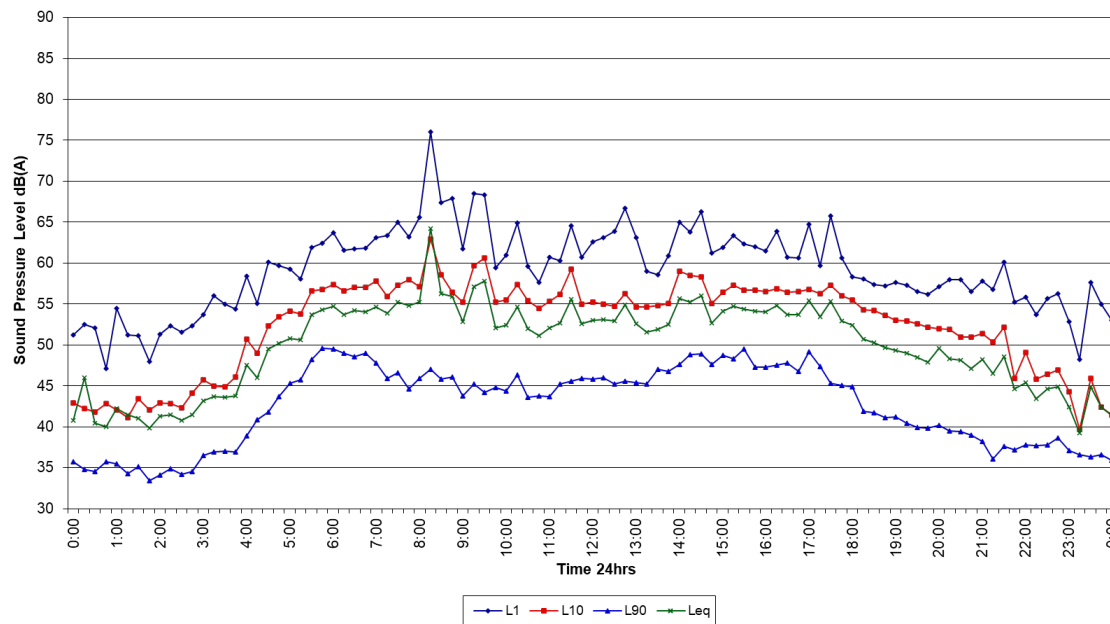
Sunday 27/08/2023



Background Noise Logging

NL2 - 29 Mandarin Court

Monday 28/08/2023

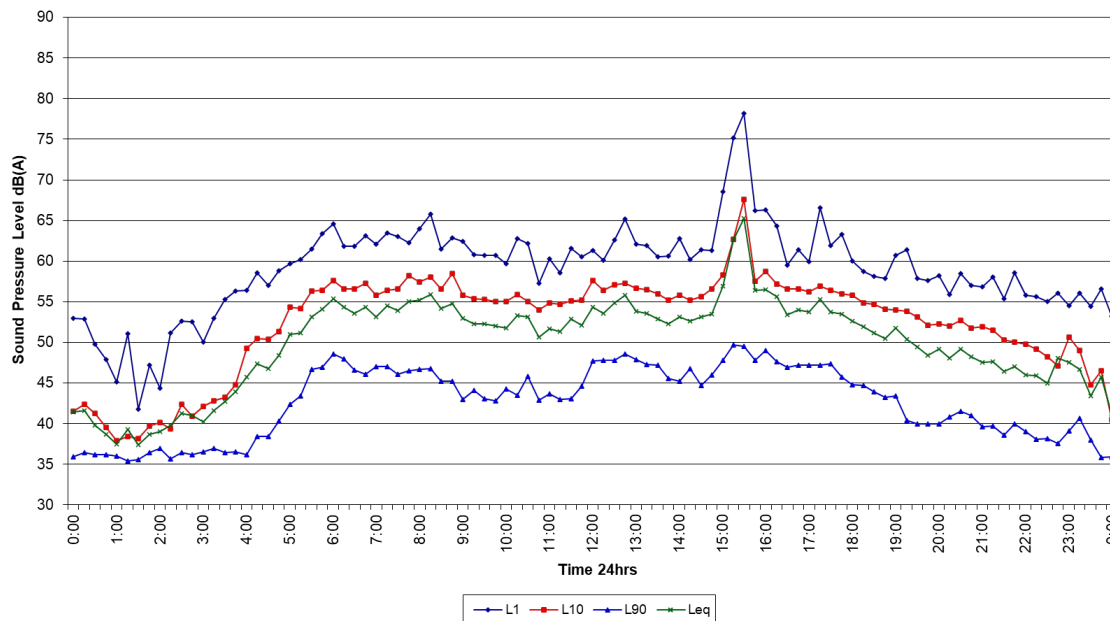




Background Noise Logging

NL2 - 29 Mandarin Court

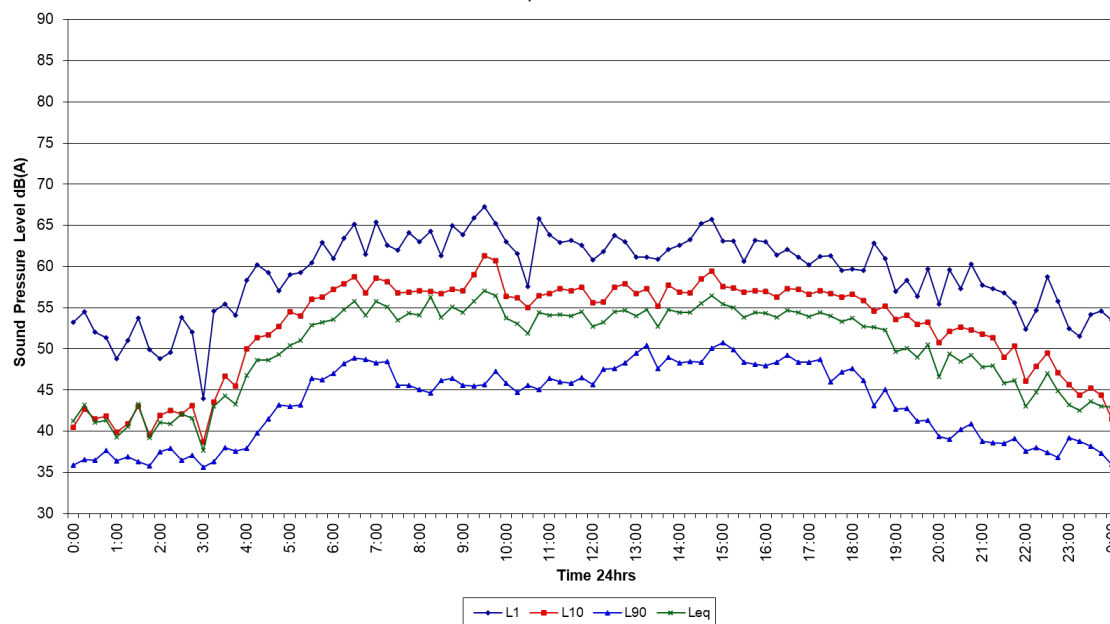
Tuesday 29/08/2023



Background Noise Logging

NL2 - 29 Mandarin Court

Wednesday 30/08/2023

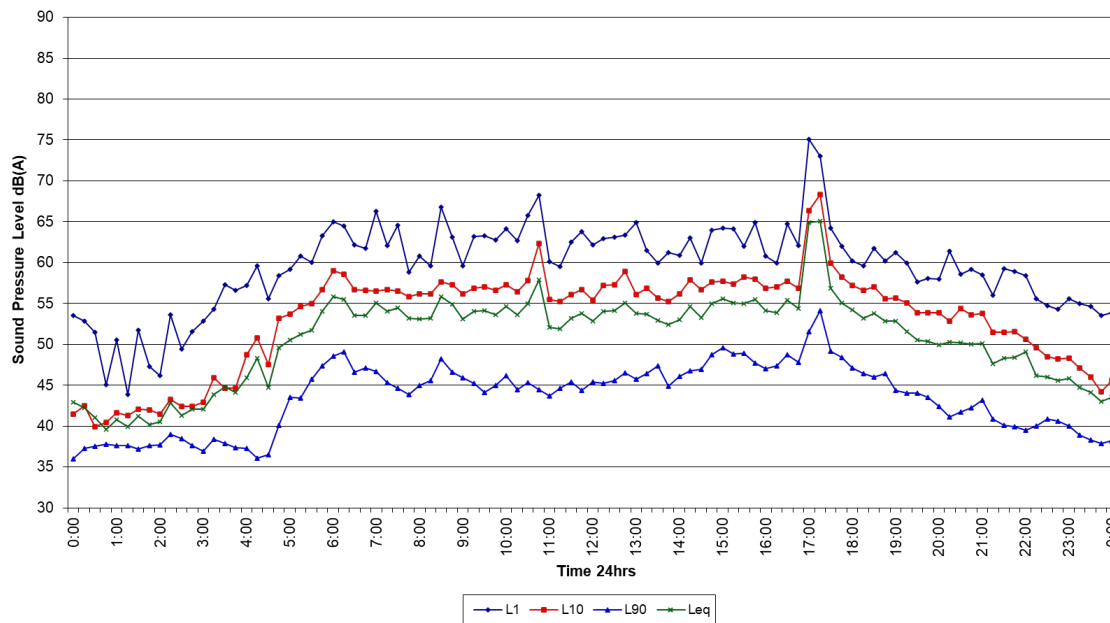




Background Noise Logging

NL2 - 29 Mandarin Court

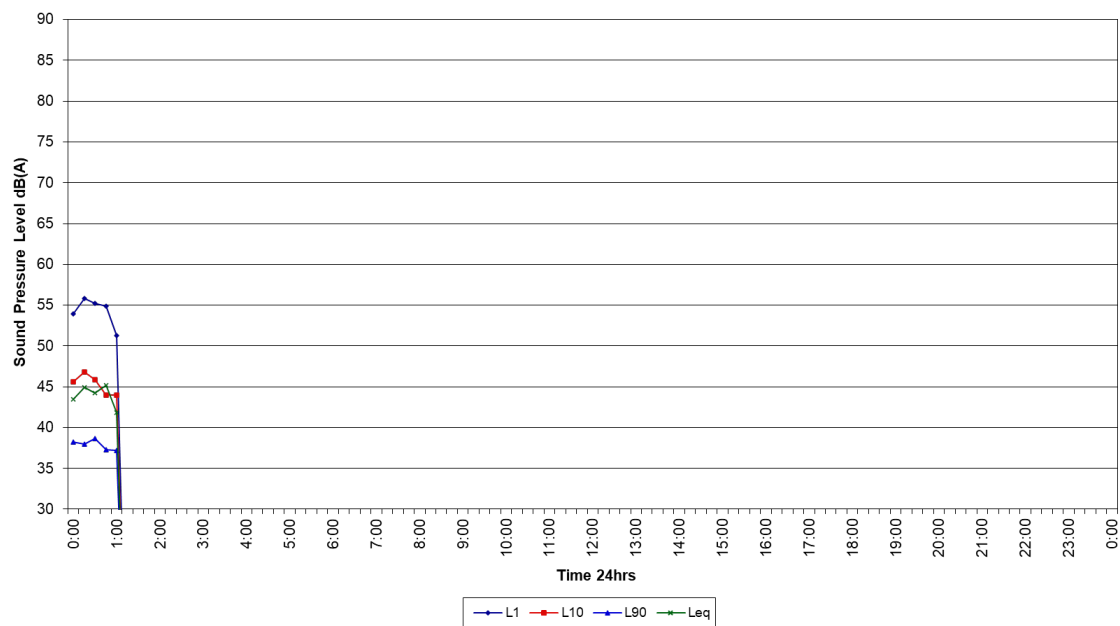
Thursday 31/08/2023



Background Noise Logging

NL2 - 29 Mandarin Court

Friday 1/09/2023

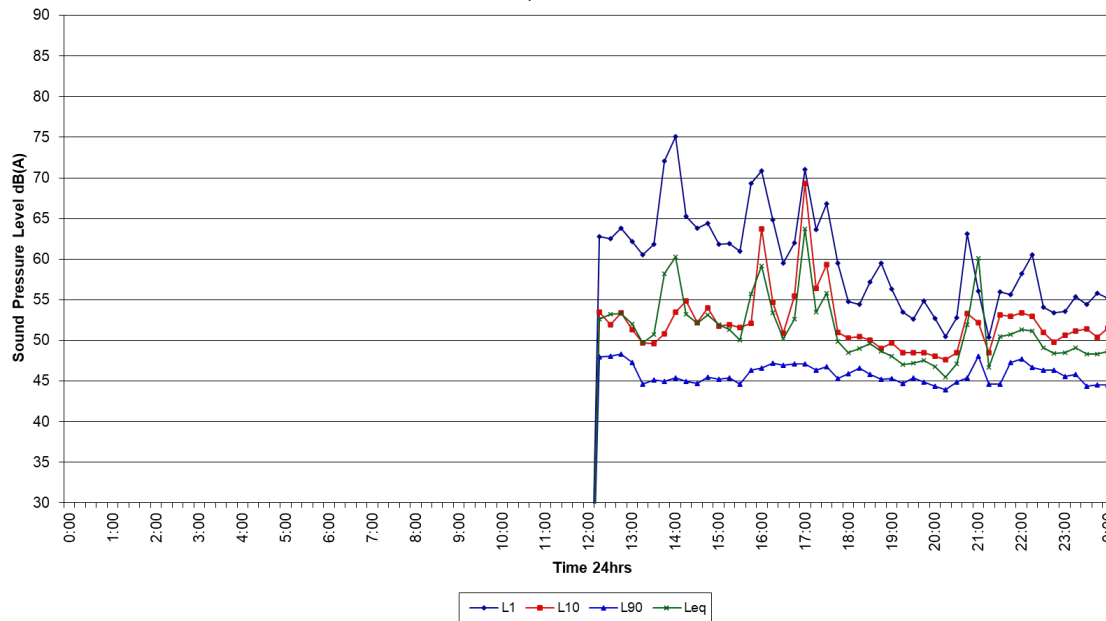




Background Noise Logging

NL3 - Kotara Street

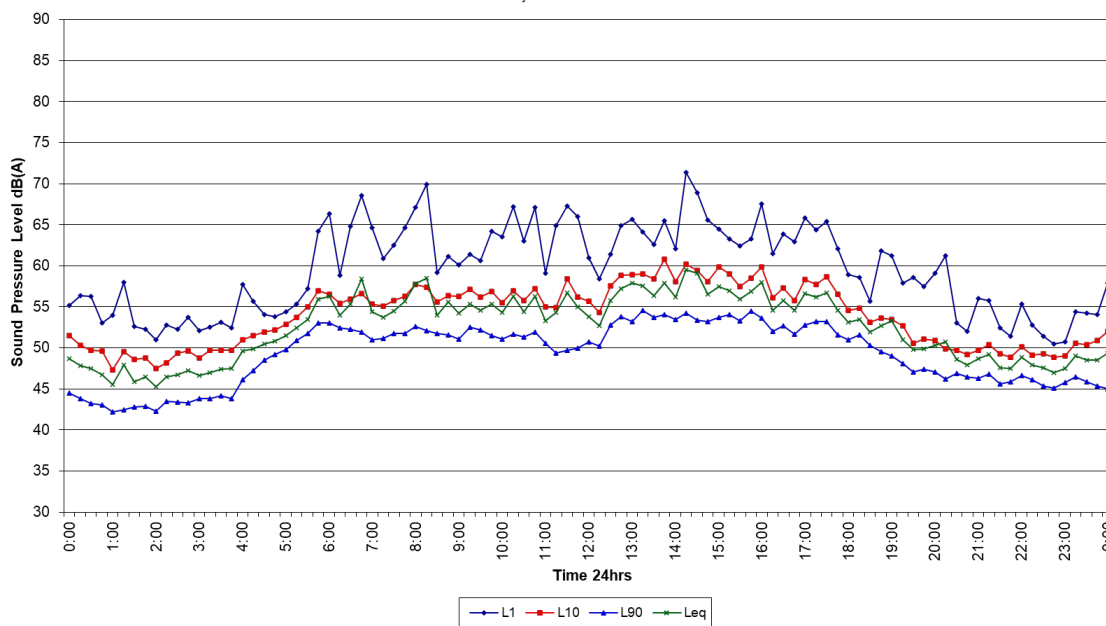
Wednesday 23/08/2023



Background Noise Logging

NL3 - Kotara Street

Thursday 24/08/2023

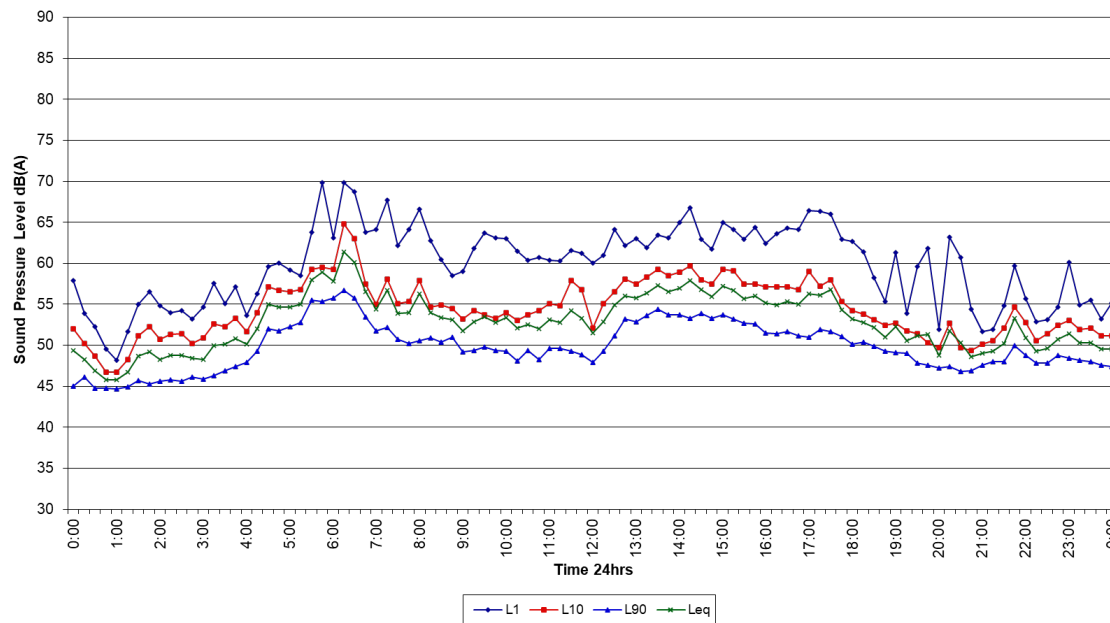




Background Noise Logging

NL3 - Kotara Street

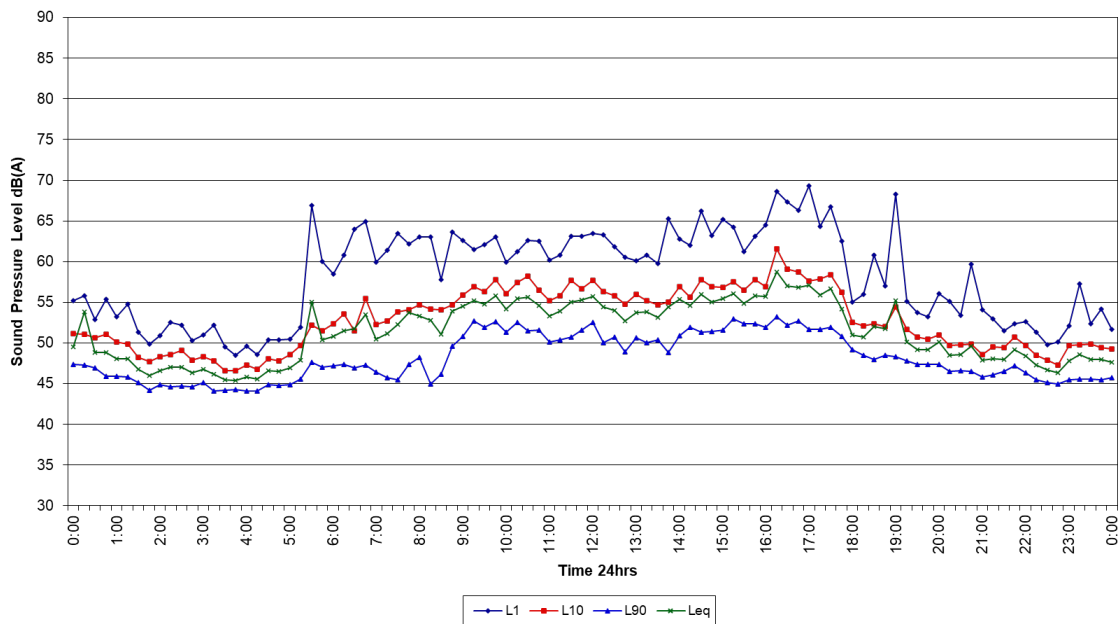
Friday 25/08/2023



Background Noise Logging

NL3 - Kotara Street

Saturday 26/08/2023

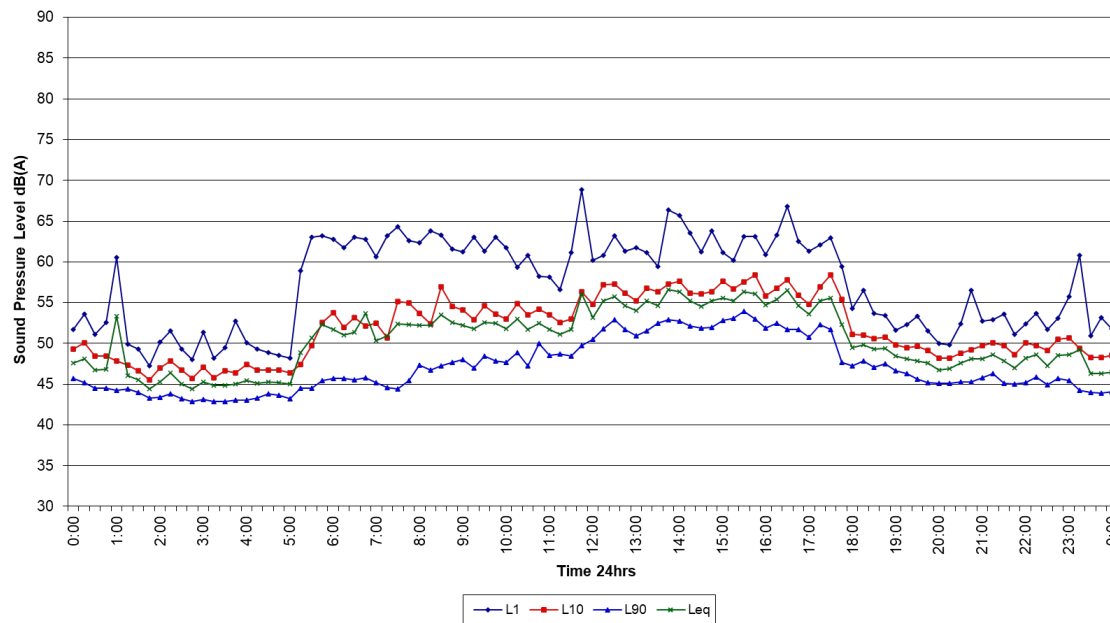




Background Noise Logging

NL3 - Kotara Street

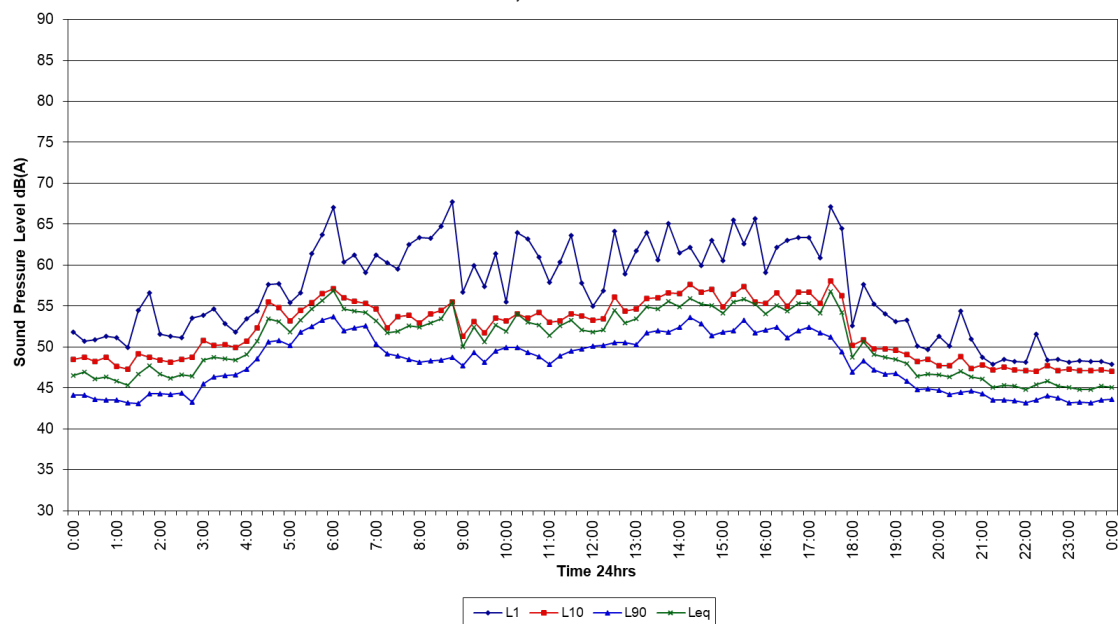
Sunday 27/08/2023



Background Noise Logging

NL3 - Kotara Street

Monday 28/08/2023

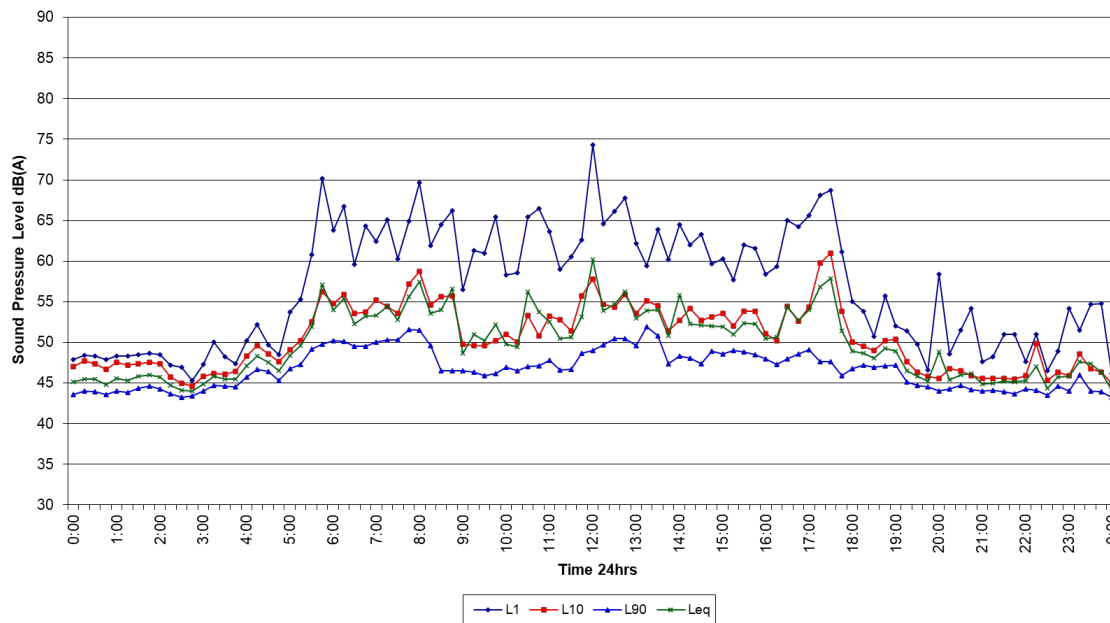




Background Noise Logging

NL3 - Kotara Street

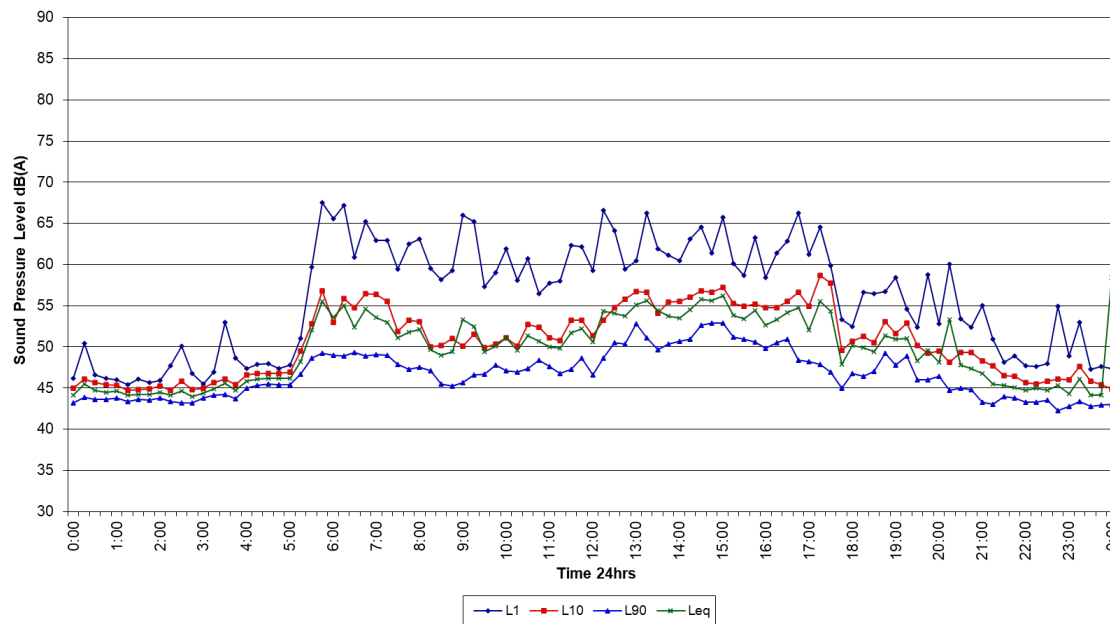
Tuesday 29/08/2023



Background Noise Logging

NL3 - Kotara Street

Wednesday 30/08/2023



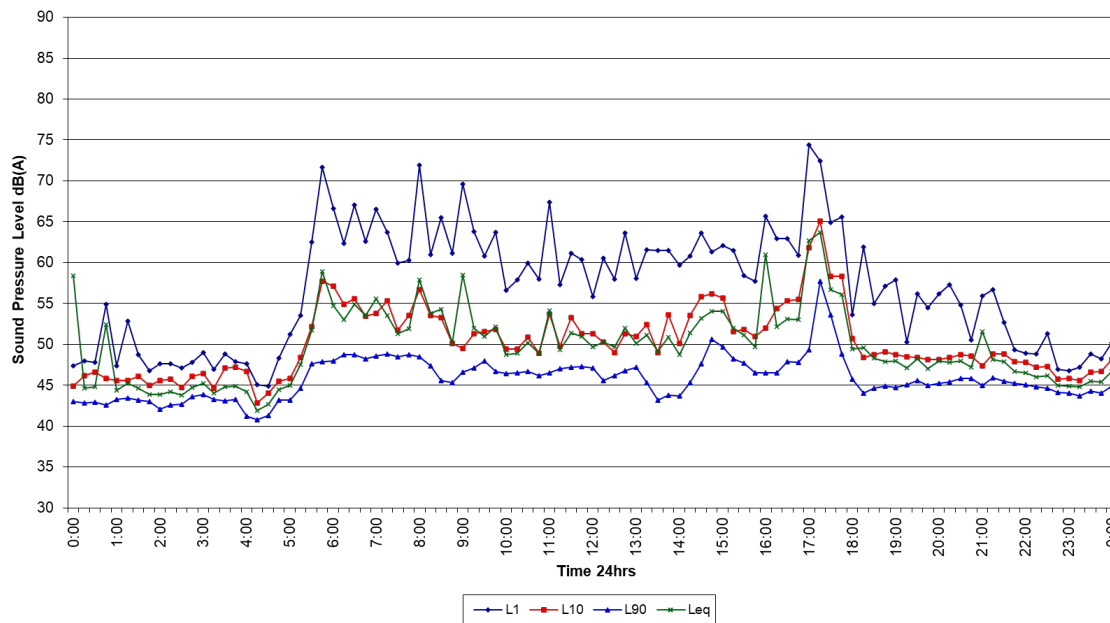


Background Noise Logging

NL3 - Kotara Street

Thursday

31/08/2023



Background Noise Logging

NL3 - Kotara Street

Friday

1/09/2023

