MATTHEW PALAVIDIS
VICTOR FATTORETTO
MATTHEW SHIELDS

Muswellbrook Hospital Stage 3 Redevelopment

Main Works Operational Noise Impact Assessment

SYDNEY
9 Sarah St
MASCOT NSW 2020
(02) 8339 8000

ABN 98 145 324 714
www.acousticlogic.com.au

Project ID	20220489.2
Document Title	Main Works Operational Noise Impact Assessment
Attention To	Health Infrastructure (89 600 377 397)

Revision	Date	Document Reference	Prepared By	Checked By	Approved By
0	4/11/2022	20220489.2/0411A/R0/SN	SN		SN

TABLE OF CONTENTS

1 INTRODUCTION

Acoustic Logic (AL) has been engaged to conduct an acoustic assessment of potential noise impacts associated with the proposed Stage 3 redevelopment of Muswellbrook Hospital including:

- Noise emissions from the mechanical plant and equipment to service the project site.
- Activity noise emissions.
- Helicopter noise impacts.
- Noise emissions from use of the carpark and traffic generated on local streets.
- The impact of local environmental noise sources on the proposed use.

Operational noise emission trigger levels have been established for the receivers surrounding the proposed redevelopment based on measurements of ambient noise levels.

The applicable assessment guidelines and the results of long-term ambient noise monitoring near the potentially most impacted residential receivers have been used to develop assessment criteria for each noise source and receiver type.

Noise emissions from the proposed development will comply with the relevant guidelines provided the recommendations of this report are adopted. Principally, these are:

- Management of operational noise levels, as recommended in Section 5.3.

With the adoption of these controls, noise emissions from the operation of the proposed will not adversely impact any of the surrounding receivers.

AL have utilised the following background documents, guidelines and regulations to assess noise impacts:

- Muswellbrook Shire Development Control Plan 2009 (**DCP**)
- NSW Environmental Protection Authority (EPA) *Noise Policy for Industry* 2017 (**NPfI**)
- NSW EPA – 'Road Noise Policy" (**RNP**) March 2011
- Traffic Report *'Review of Environmental Factors Transport Impact Assessment'* dated 31 October 2022 (**Stantec Report**).

2 SITE DESCRIPTION AND PROPOSAL

The stage 3 redevelopment and proposal comprise of internal alterations and additions to the Lower Ground level of the hospitals main building to convert the existing shell space being retained from the Stage 2 Redevelopment for relocations of the community health services department.

In addition, demolition of the existing Weidmann Wing building and the erection of a new- two (2) story in-patient and maternity unit building and associate works. The associated works broadly comprised of civil engineering works (earth works and stormwater management works), tree removal and replacement planting in various locations.

The land uses surrounding the proposed stage 3 redevelopment main works of Muswellbrook Hospital are existing hospital departments within Muswellbrook Hospital, residential receivers to the south, east and west of Muswellbrook Hospital, commercial receiver to the south and *'Goodstart Early Learning Muswellbrook'* childcare centre to the south-west.

Site investigation has been carried out and the nearest potentially most affected receivers are:

- **Receiver 1:** Existing hospital departments within Muswellbrook Hospital, which include recovery bays and an operating theatre (See Figure 1 for a mark-up of the receiver locations).
- **Receiver 2:** Existing hospital departments within Muswellbrook Hospital on the ground floor, which include general x-ray imaging, ultrasound and dental surgery rooms. (See Figure 2 for a mark-up of the receiver locations).
- **Receiver 3:** Residential receivers to the south, across Brentwood Street at 21, 23, 27 and 29 Brentwood Street, Muswellbrook.
- **Receiver 4:** Commercial receiver to the south, across Brentwood Street at 25 Brentwood Street, Muswellbrook.
- **Receiver 5:** Residential receivers to the east, across Brecht Street at 63, 65, 67, 69, 73 & 75 Brecht Street, Muswellbrook and 38 Brentwood Street, Muswellbrook.
- **Receiver 6:** *'Goodstart Early Learning Muswellbrook'* child care centre to the south-west at 14/18 Brentwood Street, Muswellbrook.
- **Receiver 7:** Residential receivers to the west, across Doyle Street at 1 and 2A Doyle Lane and 4 Doyle Street, Muswellbrook.

The remaining receivers surrounding the site will not be adversely impacted if the receivers identified above are not impacted.

See Figure 3 below for a site survey and nearest sensitive receivers.

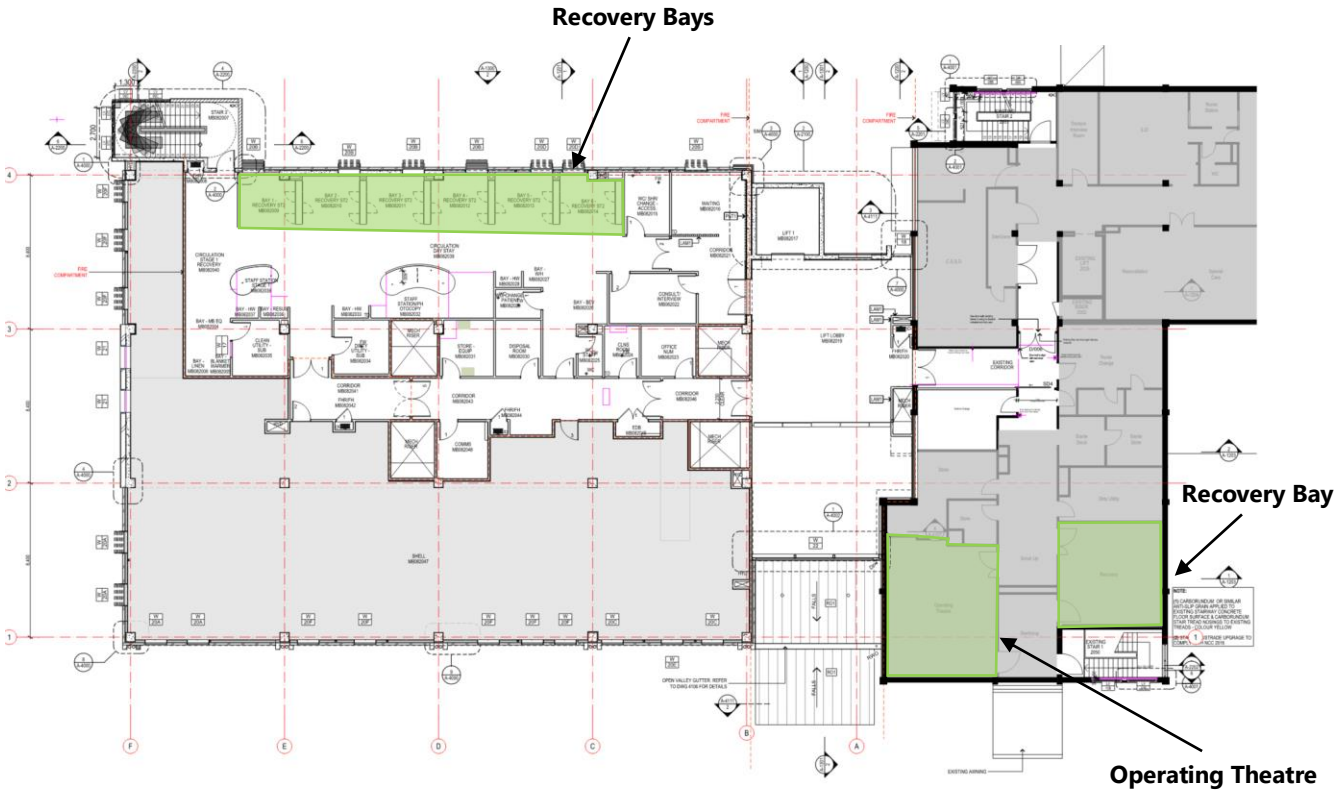


Figure 1: Existing Level 1 Hospital Receivers within Muswellbrook Hospital

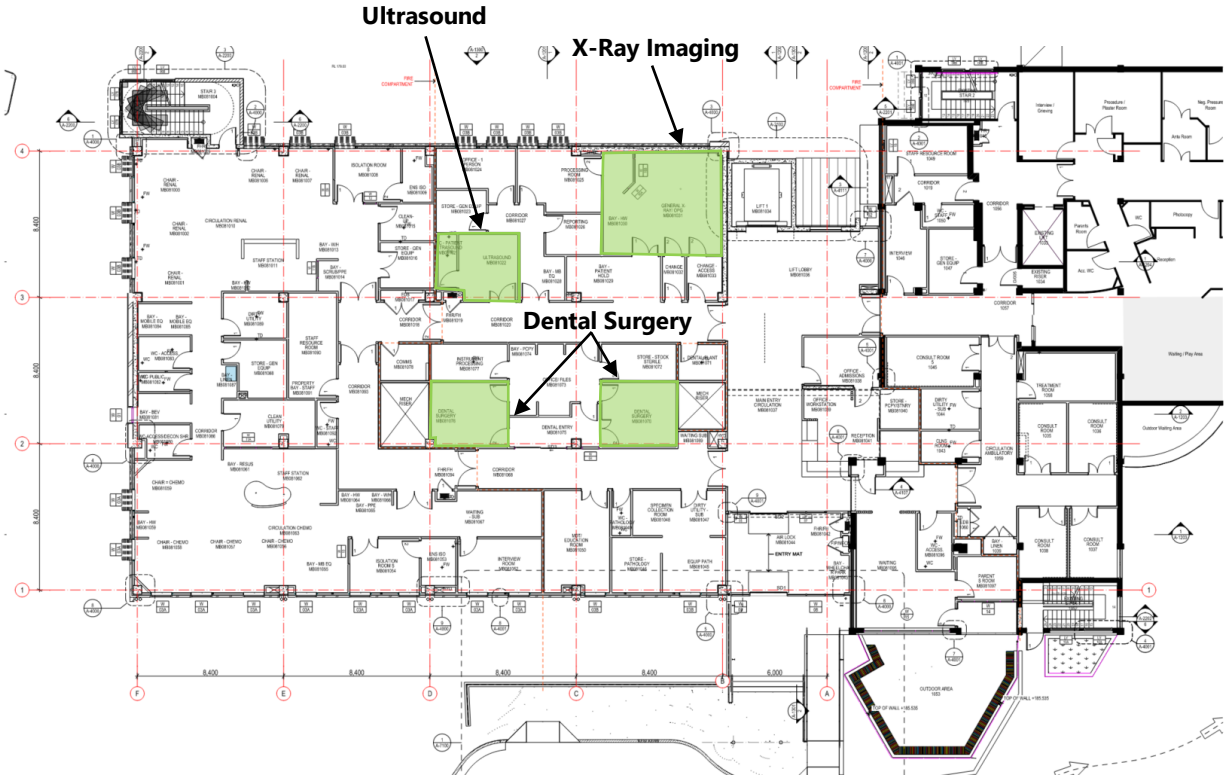
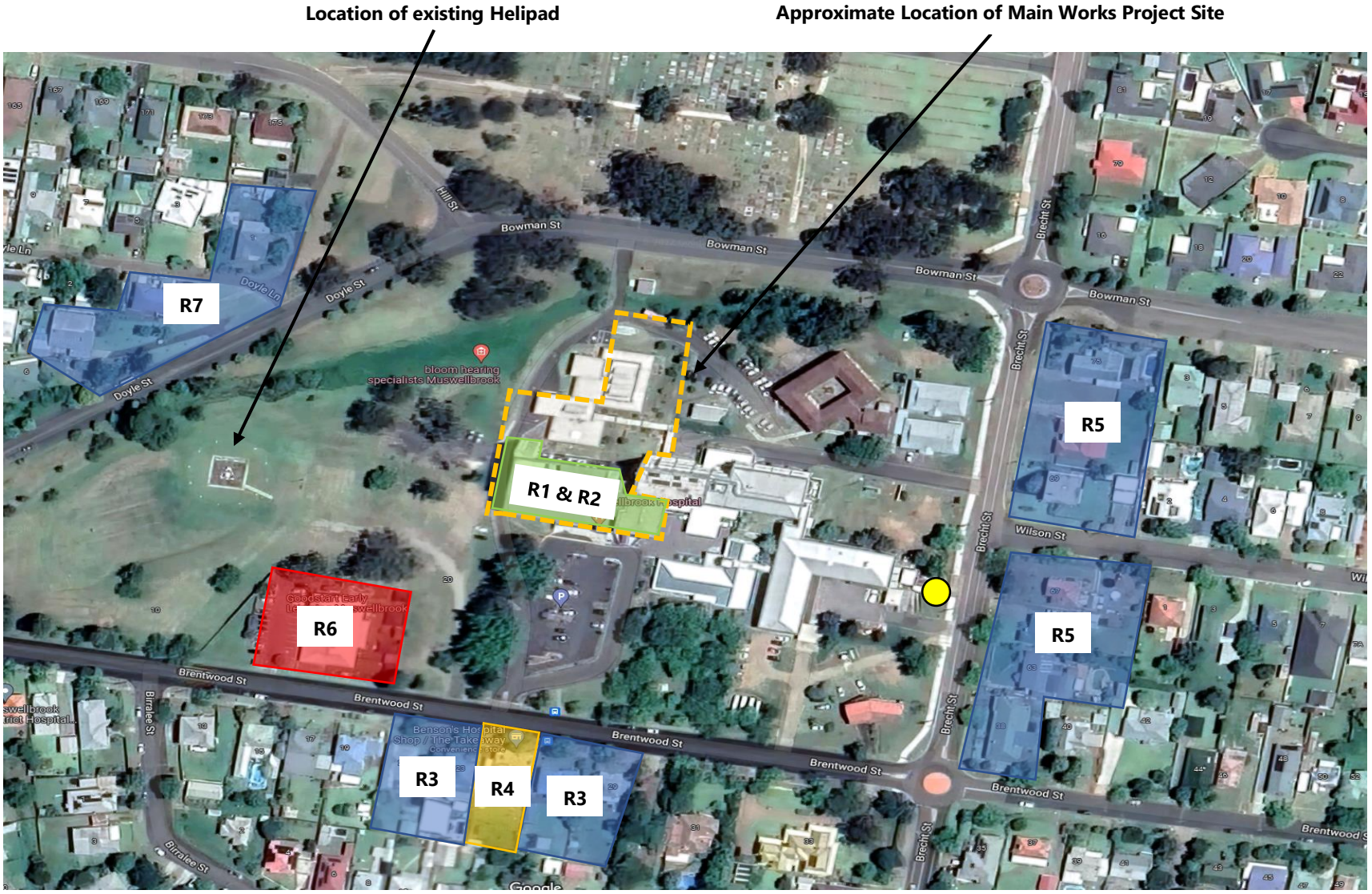


Figure 2: Existing Ground Floor Hospital Receivers within Muswellbrook Hospital



= Unattended Noise Monitor

Figure 3: Nearest Sensitive Receivers

= Child Care Centre Receiver

= Residential Receiver

= Commercial Receiver

= Hospital Receiver

3 EXISTING ACOUSTIC ENVIRONMENT

Long term, unattended monitoring has been used to characterise the existing noise environment at the nearby residential properties.

3.1 NOISE DESCRIPTORS

Ambient noise constantly varies in level from moment to moment, so it is not possible to accurately determine prevailing noise conditions by measuring a single, instantaneous noise level. Typically, noise is continuously sampled over a minimum of 1 week of valid data using an unattended logger.

At the end of every 15minute interval, a number of statistical parameters are calculated from the instantaneous noise levels recorded and stored in memory. The recorded 15 minute statistical levels are then downloaded for review and analysis to determine long term trends.

The principal measurement parameters obtained from the data are:

L_{eq} - represents the average noise energy during a measurement period. This parameter is derived by integrating the noise levels measured over the measurement period. L_{eq} is important in the assessment of noise impact as it closely corresponds with how humans perceive the loudness of time-varying noise sources (such as traffic noise).

L_{90} – This is commonly used as a measure of the background noise level as it represents the noise level heard in the typical, quiet periods during the measurement interval. The L_{90} parameter is used to set noise emission criteria for potentially intrusive noise sources since the disturbance caused by a noise source will depend on how audible it is above the pre-existing noise environment, particularly during quiet periods, as represented by the L_{90} level.

L_{10} is used in some guidelines to measure noise produced by an intrusive noise source since it represents the average of the loudest noise levels produced at the source. Typically, this is used to assess noise from licenced venues.

L_{max} is the highest noise level produced during a noise event, and is typically used to assess sleep arousal impacts from short term noise events during the night. It is also used to assess internal noise levels resulting from aircraft and railway ground vibration induced noise.

L_1 is sometimes used in place of L_{max} to represent a typical noise level from a number of high level, short term noise events.

4 BACKGROUND NOISE LEVELS

4.1 UNATTENDED NOISE MONITORING

An unattended long term background noise survey has been carried out by this office. Background noise levels which will be used as a basis for this assessment are detailed in the following sections.

4.1.1 Measurement Equipment

Unattended noise monitoring was conducting using one (1) Acoustic Research Laboratories Pty Ltd noise logger. The logger was programmed to store 15-minute statistical noise levels throughout the monitoring period. The equipment was calibrated at the beginning and the end of each measurement using a Rion NC-73 calibrator; no significant drift was detected. All measurements were taken on A-weighted fast response mode.

4.1.2 Measurement Location

An unattended background noise monitor was installed along the eastern boundary of the existing Muswellbrook Hospital, adjacent to the residential receivers situated to the east along Brecht Street. For a detailed monitor location, refer to Figure 3.

4.1.3 Measurement Period

Unattended noise monitoring was conducted from Wednesday, 4th May to Wednesday, 11th May 2022.

4.1.4 Measured Background Noise Levels

The background noise levels established from the unattended noise monitoring are detailed in Table 1 below.

4.1.5 Unattended Noise Measurements

NSW EPA's RBL assessment procedure requires determination of background noise level for each day (the ABL) then the median of the individual days as set out for the entire monitoring period.

Appendix 1 provides the results of the unattended background noise monitoring. Weather affected data was excluded from the assessment. The processed Rating Background Noise Levels (lowest 10th percentile noise levels during operation time period) are presented in Table 1 below.

Table 1 – Unattended Noise Monitor – Assessment Background Noise Levels

Date	Day dB(A)L_{90}	Evening dB(A)L_{90}	Night dB(A)L_{90}
Wednesday, 4th May 2022	-	37	34
Thursday, 5th May 2022	38	38	33
Friday, 6th May 2022	40	38	35
Saturday, 7th May 2022	39	37	35
Sunday, 8th May 2022	34	34	33
Monday, 9th May 2022	38	35	31
Tuesday, 10th May 2022	39	36	35
Wednesday, 11th May 2022	41	36	33
RBL	**39**	**37**	**34**

Note: Items marked "-" above either did not record data through the entire period due to the monitor being installed prior during or after the period or were weather affected for more than 20% of the time period and therefore have been excluded.

4.1.6 Summarised Rating Background Noise Levels

The table below summarises the rating background noise levels determined for the day, evening and night periods as defined in the NPfI. Background levels have been calculated from the long term, unattended noise monitoring data in Appendix A.

It is noted that when determining weather affected noise data, the wind speed measured at the weather station (typically at 10m above ground level) has been corrected by a factor of 0.5 to account for the noise logger being located closer to ground level where boundary layer effects result in lower wind speeds, as well as the effect of the surrounding buildings and vegetation.

Table 1 – NPfI Rating Background Noise Level Summary

Location	Time of day	Rating Background Noise Level dB(A)$_{L90(Period)}$
Eastern boundary of the existing Muswellbrook Hospital (See Figure 3 for a detailed location)	Day (7am – 6pm)	39
	Evening (6pm – 10pm)	37
	Night (10pm – 7am)	34

5 OPERATIONAL NOISE ASSESSMENT

The primary sources of noise generated by the proposed development will be as follows:

- Noise from the mechanical plant and equipment servicing the development.
- Noise associated with the operation of the driveway and carpark.
- Emergency helicopter operations.

The various noise sources have different characteristics, and an appropriate assessment guideline should be adopted.

The noise emission assessment has been assessed using with the following documents:

- Muswellbrook Shire Development Control Plan 2009.
- NSW (EPA) *Noise Policy for Industry* (NPI) 2017 for plant and other noise emissions.
- Noise emissions from emergency helicopter movements are not required to be assessed. Noise impact from the existing helipad location will be compared to its current operation.

5.1 MUSWELLBROOK SHIRE DEVELOPMENT CONTROL PLAN 2009

The DCP does not provide any specific controls for noise emissions from hospital development.

5.2 NSW EPA NOISE POLICY FOR INDUSTRY (NPfI) 2017

This policy is generally used to assess noise from commercial and industrial operations including plant noise and the like.

The guidelines in the policy are used to formulate Project Noise Trigger Levels (PNTL). Where the predicted noise impact exceeds the trigger levels then mitigation should be assessed to minimise noise impacts.

The EPA NPfI has two primary criteria, namely Intrusiveness and amenity. Where night-time noise emissions may impact residential receivers, then night time sleep disturbance should also be assessed.

The cumulative noise emissions from the site should be assessed anywhere on a residential property within 30m of the residence, or at the balcony or façade of an apartment.

The NSW EPA Noise Policy for Industry (2017) defines;

- Day as the period from 7am to 6pm Monday to Saturday and 8am to 6pm Sundays and Public Holidays.
- Evening as the period from 6pm to 10pm.
- Night as the period from 10pm to 7am Monday to Saturday and 10pm to 8am Sundays and Public Holidays.

5.2.1 Assessing Intrusiveness

This is intended to limit the audibility of noise emissions at residential receivers and requires that noise emissions measured using the L_{eq} descriptor not exceed the background noise level by more than 5dB(A). Where applicable, the intrusive noise level should be penalised (increased) to account for any annoying characteristics such as tonality.

Rating background noise levels adopted are presented in Table 1. Noise emissions from the site should comply with the noise levels presented below when measured at nearby property boundary.

Table 2 – NPfI Intrusiveness Criteria

Receiver	Time of Day	Rating Background Noise Level, dB(A)$_{L90(15min)}$	Intrusiveness Criteria, dB(A)$L_{eq(15min)}$
Nearest Surrounding Residential Receivers	Day (7am – 6pm)	39	44
	Evening (6pm – 10pm)	37	42
	Night (10pm – 7am)	34	39

5.2.2 Assessing Amenity

The guideline is intended to limit the absolute noise level from all noise sources to a level that is consistent with the general environment.

Table 2.2 on page 11 of the NPfI sets out acceptable noise levels for various land uses. There are four categories to distinguish different residential areas - rural, suburban, urban and urban/industrial interface.

Based on the measured background noise levels detailed in Table 1 and land uses, the NPfI suggests the adoption of the 'Suburban' categorisation for residential receivers surrounding the proposed stage 3 redevelopment project site.

The NPI requires project amenity noise levels to be calculated in the following manner;

$$L_{Aeq,15min} = \textit{Recommended Amenity Noise Level} - 5\ dB(A) + 3\ dB(A)$$

The amenity levels most appropriate for the receivers surrounding the site are presented in Table 3.

Table 3 – EPA Amenity Noise Levels

Type of Receiver	Time of day	Project Amenity Noise Level, dB(A)$L_{eq(15\ minute)}$
R3, R5 and R7 (Residential)	Day (7am-6pm)	53
	Evening (6pm-10pm)	43
	Night (10pm-7am)	38
R6 *'Goodstart Early Learning Muswellbrook'* child care centre	Noisiest 1 hour when in use (i.e. day)	35 internal
R1 & R2 Remaining departments of Muswellbrook Hospital (Hospital Ward)	Noisiest 1 hour	35 internal 50 external
R4 Commercial	When in use	63

5.2.3 Sleep Arousal Criteria

The potential for sleep disturbance from maximum noise level events from premises during the night time period must be considered as the proposed operation extends into night time hours. Sleep disturbance is considered to be both awakenings and disturbance to sleep stages. Where the subject development night-time noise levels at a residential location exceed:

- $L_{eq(15min)}$ 40dB(A) or the prevailing RBL plus 5dB, whichever is greater, and/or
- $L_{AF(max)}$ 52dB(A) or the prevailing RBL plus 15dB, whichever is greater, a detailed maximum noise level event assessment should be undertaken.

Table 4 – Sleep Arousal Criteria for Residential Receivers

Receiver	Rating Background Noise Level (Night), dB(A)L_{90}	Project Sleep Disturbance Level
Residences Surrounding Site Night (10pm – 7am)	34 dB(A) L_{90}	40 dB(A) $L_{eq,\ 15min}$; 52 dB(A) $L_{f,max}$

The detailed assessment should cover the maximum noise level, the extent to which the maximum noise level exceeds the rating background noise level, and the number of times this happens during the night period.

In addition, NSW EPA Road Noise Policy states:

- Maximum internal noise levels below 50–55 dB(A) are unlikely to awaken people from sleep.
- One to two noise events per night with maximum internal noise levels of 65-70dB(A) are not likely to affect health and wellbeing significantly.

5.3 SUMMARY OF SITE NOISE EMISSION CRITERIA

The following table presents the noise emission objectives for the stage 3 redevelopment of Muswellbrook Hospital.

Table 5 – Project Noise Trigger Levels

Source	Receiver Catchment	Period	PNTL dB(A)	
			L_{eq}	L_{max}
Plant and Site Activity	R3, R5 & R7 Residential Receivers	Day	44	-
		Evening	42	-
		Night	38	52
	R1 & R2 Remaining departments of Muswellbrook Hospital (Hospital Ward)	Worst Hour	50*	-
	R6 *'Goodstart Early Learning Muswellbrook'* child care centre	Worst Hour	35 (internal)	-
	R4 Commercial	When in use	63	-

* The building is air conditioned and if the external criterion is achieved the internal noise level will comply.

6 OPERATIONAL NOISE EMISSION ANALYSIS – MUSWELLBROOK STAGE 3 REDEVELOPMENT

6.1 MECHANICAL PLANT NOISE EMISSION

Mechanical plant to service the project site including air conditioning, ventilation fans, etc. Detailed mechanical design and equipment selections are not available at this stage, detailed acoustic controls can be worked out at CC stage to ensure that the overall plant noise emissions satisfy the requirements above.

Plant shall be acoustically treated to prevent noise emissions from adversely impacting the surrounding properties in conjunction with the criteria detailed in this report. This may include selecting the quietest plant practicable, or treating the plant with enclosures, barriers, duct lining and silencers, etc as required to comply with the sound level recommendations.

Experience with similar projects indicates that it would be possible to achieve the requirement with appropriate treatment of the plant. General requirements for a number of potential plant items on the site are expanded on below. A preliminary review of the major plant items and general fans has been provided below.

6.1.1 Air Handling Units

Air Handing Units are typically located inside dedicated plant rooms, which provide good acoustic shielding. In regard to air flow; outside air to and exhaust from the AHU's is recommended to be ducted via rigid ducts which have the potential to be treated using lining, bends and silencers/attenuators. Thus, all AHUs are capable of meeting the noise emission criteria, set out in section 5.3 of this report.

6.1.2 Cooling Tower

Typically, all cooling towers are to have variable speed drives, to allow for reduced fan speed during periods of low load. Typically, a fan speed of no more than 50% would be expected at night-time, which, based on the noise emission criteria presented in section 5.3 of this report, is the most-stringent time period.

6.1.3 Emergency Generators

Generators are proposed to be used only in emergency situations.

Generators are to be installed on a concrete plinth. Plinth is to be isolated from the structural slab by two layers of 10mm thick Vibramat (from Acoustic Supplies) or equal. There should be no rigid connection between plinth and structural slab.

Generator should be isolated from the plinth using 50mm static deflection spring vibration isolators.

6.1.4 Fans and Other General Plant Items

All fans are capable of meeting the noise emission criteria, set out in section 5.3 of this report, with the implementation of lined duct work and bends.

6.1.5 Supply / Exhaust Fans

Supply and exhaust fans may be located within the underground plant rooms or in rooftop plant areas. These units typically emit high noise levels and require acoustic treatment such as silencers and internal lined ductwork. Silencer requirements would be determined once fan selections have been completed.

6.1.6 Minor Plant

Other minor plant items, such as bathroom or kitchen exhaust fans, may also be required. These items typically emit relatively low noise levels and may require minimal acoustic treatment of a standard nature, such as internally lining of ductwork.

6.1.7 Major Plant

It is at the construction design stage that consideration should be given to the placement of equipment including intake and discharge air locations. In addition to the location of the equipment acoustic treatments to the major plant items may include silencers, treatment to ducting, time control, operational limitations, vibration isolation and the like.

6.2 CARPARK USAGE NOISE EMISSIONS

The existing main carpark of Muswellbrook Hospital is located along the southern boundary, accessed via Brentwood Street. In addition, the existing staff carpark is located along the northern boundary and is accessed via Bowman Street.

Based on the information provided within the *'Review of Environmental Factors Transport Impact Assessment'* (Ref: 300303682) dated 31 October 2022 prepared by Stantec, the following is noted:

'Muswellbrook Hospital currently has around 166 FTE Staff and 44 beds. As part of the Stage 3 redevelopment, it is understood that existing staff levels will be maintained, while bed numbers be reduced to 33 (reduction of 11 beds).

Table 4: Anticipated change in parking demand based on existing parking demand rates

Method	Car parking demand rate	Proposed change from existing	Anticipated change in demand
Spaces per staff (includes public provision)	0.78 spaces per staff	No change in staff	0 spaces
Spaces per bed (includes staff provision)	2.95 spaces per bed	-11 beds	-32 spaces

'Table 4 indicates that based on this method of calculating car parking demand, the project could be expected to result in a reduction of car parking spaces. However, as parking demand for hospitals is largely related to staff and there is no proposed reduction in staff numbers as part of the redevelopment it is expected that there would be no change in parking demand'.

On this basis, the stage 3 redevelopment will not increase carparking spaces over the existing provision currently provided at Muswellbrook Hospital. Given this, the noise impact associated with carparking for the stage 3 redevelopment would be considered imperceptible.

6.3 EMERGENCY HELICOPTER NOISE

The existing helipad is located along the western boundary of Muswellbrook Hospital. See Figure 3 for a detailed location.

Thought not required to be assessed, based on the proposed stage 3 redevelopment of Muswellbrook Hospital and the information provided to this office, the Hunter New England LHD have confirmed that based on the Clinical Services Planning for Stage 3 Redevelopment at Muswellbrook Hospital does not indicate an increase in services that would generate an increase in helicopter transfers as part of the redevelopment.

On this basis, it is considered that the stage 3 redevelopment proposal would not increase noise impacts associated from the use of the existing helipad.

7 TRAFFIC GENERATION ON LOCAL ROADS

The proposed stage 3 redevelopment of Muswellbrook Hospital based on Table 6 of the *'Review of Environmental Factors Transport Impact Assessment'* (Ref: 300303682) dated 31 October 2022 prepared by Stantec states the following:

'Table 6 indicated the Stage 3 redevelopment could be expected to result in a reduction of three to five vehicle trips in the AM and PM peak hours respectively from existing conditions'.

On this basis and given no increase in traffic generation is anticipated, no traffic modelling assessment was undertaken by Stantec.

As there is no increase in traffic generation predicted, noise from the stage 3 redevelopment for traffic generation on local roads would be imperceptible to surrounding residence and therefore satisfies the 2dB(A) or below acceptable increase requirements under the Road Noise Policy guideline.

8 COMPLYING CONTROLS – BUILDING AND MANAGEMENT

The following building and management controls are indicated in order to control noise emission from the operation of the stage 3 redevelopment of Muswellbrook Hospital.

8.1 BUILDING CONSTRUCTION

- An assessment of noise emissions from mechanical plant and equipment is to be carried out during the CC phase and certification provided that the proposed plant and acoustic treatment will achieve compliance with the assessment criteria established in this assessment.

8.2 MANAGEMENT CONTROLS

- Garbage collections should occur between the hours of 7am and 10pm.

9 CONCLUSION

This report presents an acoustic assessment of operational noise impacts associated with the proposed Muswellbrook Hospital Stage 3 Redevelopment.

The assessment concludes that, provided the complying controls presented in Section 8 are adopted, noise impacts from the proposed development will comply with the acoustic requirements of the following documents:

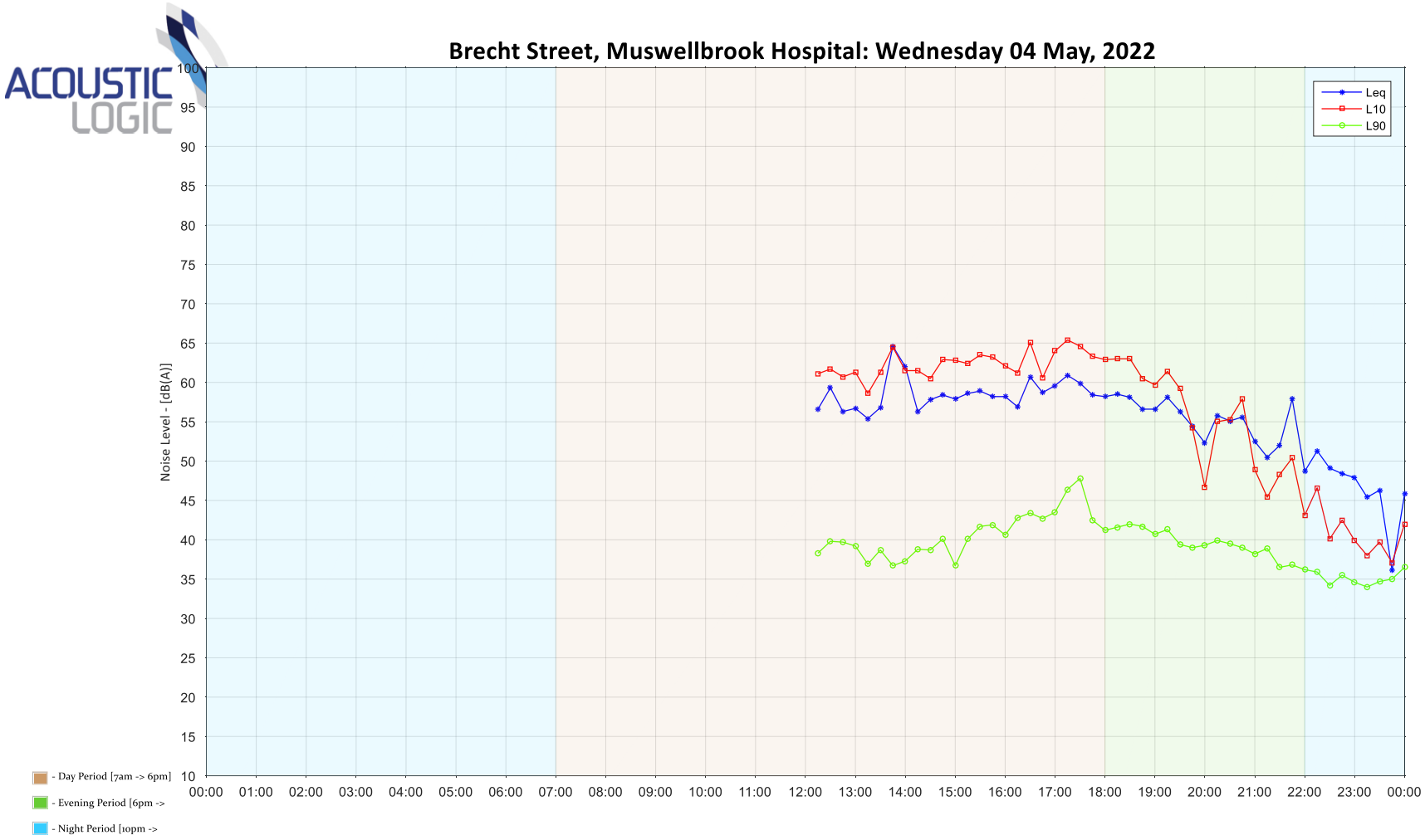
- Muswellbrook Shire Development Control Plan 2009.
- NSW Environmental Protection Authority (EPA) *Noise Policy for Industry* 2017.
- NSW EPA – 'Road Noise Policy" March 2011.

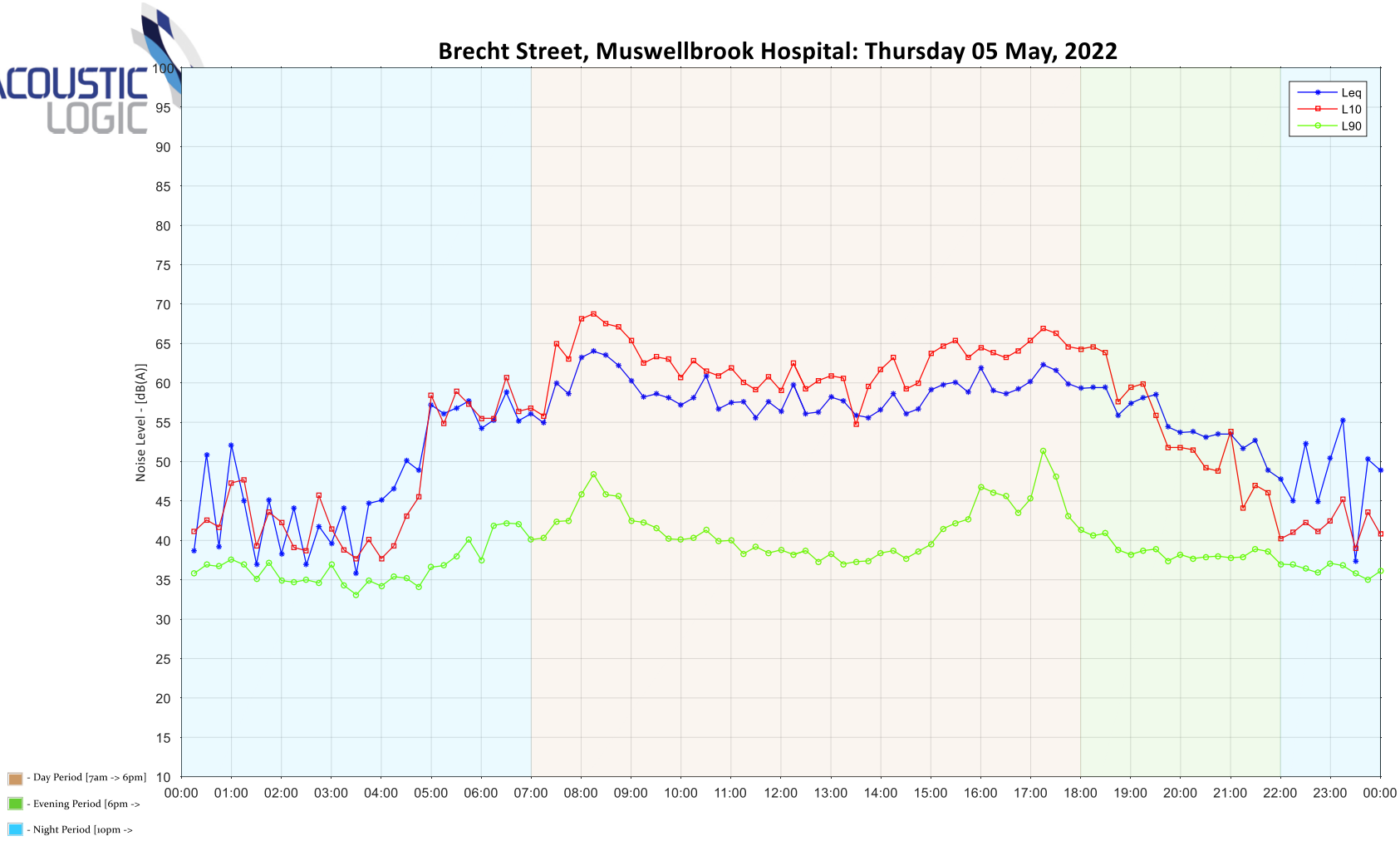
We trust this information is satisfactory. Please contact us should you have any further queries.

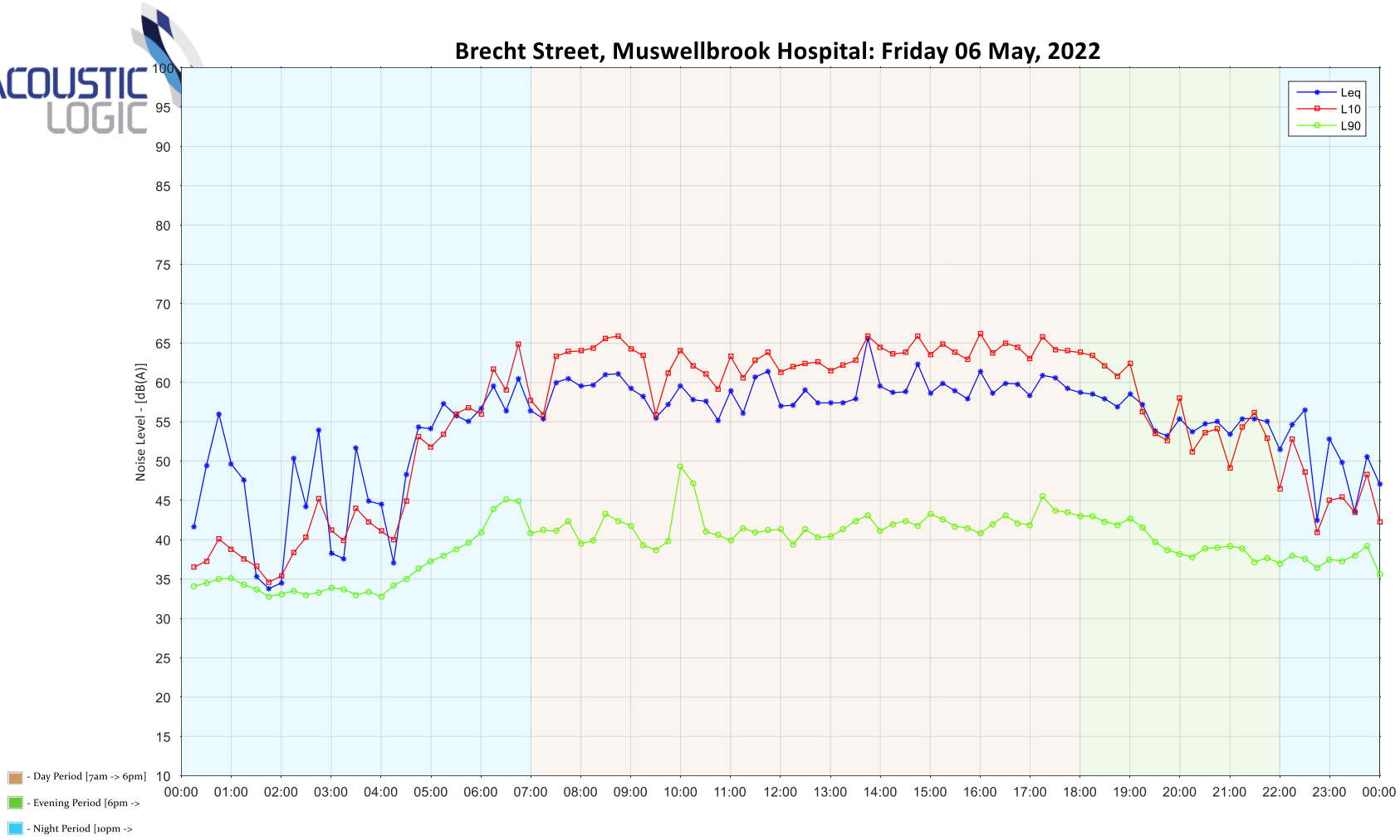
Yours faithfully,

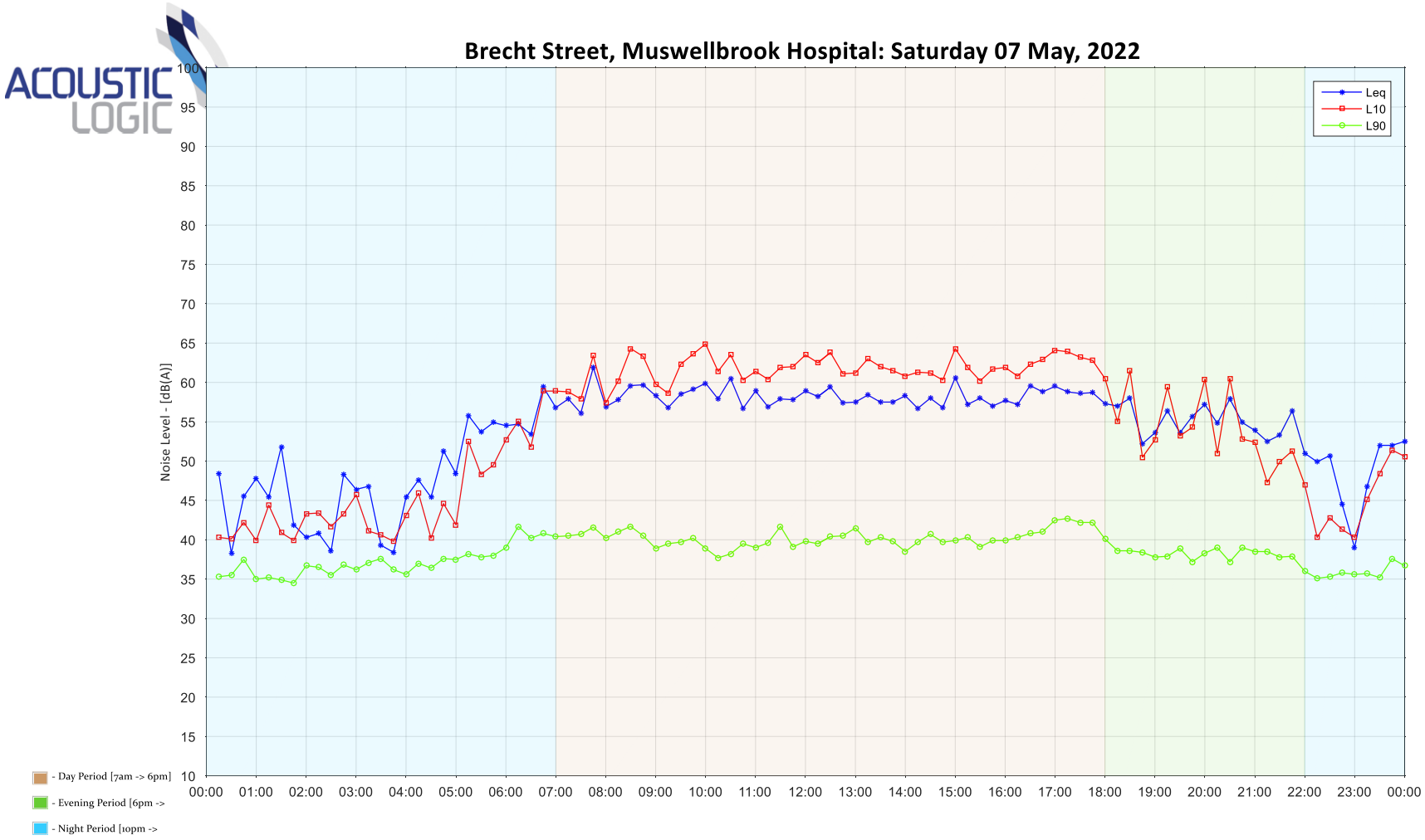
Acoustic Logic Pty Ltd
Shane Nichols

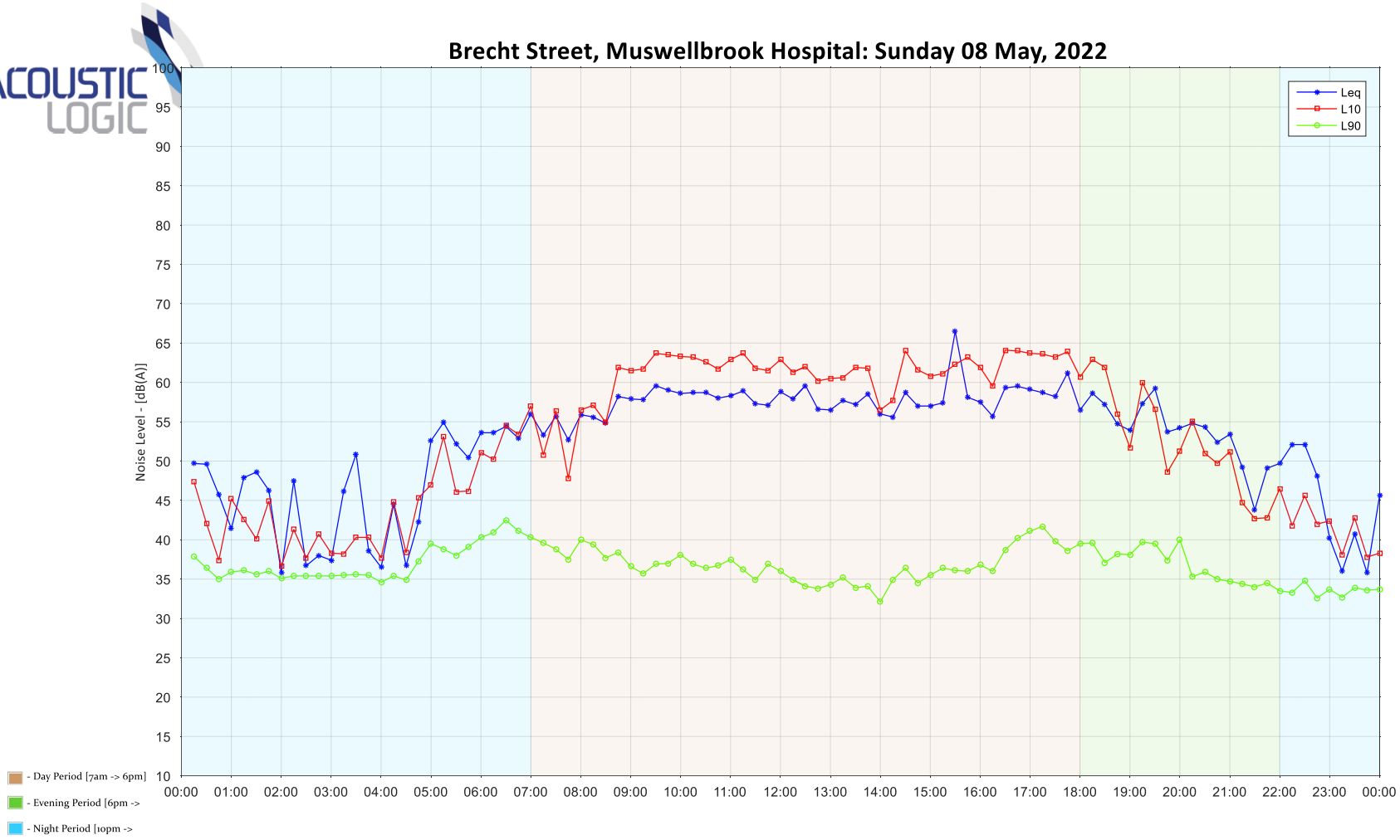
APPENDIX A – UNATTENDED BACKGROUND NOISE MONITORING DATA

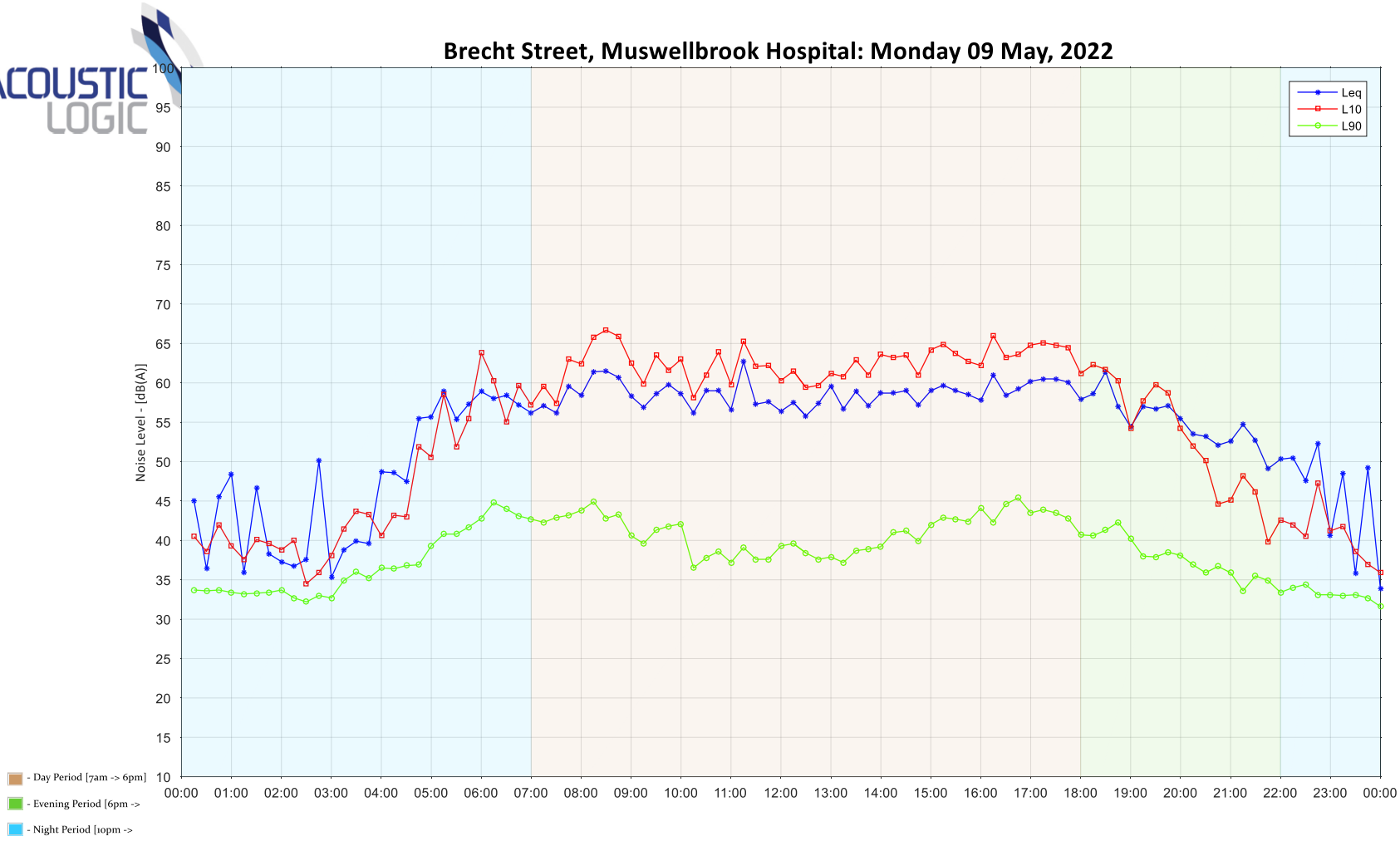

Brecht Street, Muswellbrook Hospital: Wednesday 04 May, 2022
Noise Level - [dB(A)]
100
95
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
00:00
01:00
02:00
03:00
04:00
05:00
06:00
07:00
08:00
09:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
Leq
L10
L90
- Day Period [7am -> 6pm]
- Evening Period [6pm ->
- Night Period [10pm ->

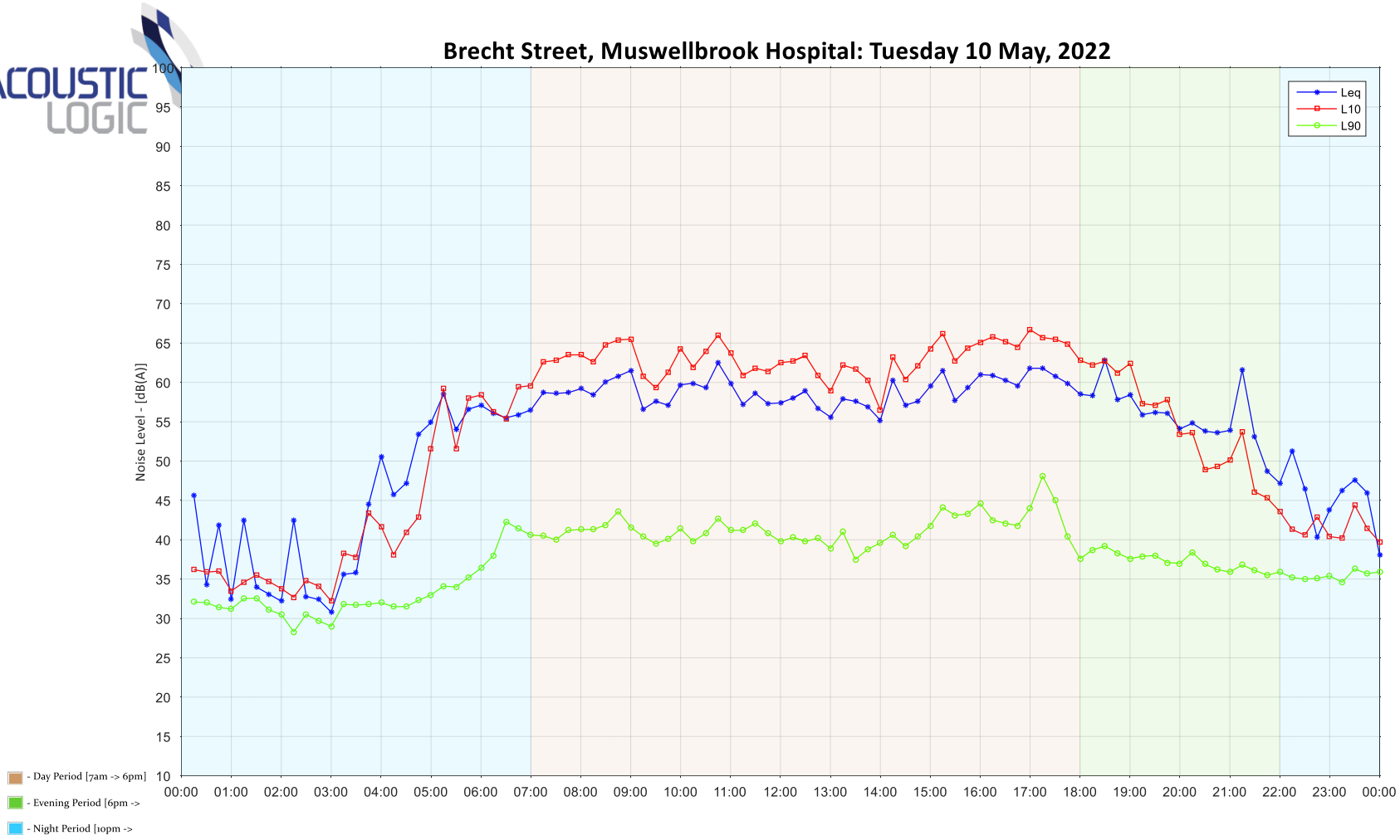

Brecht Street, Muswellbrook Hospital: Thursday 05 May, 2022
Noise Level - [dB(A)]
100
95
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
00:00
01:00
02:00
03:00
04:00
05:00
06:00
07:00
08:00
09:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
Leq
L10
L90
- Day Period [7am -> 6pm]
- Evening Period [6pm ->
- Night Period [10pm ->]

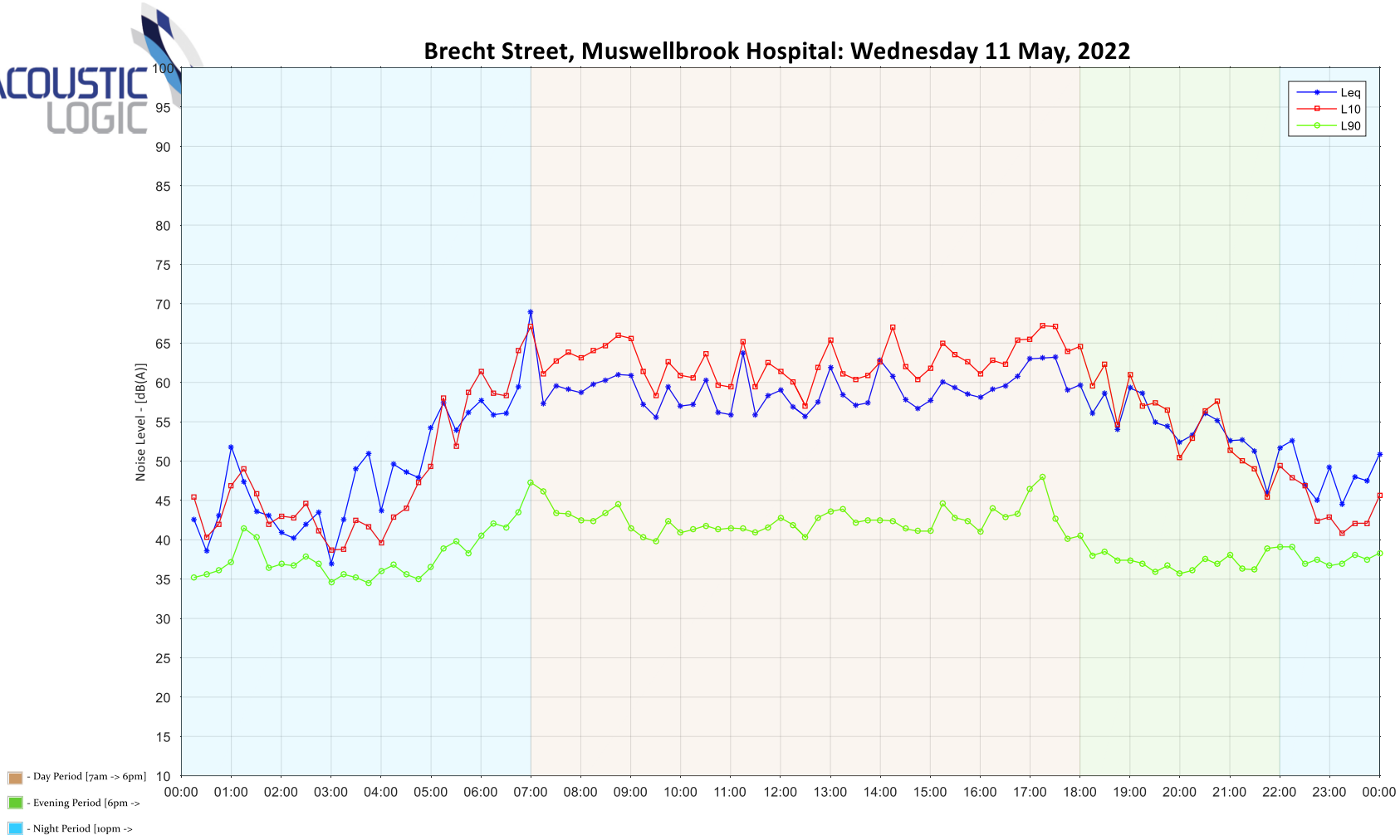

Brecht Street, Muswellbrook Hospital: Friday 06 May, 2022
Noise Level - [dB(A)]
Leq
L10
L90
- Day Period [7am -> 6pm]
- Evening Period [6pm ->
- Night Period [10pm ->
00:00 01:00 02:00 03:00 04:00 05:00 06:00 07:00 08:00 09:00 10:00 11:00 12:00 13:00 14:00 15:00 16:00 17:00 18:00 19:00 20:00 21:00 22:00 23:00 00:00

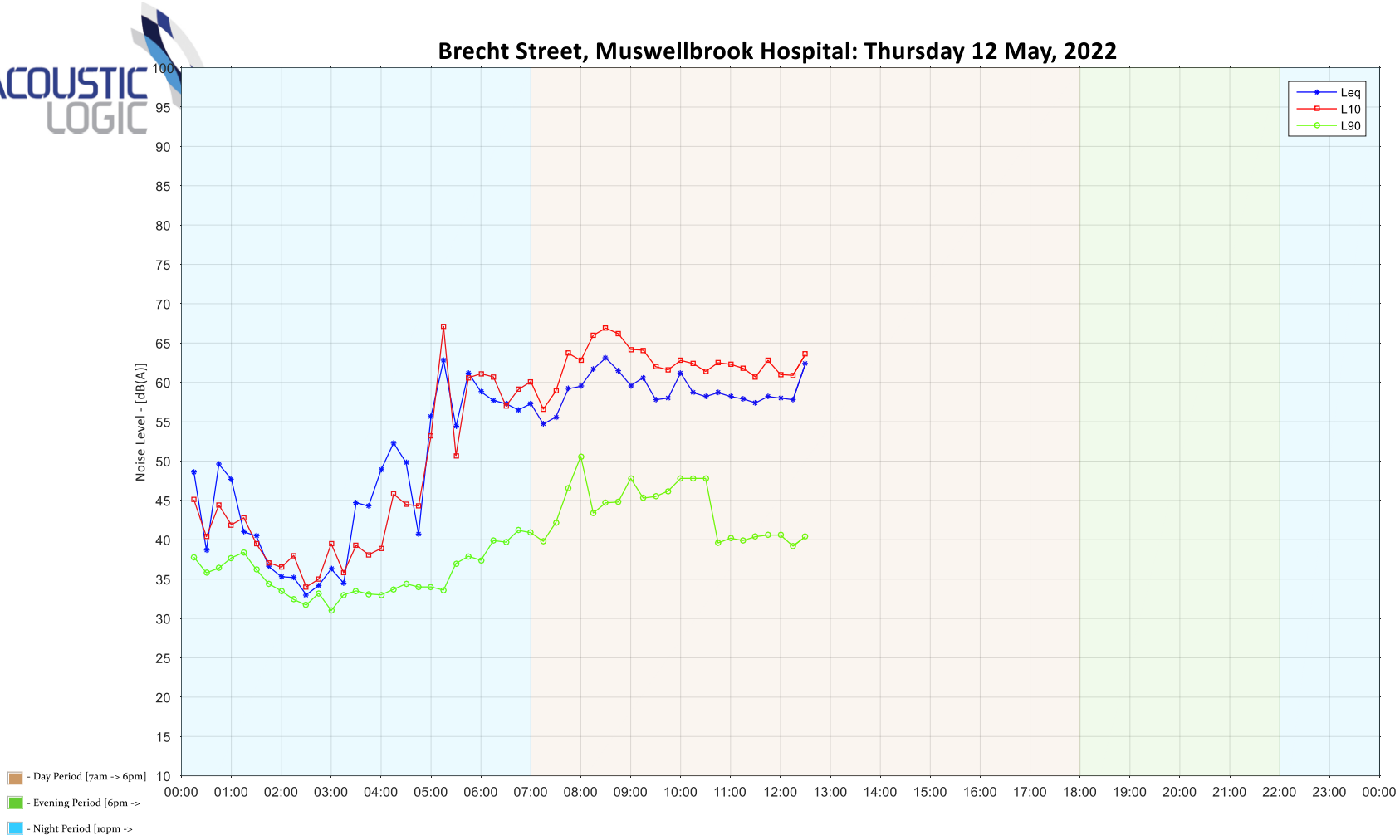

Brecht Street, Muswellbrook Hospital: Saturday 07 May, 2022
Noise Level - [dB(A)]
Leq
L10
L90
- Day Period [7am -> 6pm]
- Evening Period [6pm ->
- Night Period [10pm ->
00:00 01:00 02:00 03:00 04:00 05:00 06:00 07:00 08:00 09:00 10:00 11:00 12:00 13:00 14:00 15:00 16:00 17:00 18:00 19:00 20:00 21:00 22:00 23:00 00:00


Brecht Street, Muswellbrook Hospital: Sunday 08 May, 2022
Noise Level - [dB(A)]
Leq
L10
L90
- Day Period [7am -> 6pm]
- Evening Period [6pm ->
- Night Period [10pm ->
00:00 01:00 02:00 03:00 04:00 05:00 06:00 07:00 08:00 09:00 10:00 11:00 12:00 13:00 14:00 15:00 16:00 17:00 18:00 19:00 20:00 21:00 22:00 23:00 00:00


Brecht Street, Muswellbrook Hospital: Monday 09 May, 2022
Noise Level - [dB(A)]
Leq
L10
L90
- Day Period [7am -> 6pm]
- Evening Period [6pm ->
- Night Period [10pm ->
100
95
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
00:00
01:00
02:00
03:00
04:00
05:00
06:00
07:00
08:00
09:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00


Brecht Street, Muswellbrook Hospital: Tuesday 10 May, 2022
Noise Level - [dB(A)]
Leq
L10
L90
- Day Period [7am -> 6pm]
- Evening Period [6pm ->
- Night Period [10pm ->
00:00 01:00 02:00 03:00 04:00 05:00 06:00 07:00 08:00 09:00 10:00 11:00 12:00 13:00 14:00 15:00 16:00 17:00 18:00 19:00 20:00 21:00 22:00 23:00 00:00


Brecht Street, Muswellbrook Hospital: Wednesday 11 May, 2022
Noise Level - [dB(A)]
Leq
L10
L90
- Day Period [7am -> 6pm]
- Evening Period [6pm ->
- Night Period [10pm ->
00:00 01:00 02:00 03:00 04:00 05:00 06:00 07:00 08:00 09:00 10:00 11:00 12:00 13:00 14:00 15:00 16:00 17:00 18:00 19:00 20:00 21:00 22:00 23:00 00:00


Brecht Street, Muswellbrook Hospital: Thursday 12 May, 2022
Noise Level - [dB(A)]
100
95
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
00:00
01:00
02:00
03:00
04:00
05:00
06:00
07:00
08:00
09:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
Leq
L10
L90
- Day Period [7am -> 6pm]
- Evening Period [6pm ->
- Night Period [10pm ->]