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DELIVERING SOUND ADVICE

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ACOUSTICAL REPORT

PROPOSED ENTERTAINMENT AND RETAIL FACILITY

3/222 QUEEN STREET, ST MARYS NSW

Date: Monday, 13th September 2021

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Version	Date	Author	Review	Notes
V1	13/09/2021	MJ	NK	Report version 1 available for issue

Approved by	Nick Koikas M.A.A.S Director
Client	Pardey Street Enterprises Pty Ltd Attention: Michael Kelly Email

ACOUSTICAL REPORT

PROPOSED ENTERTAINMENT AND RETAIL FACILITY

3/222 QUEEN STREET, ST MARYS NSW

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1.0 INTRODUCTION

Koikas Acoustics Pty Ltd was commissioned to prepare a noise impact assessment for the proposed development at 3/222 Queen Street, St Marys seeking approval for the construction of a new restricted premises entertainment and retail facility.

For this DA, the acoustical adequacy of the proposed design must be assessed in terms of standard planning guidelines issued by the Council in their Local Environment Plan (LEP), Development Control Plan (DCP), and other standard planning guidelines related to common sources of noise.

As per the Council guidelines and other standard planning instruments, Koikas Acoustics has determined the following acoustical components require an assessment at the current DA stage:

- Noise emission associated with the business' typical operation to neighbouring dwellings.
- Mechanical plant noise emission from the proposed development to neighbouring dwellings.

This report presents the results and findings of an acoustical assessment for the subject proposal. In-principle acoustic treatments and noise control recommendations are included (where required) so that the premises may operate in compliance with the nominated acoustical planning levels/project noise objectives.

2.0 THE PROPOSED DEVELOPMENT

The development is proposed to occupy the site at 3/222 Queen Street, St Marys. This location is situated in a primarily urban residential area classified as B4 'Mixed-Use' as per relevant land zoning maps included in the Penrith City Council Council Local Environment Plan 2010. Surrounding properties are also predominantly residential and commercial in classification, also located within B4 'Mixed-Use' Zoning.

The subject site and surrounding properties are identified in the aerial photograph in Figure 1.

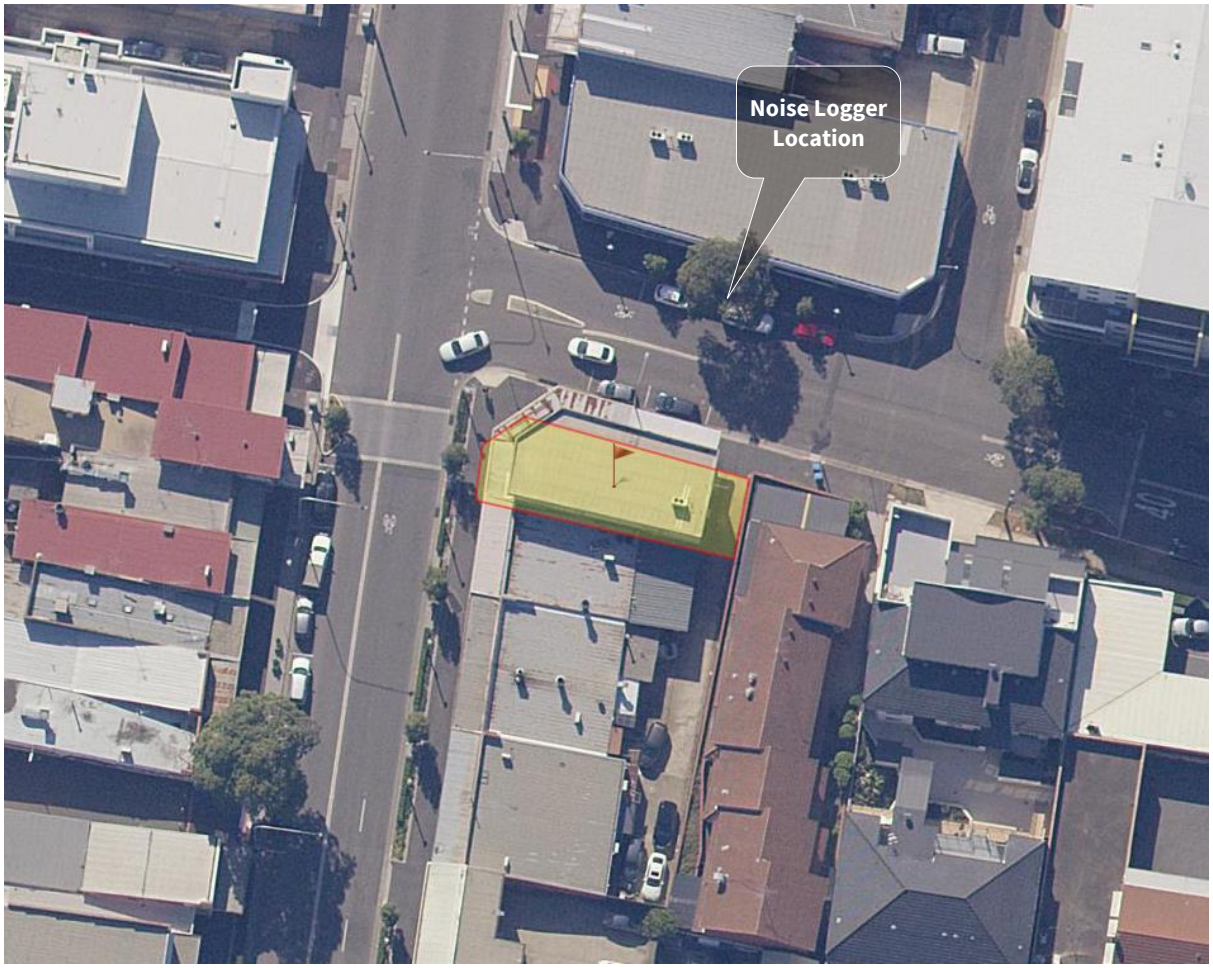


Figure 1. Aerial photo of the subject site and surrounding area – Image from SixMaps

Prevailing ambient noise conditions on-site and in the local area are generally the result of typical environmental noise such as traffic and localised domestic noise sources.

This acoustic report and any associated recommendations are based solely on the architectural design and drawings by AusJu Design and Build (Dated 10/09/2021). Any unapproved changes to the design may impact the findings of this report and associated noise control recommendations.

As per the architectural drawings prepared by AusJu Design, the proposed development will include:

- A retail premises;
- A restricted cinema room;
- An office;
- A shower/kitchen area, and
- Two bathrooms

The restricted cinema area and the retail space is proposed to operate between 8 am – 12 am every day.

3.0 AMBIENT NOISE SURVEY

An unattended noise logging survey was conducted between 27th August 2021 and 2nd September 2021. The microphone was placed within a tree along the corner of Queen Street and King Street at approximately 1.5 - 2.0 metres above the natural ground level.

A Type 1 Noise Sentry noise logger was used for the survey. The instrument was set up to measure sound pressure levels as 'A' frequency weighting and 'Fast' time response. Noise levels were stored within the logger memory at recurring 15 minutes intervals.

A NATA calibrated and certified Larson Davis CAL200 precision acoustic calibrator was used to field calibrate the sound level meter before and after the noise survey. No system drift was observed for this sound level meter.

A review of the weather records from the Bureau of Meteorology shows that adverse weather conditions did not influence the noise environment during the measurement period. Observable short-duration extraneous noise events were removed from the survey data.

A summary of the noise survey data is presented below.

Table 1. Summary of noise logger results [dB]

Location	Period, T [1]	Ambient noise level L_{Aeq}	Rating background level L_{A90}
3/222 Queen Street, St Marys	Day	60	45
	Evening	55	42
	Night	56	39

Notes

1. The **NSW EPA Noise Policy for Industry (NPfI)** refers to:
   Daytime: 7 am – 6 pm Monday to Saturday and 8 am to 6 pm Sunday and public holidays.
   Evening: 6 pm – 10 pm Monday to Sunday
   Night: 10 pm - 7 am Monday to Saturday and 10 pm to 8 am Sunday and public holidays.
2. The **EPA/RMS/NSW DoP** refers to:
   Daytime: 7 am – 10 pm seven days per week.
   Night: 10 pm - 7 am seven days per week

Daily logger graphs are attached in **Appendix A**.

The noise survey outlined above was conducted during the NSW state government-enforced

lockdown restrictions, as a result of the Covid-19 pandemic. As such, it is expected that ambient background noise levels may not be representative of the area, due to reduced traffic volumes, reduced local business operating capacity, reduced pedestrian traffic etc. As a result of the lower than expected ambient background noise levels, compliance with the adopted noise criterion outlined in Section 4.0 of this report is considered conservative and suggests that compliance will also be achieved during non-lockdown operating hours.

It is the professional opinion of Koikas Acoustics that ambient background noise levels will be higher during non-lockdown operating hours, and as a result, with the recommendations outlined in Section 5.4 of this report implemented at the subject premises, operational and mechanical plant noise levels will be compliant with more stringent noise criteria, suggesting compliance will also be achieved during non-lockdown operating hours.

4.0 ACOUSTIC REQUIREMENTS

4.1 EPA NOISE POLICY FOR INDUSTRY

Noise emission design targets have been referenced from the NSW Environmental Protection Authority (EPA) Noise Policy for Industry (NPfI).

The NPfI is designed to assess environmental noise impacts associated with scheduled activities prescribed within the Protection of the Environment Operations Act 1997, Schedule 1. It is also used as a reference tool for establishing suitable planning levels for noise generated by mechanical plant and equipment and noise emission from commercial operations.

For residential receivers, the guideline applies limits on the short-term intrusive nature of a noise or noise-generating development (project intrusive noise level), as well as applying an upper limit on cumulative industrial noise emissions from all surrounding development/industry (project amenity noise level). The most stringent of the project intrusive noise level and project amenity noise level is applied as the **project noise trigger level (PNTL)**. To determine which of the intrusive and amenity noise criteria is more stringent, the underlying noise metrics must be the same. As the intrusive noise level is defined in terms of an $L_{Aeq,\ 15\ minutes}$ and the amenity noise level is defined in terms of an $L_{Aeq,\ Period}$, a correction +3 dB correction is applied to the project amenity noise level to equate the $L_{Aeq\ Period}$ to $L_{Aeq,\ 15\ minutes}$.

Non-residential receivers are assessed to project amenity noise levels relevant to the applicable receiver category (commercial).

Where noise is measured or predicted below the project noise trigger level, the noise outcome is deemed acceptable. Above the project noise trigger level, management responses such as applying reasonable and feasible noise mitigation measures are to be recommended, along with assessing any residual noise impacts once noise mitigation has been considered.

The policy is designed in such a way that the assessing authority would consider the project noise trigger levels, reasonable and feasible mitigation measures, and any residual noise impacts when deciding on acceptable noise outcomes.

The site-specific project noise trigger levels need only be considered for the hours under which the noise or activity occurs.

Table 2. NPfI planning levels – $L_{Aeq,\ 15\ minutes}$ [dB]

Period, T (Note 1)	Intrusive		Amenity					Project noise trigger level
	RBL	RBL + 5	Area classification	Recommended amenity noise level	High traffic area	Project amenity noise level	+3dB correction	
Day	45	50	Urban	60	No	55	58	50
Evening	42	47	Urban	50	No	45	48	47
Night	39	44	Urban	45	No	40	43	43

Notes:

1. EPA defines the following periods:
   Day: 7 am to 6 pm Mon to Sat and 8 am to 6 pm Sun and public holidays,
   Evening: 6 pm to 10 pm Mon to Sun,
   Night: 10 pm to 7 am Mon to Sat and 10 pm to 8 am Sun and public holidays.
2. Project noise amenity level = recommended noise amenity level – 5dB, except where specific circumstances are met, such as high traffic.

Therefore, the following NPfI planning levels apply for this project:

- Residential premises must not be exposed to noise that exceeds $L_{Aeq,\ 15\ mins\ (Night)}$ **43 dB**.
- Surrounding commercial properties must also not be exposed to noise that exceeds $L_{Aeq,\ Business\ hours)}$ **63 dB**.

5.0 OPERATIONAL AND MECHANICAL PLANT NOISE ASSESSMENT

Operational and mechanical plant noise emission has been assessed as per the architectural drawings outlined in Section 2.0 of this report and from information provided to Koikas Acoustics by Pardey Street Enterprises Pty Ltd.

5.1 ASSESSMENT SCENARIOS

The following design scenarios are assessed. Assumptions included in the design are also noted for reference.

Table 3. Design scenarios and assumptions

Scenario	Description	Design assumptions
1	Operational noise and mechanical plant and equipment – nighttime hours	Cinema and retail space operating at maximum capacity and all air conditioners operating together.
2	AC condenser units – nighttime hours	All air conditioners operating together.

5.2 DESIGN PARAMETERS

The following noise sources were considered to be a worst-case scenario for the nighttime noise model scenario for in 15-minute period:

Table 4. Acoustic design scenarios and parameters

Noise Source	Description	Noise Level
Cinema Room	Noise egress through the windows of the facility from the cinema room. Noise from the film is judged to be the most dominant noise source. The noise level adopted has been taken from previous measurements conducted by Koikas Acoustics and is deemed to be conservative for the intended use of the cinema room.	$L_{Aeq,\ 15\text{-}minutes}$ 87 dB (Spatial Average)
AC Condenser Units	Two AC condenser units operating at full capacity	Lp @ 1-metre 65 dB

5.3 CALCULATED RECEIVER LEVELS

Mechanical plant noise levels have been predicted to nearby residential and commercial receivers by way of preparing an acoustic model and conducting point-to-point calculations based on standard sound propagation algorithms. All calculations consider the equipment as selected in the mechanical services plans, the associated sound levels and corresponding attenuators.

Reference should also be made to additional noise control recommendations included within Section 5.4 of this report, which also govern the calculated receiver noise levels.

Due to the size of the development, several potentially affected receiver locations must be assessed in terms of their respective noise exposure from mechanical plant and equipment associated with the development. The most noise-sensitive receiver locations are summarised below.

Table 5. Assessment locations

ID	Receiver type and address	Assessment location
R1	Residential / 231 Queen Street	Upper floor level
R2	Commercial / 229 Queen Street	Ground-level – nearest boundary
R3	Commercial / 227 Queen Street	Upper floor level
R4	Commercial / 216 Queen Street	Ground-level – nearest boundary
R5	Commercial / 216 Queen Street	Ground-level – nearest boundary
R6	Residential / 53 King Street	Upper floor level
R7	Residential / 54 King Street	Upper floor level
R8	Commercial / 56 King Street	Upper floor level
R9	Commercial / 222 Queen Street	Ground-level – nearest boundary
R10	Commercial /226 Queen Street	Ground-level – nearest boundary

Predicted operational mechanical plant noise levels, inclusive of all noise sources as identified in Table 4 are as follows:

Table 6. Operational Noise Levels at the Surrounding Premises [dB]

Receivers		Calculated External Noise Levels $L_{Aeq,15min}$	Project Noise Trigger Level $L_{Aeq,15min}$	Exceeding
Residential	R1	40	**43**	-
Commercial	R2	41	**63**	-
Commercial	R3	40		-
Commercial	R4	47		-
Commercial	R5	45		-
Residential	R6	41	**43**	-
Residential	R7	43		-
Commercial	R8	41	**63**	-
Commercial	R9	38		-
Commercial	R10	34		-

Operational and mechanical plant noise levels have been assessed to comply with the limiting NPfI criteria, pending the inclusion of noise control measures as detailed in the following section of this

report.

5.4 RECOMMENDATIONS

- AC condensers are to be installed on the pedestrian awning fronting King Street, locations are shown below in Figure 2.
- AC condenser units must not exceed 65 dB(A) at 1-metre.
- All windows and doors must remain shut during nighttime hours except as used for entry/exit.
- Alternate AC condenser unit locations to those nominated in this report may be used provided their performance is certified by an acoustical engineer.

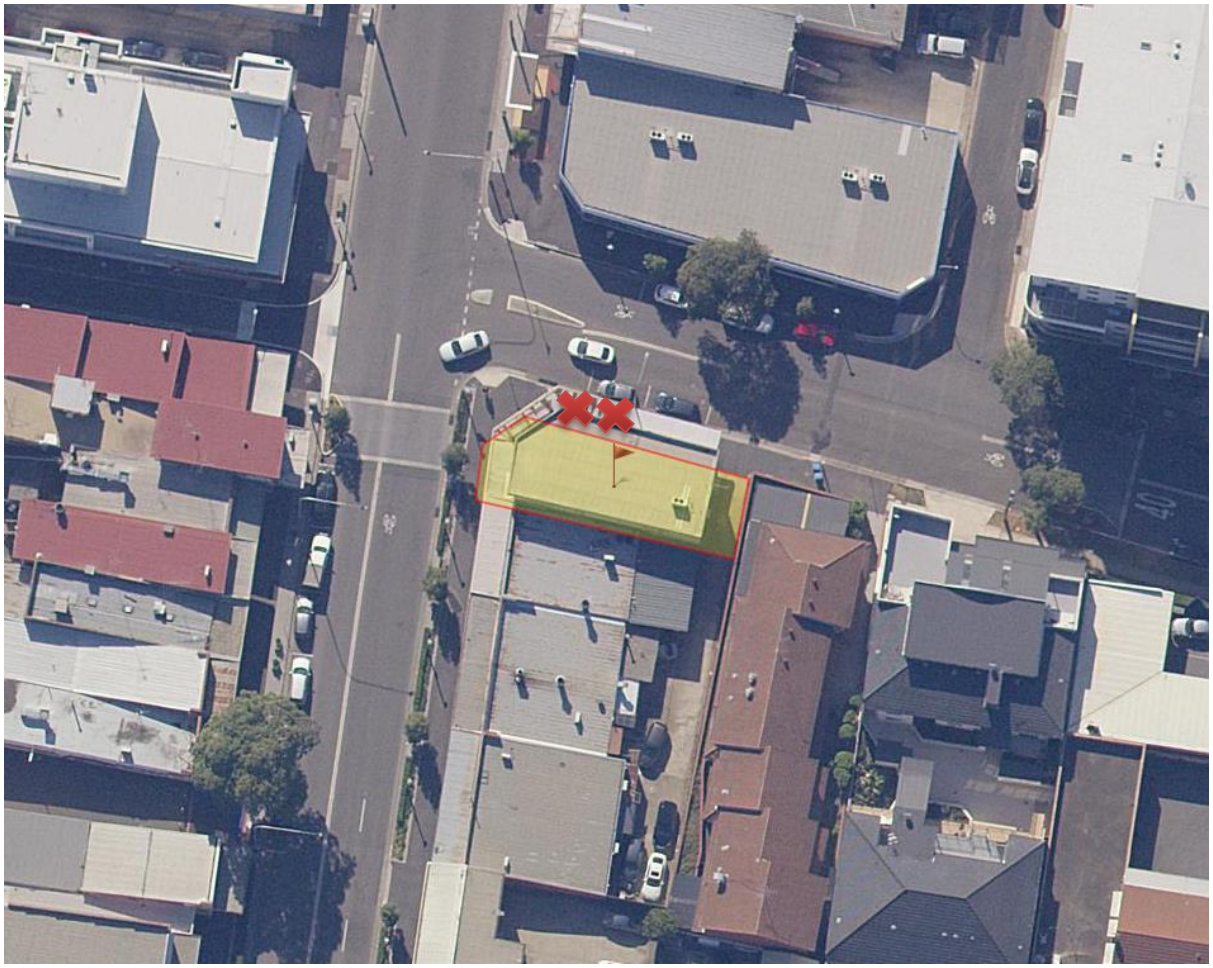


Figure 2. Proposed AC condenser unit locations – Image from SixMaps

= AC Condenser Unit

6.0 CONCLUSION

Koikas Acoustics was requested to prepare an acoustical assessment for the proposed restricted entertainment and retail facility located at 3/222 Queen Street, St Marys. The acoustical report is to accompany a development application to be submitted to Penrith City Council.

The assessment considers potential noise impacts to surrounding residents such that acceptable acoustic amenity is maintained.

Acoustic planning levels have been referenced from current EPA acoustic planning guidelines and requirements.

The included recommendations are based on designs prepared by AusJu Design.

The conclusions reached in this acoustical report should assist Council in making their determination of the proposal. A further detailed acoustical report may be required for the CC submission should the building design be amended, or as required by Council.

Of the assessed components of noise, the following conclusions have been reached:

- The proposed change of use to a restricted entertainment facility and retail space can achieve the nominated noise criterion under the EPA's NPfI such the acoustic amenity is maintained to surrounding commercial and residential receivers,

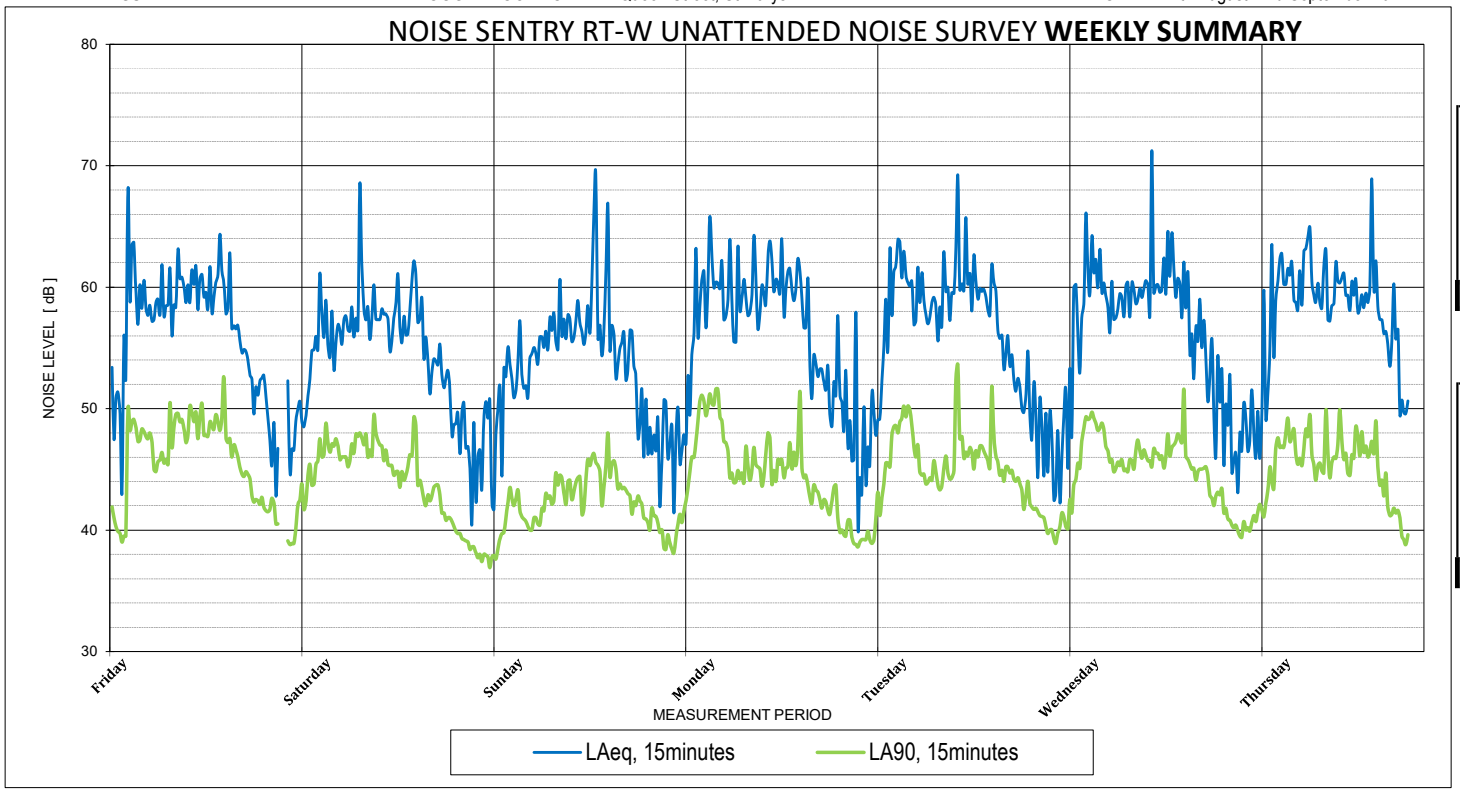
In our professional opinion, there is sufficient scope within the proposed building design to achieve the applied acoustic planning guidelines.

APPENDIX A

APPENDIX A

APPENDIX A

WEEKLY SUMMARY **LOGGER LOCATION:** 222 Queen Street, St Marys **PERIOD:** 27th August -2nd September 2021



SUMMARY OF AMBIENT NOISE LEVELS

	LA90 Daytime	*LA90* Evening	*LA90* Night-time
Day 1	46	43	38
Day 2	45	41	39
Day 3	41	42	38
Day 4	44	42	39
Day 5	44	44	39
Day 6	45	43	40
Day 7	45	39	40
RBL	**45**	**42**	**39**

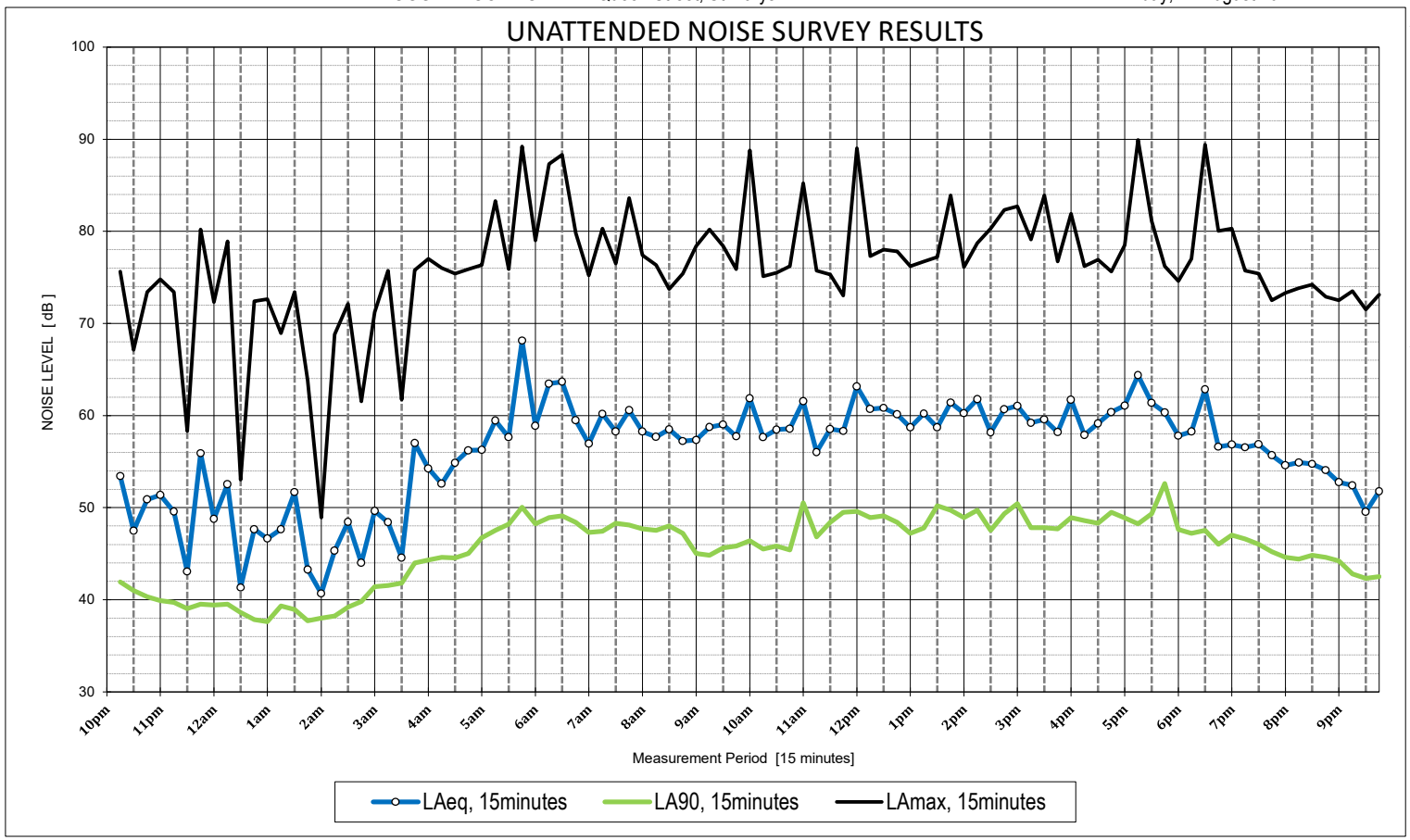
	LAeq Daytime	*LAeq* Evening	*LAeq* Night-time
Day 1	60	57	57
Day 2	59	55	53
Day 3	59	54	51
Day 4	61	55	56
Day 5	61	55	57
Day 6	61	56	57
Day 7	61	56	56
Average	**60**	**55**	**56**

SUMMARY OF TRAFFIC & MISC. NOISE LEVELS

LAeq 15 hrs	0700-2200	59	dB
LAeq 9 hrs	2200-0700	56	dB
Max LAeq 1 hr	0700-2200	62	dB
Max LAeq 1 hr	2200-0700	61	dB

* *Sundays and Public Holidays the hours change to 0800*

DAY 1 **LOGGER LOCATION:** 222 Queen Street, St Marys **DATE:** Friday, 27 August 2021



AMBIENT BACKGROUND NOISE METRICS

Descriptor	Period	Level	Units
LA90 Daytime	0700-1800	46	dB
LA90 Evening	1800-2200	43	dB
LA90 Night-time	2200-0700	38	dB

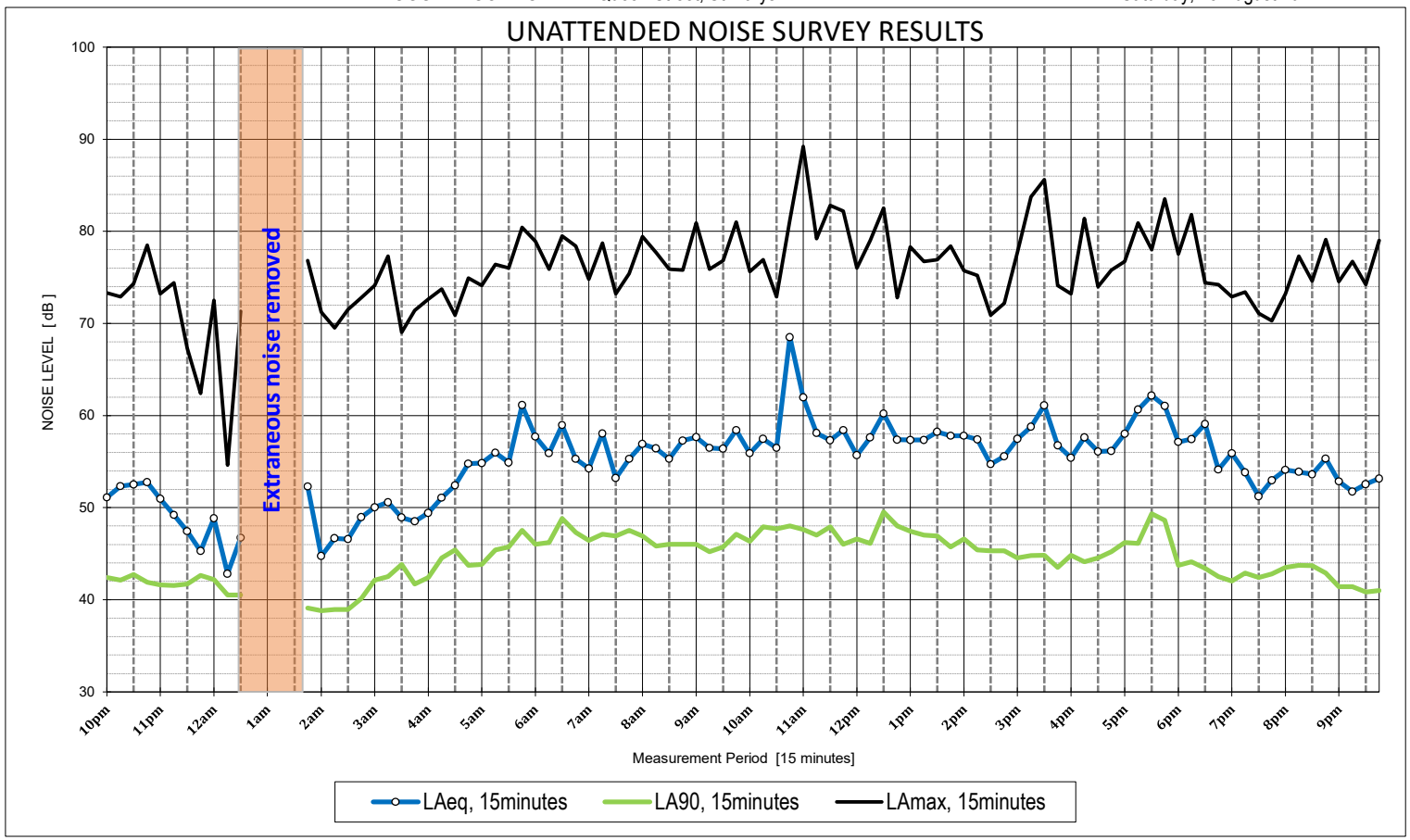
AMBIENT NOISE METRICS

LAeq Daytime	0700-1800	60	dB
LAeq Evening	1800-2200	57	dB
LAeq Night-time	2200-0700	57	dB

TRAFFIC & MISC. NOISE METRICS

LAeq 15 hours	0700-2200	59	dB
LAeq 9 hours	2200-0700	57	dB
Max LAeq 1 hour	0700-2200	61	dB
Max LAeq 1 hour	2200-0700	63	dB

DAY 2 **LOGGER LOCATION:** 222 Queen Street, St Marys **DATE:** Saturday, 28 August 2021



AMBIENT BACKGROUND NOISE METRICS

Descriptor	Period	Level	Units
LA90 Daytime	0700-1800	45	dB
LA90 Evening	1800-2200	41	dB
LA90 Night-time	2200-0700	39	dB

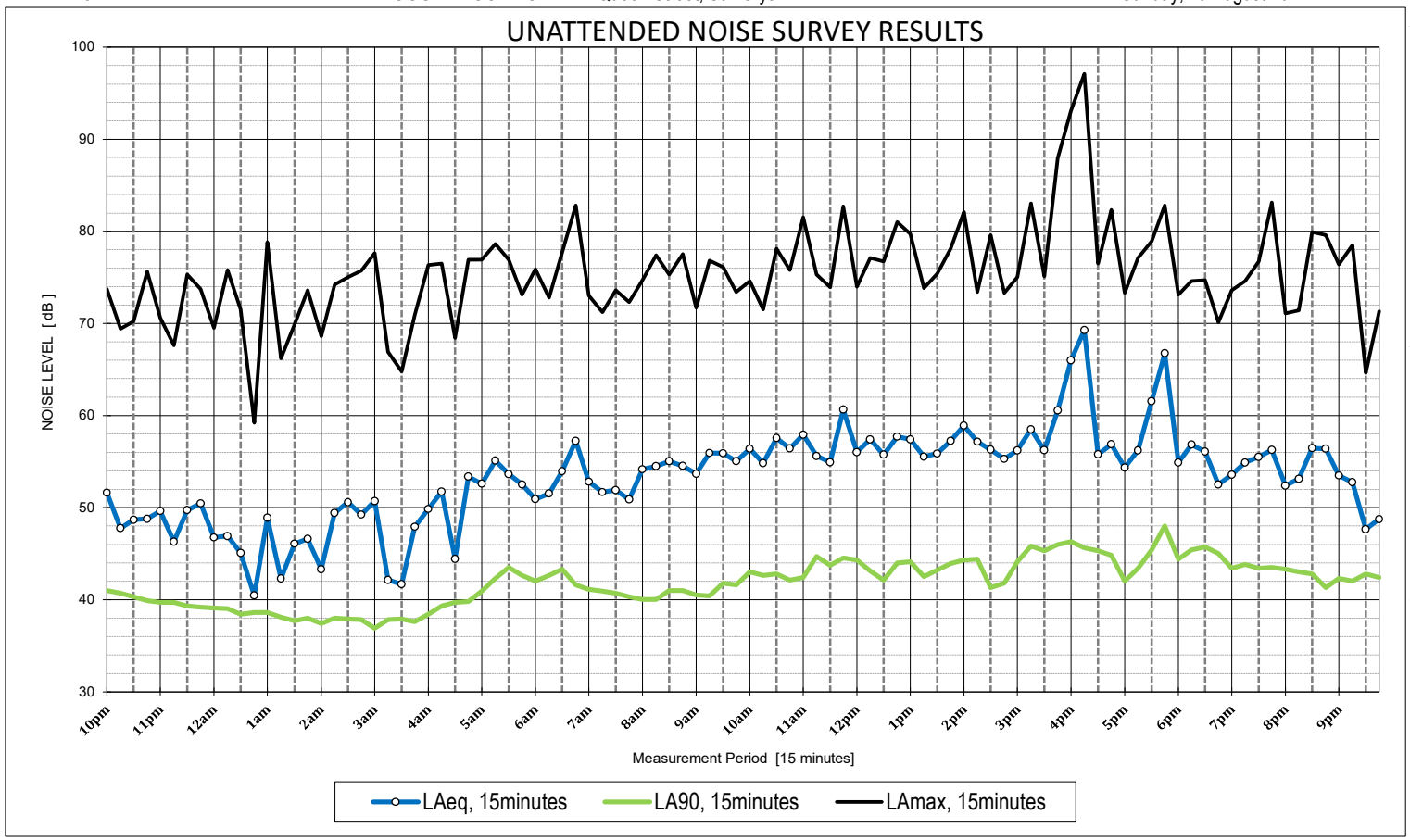
AMBIENT NOISE METRICS

LAeq Daytime	0700-1800	59	dB
LAeq Evening	1800-2200	55	dB
LAeq Night-time	2200-0700	53	dB

TRAFFIC & MISC. NOISE METRICS

LAeq 15 hours	0700-2200	58	dB
LAeq 9 hours	2200-0700	53	dB
Max LAeq 1 hour	0700-2200	60	dB
Max LAeq 1 hour	2200-0700	58	dB

DAY 3 **LOGGER LOCATION:** 222 Queen Street, St Marys **DATE:** Sunday, 29 August 2021



AMBIENT BACKGROUND NOISE METRICS

Descriptor	Period	Level	Units
LA90 Daytime	0800-1800	41	dB
LA90 Evening	1800-2200	42	dB
LA90 Night-time	2200-0800	38	dB

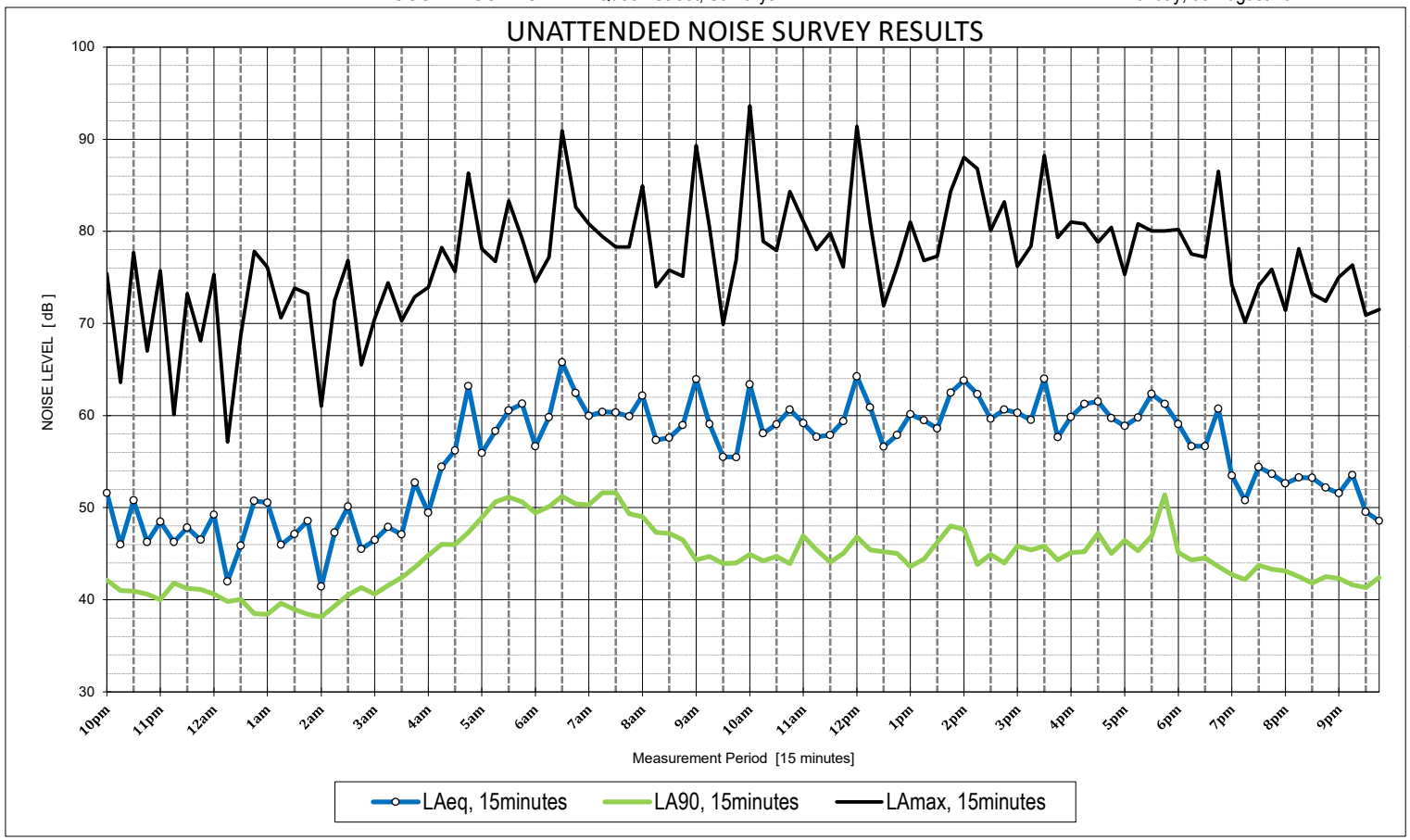
AMBIENT NOISE METRICS

LAeq Daytime	0800-1800	59	dB
LAeq Evening	1800-2200	54	dB
LAeq Night-time	2200-0800	51	dB

TRAFFIC & MISC. NOISE METRICS

LAeq 15 hours	0700-2200	58	dB
LAeq 9 hours	2200-0700	50	dB
Max LAeq 1 hour	0700-2200	62	dB
Max LAeq 1 hour	2200-0700	53	dB

DAY 4 **LOGGER LOCATION:** 222 Queen Street, St Marys **DATE:** Monday, 30 August 2021



AMBIENT BACKGROUND NOISE METRICS

Descriptor	Period	Level	Units
LA90 Daytime	0700-1800	44	dB
LA90 Evening	1800-2200	42	dB
LA90 Night-time	2200-0700	39	dB

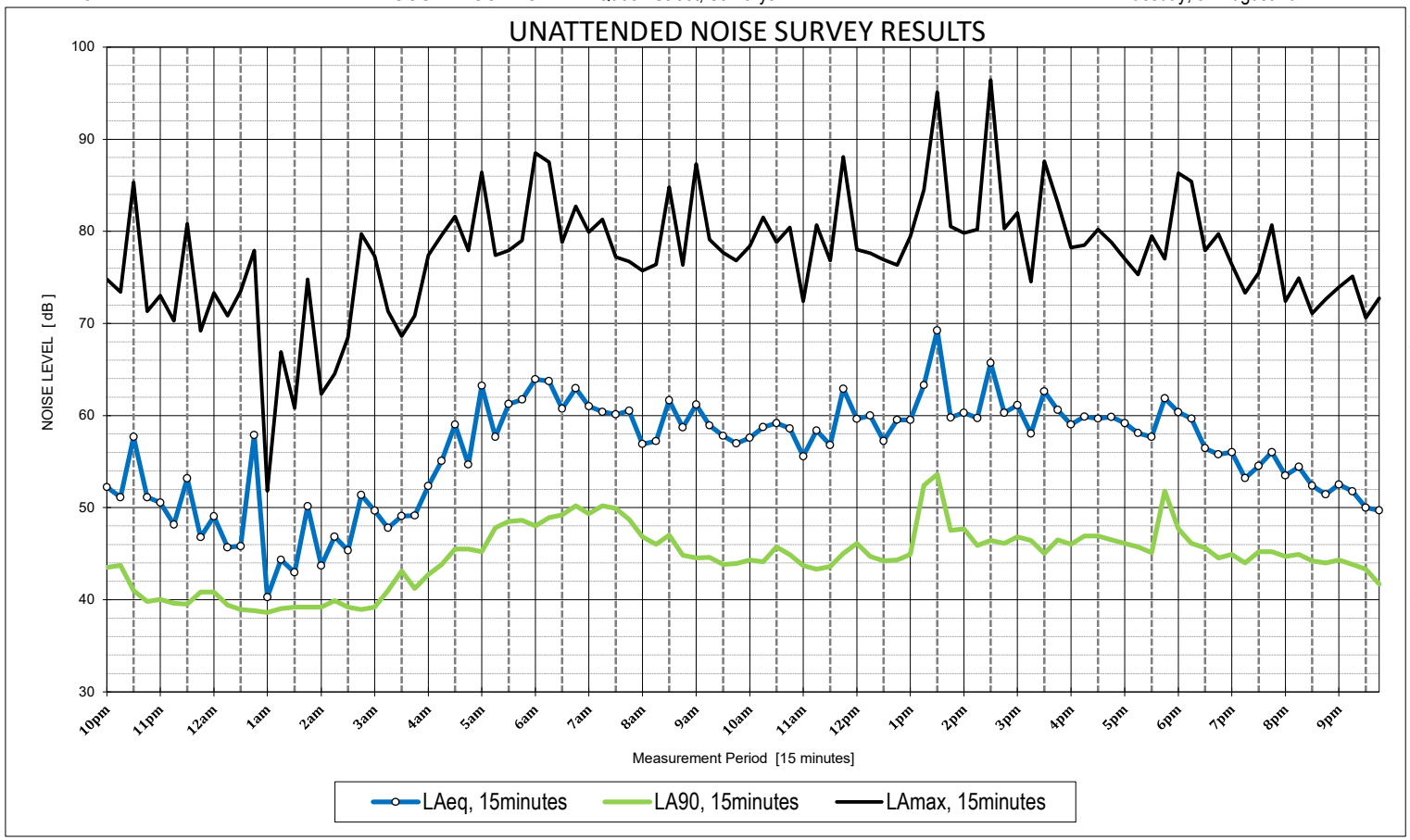
AMBIENT NOISE METRICS

LAeq Daytime	0700-1800	61	dB
LAeq Evening	1800-2200	55	dB
LAeq Night-time	2200-0700	56	dB

TRAFFIC & MISC. NOISE METRICS

LAeq 15 hours	0700-2200	60	dB
LAeq 9 hours	2200-0700	56	dB
Max LAeq 1 hour	0700-2200	62	dB
Max LAeq 1 hour	2200-0700	60	dB

DAY 5 **LOGGER LOCATION:** 222 Queen Street, St Marys **DATE:** Tuesday, 31 August 2021



AMBIENT BACKGROUND NOISE METRICS

Descriptor	Period	Level	Units
LA90 Daytime	0700-1800	44	dB
LA90 Evening	1800-2200	44	dB
LA90 Night-time	2200-0700	39	dB

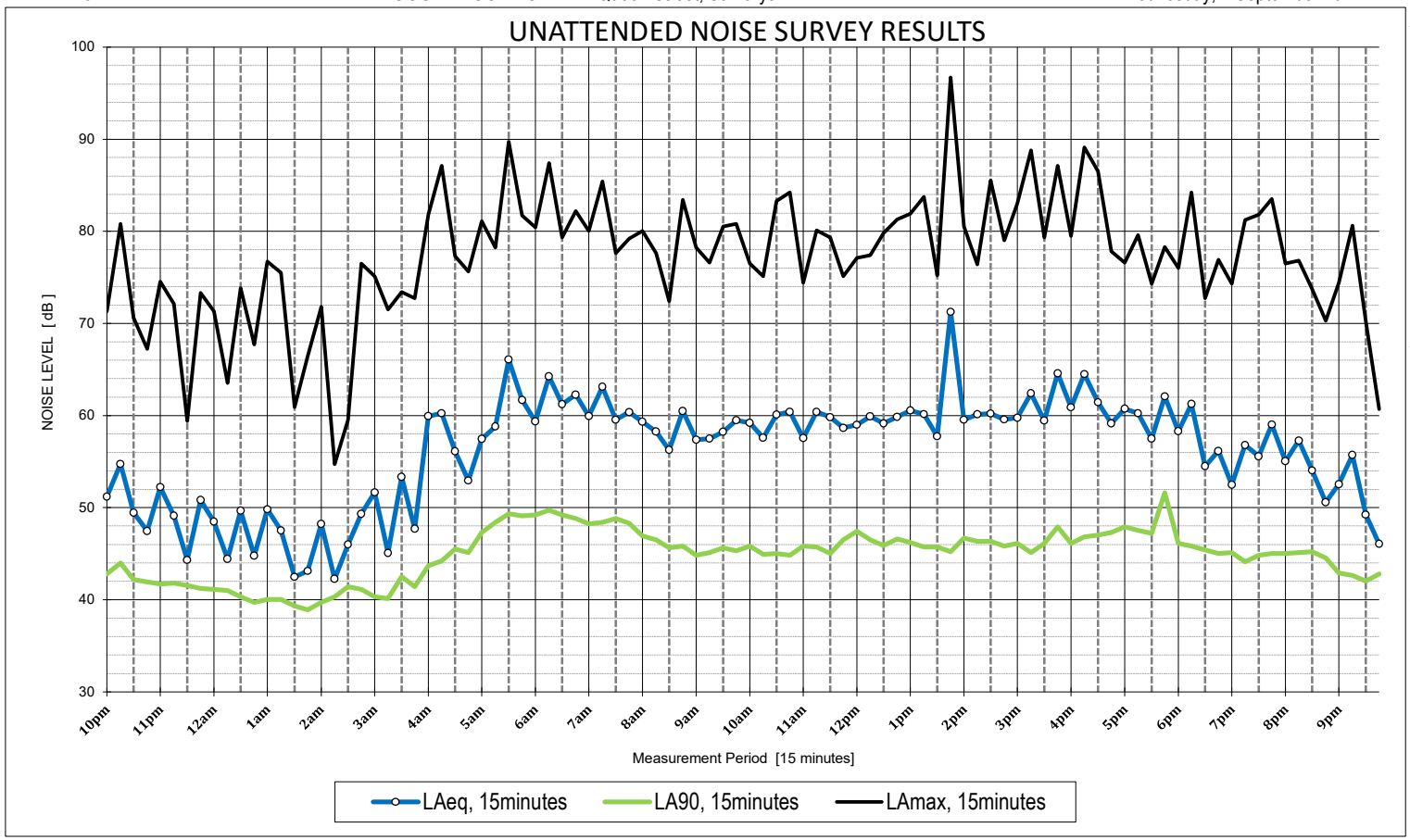
AMBIENT NOISE METRICS

LAeq Daytime	0700-1800	61	dB
LAeq Evening	1800-2200	55	dB
LAeq Night-time	2200-0700	57	dB

TRAFFIC & MISC. NOISE METRICS

LAeq 15 hours	0700-2200	60	dB
LAeq 9 hours	2200-0700	57	dB
Max LAeq 1 hour	0700-2200	62	dB
Max LAeq 1 hour	2200-0700	62	dB

DAY 6 **LOGGER LOCATION:** 222 Queen Street, St Marys **DATE:** Wednesday, 1 September 2021



AMBIENT BACKGROUND NOISE METRICS

Descriptor	Period	Level	Units
LA90 Daytime	0700-1800	45	dB
LA90 Evening	1800-2200	43	dB
LA90 Night-time	2200-0700	40	dB

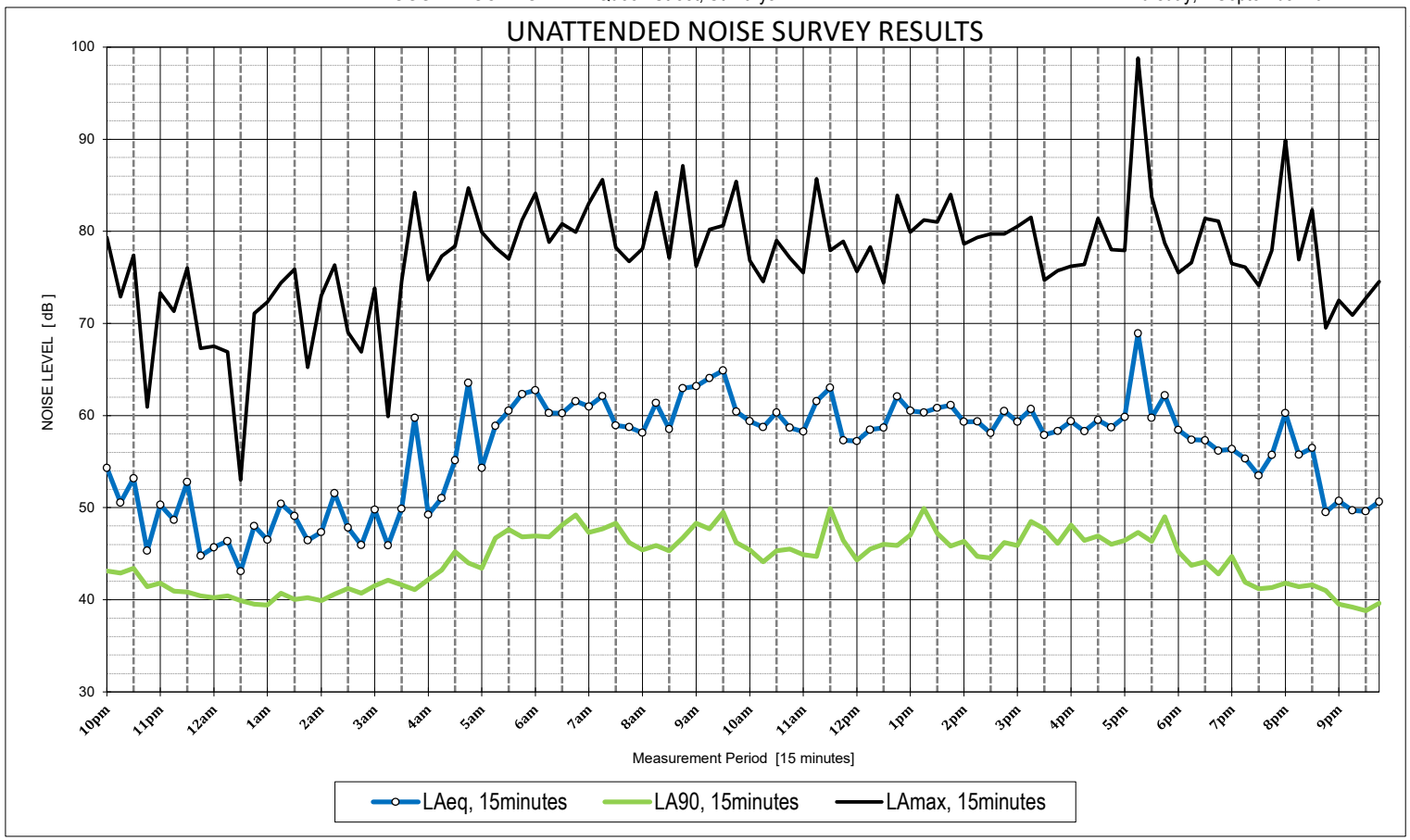
AMBIENT NOISE METRICS

LAeq Daytime	0700-1800	61	dB
LAeq Evening	1800-2200	56	dB
LAeq Night-time	2200-0700	57	dB

TRAFFIC & MISC. NOISE METRICS

LAeq 15 hours	0700-2200	60	dB
LAeq 9 hours	2200-0700	57	dB
Max LAeq 1 hour	0700-2200	62	dB
Max LAeq 1 hour	2200-0700	62	dB

DAY 7 **LOGGER LOCATION:** 222 Queen Street, St Marys **DATE:** Thursday, 2 September 2021



AMBIENT BACKGROUND NOISE METRICS

Descriptor	Period	Level	Units
LA90 Daytime	0700-1800	45	dB
LA90 Evening	1800-2200	39	dB
LA90 Night-time	2200-0700	40	dB

AMBIENT NOISE METRICS

LAeq Daytime	0700-1800	61	dB
LAeq Evening	1800-2200	56	dB
LAeq Night-time	2200-0700	56	dB

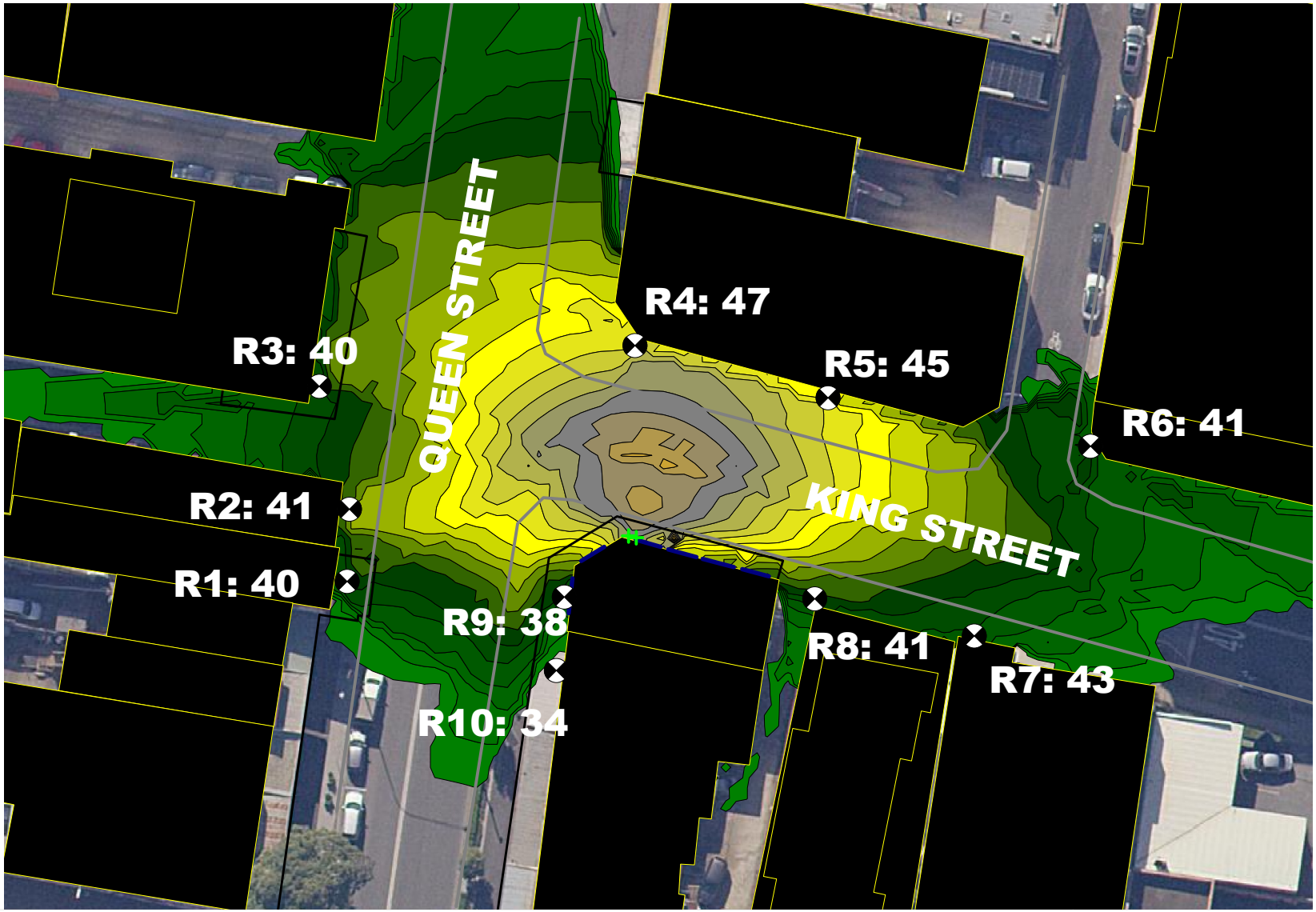
TRAFFIC & MISC. NOISE METRICS

LAeq 15 hours	0700-2200	60	dB
LAeq 9 hours	2200-0700	56	dB
Max LAeq 1 hour	0700-2200	63	dB
Max LAeq 1 hour	2200-0700	61	dB

APPENDIX B

APPENDIX B

APPENDIX B



Scenario 1
3/222 Queen Street, St Marys

Noise Sources
~ Noise egress through windows
~ AC condenser units

Note:
- LAeq,15mins noise level contours and receiver points R2, R4, R5, R9 & R10 are 1.5 m above the natural ground level.

- Receiver points R1, R3, R7 & R8 are 1.5 m above the first floor level

- Receiver point R6 is 1.5 m above the fourth-floor level

- The maximum reading at the nearest property is 47 dB.

PRINT DATE: 13/09/21

Point Source
vert. Area Source
Building
3D-Reflector
Contour Line
Receiver

> 35.0 dB
> 40.0 dB
> 45.0 dB
> 50.0 dB
> 55.0 dB
> 60.0 dB
> 65.0 dB
> 70.0 dB
> 75.0 dB
> 80.0 dB
> 85.0 dB

koikas acoustics PTY LTD
CONSULTANTS IN NOISE & VIBRATION

JOB NUMBER: 4984
CLIENT: Pardey Street Enterprises Pty Ltd
SITE ADDRESS: 3/222 Queen Street, St Marys
ASSESSED TO: EPA NPfI
LIMITING CRITERIA: 43 dB(A) - Residential
63 dB(A) - Commercial

N
W E
S