St Mary's Leagues Club Western Foyer Extension

Noise Impact Assessment

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1 INTRODUCTION

This report examines the potential environmental noise impact from the use of the proposed western foyer extension at the St Mary's Leagues Club.

This report:

- Identifies appropriate noise emission assessment criteria.
- Identifies noise sources associated with the proposed foyer extension.
- Assesses the predicted impacts against the criteria.
- Discusses the appropriate management and noise control measures that should be adopted to ensure that adverse impacts are not produced during the operation of the proposed facility.

2 PROJECT DESCRIPTION

2.1 THE PROPOSAL

The proposal for the western foyer involves the partial demolition of the existing western lounge and removal of car parking in order to accommodate:

- Ground floor public TAB,
- Ground floor Lounge and Sports Bar
- Level One Meeting Rooms / Function Rooms
- Associated Back of House / Office Areas.

Primarily the function spaces will be used for community group meetings, public meetings, corporate conferences and presentations. Operational hours are 7am to midnight for the function spaces.

The lounge and sports bar areas are operational hours are consistent with the current operational hours of the Club as follows: Monday through to Thursday, 10am – 4am; Friday from 10am to 6am; Saturday 9am to 6am; and Sunday 9am to 4am.

2.2 POTENTIALLY EFFECTED PROPERTIES

The nearest potentially affected residential properties are those located on Boronia Road to the south of the site. Noise emission compliance at these residential receivers will result in compliance at all receiver locations.

Figure 1: Site Plan

3 ENVIRONMENTAL NOISE DESCRIPTORS

Environmental noise constantly varies. Accordingly, it is not possible to accurately determine prevailing environmental noise conditions by measuring a single, instantaneous noise level.

To accurately determine the environmental noise a 15-20 minute measurement interval is utilised. Over this period, noise levels are monitored on a continuous basis and statistical and integrating techniques are used to determine noise description parameters.

In analysing environmental noise, three-principle measurement parameters are used, namely L_{10}, L_{90} and L_{eq}.

The L_{10} and L_{90} measurement parameters are statistical levels that represent the average maximum and average minimum noise levels respectively, over the measurement intervals.

The L_{10} parameter is commonly used to measure noise produced by a particular intrusive noise source since it represents the average of the loudest noise levels produced by the source.

Conversely, the L_{90} level (which is commonly referred to as the background noise level) represents the noise level heard in the quieter periods during a measurement interval. The L_{90} parameter is used to set the allowable noise level for new, potentially intrusive noise sources since the disturbance caused by the new 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.

The L_{eq} parameter represents the average noise energy during a measurement period. This parameter is derived by integrating the noise levels measured over the 15 minute period. L_{eq} is important in the assessment of traffic noise impact as it closely corresponds with human perception of a changing noise environment; such is the character of environmental noise.

4 NOISE OBJECTIVES

In the absence of any specific criteria to assess noise emissions from the occupied areas of the licenced premises in the Penrith City Council DCP 2014, the requirements Liquor and Gaming NSW have been adopted for this project.

4.1 BACKGROUND NOISE MONITORING

4.1.1 Long Term Monitoring

Long term monitoring of background and traffic noise was conducted using a noise monitor installed on site at 177 Boronia Road, St Marys.

Monitoring was conducted from the 14th to the 22nd May 2013 using an Acoustic Research Laboratories noise monitor set to A-weighted fast response. The monitor was calibrated at the start and end of the monitoring period using a Rion NC-73 calibrator. No significant drift was noted. Noise logger data is provided in Appendix 1.

The following table presents the measured background noise levels and the measured existing traffic noise levels at 177 Boronia Road, St Marys, which is one of the nearest residential receivers.

Table 1 - Measured Noise Levels – 177 Boronia Road, St Marys

Descriptor	Daytime (7am-6pm)	Evening (6pm – 10pm)	Night time (10pm-7am)
Background Noise Levels dB(A) L_{90}	43	44	40

4.1.2 Short Term Monitoring

In addition to the long term monitoring conducted on site, additional short term measurements were conducted on 12 September 2017 and 11 October 2017 in order to obtain a background noise spectrum for the purposes of the assessment. This spectrum is presented in Table 2 below:

Table 2 - Background Noise Spectrum – Boronia Road dB(A) L_{90}

Time	31.5Hz	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	A-wt
7pm to 12am (BG+5dB)	46	51	46	39	36	36	29	18	13	**40**

4.2 ACTIVITY NOISE – LIQUOR AND GAMING NSW

Liquor and Gaming NSW provides guidelines for assessing noise emissions due to activity noise including people talking, functions and music. These guidelines will form the basis of this assessment. The guidelines are:

1. The L_{10} noise level emitted from the licensed premises shall not exceed the background noise level in any Octave Band Centre Frequency (31.5 Hz – 8k Hz inclusive) by more than 5 dB between 07:00 am and 12:00 midnight at the boundary of any affected residence.
2. The L_{10} noise level emitted from the licensed premises shall not exceed the background noise level in any Octave Band Centre Frequency (31.5 Hz – 8k Hz inclusive) between 12:00 midnight and 07:00 am at the boundary of any affected residence.
3. Notwithstanding compliance with the above, the noise from the licensed premises shall not be audible within any habitable room in any residential premises between the hours of 12:00 midnight and 07:00 am.

4.3 EPA NOISE POLICY FOR INDUSTRY

Noise generated by the proposed mechanical plant will be assessed with reference to the EPA Noise Policy for Industry, Intrusiveness and Amenity Criteria.

4.3.1 NPfI - Intrusiveness Assessment

Intrusiveness criteria are calculated with reference to the existing background noise levels, and are presented below.

In all cases background noise levels have been adopted from the estimated average background A-weighted sound pressure levels (dB(A) L_{90}) for different areas of Australia as presented in Australian Standard AS 1055.2—1997.

Table 3 – EPA Intrusiveness Criteria

Location	Time of Day	Background noise Level - dB(A)$_{L90}$	Intrusiveness Noise Objective dB(A)$L_{eq(15min)}$ (Background + 5dB)
All Potentially Affected Residential Properties	Day Time (7am – 6pm)	43	48
	Evening (6pm – 10pm)	44	49
	Night (10pm-7am)	40	45

4.3.2 NPfI - Amenity Assessment

The EPA Amenity Criteria provide noise emission goals for the different areas of occupancy and are presented below

Table 4 - Amenity Criteria

Receiver Location	Land Type	Time of Day	Project Amenity Noise Level dB(A)$L_{eq(15\ min)}$
All Potentially Affected Residential Properties	Suburban	Day Time (7am – 6pm)	53
		Evening (6pm – 10pm)	43
		Night (10pm-7am)	38

4.4 PROJECT NOISE OBJECTIVES

The following noise assessment objectives have been determined from the background noise monitoring and the requirements of the Liquor and Gaming NSW.

As it is proposed to operate the TAB and Sportsbar will operate after 12am, the Liquor and Gaming NSW "Background + 0dB" criteria has been adopted for the purposes of this assessment. For the Function Rooms, the up to 12am criteria has been adopted.

Table 5 - Liquor and Gaming NSW Noise Objectives (dB(A))

Time	31.5Hz	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	A-wt
Up to 12am (BG+5dB)	51	56	51	44	41	41	34	23	18	**45**
After 12am (BG+0dB)	46	51	46	39	36	36	29	18	13	**40**

The following table presents the criteria applicable to the mechanical plant.

Table 6 - EPA Noise Objectives (dB(A))

Receiver Location	Land Type	Time of Day	Project Amenity Noise Level dB(A)$L_{eq(15\ min)}$	Intrusiveness Noise Objective dB(A)$L_{eq(15min)}$ (Background + 5dB)
All Potentially Affected Residential Properties	Suburban	Day Time (7am – 6pm)	53	48
		Evening (6pm – 10pm)	43	49
		Night (10pm-7am)	38	45

5 NOISE ASSESSMENT

5.1 TAB AND SPORTSBAR

The main noise source in the TAB and Sportsbar will be patron speech background music, which has been measured on site in the spaces. The noise level measured within the Sportsbars and TAB was 70dB(A) L_{10}, which is consistent for noise levels measured by this office in a number of similar developments.

The emission levels were corrected for distance attenuation, façade reflection and the number of patrons to determine the resultant noise level. Where noted in the tables below, noise levels have also taken into account the effect of noise attenuation treatments.

5.1.1 Predicted Noise Levels

The predicted noise levels from the indoor areas were corrected for distance attenuation, number of patrons, facade reflection and barrier effects based on the treatment nominated in section 6 of this report to determine the resultant noise level.

Table 7 - Predicted Noise Levels Location 1 – After 12.00am

Frequency	31.5Hz	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	A-wt
Predicted Noise Level (L10)*	<20	<20	<20	<20	<20	<20	<15	<10	<10	**<25**
Criteria Up to 12am (BG+5dB)	51	56	51	44	41	41	34	23	18	**45**
Complies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

*These levels have been predicted based on the assumption that the treatments set out in section 5 have been implemented. These noise levels are also "inaudible" within habitable rooms of adjacent receivers.

5.2 INDOOR AREAS (FUNCTION ROOMS)

It is proposed that the function rooms will be used for community group meetings, public meetings, corporate conferences and presentations. There will be no live music within these spaces. Typical maximum noise levels for these spaces is 85dB(A) $L_{10.}$

The emission levels were corrected for distance attenuation, façade constructions and air absorption. Where noted in the tables below, noise levels have also taken into account the effect of noise attenuation treatments.

5.2.1 Predicted Noise Levels

The predicted noise levels from the function rooms were corrected for distance attenuation, number of patrons, facade reflection and barrier effects based on the treatment nominated in section 6 of this report to determine the resultant noise level

Table 8 - Predicted Noise Levels Location 1 – Up to 12.00am

Frequency	31.5Hz	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	A-wt
Predicted Noise Level (L_{10})*	<20	<20	<20	<20	<10	<10	<10	<10	<10	**<20dB(A)**
Criteria (BG+0dB)	46	51	46	39	36	36	29	18	13	**40dB(A)**
Complies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

*These levels have been predicted based on the assumption that the treatments set out in section 6 have been implemented.

6 RECOMMENDED TREATMENT/DISCUSSION

The constructions/management controls set out below are recommended. Adoption of these controls will ensure compliance with the assessment criteria.

No substantial building treatments are required in order to achieve acceptable noise emissions. The following controls are recommended to ensure ongoing compliance:

1. No live music is to be played within the function rooms.

2. Amplified background music within the function rooms is to be limited to a sound pressure level of 85dB(A) within the space.

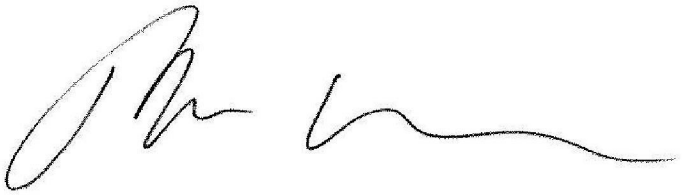
3. A detailed review of all external mechanical plant should be undertaken at construction certificate stage (once plant selections and locations are finalised). Acoustic treatments should be determined in order to control plant noise emissions to the levels set out in section 4 of this report. Compliance with these noise emission requirements will be achievable with standard acoustic treatments (plant enclosures, in-duct acoustic treatments and similar).

7 CONCLUSION

Noise impacts caused by the operation of the proposed western foyer extension have been assessed in accordance with the Liquor and Gaming NSW guidelines to determine the potential for adverse impacts on residential acoustic amenity.

Noise emissions will comply with Liquor and Gaming NSW guidelines provided that the recommendations set out in section 6 are implemented.

Yours faithfully,



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APPENDIX ONE –

AMBIENT NOISE MONITORING