

# JESSIE STEWART RESERVE

## NOISE ASSESSMENT OF PROPOSED MODIFICATIONS

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**PREPARED FOR**

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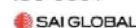
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## GLOSSARY OF ACOUSTIC TERMS

Most environments are affected by environmental noise which continuously varies, largely as a result of road traffic. To describe the overall noise environment, a number of noise descriptors have been developed and these involve statistical and other analysis of the varying noise over sampling periods, typically taken as 15 minutes. These descriptors, which are demonstrated in the graph below, are here defined.

**Maximum Noise Level ( $L_{Amax}$ )** – The maximum noise level over a sample period is the maximum level, measured on fast response, during the sample period.

**$L_{A1}$**  – The  $L_{A1}$  level is the noise level which is exceeded for 1% of the sample period. During the sample period, the noise level is below the  $L_{A1}$  level for 99% of the time.

**$L_{A10}$**  – The  $L_{A10}$  level is the noise level which is exceeded for 10% of the sample period. During the sample period, the noise level is below the  $L_{A10}$  level for 90% of the time. The  $L_{A10}$  is a common noise descriptor for environmental noise and road traffic noise.

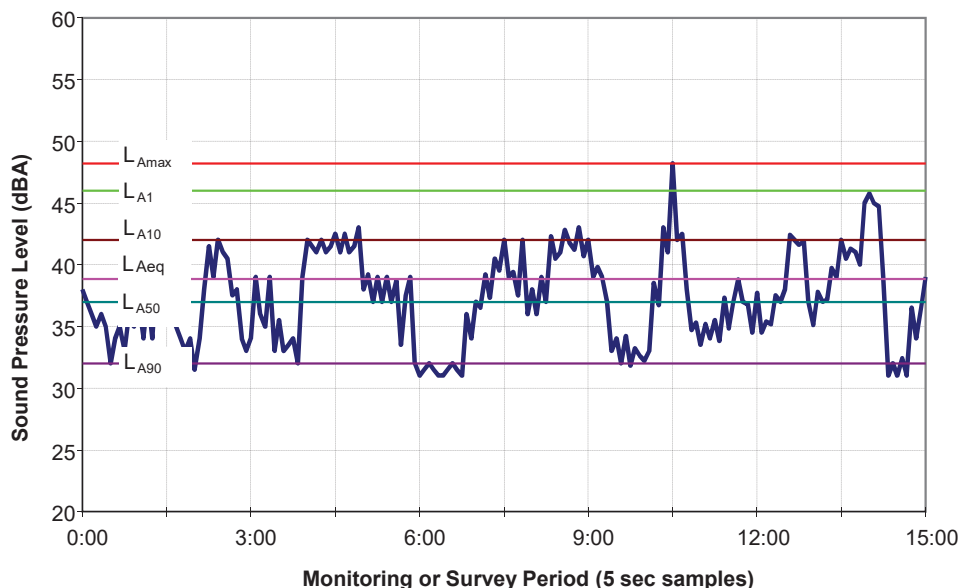
**$L_{A90}$**  – The  $L_{A90}$  level is the noise level which is exceeded for 90% of the sample period. During the sample period, the noise level is below the  $L_{A90}$  level for 10% of the time. This measure is commonly referred to as the background noise level.

**$L_{Aeq}$**  – The equivalent continuous sound level ( $L_{Aeq}$ ) is the energy average of the varying noise over the sample period and is equivalent to the level of a constant noise which contains the same energy as the varying noise environment. This measure is also a common measure of environmental noise and road traffic noise.

**ABL** – The Assessment Background Level is the single figure background level representing each assessment period (daytime, evening and night time) for each day. It is determined by calculating the 10<sup>th</sup> percentile (lowest 10<sup>th</sup> percent) background level ( $L_{A90}$ ) for each period.

**RBL** – The Rating Background Level for each period is the median value of the ABL values for the period over all of the days measured. There is therefore an RBL value for each period – daytime, evening and night time.

Typical Graph of Sound Pressure Level vs Time



## **1 INTRODUCTION**

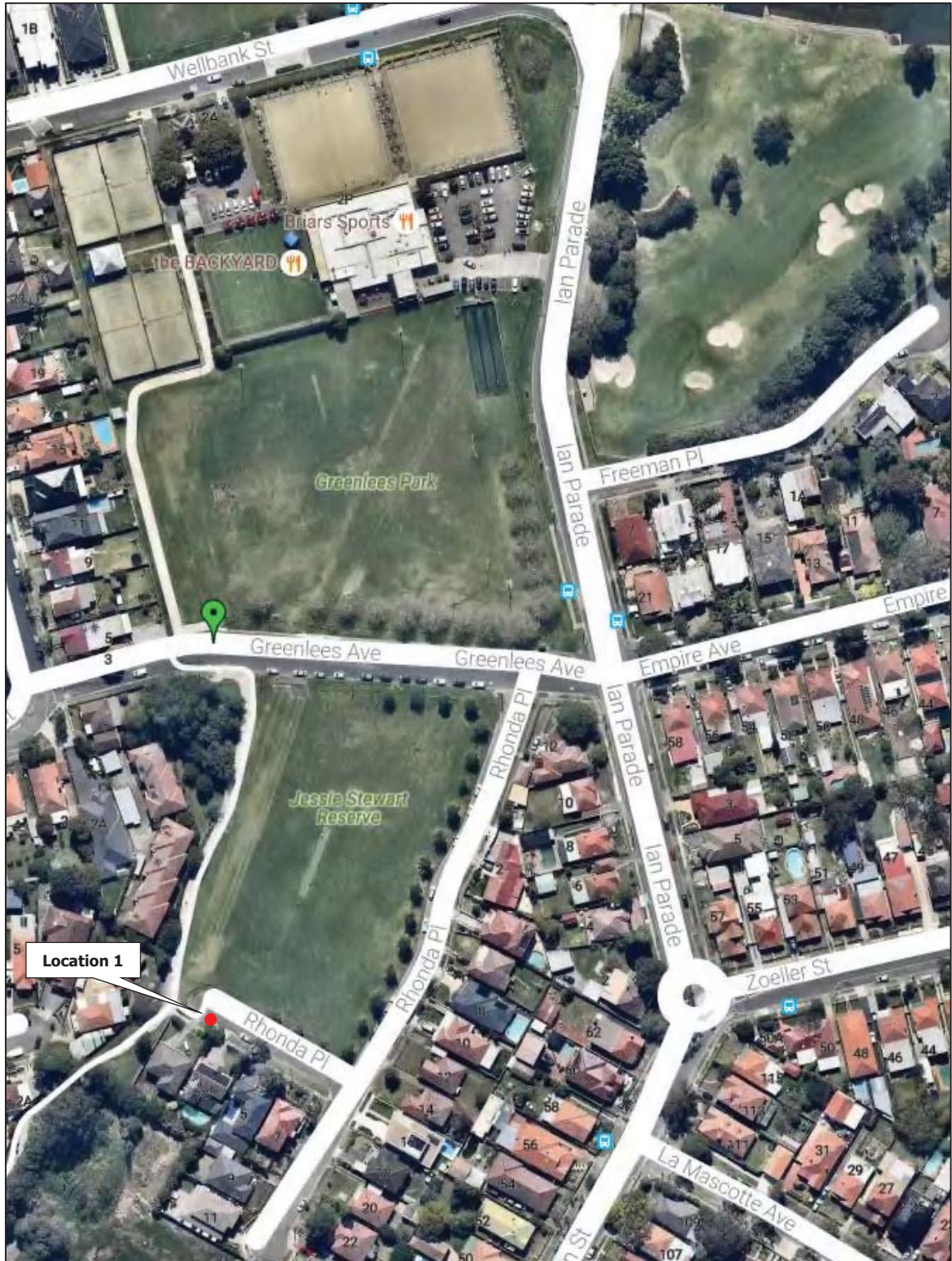
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The City of Canada Bay Council currently own and lease Jessie Stewart Reserve, Greenlees Avenue, Concord as shown in Figure 1-1. Council propose to modify the sporting facility by installing sports lighting. In addition to its current use as a cricket ground during the summer months, the field is also proposed to be used as a junior soccer venue.

This report addresses the potential noise impacts associated with the possible increased use of the playing field as a result of the new sports lighting. The assessment focuses on noise generated by sporting activities.



**Figure 1-1 Site Location**



Aerial image courtesy of © 2016 nearmap

## 2 SITE DESCRIPTION, EXISTING & PROPOSED SPORTING ACTIVITIES

Jessie Stewart Reserve is bounded by Greenlees Avenue to the north and Rhonda Place to the south and east. A pedestrian walkway, linking Crane Street and Rothwell Park to the south with Wellbank Street and the Briars Sports Club to the north, runs along the western side of the sports reserve. The surrounding area is residential and includes a number of recreational and sporting facilities. Briars Sports Club and Greenlees Park Tennis Club are located to the north with access off Wellbank Street. Greenlees Park and Massey Park Golf Club are also located to the north and Rothwell Park lies to the south.

Typical distances to residences from the centre and edge of playing field are summarised in Table 2-1.

**Table 2-1 Residential Receiver Distances, metres**

| General Receiver Areas  | Jessie Stewart Reserve |      |
|-------------------------|------------------------|------|
|                         | Centre                 | Edge |
| Rhonda Place (east)     | 60                     | 30   |
| Rhonda Place (south)    | 80                     | 35   |
| Greenlees Avenue (west) | 45                     | 18   |

The current and proposed usage of the sporting facility is summarised in Table 2-2.

**Table 2-2 Current and Proposed Sporting Field Usage**

| Field                  | Existing Use & Leasing   | Existing Hours of Operation                              | Proposed Modifications               | Future Use & Leasing  | Proposed Hours of Operation              |
|------------------------|--|--|--------------------------------------|---|--|
| Jessie Stewart Reserve | Cricket Inner Western Suburbs Cricket Association. Training Tues-Thurs 4pm -7pm and matches on weekends. | Sat & Sun and Tue, Wed, Thu evenings Summer season only. | Installation of four new light poles | Junior soccer and cricket. Concord Junior Soccer, Inner Western Suburbs Cricket Association. Training weekdays and matches on weekends. | Sat & Sun 8am-6pm and Mon-Fri 5pm-9.15pm |

### 3 AMBIENT NOISE ENVIRONMENT

Unattended long-term monitoring has previously been conducted within the Canada Bay Council area, around the nearby St Lukes sporting facilities at Concord. The area is of similar residential nature, with generally one principal arterial roadway and other local roads. The previous survey results are shown in Table 3-1 below. Only the Day and Evening periods are presented as these are the periods relevant for the operation of the sporting facilities.

**Table 3-1 INP Time Periods & Ambient Noise Levels**

| Period  | Time of Day  | Rating Background           |              |
|---------|--------------|-----------------------------|--------------|
|         |              | Level<br>(RBL) $L_{A90}$ dB | $L_{Aeq}$ dB |
| Day     | 0700-1800hrs | 43                          | 58           |
| Evening | 1800-2200hrs | 42                          | 53           |

The background and ambient noise levels shown in Table 3-1 are typical of a suburban residential receiver area and are considered an acceptable basis on which to determine assessment criteria. A series of short-term attended noise level measurements were conducted around the Canada Bay area on Tuesday 11 October 2016. A location in Rhonda Place at the southern end of Jessie Stewart Reserve was selected to establish the typical background and ambient levels during the evening. The measurements location is shown in Figure 1-1 and the measurements are presented in Table 3-2 below.

**Table 3-2 Attended Measurement Results – Jessie Stewart Reserve**

| Location | Time of day | RBL $L_{A90}$ dB | $L_{Aeq,15min}$ dB |
|----------|-------------|------------------|--------------------|
| Rhonda   | 1945hrs     | 41               | 56                 |
| Place    | 2115hrs     | 39               | 49                 |

The  $L_{eq}$  noise levels for the time period shown in Table 3-2, measured during the previous unattended long-term survey ranged between 52-56 dBA. As can be seen from the attended measurement results, noise levels surrounding Jessie Stewart Reserve were generally around this range.

Attended measurements previously undertaken during the Sunday morning period around the St Lukes sporting facility resulted in background  $L_{A90}$  and ambient  $L_{Aeq}$  noise levels at surrounding residential receivers ranging between 44dBA-47dBA and 49dBA-62dBA, respectively. The weekday evening and the Sunday morning levels were found to be within a similar range around St Lukes and it is therefore likely that weekday evening and Sunday morning noise levels would also be similar around Jessie Stewart Reserve, particularly at residences around the southern end which are less affected by traffic on Greenlees Avenue.



## 4 ASSESSMENT CRITERIA

City of Canada Bay Council has no specific criteria to address noise from sporting activities in public parks or recreation spaces. Furthermore no other applicable policies address such noise.

The EPA's *Noise Guide for Local Government* (NGLG) provides some guidance in assessing intrusive noise and relies on the *Industrial Noise Policy* (INP) which applies to the assessment of commercial and industrial noise sources but is not intended for the assessment of social or community sporting activities.

However, in the absence of any other nominated criteria we have referred to the *INP* for guidance on desirable limits of acoustic intrusiveness and amenity in the suburban context.

The *INP* aims to control industrial noise sources with respect to two criteria, firstly to address short-term intrusive noise impacts and secondly to maintain noise level amenity for an area. The intrusiveness criterion is applicable to residential receivers only. The purpose of the amenity criterion is to prevent the existing background noise level gradually increasing ("background creep") due to noise generated by successive industrial developments. Given sports fields only generate noise whilst in operation during evening training and weekend games (and any other periodic daytime usage, such as local school events), the issue of "background creep" is not relevant and the associated amenity criteria are therefore unnecessary.

The *INP* criteria for intrusive impacts are based on a background +5dB assessment. To determine the criteria for assessing the potential intrusiveness of noise from the sporting facilities, the background levels measured during the attended weekday evening monitoring and attended and unattended monitoring previously carried out around the St Lukes facility, have been adopted. The resulting Intrusiveness Criteria are detailed in Table 4-1 below.

**Table 4-1 Intrusiveness Criteria**

| Receiver                | Time of Day | Intrusive Criteria, dB |
|-------------------------|-------------|------------------------|
|                         |             | L <sub>Aeq,15min</sub> |
| Rhonda Place (east)     | Day         | 46                     |
|                         | Evening     | 44                     |
| Rhonda Place (south)    | Day         | 46                     |
|                         | Evening     | 44                     |
| Greenlees Avenue (west) | Day         | 46                     |
|                         | Evening     | 44                     |

Whilst the intrusiveness criterion is a means by which to gauge audibility, it is intended to apply to “industrial”-type noise emissions that are of a continuous nature. Noise that is more familiar in character to a receiver (and to which they are able to relate) and which is non-continuous or occurs over shorter, less frequent periods is less likely to cause disturbance or annoyance. For outdoor activity noise, a criterion of Background + 10dBA has previously been applied to assess potential impact. It is considered that this criterion is a more appropriate basis upon which to assess the potential impact of noise from the sporting field at nearby residents. A summary of the recommended limiting criteria for noise generated by the sporting activities is shown in Table 4-2.

**Table 4-2 Recommended Limiting Criteria for Sporting Activities**

| Receiver                | Time of Day | Recommended Criteria, dB |
|-------------------------|-------------|--------------------------|
|                         |             | $L_{Aeq,15min}$          |
| Rhonda Place (east)     | Day         | 51                       |
|                         | Evening     | 49                       |
| Rhonda Place (south)    | Day         | 51                       |
|                         | Evening     | 49                       |
| Greenlees Avenue (west) | Day         | 51                       |
|                         | Evening     | 49                       |

## 5 ASSESSMENT OF NOISE LEVELS

The proposed modifications to Jessie Stewart Reserve involve the installation of sports lighting comprising four new light poles and the additional use of the field as a soccer venue throughout the winter season. The proposed lighting will enable the field to be used for evening training by junior soccer teams during the winter season. There are no changes proposed to the times at which the sporting field will be used over the weekend, however year-round usage would then take place. The current on-street carparking arrangements will continue.

Noise levels generated by sport are highly variable and are influenced by the level of competition, which affects the vocal efforts of players, and the number and enthusiasm of spectators, officials and coaching staff.

Measurements of noise emissions from sporting events have established typical sound power levels ranging from 90dBA for rugby/soccer training to 95dBA for a competition game with approximately 250 spectators.

Table 5-1 summarises the range of noise levels expected at residential receivers surrounding Jessie Stewart Reserve during soccer usage which is considered to represent the worst case usage scenario. Exceedances of the associated criteria are also shown.

**Table 5-1 Predicted Noise Emissions from Jessie Stewart Reserve, dBA**

| Activity                              | Sound Power Level<br>$L_{Aeq,15min}$ | Predicted $L_{Aeq,15min}$ Noise Level |         | Exceedance  |              |                 |                 |
|---------------------------------------|--------------------------------------|---------------------------------------|---------|-------------|--------------|-----------------|-----------------|
|                                       |                                      | Distance, m                           |         | Daytime     |              | Evening         |                 |
|                                       |                                      | Closest                               | Typical | $L_{A90+5}$ | $L_{A90+10}$ | $L_{A90+5}$     | $L_{A90+10}$    |
| <b><i>Rhonda Place (East)</i></b>     |                                      |                                       |         |             |              |                 |                 |
| Training                              | 90                                   | 52                                    | 46      | 0-6         | 0-1          | 2-8             | 0-3             |
| Game                                  | 95                                   | 57                                    | 51      | 5-11        | 0-6          | NA <sup>1</sup> | NA <sup>1</sup> |
| <b><i>Rhonda Place (South)</i></b>    |                                      |                                       |         |             |              |                 |                 |
| Training                              | 90                                   | 51                                    | 44      | 0-5         | 0            | 0-7             | 0-2             |
| Game                                  | 95                                   | 56                                    | 49      | 3-10        | 0-5          | NA <sup>1</sup> | NA <sup>1</sup> |
| <b><i>Greenlees Avenue (West)</i></b> |                                      |                                       |         |             |              |                 |                 |
| Training                              | 90                                   | 57                                    | 49      | 3-11        | 0-6          | 5-13            | 0-8             |
| Game                                  | 95                                   | 62                                    | 54      | 8-16        | 3-11         | NA <sup>1</sup> | NA <sup>1</sup> |

Note 1: Competitive games will not be held during weekday evenings.

The noise emissions currently experienced at surrounding residences during cricket practice and matches will likely achieve recommended background+10dBA criteria. During the proposed future usage by junior soccer teams, received levels may exceed the recommended criterion by up to 3dBA at the closest receivers in Rhonda Place (east), up to 5dBA at Rhonda Place (south) and up to 11dBA at Greenlees Avenue (rear of residences to the west) during competitive games when players are in closest proximity to these residences. During training, only marginal (2-3dBA) exceedances are predicted when players are located in closest proximity to Rhonda Place residences. Exceedances of up to 8dBA may at times occur at the rear of the closest residences to the western side of the field, when players are adjacent the western sideline. When play occurs away from the sidelines, the recommended assessment criteria are generally achieved at surrounding residences during both training and game scenarios.

Noise emissions associated with individual vehicles will be unchanged however vehicular activity associated with the field usage will extend to the winter season and can be expected to occur until around 9.15pm-9.30pm weekday evening following training.

## 6 CONCLUSION

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This study was conducted to assess the potential noise impacts resulting from the proposed modifications to the existing sporting facilities at Jessie Stewart Reserve. The noise emissions assessed from the development include:

- Participant and spectator noise.
- Vehicular noise.

The noise impact assessment gives consideration to the following criteria and control guidelines:

- The EPA's *Industrial Noise Policy*, and
- The EPA's *Noise Guide for Local Government*.

The site benefits from several planning features in terms of limiting the impact of noise emissions:

- The site is an established sporting and recreational facility.
- Intervening roadways and landscaped buffer zones around the perimeter.

The conclusions of our assessment are as follows:

### **Participant and Spectator Noise**

Noise emissions from participants and spectators are an integral part of sporting facilities. These facilities are a necessary and important part of any residential community and as such, noise emissions are generally tolerated by surrounding residents.

The noise levels currently received at nearby residences during training and sporting events at Jessie Stewart Reserve are likely to increase as a result of the proposed modifications. The proposed use as a soccer venue will extend the current summer season usage to year-round. Provision of sports lighting will enable training to be held at the ground (as required) until 9.15pm Monday through Friday evenings.

Predicted noise levels from training and competitive fixtures are predicted to exceed the recommended assessment criteria for weekend and evening operations when play occurs near the edge of the field in closest proximity to these receivers. Training and competition games generally achieve the recommended assessment criteria when players are located at typical distances to receivers, away from the sidelines.

### **Vehicular Noise**

Whilst there would be no change in existing vehicular noise emissions expected to result from the proposed modifications, movements are expected to occur slightly later on weekday evenings due to the extension in training times made possible by sports lighting. In addition, the proposed use of the venue by junior soccer clubs will result in associated vehicular activities occurring throughout the winter sporting period.