Final Environmental Noise Report

Listen Out 2022
The Brazilian Field, Centennial Park
October 1st, 2022

Prepared for
The Centennial Parklands & Moore Park Trust
Mrs Macquarie's Rd
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A. Introduction

The P.A. People were engaged by The Centannial Parklands & Moore Park Trust to provide Environmental Noise Monitoring Services for Listen Out 2022

This document is the final report outlining the process and procedures employed by our Company to assist the venue and the event organiser to manage the environmental impact of this event on the surrounding residential areas of Centennial Park. The document is intended to fulfil the requirements of the sound monitoring report as required by The Centannial Parklands & Moore Park Trust to comply with Centennial Park EPA Notice details - Clause 17 (a) through (h) of the Trusts Prevention Notice No 1002139, file No SR125 dated 26-Feb-2001. And Variations of Prevention Notice No 1521549 File No EF13/8821 dated 18-Feb-2015

To proactively prevent perimeter sound pressure levels exceeding the levels set by the regulator, The PA People provided SPL*net* - a networked, real time sound pressure level monitoring system.

Sound pressure levels from five (5) fixed SPL data collectors located at key perimeter locations, and three (3) fixed SPL monitors at the FOH audio control mix positions were centrally monitored in real time. During the event two additional mobile sound pressure level monitoring engineers supplemented the SPL*net* system. These mobile monitors were used to patrol the perimeter, verify SPL*net* measurements and to conduct location specific measurements in response to any received complaints.

This report comprises:

- An introduction
- Event Details
- Environmental Noise management approach
- Monitoring Details
- Results
- Appendices

The P.A. People prepared the report for this event, under the guidance of Chris Dodds M.A.A.S (Managing Director).

The report also draws extensively on our experience in other similar venues and our understanding of event operational requirements, coupled with our strong understanding of environmental noise issues as they relate to outdoor venues and live entertainment.

Please do not hesitate to contact us should you require clarification of any part of this report.

B. Compliance with the Prevention Notice

The location of perimeter noise loggers, as directed by the CPMP Trust, is based on historical data of resident complaint locations. In addition, guidelines on the position of stages and the type and direction of sound amplification are designed to minimise noise spill to residential areas, and noise loggers are generally positioned at the most sensitive perimeter areas. This provides consistency in approach to noise management and is reviewed for continuous improvement. An independent review of sound management for events on CPMP land provided further investigation of the most sensitive perimeter areas and provided recommendations that have been implemented for the 2018/19 season onwards to concentrate noise loggers on sensitive areas that provide data that corresponds to the event levels.

The above procedures are implemented for each event in consultation between the Centennial Parklands and Moore Park Trust representatives, The P.A. People, and the event organiser. The Centennial Parklands and Moore Park Trust representatives and The P.A. People complement this further with the review of each event Noise Management Plan, providing feedback and recommendations to further mitigate noise impact.

At Listen Out 2022, 4 x noise limit exceedances were identified through the full sound checks, rehearsals, and event. The PA People and Event Organiser worked together to address these exceedances. In all other areas, Listen Out 2022 complied with the Prevention Notice, however due to these exceedances Listen Out 2022 has not fully complied with the noise monitoring conditions of the Trusts Prevention Notice No 1002139, file number SR125, dated 26 February 2001. And Variations of Prevention Notice No 1521549 File No EF13/8821 dated 18-Feb-2015

B.1 Exceedances

The PA People have collected a substantial amount of data pertaining to the noise levels at the perimeter during this event. On closer examination of the data than was possible when the preliminary report was written the quantity of exceedances has been increased from that stated in the preliminary report, as is noted in section B.1.2 below.

B.1.1 Rehearsals and Sound Tests

Zero (0) exceedance of the 65dB(A) limit was identified at the perimeter monitoring locations
Zero (0) exceedance of the 85dB(C) limit was identified at the perimeter monitoring locations

B.1.2 Main Event

There were four (4) separate occasions where the limits were exceeded. Three (3) of these had exceedances of both the A-weighted and C-weighted limits and one (1) where only the A-weighted limit was exceeded.

Four (4) exceedances of the 65dB(A) limit were identified at the perimeter monitoring locations.
Three (3) exceedances of the 85dB(C) limit were identified at the perimeter monitoring locations.

In response to condition 17(f) of the Prevention Notice a list of all limit breeches as measured on the perimeter of the Centennial Parklands while the event sound system was in use is shown below.

It is noted that where the data logger was located at the Oxford Street location there were particularly high noise levels prior to the event commencing, for the duration of the event, and after the event had concluded. SPL measurements in this area were consistently higher than the limits set out in the prevention notice. SPL measurements in this area were confirmed by mobile monitoring engineers as

being the result of local heavy vehicular traffic. Because of this, the limit breeches in this location are not noted individually here.

Similar circumstances were present at all other fixed monitoring locations on the perimeter of Centennial Park except Martin Rd.

Date	Time	Location	Levels	Duration	Exemption
Oct 1	1946	Lang Rd	71dBA / 87.8dBC	21 seconds	No Exemption
Oct 1	1958	Lang Rd	68.7dBA	39 seconds	No Exemption
Oct 1	2041	Lang Rd	68dBA / 87.3dBC	10 seconds	No Exemption
Oct 1	2053	Lang Rd	68.7dBA / 88.9dBC	18 seconds	No Exemption
Oct 1	1916	Lang Rd	73.9dBA / 87.6dBC	N/A	Condition 14(c)
Oct 1	1924	Lang Rd	71dBA / 88dBC	N/A	Condition 14(c)
Oct 1	1926	Lang Rd	71dBA / 88dBC	N/A	Condition 14(c)
Oct 1	1931	Lang Rd	68.7dBA / 87.1dBC	N/A	Condition 14(c)
Oct 1	2034	Lang Rd	68dBA / 90dBC	N/A	Condition 15 (stage 2)
Oct 1	2044	Lang Rd	69.1dBA / 87.1dBC	N/A	Condition 15 (stage 3)
Oct 1	2105	Lang Rd	74.6dBA / 89.6dBC	N/A	Condition 15 (stage 1)
Oct 1	2122	Lang Rd	68dBA / 89dBC	N/A	Condition 14(c)

On each occasion a limit breech was noted by the SPL*net* engineer to have occurred, and when feasible, a mobile monitoring engineer was sent to the logger locations to verify the source of noise. When the source of the breech was not due to extraneous local noise the sound system operators and the production manager for the event were notified. When appropriate, requests were for a reduction in levels were made. Where frequency information was available this information was provided to all parties so spectrum adjustments could also be made.

B.2 Complaints

As confirmed by the Trust, there were eighteen (18) sound-related complaints received. Seventeen (17) of the complaints were made to the telephone hotline during the sound tests on September 30th and day of the event. Post event the 18th complaint was made to the EPA.

A full list of complaints and the relevant details is available from the Trust on their complaints log.

Mobile noise monitors were available during sound tests and the event day to respond to all telephone hotline complaints. Real time and spot measurement investigation of these complaints revealed only four (4) exceedances due to the event.

B.3 Hours of Operation

Listen Out 2022 took place within the nominated hours as detailed for this event.

C. Event Details

C.1 Dates and Times

Listen Out 2022 was a multi-stage music concert held at The Brazilian Field, Centennial Park, Sydney from 12pm – 10pm on Saturday 1st October 2022. Sound system checks and rehearsals were held on both Friday 30th September from 1400–1600 and on Saturday 1st October between 1000 – 1100.

The Trust reports that 21,248 people attended the event.

The Trust confirms that music concluded before 22:00pm as scheduled.

The event, rehearsals and sound tests were all held within the licensed hours nominated in the venue licence and contained in the event plan.

C.2 Schedule of Acts

A complete schedule of acts can be seen below. In general, all acts conformed to this schedule.

C.3 Weather Conditions

During the times when noise monitoring was conducted for this event information pertaining to weather conditions around the event site were obtained from the Sydney Airport Weather Station, as it appears on the Bureau of Meteorology website.

Conditions could be described as cool with moderate to high winds throughout the day. There was no recorded rainfall although at the event site it is noted there were brief patches of light rain that did not last long on any occasion. Temperatures ranged between 18.7°C early in the afternoon of October 1st and dropped to 14.2°C at around 2100. Humidity was from 53-76% and the winds were predominantly from a south-easterly direction all day on October 1st. Wind speeds were noted between 11km/h and 32km/h with much of the day and evening being above 20km/h.

D. Environmental Noise Management Approach

D.1 Mitigation before the Event

Fuzzy, the event organisers for Listen Out 2022, are a well-established organisation with a good history of managing its noise emissions on event sites.

Audio system design has historically been done by the sound system contractors with the dual goal of reducing emissions, whilst maintaining acceptable performance levels for the artist's requirements. On this occasion we are satisfied that the systems provided for event were of an appropriate professional standard and level of performance.

Our client's Noise Management Plan forms the basis for sound monitoring for Listen Out 2022.

D.2 Mitigation during the Event

The SPL*net* system was used to continuously monitor and log noise levels at the event site.

The SPL*net* engineer at event control was able to use this data, in combination with the subjective analysis of the information received from the mobile monitoring engineers, to identify the source of any sound pressure level exceedances at the event perimeter. Any perimeter exceedances detected by SPL*net*, or the mobile monitoring engineers caused by external factors were identified. Any potential exceedances caused by the Listen Out 2022 sound reinforcement systems were identified and immediately actioned by event control.
The SPL*net* engineer set dynamic SPL thresholds and exceedance indicators for the FOH positions. These thresholds were based on the stage's effect on perimeter SPL conditions. Therefore, the sound engineer was able to proactively adjust the sound pressure level produced by the stage based on its' effect on perimeter conditions at any given time.

D.3 Mitigation after the Event

The Trust, the P.A. People and the organisers of Listen Out 2022 regard the management of environmental noise for this event to be appropriate and in compliance with the venue License and the EPA Prevention Notice. It is proposed that this level of sound management and monitoring is implemented for future events of this nature in Centennial Park.

E. Monitoring Details

E.1 Details of Measurement System

To monitor perimeter sound pressure levels for Listen Out 2022, The PA People provided a networked, real time sound pressure level monitoring system based on SPL*net*.

Key features of this system include:

- The centralised logging of SPL data includes information as to when stages are notified of exceedances or, to the best of our knowledge, impending exceedances, to ensure immediate action from the stages otherwise penalties are implemented from the sound bond.
- When notified of a complaint, sound control can immediately identify readings at the perimeter so there is an immediate measurement in the vicinity at the time of the complaint before the roving sound monitor arrives at the complaint location. This allows more accurate and immediate response to the complainant, and if there is an exceedance this can be immediately rectified centrally while the mobile sound monitor is being dispatched to the residence.
- The communication lines between identifying an exceedance and notifying the offending stage are more streamlined.
- All logging meters work in all weather conditions. Most logging meters currently employed for event monitoring in Australia are affected by wet weather or cannot be used at all.

As noted previously, the SPL*net* system is focused on proactively preventing perimeter sound pressure level exceedance.

Sound pressure levels for the Listen Out 2022 event were centrally monitored and recorded from fixed SPL meters located at five (5) key perimeter locations, and from three (3) FOH mixing positions in real time. During the event two (2) mobile sound pressure level monitors supplemented the SPL*net* system. The mobile monitors were used to patrol the perimeter and verify the SPL*net* measurements and to conduct location specific measurements in response to any received complaints.

The SPL*net* system was used to continuously monitor and log noise levels at, and around the event site. The SPL*net* system continuously recorded data from each of the five (5) SPL*net* perimeter monitors for the duration of the event.

The SPL*net* engineer at event control was able to use this data, in combination with the subjective analysis of the mobile monitoring engineers, to identify the source of sound pressure level exceedances at the event perimeter. Any perimeter exceedances detected by the SPL*net* system or the mobile monitoring engineers caused by external factors (i.e., not due to sound emanating from the event) were identified. Similarly, exceedances caused by the event sound reinforcement system could be identified and immediately actioned by event control.

Fast dB(A) and dB(C) SPL measurements for all SPL*net* meters were simultaneously monitored by the engineer at event control.

Fast dB(A) and dB(C) SPL results for the three (3) stages were also monitored at the FOH mixing position by the sound engineers. Dynamic SPL thresholds and exceedance indicators were set for the FOH positions by event control. These thresholds were based on the stage's effect on perimeter SPL conditions. Therefore, the sound engineer was able to proactively adjust the sound system outputs to maintain predetermined sound pressure levels based on their effect on perimeter conditions at any given time.

E.2 Site Plan and Measurement Locations

The P.A. People reviewed The Centannial Parklands & Moore Park Trust prevention notice and noise management plan. This information assisted us in formulating the event monitoring strategy that was implemented for this event.

E.2.1 Perimeter Monitoring

As per the requirements outlined in The Centannial Parklands & Moore Park Trust prevention notice for this category of event. Five (5) perimeter locations were used for the installation of fixed sound pressure level monitoring instruments. At these locations the instrument was attached to a light pole at a height of approximately three (3) metres.

The instrument cabinet comprises the following items:

- SPL*net* M100 analyser complete with third octave analysis software
- SPL*net* M121 Type 1 measurement microphone fitted in a weatherproof enclosure
- Battery, 4G mobile broadband modem

The five (5) fixed locations were near the following locations.

- 60 Oxford Street
- 10 Lang Road, Centennial Park
- 12 Martin Road, Moore Park
- 87 Darley Road, Centennial Park
- 60 York Road, Queens Park

To proactively manage levels at the perimeter of the event site, the engineer uses the fixed location data collection units. If the engineer detects any exceedance of the limits set out in the prevention notice a roving noise monitor is dispatched to the location to conduct location specific measurements and determine if the exceedance is a result of the amplified sound from the event.

These measurements are conducted using a class one portable analyser at a height between 1.2m-1.6m above ground, this meter when practical would be placed within 1m of the boundary of the nearest affected premises in relation to the fixed monitoring location.

E.2.2 Stage Monitoring

Three (3) systems were also located within the event boundary, at the FOH mixing locations. At these locations, an instrument was attached to the supporting structure of the platform.

The instrument cabinet comprises the following items:

- SPL*net* M100 analyser complete with third octave analysis software
- SPL*net* M121 Type 1 measurement microphone fitted in a weatherproof enclosure

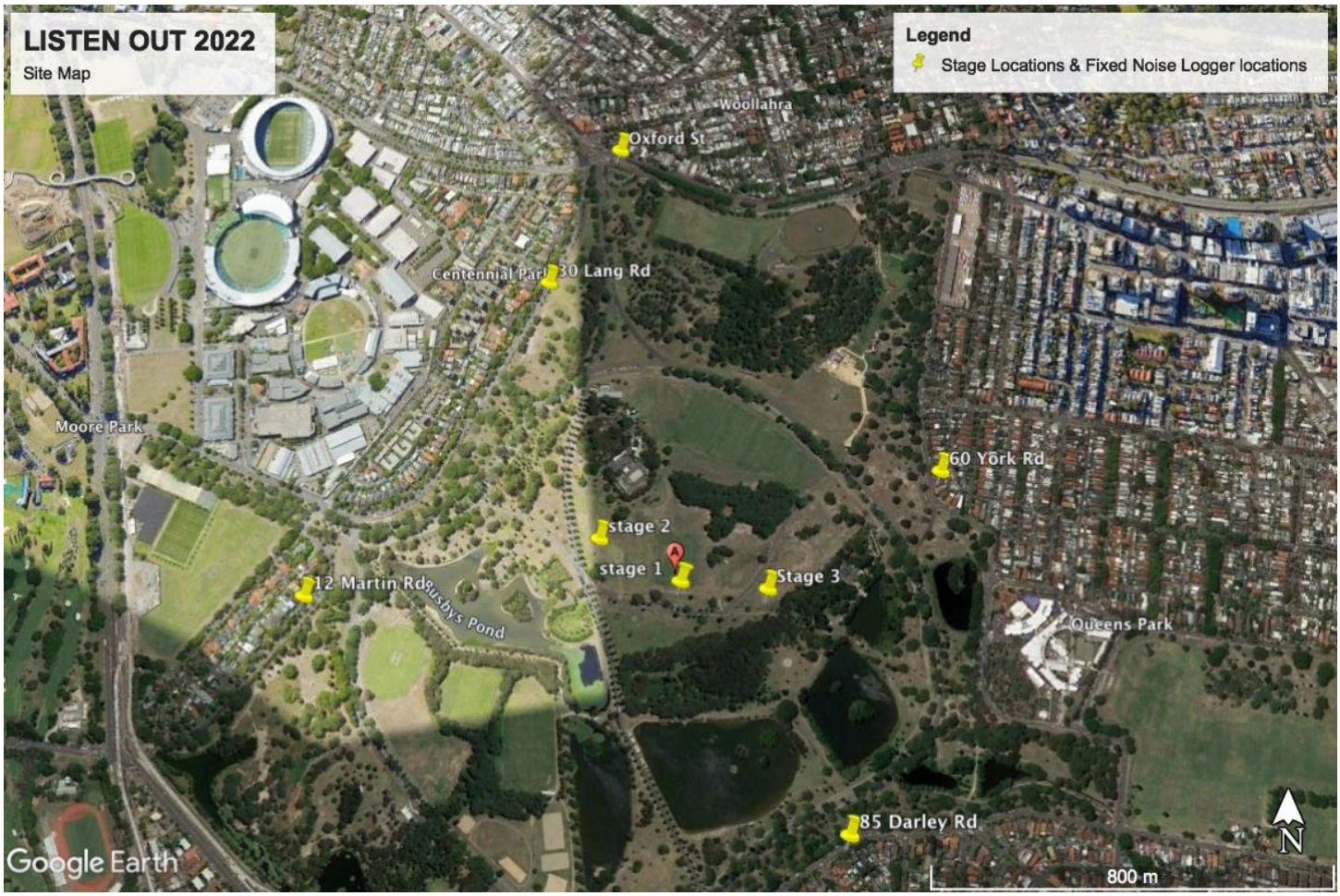
E.2.3 Mobile Monitor

Two (2) mobile monitoring personnel were also available to patrol the perimeter, corroborate the SPL*net* measurements and to conduct location specific measurements in response to any received complaints or exceedances noted by the engineer.

The remote monitoring engineers were provided with a Type1 sound analyser complete with calibrator.

E.2.4 Site Plan

Below is a plan showing the event site location and the position of the perimeter monitoring locations, as directed by the Centennial Park and Moore Park Trust representatives, used for this event.



E.2.5 Calibration

Each instrument was calibrated using either Bruel and Kjaer 4230 calibrator prior to and after use. No significant variations were noted between pre and post use measurements.

E.3 Use of Third Octave information

A feature of the SPL*net* system is the capability for third octave analysis at all measurement locations, again in real time.

This capability is significant in that it allows the audio operators of each system to tailor the response of their system to maximise the perceived level of their system by adjusting spectral content of the music, rather than relying on level only.

This also reduces the annoyance factor of the noise by reducing dominant frequencies and smoothing the resultant frequency response.

E.4 Complaints Management

The Centannial Parklands & Moore Park Trust has adopted a comprehensive sound management program, which includes a detailed complaints management procedure.

The focus of The P.A. People and The Centannial Parklands & Moore Park Trust for this event was to proactively minimise complaints by monitoring perimeter sound pressure levels continuously in real time. In addition to continuous static perimeter monitoring, two (2) mobile monitoring engineers were available to attend complainant locations personally.

F. Results

F.1 Perimeter Results

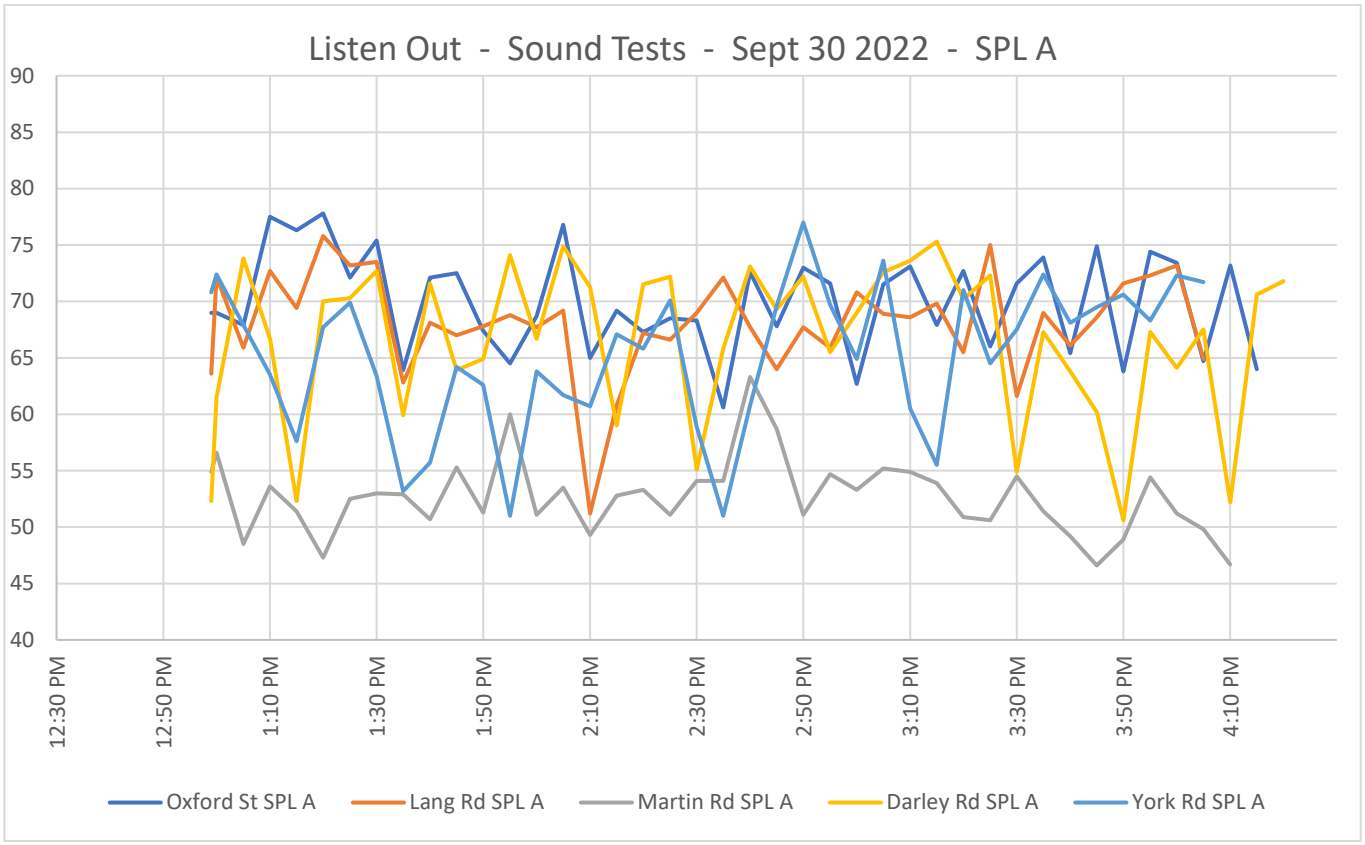
The SPL*net* system employed for this event provided a significant amount of data.

One would expect that continuous monitoring of all perimeter sensors might reveal a significant increase in the number of exceedances identified. This has not proven to be the case, due mostly to the proactive approach of using this same information to adjust the exceedance thresholds provided to each stage.

Below are four (4) graphs outlining the levels at each perimeter location over the duration of the event, please note that these graphs are of limited use in and of themselves as they record absolute levels due to all environmental factors, not only levels that are associated with the sound generated by the Listen Out 2022 stages.

Each plot represents samples taken at 5-minute intervals of a total some 3600 points per hour at each measurement location.

On the event day graphs it can be seen that the data logger located at Martin St stopped delivering data at approximately 2030. Measurements throughout the day showed no exceedances of the noise limits and random measurements were taken by mobile monitoring engineers and confirmed no breeches at this location.


Listen Out - Sound Tests - Sept 30 2022 - SPL A
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1:30 PM
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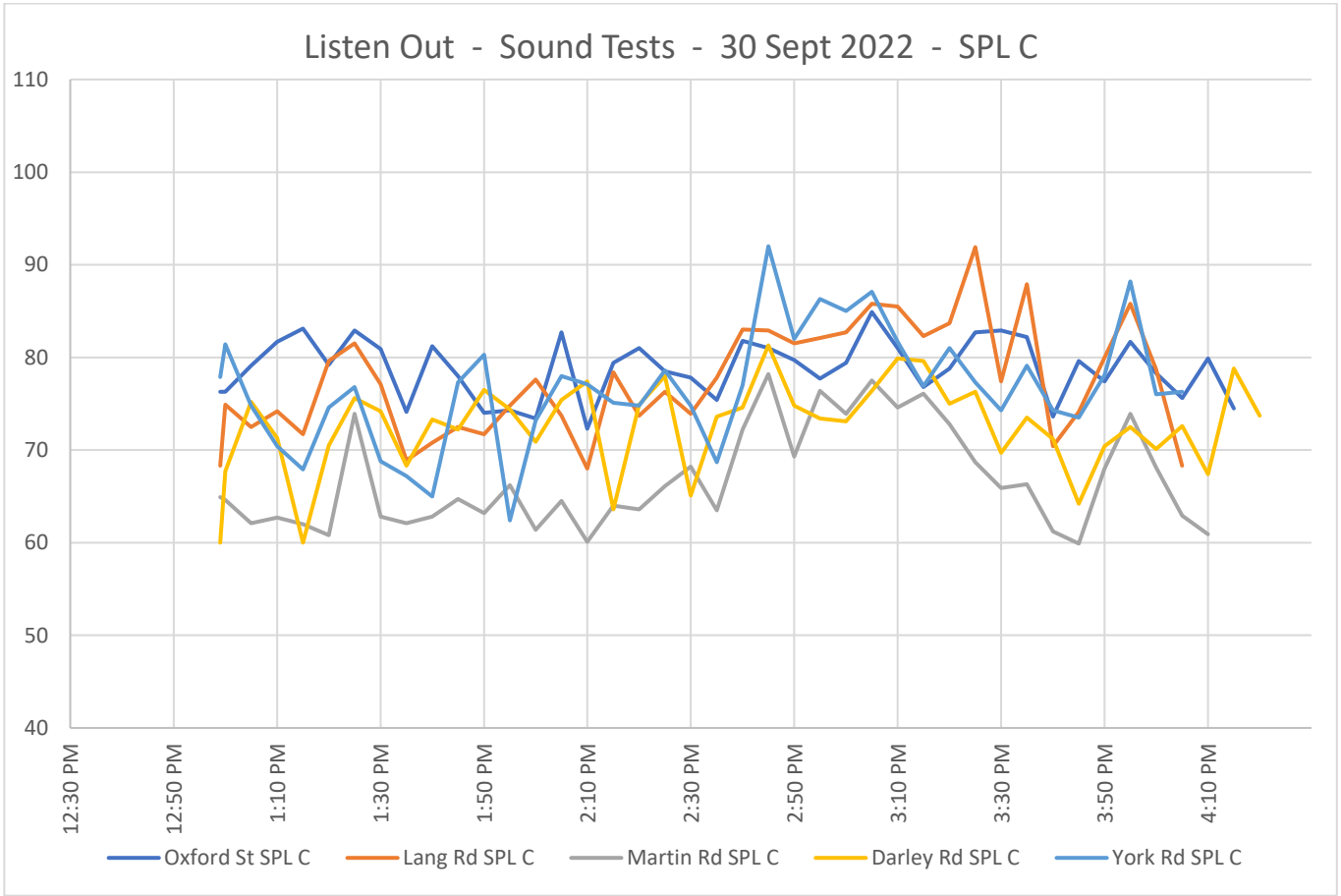
Oxford St SPL A
Lang Rd SPL A
Martin Rd SPL A
Darley Rd SPL A
York Rd SPL A


Listen Out - Sound Tests - 30 Sept 2022 - SPL C
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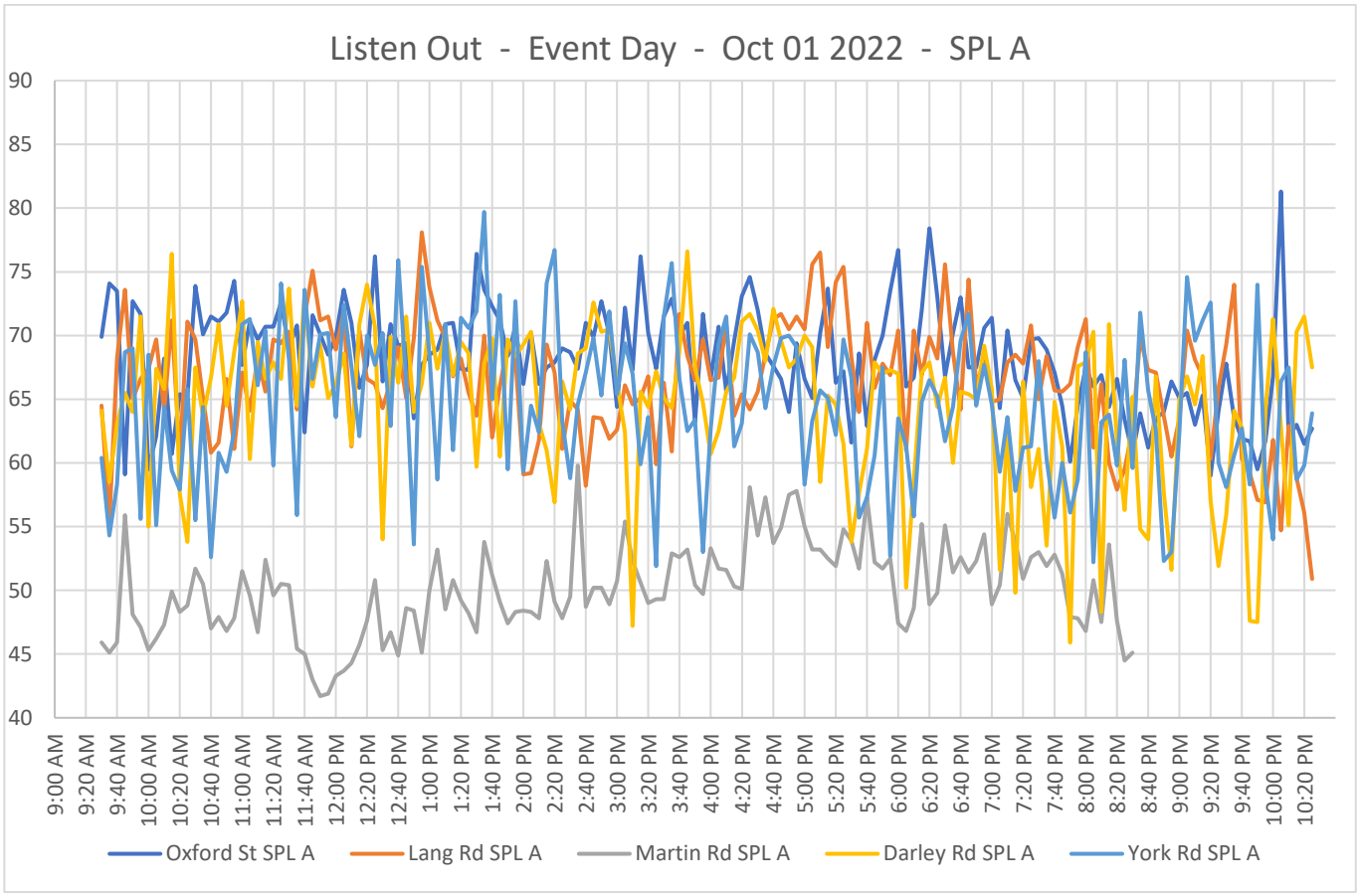
Oxford St SPL C
Lang Rd SPL C
Martin Rd SPL C
Darley Rd SPL C
York Rd SPL C


Listen Out - Event Day - Oct 01 2022 - SPL A
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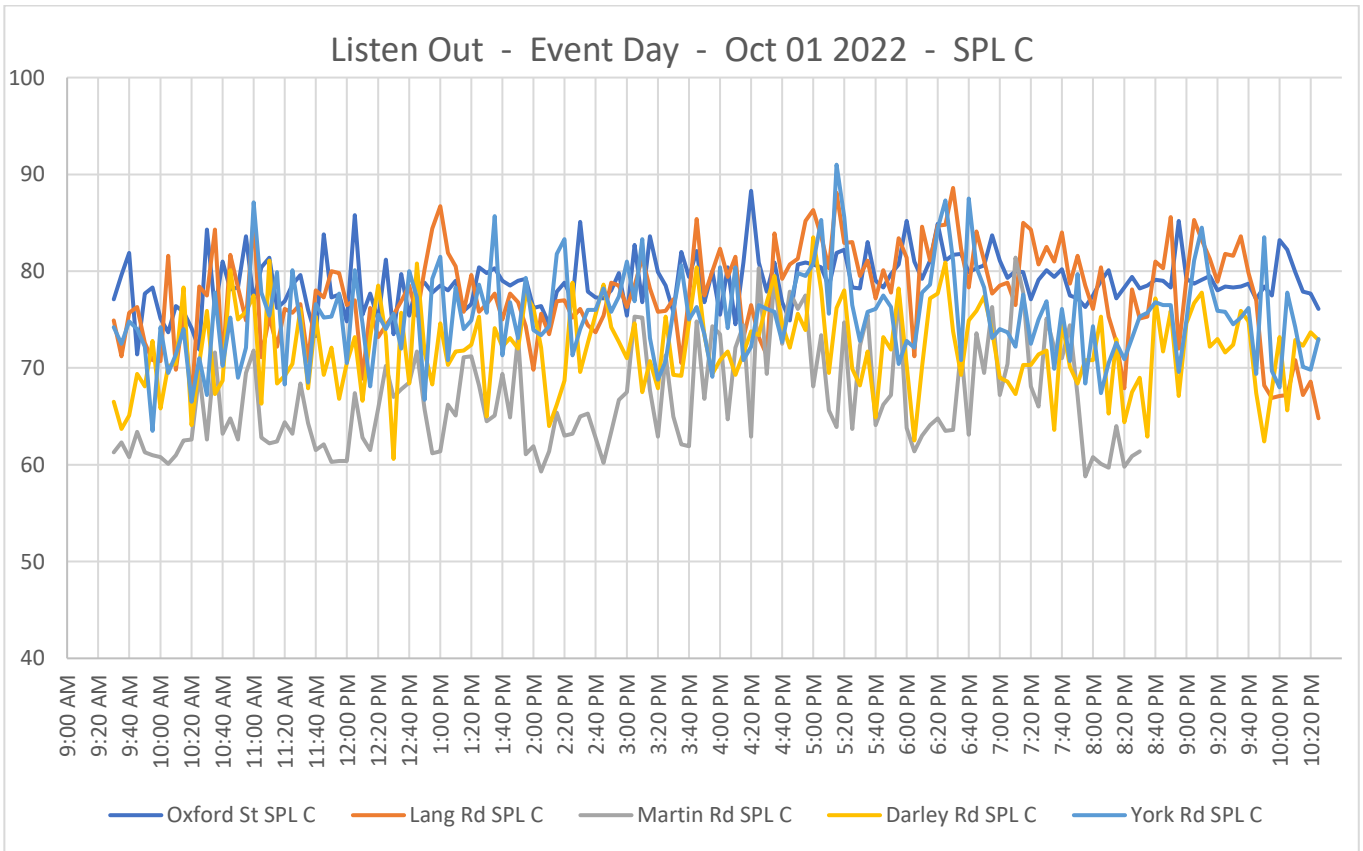
Oxford St SPL A
Lang Rd SPL A
Martin Rd SPL A
Darley Rd SPL A
York Rd SPL A


Listen Out - Event Day - Oct 01 2022 - SPL C
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Oxford St SPL C
Lang Rd SPL C
Martin Rd SPL C
Darley Rd SPL C
York Rd SPL C

F.2 Management Process for Exceedances

With the SPL*net* system, noise levels at all perimeter points were centrally monitored in real time from event control. The system is designed so that upon the detection of a perimeter exceedance deemed to be the result of the Listen Out 2022 sound reinforcement systems, event control would immediately contact the front of house sound control position and, or the event organiser to request a level decrease.

In general, communications between event control and the stages were prompt and effective in preventing and correcting any perimeter exceedances.

The dynamic sound pressure level thresholds set for the stage were effective in preventing perimeter exceedances.

G. Summary

Overall, we believe that the implementation of the SPL*net* system as part of the environmental noise management plan for Listen Out 2022 has ensured overall compliance with the EPA Prevention Notice and improved the quality of noise management for the event.