



Final Environmental Noise Report

**Listen Out
Brazilian Field, Centennial Park
September 30 2017**

Prepared for
**Centennial Parklands Trust
Locked Bag 15
Paddington
NSW. 2021**

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A. Introduction

The P.A. People were engaged by Centennial Parklands Trust to provide Environmental Noise Management and Monitoring Services for Listen Out

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 the Royal Botanic Gardens precinct. The document is intended to fulfil the requirements of the sound monitoring report as required by Centennial Parklands Trust to comply with Clause 13 through 17 of the Trusts Prevention Notice No 1521549 dated 18 February 2015.

In order to proactively prevent perimeter sound pressure levels exceeding the levels set by the regulator, The PA People provided *SPLnet* - a networked, real time sound pressure level monitoring system.

Sound pressure levels from five (5) fixed SPL meters located at key perimeter locations along with two (2) fixed monitors at the FOH mix position were centrally monitored in real time. During the event two (2) additional mobile sound pressure level monitor personnel supplemented the *SPLnet* system. These mobile monitors were used to patrol the perimeter, verify *SPLnet* 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. Event Details

B.1 Dates and Times

Listen Out was a multi stage music festival held at The Brazilian Field, in Centennial Park, Sydney from 1300 – 2200 on Saturday 30 September 2017.

Sound system checks and rehearsals were held on both Friday 29th September from 1600-1800 and Saturday 30th September 1200-1300.

The Trust reports that approximately 28,831 people attended the event this year.

The Trust confirms that music concluded by 2200 as scheduled.

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

B.2 Schedule of Acts

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

Atari stage		909 stage		3rd Base stage	
time	artist	time	artist	time	artist
1330-1400	Mallrat	1300-1335	Mookhi	1400-1500	Willaris K
1405-1505	Jai Wolf	1350-1430	Kucka	1500-1600	CLYPSO
1515-1600	Little Simz	1440-1520	Touch Sensitive	1600-1700	Annie Bass
1610-1655	Mac Miller	1530-1615	Vallis Alps	1700-1800	Alice Ivy
1715-1805	SAFIA	1620-1720	Malaa	1800-1900	Nyxen
1820-1920	Bryson Tiller	1725-1825	Getter	1900-2000	Ninajirachi
1935-2030	Hermitude	1830-1930	Green Velvet	2000-2100	Kayex
2045-2145	What So Not	1945-2045	Pnau		
		2050-2150	Duke Dumont		

B.3 Weather Conditions

It is noted that the weather conditions during the event were generally fine and sunny with temperatures between approximately 16 and 23 degrees centigrade. Wind was from a west-south west direction early in the day and moving to a predominantly south-south east direction late in the afternoon and evening. Wind speeds of between 15 & 30km/hour were evident as recorded on the Bureau of Meteorology website.

C. Environmental Noise Management Approach

C.1 Mitigation before the Event

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

Audio system design has historically been carried out by the sound system contractors with the dual goal of reducing emissions, whilst maintaining acceptable performance 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.

The P.A. People also reviewed the site layout plan prior to the event.

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

C.2 Mitigation during the Event

The *SPLnet* system was used to monitor and log environmental conditions at the event site.

The engineer at event control was able to use this data, in combination with the subjective analysis of the mobile monitors, to identify the source of any sound pressure level exceedances at the event perimeter. Any perimeter exceedances detected by the *SPLnet* or mobile monitor caused by external factors were identified. Any potential exceedances caused by the Listen Out sound reinforcement systems were identified and immediately actioned by sound control and roving engineers.

Event control set dynamic SPL thresholds and exceedance indicators for the stage positions. These thresholds were based on the stage's effect on perimeter SPL conditions. Therefore, the stage 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.

C.3 Mitigation after the Event

Overall, The Trust, The P.A. People and the organisers of Listen Out 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 monitoring and management is implemented for future events of this nature in Centennial Park.

D. Monitoring Details

D.1 Details of Measurement System

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

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 *SPLnet* system is focused on proactively preventing perimeter sound pressure level exceedance.

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

The *SPLnet* system was used to monitor and log environmental conditions at the event site. The *SPLnet* system recorded data from each of the five (5) *SPLnet* perimeter monitors for the duration of the event.

The engineer at event control was able to use this data, in combination with the subjective analysis of the mobile monitors, to identify the source of sound pressure level exceedances at the event perimeter. Any perimeter exceedances detected by the *SPLnet* system or the mobile monitor 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 *SPLnet* meters were simultaneously monitored by the engineer at event control.

Fast dB(A) and dB(C) SPL results for the stages were also monitored at the FOH mixing position by the sound engineers. Dynamic SPL thresholds and exceedance indicators were set for the stage/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.

D.2 Site Plan and Measurement Locations

The P.A. People reviewed the Centennial Parklands Trusts' prevention notice and noise management plan. This information assisted us in formulating the event monitoring strategy that was implemented for this event.

D.2.1 Perimeter Monitoring

As per the requirements outlined in Centennial Parklands prevention notice for this category of event, Five (5) perimeter locations were used for the installation of a 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:

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

The five (5) fixed locations were in the vicinity of:

- 8 Martin Rd
- Lang Rd
- Oxford St
- 47 York Rd
- 85 Darley Rd

To proactively manage levels at the perimeter of the event site, the engineer uses the fixed location monitor. If the engineer detects any exceedance of the limits set out in the prevention notice a roving 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 mounted on a tripod stand 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.

D.2.2 Stage Monitoring

Two (2) systems were also located within the event boundary, at the Front of House mixing locations for The Atari stage and the 909 stage. At these locations an instrument was attached to the supporting structure of the platform.

The instrument cabinet comprises the following items:

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

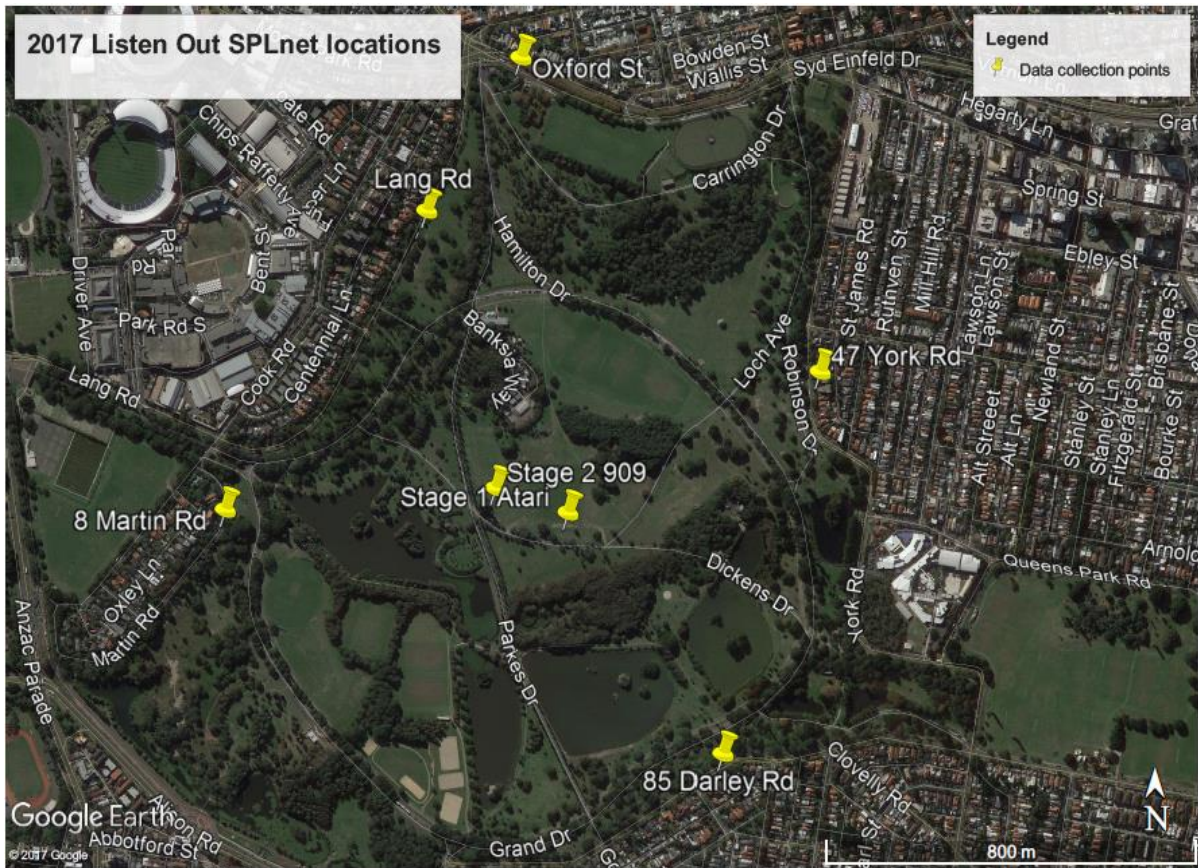
D.2.3 Mobile Monitor

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

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

D.2.4 Site Plan

Below is a plan showing the relative position of the monitoring location used for this event. It also shows the event site location.



D.2.5 Calibration

Each instrument was calibrated using either Bruel and Kjaer 4230 calibrator or a BWSA Type 660 calibrator prior to, and after use.

D.3 Use of Third Octave information

A feature of the *SPLnet* 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.

D.4 Complaints Management

Centennial Park Trust has adopted a comprehensive sound management program, which includes a detailed complaints management procedure.

The focus of The P.A. People and Centennial Park Trust for this event was to proactively minimise complaints by monitoring perimeter sound pressure levels in real time. In addition to static perimeter monitoring, Two (2) mobile monitor personnel were available to attend complainant locations personally.

E. Results

E.1 Perimeter Results

The *SPLnet* system employed for this event provides a significant amount of data particularly compared to the data collected from previous events.

In particular 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.

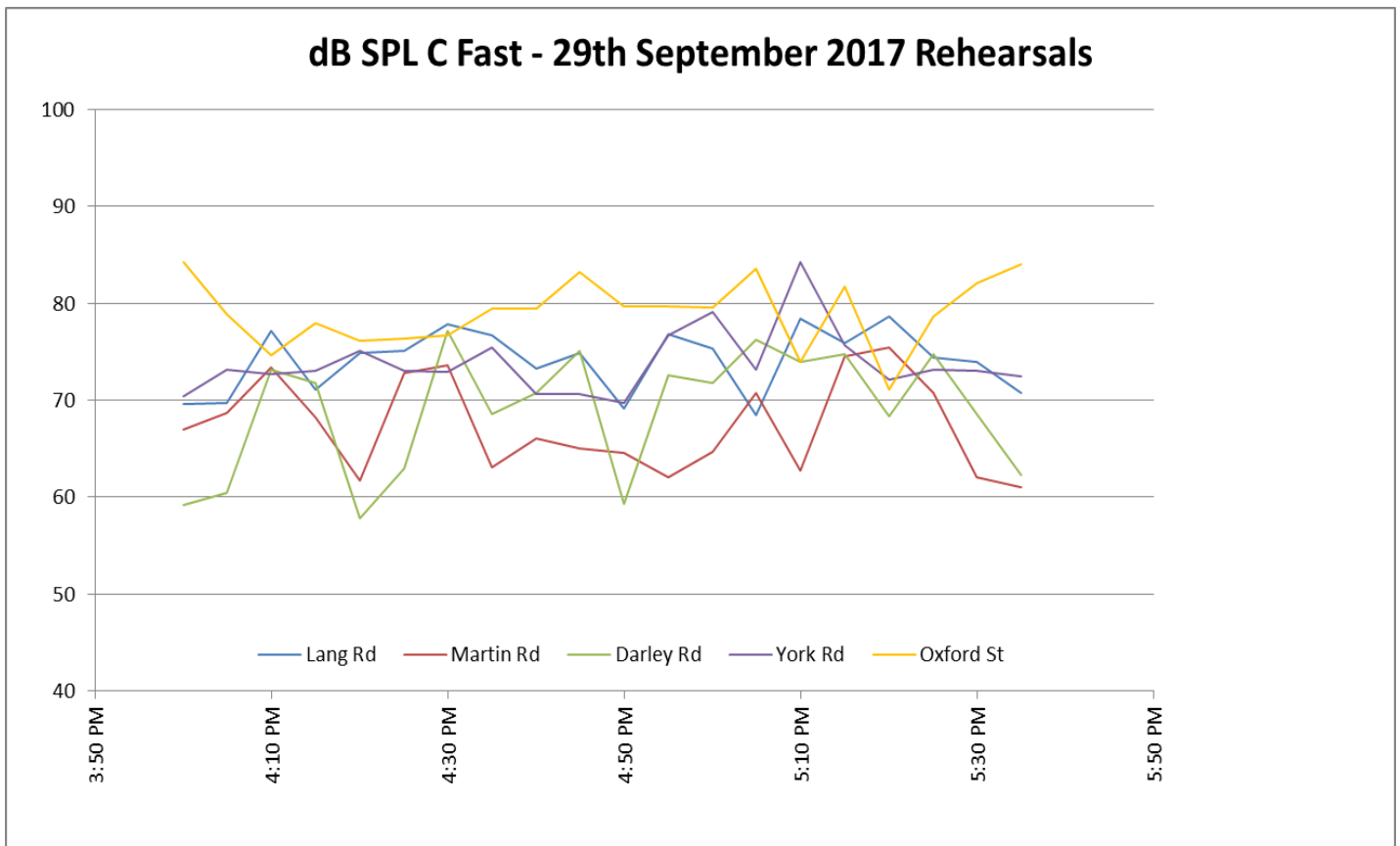
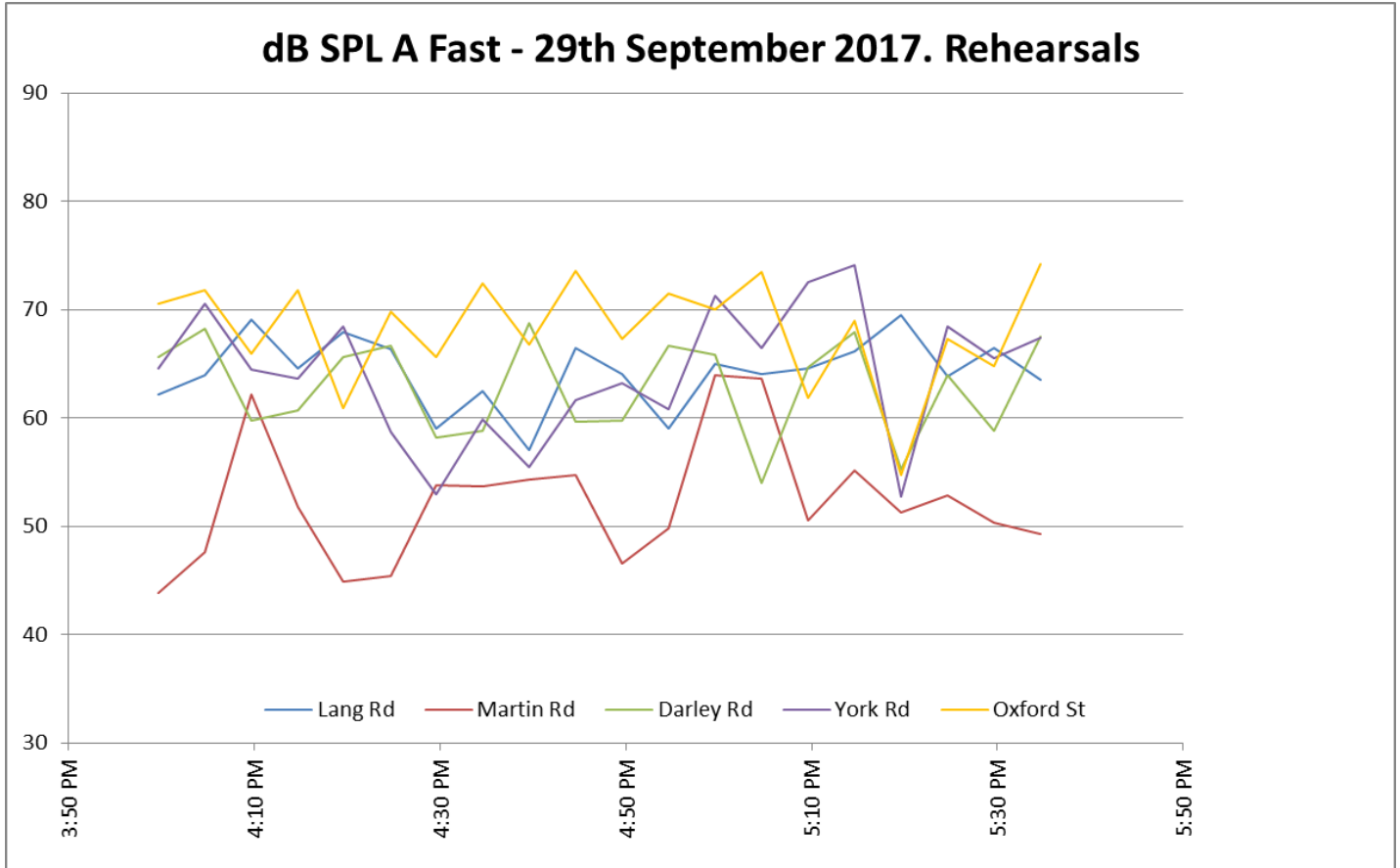
Perimeter data is collected using the Telstra 4G Mobile Data Network. During this event there was a failure of the Telstra 4G network, which we utilise to transfer SPL information from the data collection units to our monitoring location.

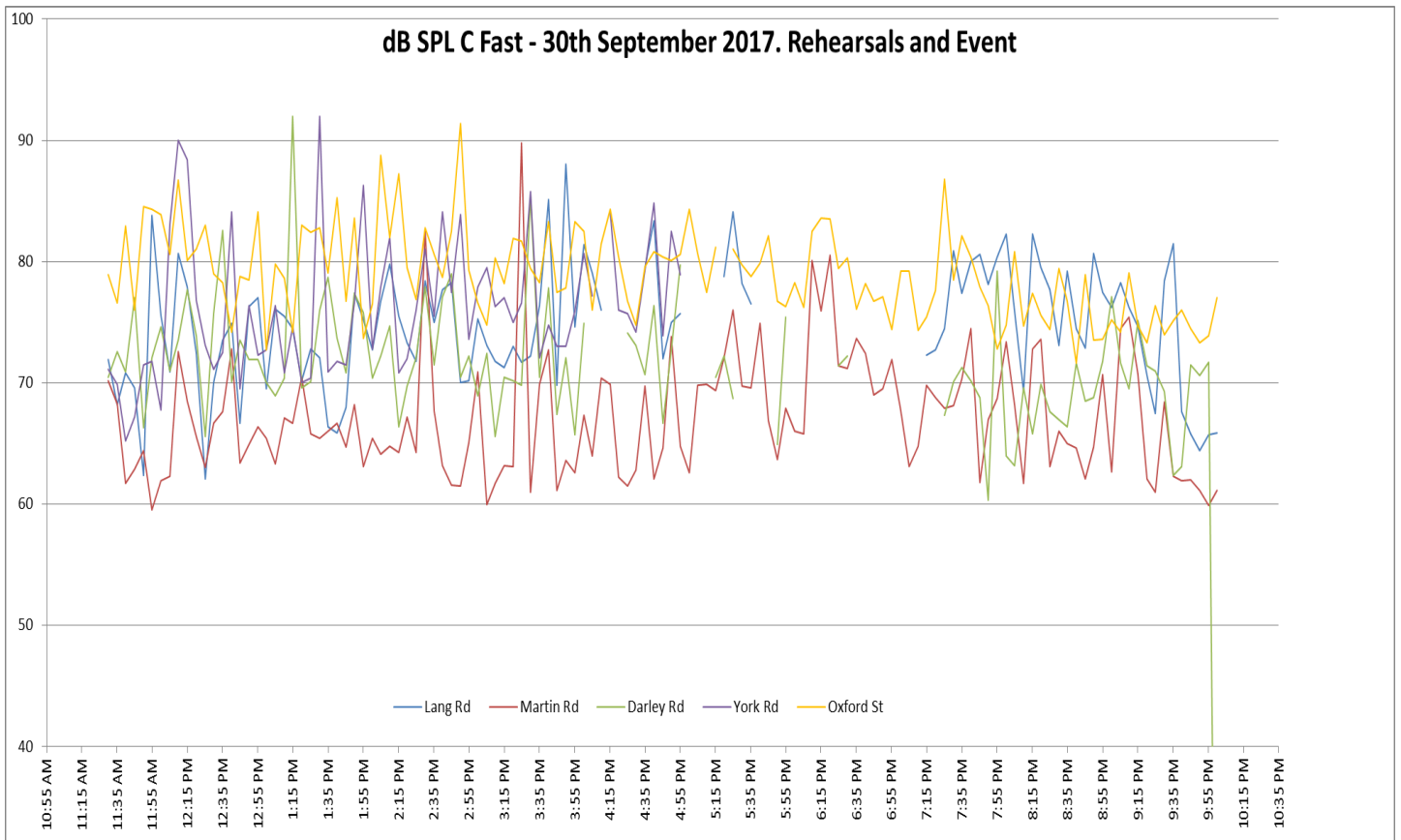
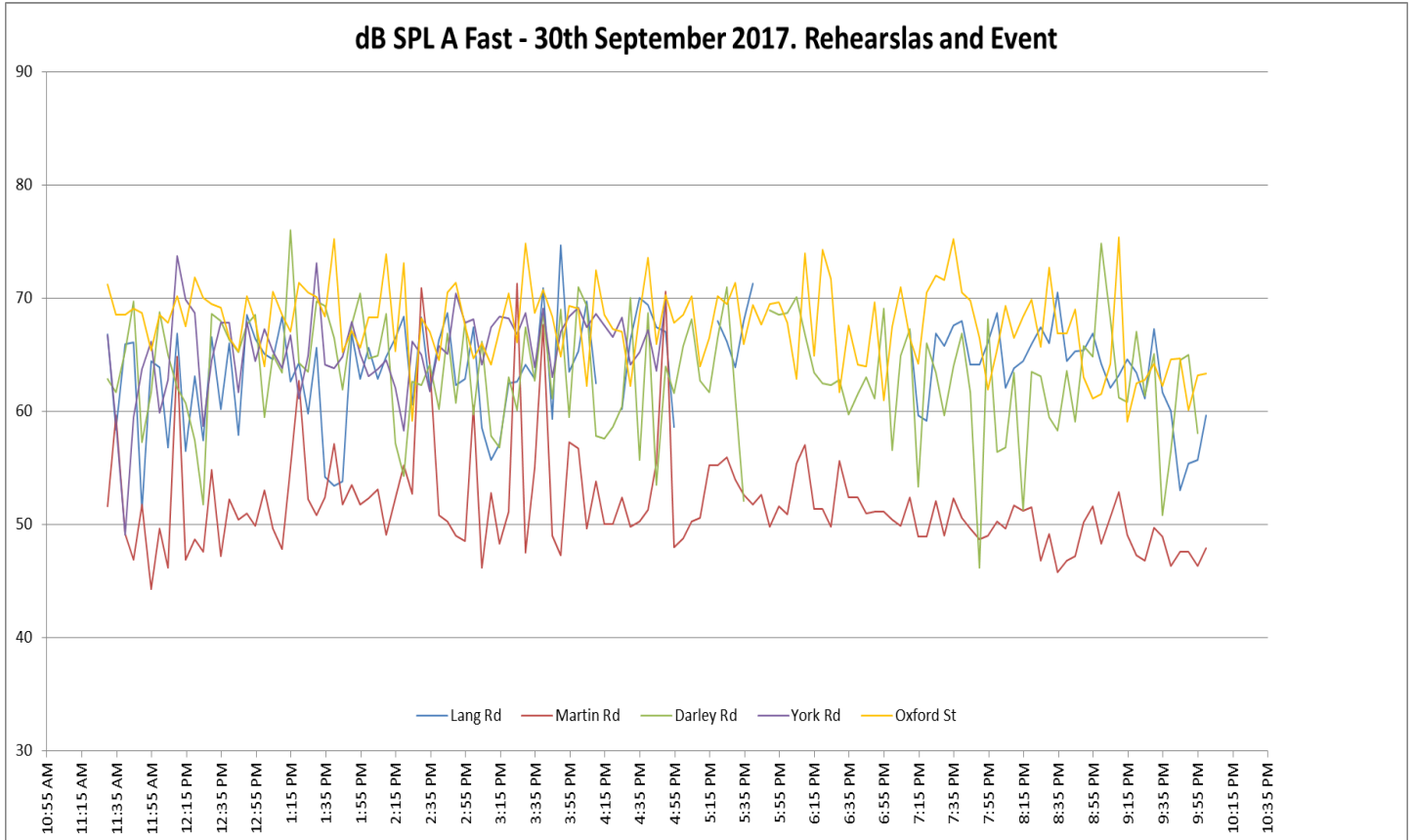
This failure affected the operators' ability to monitor the perimeter sensors located in York Rd and Darley Rd. Weather conditions on the day assisted in mitigating the impact of the failure in these areas due to the strength and direction of the wind, which was predominantly from SSE during the period when network would not allow the data collection units to connect to the network.

During the failure, our roving *SPLnet* engineers were deployed to the effected locations to monitor sound pressure levels using hand held SPL meters.

Below are five (5) graphs outlining the levels at each perimeter location over the duration of the event day. 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 stage sound systems.

Each plot represents samples taken at 5-minute intervals of a total some 50,000 points per measurement location.





E.2 Exceedances

As noted previously we have collected a substantial amount of data pertaining to the noise levels at the perimeter during this event.

E.2.1 Rehearsals and Sound Tests

There were three (3) exceedances of the 65db LAMax/85db LCMax levels caused by the amplified sound noted during sound tests at the perimeter on the 29/09/17

Exceedance 1 occurred at approximately 1631 and recorded a 65dBA reading and a 97dBC reading. The SPLnet messaging system was used to notify the sound engineer and a reduction in the level actioned.

Exceedance 2 occurred at approximately 1656 and recorded a 70dBA reading and a 76dBC reading. The roving engineer reported the amplified sound from the event was barely audible at the location of the data collection unit.

Exceedance 3 occurred at approximately 1717 and recorded a 68dBA reading and an 88dBC reading. Only stage 3 (3rd Base) was operating at the time and the sound engineer was notified of the exceedance and action taken to reduce the SPL output from the associated sound system.

There was one (1) exceedance of the 65db LAMax/85db LCMax levels caused by the amplified sound noted during rehearsals at the perimeter on the 30/09/17

This exceedance occurred at approximately 1220 on Saturday afternoon during final rehearsals and recorded a 67dBA reading and an 89dBC reading. It was the result of one of the headline artists conducting their rehearsal.

The sound engineer was notified.

E.2.2 Main Event

There were two (2) perimeter exceedances of the 65db LAMax/85db LCMax levels caused by the amplified sound noted during the event at the perimeter.

Through roving engineer reports and analysis of the Bureau of Meteorology website weather information it was determined these exceedances were mitigated by the wind speed and direction at the time of the exceedances.

E.3 Complaints

As confirmed by the Centennial Parklands Trust, there were ten (10) sound-related complaints to the telephone hotline during the event day of Listen Out.

E.4 Management Process for Exceedances

With the SPLnet system SPL 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 as a result of Listen Out sound reinforcement systems, Event Control would immediately contact the event organiser or front of house sound control position 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 stages were effective in preventing perimeter exceedances.

F. Summary

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