



*Final Environmental Noise Report*

**Listen Out 2016**  
**Centennial Parklands, Sydney**  
**1<sup>st</sup> October 2016**

*Prepared for*  
**Botanic Gardens & Centennial Parklands**

*by*  
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## A. Introduction

The P.A. People were engaged by The Botanic Gardens & Centennial Parklands (The Trust) to provide Environmental Noise Management and Monitoring Services for Listen Out Festival held on the 1<sup>st</sup> October 2016.

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 Centennial Parklands precinct. The document is intended to fulfil the requirements of the sound monitoring report as required by The Trust to comply with Clause 17 (a) through (l) of the Trusts Prevention Notice No 1002139 dated 26 Feb 2001.

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 on Lang Rd, Oxford St, York Rd, Darley Rd and Martin Rd along with two (2) fixed monitors at the FOH mix position of the two stages were centrally monitored in real time. During the event an additional two 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

The Listen Out Festival was on the 1<sup>st</sup> of October 2016 with very low level sound checks on the 30<sup>th</sup> of September.

The rehearsals and sound tests were all held within the licensed hours nominated and contained in the venue licence and the event plan except for one (1) curfew exceedance at 10.45am on the 1st October (Show Day). This occurred when event staff began sound checking on-stage monitors. The exceedance lasted approximately 3 minutes and the monitors were turned off immediately upon reporting to the relevant sound staff.

There were no (0) exceedances of the 65(A) and 85 dB(C) limit at the Perimeter on the 30<sup>th</sup> September.

There was one (1) exceedance of the 65dB(A) and 85 dB(C) limit at the Perimeter on the 10<sup>th</sup> September.

### B.2 Schedule of Acts

Friday 30<sup>th</sup> September 2016 (Production Day)

- 1600-1800 (All Stages, 50-100% amplification, intermittent pink noise, FOH & Monitor systems)

Saturday 1<sup>st</sup> October 2016 (Rehearsal Day/Event Day)

- 1100-1230 Sound Checks - Headliners All Stages(50-100% amplification, intermittent, FOH & Monitor systems)
- 1230-1300 Sound Checks- Locals All Stages(50-100% amplification, intermittent, FOH & Monitor systems)
- 1300-2200 Event Mode – All Stages (75%-100% amplification, continuous, FOH & Monitor systems)
- 2200 Event Finish – No amplified sound.

Listen Out 2016 had the following schedule:

#### Atari Stage

1300-1330: Sui Zhen  
1330-1400: Joy  
1415-1445: Ngaiire  
1500-1530: One Day  
1535-1630: Yung Lean  
1640-1720: Anderson Paak  
1730-1830: Baauer  
1840-1920: A\$AP Ferg  
1940-2020: Travis Scott  
2050-2200: RUFUS

#### 909 Stage

1315-1345: Wallace  
1400-1430: Willow Beats  
1440-1510: Tash Sultana  
1520-1600: Cosmo's Midnight  
1610-1650: LDRU  
1700-1800: Gorgon City  
1815-1915: Claptone  
1925-2025: Jauz  
2030-2150: Tchami

## **B.3 Weather Conditions**

It is noted that there was a strong NW breeze condition during the Listen Out 2016 event. The wind speeds were averaging 40km/h until 4pm, gradually dropping off to 7km/h until 10pm. The wind initially dropped to below 21km/h (the speed at which exceedances are exempt) at around 5.30pm.

## **C. Environmental Noise Management Approach**

### **C.1 Mitigation before the Event**

Audio system design has been carried out by the sound system contractors with the dual goal of reducing emissions, whilst maintaining acceptable coverage of the intended crowd coverage area. On this occasion we are satisfied that the systems provided for event was of an appropriate professional standard and level of performance.

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

The Trust's Noise Management Plan forms the basis for sound monitoring for the Listen Out Festival.

### **C.2 Mitigation during the Event**

The *SPLnet* system was used to continuously monitor and log environmental conditions at the event site. The *SPLnet* system continuously recorded audio from each of the *SPLnet* 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 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 Listen Outs' sound reinforcement systems were identified and immediately actioned by sound control.

Event control set dynamic SPL thresholds and exceedance indicators for the stage/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 stages based on their 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 at the Centennial Parklands.

## 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 also includes information as to when stages are notified of exceedances or 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 residence. 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 is 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 Festival were centrally monitored and recorded from fixed SPL meters located at the main stages and five key perimeter locations in real time. During the event two additional mobile sound pressure level monitors supplemented the *SPLnet* system. The mobile monitors were used to move between the stages and 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 continuously monitor and log environmental conditions at the event site. The *SPLnet* system continuously recorded data from the perimeter *SPLnet* monitor 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 any sound pressure level exceedances at the event perimeter. Any perimeter exceedances detected by the *SPLnet* system or the mobile monitors 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 stage were also monitored at the FOH mixing positions 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 pressure level produced by the stage based on its' effect on perimeter conditions at any given time.

## **D.2 Site Plan and Measurement Locations**

The P.A. People reviewed the 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 the Trusts prevention notice for this category of event five perimeter locations were used for the installation of a fixed sound pressure level monitoring instrument. At these locations the instrument was attached to a light pole at a height of three 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, solar panel, audio monitoring unit, 4G mobile broadband modem

The fixed locations were in the vicinity of:

- Lang Rd, Centennial Park
- Oxford St, Near the Lang Gates, Centennial Park
- York Rd, Bondi Junction
- Darley Rd, Randwick
- Martin Rd, Moore Park

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 the 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 1.5-1.6m 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 systems were located within the event boundary, at the Front of House mixing location for both Stages. At these locations an instrument was attached to the supporting structure of the operators 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 fixed monitoring locations used for this event.



### **D.2.5 Calibration**

Each instrument was field calibrated using either a Bruel and Kjaer 4231 or a BSWA CA111 calibrator.

No significant variations were noted between pre and post use measurements.

## **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**

The Botanic Gardens & Centennial Parklands have adopted a comprehensive sound management program, which includes a detailed complaints management procedure.

The focus of The P.A. People and The Trust for this event has been to proactively minimise complaints by monitoring perimeter sound pressure levels continuously in real time. In addition to continuous perimeter monitoring one mobile monitor personnel was available to attend to complainant locations personally.

## E. Results

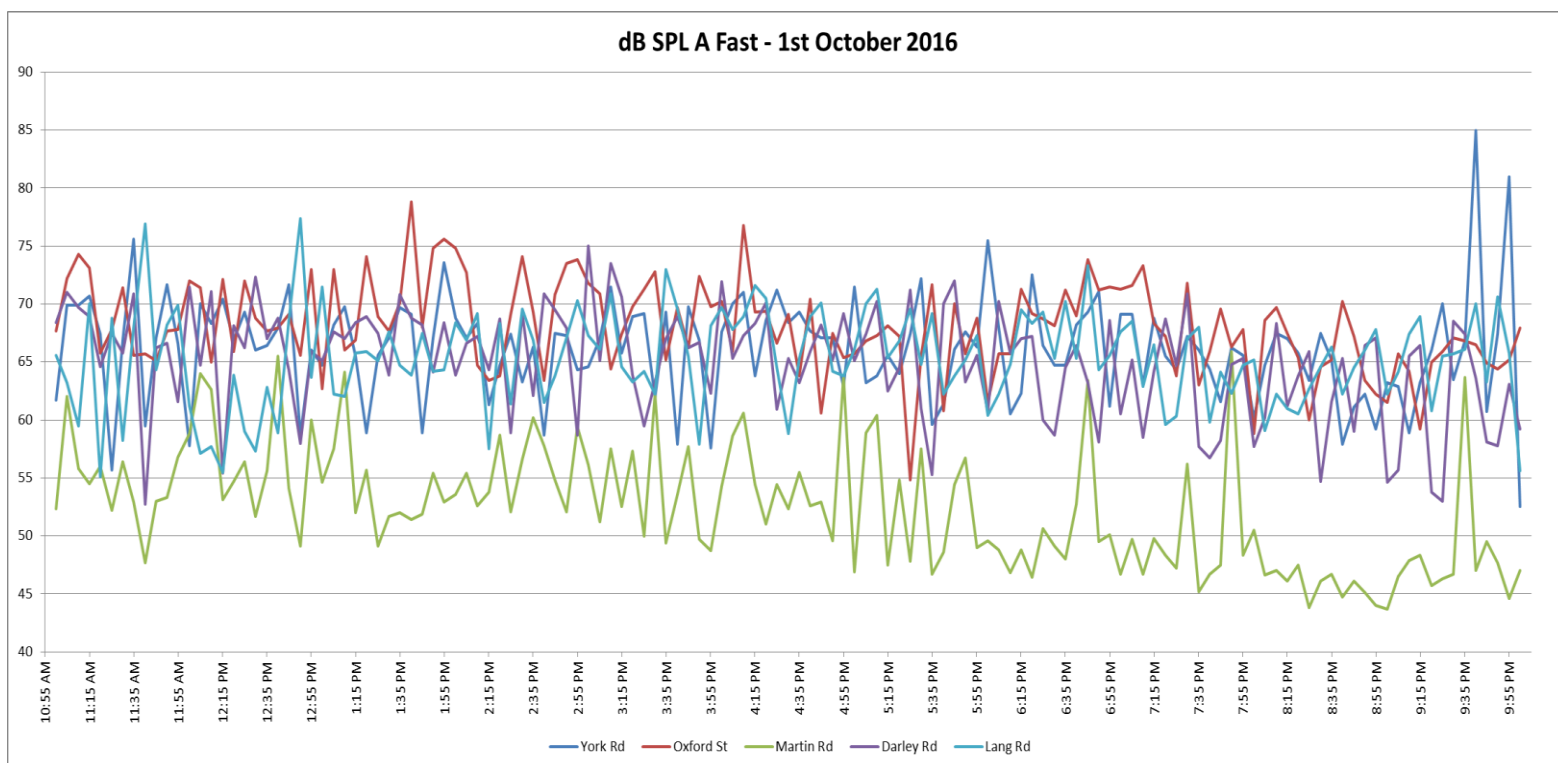
### E.1 Perimeter Results

The SPL<sub>net</sub> system employed for this event provides a significant amount of data.

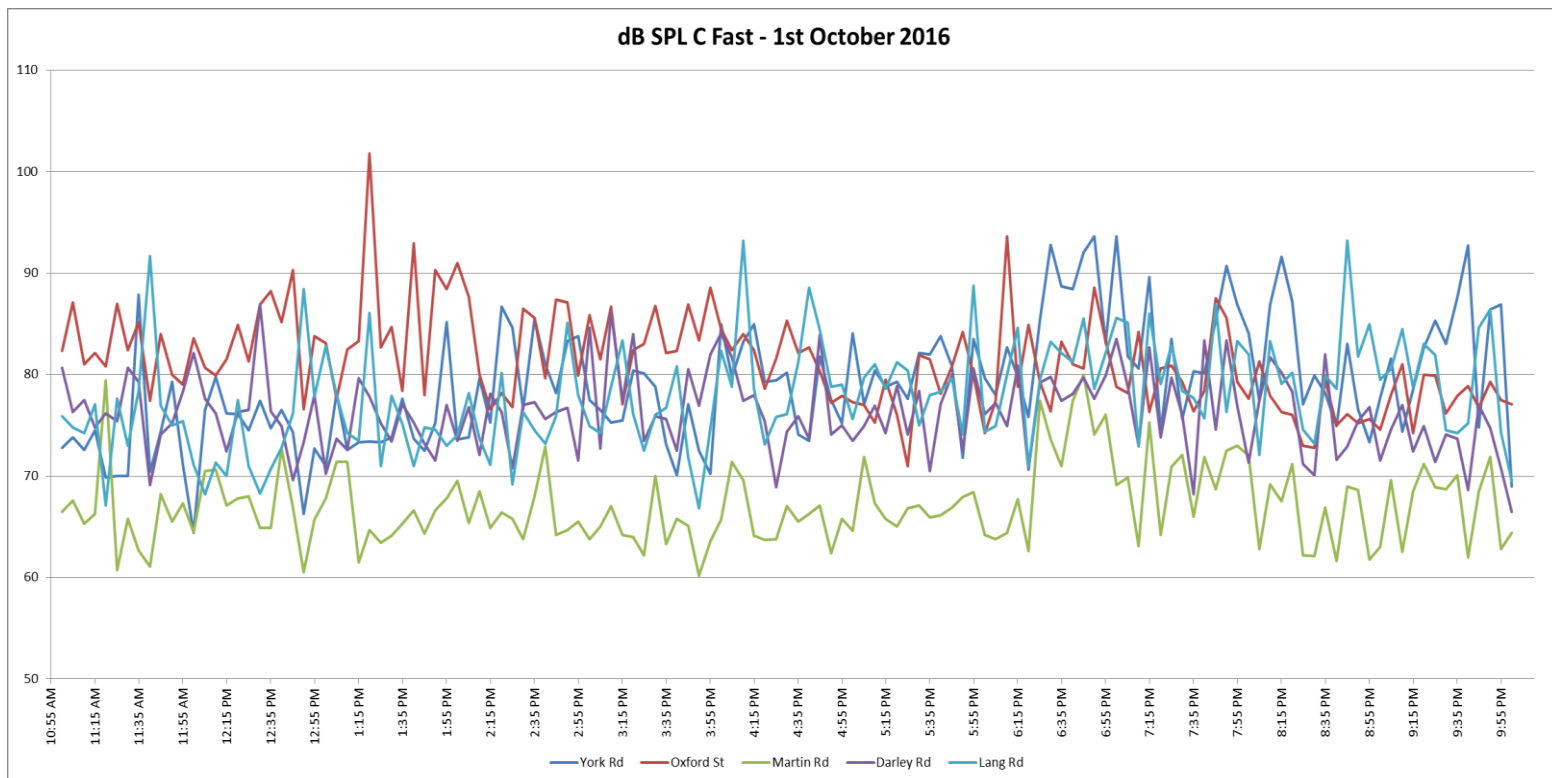
In particular one would expect that continuous monitoring of all perimeter sensors might reveal a significant increase in the number of exceedances identified. This has not proven to be the case, due mostly to the proactive approach of using this same information to adjust the exceedance thresholds provided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

Below is a graph outlining the levels at the 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 event.

These plots represent samples taken at 5-minute intervals of a total some 130,000 data points collected at the measurement locations across the day.



dB SPL C Fast - 1st October 2016



## 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. One (1) exceedance was recorded and is detailed below:

### E.2.1 Sound Tests – 30<sup>th</sup> September 2016

There were zero (0) exceedances of the 65dB LA Max/85dB LC Max levels caused by the amplified sound noted at the perimeter during Sound Tests.

### E.2.2 Main Event – 1<sup>st</sup> October 2016

There was one (1) exceedance of the 65dB LA Max/85dB LC Max levels caused by the amplified sound noted at the perimeter during the Main Event day. This exceedance was the result of a complaint received from a resident. A roaming monitor took a reading at the address and reported an exceedance. This was immediately followed by an alert to the mixing engineer and resulted in both a response and a reduction in level.

The exceedance occurred at:

Time	Location	LAFMax	LCFMax	Notes
1832	19A Darley Rd	69	88	Exceedance noted. Notified engineer of exceedance. Volume Reduced

As confirmed by the Trust, there were five (5) sound-related complaints to the telephone hotline during the day of Listen Out 2015. This was a reduction of 50% over the previous year.

The mobile monitors responded to all telephone complaints on the event day.

Real time and spot measurement investigation of these complaints revealed one (1) exceedance due to Listen Out audio.

## E.3 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 the 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 perimeter exceedances.

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

## **F. Summary**

Overall we believe that the implementation of the *SPLnet* system as part of the environmental noise management plan for The Listen Out Festival has ensured minimal impact on local residents.