

**Appendix 3**  
**Literature Review**

## Literature Review

As part of the EPA Notice Requiring Further Information, there was a requirement for “Completion of a literature review of noise sensitive receiver criteria for international and national motorsport facilities”, which is provided in this section by Lloyd George Acoustics.

### ***Sandown Raceway (Victoria, Australia)***

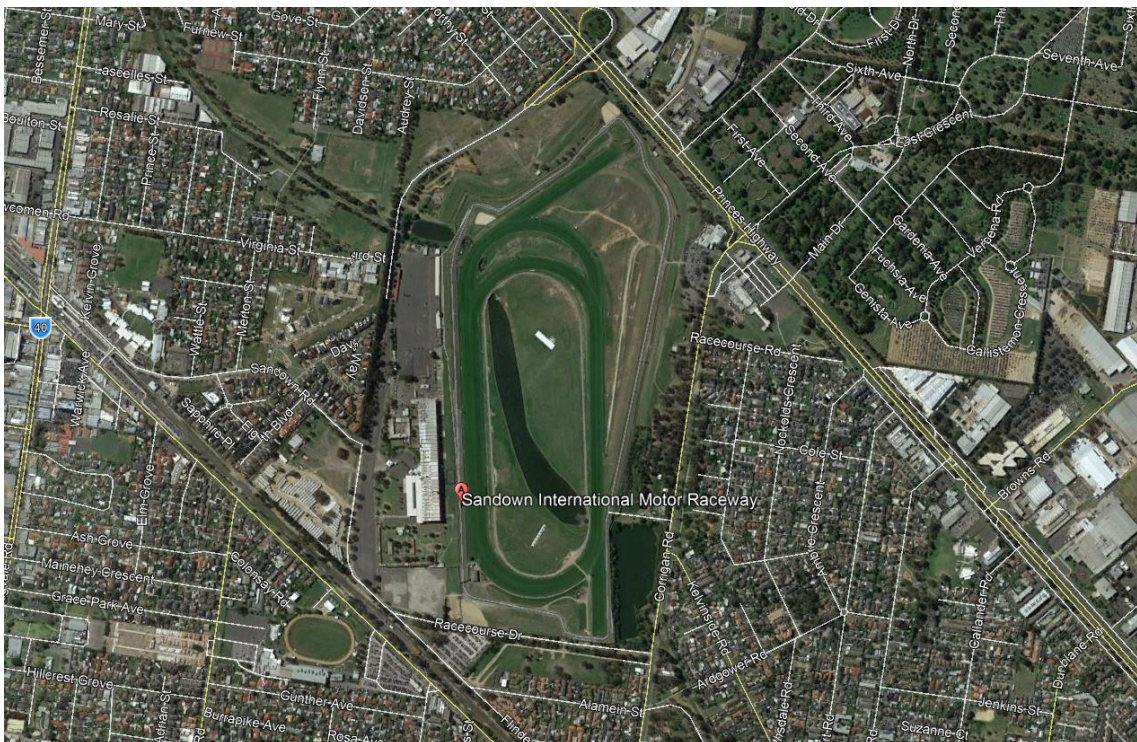
Sandown is 3.1 km in length and features 13 corners, located on Princes Highway, Springvale, Victoria. The circuit is laid around a horse racing track and is also used for festivals. The surrounding area is reasonably densely populated with residences typically at around 200 metres from the track, with one residence around 90 metres to the southeast. The regulations for the site can be found at

[http://www.sandown.net.au/uploads/1/9/6/2/19620565/sandown\\_standing\\_venue\\_regulations\\_-\\_mspt\\_approved.pdf](http://www.sandown.net.au/uploads/1/9/6/2/19620565/sandown_standing_venue_regulations_-_mspt_approved.pdf)

The site is permitted motorsport meetings with noise levels up to 95 dB(A) at 30 metres as per the CAMS guidelines and Sandown staff monitor these levels on motorsport and car club days.

In terms of managing the site:

- Website is updated to advise of upcoming events;
- Managing traffic away from local roads;
- Free ticket offers to local residents for certain events (excludes v8 Supercars);
- Noise levels are monitored and any vehicle above 95 dB(A) at 30 metres are removed from the track until rectified;
- Driver training days would generally be limited to 75 dB(A) at 30 metres;
- There are to be no competition engines started prior to 0900 hours or after 1800 hours.

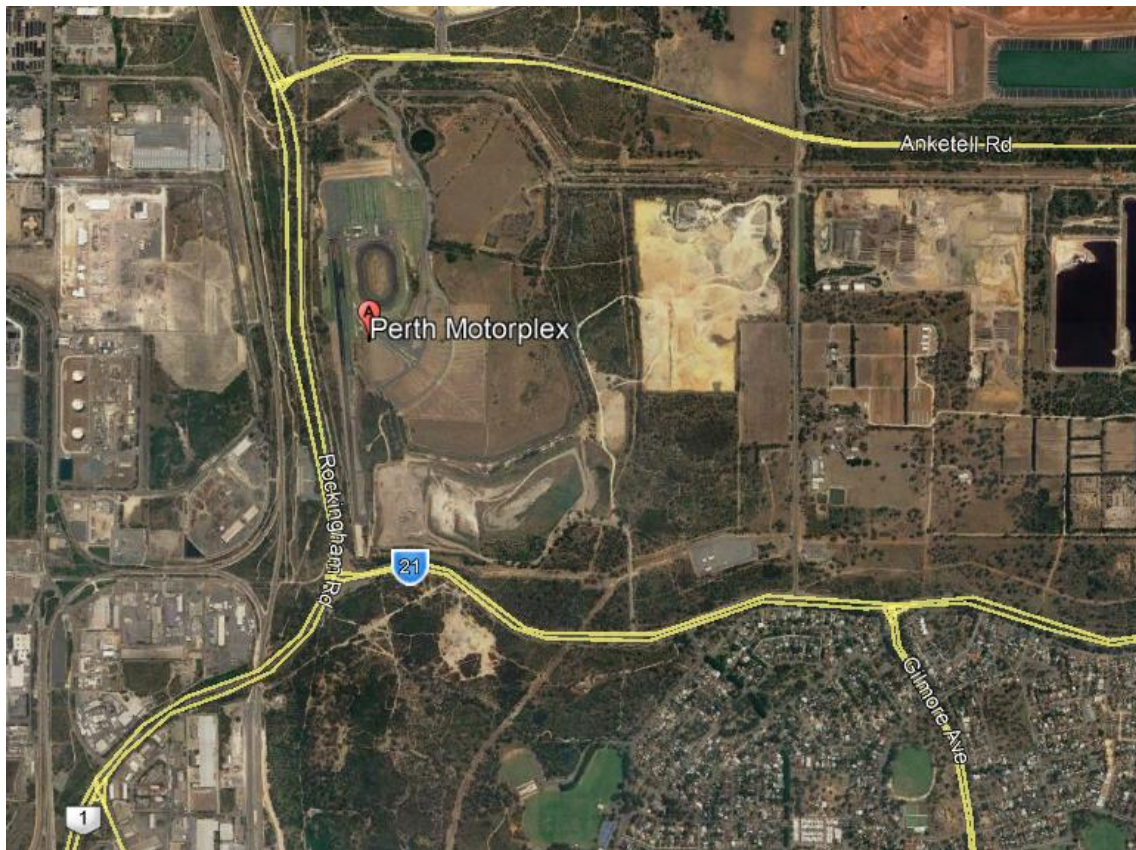


### **Perth Motorplex (Western Australia, Australia)**

Perth Motorplex is located in Kwinana Beach and is used for drag racing, dirt track speedway, burnout competitions, street machine car shows, monster trucks, stunt shows and super cross events. It has also been used for concert events. The nearest residences are located in the suburb of Medina, at a distance of over 1 kilometre. Information on the track regulations can be found at <http://www.motorplex.com.au/wp-content/uploads/2017/08/2017-18-PM-SW-Track-Supp-Regs.pdf>.

The site operates under an approved noise management plan which requires:

- All speedway vehicles likely to exceed the 95 dB(A) at 30 metre noise *limit* to be tested annually and certified for compliance.
- Noise testing will be carried out early in the racing season at the Wednesday night Speedway practice sessions.
- Further random noise testing will be carried out throughout the season.
- All Sprintcar, Late Model and Super Sedan teams are required to attend one of the practice nights to be certified.
- Racecars must be fitted with a recognised Speedway Type muffler.
- Vehicles that are deemed too noisy will be black flagged and disqualified.
- Race curfews are enforced.



### **Mallory Park Circuit (Leicestershire, United Kingdom)**

The Mallory Park Circuit is located in a rural area, in the village of Kirkby Mallory with the nearest residence within 100 metres north east of the hairpin. The site's operational noise management plan can be found at <https://www.malloryparkcircuit.com/wp-content/uploads/2015/05/Mallory-Park-Noise-Management-Plan-2015-V5-Active.pdf> . As well as a motorsport venue, the site is also used for cycling and triathlon events.

Part of the management of the venue requires:

- Static testing may be required and drive by noise testing will be undertaken with a maximum noise level of 105 dB(A), although the distance is not nominated;
- Where limits are exceeded, the vehicle is not permitted to use the circuit until changes have been made and the vehicle passes the test;
- Tolerances are provided to the noise *limit* enforced on the day of + 2 dB for a single vehicle on the track, +3.5 dB where two vehicles pass and +4.5 dB for three vehicles;
- Tyre squeal can also be investigated;
- Donuts, burnouts, drifting or the like are not permitted;
- The PA system is zoned so its output can be restricted to certain areas of the circuit with the volume restricted to the lowest practical level;
- The PA must not be used prior to 8am or after 6pm;
- No music is played through the PA at any time;
- Circuit bookings and noise limits are maintained and published on the web site;
- Records are kept for 12 months with monthly reports provided to Hinckley and Bosworth Borough Council (HBBC);
- Complaints are logged, investigated and reported;
- The days are defined as follows:
  - High Noise Day – Noise from motor vehicles is greater than 45 dB  $L_{Aeq,10mins}$  and less than 68 dB  $L_{Aeq,30mins}$  at a noise measurement point outside the circuit;
  - Non-Noise Day – Noise does not exceed 45 dB  $L_{Aeq,10mins}$  and 55 dB  $L_{Amax}$  at a noise measurement point outside the circuit;
  - Quiet Day – Noise does not exceed 38 dB  $L_{Aeq,30mins}$  at a noise measurement point outside the circuit. This point is defined as Stapleton Lane Pumping Station (or a house facade), considered to be located north east of the hairpin near the closest residences.



### **Mike Pero Motorsport Park (Christchurch, New Zealand)**

This motorsport facility has a raceway, speedway as well as radio control car track. The raceway is also used for cycling, athletics and social/business functions. The nearest residences are around 450 metres from either the raceway or speedway. Noise management plans exist for both the raceway and the speedway. Both NMPs (<http://www.canterburycarclub.co.nz/track/raceway-noise-management/>) follow a similar format with the noticeable management requirements being:

- A community liaison committee is formed and must meet a minimum of 4 times per year;
- Local residents are invited to attend a public open day or offered free entry to an event;
- Council boundary noise monitoring information is available;
- Noise feedback form;
- Other than Special Interest Vehicles and Drag Racing, the trackside noise limit is 95 dB  $L_{AFmax}$  at 30 metres from the edge of the sealed track (in accordance with MotorSport NZ). These measurements are done by the Car Club;
- Specifies the following noise limits for the raceway, measured at the boundary noise logger (operated by the Council), which is located approximately 100 metres from both tracks for the raceway:

Cat	Activity	Days	Max Days	$L_{Aeq}$ , dB	$L_{AFmax}$ , dB	Hours
F	Non-race vehicles up to 100 km/h	Mon	50	65	85	0900-1800
E	Motor racing vehicles	Tue-Sun	90	65	90	0900-1800
D			75	70	90	0900-2000 for 5 days Fri-Sun)
C			120 (50 Tue-Fri)	80	95	
B	Drag Racing	Tue-Sun	5	80	105	0900-1800
A	Special interest vehicles	Tue-Sun	6	90	105	90 minutes, 1000-1700

All other activities at the raceway have to comply with noise limits at the site boundary of 50 dB  $L_{Aeq,15mins}$ , 75 dB  $L_{AFmax}$  during the day (0700-2200) and 40 dB  $L_{Aeq,15mins}$  and 65 dB  $L_{AFmax}$  at night.

- In addition to the above, the following is also required:
  - Any activity on the following days to comply with a noise limit of 40 dB  $L_{Aeq,15mins}$  and 65 dB  $L_{AFmax}$  which precludes any motor racing vehicles: Good Friday, Easter Monday, 25 to 31 December, New Years Day, ANZAC Day.
  - 10 weekend days scheduled between 31 October and 31 March (at least 4 of them between 2 January and 31 March) to have non-motorsport activities.
- Complaints or issues of non-compliance by Council are to be immediately investigated and corrective action taken;
- PA System used for background music and communication:
  - Loudspeakers by spectator areas only used during event (not practice/test/qualifying);
  - Music serving the pits is background only and to be inaudible at the nearest houses;

- Only used between 0900 and 1800 hours, other than during race events where it may be used up until 2000 hours. PA in the pit area can be used for race administration from 0830 hours.
- Maintenance activities are to be between 0900 and 1800 hours;
- Traffic management;
- Specifies the following noise limits for the speedway, measured at the boundary noise logger (operated by the Council), which is located approximately 100 metres from both tracks:

Cat	Activity	Days per year	Time	$L_{Aeq,15min}$ dB	$L_{AFmax}$ dB
A	Race events and practices	15 races and 5 practice days (any day except Monday)	1800-2200 and 1200-1800	65	85
B	Remote controlled vehicles	Any day (electric vehicles only) & 50 racing days (non-electric vehicles) any day except Monday	0900-1800	65	90
C	Other activity	Unrestricted	0700-2200 2200-0700	50 40	75 65

Any activity at the Speedway exceeding 40 dB  $L_{Aeq,15mins}$  and 65 dB  $L_{AFmax}$  is a non-complying activity on: Good Friday, Easter Monday, ANZAC Day, Christmas Day, New Years Day and the days between 26 December – 31 December.

- Noise levels measured by the logger are reduced by 10 dB before comparing to the noise limits. This is applied due to the logger being elevated and a tested difference between the logger location and most exposed point on the boundary.
- Trackside noise levels are to be no more than 95 dB  $L_{AFmax}$  at 25 metres on the fastest part of the straight. These measurements are undertaken by Speedway New Zealand who provide personnel to monitor noise levels.



This NMP formed the framework of the Keysbrook Motorsport Facility and is in a similar style to the Highlands Motorsport Park discussed on the following page.

**Highlands Motorsport Park (Cromwell, New Zealand)**

The park caters for motorsport events, fastlaps, go karts, functions, mini golf, motorsport museum and a Jurassic Park adventure. The nearest residence is to the northwest on Kawarau Gorge Road at a distance of around 200 metres. The management of the venue includes the following:

- Online noise feedback form for residents;
- Advertising of the noisier events (referred to as Tier 2) are via the website and local newspaper;
- The following table is provided specifying the noise limits:

Activity	Number of Days	Noise Limit	
		0800-1800 Mon-Sat 0900-1800 Sunday	All other times
Tier 1 – Day to day Activities and Off-track Activities	No limit	55 dB LAeq	40 dB LAeq
Tier 2 – Event days	16 (only 2 public holidays)	95 dB LAfmax at 30 metres	40 dB LAeq

Other than the trackside noise limit, the levels apply within 20 metres of a residence (or their boundary if closer).

All vehicles (other than special interest) must comply with 95 dB LAfmax at 30 metres.

Tier 1 days may extend to 2100 hours on up to 5 days per year for the purposes of noise monitoring and calibration or the noise logger.

A Tier 1 day will not be in breach as long as any exceedance of the noise limits is for not more than four 15 minute periods. Where a breach is recorded, the event will be counted as a Tier 2 day.

No activity on Christmas Day or before 1pm Anzac day.

- Vehicles found to exceed the 95 dB LAmax limit are removed from track following appropriate protocols.
- Vehicles are not to generate annoying features such as tyre squeal or backfiring;
- Limitations on function times in different areas.
- Limitations on the number of temporary activities (e.g. Christmas in the Park). No such event will be a dedicated music concert.
- Public address system to be inaudible (where practicable) at the nearest residences and the sound level shall not exceed Tier 1 noise limits.
- Maintenance activities are limited to weekdays between 0800 and 1800 hours;
- Traffic management.



### ***Noise Guide for Local Government – Part 3 Noise Management Principles (New South Wales, Australia)***

This guide

(<https://www.epa.nsw.gov.au/~media/EPA/Corporate%20Site/resources/noise/130127NGLGPart3.ashx>) provided a case study (Case Study 2) in relation to a motor sport facility and discussed the requirements for a noise assessment and noise management plan. The NMP is to identify the number of events, noise monitoring program and the complaint management system, all of which have been considered in the Keysbrook Motorsport Facility NMP. Also discussed is finding a balance between how often different events occur based on how noisy they would be. In this case, how much the event exceeded background noise was the basis. For instance, 50 events were permitted that would exceed background noise by 5 dB. If an event was to exceed background by 30 dB, 1 event would count as 10 events for instance.

The approach taken for the Keysbrook Motorsport Facility is to use a trackside equivalent noise level and applying a 5 dB penalty for weekend events.

### ***Wokolena Road Motor Sports Complex (Wagga Wagga, Australia)***

This proposed facility was to be located in a rural area incorporating a 2.6km long track and was to be used for driver education, track days and race events. The noise assessment report found at [https://www.wagga.nsw.gov.au/\\_\\_data/assets/pdf\\_file/0011/32024/Separate-Cover-Attachments-Combined-RP-11-Major-Recreational-Facility-Wokolena-Motor-Racing-Track-and-Driver-Training-Centre-DA11-0625.pdf](https://www.wagga.nsw.gov.au/__data/assets/pdf_file/0011/32024/Separate-Cover-Attachments-Combined-RP-11-Major-Recreational-Facility-Wokolena-Motor-Racing-Track-and-Driver-Training-Centre-DA11-0625.pdf) considered the previously discussed Noise Guide for Local Government approach. The nearest residence was around 1 kilometre from the track.

Another consideration in this report was not to have major events on more than two weekends in a month. Whilst this was considered, this is not considered a practicable operational restriction during the busier racing months.

It is understood this track is yet to proceed.

### ***Motor Sports Noise – Environmental Protection Policy (Australian Capital Territory, Australia)***

This document was developed to balance the rights of motor sports enthusiasts with the need to protect neighbouring residents and can be found at

[https://www.accesscanberra.act.gov.au/app/answers/detail/a\\_id/3361](https://www.accesscanberra.act.gov.au/app/answers/detail/a_id/3361)

This Policy identified a number of factors to be considered including:

- The level of the noise;
- The number of events each year;
- The time at which the event takes place;
- The spread of events during the year; and
- The amount of warning ('prior notification') provided to residents about upcoming events.

Again, the approach taken was the greater the noise level exceeded the 'zone noise standard', the less events permitted, noting that no event was permitted to exceed 65 dB(A).

### Phillip Island Grand Prix Circuit – Victoria, Australia

Phillip Island hosts the Australian MotoGP, World Superbikes, Hot Laps, Go Kart and v8 Supercars. The site is located in a rural environment with the nearest residence around 280 metre from the track. The environment and distance to residences was considered similar to that of Keysbrook. A documented noise management plan could not be found for Phillip Island, however the website (<https://www.phillipislandcircuit.com.au/more/noise-and-weather>) does provide an indication of how different events are classified and the number of events held as shown below.

Class	Noise Limit	Examples of Activities	No. Of Midweek Days	No. Of Weekend Days	Total
A	> 95 dB(A)	International	15	6	21
B	Up to 95 dB(A)	National Events, Motorbike Ride Days, International Events & Club Sprints	110	50	160
C	Up to 75 dB(A)	Club Sprints, Vehicle Launches, Driver Training, Rider Training	100	12	112
D	Quiet	Push bike racing, Running events & Go Karts	36	36	72

The website provides the expected maximum noise level and wind speed and is then updated with the actual measured maximum noise level and wind speed and direction.

The above vehicle classification was followed in the Keysbrook Motorsport Facility NMP, noting that Keysbrook would not have any Class A events, whereby the noise is exempt (greater than 95 dB(A) at 30 metres).

