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WM Project Number: 19292-A
Our Ref: VNSW08092019PT
Email: steveclark@venuesnsw.com

Steve Clark
Venues NSW
15 EDWIN FLACK AVENUE
OLYMPIC PARK NSW 2127

Dear Steve

Re: Western Sydney Stadium (Bankwest) - Extra Events Noise Assessment

INTRODUCTION

Wilkinson Murray has been commissioned by Venues NSW to prepare a noise impact assessment (NIA) to support a proposal to modify Development Consent SSD 8175 relating to Stage 2 Design and Construction of Western Sydney Stadium (Bankwest Stadium). The Western Sydney Stadium (SSD 8175) was approved by the Minister for Planning's delegate on 31 August 2017.

Venues NSW has submitted a modification application which seeks to temporarily increase the number of major events able to be held at Bankwest Stadium each year from 49 to 80 major sporting events, and from 3 to 5 concert events.

In order to determine the feasibility of the proposed modification, the NIA included a review of the original noise impact assessment (NIA) for the construction and operation of Bankwest Stadium, monitoring of events since operations commenced, the Operational Noise Management Plan (ONMP), and the acoustic components of the Biodiversity Operational Management Plan (BOMP).

PROPOSED MODIFICATION

Condition A4 of Schedule 2 stipulates that:

A4) The operation of Western Sydney Stadium allowed by this approval is limited to the following major events (per annum) and operational hours as follows:

a) Event type:

- i. 49 major sporting events, including but not limited to National Rugby League games, Australian Rugby Union games, and A-League and W-League soccer games and/or international soccer games;*
- ii. 3 music concerts*

Bankwest Stadium is part of a network of contemporary venues delivered by the NSW Government which aims to maintain a competitive edge in the national and international sporting and event market. As redevelopment is scheduled for the Sydney Football Stadium and Stadium Australia, which are both included in this network, Bankwest Stadium will be the only Tier 2 Stadium in available in the network for approximately (2) years.

In order to meet the increased demand from sporting clubs and event organisers, Venues NSW seeks to revise the limits on the number of events permitted to be held at Bankwest Stadium. Ultimately, this modification aims to replace Condition A4 of the Development Consent with the following:

A4) The operation of Western Sydney Stadium allowed by this approval is limited to the following major events (per annum) and operational hours as follows:

- a) Event type:*
 - i. 80 major sporting events, including but not limited to National Rugby League games, Australian Rugby Union games, and A-League and W-League soccer games and/or international soccer games;*
 - ii. 5 music concerts*

The increase in major sporting events represents an approximate additional event every two weeks. This increase will enable the NSW Government to accommodate major events within the stadium network, while at the same time providing value for money for the investment in Bankwest Stadium.

NOISE GOALS

The ONMP, prepared by Acoustic Logic in August 2019, presents relevant noise management levels for Bankwest. Noise management levels have been developed for surrounding residential receivers by comparing the expected noise impacts associated with the holding of events at Allianz Stadium which has similar operational characteristics. The ONMP also refers to the BOMP, prepared by AMBS Ecology & Heritage in April 2019, to provide noise limits relevant to the Grey-Headed Flying Fox (GHFF) roost to the west of the Stadium.

Table 1 presents the noise management levels from the ONMP.

Table 1 Bankwest Stadium Noise

Event	Compliance Location	Noise Source	Noise Management Level	
			L _{Amax}	L _{Cmax}
Sporting Event	Surrounding Residential Receivers	Amplification Equipment	60	N/A
Concerts & Sound Test	Surrounding Residential Receivers	All	80	100
Sporting Event	GHFF Camp	All	See below	See below
Concerts & Sound Test	GHFF Camp	All	See below	See below

As per the Biodiversity Impact Assessment for the GHFF Roost:

"Noise at the GHFF Camp should not exceed 75-76dBA with occasional spikes up to 84dBA during operation. Corrective action process will be triggered when noise criteria is missed."

COMPLETED MONITORING

Noise monitoring has been completed by The Acoustic Group (TAG) as part of the requirements of the Operational Noise Management Plan. Monitoring was conducted during two major sporting events, being the 10 August 2019 and 22 August 2019.

On the 10 August 2019, monitoring was conducted between 3.30pm and 7.30pm. Three Rugby League matches were held on the day of monitoring, with the kick-off for the main game at 5.30pm. Monitoring confirmed that noise levels from the event were mostly inaudible and significantly less than the maximum noise limit of 60dBA, when measured at the nearest residential receiver. When measured at the GHFF Camp location, noise levels from the crowd and PA system was in the range of 60-62dBA. The operation of the siren during the match recorded maximum levels of 78-82dBA. Measured levels at the GHFF camp location complied with the noise management levels.

On the 22 August 2019, monitoring was conducted between 5.30pm and 9.45pm. Two Rugby League matches were held on the day of monitoring, with the kick-off from the main game at 7.50pm. Monitoring on this day confirmed that noise from the event was mostly inaudible at the nearest residential receiver. There was one event where music noise from the stadium was measured to be approximately 56dBA, however this complies with the 60dBA limit. Noise from the stadium was in the range of 53-77dBA when measured at the GHFF camp location, which complies with the noise management levels.

Noise monitoring was conducted during the demolition and construction phase of the Stadium. Daily monitoring at the GHFF Camp location indicated that average noise levels during the construction works were between 60dBA and 65dBA with occasional maximums of 83dBA. These levels are similar to the measured noise levels during the major sporting events. The BOMP confirmed that after over a year of daily construction activity, there was no detrimental impact to the GHFF colony, and the population remained within its historical range. As such, minimal noise impact is expected from the increase of major sporting events held at the stadium on the GHFF roosts.

GHFF population monitoring has also been completed by Cumberland Ecology as part of the requirements of the BOMP. Cumberland Ecology undertook initial baseline monitoring for the camp in May 2019 and ongoing monitoring on 27 August 2019. Results from monitoring in August has determined that the camp's population has remained stable and may have increased slightly since the May baseline monitoring. This has confirmed that the operation of the Stadium has not appeared to have had a detrimental impact on the GHFF population.

NOISE ASSESSMENT

Monitoring has confirmed that noise from the use of the Stadium for major sporting events comfortably complies with the noise management levels. Currently there has been in the order of 20 sporting events without any specific noise complaints. On this basis, there appears to have been negligible noise impacts on the surrounding residential receivers. Additionally, population monitoring of the GHFF indicate that the population has remained stable and may have increased slightly confirming that the operation of the Stadium has not had a detrimental impact on the GHFF population.

Based on the completed monitoring, it is unlikely that additional noise impact would be expected from increasing the number of major sporting events from 49 to 80 events. Monitoring has observed that noise from sporting events has been mostly inaudible at residential receivers. An increase in the number of sporting events would therefore be unlikely to result in additional noise impacts, as long as proper noise management procedures, presented in the ONMP, are adhered to.

No music concert events have been held at the Stadium since its opening. As such no information is available regarding the actual received noise levels from these events. The noise impact assessment completed by Acoustic Logic in February 2017 as part of the Stage S2 SSD DA, presents predicted noise levels emitted from sporting and concert events. The predicted noise levels from the sporting

events were in line with those measured. The assessment for concerts predicted that received noise levels at the nearest residential receiver will be approximately L_{Aeq} 78dBA, which complies with the 80dBA limit set in the ONMP. The assessment also predicted that the GHFF roost will experience noise levels ranging between 73dBA and 76dBA with occasional maximums of 84dBA. Since the sporting events were predicted accurately, it is likely that the concert levels would also be accurate, therefore indicating compliance with the Noise Management Levels.

The BOMP discusses the potential for negative impacts from concert noise on the GHFF roost. The BOMP states that when noise has been used to disperse roosts, the noise would be applied over a period of 30 to 60 minutes and repeated throughout the day, over several days. Additionally, the BOMP suggests that due to the historic and recent co-existence between the roost and the WSS precinct, the GHFF may have become adapted to noise events associated with the precinct.

The modification proposes to increase the number music concerts from 3 to 5 events per calendar year. It would be reasonable to assume that the small number of events will have a minor impact on residential receivers and the GHFF roost provided reasonable noise management procedures are in place.

It is recommended that future monitoring information be reviewed closely to ensure that the operation of Bankwest Stadium is not having a negative impact on the GHFF population.

The ONMP has been reviewed as part of this noise review. It is considered that currently no changes are required to the ONMP.

CONCLUSION

Wilkinson Murray has prepared this NIA to determine the potential noise impacts associated with temporarily increasing the number of major events at Bankwest Stadium. The modification application seeks to increase the number of major sporting events from 49 to 80 events per calendar year, and to increase the number of music concerts from 3 to 5 events per calendar year.

The NIA included a review of monitoring undertaken since the opening of the Stadium and a comparison with the criteria and requirements of both the Operational Noise Management Plan and the Biodiversity Operational Management Plan. The NIA concludes that the increase in frequency of events at Bankwest Stadium will have minimal additional noise impact on both the nearest residential receivers and the grey-headed flying fox roost situated to the west of the Stadium.

I trust this information is sufficient. Please contact us if you have any further queries.

Yours faithfully

WILKINSON MURRAY



Peter Thang

Graduate Engineer

QA Review



John Wassermann

Director