'Without Prejudice'

The Independent Planning Commission (IPC)

North Byron Parklands Cultural Events Site, Yelgun
Re: Application No. SSD 8169 and MP 09_0028 MOD 3 (Concept Plan)

We request anonymity with our names and address to be removed. Thank you.

Dear Commissioners,

Re: Sensitive Receiver R12

We request that this submission (App. A) and attachments (Attachment. H. Warton & Transcripts DPE edit AW) be reviewed alongside our 16 page submission (App. B Feb '18) and attachments (App. 1 & 2) to the SSD & Concept Plan forwarded to the Department of Planning and Environment (DP&E) in Feb. 2018, attached.

We wish to remind the Independent Planning Commission (IPC) that North Byron Parklands (NBP) did not address the issues we raised in our submission to the SDD. Consequently, these issues were not raised in Parklands summary to the RTS. Under these circumstances, we have attached our original submission for your perusal.

In January 2018, we met with Directors from the DP&E. We discussed the lack of resolution with Parklands in relation to mitigation, a mutually acceptable agreement, impacts from the development, the threat of fire and the need for an emergency evacuation route for residents located at the eastern end of Jones Road.

The Department advised and encouraged us to include our concerns regarding the impacts from the development, health & safety issues etc. in our submission to the SSD, which we did. (Mtg. DP&E Jan 2018)

We were dismayed to discover that Parklands had not responded to any issues raised in our submission, a requirement of the SEARS. Under the circumstances we believe that the submission process to the SSD is flawed. As an immediate neighbour, sensitive receiver and residents that have been directly impacted by the development throughout the 6.5 year 'Trial', we find this totally unacceptable. Nearly all of the issues raised in our submission have been ongoing for over 6 years of the Trial and still remain unresolved.

Because Parklands have not resolved the impacts their development is having on us, we continue to suffer with various health ailments and safety issues as a result of the development. This needs to be URGENTLY resolved before any future approval is given.

Introduction

We are the owners of a small 2.2 ha property on Jones Road, Yelgun, and identified in the North Byron Parklands (NBP) Project Approval as Sensitive Receiver (SR) R12.

We have lived here for 40 years and adjoin the festival site at the eastern end of Jones Road. Our property is located approx. 600m from the Parklands campground and is one of 3 properties that was identified in the 2012 PAC approval where noise limits would exceed. Parklands made a commitment to mitigate these 3 properties (refer SOC's C14,B) It is now 2019 and Parklands have still not complied with the Trial consent conditions.

Throughout the 6.5 year Trial, we have been exposed to excessive noise, extended hours of operation, trespass, extreme dust pollution, illegal fireworks, traffic incidents and the nuisance of search and laser lights throughout out our property. Because Parklands have not provided us with the benefit of mitigation, a requirement of the 2012 Project Approval, we suffer with various ailments such as stress, uncertainty, headaches, chronic sinuses and throat irritation, sleep deprivation and 'fear' of

fire, during festival events.

The campground noise often continues well after midnight and 2.00 am and has been recorded continuing as late as 5.00, 6.00 and on one occasion, 7.00am in the morning.

This has been extremely difficult especially when one considers that we are often exposed to 18+ hours per day of combined amplified music, DJ music, fireworks, campground noise, generators and associated noise for up to 5 consecutive days during events.

Concept Plan and Development Consent

We object to the section 75W modification request to modify the existing Concept Plan approval (MP 09_0028 MOD 3) to facilitate the SSD application. If the modification to the Concept Plan were to be approved, this will mean there will be 2 consent authorities for the Project, i.e. the Minister for Planning would be consent authority for the Concept Plan and the Independent Planning Authority would be the consent authority for the SSD. This is not ideal. **The SSD is a completely new development which requires a new Concept Plan and not a Modification.**

We object to the approval of the MP 09_0028 Concept Plan (MOD3) and the Development Consent for SSD 8169 because Parklands has failed to uphold the very consent conditions the NSW Planning and Assessment Commission (PAC) required the proponent to undertake back in 2012. Parklands have clearly demonstrated that sensitive receivers are NOT a priority and despite the consent conditions, it has failed to resolve it's requirement to mitigate us against festival noise and other impacts generated by their development.

We wish to refer the Commissioners to our earlier submission to the SSD where we include a 2 page chronology of Parklands non-compliance in relation to SR R12 during the Trial. **(App B, 1 & 2, Feb'18)**

Unfortunately, the DP&E is not upholding the PAC's consent conditions and yet, on several occasions has supported changes to the original consent conditions that benefit the proponent and disadvantages sensitive receivers. Where is the fairness in all this?

Furthermore, it appears that the Department has removed nearly all of the consent conditions (there weren't many) that offered some protection to sensitive receivers. The removal of these consent conditions benefits the proponent and once again disadvantages the sensitive receivers who suffer with various ailments from festival impacts.

We do not support the increase in more events annually, nor do we support an increase in patron numbers. The overall impact on ourselves, the nearby communities and the surrounding environment during the Trial has been significant. Any increase in numbers of patrons and events would merely exacerbate an already difficult situation. The impacts with any future approval will be far greater for the community and in particular for sensitive receivers. than experienced throughout the Trial.

Attenuation Process – SR R12

Parklands did not provide us with the benefit of attenuation, consequently our family suffered with various 'health and safety' issues from their exposure to festival impacts.

In the 2012 PAC approval, 3 residences (R05, R12 & R13) on Jones Road were identified where the noise criteria would be exceeded. Our home is one of the 3 properties that NBP made a commitment to mitigate against festival noise in accordance with consent C16(2)(e) & SoC C14,16B.

In July 2013, DPE Director H. Warton instructed the General Manager of Parklands to,

- 'commence mitigation to our residence prior to the commencement of events at the site &
- the NMP is required to be updated to reflect the commitments made in relation to physical attenuation measures to the homes of sensitive receivers R05, R12 & R13.'(refer DP&E email App. B)

Despite the requirements of the Project Approval and a directive from DPE, NBP did not attenuate our

residence before the commencement of events on site, and to this day have still not considered, nor resolved, the various impacts on our family's 'health and safety' from exposure to festival noise.

As Parklands had not initiated mitigation, and following advice from the DPE, we activated consent C18 in October 2013 for Parklands to mitigate against festival noise.

Noise Mitigation

Over the past 5 years, we have followed due process with both the Department and Parklands, opening our home on numerous occasions to accommodate Parklands engineers, noise consultants, architects & builders to assess what mitigation measures would be required. This was an inconvenience and meant a loss of privacy.

In June 2014, the DPE also engaged an independent acoustic engineer, Wilkinson Murray, to asses our home for attenuation. In Dec 2014 Chris Wilson (DPE) signed-off on what the Department thought was reasonable and feasible.

We wish to emphasize to the Department, that all engineers, acoustic consultants, architects and builders informed us that they could attenuate our home, however, due to the intrusive nature of the noise and considering the age and style of our home (built in 1948), they could not assure us that the mitigation would provide the benefit needed.

We repeatedly asked Parklands for a scope of works (SOW) and costings for the Alderson (July 2013) and Environmental Results (March 2014) Reviews. Although DPE directed Parklands to attenuate in July 2013, it took Parklands 3 years to provide a Scope of Works and Architectural Drawings.

Parklands have repeatedly delayed and confused the attenuation process. The 5 year delay has been extremely stressful, frustrating and has virtually curtailed any home improvements we were keen to undertake on our home due to the uncertainty.

When the PAC approved the change to the noise criteria in MOD 3 (April 2016), it virtually undermined the 3 year process that had been underway with ourselves, Parklands and DPE in attempting to negotiate a satisfactory agreement.

This is because all of the attenuation assessments undertaken on our home were carried out in accordance with the original noise criteria in consent B3 *Noise restrictions* i.e. background+, in the 2012 PAC approval and not in accordance with the new criteria approved in MOD3.

Not only did the approval of MOD 3 undermine the whole mitigation process, but it also meant that Parklands could increase the allowable noise at our residence, an identified sensitive receiver, by 15-20 dBs (ANE 2016) which equates to an increase of 3 to 4 times louder than what was originally approved by the 2012 PAC. The increase in allowable noise was not addressed by Parklands, the DPE or the PAC.

The Noise Guide for Local Government provides some rules of thumb in measuring noise. A10 decibel increase in noise is perceived as twice as loud (PAC Determination 2012).

As we experienced more festivals with varying impacts, it became evident that attenuation would only partly resolve the intrusive noise, however it would not resolve other impacts such as dust pollution, threat of fire etc., during events. Furthermore, it would not resolve the intrusive noise over our 2.2 ha property.

It took Parklands 3 years to provide us with architectural drawings and costings. Parklands provided the costings in May 2016, 2 weeks after the PAC approved the new noise criteria, rendering the entire attenuation process futile.

It is evident, that if the consultants and builders could not guarantee the effectiveness of the mitigation works based on the original noise restrictions outlined in consent condition B3 background+, then it was futile to proceed with any mitigation works given the substantial increase in noise of 15-20dB(A) at our home. (ANE 2016)

Coincidently, and not long after the approval of the new noise criteria, Parklands sent us correspondence stating they no longer had a requirement to mitigate our home. This is not correct.

In Aug 2018, the GM of Parklands told us that a Director of the DP&E informed him that Parklands no longer had a requirement to attenuate our home. However, when we met with the DP&E in December 2018, we asked the Director if he had said that? He replied 'No, I did not say that', and added that 'Parklands still have a requirement to mitigate our home'. (mtg. DP&E 28 Nov 2018)

How can any issues be resolved when so much misinformation is circulated though the system? The past six years have been extremely stressful. The DP&E has full knowledge of our situation and the insidious 'health and safety' issues we suffer during events. The DP&E has not assisted in resolving any of these impacts nor has it enforced the PAC's Consent conditions.

Parklands have mitigated other sensitive receivers in Zone 1 with double glazing where noise is a problem. Yet after 6 years, Parklands has still not mitigated our home against noise, a commitment it made in C14,16B *Noise Management* (SOC's 2012 Approval).

Parklands simply did not attenuate our home when required by the Department. The 3 year delay combined with Parkland terms in relation to attenuation were unreasonable. For example, Parklands would not enter into a legal agreement before mitigation works commenced, nor would they give a guarantee that our home would be restored to its original condition.

Parklands repeatedly suggested that an agreement with NBP would be preferable to attenuation. Given the impasse with the mitigation process, we considered Parklands option of entering into a permanent agreement that would relocate us, away from the festival events which are having an insidious impact on our health and safety.

Parklands would not consider an agreement unless we were prepared to provide them with an easement (noise) over our Property Titles in perpetuity. We declined, as these terms were unreasonable.

The mitigation process has been a farce. The goalposts are constantly changing. We have been cooperative and have attempted to resolve this issue the best way we know how. However, Parklands have been difficult and have blocked each proposed resolution with unreasonable demands.

Parklands development is impacting on our family's health and safety. We have lived here for forty years and have existing use. Parklands have had 5 years to resolve this issue, and to our detriment, they have not.

Parklands performance over the past 5 years has been unsatisfactory as evidenced by the list of non-compliance. Parklands did not mitigate in a timely manner, nor have they resolved the impacts their festivals events are having on us. Alternative solutions need to be looked at and resolved by Parklands ASAP.

We have been co-operative, responsive and patient throughout this whole ordeal. Parklands have had ample time to resolve this and to date, they have not done so.

The Department has been in regular consultation with Parklands throughout the 'Trial' and has continually accepted Parklands word that it has entered into an agreement with SR R12 in relation to noise. This is simply not true. **Contrary to what Parklands have told the DP&E, we have never entered into an agreement with Parklands.** This has been through no fault of our own. Parklands offers have simply been unreasonable. It is disappointing that during the 6.5 years of the 'Trial', at no time did the Department ever contact us to verify, if what the proponent was saying in relation to SR R12 entering into an agreement, was accurate.

Deletion of PAC Consent Conditions (2012 & 2016)

Sensitive Receivers

It appears the Department, in their assessment of the SSD, has deleted the very Consent Conditions & Commitments the 2012 & 2016 PAC applied to protect 'sensitive receivers' against festival impacts.

If any future approval is granted, we urge the Commissioners to retain the following consent conditions from the 2012 & 2016 approval in the SDD to protect 'sensitive receivers'….

- **Consent C16(e) Noise Management Plan**

The phrase*, 'insulation/double glazing of sensitive receivers etc.'* has been removed from the consent in the SSD. Consent C16(e) was also recommended for deletion in Parklands MOD 3 application in 2016. However the Chair of the NSW PAC, Lynelle Briggs, asked the Department to justify why it wanted to remove part of clause C16(d) identifying '*insulation & double glazing of sensitive receivers etc*.'

Despite the Department's explanation, the PAC sought to retain the clause in consent condition C16(2)(d) and also included it into consent C18 to protect sensitive receivers. (MOD 3 App 4. Info Request to DP&E, Lynelle Briggs, PAC, Mar. 2016)

It is difficult to comprehend why the Department is being persistent in seeking to remove this part of the clause from C16 and C18 again in the SSD application, despite the decision by the 2016 PAC to retain this clause in the MOD3 approval. This is a basic requirement for 'sensitive receivers' who are the ones directly impacted by amplified music and associated noise during events.

- **Consent C18 *Noise Mitigation***

Consent C18 has also been deleted even though the DP&E directed us to activate this consent back in 2013. This simply does not make sense. Instead of managing this problem, the Department instead is deleting the very consent conditions that offered immediate neighbours some relief. The Department is fully aware, that despite directing us to activate consent C18, it has not resolved the issue of mitigation and a mutually acceptable agreement. Considering these circumstances, and considering the impacts the development is having on our health and wellbeing , it is difficult to comprehend why the Department would delete this, and other clauses, from the SSD.

Furthermore, the Department informed us that it would definitely be retaining consent condition C18, yet there is no evidence of this in the Consent Development. (mtg. DP&E Nov. 2018) This clause is NOT included in the Development Consent nor is it included in the M&MM, yet there are unresolved issues still outstanding with the Department and Parklands in relation to SR R12. As outlined in our submission to the SSD, this has been through no fault of our own.

It appears that if the consent conditions and commitments defined in the 'Trial' are too difficult to comply with, they are simply removed or retrofitted to suit the development.

We have been residents of Jones Road for 40 years. As an immediate neighbour and a sensitive receiver who has not been provided with the benefit of mitigation, a requirement of the Trial, we are appalled at the planning process and the way this development has been dealt with throughout the Trial.

The Department and the proponent STILL have not addressed the 'health and safety' issues we suffer as a result of festival events. How can any future approval be granted when so many of the non-compliance issues during the Trial, remain unresolved ?

- **Consent C16(2)(d) *Noise Management Plan***

Consent C16(2)(d) is removed from the SSD ……'*identification of noise limits within the camping areas between midnight and 8.00 am to support peaceful rest during events*' and

- **Consent C8 (i) *Event Management Plan***

'*details on a regular security guard surveillance service (day and night) for the site boundary with adjoining residential properties on Jones Road*.'

- **Consent C16 (c) *Noise Management Plan***

'*identification of noise limits within the site, including camping areas between midnight and 8 am to* ***support peaceful rest*** *during events*.' (2016 MOD 3)

- **Consent C17 (a) *Acoustic Monitoring Program***

'*locations (identified on a map) at which monitoring will be undertaken. As a minimum monitoring locations must include the most sensitive receivers (residential and the adjoining Nature Reserve*).'

- **Consent C40 (b) *Noise Management***

Consent C40 is removed from the SSD**……** *'Noise within the camping area between midnight and 8.00am of each event day shall support peaceful rest for overnight patrons during events.'*

Deletion Sch. 3 - Statement of Commitments (2012)

Likewise, the following list identifies some of Parklands Commitments from the 2012 & 2016 PAC which have been **omitted** from the proposed SSD. These Commitments offered some protection for sensitive receivers.

If any future approval is granted, we urge the Commissioners to retain the following consent conditions from the 2012 & 2016 approval in the SDD to protect 'sensitive receivers'….

- **C8 - Traffic Management**

14. '*Secure approval for temporary road closure of and access control of Jones Road for event days'.*

- **C9 - Environmental Management**

8. '*Use low pressure sodium vapor lights which are less attractive to insects or bats, where possible*'

11. '*No use of **fireworks***'

- **C13 - Off-site Management**

4.'*Provide security services along Jones road to ensure patrons or unauthorized persons are not permitted either on the road, adjacent to the road or within the vicinity of residential dwellings;*'

***5.** 'Provide security services, in consultation with the Parklands RWG, within the immediate locality to manage any potential for unauthorised persons to enter private property or the Billinudgel Nature Reserve;'*

6. '*provide a litter response team for the duration of the event covering Jones Road, Tweed Valley Way, Yelgun Road and the Yelgun Interchange and adjacent the BNR*.'

- **C14.B Noise Management**

'*Parklands will implement best practice mitigation measures listed within the Noise Management strategy (technical Paper D) in consultation with the 3 residents identified as potentially being exposed to elevated noise emissions (R05, R12 & R13) Parklands will undertake noise monitoring during events to confirm effectiveness of noise mitigation measures.*'

Please refer to correspondence from H. Warton, Director of DP&E, dated July 2013, who stated that '*these works should occur prior to the commencement of events at the site*.' **(refer SR12 App. 1)**

Management and Mitigation Measures – Sch. 3 (SSD)

Dust pollution

We note that the Department has included a clause in *Air Quality and Greenhouse Gases* in Sch.3, Management and Mitigation Measures (M&MM) to minimise dust pollution from the site during events.

During dry events, we suffer with chronic sinus inflammation and throat infections from the dust pollution generated from the Parklands site. The pollution is most prevalent during the 'bump out' times when the dust from the site is already stirred up from the 'bump in' phase, the tens of thousands of patrons during the event and then to be followed by a 14 day 'bump out' time involving significant numbers of heavy vehicle movements.

SITG 2018

The dust pollution from Splendour in the Grass 2018 was particularly chronic. During the bump out of the 2018 SITG festival, when our symptoms were at their worst, prominent dust clouds were seen hovering over the Parklands site.

The DP&E is not considering the health and wellbeing of nearby sensitive receivers who are exposed to the festivals emissions. This is evidenced by the 2nd dot point outlined in *Air Quality and Greenhouse Gases* in the M&MM, where the Department is proposing dust mitigation during the 'event' only. This benefits patrons and not sensitive receivers who are still choked up during the 'bump out' period. The EIS clearly demonstrates that the Department is designing consent conditions in consideration of the proponent and the patrons and not nearby neighbours. Despite numerous emails to the Department including the Compliance Section advising them of the various ailments we suffer with as a result of the festival impacts, little consideration has been given to sensitive receivers and immediate neighbours.

We ask the Commission to include the following phrase '*during bump in and bump out times*' into the 2nd dot point in Air Quality to protect sensitive receivers. (Sch. 3 Mitigation Measures)

DP&E

The Trial has demonstrated that the Department is not equipped to oversee this development. For example, responding to emails is a basic requirement of any department, business etc., yet the DP&E have failed to respond to a range of correspondence outlining health impacts, dangerous situations and non-compliance that have occurred during festivals. Many in the community have also expressed the same frustration with the Department in respect to unanswered correspondence. This problem appears to be widespread and one that needs to urgently change. The SSD development needs to be handed back to local Council.

The Department is fully aware that we have wanted this matter resolved and that Parklands demands on us have been unreasonable. The Department has not resolved this and instead seem intent on removing the very consent conditions in the SSD application designed to protect sensitive receivers.

Our understanding is that a '5 year trial' was granted to Parklands to provide enough time for the proponent to demonstrate to the Department that it could comply with the PAC consent conditions, SOC's, KPI's etc. This has not occurred.

Designated Liaison Person – *Community & DP&E*

During the Trial, the Department and the Proponent have regularly spent time communicating and meeting in relation to Parkland's development. This has also been the case with the various Government Agencies that have a role in overseeing the development, as would be expected.

Unfortunately, the people who are directly affected by this development, i.e. immediate neighbours and 'sensitive receivers' and community, do not have the same privilege. In our circumstances, and I know of many others who have been in the same position, it has been frustrating, difficult and nigh on impossible to have your say and be heard regarding impacts generated from the development.

If you approve this proposal, we strongly recommend that you require Byron Council to appoint a staff member to be the designated liaison between the community, the consent authority, and Parklands, with the responsibilities of handling issues that concern the sensitive receivers, other near neighbours, and other residents and businesses in the community who are impacted by the festivals.

The Community Representatives on the Regulatory Working Group do a good job of representing *general* community concerns, but they serve only for two years, are volunteers, and have no authority to take action. They cannot always develop in-depth understandings of all of the issues that arise because of the festivals and in any case can do little but report issues to the Parklands-controlled RWG. If a full-time Council staff person has liaison responsibilities, the people in the shire will have someone to turn to who does not answer to Parklands and who is able to work directly with Parklands and the consent authority to resolve the issues that will almost certainly arise if the festivals are allowed to continue.

It would be advisable to require a similar position be established at Tweed Shire Council to handle the concerns of the residents and businesses in Mooball, Wooyung, Pottsville, and elsewhere in that shire. Locals should have a consistent neutral person in their council offices as the go-to individual for festival-related issues. Parklands should be expected to fund (partially or fully) these liaisons since they will be needed only if Parklands is allowed to continue operations.

Industrial Noise Policy

NSW Industrial Noise Policy (INP) provides the overall noise framework for the assessment and management of the potential effects of noise on communities throughout NSW. The overall objective of the policy is :

'*to allow the need for industrial activity to be balanced with the desire for quiet in the community*.'

Parklands noise consultants, Air Noise and Environment (ANE) have assessed the criteria against the Industrial Noise Policy which is outlined in App. L of the EIS.

The NSW Industrial Noise Policy is listed as one of the relevant guiding documents and policies outlined in the Secretary's SEARS issued in Jan 2017.

It appears, however, that Parklands and the Department have no intention of utilizing the *NSW Industrial Noise Policy* and instead wish to continue with the noise criteria adopted in 2016 following Parklands MOD3 application to alter the background+ noise criteria applied by the 2012 PAC.

How is this possible? The SSD is a completely new development which needs to be assessed in accordance with the relevant legislation which is the *NSW Industrial Noise Policy.*

Both a Director and the GM of Parklands stated to neighbours that the overall impacts associated with any future approval will be greater, and in particular for sensitive receivers. (NBP & Neighbours mtg. Feb 2017)

If the SSD is approved, additional noise will be generated by the addition of an extra stage, extra patron numbers, increase use of generators and lights and the events area will be moved closer to our property as proposed for a 50,000 patron event.

We do not support the noise criteria previously adopted in MOD3 because ANE identified that the noise could increase at our home by up to 15-20 decibels. (April 2016) This increase was not considered by the Department, Parklands or the 2016 PAC. We strongly object to the current noise levels adopted in MOD3.

Another reason why we do not support the noise criteria previously adopted in MOD3, is because the NBP site adjoins and is part of one of the most important and environmentally sensitive sites on the north coast of NSW and is located within a highly significant wildlife corridor which links the Billinudgel Nature Reserve (BNR) to the World Heritage Rainforests of the Mt. Warning caldera. It is therefore, imperative the *NSW Industrial Noise Policy* be applied to any future SSD approval. (refer FNCRCP Dec. 2010)

Parklands have had over 6 years to provide us with the benefit of mitigation and to date have not done so, even though it is a requirement of the 2012 Project Approval.

Because of this our health and safety continues to be compromised during festival events and it appears that Parklands have no intention of resolving these matters despite the Commitment they made in the 2012 Project Approval.

This is a completely new development therefore, the relevant legislation is the NSW Industrial Noise Policy, which must apply to the SSD.

NOISE

Parklands state, '*As well as complying with the revised noise criteria, an analysis of the description of the noise experienced by the community (via the Community Hotline) highlighted that the adverse effects of noise on the local community, particularly with respect to lower frequencies (i.e. bass), were reduced versus the previous noise regime*.'

In 2014 and 2015 the Department issued 2 separate penalty infringements for noise exceedence during the Splendour in the Grass festivals. Parklands MOD 3 application was primarily to change the noise criteria from background+ to two noise limits across the board, depending on where you lived. The MOD 3 noise criteria which was approved in April 2016 was basically retrofitted to align with Parklands existing noise levels.

The reason why there were less calls to the community hotline for the SITG 2016 festival and all festivals thereafter, was because the background+ noise criteria that the 2012 PAC applied was replaced with a 60 decibel limit for Zone 1 and a 55 decibel limit for Zone 2, disadvantaging many in the community and making it pointless to lodge noise complaints. For example, Parklands noise consultants, ANE, identified that **MOD3** would **increase** the allowable noise at our property by **15-20 decibels.** (ANE 2016) This increase was not considered by the Department, Parklands or the 2016 PAC.

Even though many people in the community were still affected by noise, it was futile to complain because the noise criteria had been altered and raised so that Parklands would comply. We also read that prior to the MOD 3 application, Parklands were required to discuss the proposed changes to the noise criteria with stakeholders, including neighbours and sensitive receivers. We wish to inform the IPC that Parklands did not consult with us regarding the proposed changes to the noise criteria.

The proposed use of the site outlined in the SSD and Concept Plan application would mean a significant intensification [of noise] when compared to the Trial period. This has been confirmed by Parklands and in particular for sensitive receivers.

Please refer to comments made by our noise consultant *Acoustic Works* in Appendix A, titled "Transcripts DP&E edit AW" attached.

We wish to remind the Commissioners that Parklands did **NOT** include the following information in their SSD application, a requirement of the SEARS

1. SR R12 was 1of 3 properties identified in the 2012 Approval, where noise levels would not comply.
2. SR R12 has not been mitigated against noise in accordance in C16 and C18
3. Alternatively, Parklands has not reached an alternate mutually acceptable agreement with SR R12.

NBP - Response to Submissions

4.1.4. Social

Intangible Social Impacts

"*The SIA's assessment of intangible social impacts consists largely of assertions rather than analysis. Effects on matters such as wellbeing, cultural values, community identity/character, and way of life are not adequately assessed in the SIA. Please ensure these matters are addressed in your RTS, using accepted social-science methods*." (RTS pg. 30)

***Further Consultation, Assessment & Mitigation of Social Impacts* (RTS p. 30)**

"*Further consideration is required regarding the impact to the surroundings, property rights and access arrangements of neighbouring residents. Although this may have been assessed from a technical perspective in the EIS, it has not been addressed from a social perspective. To understand*

the social dimensions, further assessment is needed on how people expect to experience the respective impacts. This requires evidence based on the testimony of affected stakeholders. Also required, in turn, are proposed measures to respond to people's concerns (through mitigation) and aspirations (through enhancement)." (RTS DP&E p.30)

'Additional community consultation has been undertaken since the exhibition of the EIS with Parklands' immediate and surrounding neighbours to gain further insight into the impacts experienced on their surroundings, property rights and access arrangements from a social perspective. This additional consultation builds on the extensive community consultation undertaken as part of the preparation of the EIS and SIA, and undertaken during the trial period.' (SGC pg. 30 RTS)

Our Comment: The above comments from *Sarah George Consulting (SGC)* are incorrect. We wish to advise the Commissioners that SGC did not carry out further consultation with us and we understand that other immediate neighbours were also not consulted.

'Detailed consideration of this additional consultation is contained in Section 3 of the SIA Addendum (see Appendix I). This includes the testimonies of Parklands' closest neighbours outlining the impacts they have experienced and/or expect to experience with the continuation of events at Parklands, and proposed responsive mitigation measures to address those concerns and aspirations.' (SGC pg. 30 RTS)

Our Comment: In response to the above paragraph, SGC has referenced the wrong Appendix. It should read Appendix V, not Appendix I.

'We also note in sec. 7.6.3 of the Social Impact Assessment that, 'Sarah George Consulting is advised that Parklands has worked with this resident since 2013 to attenuate parts of their dwelling.. and .... 'After further negotiations the scope of works was approved and signed off by the resident.' (SGC EIS App. V pg. 107)

Our Comment: We wish to advise the Commissioners that this statement is also inaccurate. We did not sign off on the scope of works. We gave the go ahead for Parklands to get 3 building quotes, and made it clear that this was not to be construed as a go ahead for attenuation works. (email NBP March 2016)

This is another example where Parklands consultants, much the same as the DP&E, merely take the word of the proponent and do not consult with the affected resident, sensitive receiver or the like, to ascertain if the statements made are accurate. This is unacceptable and creates a lot of unnecessary confusion, uncertainty and delay.

Buses – Social Impact Assessment

The Traffic Assessment indicates that bus numbers are likely to increase to the site, and it is likely that some of the increase would use Gate A. Compared to the Splendour 2017 event, bus numbers are expected to increase from 479 to 1,045 for a 50,000 patron event. This increase would reduce the traffic impact of vehicles in other parts of the road network.

The statement above does not take into consideration the impact the large coaches and patron vehicles have on the resident users of Jones Road.

In sec 4.3 Traffic & Transport Assessment, WSP measures the sight distances for all of the entrances leading into the North Byron Parklands site with the exception of GATE A. On pg. 23, WSP has given the sight distances for Jones Road and Tweed Valley Way. This is misleading as Gate A is located approx. 100 metres east of Tweed Valley Way along Jones Road. Tweed Valley Way, where WSP have taken sight distances, is not even visible from Gate A. (WSP - Traffic & Transport Assessment Appendix P. Sec 4.3)

In recent events however, coaches and sewage tankers have been utilizing the Jones Road entrance from TVW in order to access Gate A for entry to the site. The coaches have to take a wide berth when entering Jones Road and on at least 2 occasions we have been forced off Jones Road onto the road verges.

The traffic controllers do not appear to have control of this dangerous situation. The mix of TVW traffic, combined with traffic controllers running onto TVW when a coach approaches, security guards positioned at the entrance of Jones Road placed at risk as well as resident traffic, all competing for space and safety, can present a chaotic and dangerous situation.

Following the recent Falls 2018/2019 festival, patron cars were being directed out of the site via Gate A and Jones Road. This is the first time that patron cars have utilised Jones Road to exit the site. Residents do NOT understand why this occurred considering the event was low key with only 17,000 tickets sold.

Likewise, residents did not understand why the large coaches were entering Jones Road when there was no visible traffic, cars or coaches, that were entering the site at the main entrance via Gate C. The Highway and the venue itself was extremely quiet in relation to traffic as patron numbers where down. It does not make sense to send coaches to Jones Road when the main car park and entrance roads were devoid of cars, coaches trucks etc.

Parklands have not consulted with the residents of Jones Road in relation to the use of the road for festival traffic and coaches i.e. amount and type, frequency of traffic movements depending size of event. They have not consulted with residents during the Trial, or for the SSD application. Residents of Jones road do not know what to expect for each festival and require consultation in relation to this matter.

We wish to emphasise to the Commissioners that this is an dangerous situation, with coaches, security, traffic wardens and local residents all competing for space and safety. Large coaches have forced us off Jones Road into the roadside verges on several occasions during events. This is unsatisfactory and needs be addressed as a matter of urgency.

Parklands gained approval for the construction of a tunnel under Jones Road via BSC. The tunnel was built to provide safe access for patrons and heavy duty vehicles e.g. trucks, earth moving machinery and coaches to utilize the tunnel to minimize impact on the local roads.

Fire works

Fire works have been ignited from the campground during most of the festival events so far held on site. The Falls festival held over the summer of 2016/2017 was the hottest on record. During the festival we were fearful of fire, as conditions were tinder dry. This is a grave concern.

Fire works are regularly ignited in the early hours of the morning and after the many of the staff are off duty. This has been reported to Parklands and the Department, however nothing has changed.

SITG 2018

Illegal fireworks were ignited in the campground posing a nuisance and fire threat to adjoining neighbours. For example, 9 fireworks were ignited at 5.47am on the morning of 22 July ’18.

Falls 2018/2019

Illegal fireworks were ignited in the campground in the mornings of 1, 2 & 3 January 2019 posing a nuisance and fire threat to adjoining neighbours.

There has been no resolution whatsoever in relation to the use of illegal fire works. The Trial is now in its 7th year, however, despite having 6 years of the Trial to resolve this serious matter, fire works continue.

Extreme Fire Risk - Jones Road Area

In January 2018, we met with Directors, from the DP&E. We discussed, amongst other things, the ‘fire threat’ the development, and in particular, Parklands fence line poses to residents evacuating in a fire

emergency. The DP&E advised us to include our concerns in our submission to the SSD. We wish to remind the Commissioners Parklands did not respond to any issues raised in our submission.

Jones Road traverses the middle of the North Byron Parklands property. It is a 'no through road' and provides the only legal egress for residents to evacuate to safety in a fire event. It is a 2.7 km single lane, narrow, winding, gravel road, flanked by huge eucalypt trees. The current fuel load along either side of Jones is 22 tonnes per ha., 3 times higher than the acceptable level of 7 tonnes per ha.

Far North Coast Bush Fire Risk Management Plan - RFS

The Far North Coast Bush Fire Risk Management Plan (FNCBFRMP) identifies Jones Road as an Extreme Fire Risk, with the Likelihood being 'Almost Certain' and Consequence being 'Catastrophic'.

In Sec. 6.11.3, **Bushfire Hazard**, the proponent identifies land to the east of the site and along Jones Road as having 'extreme bushfire risk', as well as an area within the campground in the north-east corner of the site that has the potential for fires associated with peat deposits. (sec. 6.11.3 EIS)

Residents are extremely concerned with the build up of understory i.e. lantana, molasses grass (highly inflammable) and other exotics along either side of Jones Road. Bushfire hazard reduction has not been carried out along the road for decades. Based on our experience with fires in this location and considering the growth of vegetation in recent years, we believe this hazardous fuel presents a serious threat to residents in a fire emergency.

Over the past 40 years there have been 11 fires in the immediate area. Three of these fires have been peat fires on the Parklands site (pre ownership) and neighbouring properties which burnt underground for months. The last fire in 2004 was declared a Sec. 44 - State of Emergency.

Festival events – Increase fire risk

Our property adjoins Parklands boundary at the eastern end and is located approx. 600m from the campground. The fire risk for Jones Road residents increases dramatically during festival events due to the influx of 35,000+ patrons, discarding cigarettes, smoking, camping and igniting illegal fireworks.

In consideration for residents safety, community representatives on the RWG made several suggested amendments to the Parklands BMP. (refer original sub)

Some of the 'suggestions amendments' from the community representatives were that …

(i) *Jones Road residents be included in Parklands BMP & BEEP because Jones Road traverses through the middle of the Parklands site and*

(ii) *Parklands reduce their hazardous fuel load (22 tonnes per ha.) along it's Jones Road fence line in consideration of neighbours having to evacuate in a fire emergency.*

Unfortunately, these basic requests were not adopted.

JRBMA – *Jones Road Bushfire Management Agreement*

'To better prepare for bushfire threats, Parklands hosted a meeting on 6 March 2018 with representatives from Byron Shire Council, NPWS, RFS and residents of Jones Road. As a result of this meeting, measures that would be undertaken by each stakeholder to manage risks associated with the potential for bushfire were documented in a voluntary Jones Road Bushfire Management Agreement (JRBMA).' (NBP RTS 4.1.8 Bushfire Hazards)

'In April 2018, Parklands finalised a Jones Road Bushfire Management Agreement which Parklands, NPWS, Rural Fire Service, Byron Shire Council and adjoining private land owners have signed onto.' (RTS sec. 4.4.3 NPWS Consultation) This is not correct.

Contrary to what was stated in the RTS, residents did not sign off on the JRBMA. This is misleading particularly because we emailed the GM saying that we were not happy with the draft VJRBMA

agreement as nothing had been resolved for neighbours in relation to the high fuel load along Parklands fence line, which remains a threat to neighbours and visitors. (email to NBP 8 May 2018)

Our Comment: We wish to direct the Commissioners to the minutes of the RWG meeting dated 25 Oct 2018 where it states, '*Mat Morris advised the meeting they would not be conducting specific works along the road and instead, would voluntarily maintain the wide firebreak behind the road …*' ' (Revised Final Minutes 25 October 2018)

The voluntary firebreak that the GM refers to above, is located approx. 20-30m north of Parklands fence line and provides a containment line for the Rural Fire Service. The containment line is located under power lines and cannot provide an alternative emergency egress for residents.

Residents support the slashing of the containment line. It does not, however, resolve the potential threat the fence line presents to residents and visitors of Jones Road having to evacuate in a fire emergency. (RFS 22 tons per ha)

The RFS has confirmed that our 'fear' of fire is genuine and have advised residents that their best option in a fire emergency, is to evacuate early. Residents have been aware of the danger for some time now and have been lobbying the Byron Council, the NPWS and North Byron Parklands for several years now to reduce the hazardous fuel.

Byron Council has committed to slashing the road verges twice a year. The NPWS has had a "controlled burn' scheduled for the past 2 seasons, but the weather has not been favourable. Parklands are no longer prepared to reduce their fuel load. (Revised Final Mins. 25 Oct. 2018)

It is difficult to understand why Parklands will not incorporate the 'under scrubbing' of this fence line into its Habitat Restoration Program. It is a relatively simple task of 'under scrubbing' the exotic weeds and inflammable grasses either side of the fence line as Parklands recently did along their fence line adjoining Tweed Valley Way. The 'under scrubbing' was undertaken over several days, with excellent results.

Objection Conference Centre Operation

"Further clarity is required regarding the proposed operation of the Conference facility. It is unclear whether this facility will be operational outside of events."

'The conference centre is proposed to be hired out on a function by function basis. It would not be permanently open, nor would it be available for hire to the general public during large events, including peak bump-in and bump-out periods. It is anticipated that the conference centre would operate for up to approximately 200 days per annum (subject to bookings).'

The proposed details and hours of operation for the conference centre are outlined in Sections 3.2.3 and 3.2.4 of the EIS. As the conference centre includes overnight accommodation, it would operate up to 24 hours a day. However, as outlined in Table 3.3 it is proposed that amplified music from the conference centre is restricted **to 11am to 2am**. These hours are consistent with the existing approved hours for the trial events (for amplified music from bars, cafes and dance floors during events).

We Object to …

1. the use of the Modified Noise Criteria (MOD3, 2016) **for the SSD & Concept Plan** (MOD3)

2. any permanent approval

In the final Determination Report - 2012 PAC Approval, it states that "*Permanent approvals for large outdoor music events are rarely granted, especially for new sites*". The SSD is a completely new development and one that has not yet been tested and therefore permanent approval at this stage should not be considered.

3. an overall increase of annual events on the site

As we understand, the SITG festival will utilize the site for 40 days (includes bump in and bump out), the Falls festival will utilize the site for another 40 days, other events up to 25,000 patrons (if utilised for 1 day events) equates to 108 event days bringing the overall total to 188 days annually.

However, this does not include the 5 days proposed for other events up to 5,000 patrons, nor does it include the 2 days for minor community events OR the 200 days (outside of events) that is proposed for Functions at the Conference Centre. The total amount of days the site could be utilized, therefore, amounts to **approx. 395 days.** This simply does not add up.

4. 15 hours+ daily of amplified music over 5 consecutive days

Amplified music should cease at midnight in line with other festivals e.g. the East Coast Blues Festival @ Tyagarah, Byron Bay.

5. amplified music at the Conference Centre between the hours of 11am to 2am.

All music must cease at midnight. Consideration needs to be given to immediate neighbours, sensitive receivers, and fauna species including resident Koalas which have been recorded at this location. Koalas are a Endangered species and are highly susceptible to noise.

6. the use of Conference Centre for 200 days annually

This is an added nuisance to neighbours who are already affected from the Large, Medium and Small festival events, including the bump in and bump out times.

7. the proposed on-site sewage treatment system

The on-site sewage proposal is highly questionable given the environmental sensitivity of the site and the number of patrons and events, including the Conference Centre, proposed annually. We are immediate neighbours, yet Parklands did not consult with us regarding this proposal. This is unacceptable given that we will be the ones directly impacted by this proposal.

8. the removal of 2012 & 2016 Consent Conditions & SOC's that were implemented by the PAC and designed to offer some level of protection to sensitive receivers

9. the coaches and patron vehicles utilizing Jones Road

10. the changes proposed for Gate A (Jones Road)

As a Sensitive Receiver and immediate neighbour to the festival site**, we recommend that……**

(a) the Modified Concept Plan be refused

(b) the SSD application be refused

The proposal to increase patron numbers to 50,000 cannot be sustained, particularly considering the impacts on neighbours, the community, the ecology of the site itself, the 50+ endangered species recorded from the immediate area and the location of the events site in the middle of a State Significant wildlife corridor.

(c) the word 'satisfactory', [removed from B4,1)], **be replaced into clause C1 *Outdoor events after 2017,* subclause 1) in the Concept Plan**

(d) a designated liaison person be appointed to liaise between the Community & DP&E (preferably a council officer)

(e) Jones Road residents be included in Parklands BMP & BEEP because Jones Road traverses through the middle of the Parklands site

(f) Parklands reduce their hazardous fuel load (22 tonnes per ha.) along it's Jones Road fence line in consideration of neighbours having to evacuate in a fire emergency.

Conclusion

It is our understanding that one of the Directors of Parklands recently addressed the NSW Parliament saying they needed 'certainty' regarding any future development.

Whilst we appreciate their concern, we would like to inform the Commissioners that we have also wanted 'certainty' ever since the Trial began in 2013. It is most unfortunate that after six years of the Trial, Parklands have still not provided us with any certainty.

Planning Services
Department of Planning and Environment

Attention: Director - Industry Assessments

[redacted]
Yelgun NSW 2483

North Byron Parklands Cultural Events Site, Yelgun
Re: Application No. SSD 8169 and MP 09_0028 MOD 3 (Concept Plan)

Introduction

The DPE provided a 2 week extension until 2 March 2018, with relevant Points being submitted by 16 February.

We object to both the proposed SSD development and the changes proposed for the MOD 3 Concept Plan for reasons outlined in this submission.

We are the owners of a small 2.2 ha property on Jones Road, Yelgun, and identified in the North Byron Parklands (NBP) Project Approval as Sensitive Receiver (SR) R12.

We have lived here for 40 years and adjoin the festival site at the eastern end of Jones Road. Our property is located approx. 600m from the Parklands campground.

In 2012 the Planning and Assessment Commission (PAC) approved a 5 year Trial to North Byron Parklands (NBP) for a major festival site accommodating up to 35,000 patrons. A 5 year Trial was granted to provide enough time for Parklands to demonstrate to the Department of Planning & Environment (DPE) that they could comply with consent conditions, KPI's and undertake their Commitments (SOC) in accordance with the Project Approval and Concept Plan.

Parklands have failed to comply with numerous consent conditions during the Trial. Non-compliance has been reported to the Department, however, for SR R12 nothing has changed. For example, the noise in the campground continues long after the shutdown time of 2.00a.m., noting that any compliance officers on site, have already retired at this time of a morning. Furthermore, the use of illegal fireworks in Parklands campground continues.

NBP - 5 Year 'Trial'

1. Attenuation Process – SR R12

Parklands did **not** provide us with the benefit of attenuation, consequently our family suffered with various 'health and safety' issues from their exposure to festival impacts.

In the 2012 PAC approval, 3 residences (R05, R12 & R13) on Jones Road were identified where the noise criteria would be exceeded. Our home is one of the 3 properties that NBP made a commitment to mitigate against festival noise in accordance with consent C16(2)(e) & SoC C14,16B.

In July 2013, DPE Director H. Warton instructed the General Manager of Parklands to,

* ‘commence mitigation to our residence prior to the commencement of events at the site &
* the NMP is required to be updated to reflect the commitments made in relation to physical attenuation measures to the homes of sensitive receivers R05, R12 & R13’

Despite the requirements of the Project Approval and a directive from DPE, NBP did **not** attenuate our residence before the commencement of events on site, and to this day have still not considered, nor resolved, the various impacts on our family’s ‘health and safety’ from exposure to festival noise.

As Parklands had not initiated mitigation, and following advice from the DPE, we activated consent **C18** in October 2013 for Parklands to mitigate against festival noise.

Noise Mitigation

Over the past 5 years, we have followed due process with both the Department and Parklands, opening our home on numerous occasions to accommodate Parklands engineers, noise consultants, architects & builders to assess what mitigation measures would be required. This was an inconvenience and meant a loss of privacy.

In June 2014, the DPE also engaged an independent acoustic engineer, Wilkinson Murray, to asses our home for attenuation. In Dec 2014 Chris Wilson (DPE) signed-off on what the Department thought was reasonable and feasible.

We wish to emphasize to the Department, that all engineers, acoustic consultants, architects and builders informed us that they could attenuate our home, however, due to the intrusive nature of the noise and considering the age and style of our home (built in 1948), they could not assure us that the mitigation would provide the benefit needed.

In relation to noise mitigation, the Industrial Noise Policy outlines, ‘***Receiver controls*** *- the least -preferred option, as it protects only the internal environment of specific receivers and not the external noise environment*.’ (sec. 3.4.4 Noise Mitigation Strategies)

We repeatedly asked Parklands for a scope of works (SoW) and costings for the *Alderson* (July 2013) and *Environmental Results* (March 2014) Reviews. Although DPE directed Parklands to attenuate in July 2013, it took **Parklands 3 years to provide a Scope of Works and Architectural Drawings**.

Parklands have repeatedly delayed and confused the attenuation process. The 5 year delay has been extremely stressful, frustrating and has virtually curtailed any home improvements we were keen to undertake on our home due to the uncertainty.

When the PAC approved the change to the noise criteria in MOD 3 (April 2016), it virtually undermined the 3 year process that had been underway with ourselves, Parklands and DPE in attempting to negotiate a satisfactory agreement.

This is because all of the attenuation assessments undertaken on our home were carried out in accordance with the original noise criteria in consent B3 *Noise restrictions* in the (2012 PAC) approval and not in accordance with the new criteria approved in MOD3.

Not only did the approval of MOD 3 undermine the whole mitigation process, but it also meant that Parklands could increase the allowable noise at our residence, an identified sensitive receiver, by 15-20 dBs (ANE 2016) which equates to an increase of 3 to 4 times louder than what was originally approved by the 2012 PAC.

The *Noise Guide for Local Government* provides some rules of thumb in measuring noise. A 10 decibels (dB) increase in noise is perceived as twice as loud (PAC Determination 2012). The increase in allowable noise at our home (MOD 3) was not addressed by Parklands, the DPE or the PAC.

As we experienced more festivals with varying impacts, it became evident that attenuation would only partly resolve the intrusive noise, however it would not resolve other impacts such as dust pollution, threat of fire etc., during events. Furthermore, it would not resolve the intrusive noise over our 2.2 ha property.

It took Parklands 3 years to provide us with architectural drawings and costings. Parklands provided the costings in May 2016, **2 weeks after the PAC approved the new noise criteria**, rendering the entire attenuation process futile.

It is evident, that if the consultants and builders could not guarantee the effectiveness of the mitigation works based on the original noise restrictions outlined in consent condition B3 background+, then it was futile to proceed with any mitigation works given the substantial increase in noise of 15-20dB(A) at our home.
(ANE 2016)

Coincidently, and not long after the approval of the new noise criteria, Parklands sent us correspondence stating they no longer had a requirement to mitigate our home.

Parklands simply did not attenuate our home when required by the Department. The 3 year delay combined with Parkland terms in relation to attenuation were unreasonable. For example, Parklands would not enter into a legal agreement before mitigation works commenced, nor would they give a guarantee that our home would be restored to its original condition.

Parklands repeatedly suggested that an agreement with NBP would be preferable to attenuation. Given the impasse with the mitigation process, we considered Parklands option of entering into a permanent agreement that would relocate us, away from the festival events which are having an insidious impact on our health and safety.

Parklands would not consider an agreement unless we were prepared to provide them with an **easement** (noise) **over our Property Titles** in **perpetuity**. We declined, as these terms were **unreasonable.**

The mitigation process has been a farce. The goalposts are constantly changing.
We have been cooperative and have attempted to resolve this issue the best way we know how. However, Parklands have been difficult and have blocked each proposed resolution with unreasonable demands.

Parklands development is impacting on our family's health and safety. We have lived here for forty years and have existing use. Parklands have had 5 years to resolve this issue, and to our detriment, they have not.

Parklands performance over the past 5 years has been unsatisfactory as evidenced by the list of non-compliance. Parklands did not mitigate in a timely manner, nor have they resolved the impacts their festivals events are having on us. Alternative solutions need to be looked at and resolved by Parklands ASAP.

We have been co-operative, responsive and patient throughout this whole ordeal. Parklands have had ample time to resolve this and to date, they have not done so.

2. NOISE – SR R12

Parklands have relocated us during 4 of the 10 festival events. festivals events.
Whilst this was a massive inconvenience, it did alleviate some of the impacts in relation to our 'health and safety' and in particular the sleep deprivation we suffer during festival events.

Throughout the 5 year Trial we have been exposed to excessive noise levels. As an immediate neighbour to the festival site this has been extremely difficult especially when one considers that we are **exposed** to 18+ hours per day of combined amplified music, DJ music, including illegal fireworks, campground noise, generators and associated noise for up to 5 consecutive days during events.

AcousticWorks recorded noise coming from the campground as late as 7.30 a.m. during SITG 2014. This information was provided to DPE and NBP.[1]

Because Parklands have not complied nor resolved our exposure to festival noise, we consequently suffer with stress, headaches, sinus difficulties and extreme sleep deprivation during festival events. This has a profound effect on our day to day living, and more importantly, affects our ability to carry out work duties as required.

To make matters worse, at times we have had our baby grandchildren and our elderly parents staying with us which, considering the circumstances, proved extremely difficult.

The DPE issued 2 penalty infringements to Splendour in the Grass for their 2014 and 2015 events. Parklands then proposed a change to the noise criteria (MOD 3) which appeared tailored to fit the existing noise emissions. The change in noise criteria, unfortunately meant an increase in noise of 20dB(A) at our home (ANE). This increase is unacceptable and was not addressed by Parklands, the DPE or the PAC.

AcousticWorks

AcousticWorks **–** Comments on EIS (sec.6.4) & Air Noise & Environment (App. L)

AcousticWorks has provided comments in **RED** in the 2 Appendices below which form part of this submission.

Appendix 1 - 'Noise section from North Byron Parklands EIS Dec17 Part 3 EDITED WITH NOTES' (attached) and

Appendix 2 - 'ANE. Report Template-2.2' (attached)

[1] AcousticWorks is an independent noise consultant engaged by Yelgun residents to monitor noise levels

***Industrial Noise Policy* (INP)**

In the Acoustic Assessment (App L) ANE outline the Industrial Noise Policy (INP) 2000 which provides the overall noise framework for the assessment and management of the potential effects of noise on communities throughout NSW.

We note that the overall objective of the policy is: '*to allow the need for industrial activity to be balanced with the desire for quiet in the community.*'

In Table 2.3, ANE outlines the **Derived Amenity Criteria** for a rural residential area and also points out that '*As required by the NSW INP, the **lower** of the intrusiveness and amenity criteria is to be adopted for an assessment.*' (ANE AA, App L)

Table 2.4 *Assessment Noise Criteria - dB(A) outlines 'The relevant criteria for the assessment based on the intrusive criteria which is the **most stringent for Parklands due to the low existing background noise levels**.'* (sec 2.2.1.2 & 2.2.1.3 ANE, AA, App L)

The INP outlines the Assessment Noise Criteria – 35 Laeq,period for Day, Evening and Night. The above criteria outlined in the INP must be endorsed by the Department as the principle guidelines for this type of development in NSW.

The Assessment Noise Criteria applies because of the low existing background noise levels at nearby neighbours, the adjoining nature reserve and the community at large.

Environmental Impact Statement (EIS)

Parklands SSD application is a completely new development and separate application to the previously approved 5 year 'Trial' and subsequent Modifications 2, 3 & 4.

During the 5 year Trial Parklands have had numerous non-compliance issues and in particular where noise is concerned.

Parklands want to utilize the noise criteria based on what was adopted for MOD3. We strongly object to this proposal because the noise criteria adopted for MOD 3 means a substantial increase in noise of (15-20 decibels) at our home (ANE 2016). We ask the Department to assess our situation and in particular our exposure to festival noise.

We would have expected a resolution to Parklands noise impacts by now especially considering the original 5 year trial is over. Parklands have had 5 years to mitigate festival impacts on us, as required by the Project Approval, and have not done so.

noise & vibration - SEARS

AcousticWorks noted audible rattling of windows at SR R12.

"*Noise measurements have shown that low frequency (bass) noise levels for SITG 2014 are significantly higher at Jones Road residential receivers than for SITG 2013. This is was also subjectively observed **by audible rattling of windows** on the dwellings at 237 and 251 Jones Road, which was not observed for SITG 2013.'(AW SITG 2014)*

AcousticWorks observed the rattling of our windows in July 2014 well before MOD3 was approved 2016.

The Secretary requests 'assessment of all noise and vibration sources and impacts, including impacts on all sensitive receivers, utilizing data obtained from the trial events to date.'

Parklands have not utilised the following data from the Trial in their **EIS** application, they…

(1) did not identify that our property SR R12 was **one of 3 sensitive receivers**, identified in the original approval (PAC 2012) where noise exceedance would occur. This was proven throughout the Trial. Our home was one of 3 properties Parklands committed to mitigate. (SOC C14, 16B)

(2) did not identify that SR R12 was **not provided** with the benefit of mitigation in accordance with consent conditions and a directive from DPE before the commencement of events on site. (C16 & SOC C14,16B)

(3) did not identify that Parklands have not reached an alternate mutually acceptable agreement with SR R12 to mitigate against intrusive noise.

(4) did not identify, nor address the 20 decibel increase (ANE, 2016) in allowable noise at our home as a result of the MOD 3 approval.

(5) did not identify that Parklands have not mitigate for the various 'health & safety' issues we continue to suffer because of our exposure to noise. (EH&S)

In the EIS, ANE have identified SR R05 (identified SR in original approval) and SR R43 (**not** identified SR in original approval) where noise limits will be exceeded. Parklands have not included our residence (SR R12), which was one of 3 sensitive receivers identified in the original project approval where noise would exceed. (SOC C14,16B)

Both R05 and R43 have a noise agreement in place with Parklands, as has R13, the other resident besides R12 that was earmarked for attenuation in the original Project Approval.

Unlike receptor R05 whose property is located close to Tweed Valley Way and is impacted by highway noise, our property (2.2km to the east) has consistently recorded one of the **lowest background noise levels** of all the sensitive receivers that underwent monitoring.

3. Non - compliance

In relation to our own personal experience, we have compiled numerous consent conditions and commitments made by Parklands which were not complied with, nor resolved during their 5 year trial period. (see chronology below)

Not only do we have to contend with the disturbance of festival and associated noise for up to 18+ hours per day for up to 5 consecutive event days including camper arrival day (CAD), but we also suffer with various health and safety issues during events because Parklands have not complied with requirements set out in the Project Approval.

In short, Parklands development is still impacting on us. We have not had the benefit of attenuation nor have we had the benefit of a mutually acceptable agreement in lieu of attenuation. The offer Parklands made was unreasonable, i.e. an easement (noise) over our Property Titles in perpetuity.

Non-Compliance during Trial
Chronology (SR R12)

SITG 2013

Parklands did not provide us with the benefit of attenuation, consequently our family has suffered with 'health and safety' issues from exposure to festival impacts.

Non-Compliance

Noise
- Exceeds noise criteria (Acoustic Works SITG 2013)
- NBP did not install a noise logger at SR R12 as required in consent C17(c)
- NMR sec.4.2.3 did not include attended noise monitoring for SR R12 on Sat. 27 July 2013
- R12 was omitted from the Summary of **Noise Logger Data**
- Summary of **Noise Logger Data** - our house is identified in the list as Attachment 6 Noise Logger Location R12, yet unlike all other locations there is NO table on p. 28 identifying the 'unattended' noise monitoring undertaken at SR R12. (Sec. 4.3 p.27)
- Our noise complaints to hotline were not included in complaints tables on p.23 & p.24

NBP Security - No security provided for eastern end of Jones Road. Dozens of patrons entered Jones Road from the Billinudgel Nature Reserve (BNR), refer SOC C13(4)&(5)

Telecommunications Failure - Mobile phone services seriously interrupted - Urgent phone messages took 7 hours to deliver.

Failure to remove Road Barriers - Road bollards left out on Tweed Valley Way post event - hazardous to motorists - near accident

Falls 2013/2014

Parklands did NOT provide us with the benefit of attenuation, consequently my family suffered with 'health and safety' issues from exposure to festival impacts.

Noise
- NBP advises it would **not** be providing a noise logger for SR R12 for the upcoming Falls festival; DPE directed Parklands to comply.
- Amplified **noise** from Falls festival much louder than SITG 2013 – Intrusive for neighbours
- Neighbours kept awake from **campground noise** until 7.30 a.m. refer C40(b)

Dust pollution – the dust from NBP's security, noise consultants & staff vehicles was a major health issue for SR R12. Fine dust particles settle on our roof, solar panels and contaminates our drinking water, which we are dependent on.

Fireworks - Illegal fireworks ignited in campground posing a nuisance and fire threat to adjoining neighbours - refer SOC C9(11)

SITG 2014

Parklands did not provide us with the benefit of attenuation, consequently my family suffered with 'health and safety' issues from exposure to festival impacts.

Noise – Noise travelled as far as Mooball (north), Mullumbimby (south-west) and Main Arm (west), approx. 10 km away from the event site.

- exceeded the noise criteria at SR R12 from 11 am to midnight - consent B3(2)
- exceeded the noise criteria at SR R12 from midnight to 2 a.m. - consent B3(4)
- Campground Noise – did not cease at 2 a.m. - consent C40(a)(b)

Noise Report - Acoustic Works SITG 2014

Acoustic Works was commissioned by residents to undertake independent noise monitoring during the SITG

2014 event. *AcousticWorks* noted **..**

"*Noise measurements have shown that low frequency (bass) noise levels for SITG 2014 are significantly higher at Jones Road residential receivers than for SITG 2013. This is was also subjectively observed by audible* ***rattling of windows on the dwellings at 237 and 251 Jones Road****, which was not observed for SITG 2013.'*

AcousticWorks also states that 'the difference in dB(A) and dB(C) at the receiver locations was measured and found to be **significant** ..' [AcousticWorks, Sept '14]

Fireworks - illegal fireworks ignited in campground posing a nuisance and fire threat to adjoining neighbours – refer SOC C9(11)

Falls 2014/2015

Parklands did not provide us with the benefit of attenuation, consequently my family has suffered with various health and safety problems from festival impacts.

Security Ineffective - several groups of patrons found roaming Jones Road. - Refer SOC C13(4)&(5)

Trespass - Patrons trespassed on our property – refer consent C8(i) & SOC C13(4)&(5)

Fireworks - Illegal fireworks ignited in campground posing a nuisance and fire threat to adjoining neighbours – refer SOC C9(11)

Search & Laser Lights - Lights were projected throughout our property on several nights during Falls festival

SITG 2015

NBP relocated us during SITG 2015.

Falls 2015/2016

NBP relocated us during Falls 2015

Security Ineffective - large group of intoxicated males entered Jones Rd from the Reserve and threatened NBP's guard located at the Quarry Trail, who fled for his safety. The mobile phone provided had no coverage for him to seek backup. refer SOC C13(4)&(5)

SITG 2016

Parklands did not provide us with the benefit of attenuation, consequently my family suffered with 'health and safety' issues from exposure to festival impacts.

Fireworks - Illegal fireworks were ignited in the campground posing a nuisance and fire threat to adjoining neighbours. refer SOC C9(11)

Falls 2016/2017

Parklands did not provide us with the benefit of attenuation, consequently my family suffered with 'health and safety' issues from exposure to festival impacts.

The summer of 2016/2017 was hottest on record

Fireworks - Illegal fireworks were ignited in the campground posing a nuisance and fire threat to adjoining neighbours. refer SOC C9(11)

SITG 2017

NBP relocated us during SITG 2017

Falls 2017/2018

NBP relocated us during Falls 2017

4. Environmental Health and Safety - NBP

Parklands EH&SM Manual outlines Parklands commitment in '*minimising impacts on neighbours and nearby residents*.' (EH&S Manual)

Also, in sec. 4.4, NBP's request for SEARS, Parklands state '*the EHSMM establishes a range of environmental, health and safety objectives under its EH&S Policy which Parklands is committed to achieving as part of its delivery of a sustainable cultural arts and music events venue*.'

Parklands also state '*each event is subject to a pre, during and post event audit by Parklands staff that evaluates continuing compliance with over 315 applicable approval conditions and standards*.' (sec. 4.4 NBP's request for SEARS Nov 2016)

The above statements cannot be taken seriously given the list of non-compliance at our residence alone. During events we are exposed to intrusive amplified music, campground noise and other accumulative noise, illegal fireworks, dust pollution, trespass etc.

In sec.7 Conclusion, of NBP's request for SEARS, it also states that '*Parklands has demonstrated that large outdoor events can be held in a manner that avoids unacceptable impacts on flora and fauna, residents, event goers and on the general community.*' (sec.7 NBP's request for SEARS Nov 2016)

Clearly Parklands have **not demonstrated** that large outdoor events can be held in a manner that avoids unacceptable impacts on **residents,** as evidenced by the list of non-compliance at SR R12 over the 5 year Trial.

Dust and Associated Health Issues

Since the approval of the Trial in April 2012 there has been a considerable increase in the amount of vehicles utilising Jones Road for sightseeing purposes and to view the festival site. Jones Road is a dirt road and all residents are reliant on tank water for drinking and household purposes.

During the early events we suffered from extreme dust pollution generated from Parklands security, noise consultants & staff vehicles patrolling Jones Road. During events, we had little choice, other than to close our southern windows because of dust, whilst our northern and western windows had to remain closed because of the festival noise.

The Director of Splendour in the Grass acknowledged the dust problems and consequently sealed 500m of the road. This was effective in minimising dust from passing vehicles.

In dry seasons however, the dust from the Event Site (during events, bump in & bump out) still poses a nuisance, covering our solar panels and polluting our water supply. Parklands could quite easily resolve this impact. For example, the NPWS after upgrading trail works near our property hosed down the dust from our roof and gutters. This was a simple solution in mitigating impacts on neighbours whilst implementing best practice management.

5. SEARS - EIS

- **Key Issues**

Parklands have not included in the EIS how they intend to avoid mitigate, manage and/or offset the potential impacts of the proposal (including cumulative impacts) on us.

With the exception of 4 festivals, when we were relocated, Parklands did not develop appropriate measures to avoid, mitigate, manage and/or off-set impacts in relation to us during the 5 year Trial.

- **traffic and access**

Jones Road & Tweed Valley Way Intersection

The right hand turn into Jones Road from Tweed Valley Way (TVW) is from an overtaking lane (90kph) and presents a danger to vehicles having to negotiate this turn.

Parklands constructed a tunnel under Jones Road when the site was originally being prepared for the events development. The tunnel was built to provide safe access for patrons and heavy duty vehicles e.g. trucks, earth moving machinery and coaches which utilize this tunnel access year round.

In recent events, however, coaches have been utilizing the Jones Road entrance from TVW in order to access Gate A for entry to the site. The coaches have to take a wide berth when entering Jones Road and on at least 2 occasions we have been forced off Jones Road onto the road verges.

The traffic controllers do not appear to have control of this dangerous situation. The mix of TVW traffic, combined with traffic controllers running onto TVW when a coach approaches, security guards positioned at the entrance of Jones Road placed at risk as well as resident traffic, all competing for space and safety, presents a chaotic and dangerous situation.

WSP states, '*A bus and coach terminus was built on the NBP site to provide a high-quality facility and ensure a smooth operation*.'….and.. '*To date, this loop has been working successfully for the trial events, and was designed with spare capacity to accommodate the bus patron demands of the 50,000 patron event*.' (sec. 6.1.3 On-Site Terminus Capacity)

It is clearly evident by the above statement that buses and coaches should not be utilizing the overtaking lane in order to turn right into Jones Road. Gate B was provided for bus entry and bus exit only. Therefore, buses and coaches are meant to access the site at Gate B and not Jones Road which is for service vehicles only during events.
We ask this matter be resolved. Jones Road is a minor road and is not suitable to receive large coaches which place residents safety at risk.

Please note school buses travelling along TVW will not enter Jones Road from the south due to the dangerous intersection. School buses will only pull onto the edge of Jones Road if travelling from the north.

Proposed realignment Gate A (Gate S in 2012 approval)

In sec. 8.4 *Traffic controllers,* (EA 2010) it states 'that one of the tasks of the Traffic Controllers would include, * coordinate vehicle movements into and out of Jones Road and Yelgun Road, and **minimize the disruption** to these residents.' (NBP EA **2010**, Tech Paper C1)

Also, in sec. 4.4 *Internal circulation*, it states … '□ *Spine Road – It would either pass under Jones Road via a underpass or intersect at an at-grade intersection (with the* ***Spine Road giving way to Jones Road*** *under normal traffic conditions) to be constructed as part of the site works*.' (NBP EA **2010** Tech Paper C1)

In sec. 4.3 App. P, of the **EIS**, however, WSP state '*Under this arrangement, the traffic controller would be responsible for ensuring that traffic on* ***Jones Road is stopped*** *to allow a vehicle exiting the site to leave Gate A*.'

Parklands have clearly outlined in the Trial that vehicles exiting Gate A need to give way to Jones Road residents, yet in the EIS Parklands have changed this, proposing the vehicles leaving the site be given right of way.

Jones Road is a **public road** and therefore all traffic leaving the NBP site is required to give way to Jones Road vehicles. For residents, this is particularly relevant in an emergency situation. As there are only 3 properties at the eastern end of Jones Road, this should not present a problem.

It is disappointing that Parklands has not discussed this protocol with Jones Road residents. To avoid confusion we ask the Department to clarify this matter for the remaining Trial, and that it be communicated to residents, traffic controllers and to Parklands staff.

As long term residents of Jones Road, we strongly recommend that all vehicles leaving the Parklands site, via Gate A, give way to vehicles on Jones Road for the remaining of the Trial and for any future use of the site.

- **bushfire impacts**

Jones Road traverses the middle of the North Byron Parklands property.

Jones Road is a 'no through road' and provides the only legal egress for residents to evacuate to safety in a fire event. It is a 2.7 km narrow, winding, gravel road, flanked by huge eucalpt trees.

Far North Coast Bush Fire Risk Management Plan - RFS

The Far North Coast Bush Fire Risk Management Plan (FNCBFRMP) identifies Jones Road as an ***Extreme Fire Risk***, with the Likelihood being '**Almost Certain**' and Consequence being '**Catastrophic**'.

In sec. 6 of the EIS, 6.11.3 ***Bushfire Hazard***, the proponent identifies

(a) Jones Road as having '**extreme bushfire risk**' (FNCBFRMP) and
(b) an area within the campground (north-east) that has the potential for **fires** associated with **peat** deposits (approx. 500m from our property)

Both (a) & (b) present a very real fire threat for the residents of Jones Road, yet Parklands have not addressed this serious impact and have not included Jones Road residents in their BMP & BEEP. (refer RWG notes pg. 15 below)

Festival events – increase fire risk to Jones Road residents

Over the past 40 years there have been 11 fires in the immediate area. Three of these fires have been peat fires on the Parklands site (pre ownership) and neighbouring properties which have burnt underground for months at a time. The last fire in 2004 was declared a State of Emergency, Sec 44.

The fire risk for Jones Road residents is increased dramatically during festival events due to the influx of 35,000 patrons (plus staff, emergency services, volunteers) discarding cigarettes, smoking, camping and igniting illegal fireworks. Our property adjoins Parklands boundary at the eastern end and is located 600m from the campground.

In a fire event, our safe evacuation is put at serious risk due to the forest situated between us and the Parklands site, unlike the patrons who can be evacuated safely across manicured grasslands.

Fireworks

Illegal Fire works are ignited in the campground during most festival events. The Falls festival held over the summer of 2016/2017 was the hottest on record. During the festival we were extremely fearful as conditions were tinder dry.

Because Jones Road traverses the North Byron Parklands site, residents would like to be included in Parklands Bushfire Management Plan, Bushfire Emergency Evacuation Plan and their Environmental Health and Safety Manual.

In consideration for residents safety, community representatives on the RWG made several suggested amendments to the Parklands BMP. (see below)

Hazard Fuel Reductions - Safe Evacuation

Parklands EH&S Manual states '*minimizing impacts on neighbours and nearby residents would be a suitable examples of objectives that relate directly to our EH&S Policy'*.

Jones Road is a narrow, winding, no-through road. The buildup of hazardous fuel load along Jones Road is a concern particularly for residents at the eastern end as it is their only legal egress for evacuation in a fire event.

Residents are concerned with the build up of understory i.e. lantana, molasses grass (highly combustible) and other exotics along either side of Jones Road. Bushfire hazard reduction has not been carried out along Parklands fence line (2km) along Jones road for decades.

The NSW **RFS** has measured the fuel load along Jones Road verges at **22 tonnes per ha**, well over the acceptable level of **7 tonnes per ha**.

Alan Bawden, Development Assessment & Planning, NSW RFS, stated at a recent meeting that residents concerns are **'genuine'.**

Last year residents of Jones Road followed due process and raised their concerns with the community representatives on NBP RWG. All 3 representatives expressed their concern after inspecting the area. Laurel Cohn, (RWG) proposed additions to the Parklands BMP to include Jones Road residents.

These proposed additions were not considered by Parklands as we understand the BMP was signed off pre-Falls festival 2017/2018. We have included the suggested amendments below for your consideration.

RWG & RFS Meeting Notes (Laurel Cohn – RWG)

Suggested amendments to BMP

1.3 Aims and Objectives.

The third the second dot point be amended as follows:

"Establish pre-planned procedures and protocols for the communication and coordination between event operators, emergency service agencies ***and immediate neighbours*** in the event of a potential or actual bushfire threat of the event site if affected by a bushfire;"

3.6 Potential for Peat Fires.

Figure 5 map to be extended to include the full extent of peat areas to the west of the current map. Previous peat fire has been in area not shown on map.

Table of targeted treatments. Amend section on hazard reduction during non-event periods – last dot point to include reference to Jones Road fence line:

"Ongoing fuel reduction activities including removal of fallen trees and vegetation and other combustible materials from site ***and along Jones Road fence line***"

Other concerns raised at the meeting

Jones Road is meant to be a firebreak but the integrity of this is compromised by the build up of weed and other understory combustibles along the road. The problem areas were recognized in Oct 2016 by Zofie Lahodny-Gesco (RFS) as leading to a rating of catastrophic, with fuel loads exceeding recommendations. In the areas concerned, Council is responsible for the road verges, National Parks are responsible for the Billinudgel Nature Reserve on the south of the road and NBP is responsible for the property on the north. ***What plans are in place for NBP to reduce the fuel load (lantana, weeds, grasses etc) along NBP fence line which runs along Jones Rd?***

Desired Outcomes

- For the evacuation of Jones Road residents to be included in Parklands BMP & BEEP for all future events held on site.
- Residents at the eastern end of Jones Road, would like a meeting with RFS to have a clearer understanding of the ***protocols in place if there is a fire on site or a fire on a neighbouring property***, including the Billinudgel Nature Reserve.

We ask DPE to seriously consider the dangerous situation our family is placed in during festival events and particularly those events held during hot, dry and windy conditions.

- **flooding and incident management**

One of the SEARS requirements is to include '*details of how the development would ensure the safety of all persons on-site and ensure negligible impacts upon persons off site;*'

Refer above section on Fire Impacts.

- **waste**

North Byron Parkland's proposal to store the solid waste from composting toilets into holding tanks to break down before been sprayed over the NBP site, raises many questions.

As neighbours we are concerned about the contaminants and chemicals that do not break down as well as the impact these contaminants could have on the surrounding ecology.

This process has the potential to impact on air quality (odours) of surrounding neighbours and properties. A thorough assessment is needed.

- **amenity**

With the exception of the 4 events where Parklands relocated us, **Parklands have still not resolved the impact noise on our amenity.** Not only do we have to contend with intrusive levels of noise and vibration in our home, but we also have to contend with intrusive noise throughout our **amenity** i.e. our 2.2 ha property.

- **hazards and risks**

The use of illegal fires works in Parklands campground during events has not been controlled despite some perpetrators being asked to leave the site.

Fireworks have been used during most festivals and continues to pose a fire threat and nuisance to neighbours. The Jones Road ridgeline is identified as an Extreme Risk in the FNCBFRMP and any use of illegal fireworks in the immediate vicinity should not be tolerated and must be controlled and prevented under all circumstances.

What visible measures has Parklands taken to deter this illegal activity? Are there any signs in the campground warning patrons that the use of illegal fireworks will attract a penalty infringement of $??? and immediate expulsion from the venue?

4.2 Statutory Context

4.2.1. Concept Plan and Permissibility

We object to the proposed changes to the 2012 Concept Plan.

Parklands want to increase the number of event days annually and increase the number of patrons from 35,000 to 50,000 based on their satisfactory performance during the Trial. Parklands are also proposing a doubling of accommodation guests for the Conference Center from 60 to 120.

Different layouts of the event area are proposed and particularly the set of the event area for a 50,000 patron event. We object to the proposed change for the 50,000 patron configuration as it has not be trialed or tested and would bring the event area closer to our home.

Unless Parklands sort out their non compliance issues and in particular the impacts experienced by sensitive receivers exposed to festival noise, the Department should not recommend approval of the SSD or changes to the Concept Plan.

Parklands have not mitigated us against festival impacts therefore any increase in patron numbers based on Parklands ‘satisfactory performance’ cannot be justified.

6. Compensation

In the EIS, ANE state, *'Parklands have advised that an agreement has been entered into with the owner of each property relating to management of impacts from the event, and in some cases **compensation** has been agreed. On the basis of these agreements, the property owner has formally agreed not to lodge complaints relating to future events at Parklands. In some instances the potential for noise impacts have been part of the decision to enter into an agreement with certain properties,…'* (sec. 4.2.5)

In sec. 4.3.6.2. EIS Parklands state that, '*It is noted that an 8 dB exceedance is predicted at Receptor 5. This is a significant exceedance and is not feasibly treated through management of volumes or stage mitigation. This has been identified and an agreement was entered with Receptor 5 which will extend to the permanent approval*.'

The noise at our residence also cannot be treated through management of volumes or stage mitigation.

We wish to advise the Department that Parklands have **not** carried out physical mitigation measures to our home. Parklands have **not** advanced a mutually acceptable agreement due to unreasonable terms. And, with the exception of the 4 events when we were relocated, Parklands have not compensated us for exposure to festival noise. We have made every effort to resolve this with Parklands.

The Department also needs to consider that Parklands intend to locate their 50,000 patron event even closer to our property. This scenario, plus additional impacts on us without the benefit of mitigation, is exposing us to more of the same and is simply unacceptable. The current stalemate regarding mitigation or an agreement has been through no fault of our own.

In April 2017, we advised Parklands their offer was unreasonable because they wanted an easement over our property titles in perpetuity. Parklands have not replied to matters raised in this correspondence.

Summary

Throughout the 5 year Trial, Parklands have not complied in regards to mitigating the impacts from festival events on us, SR R12. Please note, that SR R12 was one of 3 residences that were identified in the 2012 Project Approval where noise levels would be exceeded.

To reiterate…..
(a) Parklands did not mitigate our home/or reach a mutually acceptable agreement against noise, a requirement of the Approval.

(b) Parklands have not mitigated against campground noise that continues hours past shutdown time creating a nuisance to neighbours.

(c) Parklands have not resolved the impact of dust pollution on immediate neighbours during dry events.

(d) Parklands have not resolved trespass.

(e) Parklands have not resolved the danger and nuisance to neighbours that illegal fireworks create. Records show that illegal fireworks have been recorded from the campground during most events held on site to date.

In the EIS, ANE state, *'Acoustic modelling has determined that there is potential for increased community impacts for the larger proposed events if the same operating volumes are maintained for each venue.' (*sec. 6 Conclusion and Recommendations App L)

The GM and Director of Parklands also acknowledged at a recent meeting with residents that impacts on neighbours will increase if they get permanent approval.

Based on Parklands non-compliance and unsatisfactory performance during the Trial, we ask the Department to **refuse** the SSD and proposed changes to the existing Concept Plan.

However, if the DPE were to recommend any future approval, a balanced approach to noise is required, similar to that taken by PAC in 2012. The PAC applied background+ noise criteria in their consideration of both the industrial use of the festival site AND surrounding neighbours low background+ noise levels.

If the Department were to recommend any future approval, then measures need to be taken to protect sensitive receivers, and in our case SR R12.

The Department needs to include conditions that will …'*avoid, mitigate, manage and/or off-set these impacts*.'…on sensitive receivers to

(i) protect sensitive receiver status (SR R12) and
(ii) protect rights to mitigation and compensation against the accumulative impacts of the Trial and any future events
(iii) mitigate neighbours against dust pollution during events (bump in & bump out)
(iv) mitigate neighbours against trespass during events
(v) restrict patron numbers to 35,000
(vi) restrict events closing time from the current closing time of 2.00 a.m. to 12.00 p.m. (midnight) in line with other events e.g. the East Coast Blues Festival (Byron Bay) in consideration of neighbours and the surrounding rural community

Parklands have had 5 years to negotiate a mutually acceptable agreement to resolve the impacts festival events are having on us (SR R12). They have **not** done so.

Meanwhile, it would be in the interest of all parties to resolve this matter ASAP and before any determination is made concerning future approvals. We believe this matter can easily be resolved between Parklands and ourselves, provided Parklands stop making unreasonable demands.

The DPE needs to seriously consider the **accumulative impacts** the festival events are having on our health and safety and in particular, the intrusive noise throughout the 5 year Trial.

NSW GOVERNMENT | Planning & Infrastructure

Contact: Brent Devine
Phone: (02) 9228 6328
Fax: (02) 9228 6455
Email: brent.devine@planning.nsw.gov.au

2 July 2013

Our ref.: 09_0028

Mr Mathew Morris
General Manager
North Byron Parklands
PO Box 517
BANGALOW NSW 2482

- via email -
mat@northbyronparklands.com

Dear Mr Morris

Subject: Draft Noise Management Plan and Noise Attenuation Measures to Sensitive Receivers – Cultural Events Site, Yelgun – Byron Local Government Area (09_0028)

The Department of Planning and Infrastructure (the department) has received an enquiry from a 'sensitive noise receiver', as identified in the Noise Impact Assessment Report (NIAR) prepared by Benbow Environmental and submitted as part of the Environmental Assessment, seeking information as to when noise attenuation measures will be applied to their home, as required as part of the approval for the abovementioned project.

The department notes that as part of your Statement of Commitments (SoCs), you have committed to the implementation of best practice mitigation measures in consultation with the three residents identified as potentially being exposed to elevated noise levels (identified as R05, R12 and R13 in the NIAR). Such measures include the strategic orientation of stages, direction of speakers away from the nearest sensitive receivers, as well as the implementation of physical attenuation measures to the homes of sensitive receivers by means of double glazed windows, insulation, etc.

To date, it is understood that the works required to the homes of sensitive receivers R05, R12 and R13 has not occurred. In accordance with the SoCs, these works should occur prior to the commencement of events at the site.

It is noted that your draft Noise Management Plan (NMP) submitted to the department for approval identifies measures to address noise levels during the event. However, measures such as physical attenuation measures to the homes of sensitive receivers are not proposed as part of the plan. The NMP is required to be updated to reflect the commitments made, which form part of the approval.

In regards to the draft NMP, the department is still reviewing its adequacy and a letter will be sent to you shortly. Should you have any inquiries in regards to this matter, please do not hesitate to contact Mr Brent Devine on 9228 6328, or via email at brent.devine@planning.nsw.gov.au.

Yours sincerely,

Heather Warton
Director
Metropolitan and Regional Projects North

2/7/13

- Surface Water Management Plan, to manage surface water flows and quality. The plan would include Stormwater Management Plan(s) for applicable infrastructure on site, and a Stormwater Monitoring Program for monitoring surface water runoff from the site;
- Acid Sulfate Soils Management Plan, to manage acid sulfate soil risks during construction works;
- Wastewater Management Plan, to manage wastewater collection, treatment and discharge on site. The plan would include a Groundwater Monitoring Program, to monitor groundwater levels and quality associated with the wastewater treatment system;
- Flood Risk Management Plan, to manage flood and flood-related evacuation risks. The plan would include the existing mitigation measures identified in Section 6.3.8 above;

- construct one half of the perimeter loop road in the south-eastern car park above the 1 in 100 year ARI flood level;
- minimise disturbance within the riparian area of Billinudgel Creek and Yelgun Creek as far as practicable (ie. limited to existing infrastructure crossings/roads and environmental restoration works);
- maintain the minimum 30 metre (and up to 80 metre) buffer to the SEPP 14 wetland and pre-existing vegetation in the south-eastern area of the site;
- continue regeneration of native vegetation adjacent to the SEPP 14 wetland (see Section 6.7 for further details); and
- restrict on-site effluent disposal to identified areas to the north of Jones Road.

The management plans and monitoring programs would be updated in consultation with the applicable authorities and the RWG.

6.4 Noise and Vibration

6.4.1 Background

Event noise was a key issue raised by the community and regulatory stakeholders during the assessment of the original project application. It is also the most common issue raised in calls to Parklands' Community Hotline, and is a key issue raised in the SEARs for the proposed development.

To this end, noise has been subject to significant environmental assessment and modelling both during the original project application and in subsequent modifications, in particular MOD 3 (see below). It is also the focus of significant monitoring and assessment before, during and after each event, and has been subject to assessment by the Department's Compliance Branch.

In this regard, the Department has sent a number of officers to both Splendour and Falls Festival events to undertake detailed compliance audits and to monitor noise. Overall, the audits have found that management practices employed during the events were satisfactory, although some non-compliances and areas for improvement where identified in relation to noise conditions. The Department issued two penalty infringement notices (PINs) to Parklands in relation to noise non-compliances associated with the Splendour 2014 and 2015 events (prior to MOD 3).

A key reason for these non-compliances was the way that the noise criteria in the original project approval were formulated. In this regard, the original approval included noise limits based on a 'background plus' approach, with the criteria based on the background noise level at the receiver location plus either 5 or 10 decibels depending on the time of day.

This framework is used for industrial developments regulated under the *Noise Policy for Industry* (formerly *NSW Industrial Noise Policy*), but is not particularly suited to short term noise emissions such as those produced by events. Most events a

i.e. they couldn't comply with the original noise criteria so they created new criteria that would fit the existing noise emissions

which must be met at all off-site receivers. Such a set level provides a greater level of certainty for both the event operator and the community as to the expectations for noise performance.

And also makes it easier to comply...

The 'background plus' model was found to be problematic for a number of reasons, particularly because background noise fluctuates markedly between sites and between the winter and summer seasons, when the Splendour and Falls Festival events are held.

As a result of the non-compliances identified in Splendour in 2014 and 2015, and the resulting PINs, Parklands undertook detailed analysis of acoustic data collected during events to determine how best to manage sound emissions at future events, particularly in winter when background noise is significantly lower. The analysis found that low-frequency noise emissions from drum and bass are likely to be the cause of most of the disturbance and complaints from events. Parklands has since implemented a range of measures to mitigate these and other noise emissions during events, including:

- positioning stages to take advantage of natural topographic shielding;
- orientating stages and speakers away from sensitive receivers and Billinudgel Nature Reserve as far as practicable;
- using innovative speaker arrays, delay systems, drapes and roof sheeting to direct and contain noise spill;
- using fixed or portable barriers (eg. shipping containers or hay bales) around stages;
- using double walled tent sheets to contain noise from minor stages/venues;
- minimising use of sub-woofer speakers to minor venues;
- providing greater community liaison support on acoustic management, including a team of acoustic engineers to continually monitor noise at key off-site locations and residential receivers;
- co-locating the Noise Control Co-ordination Centre (NCCC) with the Community Hotline personnel to facilitate rapid response to complaints; and
- continuous front-of-house noise monitoring data to the NCCC, stage managers and the production team for all stages, essentially allowing the production team to 'turn down the volume' in prompt response to identified potential or actual noise exceedances.

Further, in May 2015 Parklands sought to modify the project approval conditions to move from the 'background plus' noise criteria model to absolute criteria, and to include specific criteria for low-frequency noise emissions (ie. MOD 3). Following detailed assessment by both the Department and the Commission, in April 2016 the Commission approved the proposed modification subject to the revised noise limits summarised in the following table. The noise zones[30] referred to in the table are shown on **Figure 6.9**.

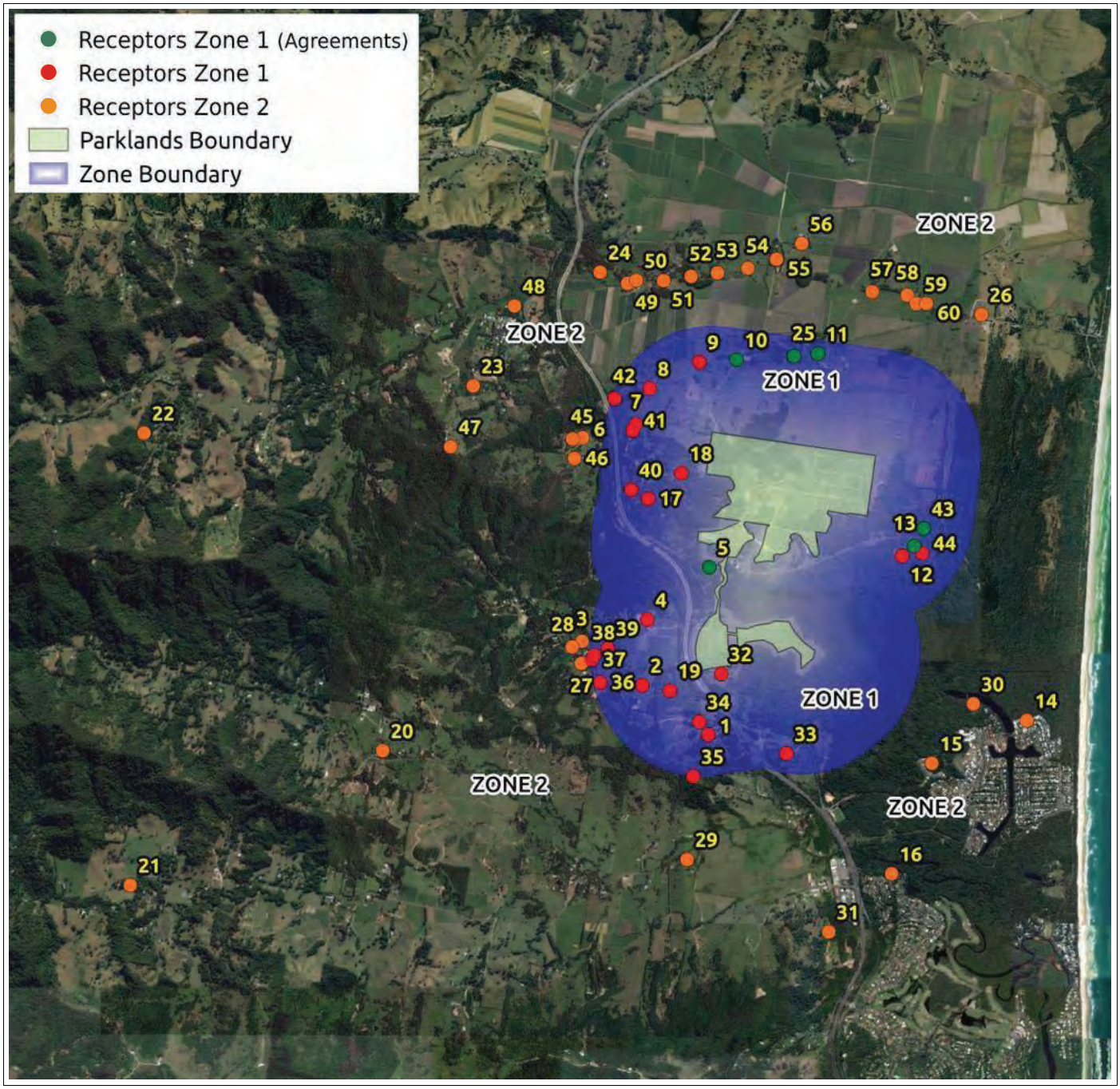
The project approval also provides limits on hours of operation for certain activities, including amplified music from the main stages, and amplified music from bars and other venues. These hours of operation are outlined in Section 3.2.4.

Table 6.3: *Revised Noise Limits*

Time	***Noise Criteria $dB_{LAeq(10\ min)}$***	
	Inner Zone (Zone 1)	***Outer Zone (Zone 2)***
11 am – midnight	60 dBA	55 dBA
	70 dB(lin)[1]	65 dB(lin)[1]
Midnight – 2 am	45 dBA	45 dBA
	60 dB(lin)[1]	55 dB(lin)[1]

1 Low frequency noise in the 63 hertz 1/1 octave band

[30] Zone 1 refers to areas within 1 kilometre from the site, and Zone 2 refers to areas more than 1 kilometre from the site.



North Byron Parklands

Date	November 2017
Author	Planners North
Reference	1287.1694

Prepared by

PJEP & Planners North

Sources | ANE Acoustic Assessment

Figure | 6.9

Noise Assessment Zones & Sensitive Receivers

North Byron Parklands| Tweed Valley Way & Jones Road

The Commission's determination report for MOD 3 noted that these noise limits are consistent with, or in some cases more stringent than, noise limits for contemporary outdoor venues both in Australia and overseas. Further, the Commission noted that low-frequency noise is not regulated at all in the benchmarked Australian venues and international events such as the Glastonbury Festival. As such, it is considered that the noise regulation for the project represents best practice.

6.4.2 Performance

Since the implementation of the above mitigation measures and revised noise criteria (ie. from Splendour 2016 onwards), Parklands has achieved compliance with all of the noise-related project approval conditions and its KPIs. The adaptive management approach and the continual improvement in performance is reflected in the number of noise-related calls to Parklands' Community Hotline, which has shown a marked downward trend over the trial period (see **Figure 6.10**). It is considered that the Performance Reports demonstrate that the recent events are being managed to an acceptable standard and generally in accordance with the community's expectations.

Not true at R12, measured data shows otherwise

Not true for R12

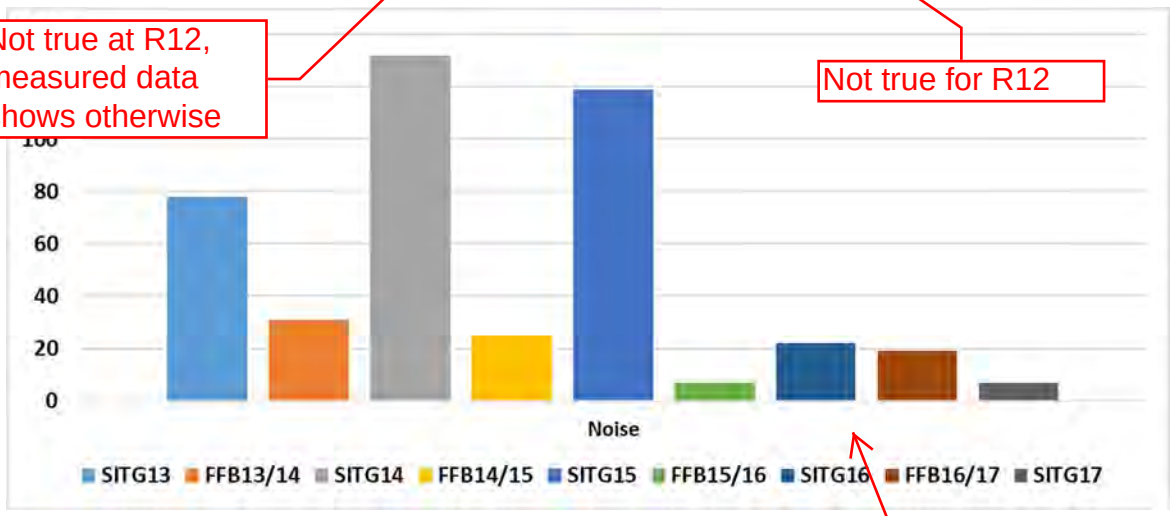


Figure 6.10: *Noise Calls to the Community Hotline (Source: Parklands)*

Chart does not indicate what proportion of the community has given up complaining based on lack of adequate action/ response

Notwithstanding, noise does continue to be the issue most raised in calls to the h
6.2). To ensure noise is effectively managed and to promote continual improv
implements a range of measures in accordance with the project approval and its
preparation and implementation of a comprehensive:

- Noise Management Plan, that includes a range of mitigation measures
  spill;
- Acoustic Monitoring Program, that includes amongst other things:
  - continuous unattended monitoring at sensitive receiver locations b
    after events;
  - attended monitoring at sensitive receiver locations, including in re
    the Community Hotline;
  - implementation of the NCCC which includes real-time monitoring of noise levels for all stages, monitoring of local meteorological conditions, and liaison between NCCC, Community Hotline personnel, stage managers and production personnel; and
- Noise Impact Reports for each event.

Parklands has also entered into negotiated noise agreements with some surrounding receivers[31], and provides complimentary event tickets to a number of surrounding landowners, as outlined in Section 2.3.

[31] Including Receivers 5, 10, 11, 13, 25 and 43.

6.4.3 Proposed Development and Noise Assessment

The proposed development involves the continuation of noise sources associated with outdoor events on the Parklands site, as well as the introduction of additional noise sources, in particular the conference centre and associated facilities.

To assess the potential noise impacts associated with the proposed development, a Noise Assessment has been undertaken by ANE, and is attached as **Appendix L**. The assessment includes consideration of construction, event and traffic related noise and vibration, and has been undertaken in accordance with applicable noise criteria and guidelines including the:

- noise criteria in the existing project approval – for event noise;
- EPA's *NSW Industrial Noise Policy (*now *Noise Policy for Industry)*[32] – for plant and equipment noise and conference centre;
- EPA's *Interim Construction Noise Guideline* – for construction noise; and
- EPA's *Road Noise Policy* – for road traffic noise.

A summary of the findings of the assessment is provided below.

6.4.4 Event Noise

From a noise impact perspective, the proposed ongoing outdoor events at the Parklands site would be similar to the existing trial events. The key change would be the potential use of one additional main stage (the 'Forest' stage) for all larger events. This stage is currently only used for the Falls Festival.

A summary of the main and minor stages modelled in the noise assessment is provided in **Table 6.4** below, and an indicative layout of the stages is shown on **Figure 6.11**. The indicative stage locations have been located to take advantage of topographic shielding and to optimise stage orientation to minimise offsite impacts.

Table 6.4: *Modelled Music Stages*

Main Stages	***Minor Stages/Venues***
S1 – Amphitheatre	S2 – Tipi
S3 – Forest	S5 – World
S4 – McLennan	S9 – Cabaret Tent
S6 – Tiny Dancer	V1 to V10 – Minor Venues
S7 – Mix Up	

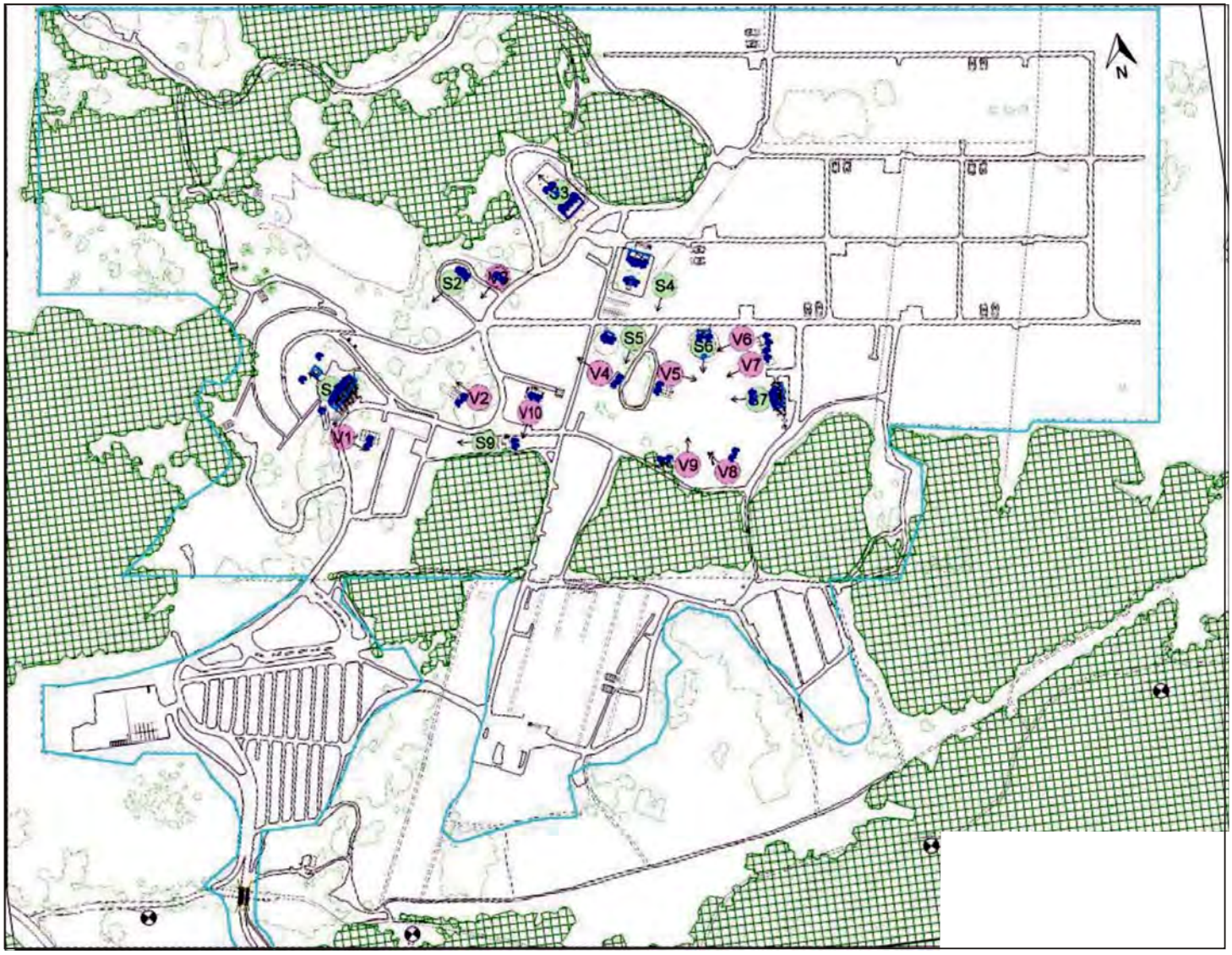
The noise assessment includes modelling of the noise levels at sensitive receiver locations associated with the proposed largest event (ie. Splendour at 50,000 patrons), with the modelling undertaken using CadnaA software.

The modelling adopts the physical mitigation measures that have been used for the existing project (as outlined in Section 6.4.1 above), and includes modelling of a number of scenarios including:

- Base case – existing Splendour layout (ie. existing operations to calibrate model);
- Future large event with all stages operating – no volume management; and
- Future large event with all stages operating – with volume management.

But only based on 11am to midnight data. No calibration between midnight and 2am with measurement data. There appears to be significant discrepancies between midnight-2am in particular

[32] The *NSW Industrial Noise Policy* (INP) was replaced by the
still applies to the proposed development under the savings pr
under both policies.



Legend

Foliage area | Sensitive receiver | Speaker noise source

North Byron Parklands

Date	November 2017
Author	Planners North
Reference	1287.1694

Prepared by

PJEP & Planners North

Sources | ANE Acoustic Assessment

Figure | 6.11

Modelled Music Stages

North Byron Parklands | Tweed Valley Way & Jones Road

The assessment notes that the modelling provides a conservative prediction of noise impacts for a number of reasons, including:

- the assessment was undertaken assuming typical worst case meteorological conditions, including source-to-receiver winds (1 to 3 m/s), or temperature inversion under calm conditions[33]. This results in predictions up to 6 dBA higher than what would occur during calm conditions;
- the assessment assumes that all stages would be operating at once. In reality, there would never be a time that all stages are operating at once;
- the model is unable to fully account for the innovative speaker arrangements that have been adopted for recent events, in particular the hanging J-curve speaker arrangements that direct sound downwards into the crowd rather than out; and
- minor music stages/venues have been assumed to radiate noise in all directions with no directivity or noise shielding from structures. In reality, all venues have some directivity and/or shielding.

Base Scenario – Existing Large Event

The modelling for the base scenario (and the future event – no volume management scenario) is based on the typical front-of-house noise levels measured for the current trial events (see **Table 6.6** below).

The modelling predicted that the existing Splendour and Falls Festival events would comply with the applicable noise limits at all off-site receivers, with the exception of a small number of receivers that were predicted to exceed the limits during the Splendour event (no exceedances were predicted for the Falls Festival event). As outlined above, these predictions are based on worst case operating levels and worst case meteorological conditions, with no active volume management.

A summary of the exceedances is provided in **Table 6.5** below.

Table 6.5: *Base Scenario (Existing Splendour Event[1]) – Predicted Exceedances (exceedances in bold)*

Receiver ID	Location	Zone	Noise Agreement	Total Noise (dBA)		Low Frequency Noise (dB_{lin})	
				Prediction	Limit	Prediction	Limit
5	Jones Rd, Wooyung	1	Yes	**65**	60	**73**	70
10	Wooyung Rd, Wooyung	1	Yes	**61**	60	66	70
11	Wooyung Rd, Wooyung	1	Yes	59	60	**72**	70
25	Wooyung Rd, Wooyung	1	Yes	59	60	**71**	70
35	Billinudgel Rd, Billinudgel	1	No	52	60	**71**	70
43	Jones Rd, Wooyung	1	Yes	58	60	**73**	70
55	Hulls Rd, Crabbes Creek	2	No	53	55	**66**	65

1 11am to midnight time period

As indicated in the table, 2 receivers are predicted to exceed the dBA noise limits and 6 receivers are predicted to exceed the low frequency dB(lin) limits, for a total of 7 receivers altogether. Parklands has negotiated noise agreements with 5 of these receivers.

Not true. It depends on the frequency, level and rate of change of the sound

exceedances are relatively minor (ie. 1 to 2 dB)[34], with the exception of Receiver 5 on ad which is subject to an agreement with Parklands, and is predicted to experience ces of 3 to 5 dB.

Model needs to be better calibrated for midnight to 2am before assumptions can be made

[33] In accordance with *ISO 9613-2:1996 Acoustics: Attenuation of sound during propagation con*

[34] Noise differences of 1 to 2 dB are not discernible by the human ear.

In practice, noise levels are managed to comply with the applicable criteria at all off-site receivers (with the exception of those with agreements) through implementation of the active noise management system described above.

Future Large Event

Modelling for the future large event (ie. Splendour at 50,000 patrons) indicates that, without volume management mitigation or other mitigation measures, exceedances of the noise limits could be experienced at a number of receivers in the surrounding area (in both Zone 1 and Zone 2).

Accordingly, the noise assessment includes consideration of additional reasonable and feasible measures that could be implemented to further mitigate noise impact to surrounding receivers. The mitigation options considered included:

- fully enclosing main stages on 3 sides;
- additional shielding behind main stages;
- tall barriers or earth turns (up to 20 metres high) to the rear of main stages;
- fully enclosing some stages with within buildings (eg. dance stages); and
- additional investigation of orientating stages away from sensitive receiver locations.

None of the enclosure/shielding options were found to provide any significant reduction in noise levels at sensitive receivers (approximately 1dB reduction). Full enclosure of some stages within buildings (eg. dance stages) was discounted for safety reasons. Further stage orientation investigation was also found to not provide any significant benefits in reducing overall off-site noise performance.

The noise assessment concludes that the existing physical mitigation measures outlin[ed] in Section 6.4.1 above represent reasonable and feasible mitigation measures available to the [proposal]. As such, source noise controls (ie. monitoring and volume management) are consider[ed] the most appropriate additional noise control strategy for the proposal.

Calibration of model between midnight and 2am appears inadequate based on measured data at R12. Needs to be improved

Through iterative modelling, the assessment found that by reducing front-of-[house] levels marginally during worst case meteorological conditions, compliance would be ac[hieved] at all sensitive receiver locations, with some minor exceptions as discussed below. The a[dopted] front-of-house noise levels for the main and minor stages are shown in **Table 6.6**.

Table 6.6: *Front-of-House Noise Levels (adjusted levels in bold)*

Stage	***11am – Midnight***				***Midnight – 2am***			
	Total Noise dBA		***Low Frequency Noise dBC***		***Total Noise dBA***		***Low Frequency Noise dBC***	
	Non-Adjusted	***Adjusted***	***Non-Adjusted***	***Adjusted***	***Non-Adjusted***	***Adjusted***	***Non-Adjusted***	***Adjusted***
S1	99	**98**	109	**108**	-	-	-	-
S2	95	95	105	105	95	**89**	105	**99**
S3	99	99	109	**105**	-	-	-	-
S4	99	99	109	**108**	-	-	-	-
S5	95	95	105	105	95	**92**	105	**104**
S6	99	99	109	**108**	-	-	-	-
S7	99	99	109	**107**	-	-	-	-
S9	91	91	101	101	91	**87**	101	**99**
V1	95	95	105	105	95	**94**	105	**104**
V2	95	95	105	105	95	**90**	105	**98**
V3	95	95	105	105	95	**91**	105	**102**
V4	95	95	105	105	95	**92**	105	**103**

Stage	11am – Midnight				Midnight – 2am			
	Total Noise dBA		Low Frequency Noise dBC		Total Noise dBA		Low Frequency Noise dBC	
	Non-Adjusted	Adjusted	Non-Adjusted	Adjusted	Non-Adjusted	Adjusted	Non-Adjusted	Adjusted
V5	95	95	105	**104**	95	**93**	105	**99**
V6	95	95	105	**104**	95	**91**	105	**99**
V7	95	95	105	**104**	95	**92**	105	**100**
V8	95	95	105	105	95	**91**	105	**98**
V9	95	95	105	105	95	**94**	105	**101**
V10	95	95	105	105	95	**94**	105	**104**

As outlined in the table, the required adjustments are only 1 dBA for one stage in the 11am to midnight time period, and between 1 and 6 dBA for a number of minor stages/venues in the midnight to 2am time period. Adjustments for low-frequency noise would be 1 to 4 dBC for a number of stages in the 11am to midnight time period, and between 1 and 7 dBC in the midnight to 2am time period. The noise assessment notes that these levels would still provide acceptable sound levels for audience satisfaction.

A summary of the predicted noise exceedances at sensitive receiver locations, based on these front-of-house noise levels, is outlined in **Table 6.7** below.

Table 6.7: *Future Large Event Scenario – Predicted Exceedances (exceedances in bold)*

Receiver ID	Location	Zone	Noise Agreement	Total Noise (dBA)		Low Frequency Noise (dB_{lin})	
				Prediction	Limit	Prediction	Limit
11am – Midnight							
5	Jones Rd, Wooyung	1	Yes	**65**	60	**72**	70
43	Jones Rd, Wooyung	1	Yes	58	60	**73**	70
Midnight – 2am							
5	Jones Rd, Wooyung	1	Yes	**53**	45	**63**	60

As outlined in the table, the modelling indicates that compliance with the applicable noise criteria would be achieved during worst case conditions at all off-site receiver locations, with the exception of 2 receivers on Jones Road which are subject to noise agreements.

Based on the results of the modelling, and the historical management and event noise monitoring, the noise assessment concludes that the proposed events are able to be managed to achieve compliance with the applicable noise limits at all off-site receivers (with the possible exception of Receiver 5 and other receivers subject to agreements), and that noise can be managed to ensure an acceptable amenity in surrounding areas.

Event Plant and Equipment

The noise assessment also includes modelling of potential noise impacts associated with the operation of fixed plant and equipment during events, in particular generators for lighting during the night time period after the cessation of event performances (ie. after midnight and 2am)[35].

The assessment adopts a night-time noise criterion of 35 dBA for these noise sources, based on the provisions of the EPA's *Noise Policy for Industry.*

[35] While generators also operate during the event performance periods, they are much quieter than event noise and do not influence the noise profile at receiver locations.

The assessment found that noise levels would comply with this criterion at all off-site receivers during the sensitive night-time period. Further, noise levels at most receivers would be below the applicable rating background noise level (ie. 30 dBA), which indicates that this noise source is unlikely to be distinguishable from background noise.

The only exceptions are Receiver 5 (ie. 34 dBA) and Receiver 32 (ie. 31 dBA). The noise assessment notes that optimising the location and orientation of lighting towers and plant near these receivers would reduce noise levels further, if required.

6.4.5 Conference Centre Noise

The noise assessment includes consideration of potential noise impacts associated with the conference centre use, including:

- amplified entertainment or announcements (eg. music, presentations);
- vehicle movements;
- outdoor activities; and
- mechanical plant and equipment.

The assessment includes modelling of the combined operation of these noise sources within the conference centre and associated accommodation precinct, with reference to the minimum nighttime criterion under the *Noise Policy for Industry* (ie. 35 dB_{LAeq}), as well as the applicable sleep disturbance criterion (ie. 45dB_{LAmax}).

The assessment found that the combined conference centre noise levels would comfortably comply with the applicable criteria at all sensitive receivers, with a maximum of 29 dB_{LAeq} at a receiver location (Receiver 5), and a maximum of 30 dB_{LAeq} at the boundary of the nearest property (Receiver 18).

The assessment also indicates that the operations would not result in any sleep disturbance impacts, with a maximum of 37 dB_{LAmax} at a receiver location (Receiver 5), and a maximum of 36 dB_{LAmax} at the boundary of the nearest property (Receiver 18). If consideration is given to noise attenuation through the conference centre glazing, then L_{Amax} levels would be below 30dB at all sensitive receiver locations.

6.4.6 Construction Noise and Vibration

The noise assessment includes consideration of construction noise and vibration, concluding that no impacts are likely given the distance to off-site receivers and the nature of the proposed construction works. In this regard, the nearest off-site receiver to the proposed conference centre (Receiver 18) is 450 metres from the proposed centre, and does not have a direct line of sight to the development.

To ensure that construction noise (including cumulative noise) is appropriately managed, Parklands would undertake construction activities within the hours stipulated in the EPA's *Interim Construction Noise Guideline* (as reproduced in Section 3.2), and implement standard best practice measures including:

- ensuring all plant and equipment is well maintained and appropriately operated;
- scheduling construction works near residents during the least sensitive time of the day where practicable;
- notifying residents of the construction works schedule; and
- maintaining the Community Hotline for complaints management.

6.4.7 Mitigation and Management

To manage noise related risks associated with the ongoing operation of the Parklands project, Parklands proposes to implement a range of measures that are generally consistent with the existing measures that have been implemented for the project to date. In this regard, Parklands would:

- manage the noise emissions from the project to comply with the existing noise limits at all times (as identified in **Table 6.3** above), for all receivers apart from those with negotiated noise agreements;
- update and subsequently implement the:
    - Noise Management Plan, to minimise and manage noise impacts associated with the project. The plan would include a range of noise mitigation and management measures, including:
        - at-source acoustic attenuation measures;
        - speaker array controls;
        - adaptive noise management via the Noise Control Coordination Centre (NCCC);
        - noise complaint monitoring and response via the Community Hotline;
        - noise impact reporting; and
    - Acoustic Monitoring Program, that includes amongst other things:
        - continuous unattended monitoring before, during and after all medium and large events;
        - attended monitoring at sensitive receiver locations for all medium and large events, and/or in response to calls to the Community Hotline;
        - implementation of the NCCC for all medium and large events, which includes:
            - real-time monitoring of noise levels for all stages;
            - monitoring of local meteorological conditions; and
            - liaison between the NCCC, Community Hotline personnel, stage managers and production personnel.

The management plan and monitoring program would be updated in consultation with the applicable authorities and the RWG.

6.5 Visual and Lighting

6.5.1 Background

The Parklands site, and particularly the event and camping area, is situated in a natural visual basin which assists in screening the majority of views from off-site sensitive receiver locations.

Billinudgel Nature Reserve and Marshalls Ridge screen the site to the south and east, while elevated terrain to the west and north-west screen the site in these directions. The screening ridges are shown on **Figure 6.12**.

Notwithstanding, there are views to the site from some sensitive receiver locations, and lighting associated with events can also be seen from surrounding sensitive receiver locations.

6.5.2 Performance

All trial events to date have been managed in accordance with the applicable lighting-related approval conditions and KPIs (Nb. The consent and KPIs do not include any visual amenity-related requirements given the minor visibility of event infrastructure).

Further, no calls to the Community Hotline have raised visual or lighting related issues during the trial period to date, although a small number of direct communications from neighbours have raised concerns regarding some lighting displays.

Air Noise Environment
Environmental Monitoring and Assessment

North Byron Parklands Acoustic Assessment for Permanent Approval

Billinudgel Property Pty Ltd

Date of Issue: 20 November 2017

Prepared by:
Air Noise Environment

ABN: 13 081 834 513



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Where site inspections, testing or fieldwork have taken place, the report is based on the information made available by the client or their nominees during the visit, visual observations and any subsequent discussions with regulatory authorities. It is further assumed that normal activities were being undertaken at the site on the day of the site visit(s).

The validity and comprehensiveness of supplied information has not been independently verified and, for the purposes of this report, it is assumed that the information provided to Air Noise Environment Pty Ltd for the purposes of this project is both complete and accurate.

Executive Summary

The North Byron Parklands Cultural Events site (Parklands) has successfully operated a series of nine medium to large events since a temporary approval was granted in 2012. Extensive noise monitoring and management has been completed during these events, and has proven to be highly effective in minimising community noise impacts. Analysis of the community noise outcomes for previous events demonstrates that there has been a significant reduction in noise related calls to the Community Hot Line during medium or large events at Parklands since July 2013. For the most recent event, Splendour in the Grass 2017, there were fewer than 10 noise related calls to the Community Hotline over the four day event.

An application for permanent approval of the existing venue, at the originally requested capacity of 50,000 is being sought. The development of additional site infrastructure and facilities is also proposed, including a conference centre and associated accommodation.

In order to assess the potential implications of the proposed permanent operations, a noise assessment has been completed. The primary risk of community impacts relates to amplified music from live entertainment events at the venue, hence this is the focus of the assessment. Ancillary activities are also considered from a noise and vibration perspective, as appropriate, in accordance with the requirements of the Secretary's Environmental Assessment Requirements for the application.

A review of acoustic criteria suitable for live entertainment events has been completed. This has concluded that adoption of the acoustic criteria included in the trial approval are consistent with the current legislative requirements, and appropriate for the nature of the proposed activity. Based on review of current policy guidelines, appropriate criteria have also been adopted for assessment of the potential noise and vibration impacts associated with fixed plant and construction of new infrastructure and facilities.

Detailed acoustic modelling of the changes to individual stages and venues necessary to accommodate the proposed increase in capacity of the venue has been completed. An initial acoustic model has been prepared and validated against the 2016 Splendour in the Grass event, including comparison to measured community noise levels during the event. The validated model has then been adjusted to account for the proposed changes, and the resultant community noise levels compared to the adopted acoustic criteria. The acoustic modelling has considered the potential for noise impacts under source to receptor wind conditions with all stages at the venue operating simultaneously, hence represents the worst case likely impact of future events. The modelling found that, without additional acoustic mitigation strategies, some non-compliance's are predicted at surrounding receivers under these worst case conditions.

Analysis of historic meteorological data demonstrates that worst case wind conditions may occur during events, hence development of an acoustic mitigation strategy to address the predicted non-compliances is necessary. Analysis of reasonable and feasible mitigation measures to reduce the predicted acoustic non-compliance has been completed. A noise management strategy has been

identified to address the non-compliances, and includes reduction of the operating volume of stages during periods with a potential for worst case meteorological conditions. The proposed reduced operating volumes are consistent with achieving audience satisfaction, although they are lower than the preferred operating levels. Revised modelling indicates that, with the mitigation measures, compliance is predicted at all surrounding receivers during worst case meteorological conditions, apart from 2 receivers which have negotiated noise agreements with Parklands. In addition, further reductions in operating volumes for specific stages can be implemented as required under worst case meteorological conditions in accordance with the procedures identified in the Parklands Noise Management Plan. The success of this approach in achieving compliance with the acoustic criteria has been demonstrated for previous Parklands events.

The assessment of ancillary activities and proposed new facilities has also identified appropriate noise management strategies, and where appropriate mitigation measures are recommended.

Overall, it is concluded that the potential acoustic impacts of the proposed permanent development at Parklands can be managed to achieve the appropriate acoustic criteria, and to minimise adverse community impacts from an acoustic perspective.

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1 Introduction

1.1 Background to the Assessment

North Byron Parklands (Parklands) is a Cultural Events site located at 126 Tweed Valley Way in the Yelgun Valley, within the Byron Shire Council local government area. The site covers an area of approximately 229 hectares. The general site locality is identified on Figure 1.1, the existing site features are identified on Figure 1.2, and an illustrative Master Plan showing the proposed new facilities is presented on Figure 1.3.

Parklands commenced operation as a Cultural Events site in April 2012, following a 3 year development assessment process that culminated in approval of a Concept Plan and Project applications for the new venue. The Concept Plan approval (which provides the land use planning provisions and permissibility for the site) enabled the use of the site for cultural events for a 5 year trial period (up until 2017) capped at 70% of capacity - 35,000 patrons, instead of the 100% capacity (50,000 patrons) sought in the original Concept and Project applications.

The objective of the trial project approval was for Parklands to demonstrate that large outdoor events could be managed consistent with a range of key performance indicators (KPIs) to avoid unacceptable impacts on flora and fauna, residents, event goers and on the general community.

Consistent with the intent of the trial project approval, Parklands has now held a total of nine large and medium events and undertaken detailed performance monitoring and analysis, resulting in ongoing management improvements across each event.

The following modifications have been submitted to and approved in relation to the Concept approval and Project approval.

- On 3 December 2012, Modification 1 was approved for minor typographical amendments to Conditions B4 and E18 of the Project Approval;
- On 29 January 2013, Modification 2 was approved to modify a typographical error in Condition C32 of the Project Approval relating to a miss-description of Yelgun Creek; and
- On 22 April 2016, Modification 3 to the Project Approval was approved, relating to noise management measures, a request for small community events and various administrative amendments;
- On 27 July 2017, a further minor modification was approved. This provided for an extension of the temporary approval for an additional 20 months (4 additional medium and large events) and provided amended conditions relating to ecological receptors.

1.2 Current State Significant Development Application

Parklands is now seeking approval for ongoing use of the cultural events site following the trial period, including the continued use of existing site infrastructure and the development of additional

infrastructure to support the cultural events site.

The proposal involves undertaking outdoor events on the site for up to 20 event days a year, comprising:

- 2 large events per year (ie. Splendour in the Grass and Falls Festival) over a maximum of 5 event days each, catering for up to 35,000 patrons per event day;
- 3 medium event days a year (for other music concerts or cultural events), catering for up to 25,000 patrons per event day;
- 5 small community event days, catering for up to 5,000 patrons per event day; and
- 2 minor community event days, catering for up to 1,500 patrons per event day.

Further, approval is sought for the progressive growth of one of the large events (ie. Splendour in the Grass) to 42,500 patrons and then 50,000 patrons a day, subject to meeting key performance indicators (KPIs) .

The proposal also involves:

- temporary camping associated with outdoor events, with capacity for up to 30,000 campers a day (ie. similar to existing);
- development of a conference centre and associated accommodation (as per the approved concept plan), with capacity for up to 180 attendees and accommodation for up to 120 guests a day;
- continued use of existing site infrastructure and facilities;
- development of additional site infrastructure and facilities, including:
    - an administration building;
    - event area facilities and works, including:
        - amphitheatre regrading works;
        - drainage improvements;
        - potable water infrastructure;
        - sewerage infrastructure and amenities;
        - security fencing;
    - on-site and off-site road and transport facilities and works; and
- continued habitat restoration and vegetation management works.

1.3 Environmental Assessment Requirements

On 16th January 2017 the NSW Office of Environment and Heritage issued Secretary's Environmental Assessment Requirements (SEARs) for preparation of an Environmental Impact Assessment (EIS) for the application for permanent approval of the Cultural Events site at North Byron Parkland. The

SEARs specify the following assessment requirements:

- Noise and Vibration – including:

  – a quantitative noise and vibration impact assessment undertaken by a suitably qualified person in accordance with the relevant Environmental Protection Authority guidelines that is to include:

    - assessment of all noise and vibration sources and impacts, including impacts on nearby sensitive receivers, utilising data obtained from the trial events to date;
    - cumulative impacts of other developments upon noise impacts at sensitive receivers; and details of the proposed noise management and monitoring measures.

Appended to the SEARs are details of submissions made by regulatory agencies in respect of developing SEARs for the proposal. Of these submission, those provided by Tweed Shire Council and Byron Shire Council identify noise management as an area to be addressed:

- Tweed Shire Council:

  Council has previously provided comment on MP09_0028 Mod 3 in relation to acoustic matters. The proponent will need to demonstrate that the proposed development will comply with the provisions of the NSW Industrial Noise Policy. An acoustic management plan will need to be prepared, which addresses all aspects of the proposed development, including low frequency noise and sleep disturbance upon surrounding properties.

- Byron Shire Council:

  Acoustic

  Plan 4.4 (Example Event Layout B) depicts the relocation of the event area to the north eastern corner of the premises. An acoustic assessment report based on past evaluations is unlikely to be helpful to Plan 4.4 (Example Event Layout B). This proposal is a major deviation from the existing site layout and therefore a fresh acoustic assessment is required.

  Any other changes to or expansion of the site layout must be subject to a new acoustic assessment.

1.4 Proposed Changes and Potential Noise Impacts

It is noted that the existing site currently holds two medium to large scale music events each year: Splendour in the Grass (Winter), and Falls Festival (Summer). The application for permanency includes additional activities to those which have thus far been shown to be manageable, including:

- Operation of two additional stages during a large scale event (e.g. Splendour in the Grass).
- Potential to increase the number of patrons.
- Additional on and off-site traffic.
- Addition of a conference centre, which may operate year round, including;
  - Accommodation units,
  - Conference and meeting room facilities,

- Car Parking.

It is noted that one of the proposed stages (Forest Stage) exists currently during the Falls Festival event, however is proposed to be included as part of a larger Splendour in the Grass style event. Details relating to the existing and proposed stages are provided in Section 4.

In order to better review the potential impacts operating under the proposed increase in activity, an acoustic assessment has been completed.

1.5 Scope of the Acoustic Assessment

This report presents the methodology, results and findings of the acoustic assessment completed for the application for Permanent Approval for the Parklands Cultural Venue. The information presented in this report includes analysis of the following:

- acoustic performance of the venue for previous trial events;
- the predicted change in community noise impacts as a result of the proposed development;
- operation of all existing stages (SiTG and Falls Festival) in a single event, as well as a proposed additional/new 'main' stage;
- provision of a new conference centre facility;
- details of the proposed noise management measures; and
- review of vibration impacts associated with previous trial events, and any changes in the potential for vibration impacts expected as a result of the proposed modifications.

This scope addresses the specific requirements of the SEARs and the comments from Tweed Shire Council and Byron Shire Council relating to potential noise and vibration impacts.

An acoustic glossary is provided in Appendix A to assist the reader.

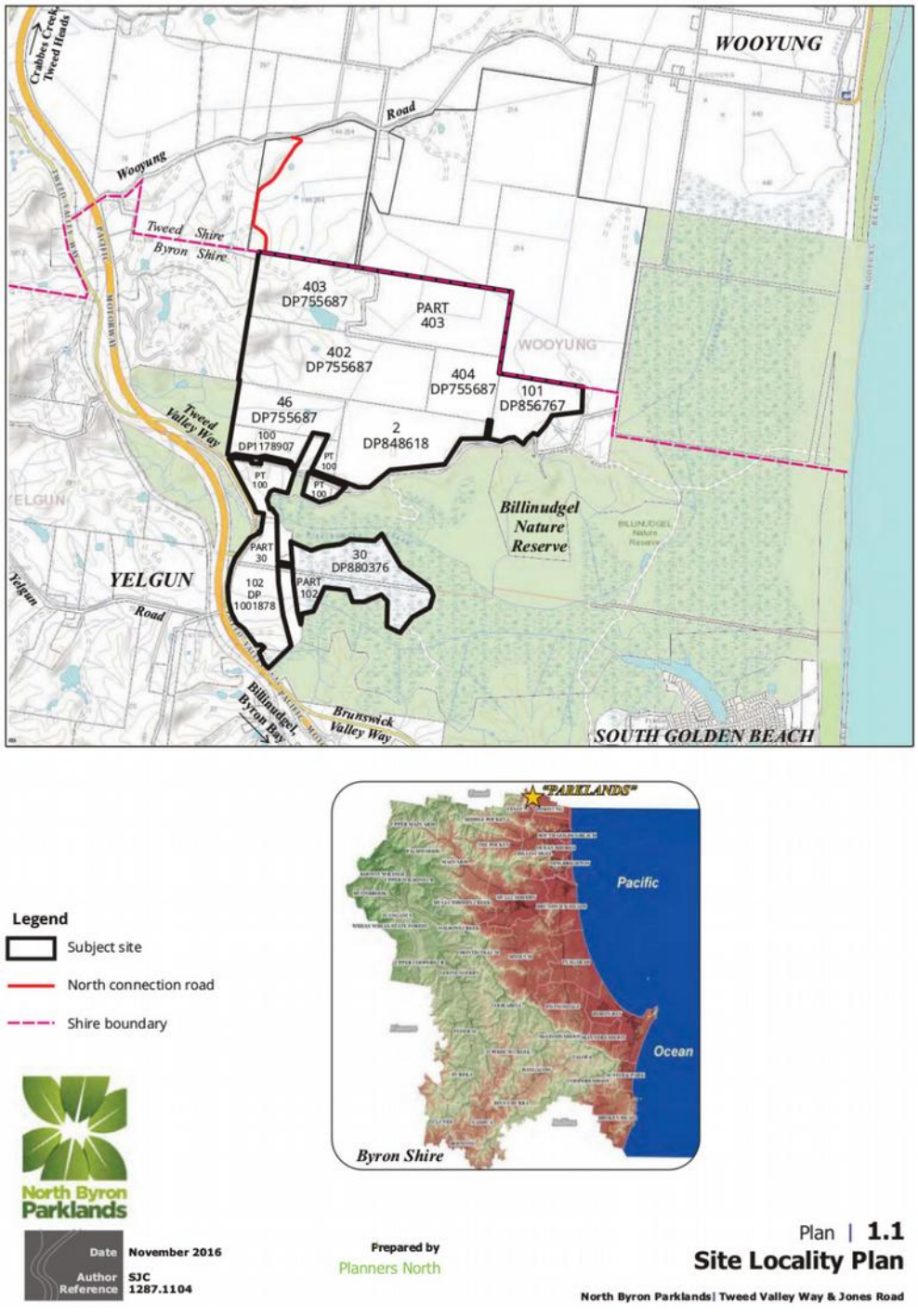


Figure 1.1: General Site Locality - Parklands

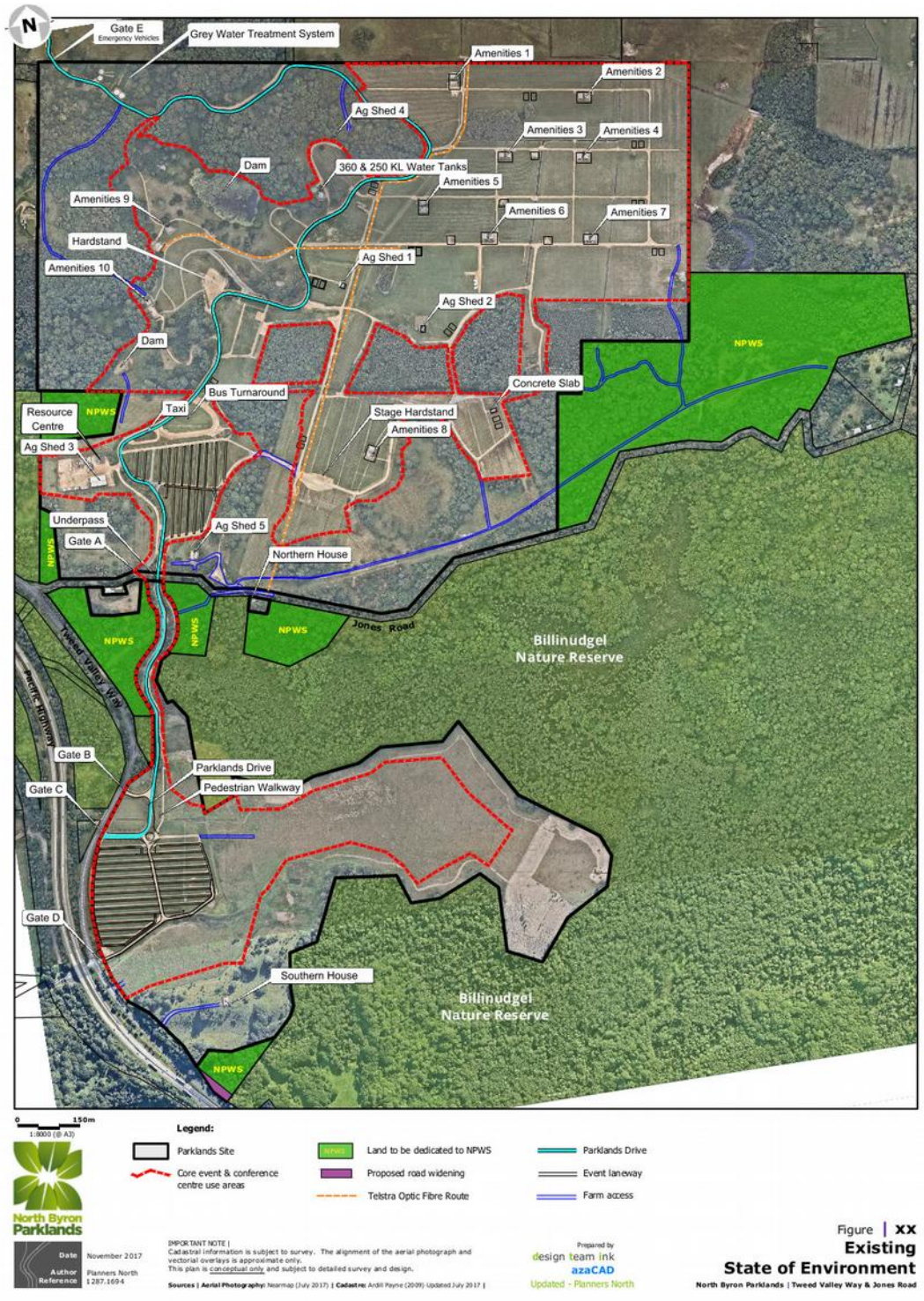


Figure 1.2: Existing Site Features

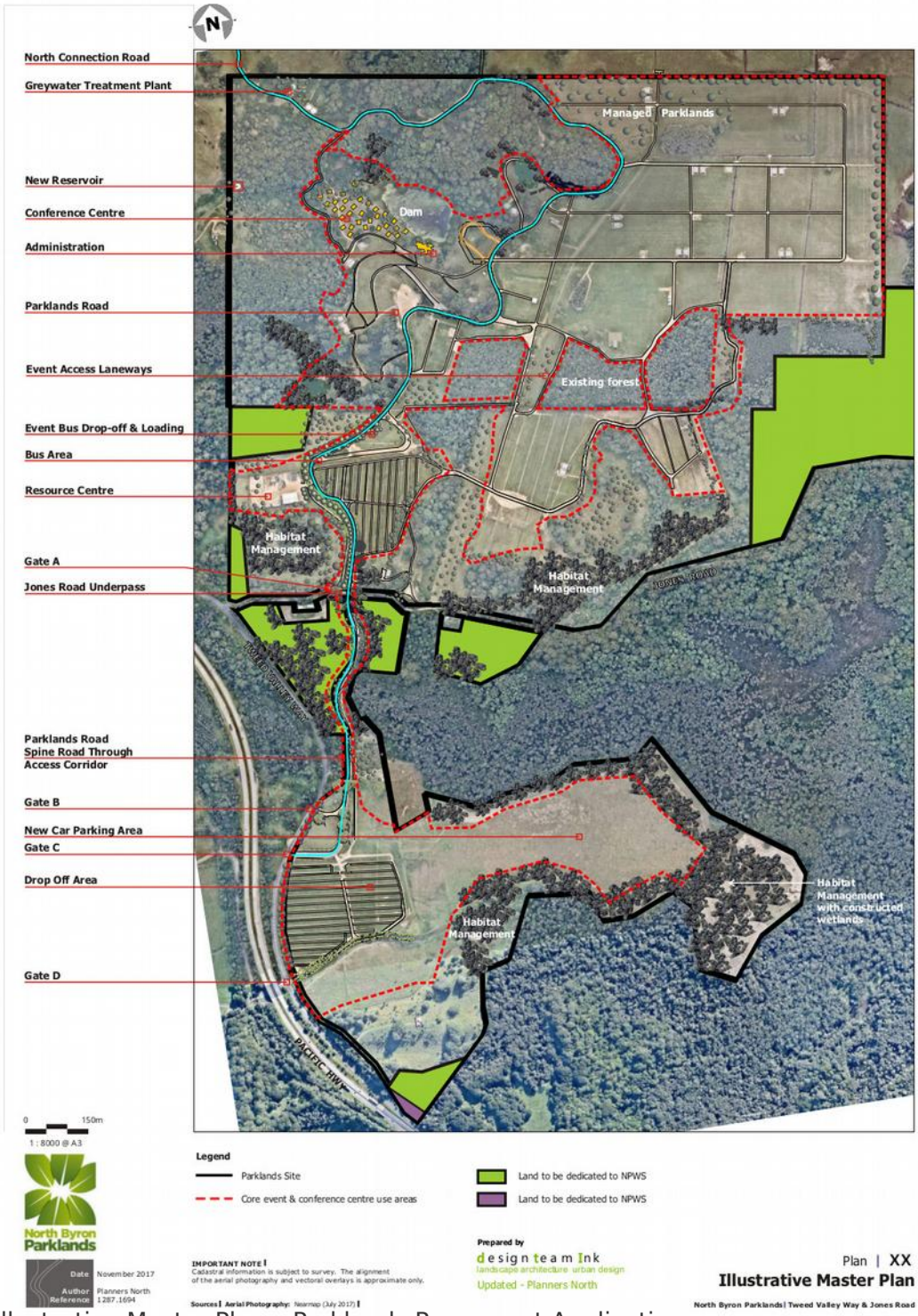


Figure 1.3: Illustrative Master Plan – Parklands Permanent Application

2 Assessment Criteria

2.1 Introduction

The key potential noise impacts associated with the proposed development relate to amplified music, hence this is the main focus of the acoustic assessment report. In addition, the SEARs identify that associated noise and vibration impacts must also be considered for both the construction and operational phases, hence the potential for noise impacts from activities at the proposed conference centre, fixed plant and construction noise and vibration are also considered. The following sections discuss the appropriate criteria for the various noise sources considered in the assessment.

The existing approval for Parklands incorporates acoustic criteria, and these are also discussed in the context of the proposed future development. Analysis of the performance of the event relative to the existing criteria is also relevant, and is considered in Section 3.

2.2 Amplified Music Criteria

2.2.1 NSW Industrial Noise Policy

The Industrial Noise Policy (INP) 2000[1] provides the overall noise framework for the assessment and management of the potential effects of noise on communities throughout NSW. The overall objective of the policy is:

> *'...to allow the need for industrial activity to be balanced with the desire for quiet in the community.'*

The purpose of the policy, then, is not to achieve inaudibility for noise sources in the community, but to provide a basis for making decisions about the appropriateness of noise emissions. The framework in which these decisions are made includes consideration of appropriate criteria, examination of feasible and reasonable mitigation, and consideration of community preferences.

The INP identifies that, as part of the decision making process, where project noise levels are predicted to exceed the identified project specific noise levels, then the regulatory authority may accept the resultant levels or negotiate a better outcome if control is thought to be achievable. In making this determination, consideration is given to the following:

- degree of exceedance of adopted criteria;
- number of people affected;
- likely impacts of the predicted noise levels on the affected community;

1 It is noted that the Industrial Noise Policy 2000 was replaced with the Noise Policy for Industry on 27 October 2017. Under transitional provisions, where SEARs have been prepared for a development application prior to 27 October 2017, the Industrial Noise Policy 2000 applies for a period of up to two years from the introduction of the Noise Policy for Industry. Therefore, for the Parklands development application, the 2000 Industrial Noise Policy provides the relevant guideline for the acoustic assessment.

- percentage of time the impact occurs;
- the economic and social benefits of the proposed development.

In terms of defining criteria, the INP is intended for application to large and complex industrial noise sources. The policy specifically identifies that it is not intended for application to:

- transportation corridors;
- motor sport facilities;
- construction activities;
- noise sources covered by other regulations (eg, domestic/neighbourhood).

The INP also notes that in particular instances, specific noise criteria may be defined for sources where the standard approach is not appropriate. The application of the amenity and intrusiveness criteria defined in the INP is not specifically identified as appropriate for temporary events such as those held at Parklands. Rather, the identification of the policy being inapplicable to motor sport activities and temporary activities such as construction, tends to suggest that the policy criteria are not suitable. For example, motor sport venues are typically restricted as to the number of events that may be held per year, as well as the timing and duration of these events. This is similar to the holding of Large Events at the Parklands venue, with the exception that the proposal for Parklands is to hold events significantly less frequently than would typically be the case for motor sport facilities.

The INP policy identifies that, within the community, there is a large range of human reaction to noise. There are members of the community that are very sensitive, and have an expectation of very low environmental noise levels. More broadly, the policy identifies that the bulk of the community is not affected by low levels of noise, and is prepared to accept levels of noise that are commensurate with living in an urban industrialised society. In this context, the INP criteria were developed on the basis of protection at least 90 % of the population living in the vicinity of industrial noise sources from the adverse effects of noise for at least 90 % of the time. The policy further notes that where the appropriate criteria cannot be met, then it does not automatically follow that the affected members of the community will find the noise unacceptable.

The criteria defined in the INP for industrial noise sources relate to both amenity and intrusiveness. The intrusive criteria are defined in terms of an allowable increment of 5 dB(A) relative to pre-existing rating background noise levels. The amenity criteria are defined on the basis of acceptable noise levels, defined on the basis of existing land use, time of day and type of receiver.

The Industrial Noise Policy and Application Notes identify that consideration must be given to the potential for adverse meteorological conditions to arise at the proposed development site and surrounding area. In particular, the influence of wind speed, direction and temperature inversion conditions can result in enhanced sound propagation from source to receiver.

Due to the potential influence of meteorological conditions, the INP recommends that noise levels from the proposed activity are considered under calm conditions, as well as any significant weather conditions that may result in enhanced sound propagation.

Where appropriate, reference has been made to the INP in the assessment completed for the proposed permanent venue at Parklands.

Where appropriate the acoustic assessments have been completed in accordance with the procedures identified in the NSW Industrial Noise Policy (INP). The policy sets two separate noise criteria to meet environmental noise objectives: one to account for intrusive noise and the other to protect the amenity of particular land uses. The derivation of the two sets of criteria in accordance with the INP are presented below.

2.2.1.1 Intrusiveness Noise Criteria

According to the INP, intrusive noise refers to noise that exceeds background noise levels (as defined by the Rating Background Level) by more than 5 dB. The intrusive noise criteria is summarised as follows:

$L_{Aeq,15minute}$ is less than or equal to rating background level + 5

The intrusiveness criteria for residential areas is summarised in Table 2.2. Intrusiveness criteria does not apply to recreational, commercial and industrial areas.

Assessment against the lowest RBL level has been considered (30 dB(A)).

2.2.1.2 Amenity Noise Criteria

To limit continuing increases in noise levels, the maximum ambient noise level within an area from industrial noise sources should not normally exceed the acceptable noise levels (ANL) specified in Section 2.2 of the INP. The ANL is dependent on the type of area being considered. Table 2.1 presents ANL values for industrial, commercial premises and residential receivers in Rural, Suburban and Urban amenity areas.

Table 2.1: INP Acceptable Noise Levels for Adjacent Receivers

Type of Receiver	Indicative Noise Amenity Area	Time of Day	Recommended L_{Aeq} Noise Level dB(A)	
			Acceptable	Recommended Maximum
Residence	Rural	Day	50	55
		Evening	45	50
		Night	40	45

When the difference between the existing industrial noise levels and ANL is minus 6 dB or higher (i.e. Existing – ANL ≥ minus 6 dB), then the noise level from a new source must be controlled to preserve the amenity of the area. The control of the new source is achieved by applying an amenity criteria derived in accordance with Table 2.2 of the INP. Table 2.2 of the INP specifies adjustments to the existing noise level or ANL to derive an amenity criteria. For example, if existing noise levels are 2 dB or more higher than the ANL, then the maximum L_{Aeq} noise level from a new source must be 10 dB below the existing noise level. Table 2.2 presents the required adjustments for deriving the amenity

criteria.

Table 2.2: Modifications to the ANL for deriving the Amenity Criteria (NSW INP Table 2.2)

Total existing L_{Aeq} noise level from industrial sources dB(A)	Maximum L_{Aeq} noise level for noise from new sources alone dB(A)
≥ Acceptable noise level plus 2	If existing noise level is likely to decrease in future: ANL minus 10 If existing noise level is unlikely to decrease in future: Existing level minus 10
Acceptable noise level plus 1	Acceptable noise level minus 8
Acceptable noise level	Acceptable noise level minus 8
Acceptable noise level minus 1	Acceptable noise level minus 6
Acceptable noise level minus 2	Acceptable noise level minus 4
Acceptable noise level minus 3	Acceptable noise level minus 3
Acceptable noise level minus 4	Acceptable noise level minus 2
Acceptable noise level minus 5	Acceptable noise level minus 2
Acceptable noise level minus 6	Acceptable noise level minus 1
< Acceptable noise level minus 6	Acceptable noise level

The residential area has been identified as rural residential. The calculated amenity criteria is shown in Table 2.3.

Table 2.3: Derived Amenity Criteria for Rural Residential Area

Period	Existing Levels L_{Aeq} dB(A)	Acceptable Noise Level dB(A)	Applicable Amenity Modification	Adopted Criteria dB(A)
Day	30	50	Existing level minus	50
Evening	30	45		45
Night	30	40		40

2.2.1.3 Summary Of INP Noise Criteria

As required by the NSW INP, the lower of the intrusiveness and amenity criteria is to be adopted for an assessment. The relevant criteria for the assessment are summarised in Table 2.4, based on the intrusive criteria which is the most stringent for Parklands due to the low existing background noise levels.

Table 2.4: Assessment Noise Criteria - dB(A)

Period	Residential
Day	35 $L_{Aeq,period}$
Evening	35 $L_{Aeq,period}$
Night	35 $L_{Aeq,period}$

The noise criteria applies at the most-affected point (ie. highest noise level) on or within the residential property boundary. If the actual property boundary is more than 30 metres from the house, then the criteria applies at the most-affected point within 30 m of the house.

2.2.1.4 Sleep Disturbance Criteria

In addition, reference has been made to the following criteria for sleep disturbance:

Sleep Disturbance Criteria ($L_{A1,1\text{-minute}}$ or L_{AMax}) = $L_{A90,15\text{-minute}}$ + 15 dB

The above criteria is referred to in the NSW INP Application Notes[2]. The NSW EPA recognises that this criteria is not ideal however, in the absence of additional research and evidence to replace it, the EPA will to continue to use it as a guide for the likelihood of sleep disturbance. Where the criterion is met, sleep disturbance is not likely, but where it is not met, a more detailed analysis can be undertaken.

Table 2.5 details the calculated sleep criteria.

Table 2.5: Sleep Disturbance Criteria (Residential Only)

Period	RBL dB(A)	Sleep Disturbance Criteria dB(A)
Night	30	45

2.2.2 NSW Independent Liquor & Gaming Authority

For the purposes of operating the conference centre, a Liquor Licence will be sought from the NSW Independent Liquor & Gaming Authority, the responsible agency for enforcing the **Gaming and Liquor Administration Act 2007.**

The Liquor and Gaming Authority imposes specific noise requirements on licensed venues, such as the proposed conference centre. The noise limits require that:

> *The L_{A10}* noise level emitted from the licensed premises shall not exceed the background noise level in any Octave Band Centre Frequency (31.5Hz – 8kHz inclusive) by more than 5dB between 07:00am and 12:00 midnight at the boundary of any affected residence.*
>
> *The L_{A10}* noise level emitted from the licensed premises shall not exceed the background noise level in any Octave Band Centre Frequency (31.5Hz – 8kHz inclusive) between 12:00 midnight and 07:00am at the boundary of any affected residence.*
>
> ** Notwithstanding compliance with the above, the noise from the licensed premises shall not be audible within any habitable room in any residential premises between the hours of 12:00 midnight and 07:00am.*

The liquor licensing requirements are relevant to the proposed conference centre activities, as a permanent liquor licence will be applied for. Temporary licenses are obtained for large events at

2 Application notes – NSW industrial noise policy, http://www.epa.nsw.gov.au/noise/applicnotesindustnoise.htm, Accessed 2 July 2013.

Parklands, and the acoustic requirements for permanent activities do not apply to the temporary licenses.

2.2.3 Noise Guideline for Local Councils

Figure is arbitrary in guideline. Unsure of whether the case study is real or fictitious. SCGT noise limit examples for highly urbanized Sydney are lower than the 75 value.

The NSW Noise Guide for Local Government provides guidance relating from activities that are not specifically the responsibility of the NSW EPA. Table ghts clearly that the Local Council has responsibility for managing noise from hues such as Parklands, except where such premises are specifically listed s in Schedule 1 of the Protection of Environment Operations (POEO) Act. Large s are included in Schedule 1 of the POEO Act, however this currently does not in date the approval has been temporary.

Examples are provided in the Noise Guideline for Local Councils relating to the appropriate management of noise from live open air venues. These include adoption of a 75 dB(A) L_{Aeq} noise limit in Case Study 1 presented in the guide.

2.2.4 Overseas Criteria and Guidelines

The issue of noise from outdoor concerts and festivals is also addressed internationally, and reference to overseas practices is useful in informing approaches that can be adopted in Australia.

The United Kingdom (UK) has developed a specific Noise Code[3] for management of environmental noise at Concerts. The noise limits defined in the Noise Code are presented in Table 2.6. These noise limits are widely adopted for the management of outdoor concerts and festivals in the UK and, for example, have been adopted in outdoor concert Codes of Practice by local Councils eg Bath and North East Somerset Council[4] and City of York Council[5].

Table 2.6: UK Noise Code (1995) $L_{Aeq,15\ min}$ Noise Limits at Sensitive Receivers

Concert Days per Calendar Year	Type of Venue	Noise Limits – 09.00 – 23.00	Noise Limits – 23.00 – 09.00
1 - 3	Urban stadia or arena's	75 dB(A)	Inaudible inside dwelling
1 - 3	Other urban and rural venues	65 dB(A)	
4 - 12	All venues	Background +15 dB(A)	

In the United States, the adopted criteria for large outdoor concerts and festivals varies between States. An example of noise criteria that have recently been applied for a proposed new major music

3 The United Kingdom Noise Council – Code of Practice on Environmental Noise Control at Concerts.

4 Bath and North-East Somerset Council – Code of Practice and Guidance Notes on Noise Control for Concerts and Outdoor Events, 2012.

5 City of York Council - Code of Practice and Guidance Notes on Noise Control for Concerts and Outdoor Events, 2014.

festival are the City of Pasadena Guidelines for Noise[6]. These define a noise limit of 70 dB(A) as acceptable for auditoria, concert halls and amphitheatres, and a higher level of 75 dB(A) for sports arenas and outdoor spectator sports.

Hong Kong is one of the most highly urbanised cities

In Hong Kong, noise limits for outdoor concerts a se Code, as summarised in Table 2.7.

Table 2.7: Hong Kong Typical Noise Limits $L_{Aeq,30\ min}$ Noise Limits at Sensitive Receivers[7]

Type of Receiver Environment	Noise Limits – 09.00 – 23.00	Noise Limits – 23.00 – 09.00
Urban	70 dB(A)	60
Low Density Residential	65 dB(A)	55
Rural	60 dB(A)	50

These examples of overseas criteria for outdoor events are consistent in identifying more stringent limits for residential receptors or venues in more rural areas, and for lower noise limits after 11 pm at night. The most stringent noise criteria of those reviewed (prior to 11 pm at night, and for 4 events or less per year) is 60 dB(A) for rural areas in Hong Kong.

2.2.5 Existing Approved Noise Limits

2.2.5.1 Overview

The existing Parklands approval provides a noise management framework, as well as imposing specific acoustic criteria for large events for sensitive community receptors. The specific requirements of the Modified Approval, and the basis for the adopted criteria, are presented in the following sections.

2.2.5.2 Modified Approval

Noise limits for sensitive receivers in the area surrounding Parklands are provided in Condition B3 of the modified PAC Approval as follows:

- For Zone 1 (as shown in Schedule 4 of this approval)

i. between 11am and midnight amplified entertainment noise from the event at sensitive receivers must not exceed 60dB(A) $L_{Aeq,10\text{-}minutes}$ AND 70dB(lin) $L_{eq,10\text{-}minutes}$ in the 63 hertz 1/1 octave band; and

ii. between midnight and 2am, amplified entertainment noise from the event at sensitive receivers must not exceed 45dB(A) $L_{Aeq,10\text{-}minutes}$ AND 60dB(lin) $L_{eq,10\text{-}minutes}$ in the 63 hertz 1/1 octave band.

- For Zone 2 (as shown in Schedule 4 of this approval

i. between 11am and midnight amplified entertainment noise from the event at sensitive receivers

6 City of Pasadena, Guidelines for Noise Compatibility Land Use, 2002.

7 Control of Noise from Public Entertainment Activities in Hong Kong, Kwin Ting Kwok and Kin Wui Cheng, Internoise 2014.

must not exceed 55dB(A) $L_{Aeq,10\text{-}minutes}$ AND 65dB(lin) $L_{eq,10\text{-}minutes}$ in the 63 hertz 1/1 octave band; and

ii. between midnight and 2am, amplified entertainment noise from the event at sensitive receivers must not exceed 45dB(A) $L_{Aeq,10\text{-}minutes}$ AND 55dB(lin) $L_{eq,10\text{-}minutes}$ in the 63 hertz 1/1 octave band.

In accordance with Condition C40 of the PAC approval, noise levels in the camping area between midnight and 8:00 am of each event day shall support peaceful rest for overnight patrons during events.

2.2.6 Parklands Noise Management Plan (NMP)

2.2.6.1 Overview

In accordance with the Modified Approval, Parklands has developed a Noise Management Plan (NMP) for large events held at the venue. The Noise Management Plan has been approved by the NSW Department of Planning and Environment, and is updated on an as-needs basis in response to improvements in the noise management practices adopted for the venue. The current NMP, updated on 29 June 2017, incorporates the following noise management procedures and processes.

2.2.6.2 Design Measures

The following design measures are adopted in the current Parklands NMP:

- where possible, public address speakers, event stages and speakers shall generally be directed away from sensitive receivers;
- where possible, speaker directivity shall be considered during design and selection of arrays to minimise spillage of noise beyond venue area;
- where possible, amplified noise is to be directed away from the Billinudgel Nature Reserve;
- where speakers are mounted on poles or otherwise elevated above ground, they are generally to be inclined downwards from the horizontal or otherwise designed to reduce noise spillage to the surrounding environment;
- event stages and speakers shall be positioned to utilise any noise attenuation to sensitive receivers provided by the natural topography of the site and surrounding area;
- use fixed or portable barriers (e.g. shipping containers, hay bales) to construct acoustic barriers where necessary to limit noise emissions from event activities (e.g. behind stages);
- if available, use double tent wall sheets to contain noise emissions;
- where space and logistics allow, place trucks between and trailers behind stages to act as an acoustic barrier;
- work with stage and production staff to install optimised sub-arrays and optimised speaker arrays;
- if suitable, employ delay tower speaker systems;

- undertake an audit of all on-site mitigation measures by a suitably qualified acoustic engineer.

Details of specific acoustic management techniques incorporated to reduce noise emissions from events (including speaker directivity and setup, stage placement acoustic barriers) are to be provided in the event acoustic monitoring program for each individual event.

Prior to commencement of the event, the implementation of on-site noise management measures outlined in the event's AMP are audited and signed off by an accredited acoustic consultant. Any further modifications to the noise attenuation measures are identified by the noise consultants prior to the event are to be implemented subject to consultation with event organisers as necessary to ensure that the implications for the security and safety (of event staff, performers and patrons), emergency personnel access, fire and traffic have been effectively considered.

2.2.6.3 Operational Controls

In addition to implementation of design controls, the NMP incorporates provision of a Noise Control Co-ordination Centre (NCCC) at the Parklands venue office. The objectives of the NCCC are to provide:

- continuous monitoring of live noise levels from the main stages to allow pro-active management of noise levels and provision of rapid communication to Parkland Management and Event Managers where noise level adjustments were considered appropriate; and
- a closer interaction with Parklands Management and Event Managers and the personnel responding to calls made to the Community Hotline.

The following acoustic resources are provided at the NCCC:

- live noise feed (instantaneous noise levels) from sound level meters installed at the main stages;
- 1 minute L_{Aeq} noise feed from a separate 10EaZy monitoring system installed by the production team for the main stages;
- access to the log of community hotline calls requesting noise monitoring, as well as other event related data; and
- web access to Bureau of Meteorology monitoring data.

Throughout the event, stage noise levels are reviewed to confirm that the measured noise levels are within the pre-agreed target noise levels for the event. Where the Acoustic Manager identifies that noise levels are approaching, or exceeding target noise levels based on the observed instantaneous noise levels, the event production team are notified and, if considered necessary, the Acoustic Manager requests a specific reduction in noise levels.

In determining whether a request to reduce stage noise levels is appropriate, the Acoustic Manager considers the following key factors:

- noise levels currently occurring from each of the stages, particularly whether noise levels from an individual stage or more than one stage are approaching pre-agreed target noise limits;
- prevailing weather conditions, and whether the current wind direction has potential to propagate

noise toward key groups of receptors;

- measured community noise levels, as reported by noise monitoring personnel;
- type of performance occurring on each stage, and the expected duration of each performance; and
- information provided by the Community Hotline relating to calls received from the community.

2.2.6.4 Responding To Adverse Meteorology

Under specific adverse meteorological conditions, the NMP acknowledges that enhanced propagation of noise from the venue may arise. To address this issue, live weather data is monitored at the NCCC. When changes in meteorological conditions arise that have the potential to adversely affect sound propagation, the event production team are notified.

In addition, at the commencement of each day of the event the weather forecast for the day is reviewed by the Acoustic Manager, and the production team and acoustic monitoring personnel briefed in relation to:

- expected weather conditions for the day, for morning, evening and night;
- the receptor groups most likely to be affected for each period, hence the locations to be the focus of attended compliance monitoring;
- any potentially adverse conditions that are expected to result in enhanced sound propagation;
- recommended changes in stage sound levels that are expected to be applicable where adverse meteorological conditions are anticipated.

2.2.7 Event Specific Acoustic Monitoring Programme

Condition C17 of the Planning Assessment Commission (PAC) modified approval[8] requires that an Acoustic Monitoring Programme is developed for each large event at Parklands. Specifically, Condition 17 requires:

> '***C17 Acoustic Monitoring Program***
>
> *Prior to the commencement of any event where amplified noise is a feature, a qualified acoustic consultant must prepare and implement an Acoustic Monitoring Program (AMP) to monitor and assess the impact of noise generated by the event on the amenity of the area. The AMP must be prepared in consultation with the RWG and be consistent with the provisions and limits within the NMP and required under Condition B3, consistent with Condition C16 and consistent with the proponent's Environmental Health and Safety Management Manual (Standard 008). The AMP shall include, but not be limited to:*
>
> *(a) locations (identified on a map) at which monitoring will be undertaken. As a minimum monitoring locations must include the most sensitive noise receivers (where no noise agreement is in place between the proponent and the receiver) and the adjoining nature*

8 Planning and Assessment Commission Modification of Minister's Approval reference MP09_0028 MOD 3 dated 22 April 2016

reserve as identified in the Noise Management Plan;

(b) procedures and protocols in accordance with OEH's Noise Guide for Local Government 2010 and Australian Standard AS1055 Acoustics - Description of measurement of environmental noise (or any subsequent versions thereof);

(c) a program for periodic attended and unattended monitoring of noise at each of the set monitoring locations, including:

(1) Unattended monitoring must be undertaken at a minimum of eight monitoring locations (to be determined in consultation with the RWG) before, during and after each event;

(2) Attended monitoring must occur on at least one (1) occasion prior to the commencement (including during sound check) and during the operation of each event; and,

(d) procedures for the reporting of monitoring results to enable an assessment of the noise performance of the event.

The AMP must be submitted for the approval of the Secretary at least 60 days prior to the commencement of the event.'

Condition 16(d) requires that acoustic design measures are implemented for events at Parklands as follows:

(d) identification and implementation of best practice management techniques for the minimisation of noise from the site. For example, appropriate siting and orientation of performance stages and speakers, acoustic barriers, insulation/double glazing of sensitive receivers, etc.;

An event specific AMP has been developed and implemented for each of the nine large live music events held at Parklands to date.

2.2.8 Background to Existing Approval Criteria

In formulating the appropriate noise criteria to adopt for the Modified Approval for Parklands, consideration was given to the range of criteria currently adopted for music entertainment events in Australia. These are summarised in Table 2.8.

Table 2.8: Summary of Noise Limits for Australian Entertainment venues

State Instrument/Guideline	Noise Limit
New South Wales: Noise Guide for Local Government	65 dB(A) $L_{AMax,15\text{-}minute}$ for non-suburban areas, and 75 dB(A) $L_{Amax,\ 15\text{-}minute}$ for suburban (traffic affected) areas recommended for control of concert noise impacts
Australian Capital Territory: Outdoor Concert Noise Environment Protection Policy 2001	Minimum criteria L_{A10} 50 dB(A) with an upper limit of $L_{A10,15\ mintues}$ 65dB(A). Concerts required to finish by 11pm.
Western Australia: Guidelines for concerts, events and organised gatherings	To comply with E…lations 1997, Guideline …sk is suitable, measur…
Queensland: Environmental Protection Act 1994, Section 440X	An occupier of p…use of, the premises for … (a) before 7a.m, … (b) from 7a.m. …f more than 70dB(A); or (c) from 10p.m. to midnight, if the use causes noise of more than the lesser of the following— (i) 50dB(A); (ii) 10dB(A) above the background level. Section 73 (2) of the Environmental Protection Regulation 2008 notes that source noise for open-air events may be measured as $L_{Aeq,T}$.

These limits are not specified as a fundamental requirement in the guideline. They appear to be taken from examples of existing noise limits for concerts in highly urbanized areas such as SCGT

Review of the criteria adopted presented in Table 2.8 confirms that noise limits derived from background noise levels are not applied. Noise limits derived from existing background levels are typically applied for permanent noise sources in order to control the audibility of the noise for nearby noise sensitive receptors (e.g. permanent music venues such as pubs and clubs).

On this basis, the application for the Modified Approval identified that outdoor music events at Parklands are occasional events which a…value to the broader community, and there is an expectation that the music w…defined event. The event is defined in terms of the start and finish hours and nu…r on which it may occur. This has been recognised by state authorities and resu…se limits in a number of states which provide set noise limits for outdoor entertainment events and concerts as summarised in Table 2.8.

Yes they are. Refer to Figure 3.2 Summary Prevention Notice No.1 third row

Given that events at Parklands are typically held over multiple days with entertainment noise extended until 12 am for main stages and 2 am for bars, numeric noise limits consistent with those adopted elsewhere in Australia and overseas were recommended for the Parklands Modified Approval. In addition, an innovative criteria designed to improve the management of low frequency bass noise from the music events was recommended. This defined a noise limit for the 63 Hz noise band. Analysis of the frequency spectra from a range of music genres and previous events at Parklands identified the 63 Hz band as a suitable octave band to represent the maximum low frequency content from low frequency (< 250 Hz) amplified music.

The subsequent Modified Approval granted by Planning NSW included specific numeric noise limits

Note: NGLG examples treat each day of an event as a concert. i.e. 3 consecutive days = 3 concert events

for L_{Aeq} and 63 Hz amplified music. The approval was consistent with the approach adopted elsewhere in Australia, and overseas, in that a 'background plus' type criteria as recommended in the INP for permanent noise sources was not imposed. Rather, the duration and nature of the event was considered, and noise limits consistent with other similar events were adopted for the venue. The adopted noise limits were presented earlier in Section 2.2.5 of this report.

2.3 Fixed Plant Noise

For the purposes of assessing fixed plant noise, the Intrusive Noise Criteria as defined in the Industrial Noise Policy (2000) has been adopted. Intrusive noise refers to noise that exceeds background noise levels (as defined by the Rating Background Level) by more than 5 dB. The intrusive noise criteria is summarised as follows:

$L_{Aeq,15minute}$ is less than or equal to rating background level + 5

2.4 Construction Noise and Vibration

2.4.1 Interim Construction Guideline

The NSW Interim Construction Noise Guideline identifies approaches to dealing with the impacts of construction noise on sensitive land uses.

The guideline provides assessment approaches, and defines appropriate criteria for different project durations. In particular, the guideline takes account of the fact that construction noise has only temporary impacts. The criteria recommended in the guideline for construction projects of more than 3 weeks, are background plus 10 dB(A) and a an upper threshold of 75 dB(A) from 7 am – 6 pm Monday to Friday and 8 am – 1 pm Saturdays. For work outside the standard hours, the criteria of background plus 5 dB(A) is adopted.

For the Permanent application, these criteria would be relevant where construction works occur for 3 weeks or more. Examples may include construction of the conference centre and other permanent facilities.

2.4.2 Assessing Vibration – A Technical Guide

The NSW Guideline Assessing Vibration – A Technical Guide provides methods and criteria for assessing the effects on amenity of vibration emissions from industry, transportation and machinery. The guideline is particularly relevant to projects where construction work is to be completed.

In the case of the Parklands application, the potential for vibration impacts is largely limited to construction works associated with the proposed new infrastructure and facilities such as the conference centre. Figure 1.3 identifies the location of the proposed facilities in the context of the surrounding landuses. Given the significant separation distance between the proposed development and the surrounding landuses, the likelihood of off-site vibration impacts during any associated construction works is considered to be negligible.

In relation to the operational phase of the Parklands venue, the only aspect identified as having potential for causing vibration is the use of large vehicles for deliveries. As all such deliveries will be made using licensed vehicles on public roads, the risk of vibration impacts from this activity is also considered negligible.

On this basis, assessment of vibration impacts in accordance with the NSW Technical Guideline is not necessary for this application.

2.5 Summary of Criteria Adopted for Assessment

There are a range of noise sources associated with operation of a venue such as Parklands. The primary risk of noise impacts, is amplified music associated with Large Events.

Based on consideration of the range of criteria adopted currently in Australia and overseas for live entertainment events, it is neither relevant nor feasible for temporary events of the type held at Parklands to comply with a background plus 5 dB(A) criteria of the type defined in the Industrial Noise Policy for a permanent, continuous industrial operation. This issue was considered in detail for the modified approval application, and Planning NSW determined that it was appropriate to adopt criteria more suited to a temporary operation. This is the approach adopted for other temporary works in NSW (such as other amplified music concerts and festivals, motor sport facilities, construction works and temporary activities).

Adoption of project specific criteria for a large event is also consistent with approaches in other Australian States and overseas. On this basis, the noise criteria approved by Planning NSW for the Modified Approval for amplified music from large live events are adopted for the assessment of live entertainment music for large events. These are as follows:

- *For Zone 1 (as shown in Schedule 4 of the approval and Figure 4.2):*

(i) between 11 am and midnight amplified entertainment noise from the event at sensitive receivers must not exceed 60 dB(A) $L_{Aeq,10\text{-}minutes}$ AND 70 dB(lin) $L_{eq,10\text{-}minutes}$ in the 63 hertz 1/1 octave band; and

(ii) between midnight and 2 am, amplified entertainment noise from the event at sensitive receivers must not exceed 45 dB(A) $L_{Aeq,10\text{-}minutes}$ AND 60 dB(lin) $L_{eq,10\text{-}minutes}$ in the 63 hertz 1/1 octave band.

- *For Zone 2 (as shown in Schedule 4 of the approval and Figure 4.2):*

(i) between 11 am and midnight amplified entertainment noise from the event at sensitive receivers must not exceed 55 dB(A) $L_{Aeq,10\text{-}minutes}$ AND 65 dB(lin) $L_{eq,10\text{-}minutes}$ in the 63 hertz 1/1 octave band; and

(ii) between midnight and 2 am, amplified entertainment noise from the event at sensitive receivers must not exceed 45 dB(A) $L_{Aeq,10\text{-}minutes}$ AND 55 dB(lin) $L_{eq,10\text{-}minutes}$ in the 63 hertz 1/1 octave band.

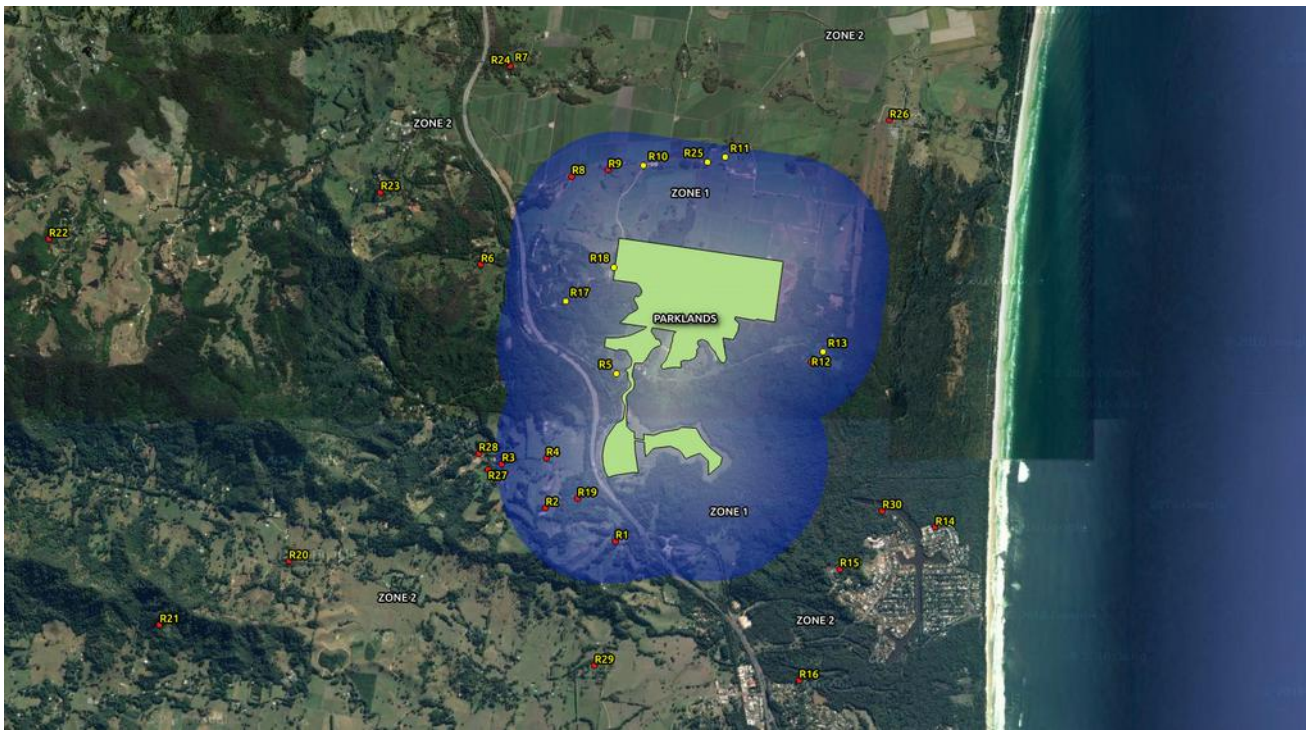


Figure 2.1: Compliance Criteria Zones

For ancillary activities associated with the new use, Table 2.9 summarises the adopted criteria.

Table 2.9: Adopted Criteria – Other Sources

Source/Activity	Adopted Limits	Source of Criteria
Fixed Plant Noise – Conference Centre, Temporary Lighting Towers/Generators	Background plus 5 dB(A)	Industrial Noise Policy
Conference Centre Activities, including amplified music, vehicles, and patrons	Background plus 5 dB(A)	Industrial Noise Policy & NSW Independent Liquor & Gaming Authority
	Inaudibility (12 midnight – 7am)	NSW Independent Liquor & Gaming Authority
Construction Noise	Daytime (7 am – 6 pm weekdays and 8 am – 1 pm Saturdays): Background plus 10 dB(A) Background plus 5 dB outside daytime hours Maximum limit of 75 dB(A) at all times	Interim Construction Noise Guideline

3 Past Performance

3.1 Previous Events

Previous medium and large events, as defined in the approval for Parklands, are shown in Table 3.1 along with the date of the events (including lead in days with minor activity and rehearsals) and the approximate number of patrons.

Table 3.1 - Previous Medium and Large Events

Event	Dates[a]	Patrons
Splendour in the Grass	25/07/2013 – 28/07/2013	25,000
	24/07/2014 – 27/07/2014	27,500
	23/07/2015 – 26/07/2015	30,000
	21/07/2016 – 24/07/2016	32,500
	20/07/2017 – 23/07/2017	32,500
Falls Festival	31/12/2013 – 03/01/2014	15,000
	30/12/2014 – 02/01/2015	17,500
	30/12/2015 – 02/01/2016	20,000
	30/12/2016 – 02/01/2017	22,500
[a] Include lead in days when campers arrive, installations are finalised and rehearsal and sound checks completed.		

For each of these events, information relating to community calls to the Parklands Hotline and acoustic monitoring data is available. The following sections present analysis of the data relating to previous events, to provide an indication of the effectiveness of noise management over time for medium and large events held at Parklands.

3.2 Calls to the Community Hotline

3.2.1 Introduction

Parklands maintains a Community Hotline throughout each Large and Medium Event held at the venue, to provide a means of responding to information and concerns raised by the local community and event patrons. Details of each call are documented by Parklands, including those where concerns about noise emissions from the venue occur.

Analysis of the number of noise related calls to the Community Hotline, and the location of the callers, allows consideration of:

- the number of calls per event;
- the location of the callers; and

- correlation of the frequency of calls per event with the prevailing weather conditions.

These analyses are presented in the following sections.

3.2.2 Number of Calls per Event

Based on analysis of all noise related calls to the Parklands Community Hotline, Figure 3.1 presents the total number of calls received for all events since commencement of the Trial Approval in 2013. The data demonstrates that the Splendour in the Grass (SITG) events have, historically, resulted in a higher number of noise related calls than Falls Festival. There are a number of reasons for this, including:

- SITG events are held during the winter period (usually mid to late July). During the winter months, background noise levels are typically lower than the summer months when insect and from noise at night can significantly increase background noise levels. As a result, increases in noise levels are likely to be more apparent above the lower background noise levels;
- SITG events have historically had a greater number of event stages than the Falls Festival events, and oriented in more directions, resulting in greater potential for off-site noise;
- Falls events are held over the New Year period, when public holidays occur. As this is a traditional period of celebration, noise associated with parties and other entertainment may also be present in the community, and it is possible that there is a greater tolerance of increases in audible noise during the period for these reasons.
- Different weather patterns during the summer (Falls) and winter (SITG) is likely to be a significant factor, and this is considered in more detail in Section 3.4.

In terms of the pattern of calls on a year by year basis, Figure 3.2 presents a breakdown of the number of calls by year and by year and event. This indicated that calls to Community Hotline were highest for the events held in 2014, and have reduced on a yearly basis since then. The same pattern is identified for SITG. In the case of Falls, Community Hotline calls were highest in 2014 and since then have remained low, and at relatively constant numbers.

Overall, the pattern of calls to the Community Hotline suggests an improvement over time, and this is consistent with the adoption of improved noise management measures since the initial events were held. The approaches adopted for each event are discussed in Section 2.2.6. Prevailing weather conditions at the time of each event may also be a significant factor, and this is discussed in Section 2.2.6.4. Equally, there are a range of other factors that may be relevant. These may include community attitudes to the event.

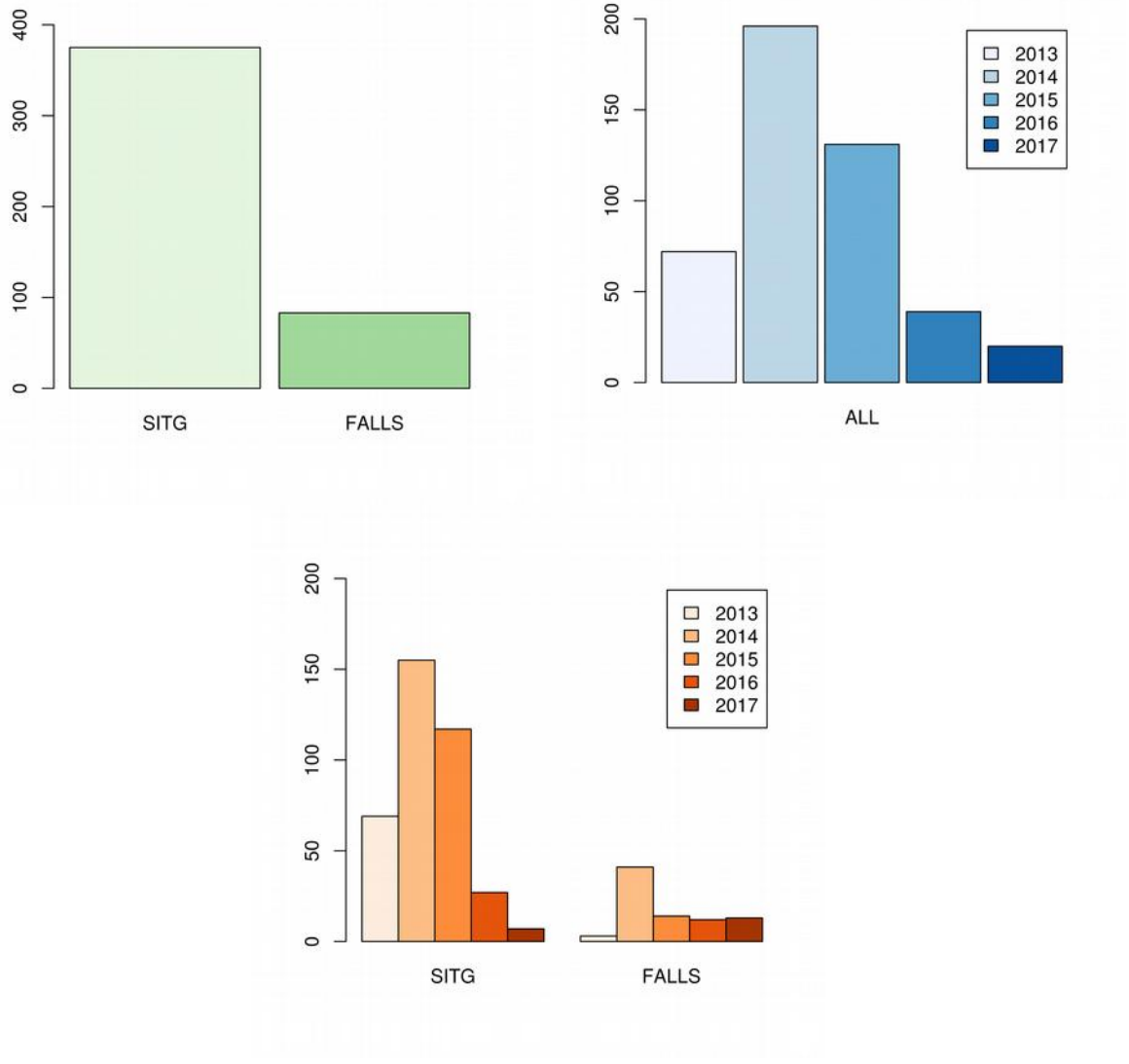


Figure 3.1 - Total Number of Noise Related Calls to the Community Hotline, All Medium and Large Events, 2013 to 2017

Indicates that residents are tired of banging their heads against the wall with respect to DILGP

3.3 Spatial Analysis

Analysis of the location of the noise related callers to the Community Hotline throughout previous events has been completed, to determine the spatial distribution of these callers. This analysis is presented in Figure 3.2. As would be expected, the largest number of calls have arisen historically from the more populated areas. South Golden Beach is the suburb with the greatest number of calls across all events, at 148. A further 34 calls arose from the adjoining suburb, North Ocean Shores. The next most significant suburbs for noise related calls are South Ocean Shores (55) and Yelgun (43). The spatial pattern for the remainder indicates that the calls are relatively widely distributed in the broader community.

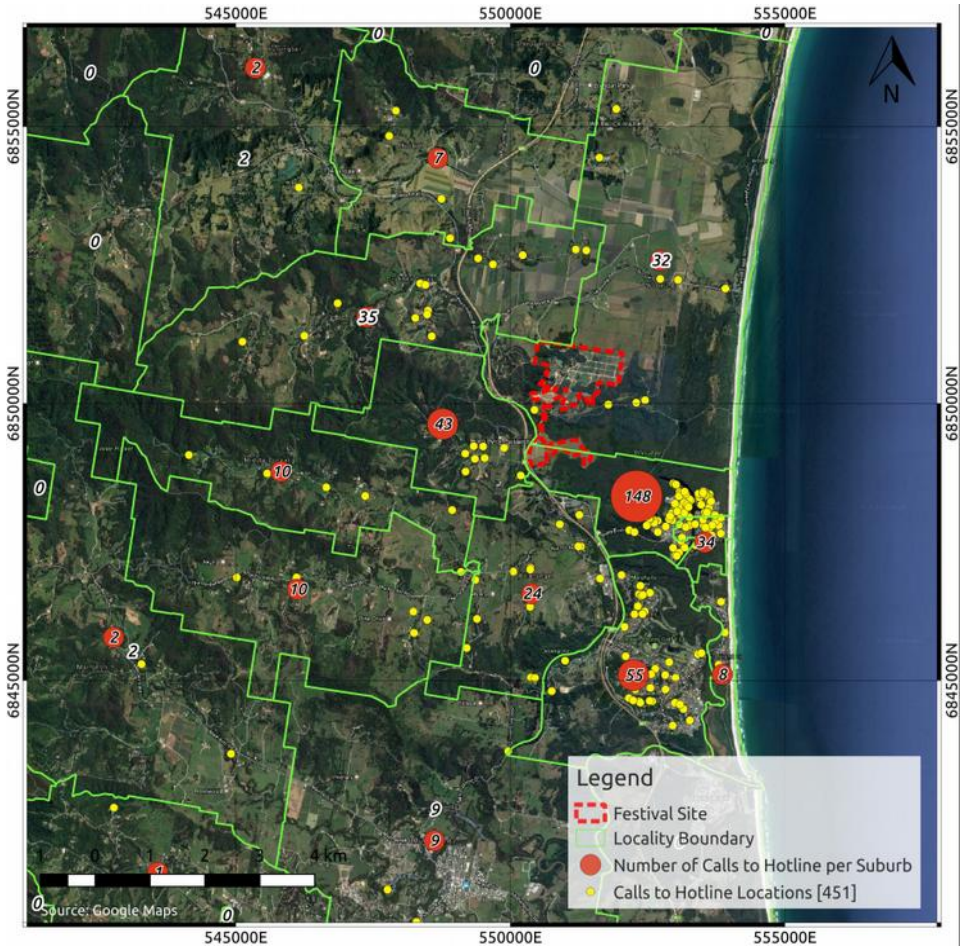


Figure 3.2 - Total Number of Noise Related Calls to the Community Hotline, By Suburb 2013 to 2017

3.4 Correlation with Meteorology

Meteorological conditions are a significant factor that influences both the direction of propagation of sound, as well as the degree of attenuation of sound that may occur with distance. Topography can also play a significant role, as this can result in localised changes in wind patterns within the broader pattern of meteorology observed in a region, and may shield a receptor from a noise source. Wind direction is described in terms of the direction from which the wind arises. Therefore, a northerly wind has the potential to propagate winds to the south of the venue. The nearest Bureau of Meteorology (BoM) station to the Parklands venue is located at Byron Bay. This station produces high quality data and weather measurements are completed at a height of 10 m above ground as is standard for BoM measurement stations. There is also a meteorological station located at Crabbes Creek, owned by Parklands and maintained by the Manly Hydraulics Laboratory. The location of these weather monitoring stations relative to Parklands is shown on Figure 3.3.

The BoM station at Byron Bay is located some 21 km to the South of the Parklands venue. While monitoring data from this station is likely to be representative of the broader regional patterns, wind speeds in particular are likely to be higher than experienced at Parklands as the BoM station is located close to the coast (100 m). The monitoring data for the Crabbes Creek monitoring station, which is positioned just to the north of the northern boundary of Parklands, is likely to be more representative of the venue.

Figure 3.3 - Location of Meteorological Monitoring Stations

For the Parklands venue, the most populated areas (Ocean Shores, New Brighton and South Golden Beach) are located to the south-east and south-south-east, hence winds from the north-west and

north-north-west would be the most likely to result in audible noise from the venue. Figures 3.4 and 3.5 present the pattern of wind speed and direction typically experienced in the local area during the summer and winter, in the form of wind roses. The bars on the wind rose represent the direction from which the wind has arisen, with the segments or width of the bars showing the % wind speed in that direction. The summer wind roses represent the wind patterns most likely to arise during Falls Festival, and similarly the winter wind roses represent the patterns most likely to occur during Splendour in the Grass.

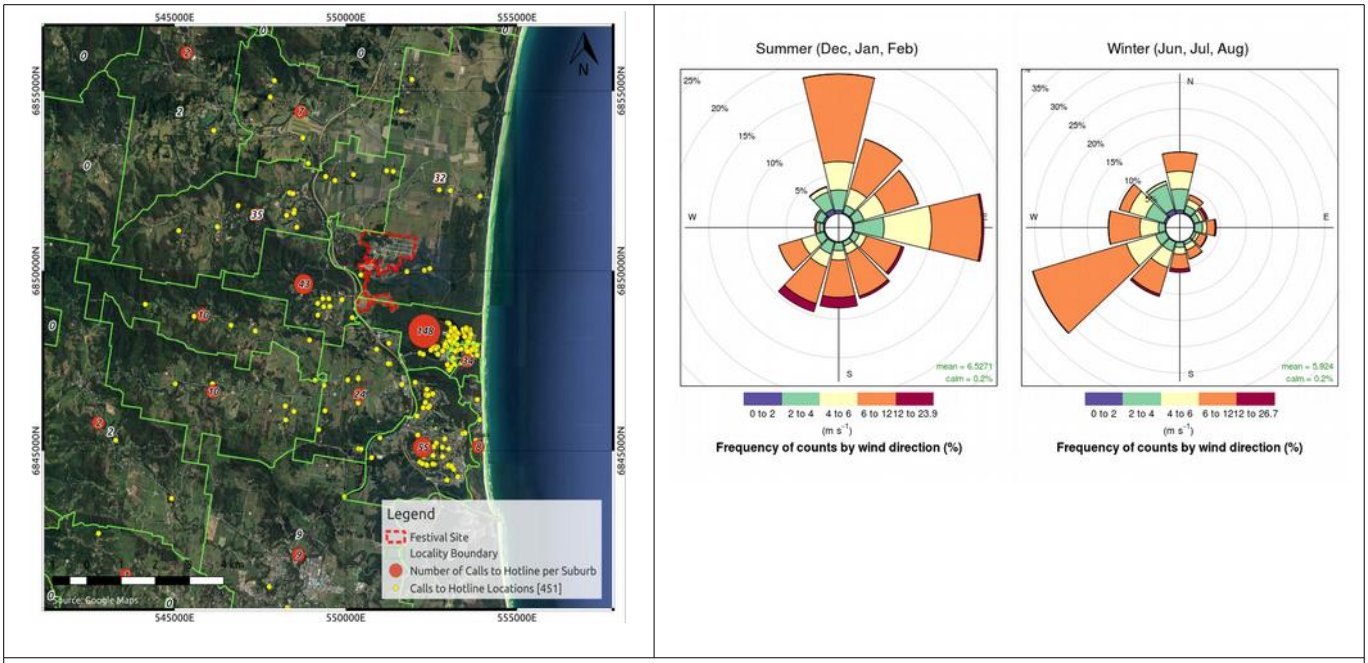


Figure 3.4 - Summer and Winter Wind Roses: Byron Bay

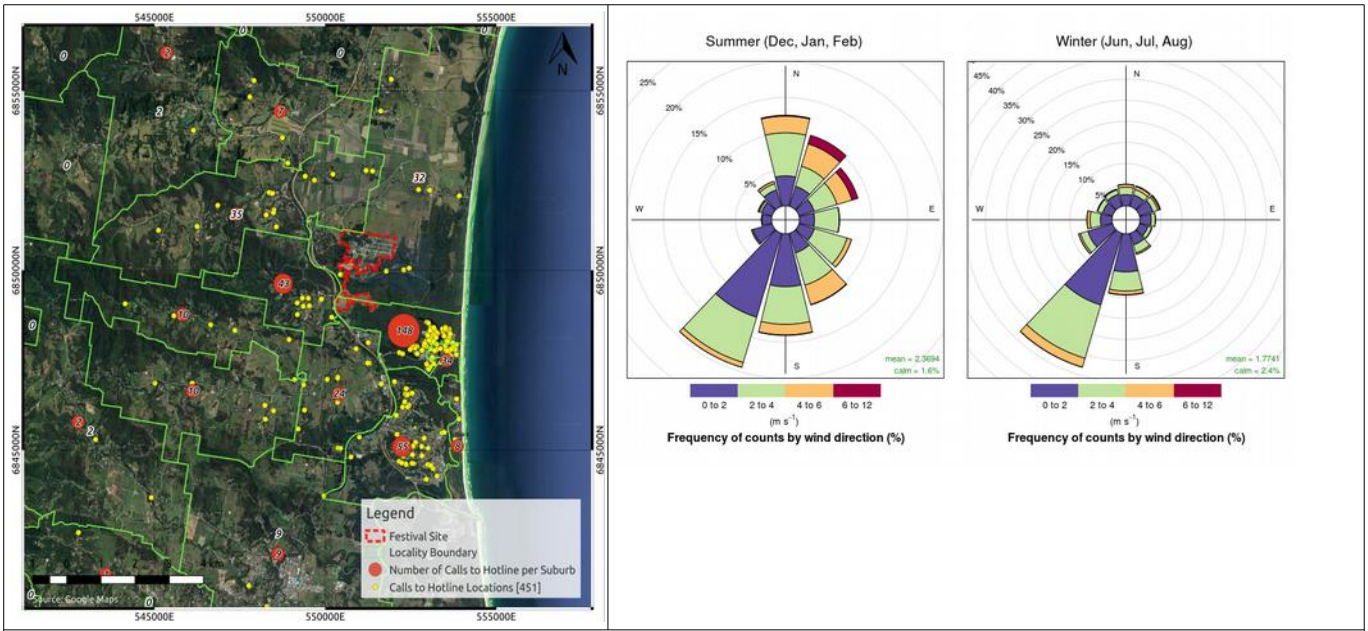


Figure 3.5 - Summer and Winter Wind Roses: Crabbes Creek

Analysis of the wind roses indicates some consistency between the winter wind directions for the Byron Bay and Crabbes Creek stations. The Crabbes Creek wind rose indicates that the most frequently occurring wind direction (commonly termed the 'prevailing' wind) is from the south-south-west. The wind direction patterns for the summer period are very different between the two weather stations. The Byron Bay station indicates prevailing northerlies (approximately 18 %) and Easterlies (approximately 17 %); the Crabbes Creek data indicates prevailing west-south-westerlies at a frequency of approximately 27 % of the time.

To further examine the relationship between the prevailing wind directions and the pattern of calls to the Community Hotline for past events, the wind direction recorded at the time of calls occurring has been analysed for each wind dataset. Figures 3.6 and 3.7 present plots that shows the correlation of the number of complaints and the wind direction that was occurring at the time of the complaint. The figures also show the map of complaints by suburb, and the wind rose for the relevant meteorological station.

Based on review of these plots, the following conclusions can be drawn:

Byron Bay meteorology:

- Falls Festival: for Falls, the pattern of calls is strongly directional. The majority of calls arise under northerly and north-north easterly winds, which is consistent with the prevailing winds during the summer. The next most frequent wind direction is south-south-east, and there is a small group of calls that arise under a direct Easterly wind. Generally the calls occur under moderate wind speeds greater than 5 m/s.
- SITG: for SITG the pattern of calls is very varied, however the most frequent wind directions

under which calls arise is the west-north-westerly sector and the north-north-easterly sector. The calls occur under a wide range of wind speeds.

Crabbes Creek meteorology:

- Falls Festival: for Falls, as with the Byron Bay dataset, the pattern of calls is strongly directional. The majority of calls arise under northerly and north-easterly winds winds, which is not consistent with the prevailing winds south-south-easterly winds during summer. The next most frequent wind direction is south-south-east, and there is a small group of calls that arise under a direct Easterly wind. Generally the calls occur under lighter wind speeds than are evident from the Byron Bay dataset, with all calls occurring at wind speeds of less than 5 m/s.
- SITG: as with the Byron Bay dataset, for SITG the pattern of calls is very varied. The most frequent wind directions under which calls arise is the northerly sector and the southerly sector, under very light wind conditions.

Overall, there is a greater degree of correlation with the wind directions from both meteorological stations for the Falls Festival dataset than SITG, and neither dataset provides a clear correlation with both events. For Falls, noise related calls are more likely to occur under northerly and south-easterly winds. For SITG, there is a very diverse pattern, however the frequency of calls is highest when winds arise from the north-westerly and northern sectors.

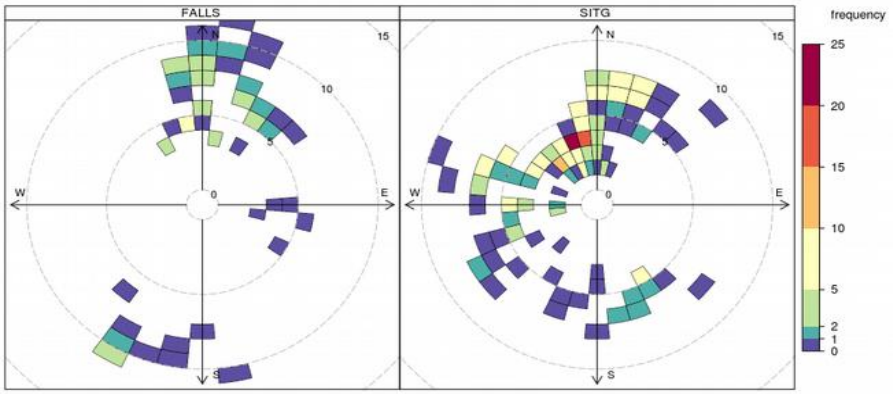
The analysis of the Hotline Caller history in the context of the prevailing meteorological conditions also provides information about the conditions that are most favourable for the venue. These are the wind directions under which no Calls to the Hotline have been made for previous events:

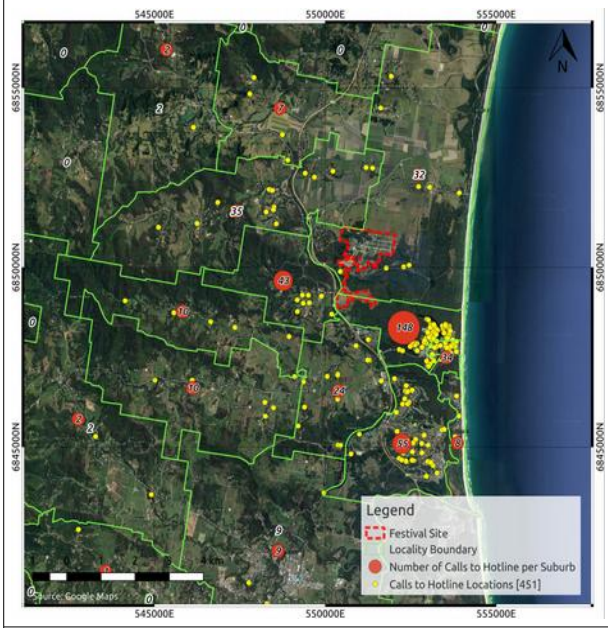
Byron Bay meteorology:

- Falls Festival: west, south-west, north-west, east-north-east, south-south-east, south-east;
- SITG: east.

Crabbes Creek meteorology:

- Falls Festival: west-north-west, north-north-west, west, north-west, west-south-west.





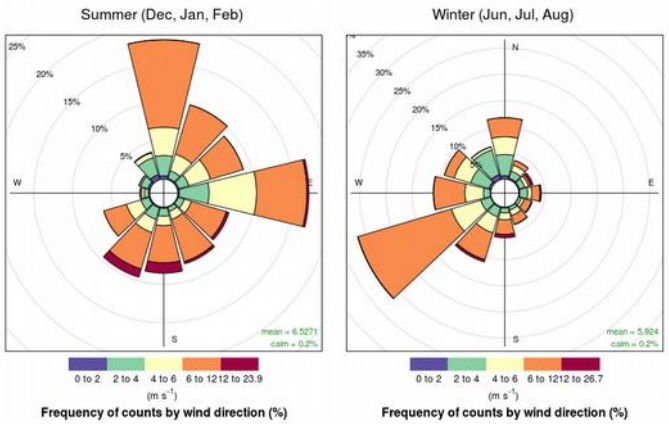
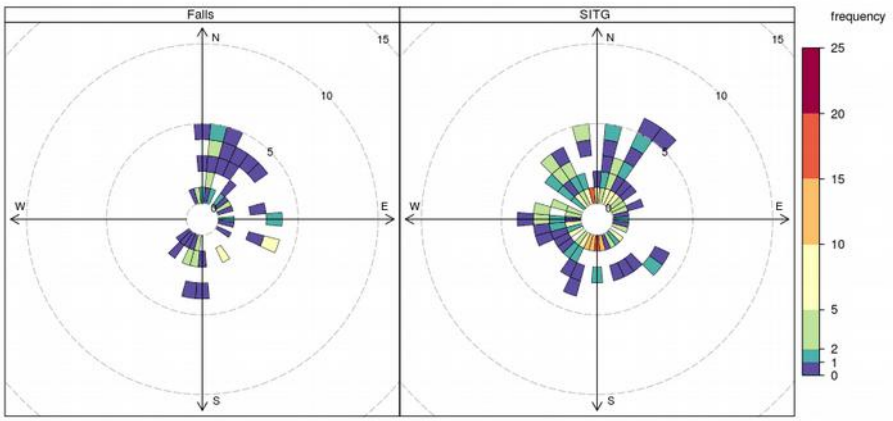
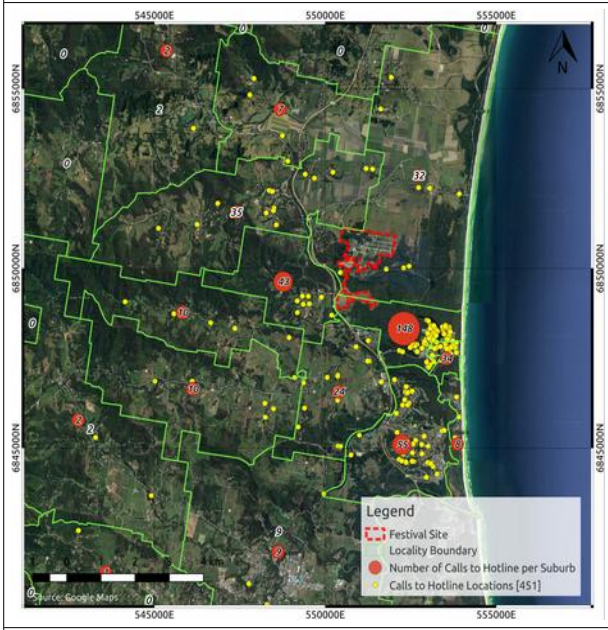


Figure 3.6 - Frequency Rose of Hotline Calls: Byron Bay Meteorology





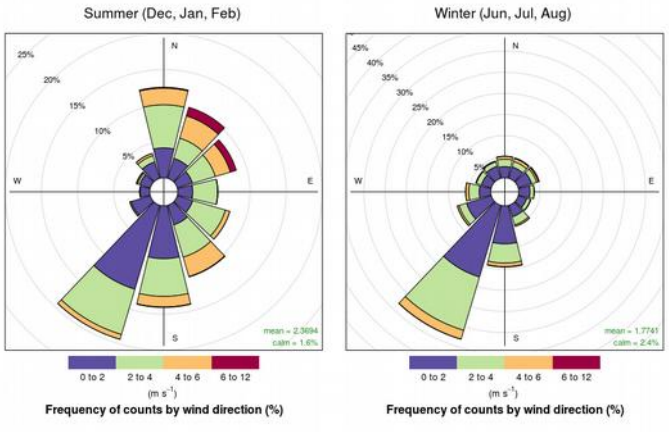


Figure 3.7 - Frequency Rose of Hotline Calls: Crabbes Creek Meteorology

3.5 Compliant Operating Levels

Event noise monitoring completed during recent large events at Parklands have resulted in compliance with the trial project conditions. This has been largely attributable to the management and monitoring measures included in the approved Parklands NMP. These have provided for live management of FOH noise levels, identification of areas impacted under specific meteorological conditions, and targeted volume control. In addition, the ongoing improvements to the stage and speaker layout design, event and system programming and communication strategies to improve response times with venue managers has been va

Complied with Modified Approval, would have been 8dBA above original approval

Event Noise monitoring reports for most recent la ughout the event, including the following:

Low frequency +4dB above criteria at R12

- Splendour in the Grass 2016[9],
- Falls Festival 2016[10],
- Splendour in the Grass 2017[11].

+3dBA above the Modified Approval at R12 after midnight

Therefore, these events provide a basis for determining a suitable operating volume for the main stages, under typical (as opposed to worst case) meteorological conditions. Table 3.2 presents a summary of the upper volumes achieved (averaged over a 10-minute period) for the main stages at the 2017 SITG event.

It is noted that positioning of the measurement microphone (eg, left or right of the stage, and slightly different distance to the FOH) can result in significant variations to the measured levels. This has been demonstrated by a comparison with the FOH noise levels from the mixing desk operators '10-EaZy' noise monitoring system, which often measure 2 – 5 dB louder. This highlights that the noise levels presented in Table 3.2 may be lower than the actual front of house levels that occurred during SITG 2017, which achieved compliance for off site noise levels.

Table 3.2 - Maximum Measured 10-Minute L_{eq} FOH values (ANE Logger) Splendour in the Grass 2017

Event Day	Amphitheatre		Mix Up		GW McLennan		Tiny Dancer	
	dB(A)	dB(C)	dB(A)	dB(C)	dB(A)	dB(C)	dB(A)	dB(C)
Day 1	102	111	97	109	99	109	96	111
Day 2	103	112	100	111	100	109	98	110
Day 3	101	113	101	112	98	109	99	109

9 Splendour in the Grass 2016 – Post Event Noise Impact Report, North Byron Parklands, prepared by Air Noise Environment (18 January 2017)

10 Falls Festival 2016 – Post Event Noise Impact Report, North Byron Parklands, prepared by Air Noise Environment (31 March 2017)

11 Splendour in the Grass – Post Event Noise Impact Report, North Byron Parklands, prepared by Air Noise Environment (7 September 2017)

4 Noise Modelling

4.1 Overview

From a potential noise impact perspective, the scope of the proposed future operations at Parklands is very similar to the activities operated since 2013. The proposed change that is of primary relevance from an acoustic perspective is the provision of an additional main stage for large events. Therefore, the focus of the noise modelling is a detailed analysis of the existing and predicted future community noise levels from large live entertainment events. This section of the report presents this analysis.

In addition, there are further changes associated with the proposed permanent application that may result in changes in community noise levels. These relate to the following issues:

- proposed conference centre;
- continuous noise emissions from fixed and temporary equipment such as lighting towers;
- construction noise impacts.

These potential noise sources are considered separately in Section 5. Where acoustic modelling is completed to assess the potential impacts, the modelling methodology adopted is as described in Section 4.2.

4.2 Methodology

4.2.1 Introduction

For the purposes of predicting impacts from large events held at Parklands, an environmental noise model of the sources and surrounding region was developed. The model package was developed using the proprietary software Cadna/A (Computer Aided Noise Abatement Model) developed by DataKustik. Cadna/A incorporates the influence of meteorology, terrain, ground type and air absorption in addition to source characteristics to predict noise impacts at receptor locations. This modelling approach provides for the following:

- calculations in accordance with the 'ISO 9613-2:1996 Acoustics – Attenuation of Sound During Propagation Outdoors – Part 2: General Method of Calculation' methodologies;
- prediction of impacts of all activities occurring simultaneously to each sensitive receiver;
- inclusion of screening effects, ground topography, attenuation and absorption;
- identification of partial contribution of each source or activity to each sensitive receiver, as well as identification of 1/1 Octave Band contributions (31.5 – 8000 Hz);
- iterative review of predictions to identify the required reductions to each noise source to achieve compliance;

- completion of an iterative review of suitable barrier heights; and
- confirmation of compliance to all sensitive areas.

All predictions have been undertaken in accordance with *ISO Standard 9613 (1996) Acoustics - Attenuation of sound during propagation outdoors,* which assumes source-to-receiver wind conditions (1 to 3 m/s) or a temperature inversion under calm conditions. It is important to recognise that this approach adopts a theoretic worst case meteorological scenario for each receptor. In reality, under more typical meteorology, compliance will be achieved for higher source noise levels than are considered in the modelling. This is discussed in Section 3.5 for previous events.

It is noted that modelling has been completed for a series of discrete receptors in the local community, and for gridded receptors calculated at 10 m grid intervals across a 10 km x 10 km area. The gridded receptors are utilised in the preparation of contour plots.

The following sections describe in detail the model inputs and assumptions.

4.2.2 Model Scenarios

As the Parklands venue has operated since 2013 under a trial approval, detailed information is available in relation to the expected noise sources for future events. Currently, two medium or large events are held each year at Parklands – Splendour in the Grass (SITG) and Falls Festival (Falls). Of these, SITG is the larger event in terms of numbers of stages and numbers of patrons. SITG is also held during the winter months, when worst case meteorology and lower background noise levels are most likely to occur. Therefore, the modelling exercise considers the potential noise impacts associated with SITG as this represents the event with the greatest potential for community noise impacts, and is also the event most likely to coincide with worst case meteorology.

The initial acoustic modelling has been completed for a typical SITG layout and typical source noise levels, based on the SITG 2016 event. Throughout the history of Parklands, noise management measures have been adopted to minimise community noise impacts, as documented in the Parklands Noise Management Plan and the Acoustic Monitoring Programmes developed for each event. Because noise management measures are already adopted for large events, the base case (existing SITG 2016) model includes the following noise management features:

- optimised sub arrays, including cardiod-arrays where possible;
- mitigation to the side and rear of stage to reduce bass emissions, including truck pans, proprietary sheeting, PVC, straw bales, etc;
- double-skinned wall tent sheets;
- delay towers;
- optimised and cutting edge technology in system design;
- stage monitors located within the lined stage area; and
- minimisation of use of sub-woofer speakers to smaller venues.

These management features have also been incorporated into the modelling of large events at the

proposed permanent facility.

Based on the predicted noise impacts for the proposed permanent scenario, including the additional main stage, further mitigation scenarios have been considered. In summary, the following modelling scenarios that have been completed:

- Scenario 1: Base case – Splendour 2016 Layout (Existing operations to calibrate model)
- Scenario 2: Proposed permanent facility - All Proposed Stages
- Scenario 3: Mitigation investigations
- Scenario 4: Volume management scenario

4.2.3 Topography

To account for shielding influences, ground absorption, and relative height differences of sources and surrounding sensitive receivers, site topography has been included in the acoustic model. The topography has been considered for the venue and surrounding area (10 km square grid) at a resolution of 1 m sourced from satellite DEM data. Figure 4.1 presents the area included in the acoustic model.

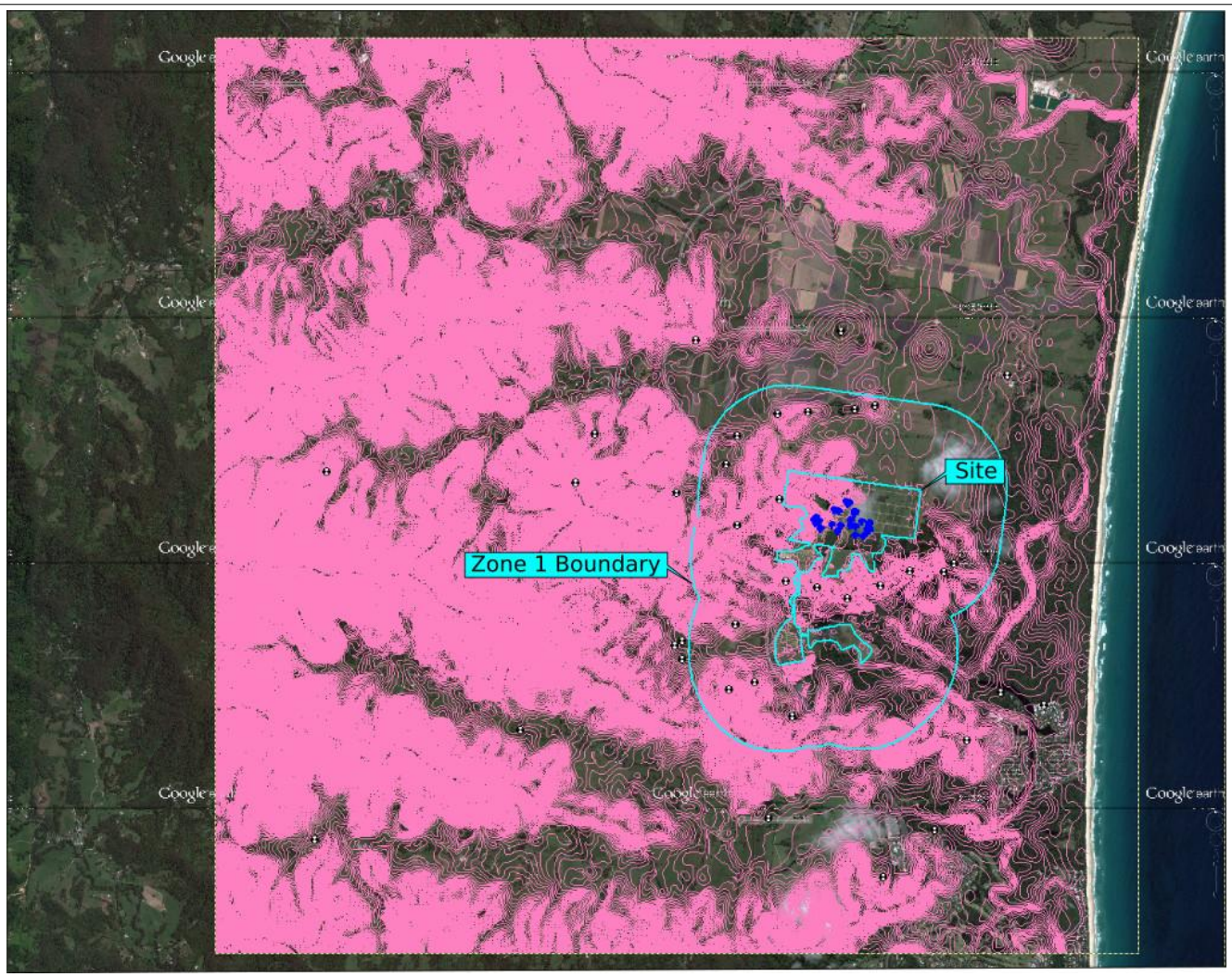


Figure 4.1 - Modelled Area and Topography

4.2.4 Meteorological Influences

The acoustic modelling has been completed in accordance with the ISO 9613-2:1996 methodologies. The base case scenario for the ISO method predicts the higher noise level of either a source-to-receiver wind condition (1 to 3 m/s) or a temperature inversion under calm conditions. Adoption of the ISO 9613-2 methodologies removes the consideration of a true calm stable scenario, and results in predictions at least 6 dB(A) higher than a calm scenario. The degree of over prediction also varies for different octave band frequencies.

Therefore the assessment is considered conservative as it assesses a 'typical worst-case' meteorological influence. However it is noted that under unique and very unusual meteorological conditions, slightly higher predicted noise levels may be expected.

It is noted that within the INP, there are screening conditions to identify whether review against these 'typical worst-case' meteorological effects is appropriate to adequately represent the local conditions. There are specific thresholds applied to determine whether extreme worst case conditions should be included in the assessment::

- *Industrial Noise Policy methodology for considering occurrence of wind and temperature inversions reviews whether the occurrence of inversions is greater than 30% of the time at night (1hr before sunset through 1 hour after sunrise, approximately 6pm - 7am) in winter, or if source to receiver winds occur greater than 30% of the time in any period and season.*

As the site is bounded by potentially affected sensitive receiver areas, the assessment has been completed on the basis that certain sensitive receiver areas could experience downwind inversion conditions more than 30% of the time. These meteorological effects typically increase noise levels by 5 to 10 dB during the occurrence of the condition. This has been considered in the modelling, resulting in a conservative assessment for the periods when these winds are not occurring.

As the site is close to the coastline strong inversions (generally occurring in arid and semi-arid areas) are unlikely to occur, and have not been considered.

4.2.5 Sensitive Receivers

Table 4.7 and Figure 4.2 identify the nearest sensitive receptors in the area surrounding Parklands. All existing sensitive residential receivers within Zone 1 have been identified, and a representative selection of residential receptors most likely to be affected by noise from large events at Parklands for the surrounding Zone 2. These receptor positions are identified in Table 4.7.

For the receivers identified in Table 4.1 as having agreements, Parklands have advised that an agreement has been entered into with the owner of each property relating to management of impacts from the event, and in some cases compensation has been agreed. On the basis of these agreements, the property owner has formally agreed not to lodge complaints relating to future events at Parklands. In some instances the potential for noise impacts have been part of the decision to enter into an agreement with certain properties, hence modelling results are presented for all properties as this can assist in identifying those properties where mitigation and management through agreements may be appropriate for the permanent site. The receptor agreements are discussed further in Section 4.3.6 in relation noise mitigation measures.

Table 4.1: Noise Sensitive Receptors Considered in Acoustic Modelling

Receptor Number	Address / Description	Zone	Agreement	Coordinates		Noise Limit 11pm - Midnight		Noise Limit Midnight - 2am	
				X	Y	dB(A)	dB(63Hz)	dB(A)	dB(63Hz)
1	Billinudgel Road, Billinudgel	1		56550466	6848271	60	70	45	60
2	Yelgun Road, Yelgun	1		56549841	6848737	60	70	45	60
3	Yelgun Road, Yelgun	2		56549272	6849152	55	65	45	55
4	Yelgun Road, Yelgun	1		56549890	6849356	60	70	45	60
5	Jones Road, Wooyung	1	Yes	56550475	6849851	60	70	45	60
6	Tweed Valley Way / Pacific Highway, Yelgun	2		56549278	6851074	55	65	45	55
7	Tweed Valley Way, Wooyung	1		56549782	6851201	60	70	45	60
8	Wooyung Road, Crabbes Creek	1		56549911	6851539	60	70	45	60
9	Wooyung Road, Wooyung	1		56550382	6851787	60	70	45	60
10	Wooyung Road, Wooyung	1	Yes	56550733	6851810	60	70	45	60
11	Wooyung Road, Wooyung	1	Yes	56551501	6851867	60	70	45	60
12	Jones Road, Wooyung	1		56552298	6849958	60	70	45	60
13	Jones Road, Wooyung	1	Yes	56552410	6850053	60	70	45	60
14	Mia Court, Ocean Shores	2		56553475	6848405	55	65	45	55
15	Flinders Way, Ocean Shores	2		56552578	6848002	55	65	45	55
16	Balemo Drive, Ocean Shores	2		56552197	6846959	55	65	45	55
17	Pacific Highway, Wooyung	1		56549897	6850497	60	70	45	60
18	Pacific Highway, Wooyung	1		56550212	6850739	60	70	45	60
19	Yelgun Road, Yelgun	1		56550103	6848687	60	70	45	60
20	Middle Pocker Road, Middle Pocket	2		56547389	6848120	55	65	45	55
21	The Pocket Road, The Pocket	2		56545003	6846851	55	65	45	55

Receptor Number	Address / Description	Zone	Agreement	Coordinates		Noise Limit 11pm - Midnight		Noise Limit Midnight - 2am	
				X	Y	dB(A)	dB(63Hz)	dB(A)	dB(63Hz)
22	Pimble Valley Road, Crabbes Creek	2		56545133	6851118	55	65	45	55
23	Bluegum Court, Crabbes Creek	2		56548244	6851563	55	65	45	55
24	Hulls Road, Crabbes Creek	2		56549443	6852637	55	65	45	55
25	Wooyung Road, Wooyung	1	Yes	56551275	6851844	60	70	45	60
26	Wooyung Road, Wooyung	2		56553046	6852236	55	65	45	55
27	Yelgun Road, Yelgun	2		56549266	6848944	55	65	45	55
28	Yelgun Road, Yelgun	2		56549179	6849099	55	65	45	55
29	The Pocket Road, Billinudgel	2		56550265	6847093	55	65	45	55
30	Hardy Avenue, Ocean Shores	2		56552970	6848562	55	65	45	55
31	The Tunnel Road, Billinudgel	2		56551603	6846410	55	65	45	55
32	Tweed Valley Way, Wooyung (Adjacent Venue Entry)	1		56550588	6848845	60	70	45	60
33	Brunswick Valley Way (Behind Yelgun Rest Stop)	1		56551204	6848092	60	70	45	60
34	Billinudgel Road, Billinudgel	1		56550380	6848394	60	70	45	60
35	Billinudgel Road, Billinudgel	1		56550324	6847879	60	70	45	60
36	Yelgun Road, Yelgun	1		56549445	6848764	60	70	45	60
37	Yelgun Road, Yelgun	1		56549366	6848979	60	70	45	60
38	Yelgun Road, Yelgun (Rental Unit fronting Yelgun Road)	1		56549387	6849021	60	70	45	60
39	Yelgun Road, Yelgun	1		56549516	6849087	60	70	45	60
40	Pacific Highway, Wooyung (Property before R17 on entry road)	1		56549736	6850583	60	70	45	60
41	Tweed Valley Way, Wooyung (Further up hill from R7)	1		56549752	6851142	60	70	45	60

Receptor Number	Address / Description	Zone	Agreement	Coordinates		Noise Limit 11pm - Midnight		Noise Limit Midnight - 2am	
				X	Y	dB(A)	dB(63Hz)	dB(A)	dB(63Hz)
42	Wooyung Road, Wooyung (Corner Wooyung / Pacific Motorway)	1		56549581	6851442	60	70	45	60
43	Jones Road, Wooyung	1	Yes	56552501	6850216	60	70	45	60
44	East of Jones Road, Wooyung (proposed development)	1		56552487	6849983	60	70	45	60
45	Tweed Valley Way, Yelgun	2		56549183	6851062	55	65	45	55
46	Yelgun Hill Road, Yelgun	2		56549200	6850879	55	65	45	55
47	Blue Gum Court, Crabbes Creek	2		56548030	6850988	55	65	45	55
48	Tweed Valley Way, Crabbes Creek	2		56548634	6852318	55	65	45	55
49	Hulls Road, Crabbes Creek	2		56549701	6852529	55	65	45	55
50	Hulls Road, Crabbes Creek	2		56549784	6852560	55	65	45	55
51	Hulls Road, Crabbes Creek	2		56550043	6852556	55	65	45	55
52	Hulls Road, Crabbes Creek	2		56550302	6852596	55	65	45	55
53	Hulls Road, Crabbes Creek	2		56550552	6852629	55	65	45	55
54	Hulls Road, Crabbes Creek	2		56550839	6852674	55	65	45	55
55	Hulls Road, Crabbes Creek (hill)	2		56551110	6852758	55	65	45	55
56	Hulls Road, Crabbes Creek (far end)	2		56551348	6852907	55	65	45	55
57	Wooyung Road, Wooyung	2		56552014	6852451	55	65	45	55
58	Wooyung Road, Wooyung	2		56552345	6852419	55	65	45	55
59	Wooyung Road, Wooyung	2		56552431	6852338	55	65	45	55
60	Wooyung Road, Wooyung	2		56552526	6852340	55	65	45	55

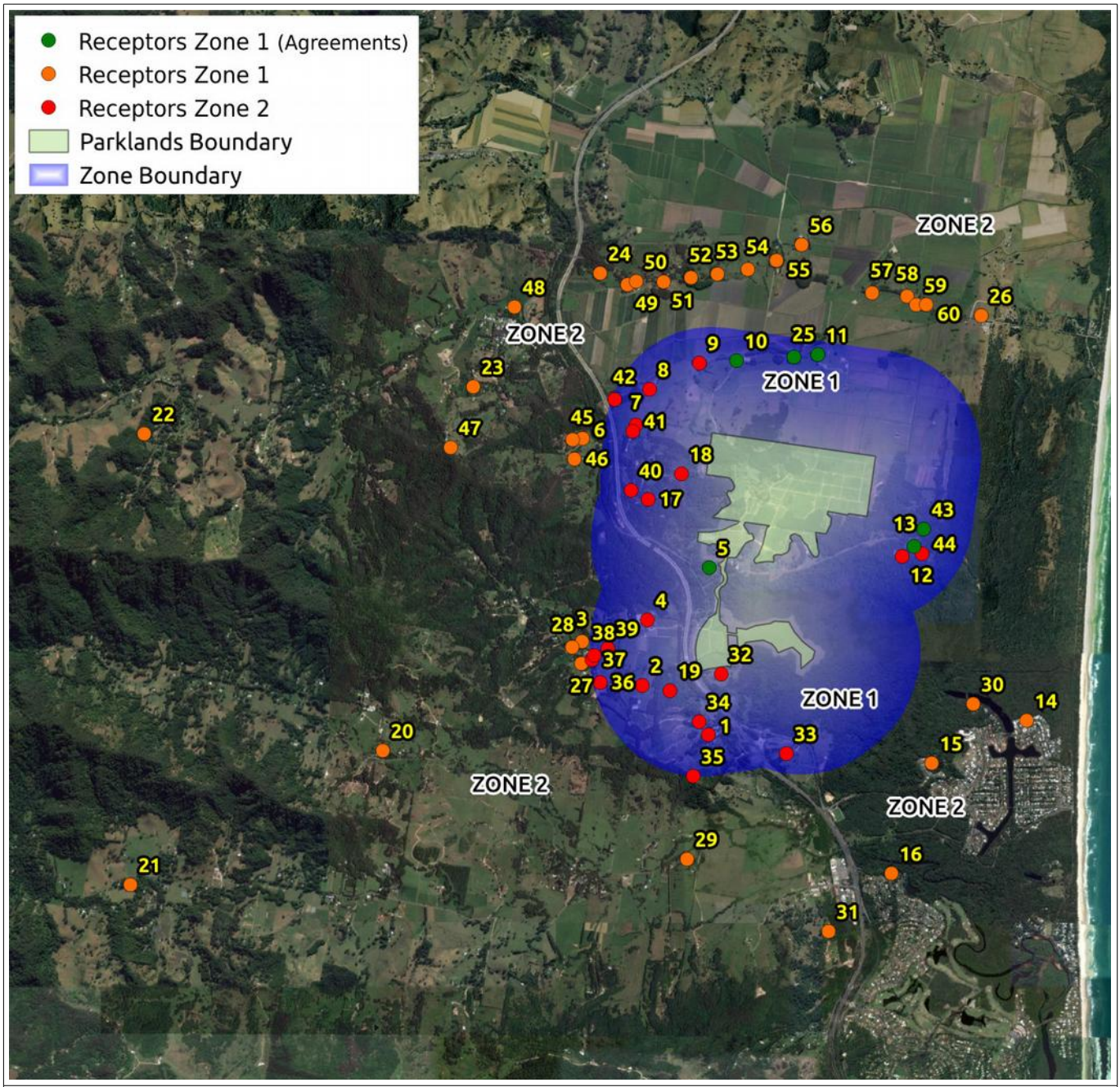


Figure 4.2: Site location and Noise Sensitive Receptors Considered in Acoustic Modelling

4.2.6 Amplified Music Source Noise Levels

Figures 4.3 and 4.4 present the modelled stage locations and orientations for the future scenario for the Permanent application, inclusive of:

- S3, Forest Stage (previously only utilised during Falls Festival).

Noise modelling for previous events has sought to optimise the stage locations to take advantage of topographic shielding, and to optimise the stage orientation to minimise off site noise impacts. The stage positions and orientation shown in Figure 4.4 for the existing stages, represents an optimised noise management scenario. For the new stage, the proposed orientation has been considered through iterative modelling and the orientations in Figure 4.4 were found to be best suited to minimising noise impacts, after consideration of the various viable orientations. Figure 4.5 presents a graphical render of the 3D modelling.

Having defined the source locations, the source noise characteristics must be determined. Noise propagation is highly dependent upon the frequency spectra of the noise source. To allow derivation of typical frequency spectra associated with the types of artist typically performing at Parklands events, noise monitoring data from historic events at Parklands have been analysed. For each stage measurements were made in 1/1 octave frequency bands at the front of house positions. Based on these measurements, source noise levels have been derived based on the 95th percentile of recorded $L_{Aeq,5min}$ front of house noise levels for the Amphitheatre stage. It is noted that analysis of front of house noise levels indicates all main stages operated at similar levels with less than 1 dB difference between the 95th percentile front of house noise levels measured during SITG 2014. This has been verified against monitoring results from subsequent events[12,13,14,15] and shown to be consistent for all events

The FoH L_{Aeq} noise levels presented in Table 4.2 represent the typical upper end emissions from the event during the headline act performances when noise management is not required due to adverse meteorology. In reality, front of house levels would typically be managed such that they increase throughout the day to the highest levels shown in Table 4.2 for the event headline acts. For the purposes of the modelling, the typical operating noise levels presented in Table 4.2 have been adopted. This is because the modelling represents worst case meteorological conditions, and the stages would not be operated to the maximum levels under such conditions.

Generally, when the weather is favourable (light winds or calm conditions), or winds are not in the direction of significantly impacted sensitive receiver areas (e.g. winds blowing toward the ocean), the stages have been found to operate at the measured upper limits (and occasionally higher) in Table 4.2 while maintaining compliance off-site. However, the ISO 9316-2 calculation methodology

12 Falls Festival 2015 Monitoring Report – Final, Look Up and Live Pty Ltd, prepared by Air Noise Environment (March 2016)

13 Splendour in the Grass 2016 – Post Event Noise Impact Report, North Byron Parklands, prepared by Air Noise Environment (18 January 2017)

14 Falls Festival 2016 – Post Event Noise Impact Report, North Byron Parklands, prepared by Air Noise Environment (31 March 2017)

15 Splendour in the Grass – Post Event Noise Impact Report, North Byron Parklands, prepared by Air Noise Environment (7 September 2017)

does not provide for a true 'calm' scenario, and as such modelling has considered the statistically derived upper volume adopted during 'typical worst-case' weather conditions.

Since the commencement of the Modified Approval, which introduced a frequency based criteria, the FOH levels for low frequency noise ('C' weighted) have typically been 10 dB higher than the adopted A-weighted levels. This has been identified as the optimal differential targeted by sound engineers in recognition of both the importance of low frequency content to the patron experience and the potential amenity impacts for nearby residences. Adoption of these source noise levels (when combined with the recommended low frequency noise limits) has been shown to result in a significant improvement in acoustic amenity for the community.

Frequency spectra for each of the stages included in the acoustic model are presented in Appendix B.

Table 4.2: Modelled Source Noise Levels – Main Stages

Stage	Upper Noise Limits @ FOH		Typical Operating Levels @ FOH		Midnight – 2am Limits @ 10m	
	L_{Aeq}	L_{Ceq}	L_{Aeq}	L_{Ceq}	L_{Aeq}	L_{Ceq}
S1 - Amphitheatre	102	112	99	109	0	0
S3 - Forest	102	112	99	109	0	0
S4 - McLennan	100	110	99	109	0	0
S6 – Tiny Dancer	102	112	99	109	0	0
S7 – Mix Up	102	112	99	109	0	0

Table 4.3: Modelled Source Noise Levels – Minor Stages

Stage	Adopted Typical Limits @ 10m		Midnight – 2am Limits @ 10m	
	L_{Aeq}	L_{Ceq}	L_{Aeq}	L_{Ceq}
S2 - Tipi	95	105	95	105
S5 - World	93	105	93	105
S9 – Cabaret Tent	91	101	91	101
V1 - Minor	95	105	95	105
V2 - Minor	95	105	95	105
V3 - Minor	95	105	95	105
V4 - Minor	95	105	95	105
V5 - Minor	95	105	95	105

Stage	Adopted Typical Limits @ 10m		Midnight – 2am Limits @ 10m	
	L_{Aeq}	L_{Ceq}	L_{Aeq}	L_{Ceq}
V6 - Minor	95	105	95	105
V7 - Minor	95	105	95	105
V8 - Minor	95	105	95	105
V9 - Minor	95	105	95	105
V10 - Minor	95	110	95	110

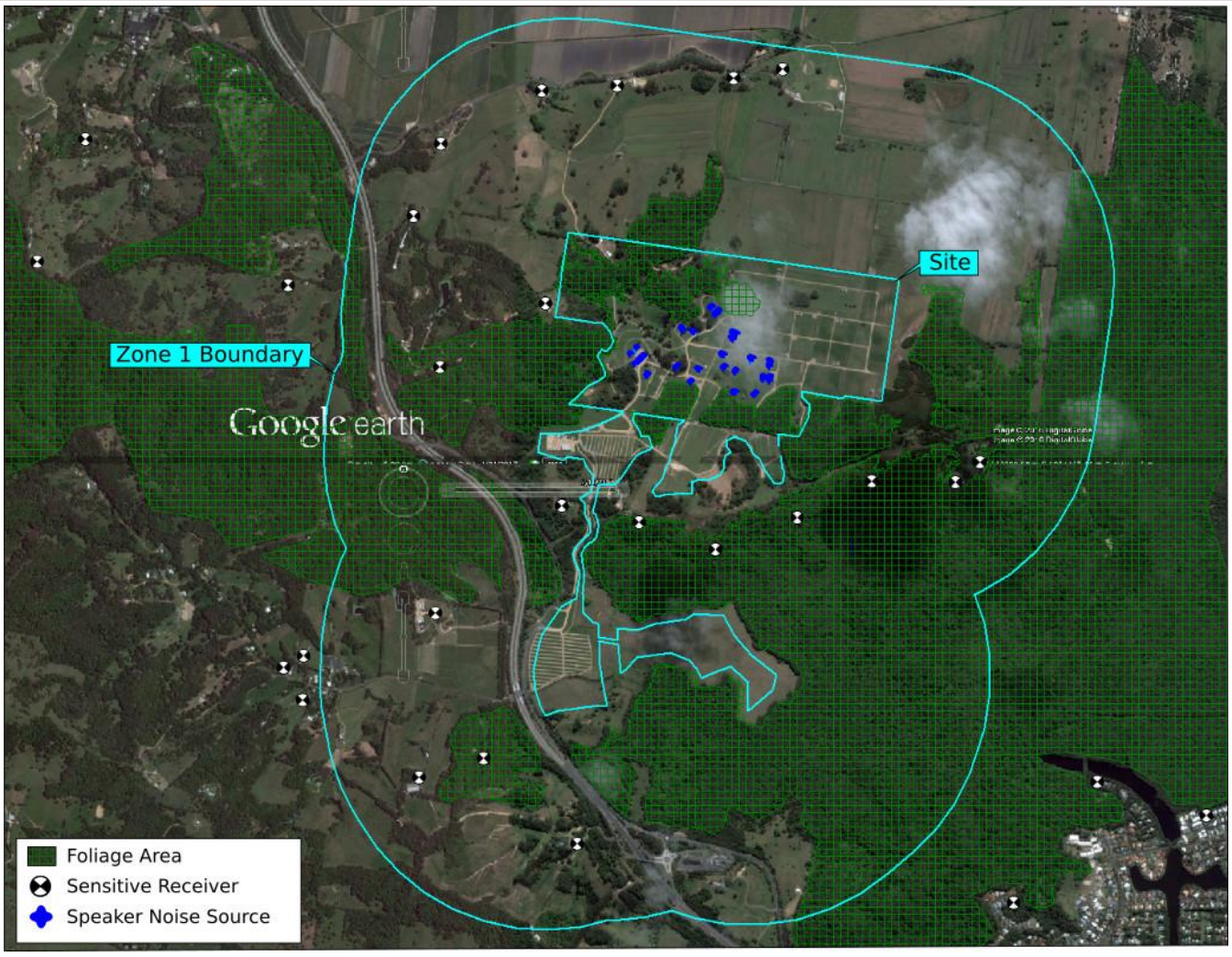


Figure 4.3 - Cadna/A Modelling – Zone 1

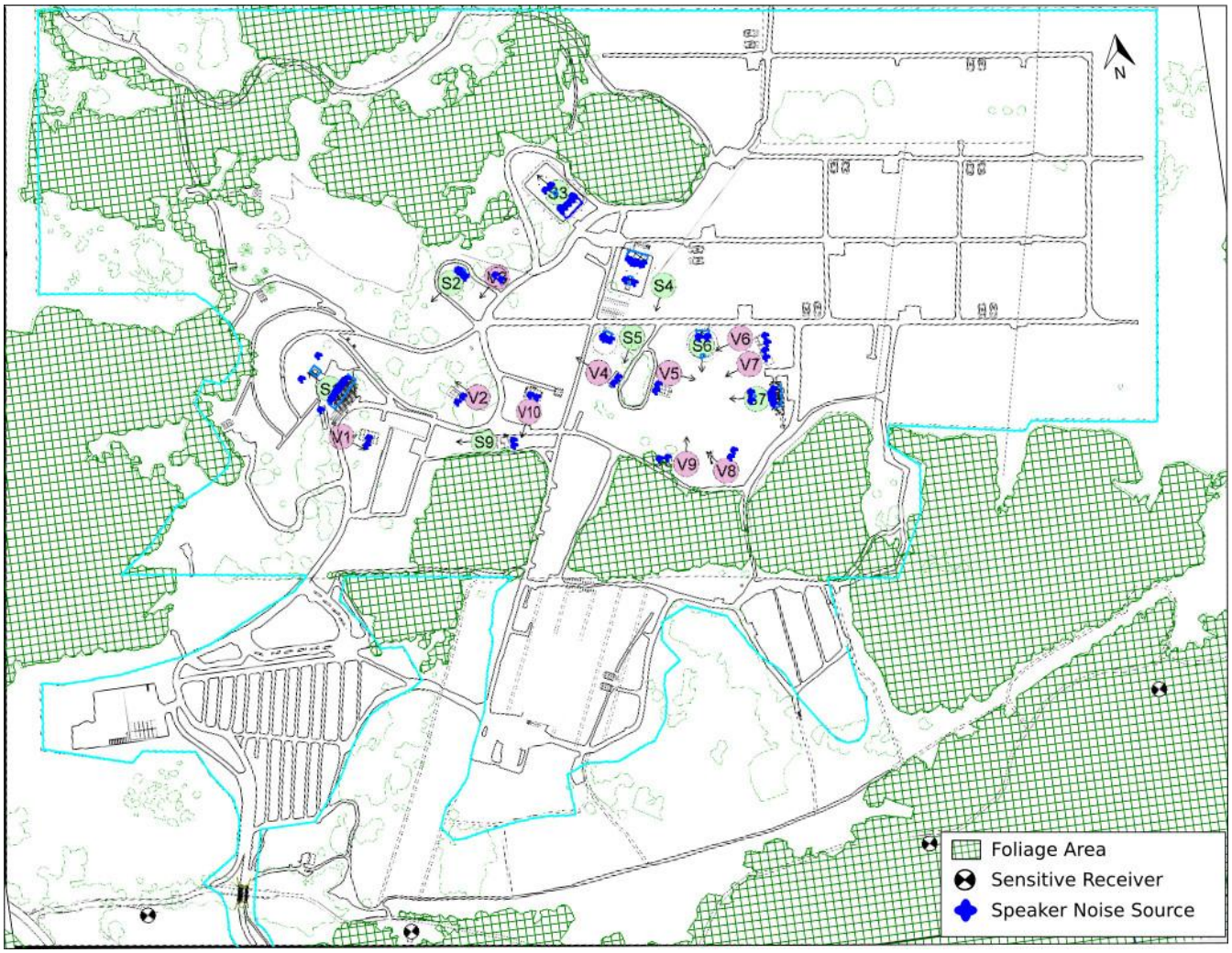


Figure 4.4 - Cadna/A Modelling – Stage Arrangements

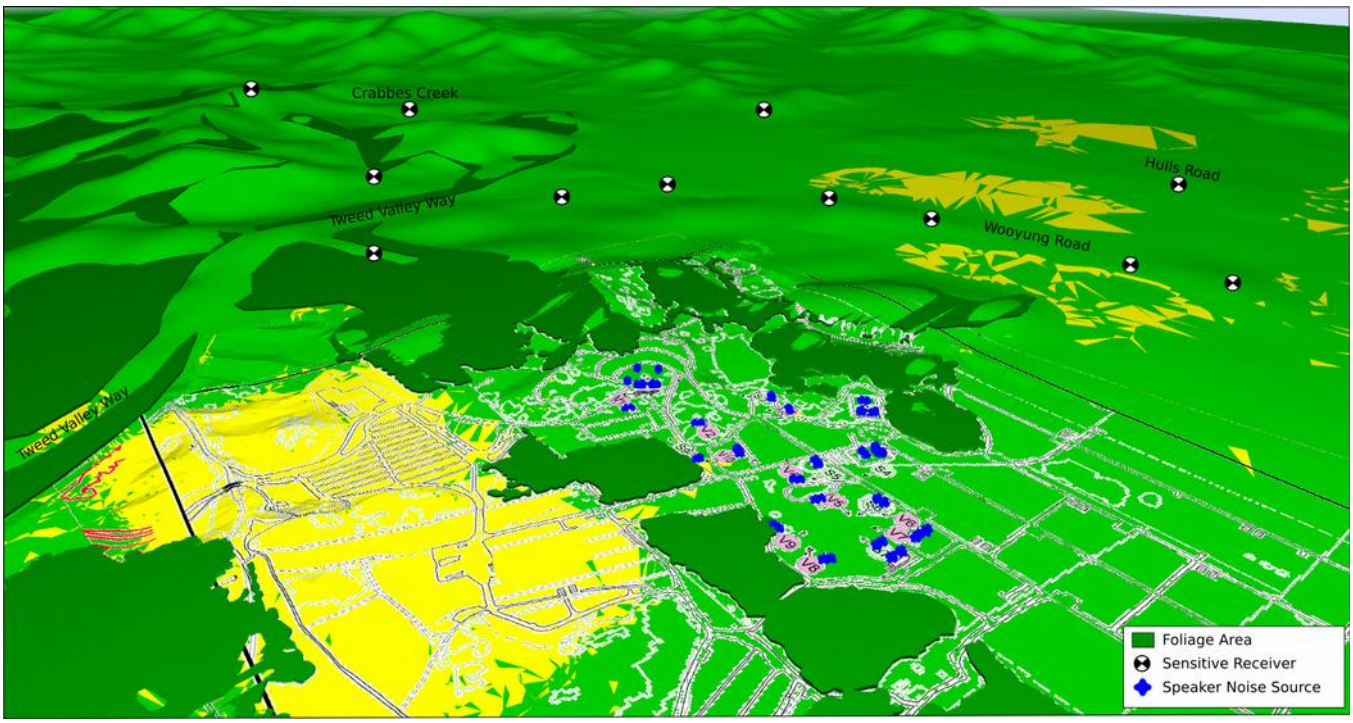


Figure 4.5 - Cadna/A Modelling – Render of Site Looking North-West

4.2.7 Sound System Characteristics

In addition to the absolute noise level and the frequency distribution of noise generated by an event stage, the sound system used also has a significant influence on sound propagation from the venue. For the purposes of the modelling, the updated sound system setup utilised for SITG 2017, as well as the potential to have the Forest Stage (from Falls Festival) operating (S3 in Figure 4.4) has been included in the acoustic model.

In 2017 the SITG system design team undertook an extensive review of all the large audio systems across the festival and the major areas, to optimise the noise levels within the venue/crowd areas, while reducing the noise spill to the surrounding area. as follows:

- Review of the types of speaker boxes used at each stage and the application of new or more suitable boxes where implemented.
- Ensuring that all systems where flown as high as possible and pointing down into the crowd to reduce sound pressure leaving the venue footprint.
- Using Sub Cardiod speaker boxes configurations at each stage where the speaker system was compatible to do so.
- Delay systems and or additional delay towers added to main venues to reduce the need for more volume from the main left and right hangs of PA.
- For the Amphitheatre stage the system also employed a distributed sound system with delay

towers used to fill directed sound beyond the mixing desk location.

Propagation characteristics for the typical speaker types utilised have been included in the modelling. The Cadna/A model and ISO 9613 modelling methodology does not fully account for the benefit of hanging J-curve speaker arrangements and the improved sound directivity associated with this arrangement. These speakers allow higher audience noise levels, while minimising the off-site noise levels. This also contributes to the conservatism inherent in the modelling approach.

Another aspect of the modelling that introduces conservatism relates to the approach adopted for modelling the bars, cafes and dance floors. These smaller venues are assumed to radiate noise in all directions (no directivity assumed for the individual sound sources). Where enclosures or tents are proposed to be constructed around minor stages and bars these structures have been assumed to be acoustically transparent for the purposes of the predictions. Hence the modelling of emissions from these sources also includes some conservatism hence represents a worst-case prediction.

4.3 Modelling Results

4.3.1 Scenario 1: Base Case

The base case considers both the existing SITG and Falls events, to allow validation of the noise model to the existing performance of the venue. Figures 4.6 and 4.7 present the stage layouts for these two events. Figure 4.4 presents the adopted FOH source noise levels as included in the acoustic model.

The results of the modelling are presented in this section as follows:

- Table 4.5 presents the predicted L_{Aeq} and $L_{eq,Oct\text{-}63Hz}$ receptor noise levels between 11 am and midnight.
- Figures 4.8 and 4.9 present the predicted L_{Aeq} and $L_{eq,Oct\text{-}63Hz}$ noise contours between 11 am and midnight (when main stages are operating).

The results represent the maximum predicted noise levels, for:

- all stages operating simultaneously;
- stages operating at highest operating volumes during worst case wind directions;
- predicted for a typical worst case down-wind scenario (to each individual receiver position);and
- for each modelled receptor position (individual and gridded receptors).

Results presented in **bold** are noted to exceed the criteria for all stages operating simultaneously. It is noted that it is rare for all stages to be operating simultaneously, and often stages will not operate at the maximum volume for significant portions of their performance.

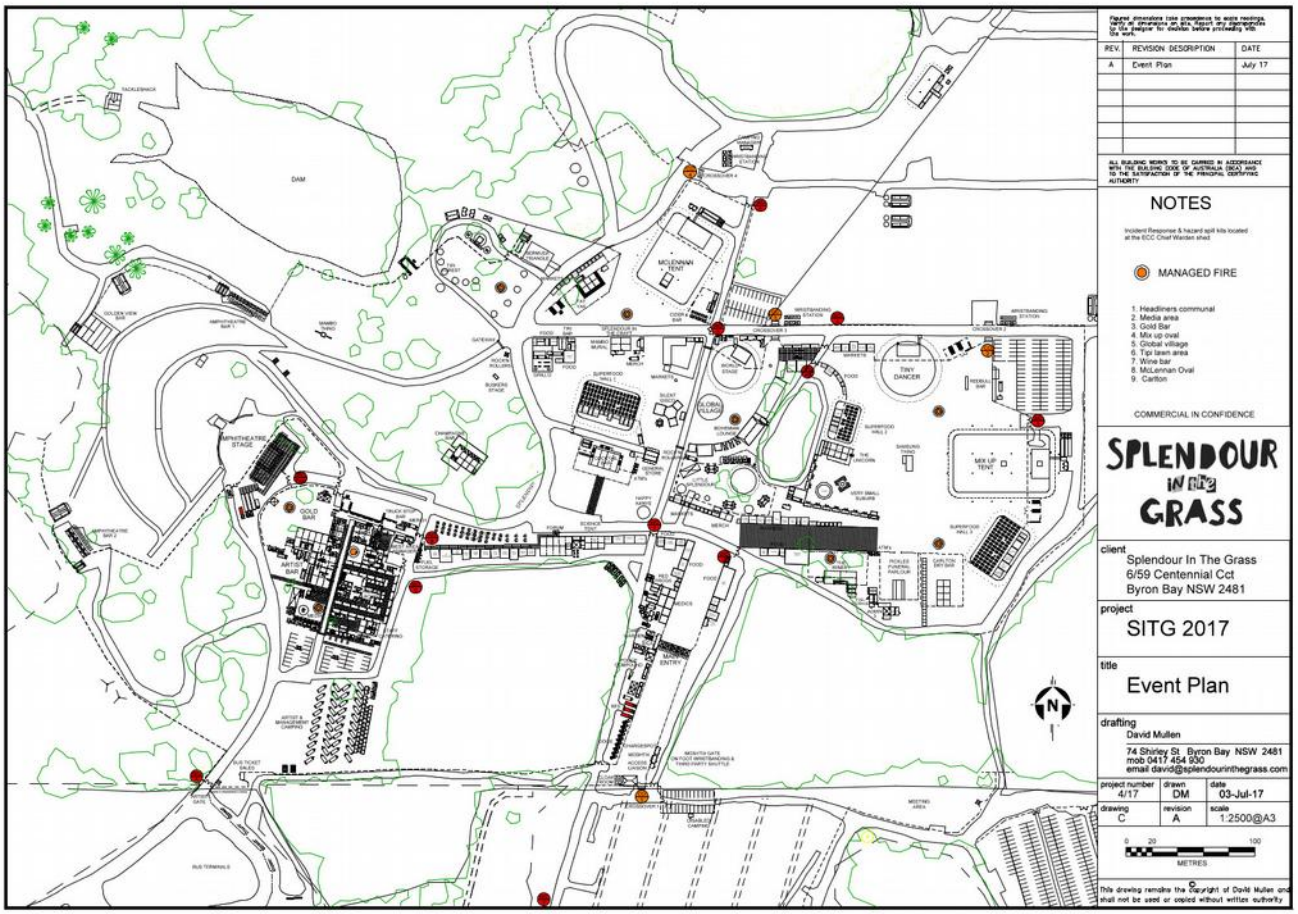


Figure 4.6 - Event Stage Layout – Splendour in the Grass 2017

Figure 4.7 - Event Stage Layout – Falls Festival 2016-2017

Table 4.4: Modelled FOH Noise Levels – All Stages, Bars, Cafes and Dance-floors

Stage	SPLENDOUR IN THE GRASS 11am - Midnight		FALLS FESTIVAL Midnight - 2am		Distance (FOH)
	dB(A)	dB(C)	dB(A)	dB(C)	
Amphitheatre	99	109	99	109	30m / 35m
Mix Up	99	109	-	-	22.5m
Forest	-	-	99	109	30m
McLennan	99	109	-	-	20m
Tiny Dancer	99	109	-	-	10m
World Stage / The Green	95	105	95	105	10m
Smirnoff Cocktail	95	105	-	-	10m
Tipi Forest / Big Top	95	105	95	105	10m
Bollywood / Lola's	95	105	95	105	10m
Carlton Bar	95	105	-	-	10m
Tent of Miracles	95	105	-	-	10m
SiTG Red Bull	95	105	-	-	10m
Wine Bar	95	105	-	-	10m
Moet Bar / Bar 6	95	105	95	105	10m
Gold Bar	95	105	95	105	10m
Forum	90	100	-	-	10m
Falls Red Bull	-	-	95	105	10m

Table 4.5: Predicted Receptor Noise Levels – Scenario 1 Base Case (All Sources, 11am-midnight)

Receptor Number	Zone	Predicted dB(A)		Criteria	Predicted $dB_{,Oct-63Hz}$		Criteria
		SITG 2017	FALLS 2016		SITG 2017	FALLS 2016	
1	1	52	41	60	64	59	70
2	1	53	43	60	64	60	70
3	2	52	43	55	64	60	65
4	1	56	47			62	70
5	1	**65**	55				
6	2	52	50	55	65		
7					67		
8					67		
9					66	64	70
10			57	60	66	66	70
11	1	59	52	60	**72**	66	70
12	1	55	43	60	66	61	70

Actual 53dBA Leq 15min 11am-Mid. 48dBA Leq 15min Mid-2am

Actual <45dBA Leq 15min 11am-Mid and Mid-2am

Actual 62dB 63Hz 15min 11am-Mid

Actual 62dB 63Hz 15min 11am-Mid. 64dB 63Hz 15min Mid-2am when criteria is 60dB

Therefore Falls Festival after midnight LF is underestimated. Or the low frequency noise is coming from elsewhere within the site.

Receptor Number	Zone	Predicted dB(A)		Criteria	Predicted $dB_{,Oct-63Hz}$		Criteria
		SITG 2017	FALLS 2016		SITG 2017	FALLS 2016	
13	1	57	44	60	67	61	70
14	2	45	34	55	58	55	65
15	2	47	36	55	62	58	65
16	2	44	33	55	58	54	65
17	1	60	56	60	69	67	70
18	1	57	53	60	69	66	70
19	1	53	43	60	64	60	70
20	2	42	36	55	58	54	65
21	2	33	29	55	53	49	65
22	2	39	37	55	55	53	65
23	2	44	43	55	61	56	65
24	2	52	51	55	62	60	65
25	1	59	54	60	**71**	66	70
26	2	49	40	55	63	59	65
27	2	52	43	55	64	60	65
28	2	51	43	55	64	60	65
29	2	45	35	55	60	54	65
30	2	48	37	55	60	56	65
31	2	42	32	55	58	53	65
32	1	56	45	60	66	61	70
33	1	51	40	60	65	58	70
34	1	52	42	60	64	59	70
35	1	52	41	60	**71**	63	70
36	1	52	43	60	64	59	70
37	1	52	43	60	64	60	70
38	1	52	44	60	64	60	70
39	1	53	44	60	65	60	70
40	1	57	51	60	67	64	70
41	1	53	50	60	66	62	70
42	1	54	53	60	66	63	70
43	1	58	44	60	**73**	62	70
44	2	55	42	60	66	61	70
45	2	52	50	55	65	62	65
46	2	53	51	55	65	63	65
47	2	50	46	55	62	60	65
48	2	51	50	55	62	59	65
49	2	54	52	55	63	61	65
50	2	54	52	55	63	61	65

Receptor Number	Zone	Predicted dB(A)		Criteria	Predicted $dB_{,Oct-63Hz}$		Criteria
		SITG 2017	FALLS 2016		SITG 2017	FALLS 2016	
51	2	54	53	55	63	62	65
52	2	54	52	55	63	62	65
53	2	54	52	55	62	63	65
54	2	53	51	55	62	63	65
55	2	53	50	55	**66**	62	65
56	2	51	48	55	61	62	65
57	2	52	46	55	65	62	65
58	2	51	44	55	62	61	65
59	2	51	44	55	62	61	65
60	2	50	43	55	62	60	65

[a] Note: Results presented in **BOLD** exceed the criteria for all stages operating simultaneously

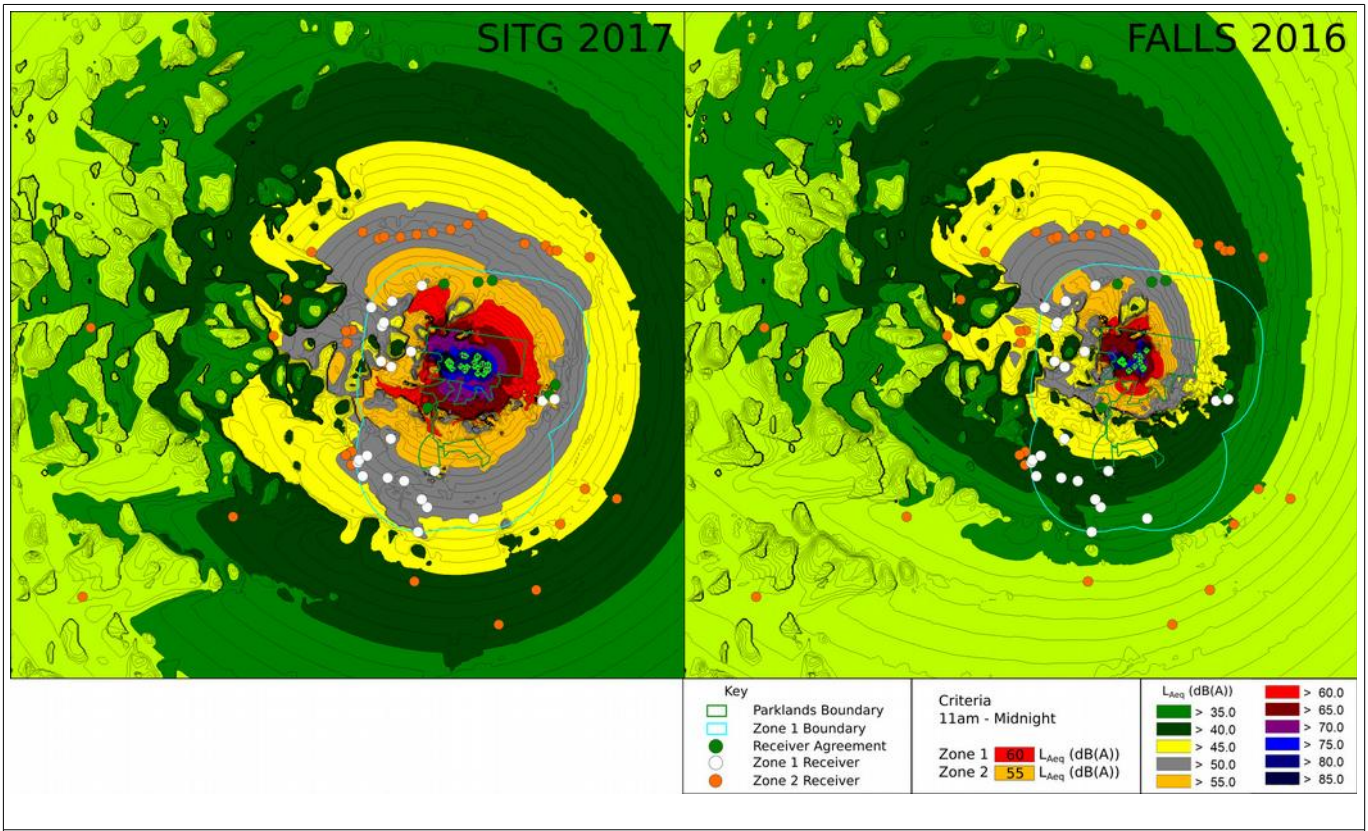


Figure 4.8 - Scenario 1, Base Case, Noise Contour Plot, 11am – Midnight (dB(A))

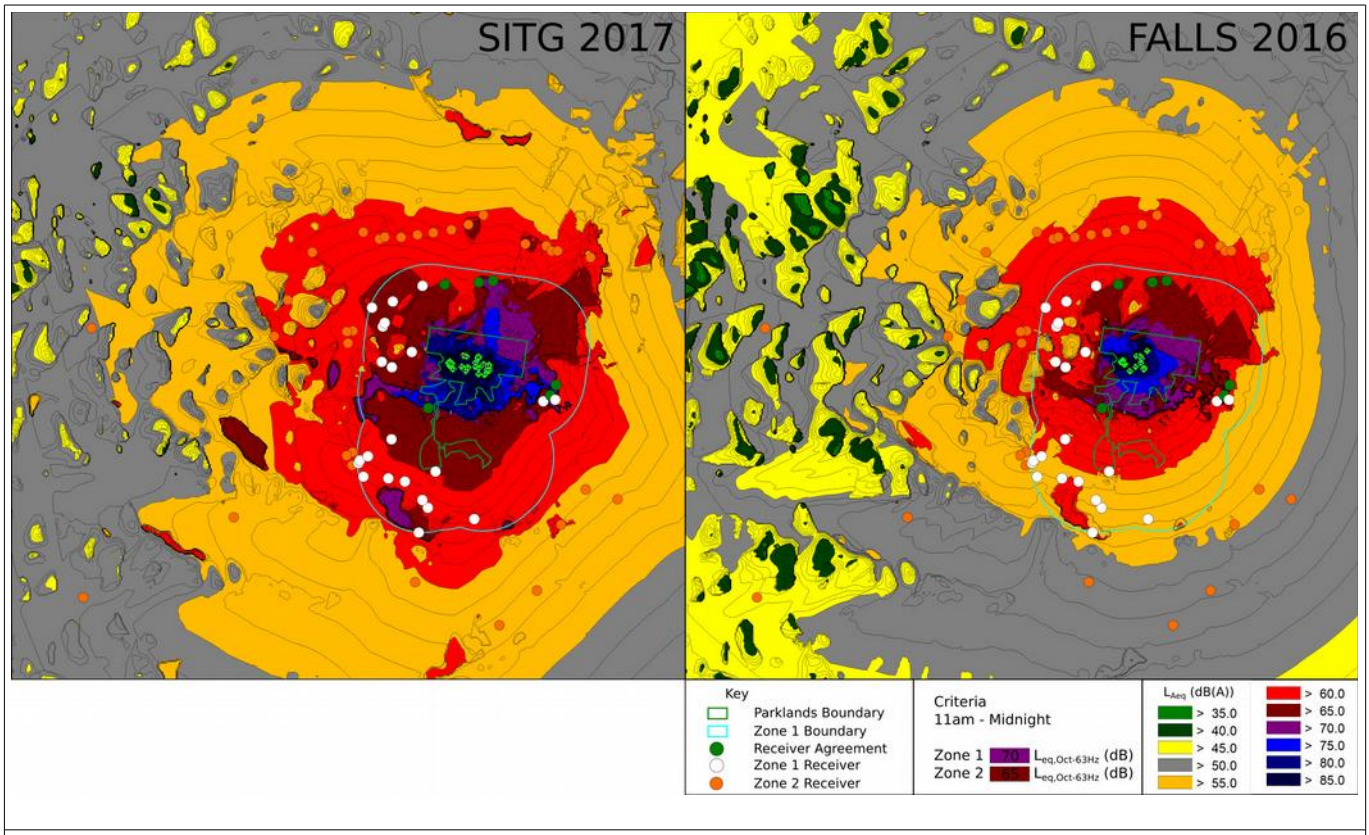


Figure 4.9 - Scenario 1 Base Case, Noise Contour Plot, 11am – Midnight (dB(C))

The results of the predictive noise modelling indicates that from 11am to midnight where all stages and venues are assumed to be operating, compl the modelled sensitive off-site receivers.

Where are the predictions for SITG 2017 and Falls 2016 for Midnight to 2am? This is the period where some of the breaches at R12 were observed.

For the modelling of SITG, 2 sensitive receptors both of which have noise agreements with Parklands in place. 6 sensitive receptors have a predicted exceedances ranging from 1 to 3 dB for the $L_{Oct\text{-}63\ Hz}$ criteria, with 4 of these having existing noise agreements in place.

No receivers are predicted to exceed the criteria for Falls Festival. This is consistent with monitoring of the two events. SITG is a larger event with additional stages and venues resulting in a potential for increased community noise.

Review of the noise contour plots highlight that SITG results in greater noise propagation into the surrounding area. This is related to the increased number of stages relative to Falls, and the presence of two larger stages oriented southward (GW McLennan, and Tiny Dancer stages).

Overall the modelling correlates well with the monitoring data from previous events, whereby under stable light-downwind conditions, with FOH noise levels of approximately 99 dB(A) and 109 dB(C),

the noise limits are usually achieved at all off-site receivers.

Based on experience of previous events, it is noted that the modelling over-predicts in some specific areas. This specifically relates to receptor R6 to the west, and receptor R26 to the north-east. This suggests that the model may be underestimating one or more of the following:

- terrain shielding;
- vegetation and ground absorption; and
- on-site treatments (e.g. tent and stage enclosures, cardiod sub treatments, speaker hangs, truck bodies, crowd and intervening structure shielding and absorptions).

Alternatively, the model may simply represent the most conservative meteorological scenarios, through the corrections included in the model (refer to Section 4.2.4).

4.3.2 Scenario 2: Proposed Permanent Full Scale

The results of the modelling for the proposed event layout (Figure 4.4) for the FOH noise levels presented in Table 4.6 are provided in this section as follows:

- Tables 4.7 to 4.8 present predicted L_{Aeq} and $L_{eq,Oct\text{-}63Hz}$ receptor noise levels for operations between 11 am and midnight (when all stages are operating).
- Figures 4.10 and 4.11 present predicted L_{Aeq} and $L_{eq,Oct\text{-}63Hz}$ noise contours for operations between 11 am and midnight (when all stages are operating).
- Tables 4.9 to 4.10 present predicted L_{Aeq} and $L_{eq,Oct\text{-}63Hz}$ receptor noise levels as a result of emissions from the future proposed venue layouts, for the period midnight to 2 am.
- Figures 4.12 and 4.13 present predicted L_{Aeq} and $L_{eq,Oct\text{-}63Hz}$ noise contours for the period midnight to 2 am (where only bars, cafes and dance floors operate).

The results represent the maximum predicted noise levels, for:

- all **proposed** stages operating simultaneously,
- stages operating at highest operating volumes during worst case wind directions(based on historic SITG and Falls Festival events),
- predicted for a down-wind scenario (to each individual receiver position),
- for each modelled receptor position (individual and gridded receptors).

Results presented in **bold** are noted to exceed the criteria for all stages operating simultaneously. It is noted that it is rare for all stages to be operating simultaneously, and often stages will not operate at the maximum volume (as modelled) for portions of their performance. It is noted that the main stages S1, S3, S4, S6, S7 will not operate after midnight. Due to modelling limitations, predictions of stage contributions for $L_{eq,Oct\text{-}63Hz}$ have only been presented where the criteria is predicted to be exceeded.

Table 4.6: Scenario 2: Modelled FOH Noise Levels

Stage	11am - Midnight		Midnight - 2am		Distance (FOH)
	dB(A)	dB(C)	dB(A)	dB(C)	
S1	99	109	-	-	35m
S2	95	105	95	105	16m
S3	99	109	-	-	22m
S4	99	109	-	-	20m
S5	95	105	95	105	10m
S6	99	109	-	-	25m
S7	99	109	-	-	22.5m
S9	91	101	91	101	10m
V1	95	105	95	105	10m
V2	95	105	95	105	10m
V3	95	105	95	105	10m
V4	95	105	95	105	10m
V5	95	105	95	105	10m
V6	95	105	95	105	10m
V7	95	105	95	105	10m
V8	95	105	95	105	10m
V9	95	105	95	105	10m
V10	95	105	95	105	10m

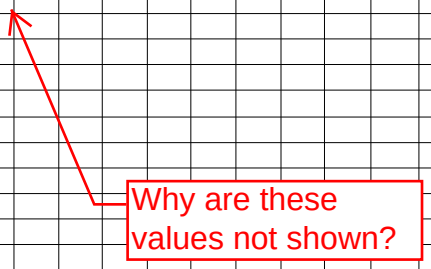
Table 4.7: Scenario 2: Predicted L_{Aeq} Receptor Noise Levels – All Stages, Bars, Cafes and Dance-floors (11am-midnight)

Receptor Number	Zone	Predicted Noise Level, 11am - Midnight																			
		Predicted[a] dB(A)	Limit dB(A)	S1	S2	S3	S4	S5	S6	S7	S9	V1	V2	V3	V4	V5	V6	V7	V8	V9	V10
1	1	52	60	48	36	36	45	34	44	40	21	29	24	32	23	25	29	29	25	23	35
2	1	53	60	50	39	38	46	35	43	41	25	28	26	34	25	24	32	32	27	23	36
3	2	52	55	49	35	39	44	33	41	41	26	25	28	33	26	22	31	31	28	23	34
4	1	56	60	53	37	42	49	38	46	46	30	27	31	35	29	26	35	36	31	26	39
5	1	**65**	60	62	51	50	58	47	55	55	38	41	39	47	37	33	44	44	39	32	49
6	2	53	55	47	40	46	44	31	39	46	30	22	36	32	34	23	32	32	34	28	29
7	1	54	60	46	39	45	45	33	42	49	31	16	39	30	38	26	33	34	38	31	31
8	1	59	60	57	41	48	45	33	41	48	25	25	39	32	38	25	32	32	38	32	29
9	1	59	60	58	32	40	40	28	34	42	25	26	39	24	34	24	28	28	34	33	28
10	1	**61**	60	60	36	50	47	34	43	49	28	29	41	25	39	27	32	32	39	39	29
11	1	60	60	55	39	54	50	34	46	53	25	29	35	29	35	30	32	32	38	44	30
12	1	55	60	50	37	42	48	35	49	43	21	37	27	29	27	40	30	30	29	30	31
13	1	57	60	52	39	44	50	37	51	46	23	39	28	30	28	44	31	31	31	34	33
14	2	46	55	43	27	31	37	25	37	31	14	29	20	21	19	28	20	20	20	20	24
15	2	48	55	45	29	34	40	28	40	34	15	29	27	24	19	28	22	22	21	21	28
16	2	44	55	41	26	28	36	24	35	29	13	25	18	21	16	22	19	19	18	18	25
17	1	**61**	60	58	44	48	51	39	47	52	39	29	41	39	38	28	39	39	40	31	38
18	1	58	60	53	40	49	48	31	40	53	35	22	39	34	36	28	34	33	41	34	32
19	1	53	60	50	38	37	46	35	44	41	24	29	26	34	24	24	31	31	26	23	36
20	2	42	55	40	26	30	33	21	28	28	16	16	19	22	17	14	22	22	19	15	24
21	2	34	55	31	17	21	26	12	20	20	10	9	13	15	11	9	15	15	13	10	16
22	2	39	55	38	21	25	26	13	19	25	14	12	19	16	16	11	17	17	17	12	15
23	2	44	55	40	29	36	36	23	30	37	21	15	26	23	26	18	25	25	27	21	22
24	2	53	55	52	32	45	38	25	32	38	22	21	32	23	30	19	24	24	30	27	23
25	1	**61**	60	57	30	55	49	34	45	53	26	27	37	28	37	30	33	33	36	41	30
26	2	49	55	46	30	41	41	27	37	40	16	24	29	22	24	27	22	22	24	31	26
27	2	52	55	49	37	38	44	32	40	40	25	25	26	33	24	22	30	31	27	22	34
28	2	52	55	49	36	39	44	32	40	41	26	24	27	33	25	22	31	31	27	22	34
29	2	45	55	42	25	29	38	26	36	32	15	23	19	26	17	20	23	23	19	18	28
30	2	48	55	45	29	34	40	28	40	35	15	31	22	23	21	31	22	23	22	22	27
31	2	42	55	40	25	26	35	23	33	28	12	22	17	21	15	20	19	19	17	16	25
32	1	56	60	52	40	41	49	39	49	45	26	33	28	36	26	28	33	33	29	26	40
33	1	51	60	48	34	35	44	33	44	39	19	30	23	29	21	27	27	27	24	23	34
34	1	52	60	49	37	37	46	35	44	40	22	29	25	33	23	25	30	30	26	23	36
35	1	52	60	48	34	37	46	35	46	40	19	26	30	30	26	28	30	31	23	21	35
36	1	52	60	49	38	38	44	33	41	40	24	26	26	33	24	22	30	30	26	22	34
37	1	52	60	50	38	39	44	33	41	41	25	26	27	34	25	22	31	31	27	22	34
38	1	53	60	50	38	39	45	33	41	41	26	26	27	34	25	22	31	31	27	22	35
39	1	53	60	51	38	39	46	34	42	42	27	27	28	35	26	23	32	32	28	23	36
40	1	57	60	54	38	40	49	37	45	50	37	26	40	35	37	26	37	37	38	30	36
41	1	54	60	44	39	47	47	34	42	49	28	18	37	32	37	26	34	34	38	31	31
42	1	56	60	52	40	49	45	32	40	46	31	21	39	31	36	24	32	32	36	30	29
43	1	58	60	52	40	46	51	39	52	48	24	40	29	30	27	42	30	30	32	36	32
44	2	55	60	50	37	43	48	34	48	43	21	37	27	28	26	41	28	28	29	31	31
45	2	53	55	49	39	45	43	31	39	45	30	23	36	31	33	23	32	32	34	27	30
46	2	54	55	51	39	46	44	31	39	45	31	23	36	32	33	23	33	33	34	27	31
47	2	50	55	49	33	37	37	24	31	37	24	19	29	26	26	18	26	26	27	21	24
48	2	51	55	50	31	41	36	23	30	37	22	20	31	23	28	18	24	24	28	24	22
49	2	54	55	53	33	46	40	26	34	40	23	22	34	25	32	20	25	25	31	29	24
50	2	54	55	53	33	47	40	27	34	40	23	22	34	24	32	21	25	25	31	29	24
51	2	55	55	54	34	48	41	27	35	41	23	22	34	25	32	21	26	26	32	30	24
52	2	55	55	54	34	48	41	28	35	41	23	23	34	24	33	22	26	26	32	32	24
53	2	55	55	53	34	48	41	28	35	41	22	23	34	23	33	22	26	25	32	33	24
54	2	55	55	52	34	48	41	28	35	41	22	23	33	23	32	23	25	25	31	33	24
55	2	54	55	52	33	47	42	28	35	45	21	23	32	24	31	23	29	29	30	34	25
56	2	52	55	50	32	45	40	26	33	39	19	22	30	22	29	23	23	23	28	33	23
57	2	53	55	50	33	45	44	28	40	44	19	25	33	24	28	31	29	29	33	37	26
58	2	52	55	48	32	43	43	27	39	43	18	25	32	24	27	26	23	23	27	34	29
59	2	51	55	48	32	43	43	27	36	43	18	25	29	24	26	27	23	23	27	34	29
60	2	51	55	48	32	43	42	27	36	42	17	25	29	24	26	27	23	23	26	33	29

[a] Note: Results presented in **BOLD** exceed the criteria for all stages operating simultaneously

Table 4.8: Scenario 2: Predicted $L_{eq,Oct\text{-}63Hz}$ Receptor Noise Levels – All Stages, Bars, Cafes and Dance-floors (11am-midnight)

Receptor Number	Zone	Predicted Noise Level, 11am - Midnight																		
		Predicted[a] $dB_{,Oct\text{-}63Hz}$	Limit dB	S1	S2	S3	S4	S5	S6	S7	S9	V1	V2	V3	V4	V5	V6	V7	V8	V9	V10
1	1	64	70																		
2	1	65	70																		
3	2	65	65																		
4	1	67	70																		
5	1	**73**	70	67	62	64	65	54	63	67	49	55	55	57	52	50	52	52	53	51	57
6	2	**66**	65	57	56	59	56	44	52	59	44	43	53	49	50	44	45	45	49	45	45
7	1	68	70																		
8	1	69	70																		
9	1	67	70																		
10	1	70	70																		
11	1	**72**	70	62	46	58	48	40	52	71	40	48	53	50	51	47	45	45	50	53	47
12	1	66	70																		
13	1	67	70																		
14	2	59	65																		
15	2	62	65																		
16	2	58	65																		
17	1	69	70																		
18	1	69	70																		
19	1	64	70																		
20	2	59	65																		
21	2	54	65																		
22	2	56	65																		
23	2	61	65																		
24	2	**66**	65	60	50	63	42	37	44	52	39	43	51	43	47	41	41	41	47	45	42
25	1	**72**	70	62	43	65	46	39	51	70	41	48	54	50	52	48	50	50	51	53	48
26	2	65	65																		
27	2	65	65																		
28	2	65	65																		
29	2	60	65																		
30	2	60	65																		
31	2	58	65																		
32	1	66	70																		
33	1	65	70																		
34	1	64	70																		
35	1	**71**	70	63	52	42	66	48	66	53	36	46	56	47	50	52	53	53	42	42	57
36	1	65	70																		
37	1	65	70																		
38	1	66	70																		
39	1	66	70																		
40	1	67	70																		
41	1	68	70																		
42	1	68	70																		
43	1	**73**	70	59	57	48	70	56	70	46	41	53	50	48	48	54	47	47	50	49	48
44	2	66	70																		
45	2	**66**	65	59	55	59	56	44	52	59	43	45	53	49	49	43	45	45	49	45	45
46	2	**66**	65	60	56	57	53	45	53	59	44	45	53	49	49	44	46	46	49	44	46
47	2	62	65																		
48	2	65	65																		
49	2	**66**	65	61	50	64	40	37	45	52	39	44	52	44	48	42	41	41	47	46	43
50	2	**66**	65	61	50	64	38	37	45	52	39	44	52	44	48	42	41	41	47	46	43
51	2	**67**	65	61	50	64	35	36	44	50	39	45	52	45	49	42	41	41	48	47	43
52	2	**67**	65	61	49	65	41	36	44	46	39	45	52	45	49	43	41	41	48	48	43
53	2	**67**	65	60	48	65	47	35	44	43	38	45	52	45	49	43	41	41	48	48	44
54	2	**66**	65	59	46	64	43	34	45	49	38	45	51	45	48	43	41	41	47	49	44
55	2	**68**	65	58	45	62	40	34	46	65	37	44	50	45	48	43	51	51	47	49	43
56	2	63	65																		
57	2	65	65																		
58	2	64	65																		
59	2	65	65																		
60	2	64	65																		



[a] Note: Results presented in **BOLD** exceed the criteria for all stages operating simultaneously

Table 4.9: Scenario 2: Predicted L_{Aeq} Receptor Noise Levels – Bars, Cafes and Dance-floors Only (midnight-2am)

Receptor Number	Zone	Predicted Noise Level, Midnight – 2am																			
		Predicted[a] dB(A)	Limit dB(A)	S1	S2	S3	S4	S5	S6	S7	S9	V1	V2	V3	V4	V5	V6	V7	V8	V9	V10
1	2	42	45		36			32			26	24	27	33	25	22	31	31	27	22	34
2	2	32	45		26			21			16	16	19	22	17	14	22	22	19	15	24
3	1	**46**	45		40			39			26	33	28	36	26	28	33	33	29	26	40
4	2	25	45		17			12			10	9	13	15	11	9	15	15	13	10	16
5	1	45	45		40			31			31	21	39	31	36	24	32	32	36	30	29
6	1	40	45		34			33			19	30	23	29	21	27	27	27	24	23	34
7	2	44	45		40			31			30	22	36	32	34	23	32	32	34	28	29
8	2	44	45		39			31			30	23	36	31	33	23	32	32	34	27	30
9	2	44	45		39			31			31	23	36	32	33	23	33	33	34	27	31
10	2	28	45		21			12			14	12	19	16	16	11	17	17	17	12	15
11	2	38	45		33			24			24	19	29	26	26	18	26	26	27	21	24
12	1	43	45		37			35			22	29	25	33	23	25	30	30	26	23	36
13	1	43	45		38			35			24	29	26	34	24	24	31	31	26	23	36
14	2	36	45		29			23			21	15	26	23	26	18	25	25	27	21	22
15	1	**46**	45		39			34			28	18	37	32	37	26	34	34	38	31	31
16	1	**46**	45		39			33			31	16	39	30	38	26	33	34	38	31	31
17	2	37	45		31			23			22	20	31	23	28	18	24	24	28	24	22
18	1	42	45		34			34			19	26	30	30	26	28	30	31	23	21	35
19	2	39	45		32			25			22	21	32	23	30	19	24	24	30	27	23
20	1	42	45		38			32			24	26	26	33	24	22	30	30	26	22	34
21	1	43	45		38			33			25	26	27	34	25	22	31	31	27	22	34
22	1	43	45		38			33			26	26	27	34	25	22	31	31	27	22	35
23	1	45	45		37			35			21	37	27	29	27	40	30	30	29	30	31
24	1	43	45		38			34			27	27	28	35	26	23	32	32	28	23	36
25	1	**46**	45		37			38			30	27	31	35	29	26	35	36	31	26	39
26	1	**56**	45		51			47			38	41	39	47	37	33	44	44	39	32	49
27	2	40	45		33			26			23	22	34	25	32	20	25	25	31	29	24
28	2	40	45		33			26			23	22	34	24	32	21	25	25	31	29	24
29	2	34	45		25			26			15	23	19	26	17	20	23	23	19	18	28
30	1	42	45		36			34			21	29	24	32	23	25	29	29	25	23	35
31	1	**47**	45		40			39			24	40	29	30	27	42	30	30	32	36	32
32	2	45	45		37			34			21	37	27	28	26	41	28	28	29	31	31
33	1	**46**	45		41			33			25	25	39	32	38	25	32	32	38	32	29
34	1	43	45		32			28			25	26	39	24	34	24	28	28	34	33	28
35	1	44	45		39			35			25	28	26	34	25	24	32	32	27	23	36
36	2	41	45		34			27			23	22	34	25	32	21	26	26	32	30	24
37	2	41	45		34			27			23	23	34	24	33	22	26	26	32	32	24
38	1	**47**	45		36			34			28	29	41	25	39	27	32	32	39	39	29
39	2	41	45		34			28			22	23	34	23	33	22	26	25	32	33	24
40	1	**46**	45		30			34			26	27	37	28	37	30	33	33	36	41	30
41	2	41	45		34			28			22	23	33	23	32	23	25	25	31	33	24
42	1	**47**	45		39			33			25	29	35	29	35	30	32	32	38	44	30
43	2	40	45		33			28			21	23	32	24	31	23	29	29	30	34	25
44	2	39	45		32			26			19	22	30	22	29	23	23	23	28	33	23
45	2	42	45		33			28			19	25	33	24	28	31	29	29	33	37	26
46	2	40	45		32			27			18	25	32	24	27	26	23	23	27	34	29
47	2	40	45		32			27			18	25	31	24	26	27	23	23	27	34	29
48	2	39	45		32			27			17	25	29	24	26	27	23	23	26	33	29
49	2	38	45		30			26			16	24	29	22	24	27	22	22	24	31	26
50	2	35	45		27			24			14	29	20	21	19	28	20	20	20	20	24
51	2	38	45		29			28			15	31	22	23	21	31	22	23	22	22	27
52	2	37	45		29			27			15	29	27	24	19	28	22	22	21	21	28
53	2	33	45		26			24			13	25	18	21	16	22	19	19	18	18	25
54	2	32	45		25			23			12	22	17	21	15	20	19	19	17	16	25
55	1	**47**	45		39			37			23	39	28	30	28	44	31	31	31	34	33
56	1	**48**	45		38			37			37	26	40	35	37	26	37	37	38	30	36
57	2	42	45		35			33			26	25	28	33	26	22	31	31	28	23	34
58	1	**50**	45		44			39			39	29	41	39	38	28	39	39	40	31	38
59	1	**47**	45		40			31			35	22	39	34	36	28	34	33	41	34	32
60	2	42	45		37			32			25	25	26	33	24	22	30	31	27	22	34

[a] Note: Results presented in **BOLD** exceed the criteria for all stages operating simultaneously

Table 4.10: Scenario 2: Predicted $L_{eq,Oct-63Hz}$ Receptor Noise Levels – Bars, Cafes and Dance-floors Only (midnight-2am)

Receptor Number	Zone	Predicted Noise Level, Midnight – 2am																			
		Predicted[a] $dB_{,Oct-63Hz}$	Limit dB	S1	S2	S3	S4	S5	S6	S7	S9	V1	V2	V3	V4	V5	V6	V7	V8	V9	V10
1	1	58	60																		
2	1	59	60																		
3	2	**59**	55		54			46			41	45	47	50	44	42	45	45	45	43	48
4	1	**61**	60		55			48			43	47	50	52	46	45	47	47	48	46	51
5	1	**66**	60		62			53			49	55	55	57	51	50	52	52	53	51	57
6	2	**60**	55		56			44			44	43	53	49	50	44	45	45	49	45	45
7	1	**62**	60		57			45			45	39	56	49	52	46	47	47	51	48	47
8	1	**62**	60		56																
9	1	60	60																		
10	1	**61**	60		51																
11	1	60	60																		
12	1	60	60																		
13	1	**61**	60		49																
14	2	54	55																		
15	2	**57**	55		48																
16	2	53	55																		
17	1	**64**	60		60																
18	1	**65**	60		59																
19	1	59	60																		
20	2	53	55																		
21	2	48	55																		
22	2	50	55																		
23	2	**56**	55																		
24	2	**57**	55		50																
25	1	**61**	60		42																
26	2	**57**	55		44																
27	2	**58**	55		54			45			40	45	47	49	43	42	44	44	45	43	48
28	2	**58**	55		54			45			41	45	47	49	44	42	45	45	45	43	48
29	2	54	55																		
30	2	55	55																		
31	2	52	55																		
32	1	**61**	60		56			49			40	50	49	51	46	45	46	46	46	46	51
33	1	57	60																		
34	1	58	60																		
35	1	**63**	60		52			48			36	46	56	47	50	52	53	53	42	42	57
36	1	58	60																		
37	1	59	60																		
38	1	59	60																		
39	1	59	60																		
40	1	**63**	60		57			48			47	48	56	52	52	46	48	48	51	47	50
41	1	**62**	60		57			46			43	41	56	51	52	46	47	47	51	48	47
42	1	**61**	60		56			43			44	43	55	49	51	44	45	45	50	47	45
43	1	**63**	60		57			56			41	53	50	48	48	54	47	47	50	49	48
44	2	60	60																		
45	2	**60**	55		55			44			43	45	53	49	49	43	45	45	49	45	45
46	2	**60**	55		56			45			44	45	53	49	49	44	46	46	49	44	46
47	2	**56**	55		51			41			40	42	49	45	45	40	42	42	45	40	42
48	2	**56**	55		50			38			39	42	50	43	46	40	41	41	46	43	41
49	2	**57**	55		50			37			39	44	52	44	48	42	41	41	47	46	43
50	2	**57**	55		50			37			39	44	52	44	48	42	41	41	47	46	43
51	2	**58**	55		50			36			39	45	52	45	49	42	41	41	48	47	43
52	2	**58**	55		49			36			39	45	52	45	49	43	41	41	48	48	43
53	2	**57**	55		48			35			38	45	52	45	49	43	41	41	48	48	44
54	2	**57**	55		46			34			38	45	51	45	48	43	41	41	47	49	44
55	2	**58**	55		45			34			37	44	50	45	48	43	51	51	47	49	43
56	2	**56**	55		43			34			36	44	49	45	47	42	40	40	46	48	43
57	2	**62**	55		43			38			37	44	57	46	46	54	52	52	56	50	44
58	2	**59**	55		43			37			36	44	55	45	45	44	41	41	44	49	53
59	2	**59**	55		44			36			36	44	55	45	45	44	41	41	44	49	53
60	2	**57**	55		44			36			36	44	50	45	44	44	41	41	44	49	53

This prediction is right on the 60dB limit, whereas we have measured noise levels above the ANE levels after midnight. There is no detailed ANE modelling provided compared modelled and measured noise levels for SITG2017 and Falls2016 after midnight. Therefore this seems to be a glaring omission.
So in summary, the predcited/measured levels prior to midnight seem to be reasonably well correlated, but the values after midnight would appear to have a much greater margin of error.

[a] Note: Results presented in **BOLD** exceed the criteria for all stages operating simultaneously

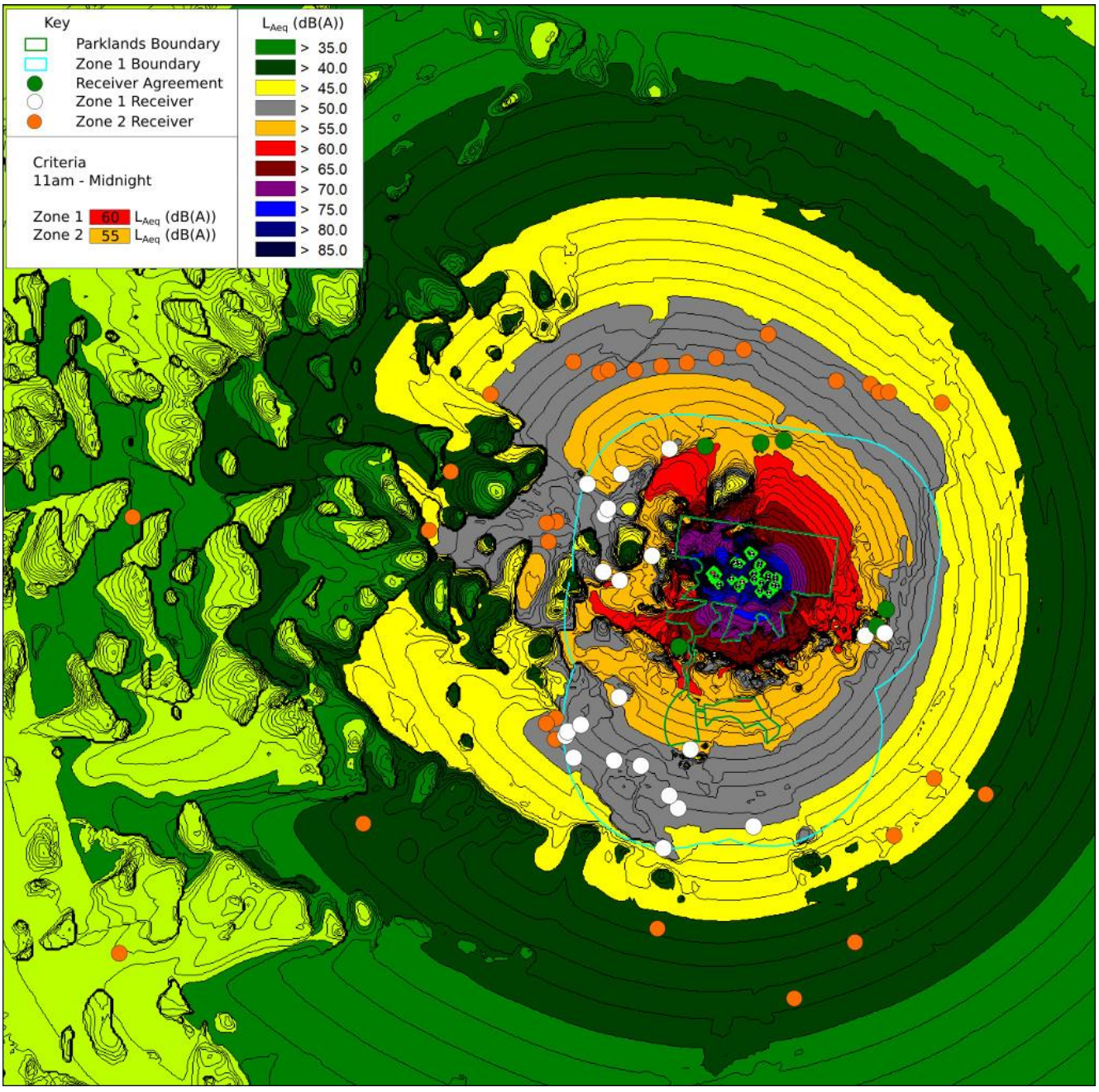


Figure 4.10 - Scenario 2: Noise Contour Plot, 11am – Midnight (dB(A))

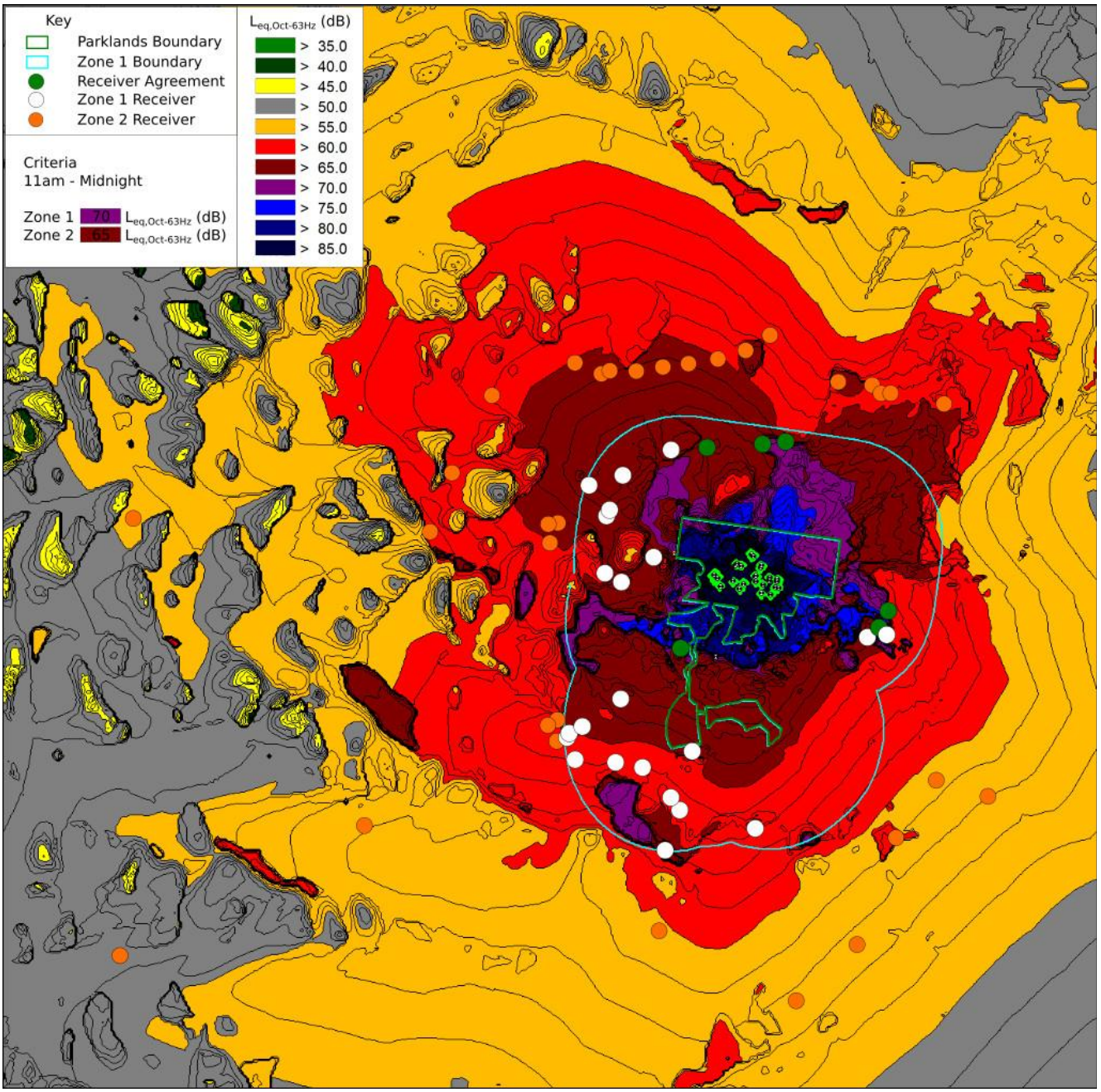


Figure 4.11 - Scenario 2: Noise Contour Plot, 11am – Midnight ($dB_{,Oct - 63Hz}$)

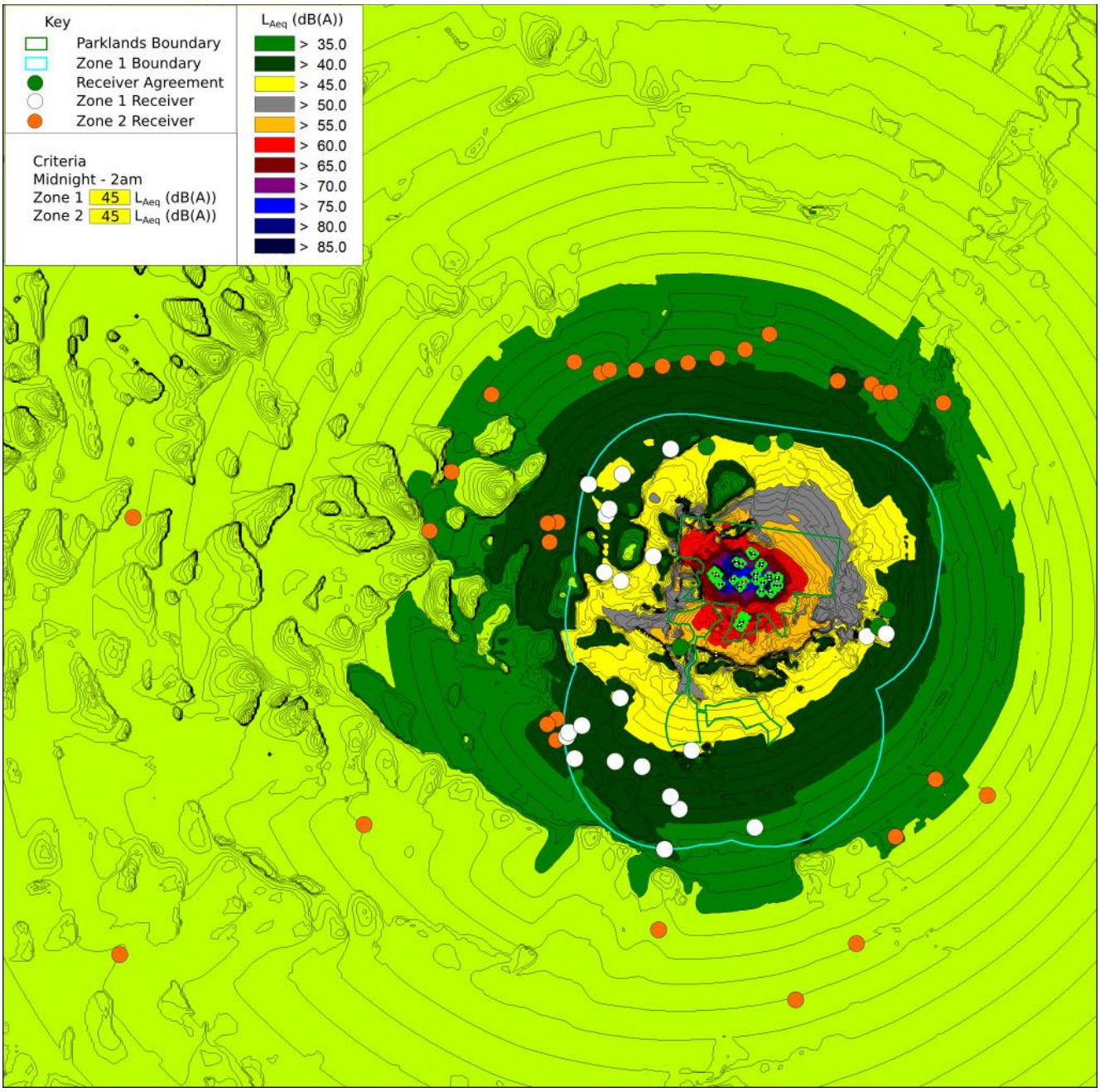


Figure 4.12 - Base Case, Noise Contour Plot, Midnight - 2am (dB(A))

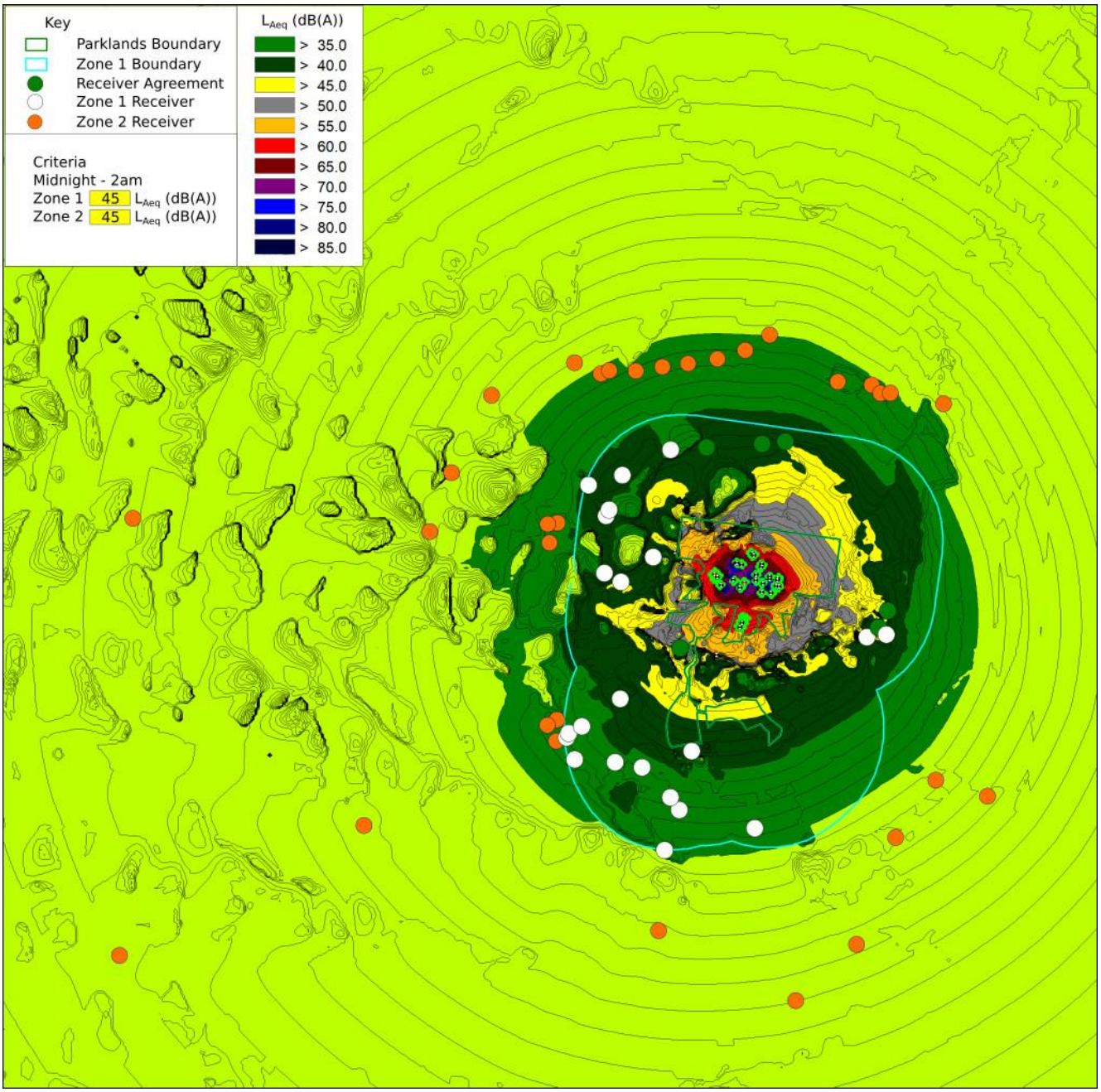


Figure 4.13 - Base Case, Noise Contour Plot, Midnight - 2am ($dB_{,Oct - 63Hz}$)

4.3.3 Discussion of Scenario 2 Modelling Results

4.3.3.1 Full Operations

The results of the predictive noise modelling indicates that from 11 am to midnight where the main stages are operating (cumulatively, in addition to minor stages), compliance with the criteria is predicted for the majority of the modelled sensitive off-site receivers for the worst case meteorological condition. Three (3) of the Zone 1 receivers are predicted to exceed by 1 dB L_{Aeq}, and R5 by 5 dB(A), and 5 of the Zone 1 receivers are predicted to exceed the $dB_{,Oct\text{-}63Hz}$ criteria (4 of these have existing agreements in place). Eleven (11) of the Zone 2 receivers are predicted to exceed the $dB_{,Oct\text{-}63Hz}$ criteria by 1 – 3 dB. Therefore a small adjustment to operating volumes, or consideration of modelling accuracy and meteorological influence, may account for these exceedances. It is noted that, as identified in Table 4.1, some of the modelled sensitive receivers have agreements in place with the Parklands venue, and as a result adjustment of stage noise levels to achieve compliance is not necessarily required for those properties for current events.

For low frequency (Oct-63Hz) noise levels, the results of the modelling indicate that the greatest exceedances of the recommended noise limits are predicted at receptors 5, 43, and 55 at up to 3 dB(A) above the adopted criteria. Two of these have agreements in place, and the other (R55) has been historically measured at various previous events. Based on attended noise measurements at receptors during previous events, exceedances of up to 3 $dB_{,Oct\ 63Hz}$ have been measured (SITG 2017) under adverse source to receptor wind conditions at R55, and adjustments were made to the system to achieve measured compliance. Therefore the modelling calibrates well with previous monitoring data, and equally the attended monitoring demonstrates that the venue is able to manage source noise levels to achieve compliance even under adverse meteorological conditions of this type.

Review of the modelling contour plots indicate that the L_{Aeq} contour extends only to the nearest Zone 2 sensitive receiver areas, and low frequency (Oct-63Hz) contour extends into the Wooyung community to the north-east, with some exceedances of the criteria predicted at elevated landforms to the west.

4.3.3.2 Midnight Until 2am (Bars, Minor Venues)

For the period from midnight to 2am where only bars, cafes and dance floors operate, non-compliance is predicted for 14 receptors for the dB(A) under the worst case meteorological conditions, and exceedances of the $dB_{,Oct\text{-}63Hz}$ criteria at 39 sensitive receivers. Overall the modelling identifies that after midnight a reduction in operating volumes of the minor stages will be required to achieve predicted compliance.

The modelling shows agreement with the site management observations, in that the bass from the Tipi (S2), World (S5) and Smirnoff (V10) venues define the bass levels ($dB_{,Oct\ 63Hz}$) after midnight, and reduction of these sources results in measured compliance to the surrounding areas. Generally these sources are the first point of management for activities between 12 am and 2 am, and have only been a concern under specific adverse meteorological conditions for previous events.

Review of the modelling contour plots indicate that the dB(A) contour extends only to the nearest

Zone 2 sensitive receiver areas, and low frequency (Oct-63Hz) contour extends into the Wooyung community to the north-east, with some spikes above the criteria on surrounding elevated landforms to the west.

4.3.3.3 Comparison To Existing Operations

To allow determination of the change in predicted community noise levels, Figures 4.14 and 4.15 present the changes in predicted noise levels when Scenario 2 (future) is compared to Scenario 1 (existing). This comparison indicates that the increase in predicted L_{Aeq} noise levels at the nearest receptors are typically less than 1 dB(A). For the $L_{Oct\text{-}63\ Hz}$ noise levels are predicted to the north-west (up to 3 dB(A). This is related to noise propagation from the potential inclusion of the Forest stage as a new main stage for future events.

May be reasonably close for 11am to midnight but sketchy between midnight and 2am due to the lack of presentation of investigation of previous modelling/measurement comparison SITG2017 and Falls2016 data.

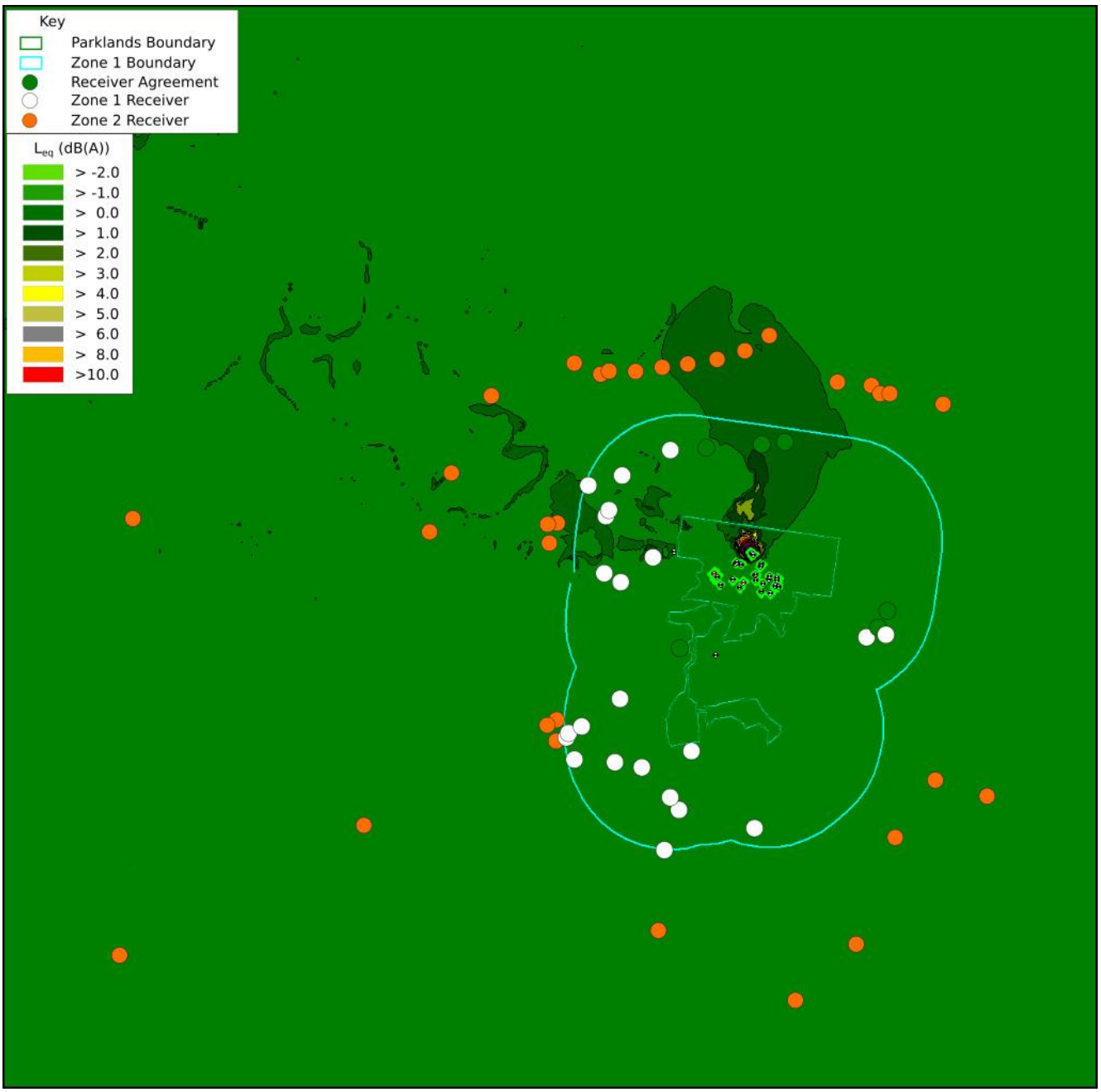


Figure 4.14 - Comparison: Proposed Full Scale Event vs SiTG, 11am – Midnight (L_{Aeq})

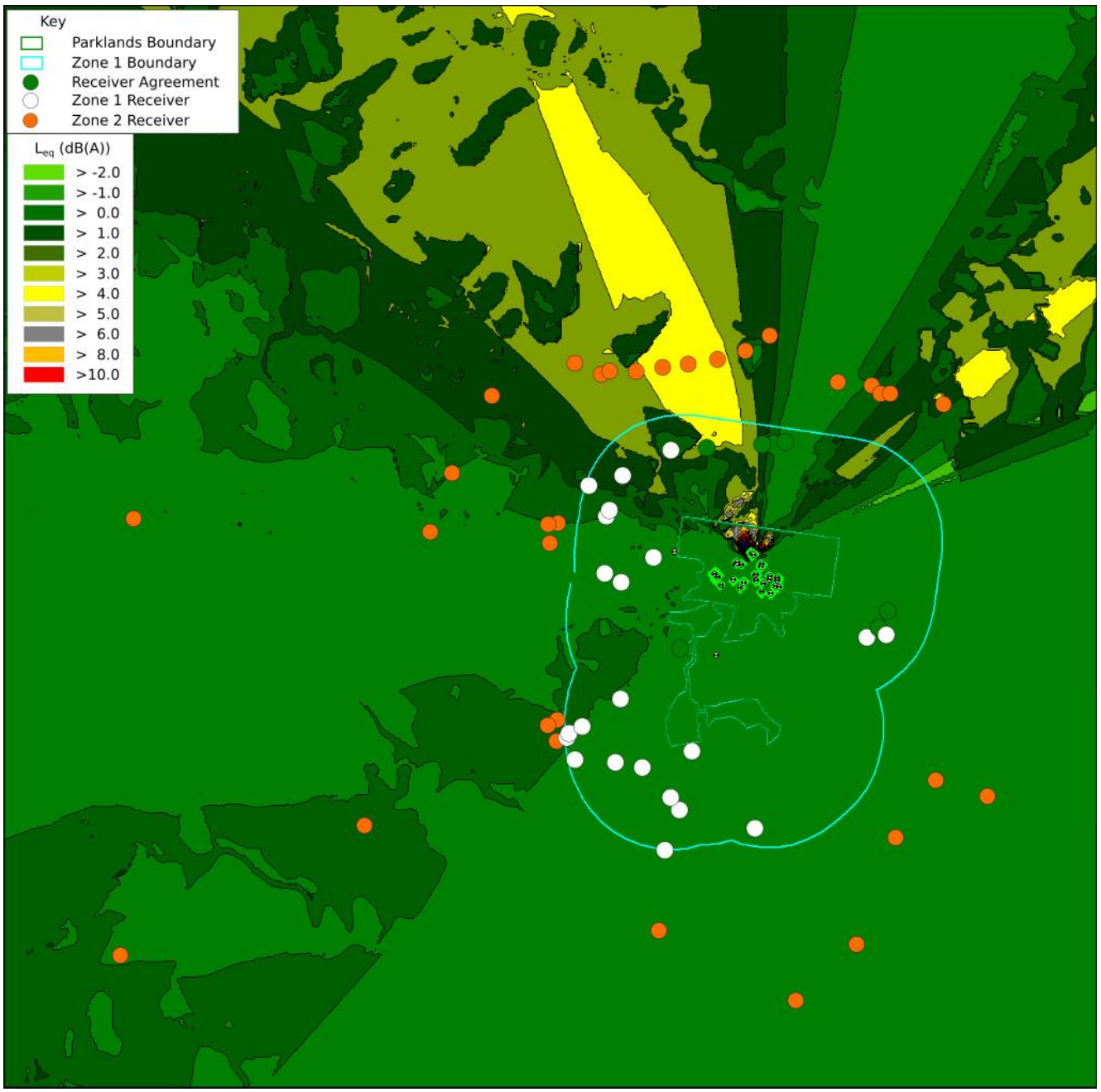


Figure 4.15 - Comparison: Proposed Full Scale Event vs SiTG, 11am – Midnight ($dB_{,Oct\ -\ 63Hz}$)

4.3.3.4 Summary

Overall, the results of the Scenario 2 modelling demonstrate that while exceedance of the L_{Aeq} noise limit is predicted to be 1 dB(A) or less off-site, some increase of the $L_{Oct-63Hz}$ noise levels are predicted, up to 3 dB(C) above the criteria at some locations. Whilst these predictions relate to worst case meteorological conditions, coupled with all noise sources (stages/venues) operating at maximum volumes, experience at previous events demonstrates that these conditions may occur during events

hence must be considered for the proposed permanent operations.

On this basis, analysis of appropriate noise mitigation and management solutions, over and above the mitigation adopted for previous events, has been completed for the proposed permanent layout.

4.3.4 Scenario 3: Mitigation Investigations

Given the identified non-compliance predicted for the proposed development scenario under worst case meteorology, appropriate mitigation measures to address the non-compliances that may occur under these conditions have been considered.

In terms of best practice, and in accordance with the NSW INP, it is also necessary to consider all reasonable and feasible mitigation measures that could be adopted to minimise the impacts of the proposed permanent facility at Parklands.

On this basis, preliminary modelling and analysis of a range of potential – but not necessarily reasonable and feasible mitigation strategies – were considered to assess the opportunity for incorporating physical acoustic controls at the site. The mitigation options considered were as follows:

- Full enclosure of large stages on 3-sides, including absorptive linings (e.g. blockwork behind stage footprint).
- Three sided structures behind large stages, tall enough to shield flown arrays noise to sides and rear (e.g. light-weight panels).
- Investigation of tall barriers, earth berms, or a combination for heights of 5m, 10m and 20m, located to the rear of large stages (S1 Amphitheatre, S3 Forest Stage) to reduce the throw to surrounding area.
- Review of potential to construct fully enclosed buildings to house some stages (especially low-frequency dominant dance music stages).
- Rotation of specific stages to reduce impacts on the surrounding area, specifically rotating the S3 Forest Stage 180 degrees.
- Acquisition of a formal agreement for properties that have the potential to be impacted beyond the criteria.

Due to the surrounding topography and the distances to the surrounding sensitive receptors, barriers and earth mounds at the boundary of Parklands, at intermediate positions or to the rear of specific stages (e.g. S3 Forest) achieved reductions of less than 1 dB even when very tall barriers (up to 20 m) were included. The main reason for this is that the Parklands venue incorporates a large number of discrete sources of amplified music, distributed over a large site. Because of this, no single source dominates the sound propagation to surrounding areas. Therefore providing acoustic barriers at specific locations will only address a small number of sources. Because the noise scale is logarithmic, reducing a small number of noise sources results in only a small reduction in overall noise levels. In addition, the modelling already considers provision of acoustic screening to the rear

of the main stages, which reduces propagation of low frequency noise to the rear of the stages. This also reduces the potential for achieving additional acoustic mitigation by providing barriers at the rear of the main stages. In terms of assessing whether provision of acoustic barriers for the main stages would be considered reasonable and feasible, as a guide, a road traffic noise barrier is only considered effective if it can reduce a minimum of 5 dB(A).

Review of rotating specific stages resulted in increased noise to specific areas, with only a minimal reduction achieved within the area they were previously oriented. For example, the S3 Forest stage is a significant source of noise to the North-West, if rotated to face to the east these noise emission are superimposed on existing noise levels resulting in significant increase in noise levels travelling east to the heavily populated South Golden Beach area.

Full enclosure of venues was not feasible for safety reasons. Construction of permanent stages would provide for some improvement over and above the existing controls at the temporary stages, however Parklands require flexibility in terms of stage locations for the future hence this option was not pursued further. This operational requirement is consistent with the provision of a large scale music festival event which would usually involve provision of stages and venues on a temporary basis, with potential changes in locations occurring over time.

It is important to recognise that the predicted non-compliances for Scenario 2 represent worst case meteorological conditions, hence only specific receptor groups would be affected at any given time. The patterns of meteorology and the frequency of occurrence of these conditions has been considered in detail in Section 3.4. Under favourable meteorological conditions, full compliance would be anticipated. These meteorological conditions (based on analysis of noise complaints relative to wind directions from the Byron Bay Bureau of Meteorology station) are as follows:

- Falls Festival: west, south-west, north-west, east-north-east, south-south-east, south-east;
- SITG: east.

Furthermore, given the temporary nature of events (SITG – 4 days per year, Falls 3 days per year), the cost benefit of large physical structures is significantly less than, for example, for a permanent venue that is utilised on a daily or weekly basis, such as a night club or licensed hotel.

Overall it was found that the current physical mitigation solutions as described in Section 2.2.6.2 represent reasonable and feasible measures that can be implemented by the venue, and achieve noise reductions of 3 dB or more in noise emissions from the venues in specific directions. Given the difficulties associated with the provision of additional physical control solutions, and based on development of a detailed active noise control management process since the first large event was held in 2013, source noise controls are identified as the most appropriate reasonable and feasible noise control strategy to address the potential non-compliances identified for the Scenario 2 acoustic modelling.

4.3.5 Scenario 4: Volume Management Scenario

In order to provide a mitigation solution for the proposed Permanent operations, modelling of the

required FoH volume reductions to each stage (with all stages operating simultaneously, under typical worst-case meteorological conditions) have been determined. The FOH volumes have been iteratively adjusted in the modelling to achieve predicted compliance to all sensitive off-site receivers under worst case meteorological conditions as considered in the acoustic modelling. Table 4.11 presents the resultant reduced FOH noise levels for each stage, to achieve this requirement.

Table 4.11: Modelled Mitigated FOH Noise Levels – All Stages, Bars, Cafes and Dance-floors

Stage	11am - Midnight		Midnight - 2am		Distance (FOH)
	dB(A)	dB(C)	dB(A)	dB(C)	
S1	98	108	-	-	35m
S2	95	105	89	99	16m
S3	99	105	-	-	22m
S4	99	108	-	-	20m
S5	95	105	92	104	10m
S6	99	108	-	-	25m
S7	99	107	-	-	22.5m
S9	91	101	87	99	10m
V1	95	105	94	104	10m
V2	95	105	90	98	10m
V3	95	105	91	102	10m
V4	95	105	92	103	10m
V5	95	104	93	99	10m
V6	95	104	91	99	10m
V7	95	104	92	100	10m
V8	95	105	91	98	10m
V9	95	105	94	101	10m
V10	95	105	94	104	10m

Clearly, for an event to be viable it is critical that the FOH sound levels achieved at each venue within the Parklands site is appropriate for audience satisfaction. Based on experience of previous events at Parklands and other venues, the volumes identified in Table 4.11 are considered to be acceptable levels to ensure a viable outdoor concert event, from a patron perspective.

The lower FOH noise levels are considered necessary under worst-case meteorological conditions, with all stages operating simultaneously. These adjusted FOH levels have proved to be a workable solution under similar circumstances to the worst case modelling, for previous events.

It is also noted that higher volumes for individual stages may be achievable depending which stages are operating concurrently, and similarly under certain meteorological conditions (wind blowing up-wind from the sensitive receiver area it is oriented toward).

Modelling results for the adjusted volumes in Table 4.11 are presented below:

- Tables 4.12 to 4.13 present predicted L_{Aeq} and $L_{eq,Oct\text{-}63Hz}$ receptor noise levels as a result of emissions from the future proposed venue layouts, for amplification between 11 am and midnight.
- Figures 4.16 and 4.17 present predicted L_{Aeq} and $L_{eq,Oct\text{-}63Hz}$ noise contours for amplification between 11 am and midnight (when main stages are operating).
- Tables 4.14 to 4.15 present predicted L_{Aeq} and $L_{eq,Oct\text{-}63Hz}$ receptor noise levels as a result of emissions from the future proposed venue layouts, for amplification between midnight and 2 am.
- Figures 4.18 and 4.19 present predicted L_{Aeq} and $L_{eq,Oct\text{-}63Hz}$ noise contours for amplification between midnight and 2 am (where only bars, cafes and dance floors operate) respectively.

It is noted that after midnight, the weather conditions are typically more stable than daytime, and the predicted values are likely to over-predict by at least 6 dB(A) due to the modelled downwind or inversion conditions. However as discussed in Section 4.2.4, the ISO 9613-2 standard does not provide for a truly calm condition, and a worst-case downwind or light inversion scenario has been considered.

Currently there appears to be a mismatch between measured data and modelling after midnight

Table 4.12: Scenario 4: Predicted Mitigated L_{Aeq} Receptor Noise Levels – All Stages, Bars, Cafes and Dance-floors (11am-midnight)

Receptor Number	Zone	Predicted Noise Level, 11am - Midnight																			
		Predicted[a] dB(A)	Limit dB(A)	S1	S2	S3	S4	S5	S6	S7	S9	V1	V2	V3	V4	V5	V6	V7	V8	V9	V10
1	1	51	60	47	36	36	45	34	44	39	21	29	24	32	23	25	29	29	25	23	35
2	1	53	60	49	39	38	46	35	43	41	25	28	26	34	25	24	32	32	27	23	36
3	2	52	55	48	35	38	44	33	41	41	26	25	28	33	26	22	31	31	28	23	34
4	1	56	60	52	37	41	49	38	46	46	30	27	31	35	29	26	35	36	31	26	39
5	1	**65**	60	61	51	50	58	47	55	55	38	41	39	47	37	33	44	44	39	32	49
6	2	52	55	46	40	45	44	31	39	45	30	22	36	32	34	23	32	32	34	28	29
7	1	54	60	46	39	45	45	33	42	49	31	16	39	30	38	26	33	34	38	31	31
8	1	58	60	56	41	48	45	33	41	48	25	25	39	32	38	25	32	32	38	32	29
9	1	58	60	57	32	40	40	28	34	42	25	26	39	24	34	24	28	28	34	33	28
10	1	60	60	59	36	50	47	34	43	49	28	29	41	25	39	27	32	32	39	39	29
11	1	59	60	55	39	54	50	34	46	52	25	29	35	29	35	30	32	32	38	44	30
12	1	55	60	50	37	42	48	35	49	43	21	37	27	29	27	40	30	30	29	30	31
13	1	57	60	51	39	44	50	37	51	45	23	39	28	30	28	44	31	31	31	34	33
14	2	45	55	42	27	31	37	25	37	31	14	29	20	21	19	28	20	20	20	20	24
15	2	47	55	44	29	33	40	28	40	34	15	29	27	24	19	28	22	22	21	21	28
16	2	44	55	41	26	28	36	24	35	28	13	25	18	21	16	22	19	19	18	18	25
17	1	60	60													28	39	39	40	31	38
18	1	58	60													28	34	33	41	34	32
19	1	53	60													24	31	31	26	23	36
20	2	42	55	40	26	28	33	21	28	28	16	16	19	22	17	14	22	22	19	15	24
21	2	34	55	31	17	18	25	12	20	18	10	9	13	15	11	9	15	15	13	10	16
22	2	39	55	38	21	23	26	13	19	24	14	12	19	16	16	11	17	17	17	12	15
23	2	44	55	39	29	35	36	23	30	37	21	15	26	23	26	18	25	25	27	21	22
24	2	52	55	51	32	44	38	25	32	38	22	21	32	23	30	19	24	24	30	27	23
25	1	60	60	56	30	55	49	34	45	53	26	27	37	28	37	30	33	33	36	41	30
26	2	49	55	46	30	40	41	27	37	39	16	24	29	22	24	27	22	22	24	31	26
27	2	51	55	49	37	37	44	32	40	40	25	25	26	33	24	22	30	31	27	22	34
28	2	51	55	48	36	38	44	32	40	40	26	24	27	33	25	22	31	31	27	22	34
29	2	45	55	42	25	29	38	26	36	31	15	23	19	26	17	20	23	23	19	18	28
30	2	48	55	44	29	33	40	28	40	35	15	31	22	23	21	31	22	23	22	22	27
31	2	42	55	40	25	26	35	23	33	27	12	22	17	21	15	20	19	19	17	16	25
32	1	56	60	51	40	40	49	39	49	44	26	33	28	36	26	28	33	33	29	26	40
33	1	51	60	47	34	35	44	33	44	38	19	30	23	29	21	27	27	27	24	23	34
34	1	52	60	48	37	37	46	35	44	40	22	29	25	33	23	25	30	30	26	23	36
35	1	52	60	47	34	37	46	35	46	40	19	26	30	30	26	28	30	31	23	21	35
36	1	51	60	48	38	37	44	33	41	40	24	26	26	33	24	22	30	30	26	22	34
37	1	52	60	49	38	38	44	33	41	41	25	26	27	34	25	22	31	31	27	22	34
38	1	52	60	49	38	38	45	33	41	41	26	26	27	34	25	22	31	31	27	22	35
39	1	53	60	50	38	39	46	34	42	42	27	27	28	35	26	23	32	32	28	23	36
40	1	57	60	53	38	40	49	37	45	50	37	26	40	35	37	26	37	37	38	30	36
41	1	54	60	44	39	46	47	34	42	49	28	18	37	32	37	26	34	34	38	31	31
42	1	55	60	51	40	49	45	32	40	46	31	21	39	31	36	24	32	32	36	30	29
43	1	58	60	51	40	45	51	39	52	48	24	40	29	30	27	42	30	30	32	36	32
44	2	55	60	50	37	43	48	34	48	43	21	37	27	28	26	41	28	28	29	31	31
45	2	53	55	49	39	45	43	31	39	45	30	23	36	31	33	23	32	32	34	27	30
46	2	54	55	50	39	46	44	31	39	45	31	23	36	32	33	23	33	33	34	27	31
47	2	50	55	48	33	37	37	24	31	37	24	19	29	26	26	18	26	26	27	21	24
48	2	50	55	49	31	41	36	23	30	37	22	20	31	23	28	18	24	24	28	24	22
49	2	54	55	52	33	46	40	26	34	40	23	22	34	25	32	20	25	25	31	29	24
50	2	54	55	52	33	46	40	27	34	40	23	22	34	24	32	21	25	25	31	29	24
51	2	54	55	53	34	47	41	27	35	41	23	22	34	25	32	21	26	26	32	30	24
52	2	55	55	53	34	48	41	28	35	41	23	23	34	24	33	22	26	26	32	32	24
53	2	54	55	52	34	48	41	28	35	41	22	23	34	23	33	22	26	25	32	33	24
54	2	54	55	51	34	48	41	28	35	41	22	23	33	23	32	23	25	25	31	33	24
55	2	54	55	51	33	47	42	28	35	45	21	23	32	24	31	23	29	29	30	34	25
56	2	51	55	49	32	45	40	26	33	39	19	22	30	22	29	23	23	23	28	33	23
57	2	53	55	49	33	45	44	28	40	44	19	25	33	24	28	31	29	29	33	37	26
58	2	51	55	48	32	43	43	27	39	42	18	25	32	24	27	26	23	23	27	34	29
59	2	51	55	48	32	43	43	27	36	43	18	25	29	24	26	27	23	23	27	34	29
60	2	51	55	47	32	42	42	27	36	42	17	25	29	24	26	27	23	23	26	33	29

No change compared to unmitigated

[a] Note: Results presented in **BOLD** exceed the criteria for all stages operating simultaneously

Table 4.13: Scenario 4: Predicted Mitigated $L_{eq,Oct\text{-}63Hz}$ Receptor Noise Levels – Bars, Cafes and Dance-floors Only (11am-midnight)

Receptor Number	Zone	Predicted Noise Level, 11am - Midnight																		
		Predicted[a] $dB_{,Oct\text{-}63Hz}$	Limit dB	S1	S2	S3	S4	S5	S6	S7	S9	V1	V2	V3	V4	V5	V6	V7	V8	V9	V10
1	1	63	70																		
2	1	64	70																		
3	2	64	65																		
4	1	66	70																		
5	1	**72**	70	66	62	60	64	53	62	65	49	55	55	57	51	50	52	52	53	51	56.84
6	2	65	65																		
7	1	66	70																		
8	1	68	70																		
9	1	66	70																		
10	1	68	70																		
11	1	70	70																		
12	1	66	70																		
13	1	66	70																		
14	2	58	65																		
15	2	62	65																		
16	2	58	65																		
17	1	68	70																		
18	1	69	70																		
19	1	64	70																		
20	2	58	65																		
21	2	53	65																		
22	2	55	65																		
23	2	60	65																		
24	2	64	65																		
25	1	70	70																		
26	2	64	65																		
27	2	64	65																		
28	2	64	65																		
29	2	60	65																		
30	2	60	65																		
31	2	58	65																		
32	1	66	70																		
33	1	65	70																		
34	1	64	70																		
35	1	70	70																		
36	1	64	70																		
37	1	64	70																		
38	1	64	70																		
39	1	65	70																		
40	1	66	70																		
41	1	66	70																		
42	1	67	70																		
43	1	**73**	70	59	57	44	68	56	70	44	41	53	50	48	48	54	47	47	50	49	47.63
44	2	65	70																		
45	2	65	65																		
46	2	65	65																		
47	2	61	65																		
48	2	63	65																		
49	2	64	65																		
50	2	64	65																		
51	2	65	65																		
52	2	65	65																		
53	2	64	65																		
54	2	64	65																		
55	2	65	65																		
56	2	61	65																		
57	2	64	65																		
58	2	63	65																		
59	2	63	65																		
60	2	63	65																		

Where are the data values for the rest of the table?

[a] Note: Results presented in **BOLD** exceed the criteria for all stages operating simultaneously

Table 4.14: Scenario 4: Predicted Mitigated L_{Aeq} Receptor Noise Levels – Bars, Cafes and Dance-floors Only (midnight-2am)

Receptor Number	Zone	Predicted Midnight – 2am																				
		Predicted[a] dB(A)	Limit dB(A)	S1	S2	S3	S4	S5	S6	S7	S9	V1	V2	V3	V4	V5	V6	V7	V8	V9	V10
1	1	39	45		30			32			18	28	19	29	21	23	26	27	22	22	34
2	1	41	45		33			33			21	27	21	31	23	22	28	30	24	22	35
3	2	39	45		29			31			23	24	22	30	24	20	28	29	25	22	33
4	1	43	45		31			36			26	27	26	32	27	24	32	33	28	25	38
5	1	**53**	45		45			45			34	40	34	43	35	31	41	42	36	32	48
6	2	41	45		34			29			26	21	31	28	32	21	29	30	31	27	29
7	1	43	45		33			31			28	16	34	27	36	24	30	32	35	31	31
8	1	43	45		35			31			21	25	34	28	37	23	29	30	35	32	29
9	1	40	45		25			27			21	25	34	23	32	22	25	26	31	33	27
10	1	44	45		29			32			25	28	35	23	37	25	29	30	35	39	29
11	1	45	45		33			32			21	29	30	26	33	28	29	30	35	43	29
12	1	43	45		31			33			18	36	22	26	25	39	26	27	26	30	30
13	1	45	45		32			35			20	37	23	27	27	42	27	28	28	33	32
14	2	33	45		20			23			11	28	15	18	18	27	17	18	17	19	23
15	2	34	45		22			26			12	29	18	21	18	26	19	20	17	19	27
16	2	31	45		19			22			10	24	12	19	15	20	16	17	14	16	24
17	1	45	45		37			37			35	29	36	36	36	25	36	36	36	31	36
18	1	44	45		34			30			32	22	34	32	35	26	31	31	38	33	31
19	1	40	45		32			33			20	28	21	30	23	22	28	29	23	22	35
20	2	29	45		19			19			14	16	13	20	15	11	18	19	15	14	23
21	2	22	45		10			11			7	9	7	13	10	5	11	12	9	8	15
22	2	24	45		14			12			11	12	13	14	15	7	13	14	14	10	14
23	2	33	45		23			21			18	15	21	21	24	16	22	23	24	20	21
24	2	36	45		26			23			19	21	27	21	29	17	21	22	27	27	22
25	1	44	45		24			32			22	27	32	26	35	28	30	31	33	41	29
26	2	35	45		24			25			13	24	21	19	22	25	18	19	21	31	24
27	2	39	45		31			30			21	25	21	30	23	19	27	28	24	21	33
28	2	39	45		30			30			22	24	22	29	23	19	28	29	24	21	33
29	2	32	45		18			24			12	22	14	22	16	17	19	20	16	17	27
30	2	36	45		23			26			13	30	17	20	19	29	19	20	19	21	26
31	2	30	45		19			21			9	22	11	18	14	17	15	16	13	15	24
32	1	44	45		34			37			22	33	22	33	25	27	30	31	26	25	39
33	1	38	45		28			31			16	30	17	26	20	25	24	25	20	22	33
34	1	40	45		31			33			19	29	19	29	22	23	26	28	22	22	35
35	1	39	45		27			33			16	26	22	26	24	24	26	27	19	20	34
36	1	39	45		31			31			21	25	20	30	22	20	27	28	23	21	33
37	1	39	45		31			31			22	25	22	30	23	20	28	29	24	21	34
38	1	40	45		31			31			22	25	22	31	24	20	28	29	24	22	34
39	1	40	45		31			32			23	26	23	31	24	21	29	30	25	22	35
40	1	45	45		32			35			33	26	35	31	35	24	34	35	35	30	35
41	1	43	45		32			32			24	17	32	29	36	24	31	32	35	30	30
42	1	42	45		34			30			27	21	34	28	34	22	29	29	33	30	28
43	1	45	45		34			37			21	39	23	27	26	40	27	28	28	35	31
44	2	43	45		31			32			18	36	21	25	25	40	25	26	26	31	30
45	2	40	45		33			29			27	23	31	28	31	21	29	30	31	27	29
46	2	41	45		33			29			27	23	31	28	31	21	29	30	31	27	30
47	2	34	45		26			22			20	19	23	23	24	15	23	24	24	20	24
48	2	34	45		25			21			19	20	25	20	26	15	21	22	25	23	21
49	2	37	45		27			24			20	21	28	22	30	18	22	23	28	28	23
50	2	37	45		27			25			20	21	28	22	30	18	22	23	28	29	23
51	2	38	45		28			25			20	22	29	22	31	19	23	23	29	30	23
52	2	38	45		28			26			20	22	29	21	31	19	23	23	29	31	23
53	2	38	45		28			26			19	23	29	21	31	20	22	23	29	33	23
54	2	38	45		28			26			18	23	28	21	30	20	22	23	28	33	23
55	2	38	45		27			26			17	23	26	21	29	21	25	26	27	33	24
56	2	36	45		26			24			16	22	24	20	27	20	20	21	25	33	22
57	2	39	45		26			25			16	24	26	21	26	26	24	24	27	36	24
58	2	37	45		26			25			15	24	25	21	25	24	20	21	24	34	27
59	2	37	45		26			25			15	24	24	21	25	25	20	21	24	34	27
60	2	37	45		26			25			15	24	23	21	24	25	20	20	23	33	27

[a] Note: Results presented in **BOLD** exceed the criteria for all stages operating simultaneously

Table 4.15: Scenario 4: Predicted Mitigated $L_{eq,Oct\text{-}63Hz}$ Receptor Noise Levels – Bars, Cafes and Dance-floors Only (midnight-2am)

Receptor Number	Zone	Predicted Noise Level, Midnight – 2am																			
		Predicted[a] $dB_{,Oct\text{-}63Hz}$	Limit dB	S1	S2	S3	S4	S5	S6	S7	S9	V1	V2	V3	V4	V5	V6	V7	V8	V9	V10
1	1	54	60																		
2	1	55	60																		
3	2	54	55																		
4	1	57	60																		
5	1	**63**	60		55			53			49	55	45	54	49	42	46	46	43	46	55
6	2	55	55																		
7	1	56	60																		
8	1	56	60																		
9	1	55	60																		
10	1	57	60																		
11	1	56	60					Values?													
12	1	57	60																		
13	1	57	60																		
14	2	51	55																		
15	2	52	55																		
16	2	50	55																		
17	1	60	60																		
18	1	59	60																		
19	1	55	60																		
20	2	49	55																		
21	2	44	55																		
22	2	45	55																		
23	2	50	55																		
24	2	52	55																		
25	1	56	60																		
26	2	53	55																		
27	2	54	55																		
28	2	54	55																		
29	2	50	55																		
30	2	52	55																		
31	2	49	55																		
32	1	57	60																		
33	1	54	60																		
34	1	55	60																		
35	1	59	60																		
36	1	54	60																		
37	1	54	60																		
38	1	55	60																		
39	1	55	60																		
40	1	58	60																		
41	1	57	60																		
42	1	55	60																		
43	1	59	60																		
44	2	56	60																		
45	2	55	55																		
46	2	55	55																		
47	2	51	55																		
48	2	51	55																		
49	2	52	55																		
50	2	52	55																		
51	2	53	55																		
52	2	53	55																		
53	2	53	55																		
54	2	52	55																		
55	2	53	55																		
56	2	51	55																		
57	2	55	55																		
58	2	54	55																		
59	2	54	55																		
60	2	54	55																		

[a] Note: Results presented in **BOLD** exceed the criteria for all stages operating simultaneously

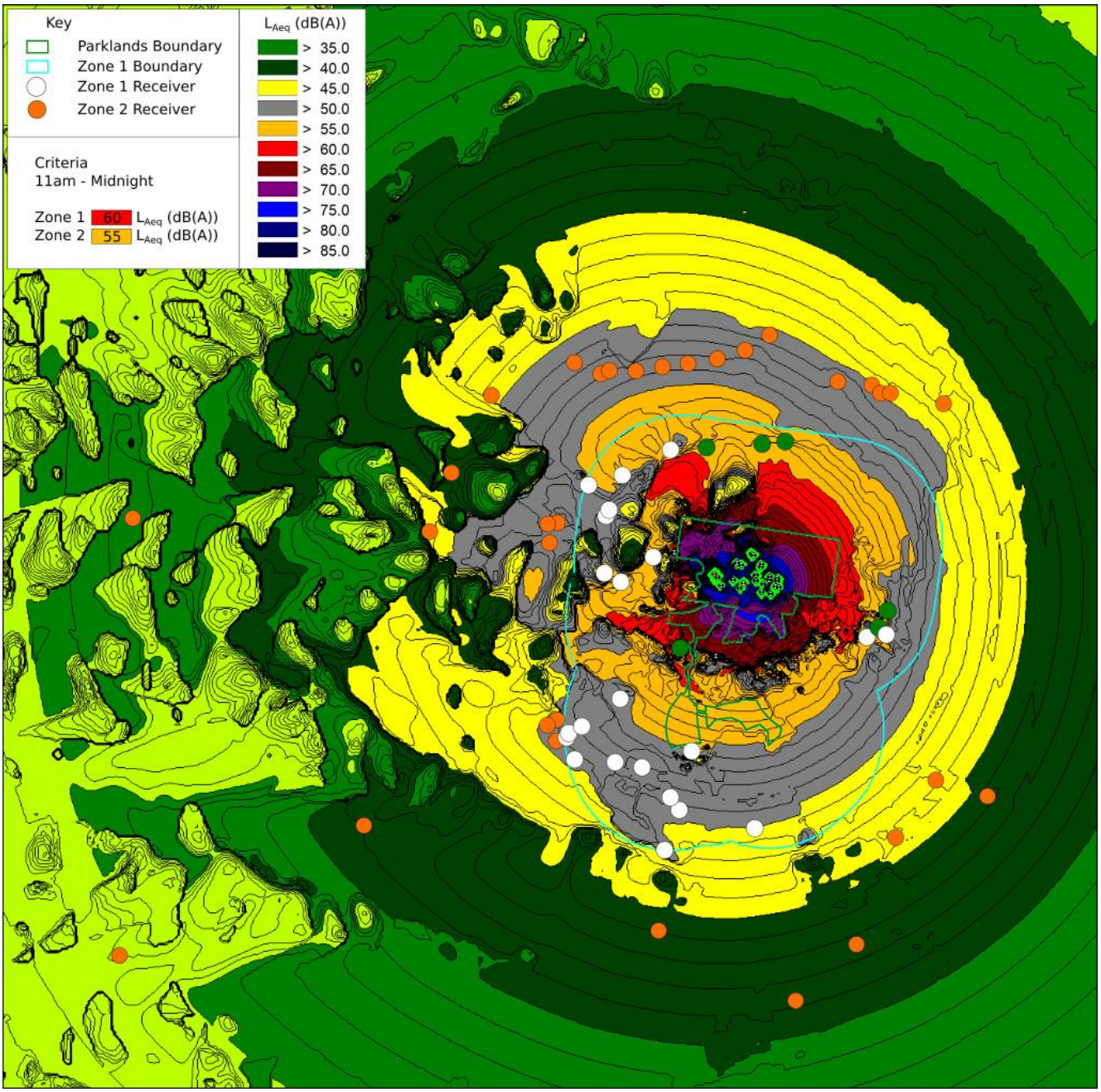


Figure 4.16 - Mitigated Case, Noise Contour Plot, 11am – Midnight (dB(A))

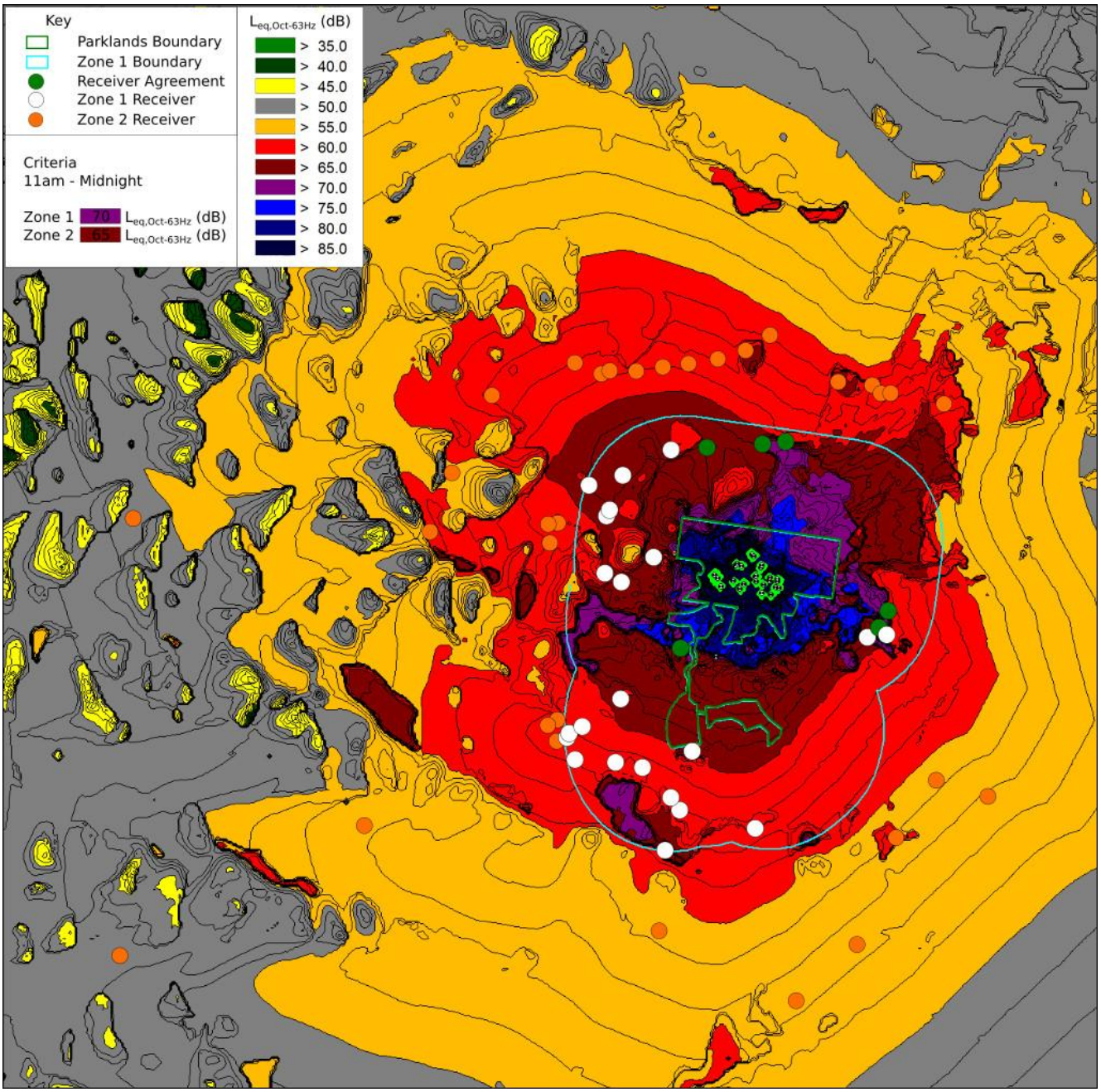


Figure 4.17 - Mitigated Case, Noise Contour Plot, 11am – Midnight ($dB_{,Oct - 63Hz}$)

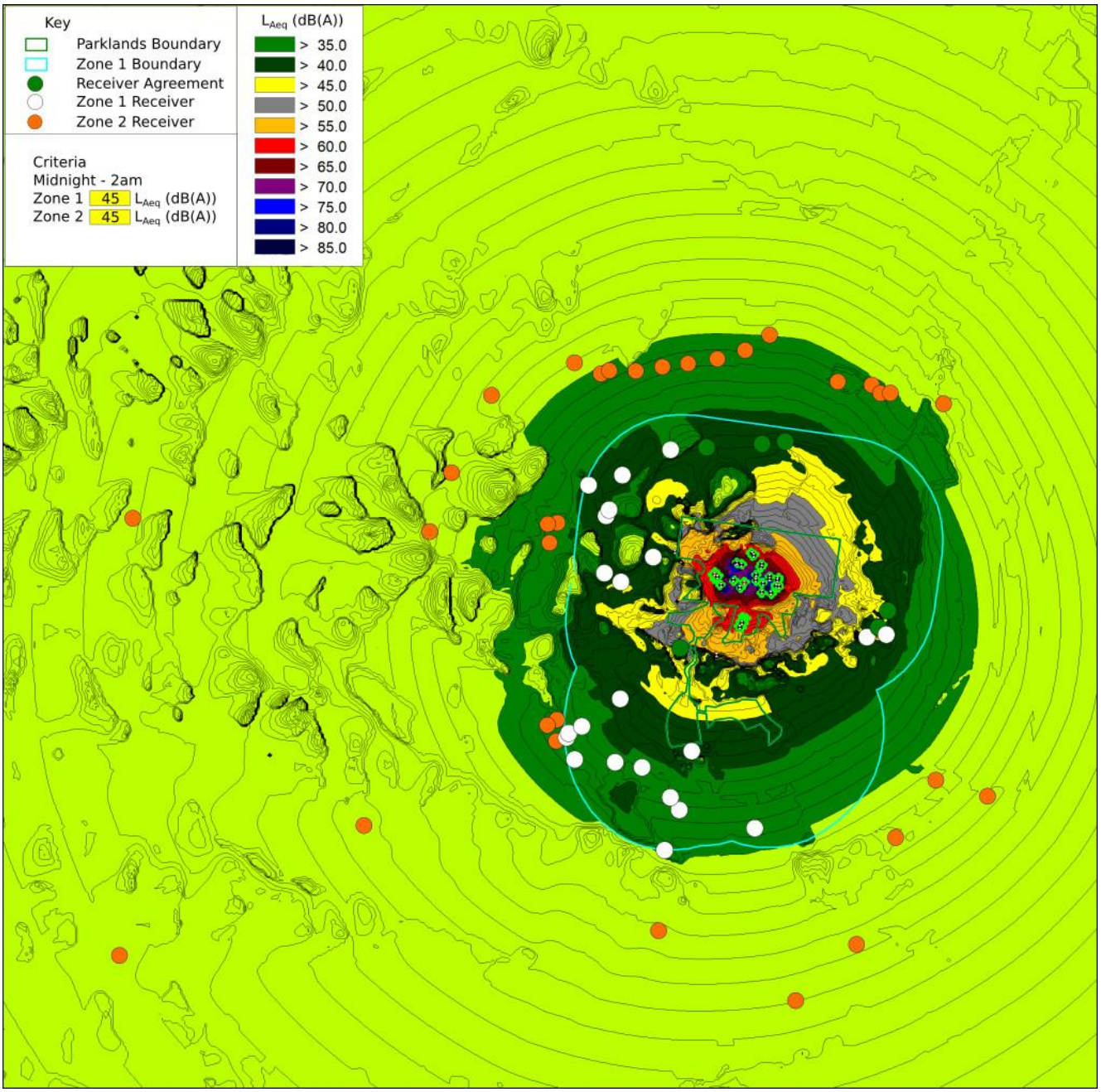


Figure 4.18 - Mitigated Case, Noise Contour Plot, Midnight - 2am (dB(A))

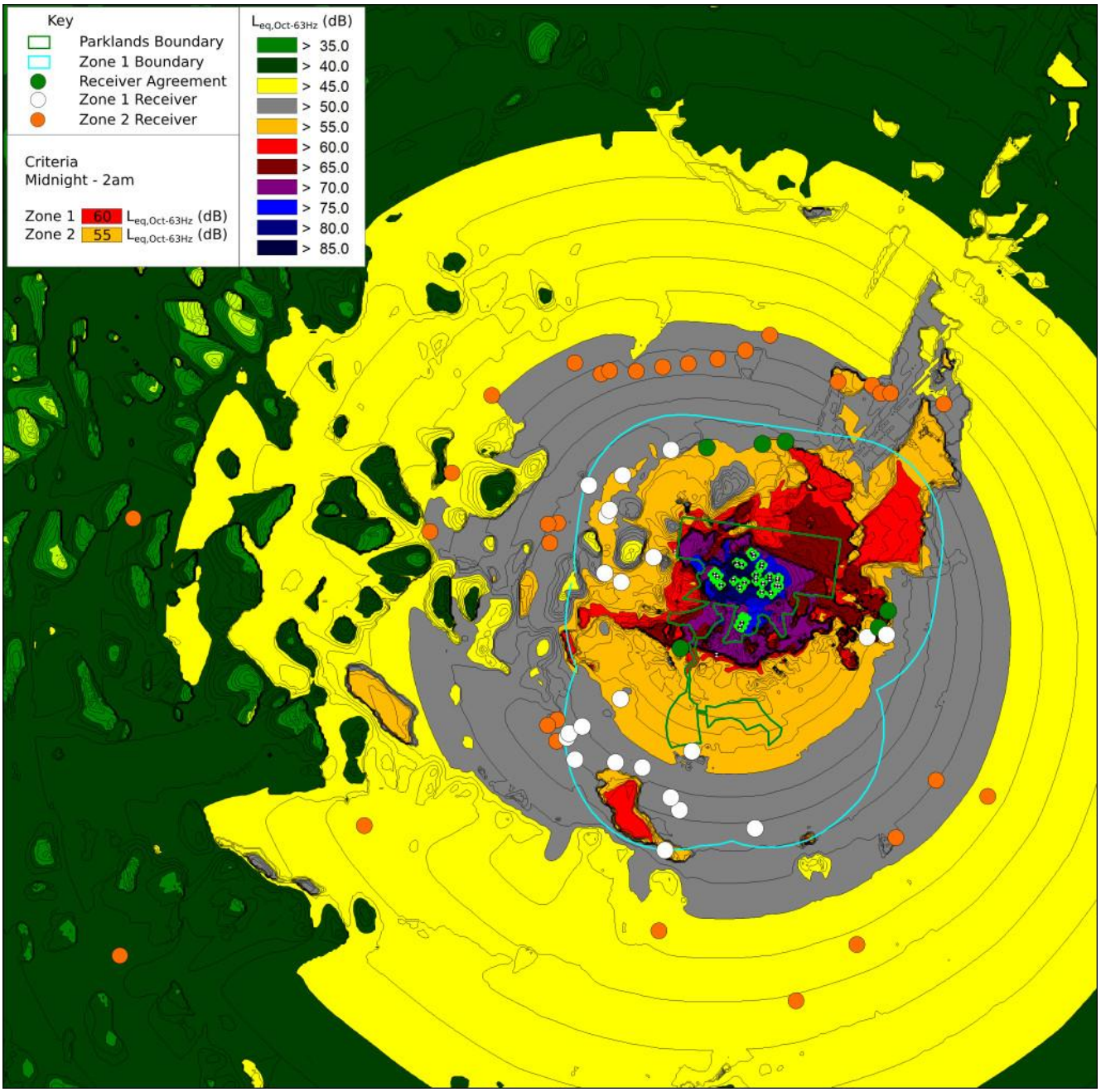


Figure 4.19 - Mitigated Case, Noise Contour Plot, Midnight - 2am ($dB_{,Oct - 63Hz}$)

4.3.6 Discussion of Mitigated (Volume) Modelling Results

4.3.6.1 Full Operations

The results of the mitigated (adjusted volume) noise modelling indicates that from 11am to midnight where the main stages are operating (cumulatively, in addition to minor stages), compliance with the criteria are predicted for the majority of the modelled sensitive off-site receivers for the unfavourable meteorological condition. There are minor exceedances predicted for Receptor 5 (2 dB(A)) and 43 (3 dB(A)) within Zone 1. Receptors 5 and 43 currently have noise agreements in place which would extend to the permanent approval.

Review of the modelling contour plots indicate that the dB(A) contour extends only to the nearest Zone 2 sensitive receiver areas, and low frequency (Oct-63Hz) contour extends toward the Wooyung community to the north-east, with some elevated levels above the criteria occurring on surrounding elevated landforms to the west.

4.3.6.2 Midnight Until 2am (Bars, Minor Venues)

For the period from midnight to 2 am where only bars, cafes and dance floors operate, compliance with the dB(A) criteria are predicted for the majority of sensitive off-site receivers for the predicted typically unfavourable meteorological condition, and small exceedances of the $dB_{,Oct\text{-}63Hz}$ criteria. Overall the modelling identifies that after midnight a reduction in operating volumes of the minor stages will be required to achieve predicted complian

Still have correlation issues between measured and modelled after midnight so these assertions are debatable for R12

It is noted that an 8 dB exceedance is predicted at Re is not feasibly treated through management of volumes or stage mitigation. This has been identified and an agreement was entered with Receptor 5 which will extend to the permanent approval.

The modelling shows agreement with the site management observations, in that the bass from the Tipi (S2), World (S5) and Smirnoff (V10) venues define the bass levels ($dB_{,Oct\ 63Hz}$) after midnight, and reduction of these sources results in measured compliance to the surrounding areas.

Needs to be better checked by ANE to determine why there are particular issues after midnight

Generally these sources are the am and 2 am, and only a concern under specifi

Review of the modelling contour plots indicate that the dB(A) contour extends only to the boundary of Zone 1 sensitive receiver areas, and low frequency (Oct-63Hz) contour extends into the Wooyung community to the north-east, with some spikes above the criteria on surrounding elevated landforms to the west.

4.3.6.3 Mitigated Scenario Compared To Existing Operations

To allow determination of the change in predicted community noise levels, Figures 4.20 and 4.21 present the changes in predicted noise levels when the mitigated Scenario 2 (future) is compared to the existing base case (Scenario 1). This comparison indicates that the increase in predicted L_{Aeq} noise levels at the nearest receptors are typically less than 1 dB(A). For the $L_{Oct\text{-}63\ Hz}$ predictions there is a significant reduction in noise levels relative to the unmitigated Scenario 2, with increases of up to 3 dB(A) relative to the existing scenario. In particular, noise increase to the north are now less

than 1 dB for the majority of receptors.

In addition to adopting the reduced stage noise levels as presented in Table 4.11, active noise monitoring and management as defined in the existing Noise Management Plan for Parklands will need to be adopted to ensure full compliance at all receptors. As discussed in Section 3, the Noise Management Plan has proved to be effective in achieving full compliance with the current noise criteria for the majority of large events held at Parklands, including SITG 2017, 2016 and Falls 2016.

Not true, refer to earlier comments regarding compliance

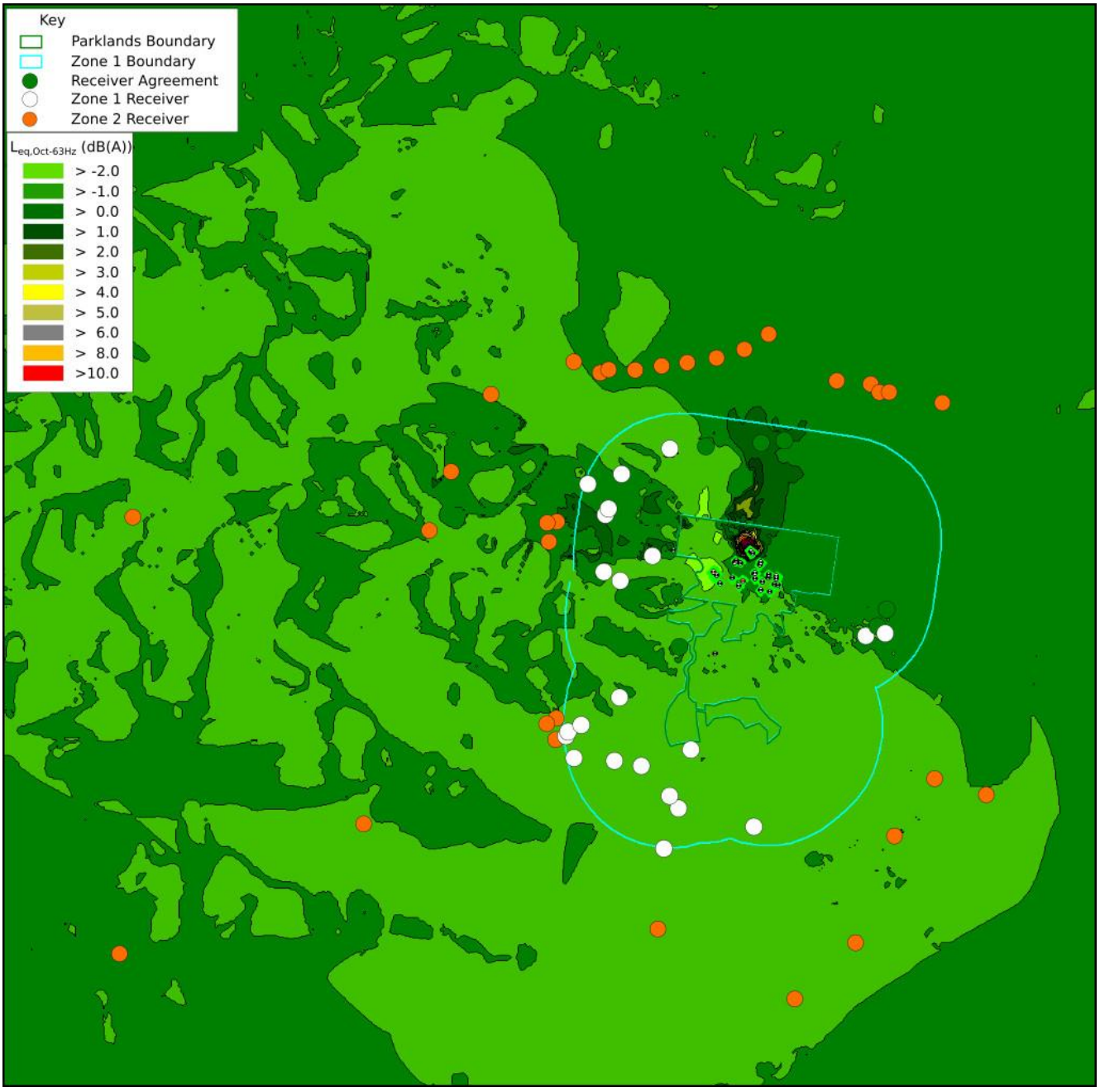


Figure 4.20 - Comparison: Mitigated Proposed Full Scale Event vs SiTG, 11am – Midnight (dB(A))

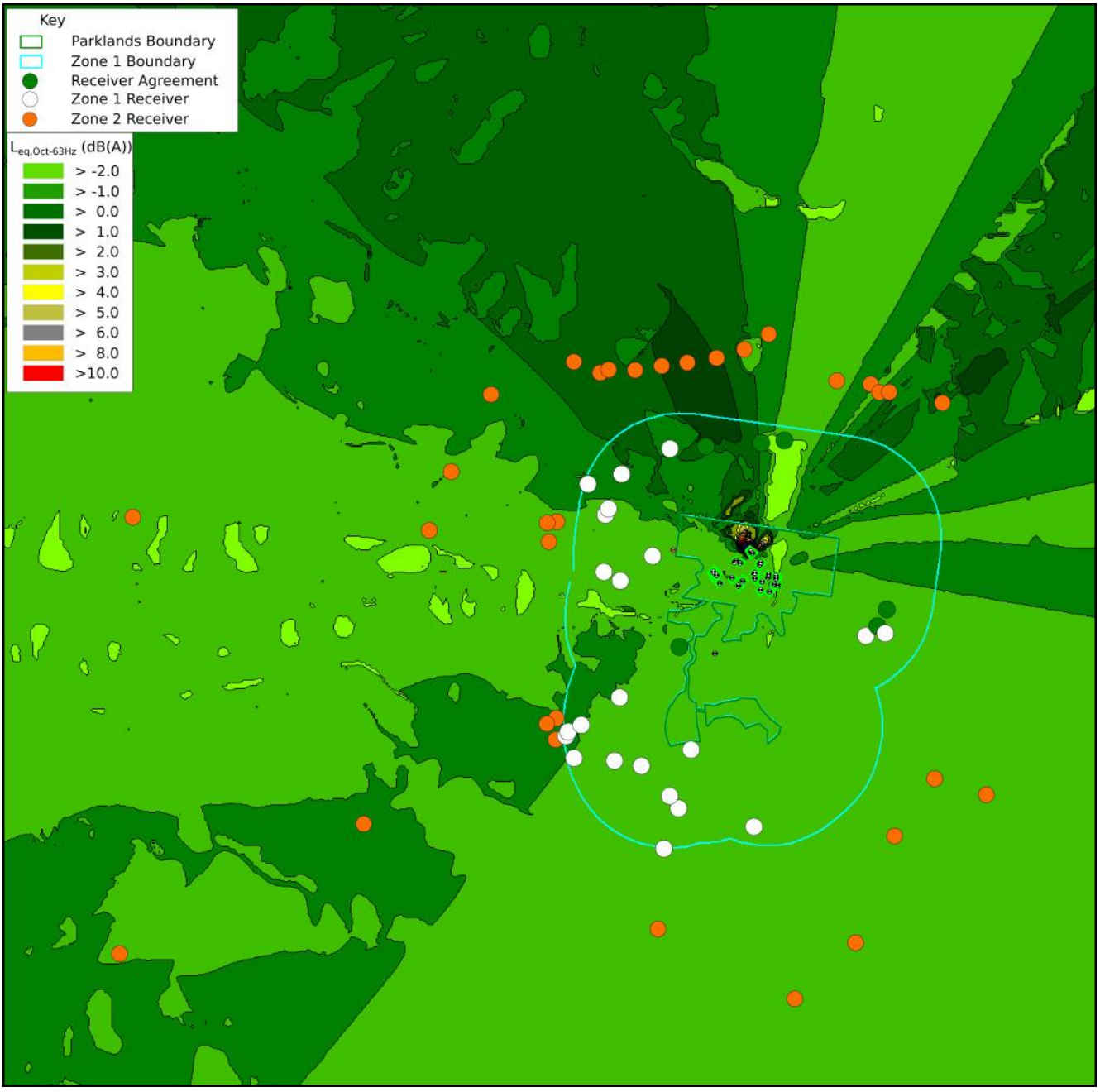


Figure 4.21 - Comparison: Mitigated Proposed Full Scale Event vs SiTG, 11am – Midnight ($dB_{,Oct - 63Hz}$)

4.3.6.4 *Summary*

Overall, the results of the predicted noise modelling combined with historical management and noise measurements, indicate that, with the adopted noise limits, noise emissions from the venue are able to be managed to achieve compliance at the vast majority of nearby sensitive receptors while achieving an appropriate acoustic level within the performance venue. For two receivers on Jones Road, located on elevated ground in close proximity to the venue, non-compliance is predicted for the mitigated modelling scenario. However, noise agreements are in place for these two receptors, hence is proposed to be adopted as the future management strategy for these properties. Alternatively, should noise agreements not prove possible. minor additional adjustments to the operating volume of specific stages will be completed under worst case meteorological conditions for these properties to allow the acoustic criteria to be achieved through active noise management measures during live entertainment events. This approach is documented in the current Noise Management Plan for Parklands, and the effectiveness of this strategy has been demonstrated in the full compliance achieved with noise criteria for the most recent events held at Parklands.

Once again not true, based on measured data at R12

5 Ancillary Noise Sources

5.1 Fixed Plant and Equipment

During large events at Parklands, there are additional noise sources occurring as part of the event activities. A significant noise sources is that of lighting generators throughout the site, which have the potential to operate after midnight and 2 am time period. Some small scale generators operate power to the commercial vendors and areas of the site, however they are generally smaller scale.

It is noted that in addition to the lighting towers, there are generators located at the large event stages, however these are all powered down after completion of entertainment. During the event, noise emissions from the stages are typically 10 dB or more higher. Therefore, it is not considered necessary to consider the generators in the noise assessment.

Modelling of the most commonly installed diesel power light towers has been completed for the larger scale event (Splendour in the Grass). Table 5.1 presents an average measured Sound Power Level (SWL) for a typical diesel powered light tower utilised at the Parklands festival events, and Figure 5.1 presents the modelled locations. It is noted that the barrel light towers are not typically diesel powered, and operate at a much lower volume. As a conservative assumption, all light towers have been modelled as the louder units.

Modelling results for stable conditions or a light inversion for the identified surrounding sensitive receivers are presented in Table 5.2. The adopted criteria is based on the historic ambient noise data, having an Assessment (ABL[16]) or Rating Background Level (RBL) as low as 30 dB(A), targeting background plus 5 dB(A) to minimise impacts, based on the NSW Industrial Noise Policy guidelines for noise from continuous noise sources.

Table 5.1: Light Towers – Sound Power Level (SWL) dB

Source	1/1/ Octave Frequency Band (Hz)									Total	
	31.5	63	125	250	500	1000	2000	4000	8000	dB(A)	dB(Lin)
Diesel Light Tower	101	108	99	87	83	79	77	72	64	88	110

16 Determination of the assessment background level is by the tenth percentile method described in Appendix B of the NSW Industrial Noise Policy

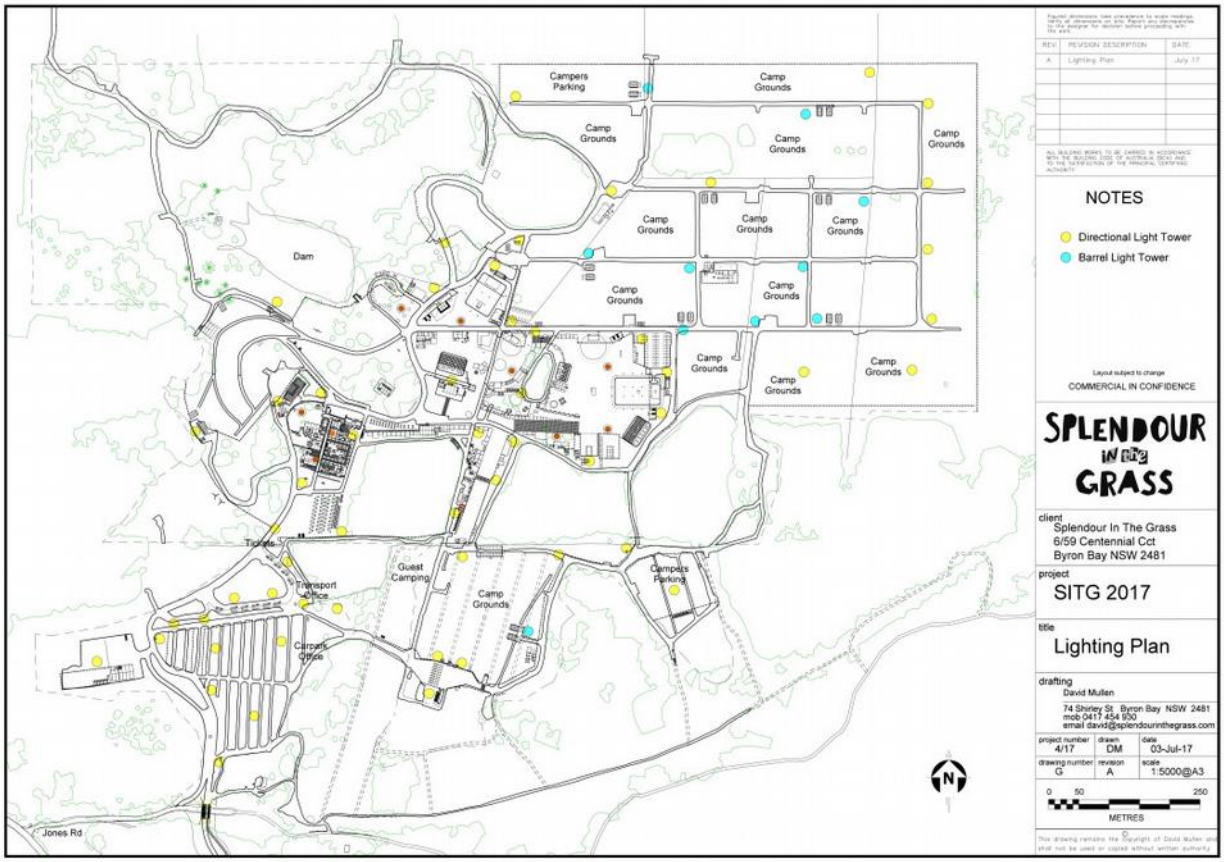


Figure 5.1 - Modelled Diesel powered Light Towers*

* Note: Additional towers located at the entry to Jones Road, and the venue entry points

Table 5.2: Predicted L_{Aeq} Receptor Noise Levels – Diesel Light Generators

Receptor Number	Zone	Predicted L_{Aeq} (dB(A))	Criteria
1	1	21	35
2	1	24	35
3	2	20	35
4	1	27	35
5	1	34	35
6	2	20	35
7	1	20	35
8	1	20	35
9	1	20	35
10	1	22	35
11	1	27	35
12	1	22	35
13	1	26	35
14	2	15	35
15	2	16	35
16	2	14	35
17	1	29	35
18	1	27	35
19	1	26	35
20	2	12	35
21	2	7	35
22	2	9	35
23	2	15	35
24	2	16	35
25	1	26	35
26	2	23	35
27	2	19	35
28	2	19	35
29	2	14	35
30	2	17	35
31	2	13	35
32	1	31	35
33	1	21	35
34	1	22	35
35	1	23	35
36	1	20	35
37	1	20	35
38	1	20	35
39	1	21	35
40	1	22	35
41	1	21	35
42	1	20	35
43	1	26	35
44	2	27	35
45	2	19	35
46	2	20	35
47	2	19	35
48	2	15	35
49	2	17	35
50	2	17	35
51	2	18	35
52	2	20	35
53	2	20	35
54	2	19	35
55	2	20	35
56	2	17	35
57	2	22	35
58	2	18	35
59	2	19	35
60	2	18	35

Review of the predicted results for operating of diesel powered lighting towers indicates full compliance with the INP criteria.

Management to ensure the impacts of specific sources are not contributing to a cumulative impact concurrent with event noise, it is recommended to the select quietest feasible plant, and appropriate orientation of plant in locations with nearby sensitive receivers should be adopted to minimise impacts.

Overall the predicted impact from diesel powered lighting towers through the venue is minimal, which is consistent with the post 2 am noise measurements completed for historic events at the Parklands venue.

5.2 Conference Centre Use

5.2.1 Introduction

The Parklands Venue, in addition to the festival event noise, is currently proposing the inclusion of a conference centre at the location shown in Figure 5.2. The conference centre is proposed to be utilised throughout the year, and operational sources of noise may include:

- amplified entertainment or announcements (e.g. music or presentations);
- vehicle movements (including car door closures);
- outdoor activities; and
- mechanical plant and equipment.

The potential noise impacts associated with these sources is considered in the following sections.

5.2.2 Continuous Noise Sources

Modelling of typical split system air conditioning (a/c) units has been considered for each building proposed within the conference centre development, as well as refrigeration plant to the roof of the conference centre buildings. It is noted that there is a preference for the accommodation units to be naturally ventilated, however modelling has considered the potential for a/c systems to be provided to each building to provide a conservative assessment. Table 5.3 presents an average measured Sound Power Level (SWL) for typical mechanical plant items, and Figure 5.2 presents the proposed layout. Modelling has assumed the plant items are all running concurrently, and continuously.

The adopted criterion is based on the historic ambient noise data, which indicates an Assessment Background Level (ABL[17]) or Rating Background Level (RBL) as low as 30 dB(A). This results in a criterion of background plus 5 dB(A), or 35 dB(A), to minimise impacts, as per the NSW Industrial Noise Policy guidelines for noise from continuous noise sources.

Modelling results for worst case meteorological conditions for the surrounding sensitive receivers are

17 Determination of the assessment background level is by the tenth percentile method described in Appendix B of the NSW Industrial Noise Policy

presented in Table 5.4. An additional sensitive receiver has been included to predict the noise level at the boundary of Receptor 18 (the nearest property).

Table 5.3: Conference Centre Mechanical Plant – Sound Power Level (SWL) dB

Source	1/1/ Octave Frequency Band (Hz)									Total	
	31.5	63	125	250	500	1000	2000	4000	8000	dB(A)	dB(Lin)
A/C Condenser	85	85	86	81	71	69	67	65	65	78	91
Refrigeration Plant	99	99	100	95	85	83	81	79	79	92	105

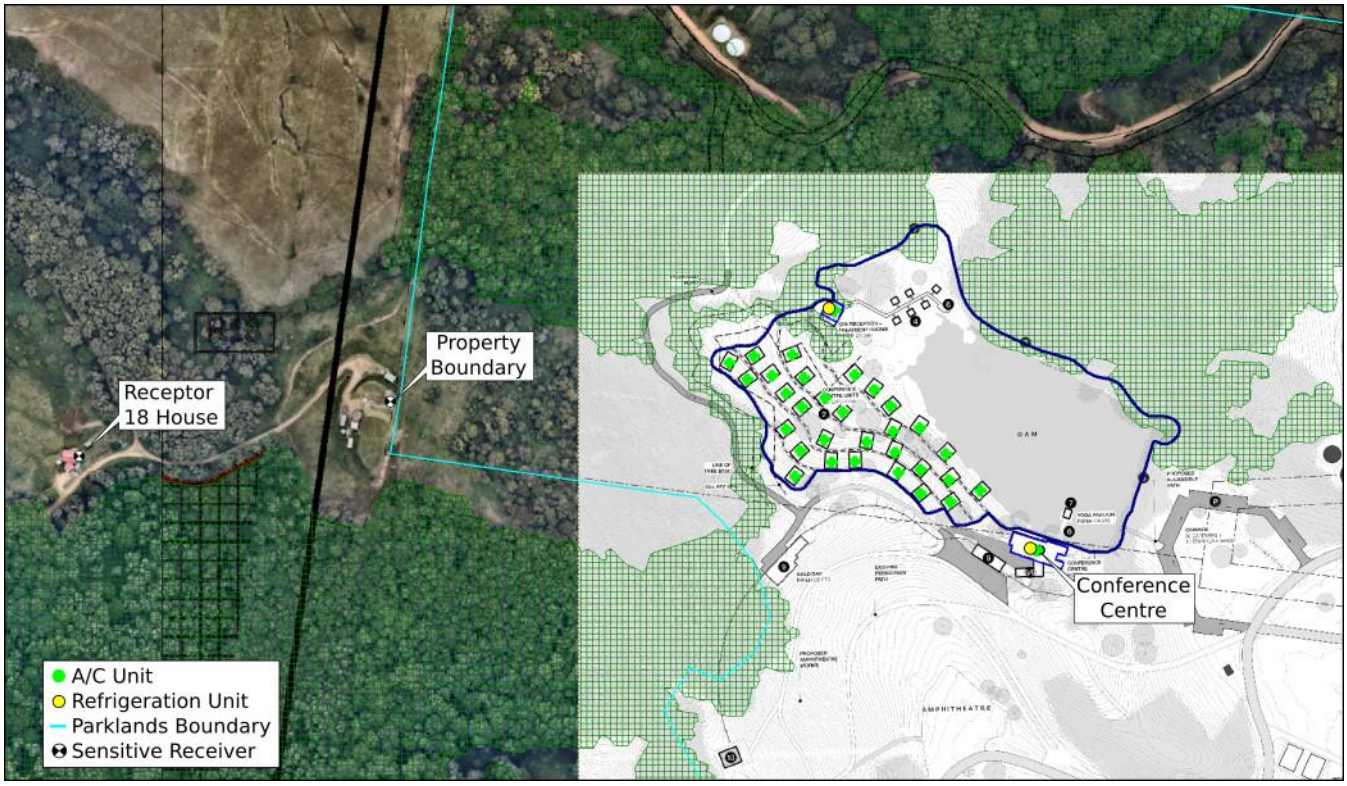


Figure 5.2 - Conference Centre Layout Plan and Modelled Sources

Table 5.4: Predicted L_{Aeq} Receptor Noise Levels – Conference Centre Mechanical Plant

Receptor Number	Zone	Predicted L_{Aeq} (dB(A))	Criteria
1	1	14	35
2	1	15	35
3	2	13	35
4	1	16	35
5	1	24	35
6	2	17	35
7	1	17	35
8	1	18	35
9	1	21	35
10	1	22	35
11	1	21	35
12	1	17	35
13	1	18	35
14	2	10	35
15	2	11	35
16	2	8	35
17	1	18	35
18	1	21	35
18 – Boundary	1	28	35
19	1	15	35
20	2	6	35
21	2	1	35
22	2	4	35
23	2	10	35
24	2	15	35
25	1	21	35
26	2	13	35
27	2	13	35
28	2	13	35
29	2	8	35
30	2	12	35
31	2	7	35
32	1	17	35
33	1	13	35
34	1	15	35
35	1	12	35
36	1	14	35
37	1	14	35
38	1	14	35
39	1	14	35
40	1	17	35
41	1	19	35
42	1	18	35
43	1	18	35
44	2	17	35
45	2	17	35
46	2	17	35
47	2	13	35
48	2	13	35
49	2	16	35
50	2	16	35
51	2	17	35
52	2	17	35
53	2	17	35
54	2	17	35
55	2	17	35
56	2	15	35
57	2	16	35
58	2	15	35
59	2	15	35
60	2	15	35

Review of the predicted results for all mechanical plant at the proposed conference centre operating simultaneously, results in compliance for all off-site sensitive areas, including the boundary of the nearest property.

If mechanical plant with SWL higher than those provided in Table 5.3 are proposed, minor treatments may be required to maintain compliance to off-site areas. However, even the most impacted existing sensitive receiver is predicted to remain 9 dB(A) below the INP criteria, hence there is some scope for slightly higher source noise levels from specific plant, providing the noise from all plant sources combined does not increase by more than 9 dB.

5.2.3 Combined Activities at Conference Centre

5.2.3.1 Overview

The proposed conference facility is located in excess of 450 m from the nearest off-site receptor and is shielded by terrain. Generally activities at the centre will be located within the air conditioned Conference Centre building hence the risk off-site noise impacts is low. During specific periods, there is potential for activities to occur external to the building, therefore an assessment of the potential noise impacts during these periods has been completed. In addition, the risk of noise associated with patron vehicles accessing the car parking area has been considered.

To provide for a complete overview of potential noise sources, and to provide for a conservative assessment of the risk of impacts, all potential sources have been considered to operate simultaneously. The sources included in the acoustic modelling are as follows:

- all assumed plant and equipment (as per Section 5.1);
- 180 patrons at conference centre, in external areas;
- 30 patrons utilising the nature walk or gardens area;
- 30 patrons within the accommodation area;
- 2 cars driving (L_{Aeq}) or car door slams (L_{Amax}) in car park area, and
- 2 speakers operating in an open area at a sound power level 10 dB above the level of patrons.

Noise source data used in the modelling is based on measured spectrum data from ANE's in-house noise database and predictive equations for crowd noise presented in 'Prediction of Noise from Small to Medium Sized Crowds' (Proceedings of Acoustics 2011)[18]. The Acoustics 2011 paper provides equations for predicting the sound power level of crowds as a function of crowd size. The equations are based on measured data for a range of crowd sizes (6 to 93 people) in various outdoor settings (restaurants, cafes, churches, RSL clubs, etc). For the purpose of the study, three groups of patrons (group sizes of 100, 50 and 30 people) have been considered for the conference centre. The model has also considered 30 people at the nature walk area and external to the accommodation area.

18 Hayne, M.J. Et al, Prediction of Noise from Small to Medium Sized Crowds, Paper Number 133, Proceedings of Acoustics 2011.

This is a conservative assumption as the facility is recommended to cater to a total of 180 people.

Table 5.5 presents the adopted Sound Power Levels (SWL) for the ancillary activities at the proposed Conference Centre, and Figure 5.3 presents the modelled source noise locations

The modelling has also included all continuous noise sources from Section 5.1.

Table 5.5: Conference Centre Activities Sources – Sound Power Level (SWL) dB

Source	1/1/ Octave Frequency Band (Hz)									Total	
	31.5	63	125	250	500	1000	2000	4000	8000	dB(A)	dB(Lin)
L_{A10} / L_{Aeq} sources											
Vehicle Movement	67	67	79	71	76	76	76	74	68	82	84
100 Patrons	82	88	87	85	91	90	87	79	67	94	97
50 Patrons	77	83	82	80	86	85	82	74	62	89	92
30 Patrons	74	80	79	77	83	82	79	71	59	86	89
Amplified music (per speaker)	83	95	99	99	103	98	96	92	93	104	107
L_{AMax} / L_{A1} sources											
Car Door Slam	96	82	84	87	88	88	84	82	77	92	98
100 Patrons	91	97	96	94	100	99	96	88	76	103	106
50 Patrons	88	94	93	91	97	96	93	85	73	100	103
30 Patrons	85	91	90	88	94	93	90	82	70	97	100
Amplified music	92	104	108	108	112	107	105	101	102	113	116

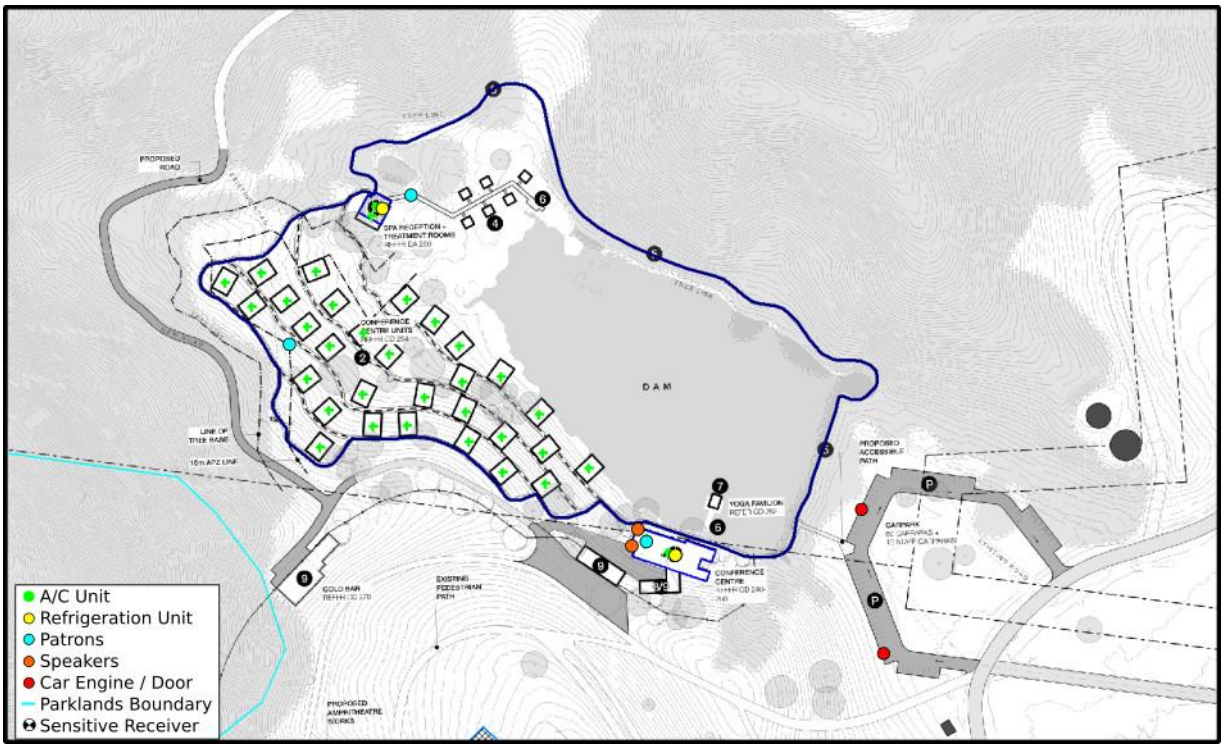


Figure 5.3 - Conference Centre Modelled Noise Sources

Modelling results for source-to-receiver wind conditions (1 to 3 m/s) or a temperature inversion under calm conditions for the identified surrounding sensitive receivers are presented in Table 4.2. The adopted criteria is based on the historic ambient noise data, having an Assessment (ABL[19]) or Rating Background Level (RBL) as low as 30 dB(A), targeting background plus 5 dB(A) to minimise impacts, based on the NSW Industrial Noise Policy guidelines for noise from continuous noise sources. This is equivalent to a noise limit of 35 dB(A) based on the requirements of the INP.

For the inclusion of amplified noise (music or announcements) an additional review against Liquor Licensing conditions have been considered, including consideration of achieving the following criteria:

- L_{A10} >= BG (L_{A90}) in any Octave Band Centre Frequency (31.5Hz – 8kHz inclusive) + 5 dB between 07:00am and 12:00 midnight at the boundary of any affected residence.
- L_{A10} >= BG (L_{A90}) in any Octave Band Centre Frequency (31.5Hz – 8kHz inclusive) + 0 dB from 12:00 midnight to 7 am at the boundary of any affected residence.
- Not withstanding compliance with the above, the noise from the licensed premises shall not be audible within any habitable room in any residential premises between the hours of 12:00

19 Determination of the assessment background level is by the tenth percentile method described in Appendix B of the NSW Industrial Noise Policy

midnight and 07:00am.

Ambient octave band frequency data is unavailable for the nearest sensitive receivers. Therefore a screening assessment of the likelihood of inaudibility within any habitable room has been completed assuming a minimum L_{oct} noise level of 30 dB for each Octave Band Centre Frequency from 31.5Hz – 8kHz. For the purposes of defining an assessment criterion, it is assumed that a minimum 5 dB reduction facade attenuation (external to internal) for a habitable room is achieved, giving a criterion of 25 dB L_{oct} in the Octave Band Centre Frequencies 31.5Hz – 8kHz for a 30 dB L_{oct} background noise level. This is based on achieving inaudibility, which is typically defined as 10 dB below ambient. It is noted this criteria is only applicable from midnight until 7:00 am, and for the period 7 am to midnight a higher criterion of 35 dB L_{oct} (ie, background plus 5 dB) would apply.

For the analysis of the live entertainment scenario, it is assumed that all patrons are external to the venue, with no reduction from the walls, roof, or windows of the facility. Similarly the amplified music has been predicted to operate external to the facility. This is a highly conservative scenario.

Typically, where a licensed premises proposes to host live entertainment, it would be necessary to complete an acoustic Liquor Licensing assessment at the commissioning phase to establish maximum music levels and appropriate management measures to achieve compliance with the liquor licence criteria. The modelling presented in this assessment is intended to identify that live entertainment is feasible for the proposed location, and a more detailed analysis will be required at the commissioning stage to allow definition of specific liquor licence conditions and noise limits, prior to commencement of operations at the conference centre.

It is noted that, if a detailed Liquor Licensing assessment is not completed at the commissioning stage, the operation of amplified entertainment could be restricted to internal speakers only operating at 75 dB(C) measured at 3 m from 7 am – 12 midnight.

5.2.3.2 Combined Activities – Modelling Results

Table 5.6 and 5.7 present the L_{A10} / L_{Aeq} values and L_{Amax} / L_{A1} values respectively for all plant and activities operating simultaneously. Comparison is made to the INP (35 dB(A) L_{Aeq}) and sleep disturbance criteria (45 dB L_{Amax}), as well as review of the results has included a screening assessment as to whether the results and 1/1 octave band results are also below 25 dB $L_{Aeq,Oct}$ (in each octave band frequency), to provide a guide as to whether inaudibility is achievable for operations from 12 midnight until 7 am.

Table 5.6: Predicted L_{A10}/L_{Aeq} Receptor Noise Levels – Conference Centre Full Scale Activities (dB(A))

Receptor	1/1/ Octave Frequency Band (Hz)									LL Review Criteria	Total dB(A)	INP Criteria
	31.5	63	125	250	500	1000	2000	4000	8000			
1	0	1	10	12	13	7	1	1	0	25	17	35
2	0	2	11	13	15	9	1	1	0	25	19	35
3	0	0	10	11	13	7	1	1	0	25	17	35
4	0	3	13	14	17	13	2	1	0	25	21	35
5	0	10	20	22	26	23	17	1	0	25	29	35
6	0	4	14	15	17	11	1	1	0	25	21	35
7	0	4	14	15	17	11	1	1	0	25	21	35
8	0	5	15	16	18	12	2	1	0	25	22	35
9	0	7	18	19	20	16	7	1	0	25	25	35
10	0	8	18	20	23	19	13	1	0	25	27	35
11	0	7	16	19	21	18	10	1	0	25	25	35
12	0	4	13	15	17	12	3	1	0	25	21	35
13	0	5	14	16	19	14	5	1	0	25	22	35
14	0	0	7	7	7	0	1	1	0	25	12	35
15	0	0	8	8	9	2	1	1	0	25	14	35
16	0	0	6	5	5	0	1	1	0	25	11	35
17	0	5	15	15	16	11	2	1	0	25	21	35
18	0	9	17	17	14	9	4	1	0	25	22	35
18 – Boundary	2	15	24	25	24	20	14	1	0	25	30	35
19	0	2	12	12	14	9	1	1	0	25	18	35
20	0	0	4	3	2	0	1	1	0	25	9	35
21	0	0	0	0	0	0	1	1	0	25	2	35
22	0	0	2	0	0	0	1	1	0	25	5	35
23	0	0	7	7	5	0	1	1	0	25	12	35
24	0	2	11	12	13	8	1	1	0	25	18	35
25	0	7	17	19	21	17	8	1	0	25	25	35
26	0	1	10	11	12	6	1	1	0	25	16	35
27	0	1	10	11	13	7	1	1	0	25	17	35
28	0	0	10	11	13	7	1	1	0	25	17	35
29	0	0	6	5	6	0	1	1	0	25	11	35
30	0	0	8	9	10	3	1	1	0	25	15	35
31	0	0	5	4	3	0	1	1	0	25	9	35
32	0	4	13	15	17	12	2	1	0	25	21	35
33	0	1	10	11	12	7	1	1	0	25	17	35
34	0	2	11	12	14	8	1	1	0	25	18	35
35	0	0	9	10	13	8	1	1	0	25	17	35
36	0	2	11	12	13	8	1	1	0	25	18	35
37	0	1	11	11	14	8	1	1	0	25	18	35
38	0	1	11	11	14	9	1	1	0	25	18	35
39	0	2	11	12	15	9	1	1	0	25	19	35
40	0	5	13	12	6	1	1	1	0	25	17	35
41	0	5	15	17	19	14	5	1	0	25	23	35
42	0	5	14	16	19	14	4	1	0	25	22	35
43	0	5	14	15	19	18	9	1	0	25	23	35
44	0	4	14	14	17	13	3	1	0	25	21	35
45	0	4	13	15	16	11	1	1	0	25	20	35
46	0	4	14	15	12	6	1	1	0	25	19	35
47	0	0	9	10	11	4	1	1	0	25	15	35
48	0	1	10	11	11	5	1	1	0	25	16	35
49	0	3	12	13	15	10	1	1	0	25	19	35
50	0	3	12	14	15	10	1	1	0	25	19	35
51	0	3	13	14	16	11	1	1	0	25	20	35
52	0	4	13	14	16	11	1	1	0	25	20	35
53	0	4	13	15	16	12	1	1	0	25	20	35
54	0	4	13	14	16	11	1	1	0	25	20	35
55	0	3	13	15	15	11	1	1	0	25	20	35
56	0	2	11	13	14	9	1	1	0	25	18	35
57	0	3	12	14	15	10	1	1	0	25	19	35
58	0	2	11	13	14	9	1	1	0	25	18	35
59	0	2	11	13	14	9	1	1	0	25	18	35
60	0	2	11	12	14	8	1	1	0	25	18	35

Table 5.7: Predicted $L_{Amax\ /\ LA1}$ Receptor Noise Levels – Conference Centre Full Scale Activities (dB(A))

Receptor	1/1/ Octave Frequency Band (Hz)									LL Review Criteria	Total dB(A)	INP Sleep Criteria
	31.5	63	125	250	500	1000	2000	4000	8000			
1	0	3	13	16	22	16	3	1	0	25	24	45
2	0	4	14	17	23	18	6	1	0	25	26	45
3	0	2	13	17	22	16	3	1	0	25	24	45
4	0	5	16	20	**26**	21	11	1	0	25	29	45
5	0	11	22	**26**	**34**	**31**	**26**	3	0	25	37	45
6	0	6	16	20	**25**	20	9	1	0	25	28	45
7	0	6	17	21	**25**	20	10	1	0	25	28	45
8	0	7	18	22	**26**	21	11	1	0	25	29	45
9	0	9	20	24	**29**	24	16	1	0	25	32	45
10	0	10	20	24	**32**	**28**	21	1	0	25	34	45
11	0	8	19	23	**30**	**26**	18	1	0	25	32	45
12	0	6	16	19	**26**	21	11	1	0	25	28	45
13	0	6	17	20	**27**	23	14	1	0	25	30	45
14	0	0	9	12	16	8	1	1	0	25	19	45
15	0	1	10	13	17	10	1	1	0	25	20	45
16	0	0	8	10	13	4	1	1	0	25	16	45
17	0	7	18	21	25	19	11	1	0	25	28	45
18	0	10	19	20	22	17	10	1	0	25	26	45
18 – Boundary	3	16	**26**	**29**	**33**	**28**	22	7	0	25	36	45
19	0	4	14	17	23	17	6	1	0	25	25	45
20	0	0	7	8	11	1	1	1	0	25	14	45
21	0	0	2	1	0	0	1	1	0	25	5	45
22	0	0	4	4	5	0	1	1	0	25	10	45
23	0	0	10	12	14	5	1	1	0	25	17	45
24	0	3	13	16	22	16	3	1	0	25	24	45
25	0	9	20	23	**30**	25	17	1	0	25	32	45
26	0	2	12	15	20	14	1	1	0	25	23	45
27	0	2	13	16	22	16	3	1	0	25	24	45
28	0	2	13	16	22	16	2	1	0	25	24	45
29	0	0	9	11	15	7	1	1	0	25	17	45
30	0	1	11	14	19	12	1	1	0	25	21	45
31	0	0	7	9	12	2	1	1	0	25	15	45
32	0	5	15	19	**26**	21	11	1	0	25	28	45
33	0	2	12	15	21	15	3	1	0	25	23	45
34	0	3	13	17	22	17	4	1	0	25	25	45
35	0	2	11	14	22	17	2	1	0	25	24	45
36	0	3	13	16	22	16	3	1	0	25	24	45
37	0	3	13	16	23	17	4	1	0	25	25	45
38	0	3	13	17	23	17	5	1	0	25	25	45
39	0	3	14	17	24	18	6	1	0	25	26	45
40	0	5	14	14	12	5	1	1	0	25	19	45
41	0	7	18	23	**28**	23	14	1	0	25	30	45
42	0	6	17	21	**27**	22	13	1	0	25	30	45
43	0	6	16	19	**28**	**26**	17	1	0	25	31	45
44	0	6	16	19	**26**	21	12	1	0	25	28	45
45	0	5	16	20	25	20	9	1	0	25	28	45
46	0	6	16	18	20	13	1	1	0	25	24	45
47	0	2	11	14	19	12	1	1	0	25	22	45
48	0	2	12	15	20	13	1	1	0	25	22	45
49	0	4	14	17	23	18	6	1	0	25	26	45
50	0	4	14	18	23	18	6	1	0	25	26	45
51	0	5	15	18	24	19	8	1	0	25	27	45
52	0	5	15	19	25	20	9	1	0	25	27	45
53	0	5	15	19	25	20	9	1	0	25	27	45
54	0	5	15	19	25	20	9	1	0	25	27	45
55	0	4	15	19	24	19	7	1	0	25	27	45
56	0	4	14	17	23	17	5	1	0	25	25	45
57	0	4	14	18	24	19	7	1	0	25	26	45
58	0	4	14	17	23	17	5	1	0	25	25	45
59	0	4	14	17	23	17	5	1	0	25	25	45
60	0	3	13	17	22	17	4	1	0	25	25	45

Review of the predicted results for all mechanical plant and activities at the proposed conference centre operating simultaneously, results in compliance for all off-site sensitive areas for the INP criteria and the daytime liquor licence criterion (7 am - midnight). Review of the potential for

inaudibility from L_{Amax} / L_{A1} noise sources for the period midnight to 7 am has identified a number of positions (including the boundary of the nearest property) predicted to exceed the adopted liquor licence screening criteria of 25 dB in each octave band frequency. This criteria is only applicable from midnight – 7:00 am, and review of the contributions from the different noise sources confirms that amplified music is the dominant noise source at these locations and all other sources comply with the criteria. Therefore mitigation of the amplified music source has been considered.

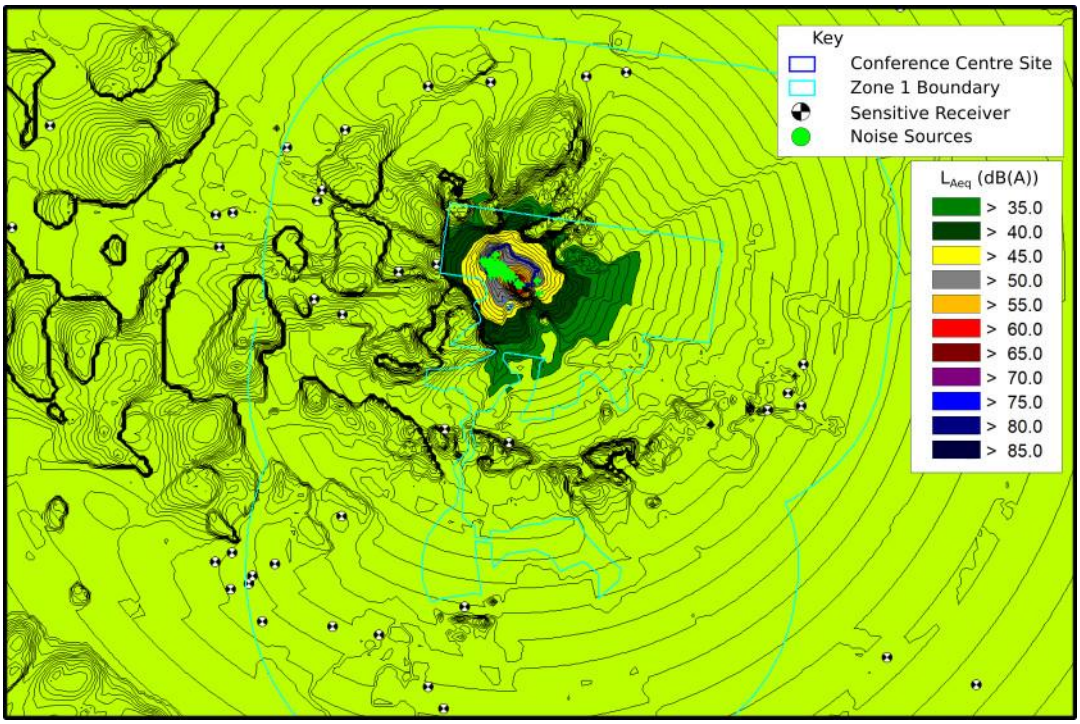


Figure 5.4 - Conference Centre Modelled Noise Contours (L_{A10} / L_{Aeq})

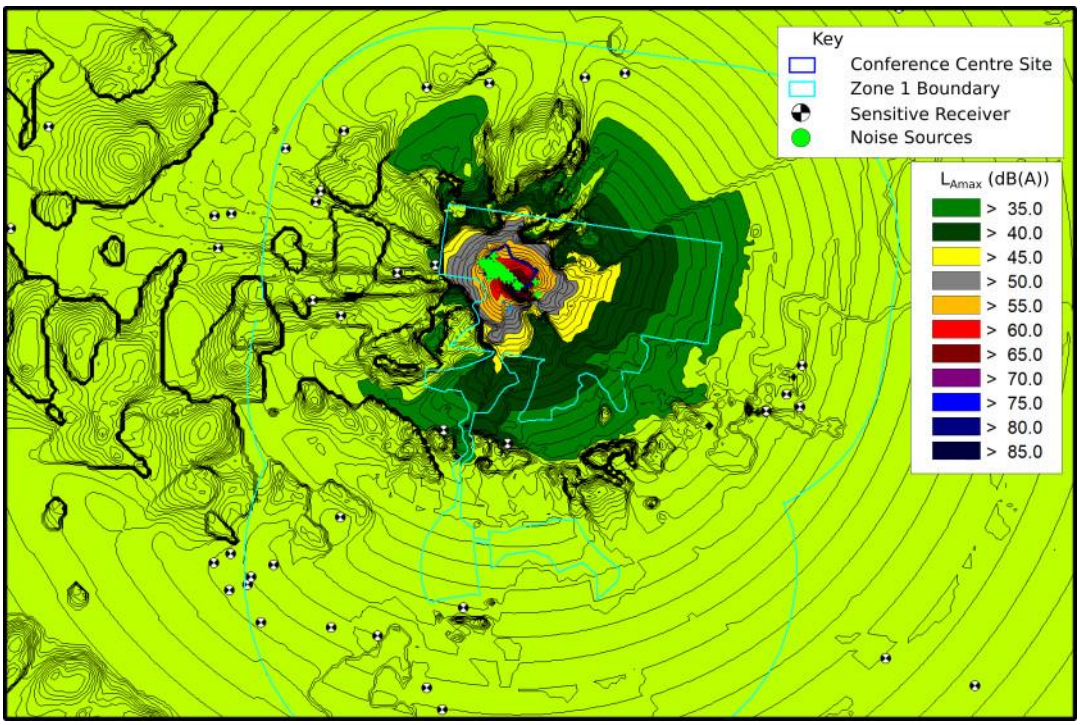


Figure 5.5 - Conference Centre Modelled Noise Contours (L_{Amax} / L_{A1})

5.2.3.3 Mitigation

To confirm the likelihood of compliance with the liquor licence requirements for the period midnight to 7 am, a mitigation scenario has been considered. This assumes the live entertainment during this time period is carried out within the building only, with all doors and windows closed, and assumes that the building fabric achieves a minimum attenuation equivalent to the typical noise attenuation of 6 mm glazing result (as per Table 5.8). No additional reduction for roof or walls has been considered (which would reduce the level of noise significantly more than the assumed glazing). It is noted that patron noise has not been mitigated, and is assumed to remain external to the building as a conservative worst case.

Table 5.8: Material Transmission Loss dB

Source	1/1/ Octave Frequency Band (Hz)									Rw
	31.5	63	125	250	500	1000	2000	4000	8000	
6.38 mm Laminated Glazing	1	11	21	25	31	35	34	37	37	33

5.2.3.4 Mitigation Modelling Results

Table 5.9 presents the mitigation scenario results for the midnight to 7 am period, for amplified music.

Table 5.9: Predicted $L_{Amax\ /\ LA1}$ Receptor Noise Levels – Mitigated Conference Centre Full Scale Activities

Receptor	1/1/ Octave Frequency Band (Hz)									LL Review Criteria	Total dB(A)	INP Sleep Criteria
	31.5	63	125	250	500	1000	2000	4000	8000			
4	0	3	13	13	15	13	2	1	0	25	20	45
5	0	10	19	21	23	23	17	1	0	25	28	45
6	0	5	14	14	14	12	1	1	0	25	20	45
7	0	4	13	14	14	12	1	1	0	25	20	45
8	0	5	15	15	15	13	2	1	0	25	21	45
9	0	8	17	18	18	17	7	1	0	25	24	45
10	0	9	18	19	21	21	13	1	0	25	26	45
11	0	7	16	18	19	19	10	1	0	25	24	45
12	0	4	13	14	15	14	3	1	0	25	20	45
13	0	5	14	15	17	16	5	1	0	25	22	45
18 – Boundary	3	15	24	24	23	21	15	1	0	25	30	45
25	0	7	17	18	19	18	8	1	0	25	24	45
32	0	4	13	14	15	14	2	1	0	25	20	45
41	0	6	15	16	16	14	4	1	0	25	22	45
42	0	5	14	15	16	14	4	1	0	25	21	45
43	0	5	14	14	17	19	9	1	0	25	23	45
44	0	4	13	13	15	14	3	1	0	25	20	45

Review of the results confirms that, for the amplified entertainment occurring within the building from midnight to 7 am, no sensitive receivers were predicted to receive noise levels above the 25 dB screening criterion for the liquor licence assessment. As noted previously, all areas were predicted to remain below the INP criteria for L_{Aeq} for the unmitigated scenario.

Figure 5.6 presents the modelled noise levels for the mitigated scenario.

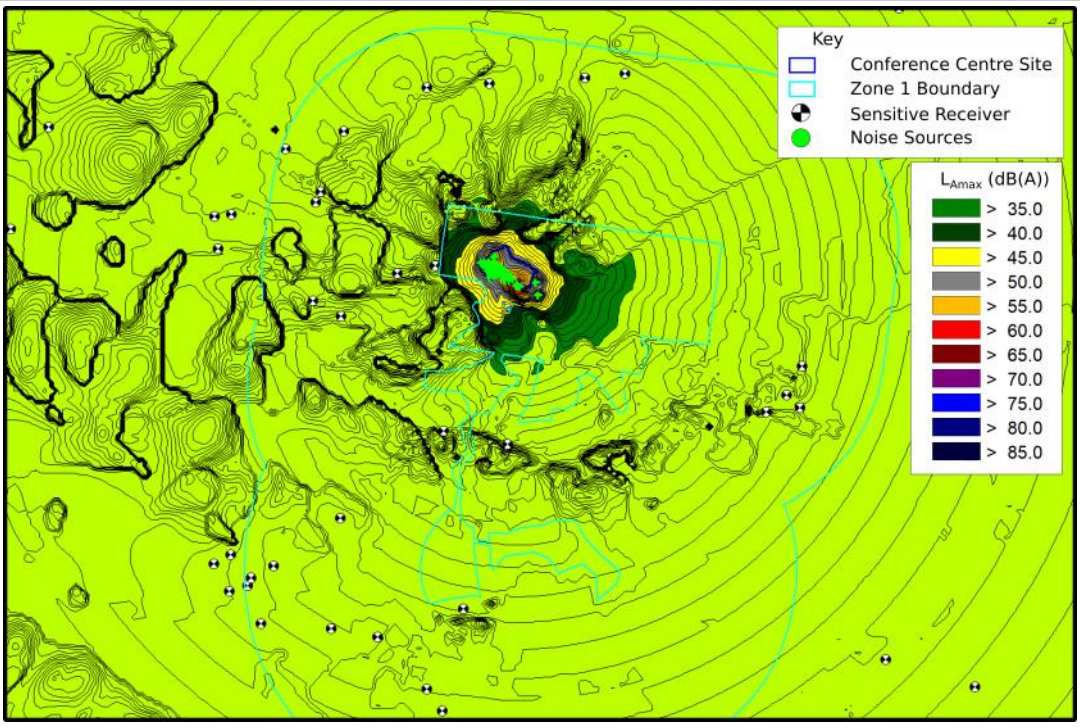


Figure 5.6 - Mitigated Conference Centre Amplified Music - Noise Contours (L_{Amax} / L_{A1})

5.2.3.5 Summary – Conference Centre Activities

Modelling of the facility under full scale operation and amplification activities are predicted to achieve acceptable noise levels at the nearest sensitive receiver positions for 24-hour operations, provided speakers are located within the Conference Centre and doors/windows are closed between the hours of 12 midnight and 7 am, during live entertainment.

5.3 Construction Noise and Vibration

There are limited construction works associated with the proposed expanded facility. The primary noise and vibration risks are associated with construction of the proposed conference centre. In terms of the likelihood of impacts, the nearest residential receptors are located at a distance of 450 m from the conference centre – R18 located on the eastern side of the Pacific Highway (refer to Figure 4.2). This residence does not have a direct line of sight to the proposed location of the conference centre.

Given the separation distance involved, it is considered that construction noise and vibration impacts are unlikely to occur. However, it is recommended that a noise and vibration management plan is implemented for the construction works, to provide guidance on the appropriate timing of activities and best practice approaches to minimising construction noise impacts.

6 Conclusions and Recommendations

The noise assessment has considered the potential for changes in community noise levels to occur, relative to previous large events, for proposed future large events at Parklands. The analysis has included consideration of the existing acoustic performance of the venue, and has considered a range of potential noise management measures.

The proposed permanent operations introduce an additional main stage, and provide for additional patron numbers relative to the previous events. Acoustic modelling has determined that there is potential for increased community impacts for the larger proposed events if the same operating volumes are maintained for each venue. Provision of additional physical mitigation measures for the venue is problematic due to the distributed nature of the noise sources, and because stage specific mitigation measures are already adopted for large events and will continue to be adopted for future events.

Historically, an extensive noise monitoring and acoustic management programme has been adopted for large events at Parklands, and the effectiveness of this approach has been demonstrated through the high degree of compliance achieved for all recent events. These monitoring and management approaches are documented in an approved Noise Management Plan. The acoustic assessment has concluded that adoption of the noise monitoring and mitigation strategies defined in the approved Noise Management Plan, in combination with reductions in operating volumes for main stages as defined in Table 4.11 will achieve compliance with the venue noise criteria for both L_{Aeq} and $L_{Oct\text{-}63\ Hz}$ noise levels.

The noise assessment has also considered ancillary noise sources associated with large events, and the proposed construction and operation of a conference centre at the venue. Mitigation measures and source noise limits are identified, where appropriate, for these sources. Management measures for ancillary noise sources at large events are also identified and will be adopted for future operations and events as required.

Appendix A - Acoustic Glossary

APPENDIX A: GLOSSARY OF ACOUSTIC TERMINOLOGY	
A-Weighting	A response provided by an electronic circuit which modifies sound in such a way that the resulting level is similar to that perceived by the human ear.
dB (decibel)	This is the scale on which sound pressure level is expressed. It is defined as 20 times the logarithm of the ratio between the root-mean-square pressure of the sound field and the reference pressure ($0.00002 N/m^2$).
dB(A)	This is a measure of the overall noise level of sound across the audible spectrum with a frequency weighting (i.e. 'A' weighting) to compensate for the varying sensitivity of the human ear to sound at different frequencies.
Facade Noise Level	Refers to a sound pressure level determined at a point close to an acoustically reflective surface (in addition to the ground). Typically a distance of 1 metre is used.
Free Field	Refers to a sound pressure level determined at a point away from reflective surfaces other than the ground with no significant contribution due to sound from other reflective surfaces; generally as measured outside and away from buildings.
Hertz (Hz)	A measure of the frequency of sound. It measures the number of pressure peaks per second passing a point when a pure tone is present.
L_{Aeq} Equivalent Continuous Sound Level	This is the equivalent steady sound level in dB(A) containing the same acoustic energy as the actual fluctuating sound level over the given period. For a steady sound with small fluctuations, its value is close to the average sound pressure level.
$L_{A90,T}$	This is the dB(A) level exceeded 90% of the time, T.
$L_{A10,T}$	This is the dB(A) level exceeded 10% of the time, T.
$L_{A50,T}$	This is the dB(A) level exceeded 50% of the time, T.
L_{WA}	The A-weighted sound power level in dB.

Appendix B – Frequency Spectra for Live Event Noise Sources

Table B1: SITG FOH Levels

Stage	Distance to FOH (m)	dB(A)	dB(C)	Octave Band Frequency (dB(Lin))								
				31.5	63	125	250	500	1000	2000	4000	8000
S1	35m	99	109	106	105	101	97	95	97	88	80	69
S2	16m	95	105	97	105	89	79	91	94	82	75	71
S4	20m	99	109	102	108	98	96	93	98	83	75	66
S5	10m	95	105	104	103	89	88	86	94	79	72	64
S6	25m	99	109	109	105	87	77	86	99	80	72	66
S7	22.5m	99	109	106	108	93	80	88	98	79	71	66
S9	10m	91	101	99	98	93	82	85	86	86	78	74
V1	10m	95	105	99	104	95	87	90	90	89	82	78
V2	10m	95	105	99	104	96	86	90	90	89	82	79
V3	10m	95	105	99	104	94	86	90	90	89	82	79
V4	10m	95	105	101	104	94	85	89	91	88	81	78
V5	10m	95	105	103	103	96	85	89	92	89	81	78
V6	10m	95	105	103	102	97	85	89	91	89	81	78
V7	10m	95	105	103	102	97	85	89	92	89	82	78
V8	10m	95	105	102	103	96	85	89	91	89	82	78
V9	10m	95	105	102	103	96	85	89	91	89	82	78
V10	10m	95	105	105	102	93	88	90	90	89	82	79

Table B2: FALLS FOH Levels

Stage	Distance to FOH (m)	dB(A)	dB(C)	Octave Band Frequency (dB(Lin))								
				31.5	63	125	250	500	1000	2000	4000	8000
S1	35m	99	109	100	104	107	98	92	95	88	89	74
S3	25m	99	109	100	103	107	98	92	95	88	89	76
The Village	10m	95	105	96	100	103	96	90	91	84	85	72
Bar 6	10m	95	105	96	105	98	84	91	91	89	82	73
Wilderness	10m	95	105	99	104	94	81	92	91	89	82	70
Red Bull	10m	95	105	99	105	94	81	92	91	89	82	70
CUB	10m	96	105	99	104	94	83	93	91	89	82	69
Big Top	10m	95	105	99	104	95	81	91	90	89	82	70
Captain Morgan	10m	95	105	80	86	104	94	88	91	83	85	72

Table B3: Base Case Full Scale FOH Levels, 11am - Midnight

Stage	Distance to FOH (m)	dB(A)	dB(C)	Octave Band Frequency (dB(Lin))								
				31.5	63	125	250	500	1000	2000	4000	8000
S1	35m	99	109	106	105	101	97	95	97	88	80	69
S2	16m	95	105	97	105	89	79	91	94	82	75	71
S3	22m	99	109	99	109	94	82	91	98	85	77	73
S4	20m	99	109	102	108	98	96	93	98	83	75	66
S5	10m	95	105	104	103	89	88	86	94	79	72	64
S6	25m	99	109	109	105	87	77	86	99	80	72	66
S7	22.5m	99	109	106	108	93	80	88	98	79	71	66
S9	10m	91	101	99	98	93	82	85	87	86	78	74
V1	10m	95	105	99	104	95	87	90	90	89	82	78
V2	10m	95	105	99	104	96	86	90	90	89	82	79
V3	10m	95	105	99	104	94	86	90	90	89	82	79
V4	10m	95	105	101	104	94	85	89	91	88	81	78
V5	10m	95	105	103	103	96	85	89	92	89	81	78
V6	10m	95	105	103	102	97	85	89	91	89	81	78
V7	10m	95	105	103	102	97	85	89	92	89	82	78
V8	10m	95	105	102	103	96	85	89	91	89	82	78
V9	10m	95	105	102	103	96	85	89	91	89	82	78
V10	10m	95	105	105	102	93	88	90	90	89	82	79

Table B4: Base Case Full Scale FOH Levels, Midnight - 2am

Stage	Distance to FOH (m)	dB(A)	dB(C)	Octave Band Frequency (dB(Lin))								
				31.5	63	125	250	500	1000	2000	4000	8000
S1	35m											
S2	16m	95	105	97	105	89	78	91	94	82	75	71
S3	22m											
S4	20m											
S5	10m	94	105	104	102	88	88	86	93	79	71	64
S6	25m											
S7	22.5m											
S9	10m	91	100	98	97	93	81	85	86	86	78	74
V1	10m	95	105	99	104	94	85	89	90	89	82	78
V2	10m	95	105	98	104	96	85	89	90	89	82	79
V3	10m	95	105	99	104	94	85	90	90	89	82	79
V4	10m	94	104	99	103	94	85	89	89	88	81	78
V5	10m	94	104	101	102	96	84	88	89	88	81	78
V6	10m	94	104	102	100	97	85	89	89	89	81	78
V7	10m	94	104	102	100	97	85	89	89	89	82	78
V8	10m	94	104	100	102	95	85	89	89	89	82	78
V9	10m	94	104	101	103	96	85	89	89	89	82	78
V10	10m	95	105	105	101	93	88	90	90	89	82	79

Table B5: Mitigated Full Scale FOH Levels, 11am - Midnight

Stage	Distance to FOH (m)	dB(A)	dB(C)	Octave Band Frequency (dB(Lin))								
				31.5	63	125	250	500	1000	2000	4000	8000
S1	35m	98	108	105	105	102	96	94	96	86	79	68
S2	16m	95	105	97	105	89	79	91	94	82	75	71
S3	22m	99	105	95	105	92	82	91	98	85	77	73
S4	20m	99	108	101	107	98	96	93	98	83	75	66
S5	10m	95	105	104	103	89	88	86	94	79	72	64
S6	25m	99	109	109	104	87	77	86	99	80	72	66
S7	22.5m	99	107	103	106	91	80	88	98	79	71	66
S9	10m	91	101	99	98	93	81	85	86	86	78	74
V1	10m	95	105	99	104	96	87	90	90	89	82	78
V2	10m	95	105	98	104	96	86	90	90	89	82	79
V3	10m	95	105	99	104	94	86	90	90	89	82	79
V4	10m	95	105	101	104	94	85	89	91	88	81	78
V5	10m	95	105	103	103	96	85	89	92	89	81	78
V6	10m	95	105	103	101	97	85	89	91	89	81	78
V7	10m	95	105	103	101	97	85	89	92	89	82	78
V8	10m	95	105	102	103	96	85	89	91	89	82	78
V9	10m	95	105	102	103	96	85	89	91	89	82	78
V10	10m	95	105	105	102	93	88	90	90	89	82	79

Table B6: Base Case Full Scale FOH Levels, Midnight - 2am

Stage	Distance to FOH (m)	dB(A)	dB(C)	Octave Band Frequency (dB(Lin))								
				31.5	63	125	250	500	1000	2000	4000	8000
S1	35m											
S2	16m	89	99	96	98	83	72	85	88	76	69	65
S3	22m											
S4	20m											
S5	10m	92	104	104	102	88	86	84	91	77	69	62
S6	25m											
S7	22.5m											
S9	10m	87	99	98	97	89	77	81	82	82	75	70
V1	10m	94	104	99	104	94	84	88	89	88	81	77
V2	10m	90	98	93	94	93	80	84	85	84	77	74
V3	10m	91	102	99	101	94	81	86	86	85	78	75
V4	10m	92	103	99	101	94	83	87	87	86	79	76
V5	10m	93	99	96	95	94	83	87	88	87	80	77
V6	10m	91	99	96	94	94	82	86	86	86	78	75
V7	10m	92	100	96	94	95	83	86	87	87	79	76
V8	10m	91	98	93	93	94	82	86	86	86	79	75
V9	10m	94	101	96	98	96	85	89	89	89	82	78
V10	10m	94	104	105	99	93	87	89	89	88	81	78

Table B7: Source Input SWL data

Stage	Stage Type	dB(A)	dB(Lin)	Octave Band Frequency (dB(Lin))								
				31.5	63	125	250	500	1000	2000	4000	8000
S1_Amph	Vocal_Main_Stage	128	136	130	132	127	127	124	126	116	110	101
S2_Tipi	Bass_Main_Stage	128	138	127	137	121	112	124	127	115	109	105
S3_Forest	Bass_Main_Stage	128	137	130	136	121	112	121	128	115	109	105
S4_McLennan	Vocal_Main_Stage	131	138	129	135	126	126	123	130	115	109	100
S5_World	Vocal_Main_Stage	126	135	131	131	120	120	116	125	109	103	94
S6_Tiny	Bass_Main_Stage	133	141	138	138	117	108	117	133	111	105	101
S7_MixUp	Bass_Main_Stage	128	135	129	133	115	106	115	128	109	103	99
Other	PA	117	135	124	135	123	112	113	111	110	103	100

Table B8: Directivities

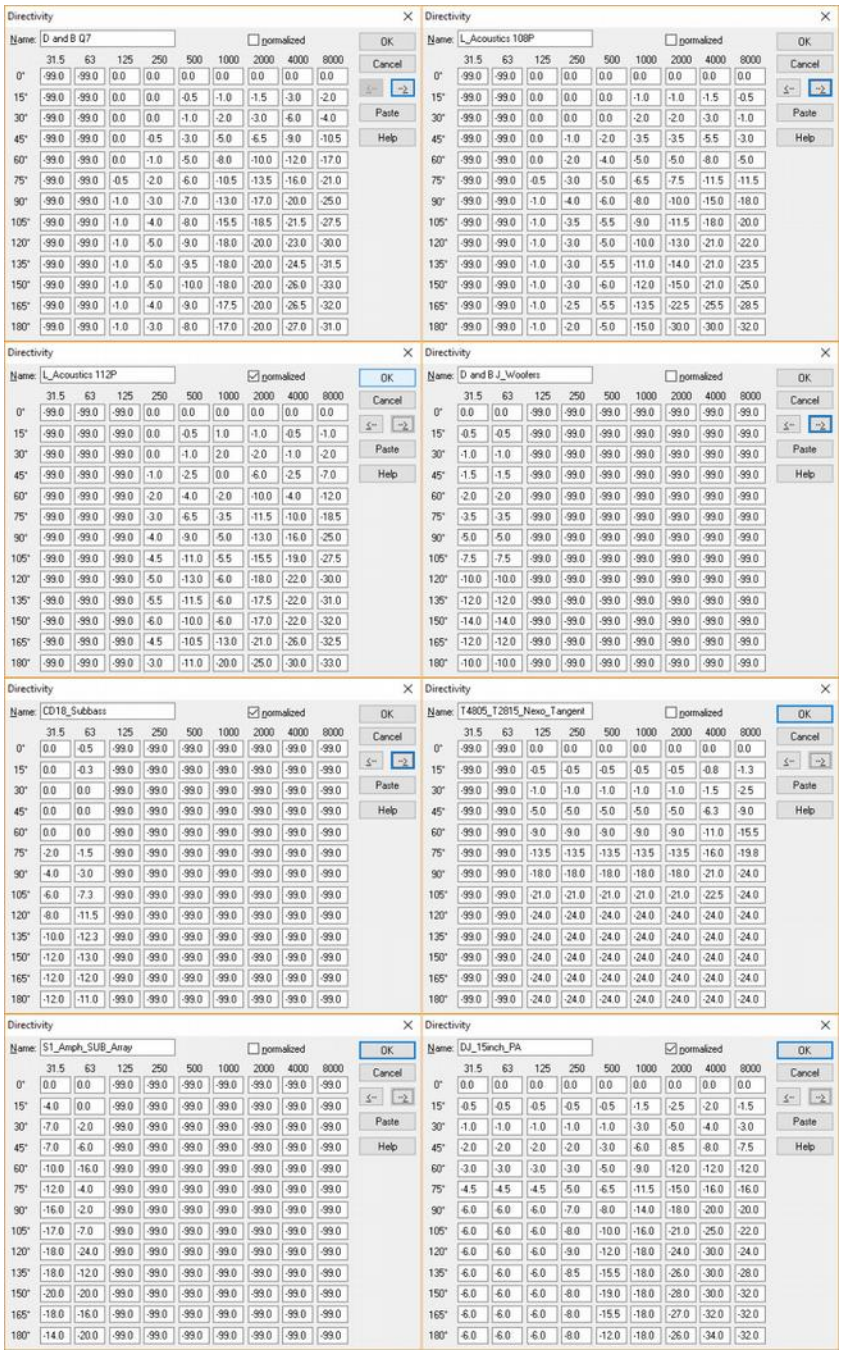


Table B9: Point Source Descriptors

Source	Adjusted PWL (dB(A))	Reference Value	Direct.	Directivity X	Directivity Y	Directivity Z	Height
S1_Main_J8_L_1	124	S1_Amph	L_Acoustics 108P	-0.707	0.707	0.000	7.75
S1_Main_J8_L_1	124	S1_Amph	L_Acoustics 108P	-0.707	0.707	0.000	7.40
S1_Main_J8_L_1	124	S1_Amph	L_Acoustics 108P	-0.707	0.707	-0.030	7.00
S1_Main_J8_L_1	124	S1_Amph	L_Acoustics 108P	-0.706	0.706	-0.050	6.70
S1_Main_J8_L_1	124	S1_Amph	L_Acoustics 108P	-0.705	0.705	-0.070	6.30
S1_Main_J8_L_1	124	S1_Amph	L_Acoustics 108P	-0.704	0.704	-0.090	5.90
S1_Main_J8_L_1	124	S1_Amph	L_Acoustics 108P	-0.702	0.702	-0.120	5.60
S1_Main_J8_L_1	124	S1_Amph	L_Acoustics 108P	-0.694	0.694	-0.191	5.20
S1_Main_J8_L_1	122	S1_Amph	L_Acoustics 108P	-0.679	0.679	-0.280	4.85
S1_Main_J8_L_1	122	S1_Amph	L_Acoustics 108P	-0.657	0.657	-0.369	4.50
S1_Main_J12_L_11	122	S1_Amph	L_Acoustics 112P	-0.617	0.617	-0.488	4.20
S1_Main_J12_L_11	122	S1_Amph	L_Acoustics 112P	-0.571	0.571	-0.591	3.90
S1_Main_J12_L_11	122	S1_Amph	L_Acoustics 112P	-0.542	0.542	-0.642	3.60
S1_Main_J12_L_11	122	S1_Amph	L_Acoustics 112P	-0.499	0.499	-0.709	3.30
S1_Main_J8_R_1	124	S1_Amph	L_Acoustics 108P	-0.707	0.707	0.000	7.75
S1_Main_J8_R_1	124	S1_Amph	L_Acoustics 108P	-0.707	0.707	0.000	7.40
S1_Main_J8_R_1	124	S1_Amph	L_Acoustics 108P	-0.707	0.707	-0.030	7.00
S1_Main_J8_R_1	124	S1_Amph	L_Acoustics 108P	-0.706	0.706	-0.050	6.70
S1_Main_J8_R_1	124	S1_Amph	L_Acoustics 108P	-0.705	0.705	-0.070	6.30
S1_Main_J8_R_1	124	S1_Amph	L_Acoustics 108P	-0.704	0.704	-0.090	5.90
S1_Main_J8_R_1	124	S1_Amph	L_Acoustics 108P	-0.702	0.702	-0.120	5.60
S1_Main_J8_R_1	124	S1_Amph	L_Acoustics 108P	-0.694	0.694	-0.191	5.20
S1_Main_J8_R_1	122	S1_Amph	L_Acoustics 108P	-0.679	0.679	-0.280	4.85
S1_Main_J8_R_1	122	S1_Amph	L_Acoustics 108P	-0.657	0.657	-0.369	4.50
S1_Main_J12_R_1	122	S1_Amph	L_Acoustics 112P	-0.617	0.617	-0.488	4.20
S1_Main_J12_R_1	122	S1_Amph	L_Acoustics 112P	-0.571	0.571	-0.591	3.90
S1_Main_J12_R_1	122	S1_Amph	L_Acoustics 112P	-0.542	0.542	-0.642	3.60
S1_Main_J12_R_1	122	S1_Amph	L_Acoustics 112P	-0.499	0.499	-0.709	3.30
S1_Main_JSub_L_1	124	S1_Amph	D and B J_Woofers	-0.707	0.707	0.000	3.30
S1_Main_JSub_L_1	124	S1_Amph	D and B J_Woofers	-0.707	0.707	0.000	3.30
S1_Main_JSub_L_1	124	S1_Amph	D and B J_Woofers	-0.707	0.707	0.000	3.30
S1_Main_JSub_L_1	124	S1_Amph	D and B J_Woofers	-0.707	0.707	0.000	3.30
S1_Main_JSub_R_1	124	S1_Amph	D and B J_Woofers	-0.707	0.707	0.000	3.30
S1_Main_JSub_R_1	124	S1_Amph	D and B J_Woofers	-0.707	0.707	0.000	3.30
S1_Main_JSub_R_1	124	S1_Amph	D and B J_Woofers	-0.707	0.707	0.000	3.30
S1_Main_JSub_R_1	124	S1_Amph	D and B J_Woofers	-0.707	0.707	0.000	3.30
S1_Main_Q7_C_1	124	S1_Amph	D and B Q7	-0.707	0.707	0.000	0.50
S1_Main_Q7_C_1	124	S1_Amph	D and B Q7	-0.707	0.707	0.000	0.50
S1_Main_Q7_C_1	124	S1_Amph	D and B Q7	-0.707	0.707	0.000	0.50
S1_Main_Q7_C_1	124	S1_Amph	D and B Q7	-0.707	0.707	0.000	0.50
S1_Main_Q7_C_1	124	S1_Amph	D and B Q7	-0.707	0.707	0.000	0.50
S1_Main_Q7_C_1	124	S1_Amph	D and B Q7	-0.707	0.707	0.000	0.50
S1_Main_Q7_C_1	124	S1_Amph	D and B Q7	-0.707	0.707	0.000	0.50
S1_Main_Q7_C_1	124	S1_Amph	D and B Q7	-0.707	0.707	0.000	0.50
S1_Main_Q7_C_1	124	S1_Amph	D and B Q7	-0.707	0.707	0.000	0.50
S1_Main_Q7_C_1	124	S1_Amph	D and B Q7	-0.707	0.707	0.000	0.50
S1_Main_B22_Front_1_24_G3	132	S1_Amph	S1_Amph_SUB_Array	-0.707	0.707	0.000	0.50
S1_Main_B22_Front_1_24_G3	132	S1_Amph	S1_Amph_SUB_Array	-0.707	0.707	0.000	0.50
S1_Main_B22_Front_1_24_G3	132	S1_Amph	S1_Amph_SUB_Array	-0.707	0.707	0.000	0.50
S1_Main_B22_Front_1_24_G3	132	S1_Amph	S1_Amph_SUB_Array	-0.707	0.707	0.000	0.50
S1_Main_B22_Front_1_24_G3	132	S1_Amph	S1_Amph_SUB_Array	-0.707	0.707	0.000	0.50
S1_Main_B22_Front_1_24_G3	132	S1_Amph	S1_Amph_SUB_Array	-0.707	0.707	0.000	0.50
S1_Main_B22_Front_1_24_G3	132	S1_Amph	S1_Amph_SUB_Array	-0.707	0.707	0.000	0.50
S1_Main_B22_Front_22_24_G3	132	S1_Amph	S1_Amph_SUB_Array	-0.707	0.707	0.000	0.50
S1_Main_J8_Delay_1	124	S1_Amph	L_Acoustics 108P	-0.707	0.707	-0.030	12.75
S1_Main_J8_Delay_2	124	S1_Amph	L_Acoustics 108P	-0.707	0.707	-0.030	12.50
S1_Main_J8_Delay_3	124	S1_Amph	L_Acoustics 108P	-0.707	0.707	-0.040	12.00
S1_Main_J8_Delay_4	124	S1_Amph	L_Acoustics 108P	-0.706	0.706	-0.060	11.60
S1_Main_J12_Delay_1	122	S1_Amph	L_Acoustics 112P	-0.705	0.705	-0.081	11.30
S1_Main_J12_Delay_2	122	S1_Amph	L_Acoustics 112P	-0.703	0.703	-0.110	10.90
S1_Main_J12_Delay_3	122	S1_Amph	L_Acoustics 112P	-0.699	0.699	-0.150	10.70
S1_Main_J12_Delay_4	122	S1_Amph	L_Acoustics 112P	-0.693	0.693	-0.201	10.20
S1_Main_J12_Delay_5	122	S1_Amph	L_Acoustics 112P	-0.674	0.674	-0.302	9.80
S1_Main_J12_Delay_6	122	S1_Amph	L_Acoustics 112P	-0.648	0.648	-0.399	9.50
S1_Main_J8_Delay_1	124	S1_Amph	L_Acoustics 108P	-0.707	0.707	-0.030	12.75
S1_Main_J8_Delay_2	124	S1_Amph	L_Acoustics 108P	-0.707	0.707	-0.030	12.50
S1_Main_J8_Delay_3	124	S1_Amph	L_Acoustics 108P	-0.707	0.707	-0.040	12.00
S1_Main_J8_Delay_4	124	S1_Amph	L_Acoustics 108P	-0.706	0.706	-0.060	11.60
S1_Main_J12_Delay_1	122	S1_Amph	L_Acoustics 112P	-0.705	0.705	-0.081	11.30
S1_Main_J12_Delay_2	122	S1_Amph	L_Acoustics 112P	-0.703	0.703	-0.110	10.90
S1_Main_J12_Delay_3	122	S1_Amph	L_Acoustics 112P	-0.699	0.699	-0.150	10.70
S1_Main_J12_Delay_4	122	S1_Amph	L_Acoustics 112P	-0.693	0.693	-0.201	10.20
S1_Main_J12_Delay_5	122	S1_Amph	L_Acoustics 112P	-0.674	0.674	-0.302	9.80
S1_Main_J12_Delay_6	122	S1_Amph	L_Acoustics 112P	-0.648	0.648	-0.399	9.50

Table B9: Point Source Descriptors … continued

Source	Adjusted PWL (dB(A))	Reference Value	Direct.	Directivity X	Directivity Y	Directivity Z	Height
S1_Main_J8_SideHangR_1	124	S1_Amph	L_Acoustics 108P	0.000	0.999	-0.050	5.75
S1_Main_J8_SideHangR_2	124	S1_Amph	L_Acoustics 108P	0.000	0.994	-0.110	5.25
S1_Main_J8_SideHangR_3	124	S1_Amph	L_Acoustics 108P	0.000	0.987	-0.160	5.00
S1_Main_J8_SideHangR_4	124	S1_Amph	L_Acoustics 108P	0.000	0.960	-0.280	4.75
S1_Main_J8_SideHangR_5	124	S1_Amph	L_Acoustics 108P	0.000	0.933	-0.360	4.50
S1_Main_J8_SideHangR_6	124	S1_Amph	L_Acoustics 108P	0.000	0.876	-0.483	4.25
S1_Main_J8_SideHangL_1	124	S1_Amph	L_Acoustics 108P	-1.000	0.000	0.000	7.75
S1_Main_J8_SideHangL_2	124	S1_Amph	L_Acoustics 108P	-1.000	0.000	-0.020	7.40
S1_Main_J8_SideHangL_3	124	S1_Amph	L_Acoustics 108P	-0.998	0.000	-0.070	7.00
S1_Main_J8_SideHangL_4	124	S1_Amph	L_Acoustics 108P	-0.995	0.000	-0.100	6.75
S1_Main_J8_SideHangL_5	124	S1_Amph	L_Acoustics 108P	-0.987	0.000	-0.160	6.30
S1_Main_J8_SideHangL_6	124	S1_Amph	L_Acoustics 108P	-0.975	0.000	-0.221	6.00
S1_Main_J12_SideHangL_1	122	S1_Amph	L_Acoustics 112P	-0.945	0.000	-0.328	5.60
S1_Main_J12_SideHangL_2	122	S1_Amph	L_Acoustics 112P	-0.898	0.000	-0.439	5.25
S1_Main_J12_SideHangL_3	122	S1_Amph	L_Acoustics 112P	-0.876	0.000	-0.483	4.90
S1_Main_J12_SideHangL_4	122	S1_Amph	L_Acoustics 112P	-0.849	0.000	-0.529	4.55
S1_Main_J8_SideHangDelayL_1	124	S1_Amph	L_Acoustics 108P	-0.985	0.172	0.000	13.75
S1_Main_J8_SideHangDelayL_2	124	S1_Amph	L_Acoustics 108P	-0.984	0.171	-0.050	13.50
S1_Main_J8_SideHangDelayL_3	124	S1_Amph	L_Acoustics 108P	-0.980	0.170	-0.100	13.00
S1_Main_J8_SideHangDelayL_4	124	S1_Amph	L_Acoustics 108P	-0.971	0.170	-0.170	12.75
S1_Main_J8_SideHangDelayL_5	124	S1_Amph	L_Acoustics 108P	-0.950	0.170	-0.260	12.40
S1_Main_J8_SideHangDelayL_6	124	S1_Amph	L_Acoustics 108P	-0.914	0.161	-0.372	12.00
S1_Main_J8_SideHangDelayL_7	124	S1_Amph	L_Acoustics 108P	-0.863	0.151	-0.482	11.60
S1_Main_J8_SideHangDelayL_8	124	S1_Amph	L_Acoustics 108P	-0.861	0.152	-0.485	11.20
S2_Main_dV-dosc_BackRight_1	121	S2_Tipi	L_Acoustics 108P	-0.818	-0.568	-0.090	4.40
S2_Main_dV-dosc_BackRight_2	121	S2_Tipi	L_Acoustics 108P	-0.814	-0.573	-0.101	4.20
S2_Main_dV-dosc_BackRight_3	121	S2_Tipi	L_Acoustics 108P	-0.810	-0.570	-0.140	3.90
S2_Main_dV-dosc_BackRight_4	119	S2_Tipi	L_Acoustics 108P	-0.802	-0.562	-0.201	3.70
S2_Main_dV-dosc_BackRight_5	119	S2_Tipi	L_Acoustics 108P	-0.781	-0.541	-0.311	3.50
S2_Main_dV-dosc_BackRight_6	119	S2_Tipi	L_Acoustics 108P	-0.737	-0.518	-0.435	3.30
S2_Main_dV-dosc_BackLeft_1	121	S2_Tipi	L_Acoustics 108P	-0.818	-0.568	-0.090	4.40
S2_Main_dV-dosc_BackLeft_2	121	S2_Tipi	L_Acoustics 108P	-0.814	-0.573	-0.101	4.20
S2_Main_dV-dosc_BackLeft_3	121	S2_Tipi	L_Acoustics 108P	-0.810	-0.570	-0.140	3.90
S2_Main_dV-dosc_BackLeft_4	119	S2_Tipi	L_Acoustics 108P	-0.802	-0.562	-0.201	3.70
S2_Main_dV-dosc_BackLeft_5	119	S2_Tipi	L_Acoustics 108P	-0.781	-0.541	-0.311	3.50
S2_Main_dV-dosc_BackLeft_6	119	S2_Tipi	L_Acoustics 108P	-0.623	-0.690	-0.368	3.30
S2_Main_SB218_BackLeft_1	122	S2_Tipi	D and B J_Woofers	-0.821	-0.571	0.000	1.38
S2_Main_SB218_BackLeft_2	122	S2_Tipi	D and B J_Woofers	-0.821	-0.571	0.000	0.82
S2_Main_SB218_BackLeft_3	122	S2_Tipi	D and B J_Woofers	-0.821	-0.571	0.000	0.28
S2_Main_SB218_BackRight_1	122	S2_Tipi	D and B J_Woofers	-0.821	-0.571	0.000	1.38
S2_Main_SB218_BackRight_2	122	S2_Tipi	D and B J_Woofers	-0.821	-0.571	0.000	0.82
S2_Main_SB218_BackRight_3	122	S2_Tipi	D and B J_Woofers	-0.821	-0.571	0.000	0.28
S2_Main_ARCS_BackCentre_1	119	S2_Tipi	L_Acoustics 108P	-0.821	-0.571	0.000	4.10
S2_Main_ARCS_BackCentre_2	119	S2_Tipi	L_Acoustics 108P	-0.902	-0.200	-0.382	4.10
S2_Main_ARCS_BackCentre_3	119	S2_Tipi	L_Acoustics 108P	-0.499	-0.779	-0.379	4.10
S3_Main_K2_BackRight_1	124	S3_Forest	L_Acoustics 108P	-0.617	0.787	0.000	7.30
S3_Main_K2_BackRight_2	124	S3_Forest	L_Acoustics 108P	-0.617	0.787	0.000	7.00
S3_Main_K2_BackRight_3	124	S3_Forest	L_Acoustics 108P	-0.617	0.787	0.000	6.60
S3_Main_K2_BackRight_4	124	S3_Forest	L_Acoustics 108P	-0.617	0.787	0.000	6.30
S3_Main_K2_BackRight_5	123	S3_Forest	L_Acoustics 108P	-0.617	0.787	0.000	5.90
S3_Main_K2_BackRight_6	123	S3_Forest	L_Acoustics 108P	-0.617	0.787	0.000	5.60
S3_Main_K2_BackRight_7	121	S3_Forest	L_Acoustics 108P	-0.617	0.787	0.000	5.20
S3_Main_K2_BackRight_8	121	S3_Forest	L_Acoustics 108P	-0.617	0.787	0.000	4.90
S3_Main_K2_BackLeft_1	124	S3_Forest	L_Acoustics 108P	-0.617	0.787	0.000	7.30
S3_Main_K2_BackLeft_2	124	S3_Forest	L_Acoustics 108P	-0.617	0.787	0.000	7.00
S3_Main_K2_BackLeft_3	124	S3_Forest	L_Acoustics 108P	-0.617	0.787	0.000	6.60
S3_Main_K2_BackLeft_4	124	S3_Forest	L_Acoustics 108P	-0.617	0.787	0.000	6.30
S3_Main_K2_BackLeft_5	123	S3_Forest	L_Acoustics 108P	-0.617	0.787	0.000	5.90
S3_Main_K2_BackLeft_6	123	S3_Forest	L_Acoustics 108P	-0.617	0.787	0.000	5.60
S3_Main_K2_BackLeft_7	121	S3_Forest	L_Acoustics 108P	-0.617	0.787	0.000	5.20
S3_Main_K2_BackLeft_8	121	S3_Forest	L_Acoustics 108P	-0.617	0.787	0.000	4.90
S3_Main_SB28_BackLeft_1	125	S3_Forest	S1_Amph_SUB_Array	-0.617	0.787	0.000	0.65
S3_Main_SB28_BackLeft_2	125	S3_Forest	S1_Amph_SUB_Array	-0.617	0.787	0.000	0.65
S3_Main_SB28_BackLeft_3	125	S3_Forest	S1_Amph_SUB_Array	-0.617	0.787	0.000	0.65
S3_Main_SB28_BackLeft_4	125	S3_Forest	S1_Amph_SUB_Array	-0.617	0.787	0.000	0.65
S3_Main_SB28_CentrerLeft_1	125	S3_Forest	S1_Amph_SUB_Array	-0.617	0.787	0.000	0.65
S3_Main_SB28_CentrerLeft_2	125	S3_Forest	S1_Amph_SUB_Array	-0.617	0.787	0.000	0.65
S3_Main_SB28_CentrerLeft_3	125	S3_Forest	S1_Amph_SUB_Array	-0.617	0.787	0.000	0.65
S3_Main_SB28_CentrerLeft_4	125	S3_Forest	S1_Amph_SUB_Array	-0.617	0.787	0.000	0.65
S3_Main_SB28_CenterRight_1	125	S3_Forest	S1_Amph_SUB_Array	-0.617	0.787	0.000	0.65
S3_Main_SB28_CenterRight_2	125	S3_Forest	S1_Amph_SUB_Array	-0.617	0.787	0.000	0.65
S3_Main_SB28_CenterRight_3	125	S3_Forest	S1_Amph_SUB_Array	-0.617	0.787	0.000	0.65
S3_Main_SB28_CenterRight_4	125	S3_Forest	S1_Amph_SUB_Array	-0.617	0.787	0.000	0.65
S3_Main_SB28_BackRight_1	125	S3_Forest	S1_Amph_SUB_Array	-0.617	0.787	0.000	0.65
S3_Main_SB28_BackRight_2	125	S3_Forest	S1_Amph_SUB_Array	-0.617	0.787	0.000	0.65
S3_Main_SB28_BackRight_3	125	S3_Forest	S1_Amph_SUB_Array	-0.617	0.787	0.000	0.65
S3_Main_SB28_BackRight_4	125	S3_Forest	S1_Amph_SUB_Array	-0.617	0.787	0.000	0.65

Table B9: Point Source Descriptors … continued

Source	Adjusted PWL (dB(A))	Reference Value	Direct.	Directivity X	Directivity Y	Directivity Z	Height
S3_Main_ARCS_BackLeft_1	121	S3_Forest	L_Acoustics 108P	-0.731	0.661	-0.170	1.41
S3_Main_ARCS_BackLeft_2	121	S3_Forest	L_Acoustics 108P	-0.617	0.787	0.000	1.41
S3_Main_ARCS_BackLeft_3	121	S3_Forest	L_Acoustics 108P	-0.617	0.787	0.000	1.41
S3_Main_ARCS_BackLeft_4	121	S3_Forest	L_Acoustics 108P	-0.617	0.787	0.000	1.41
S3_Main_ARCS_CenterLeft_1	121	S3_Forest	L_Acoustics 108P	-0.731	0.661	-0.170	1.41
S3_Main_ARCS_CenterLeft_2	121	S3_Forest	L_Acoustics 108P	-0.617	0.787	0.000	1.41
S3_Main_ARCS_CenterLeft_3	121	S3_Forest	L_Acoustics 108P	-0.617	0.787	0.000	1.41
S3_Main_ARCS_CenterLeft_4	121	S3_Forest	L_Acoustics 108P	-0.617	0.787	0.000	1.41
S3_Main_ARCS_CenterRight_1	121	S3_Forest	L_Acoustics 108P	-0.731	0.661	-0.170	1.41
S3_Main_ARCS_CenterRight_2	121	S3_Forest	L_Acoustics 108P	-0.617	0.787	0.000	1.41
S3_Main_ARCS_CenterRight_3	121	S3_Forest	L_Acoustics 108P	-0.617	0.787	0.000	1.41
S3_Main_ARCS_CenterRight_4	121	S3_Forest	L_Acoustics 108P	-0.617	0.787	0.000	1.41
S3_Main_ARCS_BackRight_1	121	S3_Forest	L_Acoustics 108P	-0.731	0.661	-0.170	1.41
S3_Main_ARCS_BackRight_2	121	S3_Forest	L_Acoustics 108P	-0.617	0.787	0.000	1.41
S3_Main_ARCS_BackRight_3	121	S3_Forest	L_Acoustics 108P	-0.617	0.787	0.000	1.41
S3_Main_ARCS_BackRight_4	121	S3_Forest	L_Acoustics 108P	-0.617	0.787	0.000	1.41
S3_Main_ARCS_BackBackRight_1	121	S3_Forest	L_Acoustics 108P	-0.617	0.787	0.000	2.39
S3_Main_ARCS_BackBackRight_2	121	S3_Forest	L_Acoustics 108P	-0.250	0.890	-0.380	2.39
S3_Main_ARCS_BackBackRight_3	121	S3_Forest	L_Acoustics 108P	-0.250	0.890	-0.380	2.39
S3_Main_ARCS_BackBackRight_4	121	S3_Forest	L_Acoustics 108P	-0.250	0.890	-0.380	2.39
S3_Main_ARCS_BackBackLeft_1	121	S3_Forest	L_Acoustics 108P	-0.617	0.787	0.000	2.39
S3_Main_ARCS_BackBackLeft_2	121	S3_Forest	L_Acoustics 108P	-0.805	0.453	-0.385	2.39
S3_Main_ARCS_BackBackLeft_3	121	S3_Forest	L_Acoustics 108P	-0.805	0.453	-0.385	2.39
S3_Main_ARCS_BackBackLeft_4	121	S3_Forest	L_Acoustics 108P	-0.805	0.453	-0.385	2.39
S3_Main_dV-dosc_MiddleDelayRight_1	124	S3_Forest	L_Acoustics 108P	-0.616	0.788	0.000	7.40
S3_Main_dV-dosc_MiddleDelayRight_2	124	S3_Forest	L_Acoustics 108P	-0.616	0.788	0.000	7.20
S3_Main_dV-dosc_MiddleDelayRight_3	123	S3_Forest	L_Acoustics 108P	-0.616	0.788	0.000	6.90
S3_Main_dV-dosc_MiddleDelayRight_4	123	S3_Forest	L_Acoustics 108P	-0.616	0.788	0.000	6.70
S3_Main_dV-dosc_MiddleDelayRight_5	122	S3_Forest	L_Acoustics 108P	-0.616	0.788	0.000	6.50
S3_Main_dV-dosc_MiddleDelayRight_6	122	S3_Forest	L_Acoustics 108P	-0.616	0.788	0.000	6.30
S3_Main_dV-dosc_MiddleDelayLeft_1	124	S3_Forest	L_Acoustics 108P	-0.616	0.788	0.000	7.40
S3_Main_dV-dosc_MiddleDelayLeft_2	124	S3_Forest	L_Acoustics 108P	-0.616	0.788	0.000	7.20
S3_Main_dV-dosc_MiddleDelayLeft_3	123	S3_Forest	L_Acoustics 108P	-0.616	0.788	0.000	6.90
S3_Main_dV-dosc_MiddleDelayLeft_4	123	S3_Forest	L_Acoustics 108P	-0.616	0.788	0.000	6.70
S3_Main_dV-dosc_MiddleDelayLeft_5	122	S3_Forest	L_Acoustics 108P	-0.616	0.788	0.000	6.50
S3_Main_dV-dosc_MiddleDelayLeft_6	122	S3_Forest	L_Acoustics 108P	-0.616	0.788	0.000	6.30
S4_Main_V-dosc_BackStageRight_1	128	S4_McLennan	L_Acoustics 108P	-0.419	-0.908	0.000	7.30
S4_Main_V-dosc_BackStageRight_2	128	S4_McLennan	L_Acoustics 108P	-0.419	-0.908	0.000	6.90
S4_Main_V-dosc_BackStageRight_3	128	S4_McLennan	L_Acoustics 108P	-0.419	-0.908	0.000	6.40
S4_Main_V-dosc_BackStageRight_4	124	S4_McLennan	L_Acoustics 108P	-0.419	-0.908	0.000	6.00
S4_Main_V-dosc_BackStageRight_5	124	S4_McLennan	L_Acoustics 108P	-0.419	-0.908	0.000	5.50
S4_Main_V-dosc_BackStageRight_6	124	S4_McLennan	L_Acoustics 108P	-0.419	-0.908	0.000	5.10
S4_Main_dV-dosc_BackStageLeft_1	128	S4_McLennan	L_Acoustics 108P	-0.419	-0.908	0.000	7.30
S4_Main_dV-dosc_BackStageLeft_2	128	S4_McLennan	L_Acoustics 108P	-0.419	-0.908	0.000	6.90
S4_Main_dV-dosc_BackStageLeft_3	128	S4_McLennan	L_Acoustics 108P	-0.419	-0.908	0.000	6.40
S4_Main_dV-dosc_BackStageLeft_4	124	S4_McLennan	L_Acoustics 108P	-0.419	-0.908	0.000	6.00
S4_Main_dV-dosc_BackStageLeft_5	124	S4_McLennan	L_Acoustics 108P	-0.419	-0.908	0.000	5.50
S4_Main_dV-dosc_BackStageLeft_6	124	S4_McLennan	L_Acoustics 108P	-0.419	-0.908	0.000	5.10
S4_Main_SB28_OnStageRight_1	128	S4_McLennan	S1_Amph_SUB_Array	-0.419	-0.908	0.000	0.65
S4_Main_SB28_OnStageRight_2	128	S4_McLennan	S1_Amph_SUB_Array	-0.419	-0.908	0.000	0.65
S4_Main_SB28_OnStageRight_3	128	S4_McLennan	S1_Amph_SUB_Array	-0.419	-0.908	0.000	0.65
S4_Main_SB28_OnStageRight_4	128	S4_McLennan	S1_Amph_SUB_Array	-0.419	-0.908	0.000	0.65
S4_Main_SB28_OnStageLeft_1	128	S4_McLennan	S1_Amph_SUB_Array	-0.419	-0.908	0.000	0.65
S4_Main_SB28_OnStageLeft_2	128	S4_McLennan	S1_Amph_SUB_Array	-0.419	-0.908	0.000	0.65
S4_Main_SB28_OnStageLeft_3	128	S4_McLennan	S1_Amph_SUB_Array	-0.419	-0.908	0.000	0.65
S4_Main_SB28_OnStageLeft_4	128	S4_McLennan	S1_Amph_SUB_Array	-0.419	-0.908	0.000	0.65
S4_Main_SB28_OnStageCenter_1	128	S4_McLennan	S1_Amph_SUB_Array	-0.419	-0.908	0.000	0.65
S4_Main_SB28_OnStageCenter_2	128	S4_McLennan	S1_Amph_SUB_Array	-0.419	-0.908	0.000	0.65
S4_Main_SB28_OnStageCenter_3	128	S4_McLennan	S1_Amph_SUB_Array	-0.419	-0.908	0.000	0.65
S4_Main_SB28_OnStageCenter_4	128	S4_McLennan	S1_Amph_SUB_Array	-0.419	-0.908	0.000	0.65
S4_Main_ARCS_FrontStageFill_CenterLeft_1	123	S4_McLennan	L_Acoustics 108P	-0.339	-0.937	-0.089	1.60
S4_Main_ARCS_FrontStageFill_CenterLeft_2	122	S4_McLennan	L_Acoustics 108P	-0.339	-0.937	-0.089	1.90
S4_Main_ARCS_FrontStageFill_CenterRight_1	123	S4_McLennan	L_Acoustics 108P	-0.501	-0.861	-0.090	1.60
S4_Main_ARCS_FrontStageFill_CenterRight_2	122	S4_McLennan	L_Acoustics 108P	-0.501	-0.861	-0.090	1.90
S4_Main_ARCS_FrontStageFill_BackRight_3	128	S4_McLennan	L_Acoustics 108P	-0.711	-0.410	-0.571	2.12
S4_Main_ARCS_FrontStageFill_BackRight_4	128	S4_McLennan	L_Acoustics 108P	-0.711	-0.410	-0.571	2.12
S4_Main_ARCS_FrontStageFill_BackLeft_3	128	S4_McLennan	L_Acoustics 108P	0.140	-0.810	-0.570	2.12
S4_Main_ARCS_FrontStageFill_BackLeft_4	128	S4_McLennan	L_Acoustics 108P	0.140	-0.810	-0.570	2.12
S4_Main_dV-dosc_DelayRight_1	125	S4_McLennan	L_Acoustics 108P	-0.482	-0.873	-0.071	7.40
S4_Main_dV-dosc_DelayRight_2	125	S4_McLennan	L_Acoustics 108P	-0.508	-0.856	-0.099	7.20
S4_Main_dV-dosc_DelayRight_3	125	S4_McLennan	L_Acoustics 108P	-0.529	-0.839	-0.130	7.00
S4_Main_dV-dosc_DelayLeft_1	125	S4_McLennan	L_Acoustics 108P	-0.360	-0.930	-0.070	7.40
S4_Main_dV-dosc_DelayLeft_2	125	S4_McLennan	L_Acoustics 108P	-0.330	-0.939	-0.100	7.20
S4_Main_dV-dosc_DelayLeft_3	125	S4_McLennan	L_Acoustics 108P	-0.299	-0.946	-0.129	7.00
S5_Main_dV-dosc_OnStageRight_1	120	S5_World	L_Acoustics 108P	-0.497	-0.865	-0.069	4.90
S5_Main_dV-dosc_OnStageRight_2	120	S5_World	L_Acoustics 108P	-0.451	-0.892	-0.020	4.70
S5_Main_dV-dosc_OnStageRight_3	114	S5_World	L_Acoustics 108P	-0.497	-0.864	-0.080	4.40
S5_Main_dV-dosc_OnStageRight_4	114	S5_World	L_Acoustics 108P	-0.519	-0.849	-0.100	4.20
S5_Main_dV-dosc_OnStageRight_5	111	S5_World	L_Acoustics 108P	-0.548	-0.827	-0.129	4.00
S5_Main_dV-dosc_OnStageRight_6	111	S5_World	L_Acoustics 108P	-0.548	-0.827	-0.129	3.80

Table B9: Point Source Descriptors … continued

Source	Adjusted PWL (dB(A))	Reference Value	Direct.	Directivity X	Directivity Y	Directivity Z	Height
S5_Main_dV-dosc_OnStageLeft_1	120	S5_World	L_Acoustics 108P	-0.381	-0.922	-0.070	4.90
S5_Main_dV-dosc_OnStageLeft_2	120	S5_World	L_Acoustics 108P	-0.419	-0.908	-0.020	4.70
S5_Main_dV-dosc_OnStageLeft_3	114	S5_World	L_Acoustics 108P	-0.379	-0.917	-0.122	4.40
S5_Main_dV-dosc_OnStageLeft_4	114	S5_World	L_Acoustics 108P	-0.340	-0.902	-0.266	4.20
S5_Main_dV-dosc_OnStageLeft_5	111	S5_World	L_Acoustics 108P	-0.310	-0.940	-0.140	4.00
S5_Main_dV-dosc_OnStageLeft_6	111	S5_World	L_Acoustics 108P	-0.310	-0.940	-0.140	3.80
S5_Main_SB218_MidStageLeft_1	119	S5_World	D and B J_Woofers	-0.438	-0.899	0.000	0.70
S5_Main_SB218_MidStageLeft_2	119	S5_World	D and B J_Woofers	-0.438	-0.899	0.000	0.70
S5_Main_SB218_MidStageLeft_3	119	S5_World	D and B J_Woofers	-0.438	-0.899	0.000	0.70
S5_Main_SB218_MidStageRight_1	119	S5_World	D and B J_Woofers	-0.438	-0.899	0.000	0.70
S5_Main_SB218_MidStageRight_2	119	S5_World	D and B J_Woofers	-0.438	-0.899	0.000	0.70
S5_Main_SB218_MidStageRight_3	119	S5_World	D and B J_Woofers	-0.438	-0.899	0.000	0.70
S5_Main_108p_MidStageLeft_1	119	S5_World	L_Acoustics 108P	-0.438	-0.899	0.000	1.40
S5_Main_108p_MidStageRight_1	119	S5_World	L_Acoustics 108P	-0.438	-0.899	0.000	1.40
S6_Main_KUDO_BackStageLeft_1	130	S6_Tiny	L_Acoustics 108P	-0.218	-0.727	-0.651	4.80
S6_Main_KUDO_BackStageLeft_2	130	S6_Tiny	L_Acoustics 108P	-0.120	-0.993	0.000	4.50
S6_Main_KUDO_BackStageLeft_3	130	S6_Tiny	L_Acoustics 108P	-0.100	-0.995	-0.020	4.10
S6_Main_KUDO_BackStageLeft_4	130	S6_Tiny	L_Acoustics 108P	-0.070	-0.996	-0.050	3.80
S6_Main_KUDO_BackStageLeft_5	125	S6_Tiny	L_Acoustics 108P	-0.030	-0.996	-0.089	3.40
S6_Main_KUDO_BackStageLeft_6	125	S6_Tiny	L_Acoustics 108P	0.000	-0.993	-0.121	3.00
S6_Main_KUDO_BackStageRight_1	130	S6_Tiny	L_Acoustics 108P	-0.211	-0.973	-0.091	4.80
S6_Main_KUDO_BackStageRight_2	130	S6_Tiny	L_Acoustics 108P	-0.120	-0.993	0.000	4.50
S6_Main_KUDO_BackStageRight_3	130	S6_Tiny	L_Acoustics 108P	-0.140	-0.988	-0.070	4.10
S6_Main_KUDO_BackStageRight_4	130	S6_Tiny	L_Acoustics 108P	-0.171	-0.984	-0.050	3.80
S6_Main_KUDO_BackStageRight_5	125	S6_Tiny	L_Acoustics 108P	-0.211	-0.973	-0.091	3.40
S6_Main_KUDO_BackStageRight_6	125	S6_Tiny	L_Acoustics 108P	-0.241	-0.963	-0.121	3.00
S6_Main_SB28_BackStageRight_1	131	S6_Tiny	D and B J_Woofers	-0.120	-0.993	0.000	0.65
S6_Main_SB28_BackStageRight_2	131	S6_Tiny	D and B J_Woofers	-0.120	-0.993	0.000	0.65
S6_Main_SB28_BackStageRight_3	131	S6_Tiny	D and B J_Woofers	-0.120	-0.993	0.000	0.65
S6_Main_SB28_BackStageRight_4	131	S6_Tiny	D and B J_Woofers	-0.120	-0.993	0.000	0.65
S6_Main_SB28_BackStageLeft_1	131	S6_Tiny	D and B J_Woofers	-0.120	-0.993	0.000	0.65
S6_Main_SB28_BackStageLeft_2	131	S6_Tiny	D and B J_Woofers	-0.120	-0.993	0.000	0.65
S6_Main_SB28_BackStageLeft_3	131	S6_Tiny	D and B J_Woofers	-0.120	-0.993	0.000	0.65
S6_Main_SB28_BackStageLeft_4	131	S6_Tiny	D and B J_Woofers	-0.120	-0.993	0.000	0.65
S7_Main_K2_BehindStageRight_1	126	S7_MixUp	L_Acoustics 108P	-0.971	0.220	-0.090	7.30
S7_Main_K2_BehindStageRight_2	126	S7_MixUp	L_Acoustics 108P	-0.987	0.160	-0.020	7.00
S7_Main_K2_BehindStageRight_3	125	S7_MixUp	L_Acoustics 108P	-0.985	0.171	-0.030	6.60
S7_Main_K2_BehindStageRight_4	125	S7_MixUp	L_Acoustics 108P	-0.971	0.220	-0.090	6.30
S7_Main_K2_BehindStageRight_5	124	S7_MixUp	L_Acoustics 108P	-0.971	0.220	-0.090	5.90
S7_Main_K2_BehindStageRight_6	124	S7_MixUp	L_Acoustics 108P	-0.971	0.220	-0.090	5.60
S7_Main_K2_BehindStageRight_7	122	S7_MixUp	L_Acoustics 108P	-0.957	0.259	-0.129	5.30
S7_Main_K2_BehindStageRight_8	122	S7_MixUp	L_Acoustics 108P	-0.939	0.300	-0.170	5.00
S7_Main_K2_BehindStageLeft_1	126	S7_MixUp	L_Acoustics 108P	-0.995	0.050	-0.091	7.30
S7_Main_K2_BehindStageLeft_2	126	S7_MixUp	L_Acoustics 108P	-0.993	0.120	-0.020	7.00
S7_Main_K2_BehindStageLeft_3	125	S7_MixUp	L_Acoustics 108P	-0.994	0.100	-0.030	6.60
S7_Main_K2_BehindStageLeft_4	125	S7_MixUp	L_Acoustics 108P	-0.995	0.070	-0.074	6.30
S7_Main_K2_BehindStageLeft_5	124	S7_MixUp	L_Acoustics 108P	-0.995	0.070	-0.074	5.90
S7_Main_K2_BehindStageLeft_6	124	S7_MixUp	L_Acoustics 108P	-0.995	0.050	-0.091	5.60
S7_Main_K2_BehindStageLeft_7	122	S7_MixUp	L_Acoustics 108P	-0.991	0.010	-0.130	5.30
S7_Main_K2_BehindStageLeft_8	122	S7_MixUp	L_Acoustics 108P	-0.985	-0.030	-0.172	5.00
S7_Main_SB28_BehindStageCenterRight_1	125	S7_MixUp	S1_Amph_SUB_Array	-0.990	0.140	0.000	1.40
S7_Main_SB28_BehindStageCenterRight_2	125	S7_MixUp	S1_Amph_SUB_Array	-0.990	0.140	0.000	0.80
S7_Main_SB28_BehindStageCenterRight_3	125	S7_MixUp	S1_Amph_SUB_Array	-0.990	0.140	0.000	0.30
S7_Main_SB28_BehindStageCenterRight_4	125	S7_MixUp	S1_Amph_SUB_Array	-0.990	0.140	0.000	1.40
S7_Main_SB28_BehindStageCenterRight_5	125	S7_MixUp	S1_Amph_SUB_Array	-0.990	0.140	0.000	0.80
S7_Main_SB28_BehindStageCenterRight_6	125	S7_MixUp	S1_Amph_SUB_Array	-0.990	0.140	0.000	0.30
S7_Main_SB28_BehindStageCenterLeft_1	125	S7_MixUp	S1_Amph_SUB_Array	-0.990	0.140	0.000	1.40
S7_Main_SB28_BehindStageCenterLeft_2	125	S7_MixUp	S1_Amph_SUB_Array	-0.990	0.140	0.000	0.80
S7_Main_SB28_BehindStageCenterLeft_3	125	S7_MixUp	S1_Amph_SUB_Array	-0.990	0.140	0.000	0.30
S7_Main_SB28_BehindStageCenterLeft_4	125	S7_MixUp	S1_Amph_SUB_Array	-0.990	0.140	0.000	1.40
S7_Main_SB28_BehindStageCenterLeft_5	125	S7_MixUp	S1_Amph_SUB_Array	-0.990	0.140	0.000	0.80
S7_Main_SB28_BehindStageCenterLeft_6	125	S7_MixUp	S1_Amph_SUB_Array	-0.990	0.140	0.000	0.30
S7_Main_SB28_BehindStageBackRight_1	125	S7_MixUp	S1_Amph_SUB_Array	-0.990	0.140	0.000	1.40
S7_Main_SB28_BehindStageBackRight_2	125	S7_MixUp	S1_Amph_SUB_Array	-0.990	0.140	0.000	0.80
S7_Main_SB28_BehindStageBackRight_3	125	S7_MixUp	S1_Amph_SUB_Array	-0.990	0.140	0.000	0.30
S7_Main_SB28_BehindStageBackRight_4	125	S7_MixUp	S1_Amph_SUB_Array	-0.990	0.140	0.000	1.40
S7_Main_SB28_BehindStageBackRight_5	125	S7_MixUp	S1_Amph_SUB_Array	-0.990	0.140	0.000	0.80
S7_Main_SB28_BehindStageBackRight_6	125	S7_MixUp	S1_Amph_SUB_Array	-0.990	0.140	0.000	0.30
S7_Main_SB28_BehindStageBackleft_1	125	S7_MixUp	S1_Amph_SUB_Array	-0.990	0.140	0.000	1.40
S7_Main_SB28_BehindStageBackleft_2	125	S7_MixUp	S1_Amph_SUB_Array	-0.990	0.140	0.000	0.80
S7_Main_SB28_BehindStageBackleft_3	125	S7_MixUp	S1_Amph_SUB_Array	-0.990	0.140	0.000	0.30
S7_Main_SB28_BehindStageBackleft_4	125	S7_MixUp	S1_Amph_SUB_Array	-0.990	0.140	0.000	1.40
S7_Main_SB28_BehindStageBackleft_5	125	S7_MixUp	S1_Amph_SUB_Array	-0.990	0.140	0.000	0.80
S7_Main_SB28_BehindStageBackleft_6	125	S7_MixUp	S1_Amph_SUB_Array	-0.990	0.140	0.000	0.30
S7_Main_108p_BehindStageCenterCenterRight_1	125	S7_MixUp	L_Acoustics 108P	-0.921	0.390	0.000	1.80
S7_Main_108p_BehindStageCenterCenterRight_2	125	S7_MixUp	L_Acoustics 108P	-0.370	0.929	0.000	1.80
S7_Main_108p_BehindStageCenterCenterLeft_1	125	S7_MixUp	L_Acoustics 108P	-0.993	-0.120	0.000	1.80
S7_Main_108p_BehindStageCenterCenterLeft_2	125	S7_MixUp	L_Acoustics 108P	-0.617	-0.787	0.000	1.80

Table B9: Point Source Descriptors … continued

Source	Adjusted PWL (dB(A))	Reference Value	Direct.	Directivity X	Directivity Y	Directivity Z	Height
S7_Main_dV-dosc_DelayLeft_1	125	S7_MixUp	L_Acoustics 108P	-0.963	0.196	-0.186	7.40
S7_Main_dV-dosc_DelayLeft_2	125	S7_MixUp	L_Acoustics 108P	-0.968	0.150	-0.200	7.20
S7_Main_dV-dosc_DelayLeft_3	125	S7_MixUp	L_Acoustics 108P	-0.952	0.178	-0.249	6.90
S7_Main_dV-dosc_DelayLeft_4	125	S7_MixUp	L_Acoustics 108P	-0.930	0.188	-0.315	6.70
S7_Main_dV-dosc_DelayLeft_5	125	S7_MixUp	L_Acoustics 108P	-0.892	0.206	-0.402	6.50
S7_Main_dV-dosc_DelayLeft_6	125	S7_MixUp	L_Acoustics 108P	-0.830	0.225	-0.510	6.50
S7_Main_dV-dosc_DelayRight_1	125	S7_MixUp	L_Acoustics 108P	-0.978	0.071	-0.194	7.40
S7_Main_dV-dosc_DelayRight_2	125	S7_MixUp	L_Acoustics 108P	-0.971	0.134	-0.200	7.20
S7_Main_dV-dosc_DelayRight_3	125	S7_MixUp	L_Acoustics 108P	-0.953	0.186	-0.239	6.90
S7_Main_dV-dosc_DelayRight_4	125	S7_MixUp	L_Acoustics 108P	-0.931	0.190	-0.313	6.70
S7_Main_dV-dosc_DelayRight_5	125	S7_MixUp	L_Acoustics 108P	-0.888	0.213	-0.407	6.50
S7_Main_dV-dosc_DelayRight_6	125	S7_MixUp	L_Acoustics 108P	-0.822	0.228	-0.522	6.30
S9_CabaretTent_Right_1	112	DJ_StagesDAY	DJ_15inch_PA	-0.995	0.105	0.000	2.50
S9_CabaretTent_Right_1	112	DJ_StagesDAY	DJ_15inch_PA	-0.995	0.105	0.000	2.50
V1_Minor_Left_1	118	DJ_StagesDAY	DJ_15inch_PA	0.794	-0.608	0.000	2.50
V1_Minor_Right_1	118	DJ_StagesDAY	DJ_15inch_PA	0.794	-0.608	0.000	2.50
V2_Minor_Right_1	118	DJ_StagesDAY	DJ_15inch_PA	-0.707	0.707	0.000	2.50
V2_Minor_Left_1	118	DJ_StagesDAY	DJ_15inch_PA	-0.707	0.707	0.000	2.50
V3_Minor_Right_1	118	DJ_StagesDAY	DJ_15inch_PA	-0.677	-0.736	0.000	2.50
V3_Minor_Left_1	118	DJ_StagesDAY	DJ_15inch_PA	-0.677	-0.736	0.000	2.50
V4_Minor_Right_1	117	DJ_StagesDAY	DJ_15inch_PA	-0.729	0.685	0.000	2.50
V4_Minor_Left_1	117	DJ_StagesDAY	DJ_15inch_PA	-0.729	0.685	0.000	2.50
V5_Minor_Left_1	117	DJ_StagesDAY	DJ_15inch_PA	0.925	-0.381	0.000	2.50
V5_Minor_Right_1	117	DJ_StagesDAY	DJ_15inch_PA	0.925	-0.381	0.000	2.50
V6_Minor_Right_1	117	DJ_StagesDAY	DJ_15inch_PA	-0.949	-0.316	0.000	2.50
V6_Minor_Left_1	117	DJ_StagesDAY	DJ_15inch_PA	-0.949	-0.316	0.000	2.50
V7_Minor_Left_1	117	DJ_StagesDAY	DJ_15inch_PA	-0.949	-0.316	0.000	2.50
V7_Minor_Right_1	117	DJ_StagesDAY	DJ_15inch_PA	-0.949	-0.316	0.000	2.50
V8_Minor_Left_1	118	DJ_StagesDAY	DJ_15inch_PA	-0.822	0.569	0.000	2.50
V8_Minor_Right_1	118	DJ_StagesDAY	DJ_15inch_PA	-0.822	0.569	0.000	2.50
V9_Minor_left_1	118	DJ_StagesDAY	DJ_15inch_PA	0.173	0.985	0.000	2.50
V9_Minor_Right_1	118	DJ_StagesDAY	DJ_15inch_PA	0.173	0.985	0.000	2.50
V10_Minor_Right_1	117	DJ_StagesDAY	DJ_15inch_PA	-0.423	-0.906	0.000	2.50
V10_Minor_Left_1	117	DJ_StagesDAY	DJ_15inch_PA	-0.423	-0.906	0.000	2.50
V10_Minor_Right_1_Elevated	110	DJ_StagesDAY	DJ_15inch_PA	-0.423	-0.906	0.000	7.50
V10_Minor_Left_1_Elevated	110	DJ_StagesDAY	DJ_15inch_PA	-0.423	-0.906	0.000	7.50

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TRANSCRIPT OF PROCEEDINGS

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O/N H-970123

INDEPENDENT PLANNING COMMISSION

MEETING WITH DEPARTMENT OF PLANNING AND ENVIRONMENT

RE: NORTH BYRON PARKLANDS CULTURAL EVENT SITE MOD 3

PANEL:	**PROF RICHARD MACKAY AM** **ANDREW HUTTON** **CATHERINE HIRD**
ASSISTING PANEL:	**DAVID KOPPERS** **JORGE VAN DEN BRANDE**
DEPARTMENT OF PLANNING AND ENVIRONMENT:	**CHRIS RITCHIE** **KANE WINEWOOD** **PATRICK COPAS** **JEFF PARNEL** **PAM MORALES**
LOCATION:	**IPC OFFICE** **LEVEL 3, 201 ELIZABETH STREET** **SYDNEY, NEW SOUTH WALES**
DATE:	**1.01 PM, TUESDAY, 4 DECEMBER 2018**

PROF R. MACKAY AM: Good afternoon and welcome, and before we begin, I would like to acknowledge the traditional owners of the land on which we're meeting, the Gadigal people of the Eora nation, and I pay my respects to their elders past and present and extend those respects to any Indigenous people who are with us this afternoon. Welcome to this meeting on development application MP 09_0028 MOD 3, and State Significant Development 8169 in relation to the North Byron Parklands Cultural Events Site from Billinudgel Property Proprietary Limited, the applicant, who seeks approval for the ongoing use of the site for cultural education and outdoor events for up to 20 event days per year. The concurrent modification requests to amend the terms of the existing concept plan approval to reflect the types of permanent cultural events that would be held at the site.

I'm Professor Richard Mackay and the chair of this Independent Planning Commission panel, and joining me are my fellow Commissioners, Andrew Hutton and Catherine Hird. And the other attendees at the meeting are, from the Department of Planning and Environment: Chris Ritchie, Director Industry Assessments; Kane Winewood, Team Leader, Transport Assessments; Patrick Copas, Environment Assessment Officer, Industry Assessments; Jeff Parnel, Technical Specialist; and Pamela Morales, Senior Environmental Assessment Officer, Industry Assessments. And from the Independent Planning Commission: Secretariat, David Koppers, who's the Team Leader; and Jorge Van Den Brande, who is Planning Officer.

In the interests of openness and transparency, and to ensure the full capture of information, today's meeting is being recorded and a full transcript will be provided and made available on the Commission's website, and this meeting is one part of the Commission's decision-making process. It's taking place at the preliminary stage of the process and will form one of several sources of information upon which the Commission will base its decision. It's important for the Commissioners to ask questions of attendees and to clarify issues wherever we consider it appropriate, so if you're asked a question and are not in a possession to answer, please feel free to take the question on notice and provide any additional information in writing subsequently, which we'll then also put up on our website.

And, if I may, if it's okay with the presenters from the department, it would be quite helpful to us if you wouldn't mind us asking questions as we go through rather than sort of saving them to the end. I think that's a more efficient way of proceeding. And if everyone's happy with that, thank you again, welcome, and we'll begin.

MR C. RITCHIE: No problem. Firstly, thank you very much for having us. What we propose to do is run through the project itself and our assessment report which has been provided as a recommendation to the IPC. Importantly, though, there is a bit of background to give context as to why we had this application before us, and I'll touch on that as well. We'll run through a little bit around the process, the response that we got in terms of exhibition from the community, and we'll touch on some issues, and then we can sort of answer questions as we go, if that's okay.

PROF MACKAY: Yes.

MR RITCHIE: What we do prepare as part of these processes is an information folder, and that sort of gives us some points to sort of talk to as we sort of raise and discuss issues as we go through the process. So we've just got one for each Commissioner.

PROF MACKAY: Okay. Thank you.

MR .....: Thank you.

MR A. HUTTON: Thank you. It might also be useful if you just announce your name kind of the first time you speak just to assist with the transcript. You weren't advised, so yes.

MR RITCHIE: That's fine. So my name is – and I can introduce everyone.

PROF MACKAY: Yes.

MR RITCHIE: It's Chris Ritchie, and I'm the Director of Industry Assessments, and I run an assessment team within Planning Services of the Department of Planning and Environment. In terms of who's here at the moment from the department side, we have Kane Winewood, who is one of my team leaders, who looks after industry projects including this particular development; the two primary assessment officers, being Patrick Copas and Pam Morales, who were the assessment officers for the project, and also Jeff Parnel, who provides acoustic or noise advice to the department on a variety of projects, and Jeff's been involved in the project with ourselves for a number of years, so he can help provide some of that background in terms of the noise issues and how that's evolved about a bit of time.

PROF MACKAY: Great. Thank you.

MR RITCHIE: So the site itself is at North Byron near Yelgun. The site's about 259 hectares in size. In terms of events within the area, there is quite a history in terms of cultural events or music events happening in the locality and including on the site. There was a project application and concept approval or concept plan proposal proposed in about 2009, which sought to have a permanent facility to house the Splendour in the Grass and Falls events on the site. That particular project, following an assessment, went through what was called the Planning Assessment Commission at the time, and community events or music events were quite new at that time, and there was a lot of community concern.

There was some agency concerns, as well, and the decision out of the Planning Commission at the time was to give that project a trial approval, and that was for a five-year period, up until September 2017. The idea of that trial approval, as well, was to demonstrate that the issues associated with the project can be managed and environmental issues can also – from an environmental plan point of view can also

be sort of to a point where the issues are addressed. During the course of that facility operating, there were some initial issues around noise, around traffic, and over time, there has been a bit of work through the trial process to improve on those issues, and noise is something that we'll touch on as we sort of go through.

The trial approval was extended till August next year, 31 August next year, to give a little bit more time to refine some of those trial issues around managing issues from the event, but also to enable – there was one more Falls event which was going to occur towards the end of that year, and also Splendour in the Grass for next year, so the current part 3A approval is up until 31 August. When the concept plan was also approved, the concept plan stipulated that any future use of the site or permanency on the site would have to be subject to a future application under part 4, which is what we have before us now. So while the trial part 3A project approval will expire, to allow ongoing use and permanency, that is the subject of the current application before us now.

Concurrently, though, the SSD assessment also includes an application to modify the concept, and that's to facilitate aspects that the SSD application is seeking to do, as well, and that's having an increase in the capacity up to 50,000 and some little, also, nuances to enable the SSD to occur. Over the course of time, we've appreciated there is concerns in the community around the projects, so while we're on exhibition for the application, we also conducted a couple of community sessions in the area, one at the Mullumbimby Farmers Market and a second community session at the Ocean Shores Shopping Centre. The Mullumbimby Markets – we had probably 15 to 20 people come up to us. We had a stand, and that enabled us to hear first-hand around what the community's issues were.

Secondly, we had the Ocean Shores, of which there was probably 30 to 50 people which we interacted with for a course of a number of hours. Community concerns vary, but one of the key things that we heard from that was around the community feel like they're impacted when the event occurs, and having a facility or a proposal up to 50,000 raised some issues with them. But equally, what was expressed was that North Byron – or the areas around the facility are – it's a smaller – it's a small rate pay area, and when the people come into the event, the numbers in terms of what's in the local area is significant compared to what the normal rate pay is.

In terms of the exhibition, we did get a significant response. If you flick through to the files, there's about 7204 submissions received, which is, even for the projects we do – is a significant response. And we do identify what the key issues that were raised were, but also the location of where submitters are coming from. So we do a – there's a radius around two and five kilometres. Equally, concerns around noise, the scale of facility, impacts during the trial, impacts on infrastructure were raised. There are about 118 public objections, but also a lot of public support, as well, so there's a number of thousand – 7000, from memory. Support submissions were raising issues around the community benefit, the cultural experience, so issues equally were raised in terms of support as well as objecting.

PROF MACKAY: And the vast majority of them were pro formas.

MR RITCHIE: The vast majority would be pro forma. So you can see the - - -

PROF MACKAY: Yes. 6000 – north of 6000.

MR RITCHIE: Yes. So the map just on that location runs through in terms of - - -

PROF MACKAY: Sorry. I'm looking at the right map.

MR RITCHIE: - - - location of submitters, so you do see, you know, a number of community members in proximity support and also object to the proposal. Equally, there is a spread as you sort of head north and south.

PROF MACKAY: A lot of Melbourne people.

MR RITCHIE: And I would say there's a lot of people go to the even – were putting in submissions.

MS HIRD: Yes ..... yes.

MR RITCHIE: So the current proposal seeks permanency on the site, and the current proposal sought to have events of up to 50,000. So there's a number of elements to the events that are going to be held. So the application seeks to have two events per year, being Splendour and Falls, which are large events, with a maximum five days each with up to 35,000 patrons per event day at Splendour in the Grass, increasing, as proposed, to forty-two and a half thousand and then 50,000 patrons – and we will explain a bit around what we've proposed in terms of our recommendation on that – subject to meeting certain key performance requirements. 35,000 patrons per day at Falls and 30,000 campers, camping patrons at these events. Three medium event days per year, which would run either on separate event days or combined three-day period, up to 25,000 patrons per event. Five small events, up to 5000 patrons; two minor; one-day community events as well.

In terms of the application as well, the proposal is deemed to be State Significant development, which is why the Minister or the Department of Planning has been assessing the proposal. So there are certain triggers within the State and Regional Development SEPP that trigger Department dealing with it, and it has been an issue that has been raised. But in terms of the category of development and the capital investment value threshold, we're satisfied it meets those two provisions. In terms of the assessment itself, so that's coordinated by the department, then, obviously, with the submissions of objections, then that triggers the need for the Independent Planning Commission to be the consent authority for the project.

I think maybe what we will do is now is we will touch on some of the key issues around the proposal, and some of those key issues we had anticipated that the issues were current within the community and within council. So the department, as part of

its assessment, did engage two experts to provide some advice, and one was around economic advice, which was from HillPDA, and also ran wastewater, which we engaged GHD. Now, wastewater had been raised by a number of community members but also by council. So we got some expertise to provide us with some advice around wastewater management on the site. In terms of touching on one of the first key issues, which was around staging, now, the applicant did propose, as the current trial approval has, is a staging mechanism to demonstrate over a period of time performance will allow the project to develop or increase in size.

The proponent or applicant had proposed to equally stage that but at seven and a half thousand increments. That was one of the key issues raised by the community, was around the scale of the proposal. So when you would read our assessment report, we've actually recommended paring that down to around 5000 increments and having some key performance measures that have to be satisfied before progressing to the next stage. And some of those performance measures do tie back to wastewater issues, which we will all touch on, around noise management, around traffic management and around general consistency with issues that have also been raised by police and others. The recommendation in the report is for an increase of patron numbers to be subject to a performance evaluation report, and that would have to be submitted to the department to review and be satisfied of, and key agencies would be consulted on that as well.

Traffic has historically, from the onset of the trial, been one of the key issues that we've had. The site is quite well-located in terms of proximity to the Pacific Highway. And over time, there has been improvements and refinements made on-site to improve how traffic flows on to the site and removes itself from some of those regional roads and major roads in the area. There are some additional improvements proposed as part of the application which we've described in the report and which is described in the EIS, including provisions for additional access to the north, access and egress. Also, some internal improvements to how traffic moves within the site. In terms of the – the outcome is the assessment found that traffic can be managed. And while there might be some small delays, it's for a short period of time. And generally, what you do find is that there is higher level of traffic in the area around Christmas time compared to the July event, where there's not as much background traffic.

In terms of noise, it's probably one of the next big key issues, and this has probably been one of the issues that has changed since the trial has come in and has been one of the issues that the applicant has developed in terms of how to manage that over the course of the trial period. Initially, the noise criteria in the trial approval was based on a background plus 10 DBA, but from the early onset of events noise was one of the key issues raised by people in the community. And over time, there has been refinements in how noise has been managed. And what I will do now is I will hand over to Jeff Parnel, our acoustic expert, that will touch on one of the key changes that came out of what we call modification 3 to the project approval, which introduced a different noise criteria, including a different category of noise, which is around c-weighted noise. So I will just hand over to Jeff.

MR PARNEL: Okay. Yes, thanks for that, Chris. Pretty much correct in that. So initially when I became involved in it, the criteria that had been established had actually been established by the PAC, and they had used a background plus, so a relative criterion. And I guess in how that came about was they were thinking that they should use something akin to an industrial noise policy and maybe reduce the stringency, given that the events only occur for 20 days, rather than something that happens 365 days a year. That thinking was quite flawed in that the backgrounds up in that area are highly variable, they don't reflect annoyance and they're highly susceptible to things like road traffic noise, but particularly in summer they're susceptible to cicadas and cricket noise, which can totally mask what they were trying to achieve.

So the thought process was solid, but it doesn't work in an area where, during winter, your backgrounds could get quite low. And, in fact, the criteria that they were developing for some of the locations was as low as 38 decibels outside of a person's property. Now, I can probably tell you that in this room we're somewhere around 40 decibels, and that's internally here, regardless of what that noise level would be outside. Outside of here we're probably around 65 decibels with about 30 decibels reduction from outside inside.

So the criteria that they establish there was – could not be met by a music event that was going to have any reasonable patron experience. So it was problematic from day 1, that it was never going to comply. Because it was never going to comply, the controls that they – they actually didn't know how to control it properly. They had no realistic benchmarks. We had a number of – the first couple of years, they were collecting a lot of information and data and we were trying to work out what would be the best way to control it. I can tell you that there is no good procedure anywhere in the world for Knebworth or any of the events that are held in England, Glastonbury or anything, they do not manage noise particularly well there. The limits that they tried to set there were set in the '70s, and they basically are fairly high and fairly unregulated. They don't actually regulate to the levels that well. But there is a dearth of information.

There is nothing you can read anywhere in the world that really manages noise well, so we kind of had this gap that we didn't know what to do. That took up myself and some of the planning officers' – a lot of our time trying to work out how we could best go ahead and regulate noise. We knew that the use of the dBA was not really going to capture and manage noise well, because a lot of the problems were with the lower frequencies by either bass. So the treble wasn't the big issue, it was all about bass noises that people could hear, and they transmit through walls, and glass, and façades and so forth, so that's what you hear inside. And I'm sure you understand that experience if you're hearing noise – music inside; it sounds completely different to what it is outside.

The other thing that's uniquely different about that compared to some of the other outdoor festivals that we do manage, and the department doesn't manage a lot of these things, but one of the things we do, we manage noise – well, concerts at the

Correct and was proven over the first few years to be well above the criteria

Incorrect and misleading - I suspect the vast majority of acoustic consultancies and government agencies that have invested significant time, money and effort into event noise assessments over the past 30 years would take exception to this statement.

Opera House steps. Now, with the Opera House steps, the closest neighbours are like those people that live in the Toaster building, the Bennelong Apartments, and they're only several hundred metres away. In this site, everybody is a kilometre to three kilometres away, and what happens with music noise, it's highly dependent – the propagation of it is highly dependent on what the weather is. So if you get temperature inversions or you get strong winds, you get an enhancement of noise to one side of the event, probably at the expense of, you know - - -

MR J. VAN DEN BRANDE: Reduction at the other side.

MR PARNEL: Sorry?

MR VAN DEN BRANDE: A reduction on the other side.

MR PARNEL: Exactly. So they pump out the same amount of noise, but it can be enhanced on one side at the expense of not hearing anything on the other side of the event. The metrology probably can account for 10 decibels quite easily, but up to probably 20 decibels, so it can really cause big difference that are really difficult to regulate. You might be checking and measuring something and then, with a change in the wind, that can enhance it by five to 10 decibels. These were the problematic things that we were looking at.

We collected a lot of information and we came up with a set of noise criteria that we thought – that I believed would provide adequate protection for two zones of people. A zone of an inner circle immediately around the event that could be considered – or should be offered probably to be associated with the project and have some kind of mitigation or agreements in place, and a second zone that extends out. So that zone would finish then before the larger populations, which are the Ocean Shores, South Golden Beach and those areas that are down towards the Pacific Ocean.

Noise catchment-wise, there's a couple of other things that are interesting to note. To the west, we've got the Pacific Motorway, which carries a lot of night time traffic, particularly heavy vehicles, and it's quite a noisy section of road. So places that are to the west of that, they hear road traffic noise consistently. Those places down near Ocean Shores and South Golden Beach, they are on – mainly on inland waterways. They get a lot of insect noise down there, particularly in summer, but they get an awful lot of ocean noise. So the ocean noise has a high component of low-frequency noise as well.

So looking at how we could best manage this, I came to the conclusion that we would measure the dBA, which is what is normally measured for noise, but also a particular octave band that is present in all music and it's usually the predominant low-frequency band, and that's a 63-hertz octave band, and it has proved to be quite a good way of distinguishing music noise from some of the other noises that we get, specifically the insect noise, and road traffic noise to a certain extent. Not so good – or at least I haven't, at this point, been able to work out a relationship between that and ocean noise, which also produces 63 hertz.

The set of noise criteria appears to be retrofitted to the early noise emissions i.e. the criteria were set so that the historical noise emissions complied. Evidence of this was provided in my presentation at the PAC meeting at Mullumbimby

Definitely not the first time this approach has been used for concert events - no trailblazing here

So long story short, we came up with a dual set of criteria: that was the dBA, similar – which had been used in the early conditions, and a low-frequency noise component. We introduced those trial conditions, and the North Byron Parklands people employ a significant amount of acousticians for each of these events and they manage – I would suggest they probably manage this to world's best practice. They certainly have a lot more people on the ground than Knebworth, or Glastonbury, or any other event I've ever heard of and they are able to manage the noise. It's not easy with the met conditions changing, but they do a very good job on that.

We found, subsequent to the management of those noise levels, that they were – they worked out to be quite pragmatic levels. They were specific; they were the whole smart objectives; they were measurable; they were achievable; they were practical; and they have kind of been able to work. We found with the introduction of those that we got significant decreases in complaints, which indicated that we were going definitely in the right direction. We also got a lot of feedback that the control of the low frequency was a good thing, and that was one of the things that were annoying people and that was being managed quite well.

Shows that there are still some issues

As a general rule, we tend to find that, out of the two criteria, it's the low frequency, the 63-hertz octave that is probably the controlling criterion out of the two. So we manage that and, really, the rest of it is, is we've been quite successful in doing that. I myself have spent an awful lot of time up there making measurements. For me, it was a bit of an R and D exercise. I probably – if we're all happy, I would – I'm happy to hand out some of the papers – I actually wrote a technical paper on what we did up there, so if we're all comfortable, I'm happy to hand that around. It provides some of the background, and the thinking and the science that underpinned the criteria that I developed. So I'm happy to hand those around. I think there should be enough for everybody.

I don't recall ever having seen this paper

So the purpose of presenting and putting this paper together was to disseminate that information amongst my contemporaries. I did that at a recent conference of the Australian Acoustical Society, which enables me to then get feedback, and it's a process that I use to get feedback from people that do work somewhat in this area and to see if anyone picks up on anything. Mostly, the feedback I've had so far is quite positive and there's certainly some other jurisdictions looking to probably take on board our experience from this side. I don't know if it's appropriate to ask, but if you've got any questions - - -

PROF MACKAY: I think it's good to do it as we go.

MR HUTTON: Yes.

PROF MACKAY: I've just got a really minor one, which is what happens at the conference centre that causes receptor 18 to be impacted?

MR PARNEL: Well - - -

PROF MACKAY: I mean, I get the concerts, and the music and the low-frequency - - -

MR PARNEL: Yes.

PROF MACKAY: - - - but also in the assessment report, it identifies this receptor right next to the conference centre as being impacted not during events and - - -

MR HUTTON: Yes.

PROF MACKAY: - - - we had a little chat about it before. Just intrigued to know what is it that's going down at the conference centre.

MR RITCHIE: Yes. It's – so from – with what Jeff has explained, we still obviously assess the acoustic issue - - -

PROF MACKAY: Sure. Yes.

MR RITCHIE: - - - from the project, and there are, despite – there are ..... some improvements in terms of managing C weighted noise through the additional condition. There's still going to be a couple of receives that are close by that, despite the different criteria, still will experience some issues and that's where there's – an agreement has been entered into between the two parties.

MR PARNEL: Is this talking about when they use the – they did an assessment to the Liquor Gaming and Administration Act.

MR HUTTON: I think the reference is on – it's on page 62, Jeff, second paragraph. Are you on page 62? You've got to – yes – come down there. It just says, about four lines down, second paragraph, five lines down:

> *Assessment predicted a criteria of 25 dB would be exceeded to several receivers, including the nearest property, of 18 located near the conference centre.*

That's a low criteria.

MR PARNEL: That's an extremely low criterion. Basically – so what has been looked at at the conference centre is a different criterion - - -

MR HUTTON: Yes. Right.

MR PARNEL: - - - to what music would be considered from the 20-day events.

MR HUTTON: Yes.

MR PARNEL: The conference centre would have a licence – a liquor licence.

MR HUTTON: Right.

MR PARNEL: When you a hold a liquor licence, it then comes under the – and I might get this wrong, but it used to be the Office of Liquor, Gaming and Racing.

MR HUTTON: Yes. Yes.

MR PARNEL: So there's a criterion which is actually unsupported now, because it has been removed, but it has quite often been still used as the reference that you use for music coming from pubs and clubs, and it's an old criterion that I don't particularly support, but they propose to use that just for the events at the conference centre. Now, it effectively means that, after midnight, you've got to be basically background plus zero, so you can't be anything, so it's a relative criterion. Some of the pubs and clubs around here, they try to use it. It kind of works in the city, but where you've got a background of something like 25, it's probably not going to really work.

MS HIRD: The festivals, though, have a temporary liquor licence. That doesn't apply in their case.

MR PARNEL: No. No, it doesn't. No. It's specific for permanent events that are held, like - - -

MS HIRD: 365.

MR PARNEL: Can be on 365 days of the year.

PROF MACKAY: Okay. Okay. Catherine, do you have other questions at this point?

MS HIRD: Not about the noise - - -

MR PARNEL: Having said that, we wouldn't expect that the music or the noise to come out from that to be anywhere near in - - -

MS HIRD: Yes.

MR PARNEL: - - - the levels that would come out from a full concert held in the amphitheatre.

MR HUTTON: Quite keen to just explore the comment about cutting edge adaptive noise mitigation and just quite – get your - - -

MR RITCHIE: I was going to ask Jeff to - - -

MR HUTTON: Yes.

MR RITCHIE: To touch on that. And that's often talking around – they're assuming amount of monitoring that occurs and interaction between what's being recorded, staff in the field - - -

MR HUTTON: Yes.

MR RITCHIE: - - - to what noise are generated at the front of house, they call it, but - - -

MR HUTTON: Yes.

MR RITCHIE: Maybe I'll get Jeff to explain that.

MR PARNEL: Yes. So one of the challenges in the area is this: that you can have three or four stages operating - - -

MR HUTTON: Yes.

MR PARNEL: - - - concurrently. What we've done quite successfully at the Opera House was we controlled noise at what is called front of house, so it's basically where the sound engineer sits. If we manage the noise at that point, we can measure – the signal to noise ratio is quite good. You're measuring a high level of music. It's not going to have extraneous noise in it. You can – you then know if the level here is what it is, then what it will be 100 metres, 200 metres back, a kilometre back. We also know that events will need to be at a certain level, because music – unlike, say, industrial noise where lower is always better, with a music concert, it's always going to be a compromise. If you get it too low, you won't get the patron experience.

So we know what that patron experience has to be. It has to be around that 95 decibel kind of range in the dBA, 105 dBc. People will be generally happy at that kind of level. If it's lower than that, they won't get the experience. If it's higher than that, probably it's higher than necessary, so there's a limit that you can have, and then you've got to control it, so when you've got that, there's other ways that you can control noise, you know, which is basically by hours, you know, limiting to midnight and so forth. Those kind of things. What they have done – they have done a lot of work with good recent technology, so at the amphitheatre, which is their biggest area where they have their prime acts on, they have delayed speakers throughout that – throughout the crowd, so they don't have to play the noise up front as much, and then they play it so there's a slight delay.

MR HUTTON: Okay.

MR PARNEL: And that's a kind of a common practice, but you've got to delay it because sound travels – or 343 metres a second, so, actually, if you're 300 metres into the crowd, you actually have to delay it by one second, otherwise you'll get – you'll – it'll sound terrible. You'll get an echo kind of thing. So they do those kind of things. They've got – they did a lot of work with their speakers, managing the low

frequency components, so the woofers, the subwoofers. You know, you can imagine they're very big speakers, but – so they've managed those, got them pointed in different directions. They also – so what happens – the event looks at what noise is being generated at the front of house. They know that of all of their main stages, if they're getting noise levels that are approaching the criteria – they've got roving acousticians that go and measure - - -

MR HUTTON: Okay.

MR PARNEL: - - - outside at the residential properties. We know from the met effects which side of the event is likely to be the worst. They will concentrate their measurements around those areas. If they come back going, "We're approaching the criteria," that's reported back to someone who's watching all stages, and he can make a determination what stage is likely to be causing the problem. And there – they can make adjustments very, very quickly. So they're able to address an issue quite quickly and proactively.

MR RITCHIE: So on that point, too, it's also when complaints have been raised and they can ferry someone out to do a measurement, and they report that back that there is an issue or it seems okay.

MR PARNEL: Yes.

MS HIRD: Are they getting real time measurements from all the receptors that are around?

MR PARNEL: They don't get actual real time measurements because that would require you to have a massive amount of monitoring equipment remotely located, and you don't actually know which side of the event. Typically, over four days, it tends to be - - -

Perhaps maybe not worlds's best practice after all...

MS HIRD: Yes.

MR PARNEL: - - - one side will be noisy one night, then, you know - - -

MS HIRD: Yes.

MR PARNEL: - - - the Friday night - - -

MR HUTTON: Yes.

MR PARNEL: - - - it'll be noisy here. It actually changes quite a bit, and it can change through the course of the night. You know, the summer events are different because they tend to have nor'east winds in summer. With the winter ones they tend to have southerly, so a different side. The Wooyung Road side tends to kind of cop a bit more noise. So that's not that feasible; however, having said that, if we do get problems, they are monitoring at the main stages. They're actually constantly

recording that data, so they can forensically go backwards and look if there was a problem at, you know, 9 o'clock at night - - -

MS HIRD: Yes.

MR PARNEL: - - - you could kind of look at your stages, and that's what we've tried to do. And I've worked with the acousticians that are contracted to do that to try and manage noise better.

MR HUTTON: It mentioned in the assessment report that there's agreements in place with some near receptors.

MR PARNEL: Yes, that's correct.

MR HUTTON: And that they were developing agreements with others. They're i the process at this stage. The criteria that would trigger the need for an agreement versus no agreement – could you talk us through that a little bit, if you're aware of

MR PARNEL: Yes. No, no, I'm well aware of it.

MR HUTTON: Yes. I wasn't sure whether it was a - - -

MR PARNEL: Yes.

MR HUTTON: - - - applicant question or a department question. That's all.

MR PARNEL: So what we established, looking at it, was that it was probably best managed by setting out two zones. So a zone 1 and a – zone 2 is effectively everything else, so there's really - - -

MR HUTTON: Yes.

MR PARNEL: - - - one inner circle. Now, we knew within that zone, the levels were likely to be annoying.

MR HUTTON: Yes.

MR PARNEL: And probably more annoying than people should necessarily have to get consistently; however, they weren't that annoying that it should preclude an event from occurring. And in many other situations, people get road traffic noise and things like that - - -

MR HUTTON: Yes, yes.

MR PARNEL: - - - much higher than the levels there.

MR HUTTON: Yes. That are here.

With regard to real-time adjustment of noise output, "forensically go backwards" won't reduce the noise at the neighbours a week ago... unless they also have a time machine.
Once again, not worlds best practice for real-time control of noise emissions

There's some interesting statements

MR PARNEL: So the levels are not considered excessive or damaging to health or anything like that, but we established a zone. We did a few iterations of that. In the end, it ended up being, like, a one-kilometre buffer zone around the area, and within that zone, the proponent agreed to enter into agreements with everybody within that area.

MR HUTTON: Yes.

MR PARNEL: And they've got different arrangements with different people.

MR HUTTON: Yes.

MR RITCHIE: So the department doesn't get involved in - - -

MR HUTTON: Yes.

MR RITCHIE: - - - what terms they are; that's between the applicant - - -

MR HUTTON: Yes, yes.

MR RITCHIE: - - - and the proponent. But, essentially, also, the criteria sets, "This is what you have to achieve."

MR HUTTON: Yes.

MR PARNEL: Yes.

MR RITCHIE: If you don't achieve that, then - - -

MR HUTTON: Yes, okay.

MR PARNEL: Yes.

MR RITCHIE: - - - the expectation is you have to – you'll have an agreement.

MR PARNEL: So even within that area, it's not like all bets are off. We do have limits within those areas so people know what they're signing up to – what agreement they're kind of going to sign up to. You know, and the events all finish at midnight, except New Year's Eve, when probably all bets are off. I mean, on New Year's Eve. But the events finish at midnight and then some of the smaller bars then continue on till 2 o'clock in the morning.

Noise created by patrons (such as music, fireworks etc) after hours needs further specific addressing and management

MR HUTTON: Yes.

MR PARNEL: Which is actually considered a good thing around events because it tends to dissipate people and they don't start making their own - - -

MR HUTTON: Yes.

MR PARNEL: - - - music and noise and stuff like that, so you can kind of control it in a steady fashion, so it's a good way of managing it. The real area that we wanted to manage was in those areas around Ocean Shores and South Golden Beach because - - -

MR RITCHIE: So to the south-east.

MR PARNEL: They're – they are residential areas. All of the other ones within the zone 1, they're all rural properties that may be on fairly big acreages themselves, so there's not that many of them for – encircling the property. But down in Ocean Shores, for example, you know, they're all on - - -

MR HUTTON: Yes.

MR PARNEL: - - - 600 square metre blocks of land, so there's an expectation that, you know, people that are in those areas, you know, probably work wherever they live a more suburban lifestyle, and we try to manage noise specifically in those areas to reasonable levels.

MR RITCHIE: So in terms of the assessment in the EIS, there's the prediction that there's two properties that the criteria still might meet and those two properties have an agreement .....

MR HUTTON: Yes, which is five and 43.

MR .....: .....

MR RITCHIE: Okay. So that's discussed on page 59 - - -

PROF MACKAY: And do you then take the view that if they've got an agreement in place, that that's, kind of, the end of it? It's satisfactory for those properties. I mean, that the noise level might not be satisfactory, but the outcome is satisfactory because they had contracted out.

MR PARNEL: Well, look, it's a process that we use in a lot of other ..... there's a lot of precedents for it. We do that around a lot of mine sites, a lot of noisy activity - - -

MR PARNEL: - - - so that are considered – the overall benefits are considered to outweigh the negatives, and what we do is we assign mitigation rights to those properties - - -

MR PARNEL: - - - or they have negotiated agreements.

MR RITCHIE: So, in essence, it's a form of mitigation to that property.

MR PARNEL: Some of these agreements, although we're not privy to them, you know, in detail, and they're different, but they do have options for people to relocate should they wish, have various things done to their properties. So they include quite a range of things, and they're – from the things that I'm aware of that are reasonably generous for the impacts that they get for 20 days.

MR .....: Thanks.

MR RITCHIE: So maybe two other issues which we will just touch on - - -

MR HUTTON: Relating to noise?

MR RITCHIE: No.

MR HUTTON: I - - -

MR RITCHIE: Did you want to continue with .....

MR HUTTON: No, I think .....

MR .....: .....

MR HUTTON: Thank you. That's really informative .....

MR .....: .....

MR PARNEL: Okay. Hopefully you will find some of the, as I said, science underpinning a few things here - - -

MR .....: Yes. No, I appreciate that.

MR PARNEL: - - - which might be of some benefit to you.

MR .....: .....

MR PARNEL: It's not highly technical, but it just - - -

MR .....: Thank you.

MR PARNEL: - - - kind of takes you a little bit on the journey that we went and tried to .....

MR RITCHIE: And that – the two other issues to talk about is around waste water management and community enhancement. In terms of community enhancement – and I will talk to waste water afterwards – is when I was mentioning that we went up to the two locations ..... exhibition to meet with community members, one of the things that I mentioned that came out of that is the community does feel impacted by

the project, particularly around the scale of events that is proposed to occur and a small rate base that exists in that location. We decided through the conditions to recommend a form of community enhancement. That is not dissimilar to something that Byron Shire Council is thinking about in terms of a tourism visitor location tax. There had been some initial discussions between a number of applicants and council. That – those discussions and that policy are still being worked on, but in the meantime we believe that an enhancement program is something that would provide the community with some benefits back in terms of when these events do occur.

MR HUTTON: So that's the dollar per patron up to a maximum of 120,000.

MR RITCHIE: Correct.

MS .....: Yes.

MR RITCHIE: Correct. We're looking to have that formalised through a voluntary planning agreement between council and the applicant.

MR .....: Yes.

MR RITCHIE: The initial discussions is the council seems in principle supportive of that, but it is subject to more broader discussions within the council.

MR .....: Was that conversation had also with the Tweed Council?

MR RITCHIE: No.

MR .....: No.

MR RITCHIE: No. No. In terms of location, it is in Byron.

MR .....: I understand. Yes.

MR RITCHIE: Yes. And in terms of the impact, it is those communities that we are talking about, but in terms of the voluntary planning agreement we would be recommending that that's stipulated to be provided to specific areas around that location - - -

MR .....: Yes.

MR RITCHIE: - - - just so that the areas directly affected by the project get a benefit from - - -

MR .....: Yes.

MR RITCHIE: - - - voluntary committee enhancement program.

MS HIRD: So is that one dollar locked in or can it change over time ..... 237 one dollars worth five cents - - -

MR RITCHIE: That's subject to the agreement, those sort of details, and that's a very good point. It would be ..... out or discussed and detailed in that agreement.

MS HIRD: Yes.

MR RITCHIE: That's a good point to raise. In terms of waste water - - -

MR HUTTON: Before you jump off - - -

MR RITCHIE: Sorry.

MR HUTTON: Yes. I'm keen to hear a little bit more about the RWG, the Regulatory Working Group - - -

MR RITCHIE: Sure.

MR HUTTON: - - - that's put together - - -

MR RITCHIE: Yes.

MR HUTTON: - - - and during the process you had some consultation with them directly when you were ..... can you just explain the make-up of that group and what their role is and then - - -

MR RITCHIE: Yes.

MR HUTTON: - - - some of the outcomes of that consultation.

MR RITCHIE: Yes. The RWG has – was constituted as part of the original project approval. It's made up of members of key agencies that are involved when an event is held and it's – also includes community members, and I think those community members, from memory, do change over a period of time. I think it's two or three year stints. So there has been a couple of different community members. And it's chaired by an independent chairperson.

MR .....: .....

MR RITCHIE: One of the main functions of the RWG currently is to review a lot of event documentation that forms part of that project approval - - -

MR .....: .....

MR RITCHIE: - - - so there are reviews – it's constant reviews of performance reports or traffic plans, event - - -

MR .....: So it's a pre and post function?

MR RITCHIE: Pretty much, yes.

MR .....: Yes. Yes.

MR RITCHIE: Yes. There was a sense that there is a lot of reviewing, a lot of reviewing, and because they have to do it at each event, it's similar plans each time.

MR .....: Yes.

MR RITCHIE: We want to keep the RWG going, but turn it into more of an interface between the event itself and the community, so not so much reviewing plans all the time, but being there to be like an interface between issues raised in community and issues that we need to - - -

MR .....: So is that more like a community consultant - - -

MR RITCHIE: Similar. Similar. Similar.

MR .....: - - - committee rather than a - - -

MR RITCHIE: Yes.

MR .....: - - - group that would be - - -

MR RITCHIE: Yes.

MR .....: approving or commenting on - - -

MR RITCHIE: Correct. Correct.

MR .....: .....

MR RITCHIE: Generally now you would have conditions which have a CCC or a community ..... but we believe we just want to keep that grant going because it was an existing operation. It has been there since 2012. But in terms of the shifting from a reviewing constant documentation through to being like an interface with the community.

MR .....: Yes. And the feedback from your engagement with them as part of this process?

MR RITCHIE: So what – in terms of community or departments engagement, we had had the meetings, the two community sessions.

MR .....: Yes.

MR RITCHIE: Similarly, we had senior officers from the department - - -

MR .....: Yes.

MR RITCHIE: - - - visit the RWG. Went to the site and had a look around.

MR .....: Yes.

MR RITCHIE: I was not at that - - -

MR .....: Yes.

MR RITCHIE: - - - particular discussion, but I can come back and report to the IPC on what issues exactly were raised - - -

MR .....: Yes.

MR RITCHIE: - - - and report that back to you ..... on notice.

MR .....: .....

PROF MACKAY: Just while we're talking about consultation, has there been any form of consultation with

MR HUTTON: Yes.

MR RITCHIE: - - - and report that back to you.

MR HUTTON: That would be great.

MR RITCHIE: So we will take that on notice.

PROF MACKAY: Just while we're talking about consultation, has there been any form of consultation with attendees at the event other than receiving 6000 pro forma submissions?

MR RITCHIE: Not from ourselves.

PROF MACKAY: Right.

MR RITCHIE: But, generally, we do – when we engage or consult - - -

PROF MACKAY: Yes.

MR RITCHIE: - - - on an application, it's very wide-reaching advertisements in the paper - - -

PROF MACKAY: Yes. So the - - -

MR RITCHIE: - - - with notices - - -

PROF MACKAY: So the – they clearly had an opportunity and, fairly obviously, been well informed.

MR RITCHIE: And I daresay the applicant has – would have been liaising - - -

PROF MACKAY: Yes.

MR RITCHIE: - - - with patrons that say there is an exhibition of a proposal.

PROF MACKAY: The Ocean Shores and other things were just for local residents.

MR RITCHIE: Yes.

PROF MACKAY: Yes. Thanks.

MR RITCHIE: Then in terms of wastewater – and that's one of the key issues that we foreshadowed from the onset of the application. We did engage GHD to provide us with advice, and that was on the back of issues raised in the community, but also by council when we had ..... up at Mullumbimby having the community – we met council as well, and that was one of the key issue that council had raised because it is a relatively sensitive environment, and they're – in terms of patron numbers, it's having up to 50,000 people which, from a wastewater management issue, is a key issue. Obviously, from a wastewater generation, it is going to increase under the proposal.

The applicant does propose to have an onsite wastewater treatment system which has a couple of key elements around wastewater treatment, disinfection, disposal and composting of materials. GHD had raised a number of issues with the proposal. The applicant, in responding to those issues, engaged a second party to also provide technical advice back on the issues that we were raising. We have stringently recommended some key actions to address wastewater management, particularly around that sensitive environment issue where there is funding issues; there is also groundwater issues. There are some restrictions around where you can irrigate in terms of groundwater location. There is also a need to ensure that the treatment system can achieve the objectives of which the applicant is indicating that it proposes to achieve.

One of the key performance indicators in terms of the performance – evaluation report we mentioned before is around satisfying issues around irrigation of the standard of effluent that they propose to achieve. One of the recommendations that GHD had had which we've adopted is around – because of the sensitiveness of the environment, because of some level of uncertainty in terms of volume, is having very strict criteria that they're going to have to meet, and there were some changes and

validation that we've also recommended as part of the conditions. So when there is a proposal to increase that capacity, there will need to be a demonstration through validation and reporting that that criteria and that wastewater treatment system is working. Should there be concerns that that is not going to be achieved, then the applicant will be required to transport that material offsite which happens in lot of other events and has happened previously here before.

MS HIRD: Yes. So reading the documentation, now, there was some uncertainty as to whether Byron Council would receive the wastewater from the site. So isn't that a key issue that that agreement must be in place?

MS P. MORALES: Yes, there needs to be an agreement with council.

MR RITCHIE: In terms of talking about – I understand one of the issues that has been experienced previously with the trial period - - -

MS HIRD: Yes.

MR RITCHIE: - - - is that there were concerns regarding the strength of the wastewater being transported to Byron Council.

MS HIRD: Yes.

MR RITCHIE: And they – in a sense, that that was triggering their limits on their EPL. And so separate to that process for the trial period, I understand that the applicant has negotiated to blend the wastewater currently generated during the trial period and shift offsite to ensure that that is of a satisfactory quality to be accepted by the treatment plant. In terms of their contingency, if they were to ship it offsite, they would have to ensure that the licensed facility that they were sending it to, they had an agreement in place and were providing wastewater in acceptable quality to them.

MS HIRD: And quantity?

MR RITCHIE: And quantity, yes.

MS HIRD: Yes. Okay. Can you give me a bit of a history – what did the pack originally approve? Just the portaloos on site and these composting toilets came later or - - -

MR RITCHIE: In terms of the original project approval, the system that proposed – that was proposed at that time was more of a traditional wastewater treatment system of a scale that would be capable of treating the wastewater generated by a 35,000 patron event which was, essentially, divided into two stages where stage 1 would be more temporary facilities as they ramped up, and then stage 2 would be the permanent wastewater treatment system. In 2014, which was around the time of the

second Splendour in the Grass festival, Parklands – the applicant was investigating alternative systems.

MS HIRD: Yes.

MR RITCHIE: In their EIS, they've discussed how that was as a result of discussions with the Woodford festival site up in Queensland - - -

MS HIRD: Yes.

MR RITCHIE: - - - which operated a similar system to the one that they had proposed under the project approval - - -

MR P. COPAS: So the 2014 system was approved by council, was it?

MR RITCHIE: Yes, in 2014, they went through the section 68 approval process.

MS HIRD: For what components, though? For the irrigation as well and - - -

MR RITCHIE: It included a number of composting toilets.

MS HIRD: Yes.

MR RITCHIE: It also included the treatment via sand beds of some of the wastewater onsite, and then the application to an existing area which, I believe, was shown in figure 19 or 20 towards the end.

MS HIRD: You mean up in EMA1, is that the - - -

MR RITCHIE: EMA1, correct.

MS HIRD: Right. So there's some sand beds where they just discharged the - - -

MR RITCHIE: Where they discharged there, and they also have a compost burial area.

MS HIRD: Yes. One thing, when going through the documentation now, is I can't see much reference to the Department of Health, and if you go through a section 68 process, there should be significant consultation with the Department of Health. So I don't see anything there. Was there or - - -

MR RITCHIE: In 2014?

MS HIRD: In – or even with your later consultation, I haven't seen anything.

MR RITCHIE: So may – well – may – we will take that on notice because - - -

MS HIRD: Yes.

MR RITCHIE: - - - I know during the course assessment, New South Wales Health contacted us around a couple of things, around potable water and some other things, and we were corresponding back with them.

MS HIRD: Yes.

MR RITCHIE: So maybe I will take that on notice and I will come back with a response.

MS HIRD: Yes. So if you go through the guidelines - - -

PROF MACKAY: That would be good.

MR RITCHIE: Yes.

MS HIRD: - - - and section 68 is - - -

MR RITCHIE: Yes, yes.

MS HIRD: - - - actually primarily a Department of Health - - -

MR RITCHIE: Yes, yes, yes.

MS HIRD: - - - issue. Okay. Give a minute.

MR HUTTON: I've got a - - -

MS HIRD: Yes, did – yes.

MR HUTTON: Sorry, yes.

MS HIRD: Just one question – sorry.

MR RITCHIE: Sure, sure, sure.

MS HIRD: Did they ever consider – they talked about a potable water pipeline coming from somewhere. Did they ever consider a sewage pipeline to the nearest sewage treatment plan? I notice that Ocean Shores isn't all that far away. So to connect into the Ocean floors - - -

MR COPAS: My understanding – and we may also have to take this on notice – is that they did look into a similar situation with wastewater. But, again, it came down to, more, the capacity of the existing sewage treatment plants in the area and the costs that would be associated in an upgrade to provide them with the capacity to

handle that increased waste, and given the intermittent nature of the festivals, being only for 20 days a year, they determined that that would not be cost feasible.

PROF MACKAY: Could - - -

MR RITCHIE: But we could look at that in more detail and - - -

PROF MACKAY: Could we work on the basis that we will take that as the answer unless you come back to us?

MR RITCHIE: Yes.

PROF MACKAY: Yes, that would be helpful. Thanks.

MS HIRD: Yes. Okay. So the – some of the – going through and some of the things worried me, that the biosolids or compost was considered compost by the composting guidelines and they are technically biosolids, so there doesn't seem to have been a process to assess, and that, of course, is a potential contamination concern. The groundwater – it's interesting. I mean, there's a lot of figures in the application, but once you get to the right ..... the figures disappear. There's no original KPIs and things like that. So that's a concern. Anyway, we will take all that on. Now, is there a possibility of meeting with the wastewater people on site up at Byron?

MR RITCHIE: From the applicant's point of view?

MS HIRD: Yes.

MR RITCHIE: I'm sure if you ask them, they will make them available.

MS HIRD: Yes. That would be helpful because I feel like I'm - - -

MR RITCHIE: Yes, and as I mentioned, we – the applicant had one consultant providing them advice. We had a lot of questions with that consultant - - -

MS HIRD: Yes. Yes.

MR RITCHIE: Then they got a second one. So - - -

MS HIRD: And what about the GST – the GHD.

PROF MACKAY: GHD.

MS HIRD: GHD.

MR RITCHIE: GHD is our consultant.

PROF MACKAY: Yes.

MS HIRD: Would I be able to – or would we be able to consult with him?

MR RITCHIE: I'm sure if you've got some questions, we can ask - - -

MS HIRD: Yes, certainly.

MR RITCHIE: We can ask GHD - - -

MS HIRD: Okay.

MR RITCHIE: - - - and we can come back to you.

MS HIRD: Right. Okay. That seems to be a better approach. Yes.

MR RITCHIE: But in terms of meeting the applicant's consultants onsite, then - - -

PROF MACKAY: Yes, we need to ask - - -

MR RITCHIE: - - - that's definitely something you can ask the applicant, and I'm sure they would be accommodating. And, again, from our point of view, that was one of the key performance criteria that we want to make sure we satisfied as part of progression.

MS HIRD: Yes. Well, it's something that happens down the track. It's not like noise and traffic where you can see it instantly what the problem is, and I think it's getting KPIs around that.

MR RITCHIE: That's right.

MS HIRD: Yes.

MR RITCHIE: And, as I was mentioning before, the key for us is making sure that criteria is very stringent and demonstration that can be satisfied beforehand.

MR HUTTON: I've got a – just a question around the broader KPIs that have – so the proposal is, as I understand it, very much put around meeting KPIs as a review and feedback process that you described earlier which were – got a diagram over here. Is it possible to get a consolidated list of the KPIs as they stand to understand what all the KPIs might be? I've read them throughout the assessment report in different sections, or is there a consolidated KPI list that I haven't yet read?

MR RITCHIE: Yes, so we – sorry. Need to answer that one, Pam, but - - -

MR HUTTON: Which is possible.

MR RITCHIE: - - - in terms of the conditions – because what we provided is a report and terms and conditions.

MR HUTTON: Yes.

MR RITCHIE: There is, on page 14, a table which we describe where we came in terms of what that - - -

MR HUTTON: Yes.

MR RITCHIE: - - - key performance measures would be.

MR HUTTON: Okay.

MR RITCHIE: There are some generic things, as I was mentioning before that we also want to be satisfied, and that is around, you know, general performance, but also around some of that policing issues which is difficult to try and pin down to a measurable KPI. In terms of traffic, there are some clear measures that - - -

MR HUTTON: Yes.

MR RITCHIE: - - - they have required – been required to meet, but also that we want to continue to ensure that it's being met. Noise, obviously there's the criteria that has been established within table 7 of the consent, and also demonstrating that the measures are continuing to work in terms of managing that. From a wastewater point of view, and that's pulling out of what I was mentioning before around having street criteria, that's measured, but then there's a range of other things that we want to ensure is also being reported on that we can check as part of a review of this process. When this is put together, as I was mentioning before, we do want to ensure that some of those key parties, like council and New South Wales Police, are consulted on that report.

MR HUTTON: On the performance evaluation report? Yes.

MR RITCHIE: Because there's going to be some policing issues that we want to ensure that they're satisfied with.

MR HUTTON: Yes. But in terms of key KPIs, table 5 - - -

MR RITCHIE: Yes.

MR HUTTON: - - - represents the current issues and the current criteria as they stand.

MR RITCHIE: Yes.

MR HUTTON: Okay.

MS HIRD: And New South Wales Health I think should go on.

MR HUTTON: Okay. Thank you. There's one other question just around the staging. There was a figure earlier in this compendium, figure – table 5. This table is quite helpful in describing the infrastructure proposal and when construction is required, but there's a number of non-specific activities that aren't triggered by a particular number of patrons and the notation at the bottom indicates that they will be constructed progressively as funding permits. Did the department give consideration to whether or not some of these key infrastructures would be triggered by patron numbers and, therefore, is it more – is it likely that the patron numbers could drive the timing rather than funding? I'm just interested in your sort of thoughts behind that table and the timing.

MR COPAS: In terms of – to set out where this table has come from, this was the original table that the applicant proposed - - -

MR HUTTON: Okay.

MR COPAS: - - - as part of its EIS and response to submissions.

MR HUTTON: Okay.

MR COPAS: With that, during the response-to-submission stage, we queried a number of these works and sought further information from the applicant as regarding when they would be provided or whether or not they should be provided at a specific patron stage. In terms of some of those relating to potable and sewerage infrastructure, for example, those were more defined as being things that would be staged as it progressed and, in that sense, in terms of our recommended conditions, we had carried over requirements setting out that that infrastructure should be in place dependent on the stage. So, say, for a 45,000-patron event – a 40,000-patron event or a 45 or 50, that they have the infrastructure in place to meet those specific ones.

MR HUTTON: Okay. So to clarify then, the consent would have a slightly different staging to what this original table was.

MR COPAS: As well, because, in terms of this table, the staging that they proposed was a seven-and-a-half-thousand increments.

MR HUTTON: Yes.

MR COPAS: In terms of our - - -

MR HUTTON: Thank you.

MR COPAS: - - - proposed staging of 5000 increments, we've made adjustments to reflect that. So to ensure that, for example, for infrastructure that they have said that

they will require at forty-two and a half thousand, because the staging that we proposed will jump from forty to forty-five thousand, we've required that it be in place by 45,000.

MR HUTTON: Okay.

MS HIRD: Does that apply to the wastewater treatment place?

PROF MACKAY: Well – yes – I just – yes, but - - -

MR COPAS: The same as well in their - - -

MS MORALES: The – sorry – in terms of the wastewater, the required – the timing would be in accordance with condition C16. So we've identified the timing of when the wastewater - - -

MS HIRD: So that's just prior to the conference centre or - - -

MS MORALES: Let me just check - - -

MR COPAS: C - - -

MR HUTTON: Can you just – just a page number.

MS MORALES: Sorry. Page 6 in the .....

MR HUTTON: Yes. Thank you.

MR COPAS: Which I understand links to the wastewater management plan, which is part of that plan they have to set out the requirements of that specific staging and how they will do it for each stage.

MS MORALES: Yes.

MS HIRD: So it's just a plan rather than an actual piece of infrastructure.

MR COPAS: In terms of that plan, the plan will set out the detail of what they will require at each stage to be able to meet the requirements or - - -

MS HIRD: Okay.

MR COPAS: - - - to facilitate that patron number.

MS HIRD: So the applicant has reserved the right – if he can't afford to put in a wastewater treatment system, then he will just send it somewhere else. Is that a satisfactory solution?

MR COPAS: In terms of the temporary nature of the events, it is comparable to what's done for a number of other events - - -

MS HIRD: Events.

MR COPAS: - - - across the country - - -

MS HIRD: Okay.

MR COPAS: - - - and in other jurisdictions.

MS HIRD: But not the case when the conference centre goes in, which will be a permanent structure.

PROF MACKAY: Yes. Okay.

MS HIRD: Okay.

MR COPAS: In term – yes.

PROF MACKAY: Could I just ask that in a sort of a more facile way. The previous stage 1, stage 2, committed them to installing certain wastewater infrastructure, but as these consent conditions are drafted, that would not apply any more. You're actually interested in meeting the standards that are in the – was it table 9 or was it table – or in condition D16 – and if those standards are met, it doesn't matter whether they have done it by building infrastructure or shipping stuff off site, they're met; is that - - -

MR RITCHIE: No. That's correct. Yes.

PROF MACKAY: I'm just being very simplistic about it. Okay.

MR RITCHIE: So if you look – so maybe we can respond in more detail on notice, but if you look at C13, the wastewater treatment system, which it described in their RTS, will have to be in place by 40,000. So maybe what we will do, we will come back and clarify - - -

PROF MACKAY: Perhaps there is a - - -

MR HUTTON: I think it - - -

PROF MACKAY: Actually – and then I think there is a - - -

MS HIRD: I think there might be something – a clause in there.

PROF MACKAY: They can both be simultaneously true. Yes. Okay.

MR RITCHIE: So that - - -

MS MORALES: Yes. This table - - -

MR RITCHIE: See, what C16 in the table refers to is actually – it does tie back to the RTS as well.

PROF MACKAY: Yes.

MR RITCHIE: Yes. So it's just we haven't replicated the 40,000 in there.

PROF MACKAY: Okay. There's the – so - - -

MR RITCHIE: So what - - -

MS HIRD: C13, I think - - -

PROF MACKAY: So what's in C13 is absent from C1.

MR RITCHIE: C13? But the intent - - -

PROF MACKAY: It's not in the ..... table.

MR HUTTON: No. It says, "In accordance with C16."

MR RITCHIE: It says "C16."

PROF MACKAY: I see. All right.

MR RITCHIE: No. C16 talks about the RTS. The RTS talks about the timing and ..... but we will come back and clarify this with you.

PROF MACKAY: I think to help us - - -

MR HUTTON: Okay.

MR RITCHIE: So the expectation would be 40,000. That's .....

PROF MACKAY: Yes. Got it.

MR HUTTON: Yes.

PROF MACKAY: I think if you were able to even present it similar to that - - -

MR RITCHIE: Replicate – yes, yes.

PROF MACKAY: - - - but based on the way you see it unpacking as part of your draft - - -

MR RITCHIE: We will do that.

PROF MACKAY: - - - that would be useful - - -

MR RITCHIE: We will do that. Yes.

PROF MACKAY: - - - just in terms of timing.

MR RITCHIE: Yes.

PROF MACKAY: And we will take that this table 5 represents the - - -

MR RITCHIE: As proposed.

PROF MACKAY: As proposed. Yes.

MR RITCHIE: Yes. And the idea of the 5000 is we wanted to pare it back and make it a smaller progression.

PROF MACKAY: Yes. The logic of that is .....

MS HIRD: Yes. No, no.

PROF MACKAY: Just while we're in these consent conditions, just harking back to a question perhaps for Jeff, if I'm reading these correctly, then D16, in combination with table 7, what's numeric limits on to zone 1?

MR J. PARNEL: Yes.

PROF MACKAY: So it doesn't matter whether they have reached an agreement with the receptor, the limits still apply. I mean, it's nice - - -

MR PARNEL: They have got - - -

PROF MACKAY: - - - for the receptor that they're getting a deal, but, in fact, that doesn't abrogate the responsibility of the proponent to meet these numbers or be in breach.

MR PARNEL: No, that's exactly right. It's not necessarily – normally, if it was around a mine site, once you've got an agreement, then we don't - - -

PROF MACKAY: Yes.

MR PARNEL: - - - look at the numbers. You've got an agreement for higher noise levels. We – these still put some limits on what they're supposed to achieve so that the - - -

PROF MACKAY: No. Thank you.

MR RITCHIE: Just - - -

MR PARNEL: Sorry. Sorry. They're the levels, so we say, for the - - -

PROF MACKAY: Okay. So you've actually got an out clause.

MR PARNEL: They do not apply if they have agreement. They can have different arrangements in those agreements. One of those agreements specifically with those people can be to have no limits if they so desire.

PROF MACKAY: Okay. Okay. Yes.

MR PARNEL: You know, in the absence of that, though, we have set criteria that are, you know, slightly above the zone 2 area.

PROF MACKAY: Yes. Okay. Thank you.

MS C. HIRD: I've got some - - -

PROF MACKAY: Catherine.

MS HIRD: - - - comments on the C15, which is where we're very specific about total nitrogen less than 50, total phosphorous less than 20. In my experience, those sort of numbers are established through doing a proper – what we call a nutrient budget and going through the whole process from treatment to the end, so, in actual fact, total nitrogen of less than 50 would be a disaster unless we are taking – we're harvesting the material off-site all the time. Similarly, phosphorous – exactly the same situation. It's going to pretty quickly get into the system, so if someone follows that section 68 process as described on the net, you will go a proper process where you will establish where the nutrients are coming out of the system and make sure they don't end up the groundwater table.

MR RITCHIE: So we can consult with GHD and come back around – that particular question.

MS HIRD: Yes, yes. He hasn't mentioned the term "nutrient budget" in any of his material. There's a lot of stuff done on this using the HCCP principles, which, again, I didn't sort of see in the report. And I've – the reed beds are not going to be particularly effective in taking a lot out. You will need those harvesting regimes at the other end. Yes.

PROF MACKAY: Okay. Have we – I think we've covered wastewater.

MR .....: Yes, I think .....

PROF MACKAY: Yes. I think you guys have covered everything you told us you were going to cover.

MR RITCHIE: Probably the key issues. There's obviously other issues, either raised in submissions or relevant to the application, and in our report, there's a table towards the latter part where we similarly look at those issues.

PROF MACKAY: Yes.

MR RITCHIE: So in table 16, of which there's biodiversity issues and crowd management, which was a policing issue raised initially, and flooding and evacuation.

PROF MACKAY: Bushfire, etcetera. Yes.

MR RITCHIE: So when an event is held, there is quite a significant emergency agency presence, so there is an emergency compound. There's a police bus. There's ambulance. There's fire brigade. There's fire control. There's security. There's policing. One of the early issues was around policing resourcing, and the applicant and New South Wales Police have come up with an arrangement for a cost-share process to provide – I think one of the key issues was around accommodation, ensuring there's enough accommodation for all police to attend the event. So when the event is on, there is a significant emergency service presence on the site.

PROF MACKAY: Look, could I just ask one more, sort of, again, facile general question. In reading all of this, at the end of it, it seemed to me that we've been through this whole series of trials and learning, and yet when you look at the package of consent conditions and the commitments of the owner, there's still quite a lot of stuff, content, be it wastewater management or be it traffic management, that is still kind on the never-never, in that we're ramping up and will adjust as necessary – okay, we've got some performance indicators there and measures, be it noise, be it water quality, but I guess my question is should there be more of that content that's locked away, given the six years of trial events and learning?

MR RITCHIE: So one of the key reasons for recommending still that progressive basis - - -

PROF MACKAY: Yes.

MR RITCHIE: There is still a lot of community concern in terms of the event themselves, so people just still feel like they are impacted by – whether it's noise or traffic management. So we believe that we should keep that going to ensure that there is continued good performance in terms of traffic management, continued

improvements on how other aspects of the event is being run. So we believe that that's important to provide some confidence in around how the site and the events will be managed over time, rather than just allowing up to the - - -

PROF MACKAY: Yes.

MR RITCHIE: - - - capacity as proposed.

PROF MACKAY: I kind of get that, but what I don't get is that after five years, you still don't know whether you're going to treat on site or ultimately ship off site, which is sort of surprising. I mean, putting on the community hat, shouldn't there be more – if I'm Byron Council and I'm objecting, shouldn't there be more certainty about that? You know, are you going to ship it to us or aren't you? I mean, you have five years of experience. I'm putting on my community objector tone of voice, too. I realise that. I mean, I just think I'm asking for a department's reaction to that. Should it not be more resolved at this point? Wasn't that the reason to have the staged process?

MR RITCHIE: Maybe it's best if I – we'll take that away.

PROF MACKAY: Yes.

MR RITCHIE: We'll come back with a formal response.

PROF MACKAY: Yes, I think it would be helpful to us.

MR RITCHIE: Sure. Yes.

PROF MACKAY: I mean, I, just to be clear, have absolutely not formed a view on that.

MR RITCHIE: Yes. Yes.

PROF MACKAY: But in reading about the early history, it kind of builds up to, "We're going to get it all sorted out," and then where it ends is some bits are still not sorted out.

MR RITCHIE: Yes. Yes.

PROF MACKAY: And that – I agree that's a sort of - - -

MS HIRD: I'll ask the question. I'm a technical expert but not a planning expert. So in the end of the day, they're not meeting those KPIs. What is the process, then, to get them to meet the KPIs?

MR RITCHIE: Well, there's – I mean - - -

PROF MACKAY: Shut it down.

MR RITCHIE: First of all, there's the recommended instrument.

MS HIRD: Yes.

MR RITCHIE: That's what you're required to satisfy. If you don't, then you're not going to increase as you propose to increase. Equally, if there's continued can't meet those criteria, whether it's noise, etcetera - - -

MS HIRD: Yes.

MR RITCHIE: - - - the department does have a strengthened compliance function, and there are compliance officers. There's a compliance team that will consider those issues in accordance with their department compliance related policies and take any necessary action that's deemed required.

MS HIRD: And those actions are extraordinarily broad in - - -

MR RITCHIE: Very broad. There's - - -

MS HIRD: Yes. Anything.

MR RITCHIE: - - - penalty notice powers or ordering powers, and that's one thing to say, is that certainly over the last number of years, we've endeavoured to ensure that there's a presence, whether it's a compliance present or an acoustic presence. When we're assessing the project, we wanted to make sure that the staff could visualise and understand what the event is like for them to be able to more clearly articulate and understand the issues that are relevant to the project. So certainly from a compliance point of view, for the last number of years, there's been a lot of presence. But if they – it's sort of an incentive. If you don't perform, then you're not going to get the increase, but then there's compliance powers if there's no - - -

MS HIRD: Yes.

MR RITCHIE: - - - continued improvement.

MS HIRD: Okay.

PROF MACKAY: Okay. Are there any further questions?

MR HUTTON: Yes, I'm happy.

PROF MACKAY: Happy?

MS HIRD: Yes.

PROF MACKAY: Anything from staff? Well, I think it remains for me to thank you for very – a very clear – I mean, very cogent and clear presentation. I think if there is a complaint, it's that everything's in such tiny font and the book's so enormous, but apart from that - - -

MS HIRD: And there's such a lot of it.

PROF MACKAY: Yes. Apart from that, it's actually – I mean, for a very complicated set of issues, it's very clearly put before us, so thank you. Thank you. And I think, for the purposes of the tape, then, I should declare this meeting closed.

RECORDING CONCLUDED **[2.18 pm]**