

# LEEFEST 2016

28th - 30th July 2016

Leppards Wilderness Farm, TN8 7LP

## NOISE MANAGEMENT PLAN

V3

<b>Document Control</b>	
Project:	LeeFest 2016
Title:	Noise Assessment and Management Plan
Revision:	V3
Date:	16th May 2016
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## Introduction

The proposed event is LeeFest: The Neverland. The event is due to take place on the 28th, 29th and 30th July 2016.

The purpose of this document is to provide an assessment of the noise impact of the event on existing nearby residential premises and to describe the noise control and monitoring scheme that will be put in place to minimise the music noise levels at local residential premises. The practical measures that will be adopted to achieve compliance with any licence conditions relating to noise are described in Section 5.

It is intended that this document is considered a 'working document' which will evolve with ongoing liaison between the Event Promoters and the local authority.

A glossary of acoustic terms is shown in Appendix A

### 1. Entertainment Noise Criteria

#### 1.1. Noise Council Code Of Practice, 1995<sup>1</sup>

The established guidance for noise from outdoor music events is contained in the Noise Council's Code of Practice on Environmental Noise Control at Concerts (1995).

The recommended noise limits contained within the Code of Practice for events held between the hours of 09:00 and 23:00 hours are summarised in Table 1 below.

**Table 1: Noise Council Recommended Noise Limits from 09:00 to 23:00**

Concert days per calendar year, per venue.	Venue Category	Guideline (As measured 1 meter from the façade of any noise-sensitive premises.)
1 to 3	Urban Stadia or Arenas	The Music Noise Level should not exceed 75 dB(A) over a 15 minute period.
1 to 3	Other Urban and Rural Venues	The Music Noise Level should not exceed 65 dB(A) over a 15 minute period.
4 to 12	All Venues	The Music Noise Level should not exceed the background noise level by more than 15 dB(A) over a 15 minute period.

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<sup>1</sup> Code of Practice on Environmental Noise Control at Concerts, Noise Council, 1995.

The recommended noise limits contained within the Code of Practice for events held between the hours of 23:00 and 09:00 hours are:

*For events continuing between the hours 23:00 and 09:00 the music noise should not be audible within noise-sensitive premises with windows open in a typical manner for ventilation.*

The Code Of Practice provides two explanatory notes for the suggested guideline of inaudibility:

*The use of inaudibility as a guideline is not universally accepted as an appropriate method of control. This guideline is proposed as there is insufficient evidence available to give more precise guidance.*

*Control can be exercised in this situation by limiting the music noise so that it is just audible outside the noise sensitive premises. When that is achieved it can be assumed that the music noise is not audible inside the noise-sensitive premises.*

The Code of Practice recognises that noise in terms of dB(A) may underestimate the intrusiveness of low frequency noise:

*dB(A) is very convenient but it can underestimate the intrusiveness of low frequency noise.*

*With certain types of events, therefore, it may be necessary to set an additional criterion in terms of low frequency noise, or apply additional controls.*

The Code Of Practice provides two explanatory notes for the statement about low frequency noise:

*It has been found that it is the frequency imbalance which causes disturbance. Consequently there is less of a problem from the low frequency content of the music noise near to an open air venue than further away.*

*Although no precise guidance is available the following may be found helpful: A level up to 70dB in either the 63Hz or 125Hz octave frequency band is satisfactory; a level of 80dB or more in either of those octave frequency bands causes significant disturbance.*

## **1.2. WHO Guidelines For Community Noise, 1999<sup>2</sup>**

To further clarify the Noise Council Code of practice recommended limit of

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<sup>2</sup> Guidelines for Community Noise, World Health Organisation, 1999

‘inaudibility within a noise-sensitive premises’ guidance from the World Health Organisation’s Guidelines on Community Noise, 1999, and its recommendations for ensuring restful sleep must be sought. This document states;

*In dwellings, the critical effects of noise are on sleep, annoyance and speech interference. To avoid sleep disturbance, indoor guideline values for bedrooms are 30 dB LA<sub>eq</sub> for continuous noise and 45 dB LA<sub>max</sub> for single sound events.*

*At night, sound pressure levels at the outside façades of the living spaces should not exceed 45 dB LA<sub>eq</sub> and 60 dB LA<sub>max</sub> so that people may sleep with bedroom windows open. These values have been obtained by assuming that the noise reduction from outside to inside with the window partly open is 15 dB.*

### 1.3. WHO Night Noise Guidelines For Europe, 2009<sup>3</sup>

A more recent study on the effects of noise disturbing sleep was published by the World Health Organisation which is described in the executive summary as ‘an extension of the WHO Guidelines for community noise (1999)’

This revises the 45dB LA<sub>max</sub> single sound event condition for undisturbed sleep to provide a more accurate threshold above which disturbance can be expected.

*Waking up in the night and/or too early in the morning: 42 dB LA<sub>max,inside</sub>*

The Night Noise Guidelines do not provide a revision of the 30 dB LA<sub>eq</sub> guideline for continuous noise, but instead move to a newly incorporated measure of L<sub>night,outside</sub> which is the 1 year LAeq taken over 8 hours outside, to provide a threshold for the onset of self reported sleep disturbance:

*Self-reported sleep disturbance: 42 dB L<sub>night,outside</sub>*

The Night Noise Guidelines go on to provide a Night Noise Guideline, recommended for the protection of public health from night noise of:

*Night noise guideline (NNG) = 40 dB L<sub>night,outside</sub>*

The Night Noise Guidelines go on to recognise that this new guideline is a measure averaged over a year and therefore is not comparable and does not replace the 45dB LA<sub>eq</sub> provided in the 1999 guidelines.

*It should be noted that the noise indicators of the 1999 guidelines are LA<sub>eq</sub> and LA<sub>max</sub> measured inside for continuous and non-continuous noise,*

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<sup>3</sup> Night Noise Guidelines For Europe, World Health Organisation Europe, E92845, 2009

*respectively. The present night noise guidelines adopt an harmonized noise indicator as defined by Environmental Noise Directive (2002/49/EC):  $L_{night}$  measured outside, averaged over a year.*

*Comparing the above statement with the recommendations, it is clear that new information has made more precise statements possible. The thresholds are now known to be lower than  $LA_{max}$  of 45 dB for a number of effects. The last three sentences still stand: there are good reasons for people to sleep with their windows open, and to prevent sleep disturbances one should consider the equivalent sound pressure level and the number of sound events. The present NNG allow responsible authorities and stakeholders to do this. Viewed in this way, the Night noise guidelines for Europe complements the 1999 guidelines. This means that the recommendations on government policy framework on noise management elaborated in the 1999 guidelines should be considered valid and relevant for the Member States to achieve the guideline values of this document.*

#### **1.4. IOA Technical Paper: Griffiths and Staunton<sup>4</sup>**

Whilst this paper does not supersede the Noise Council Code of Practice, it does provide further clarification to the Code of Practice's recommendations on noise from events regarding Night Time Noise and Low Frequency Limits where the code has recognised that further guidance is necessary.

The technical paper looks at many case studies of infrequent all night events that have used successfully used conditions based on the WHO Guidelines For Community Noise between 23:00 and 09:00 to manage environmental noise and prevent public nuisance. The conclusions of their case studies regarding Night Time Noise state:

*An absolute criterion of 45dB(A) outside a premises is sufficient to achieve the World Health Organisation's internal  $LA_{eq}$  guidance level of 30dB to preserve the restorative process of sleep.*

*The onset of noise complaints at all night music events closely correlates to the transgression of a 45dB level outside noise sensitive premises.*

*Many events and authorities have successfully adopted the 45dB  $LA_{eq}$  night time noise limit. (Matterly Bowl near Winchester, Creamfields at Daresbury, Oxford Mayday Ball at Milton Common.) The use of this objective criterion is*

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<sup>4</sup> A Review of The Noise Council Code of Practice on Environmental Noise Control at Concerts, Proc IOA Vol. 28. Pt.7 2006: Griffiths and Staunton.

*therefore recommended for further consideration when dealing with an infrequent all night event.*

The conclusions of the technical paper's research regarding Low Frequency Noise state that:

*At open air venues, the increase over background 'A' weighted criterion works well at minimizing complaints near to a venue. □*

*The 'A' weighted criterion can underestimate annoyance at greater distances from the venue (in excess of 2km) as the mid to high frequency energy is quickly attenuated with respect to low frequency and the expectation of people living some distance from the event being that the concert should be inaudible. □*

*Sound pressure levels in excess of 80dB in the 63Hz or the 125 Hz octave bands recorded in excess of 2km from the concert, are likely to give rise to complaints of low frequency noise. Levels below 70dB are likely to be acceptable at this distance or further away.*

### **1.5. Defra Noise From Pubs and Clubs (Phase II), 2006<sup>5</sup>**

DEFRA commissioned research to scrutinise different methods for assessing the impact of entertainment noise from pubs and clubs at night and to develop an appropriate rating method to complement the application of the provisions of the Noise Act 1996 to licensed premises, concentrating on levels experienced after 23:00. The findings of the research were such that:

*The majority of the members of the public reported the ability to tolerate a modest degree of intrusive audible entertainment noise in their home late at night for a "one-off" occurrence (i.e. occurring at intervals of less than six months), and that the onset of audibility of the entertainment noise did not equate to a threshold of acceptability for intrusive entertainment noise.*

*The noise metric that provided the best overall prediction of subjective ratings of all the entertainment noise types tested by ordinary members of the public was the Absolute LAeq. The level at which subjects felt the noise was "just unacceptable" in the context of a one off event in a habitable room with windows closed was at 34 dB LA<sub>eq,5 minute</sub>*

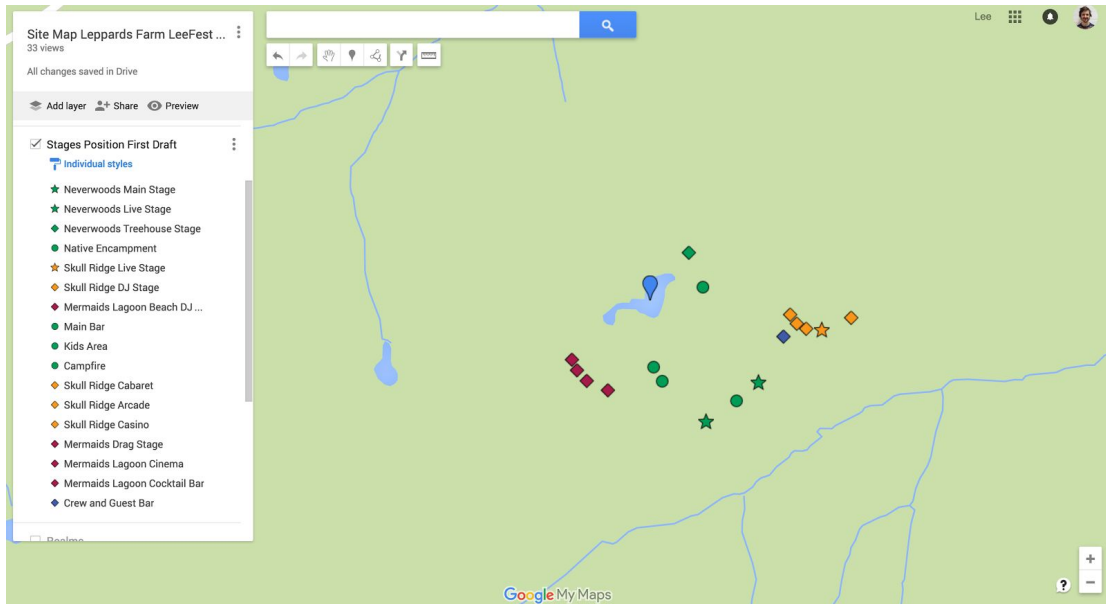
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<sup>5</sup> Noise from Pubs and Clubs Phase II, Defra, 2006.

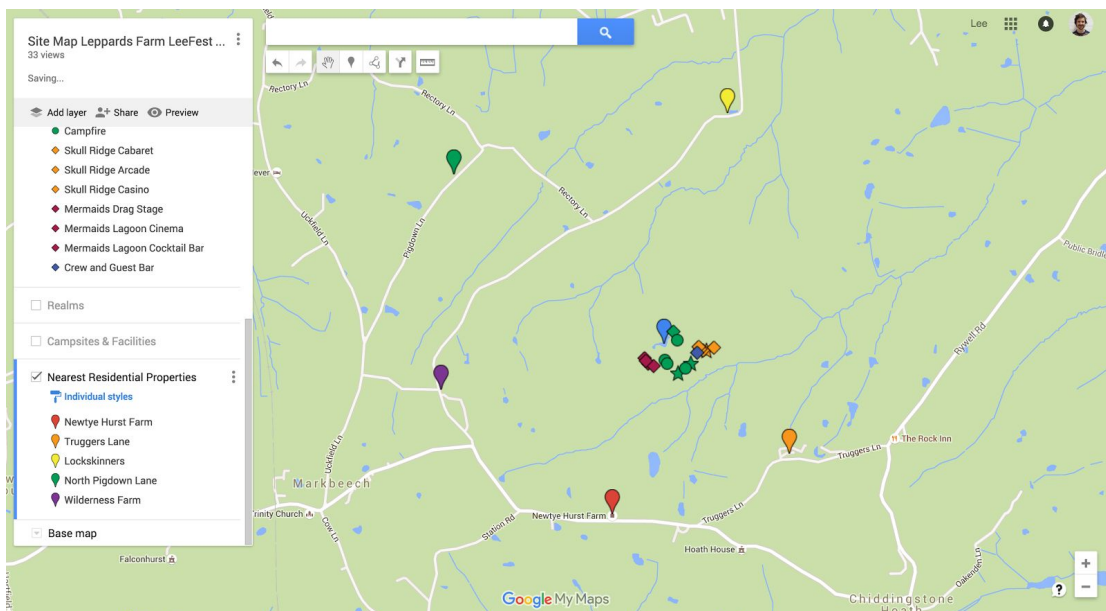
## 2. Noise Predictions

Noise predictions have been made at the five nearest noise sensitive-locations. The music source locations and prediction locations are shown in the figures below.

**Figure 1: Sound System Locations**



**Figure 2: Sound System and Noise Sensitive Premises Locations**





**Table 2: Nearest Noise Sensitive Premises**

Residential Property	Distance To Nearest Stage
Newtye Hurst Farm	595m to Mermaids Beach DJ Stage
Truggers Lane	500m to Skull Ridge DJ Stage
Lockskinners	900m to Skull Ridge DJ Stage
North Pigdown Lane	1020m to Mermaids Beach DJ Stage
Wilderness Farm	780m to Mermaids Beach DJ Stage

A noise model of each stage at the event has been produced, providing predictions for the music noise level from each stage at the five nearest noise sensitive premises. Predictions were also provided for four local wedding venues and a theatre.

These predictions utilised the ISO 9613-2 methodology for the calculation of attenuation of sound during propagation outdoors in order to predict the levels of environmental noise at a distance from a variety of sources.

NoizCalc and software was utilised in the modelling process.

The cumulative noise level from all stages at the event at each of the five nearest noise sensitive premises was then calculated using a logarithmic sum of the sound pressure level created by each stage at that property;

$$\sum_1^n L_n = 10 \log_{10} \left( 10^{\frac{L_1}{10}} + 10^{\frac{L_2}{10}} + \dots + 10^{\frac{L_n}{10}} \right)$$

Noise predictions have been made based on the intended coverage of the sound system for each stage, to achieve a music noise level of 100 dB(A), 95dB(A) or 90dB(A) at the mixing desk position of each stage.

Orientation data for the directionality of each sound system as a source of noise was sought from the manufacturers. Where this data was not available an orientation correction of 0dB between 0 and 40 degrees, rising to 6dB at 90 degrees and 18dB at 180 degrees in relation to the stage position was used.

The predictions provide for worst-case scenarios during the event with all stages operating at their full operational power at the same time. This may occur at during some small portion of the event (eg 22:00 to 23:00 when the headliners perform) but will not be the case for the majority of the time.

Tents have been assumed to provide a nominal 3dB attenuation.

**Table 3: Running Times Of Stages at Event**

	Thu 28th		Fri 29th		Sat 30th			
Realm / Stage	Open	Close	Open	Close	Open	Close	Capacity	Soundsystem
<i>General</i>								
Car Park	12:00	23:00	08:00	23:00	08:00	23:00	N/A	None
Campsite	14:00	N/A	N/A	N/A	N/A	N/A	4999	None
Arena Space	18:00	02:00	10:00	05:00	10:00	05:00	4999	None
<i>The Neverwoods</i>								
Neverwoods Main Stage	n/a	n/a	12:00	23:00	12:00	23:00	3,000	D&B V Series
Neverwoods Live Stage	18:00	23:00	12:00	23:00	12:00	23:00	1,000	D&B V Series
Neverwoods Treehouse	n/a	n/a	10:00	03:00	10:00	03:00	100	Mackie
Neverwoods Native	n/a	n/a	10:00	20:00	10:00	20:00	100	None
Neverwoods Main Bar	18:00	02:00	10:00	04:00	10:00	04:00	400	Mackie
Neverwoods Kids Area	18:00	20:00	08:00	20:00	08:00	20:00	100	None
Neverwoods Games Field	n/a	n/a	10:00	18:00	10:00	18:00	50	None
Campfire	23:00	02:00	23:00	05:00	23:00	05:00	50	None
Roaming Performances	n/a	n/a	12:00	20:00	12:00	20:00	N/A	None
<i>Skull Ridge</i>								
Skull Ridge DJ Stage	n/a	n/a	20:00	04:00	20:00	04:00	700	Funktion 1
Skull Ridge Live Stage	n/a	n/a	16:00	23:00	16:00	23:00	200	RCF Line Array
Skull Ridge Cabaret Stage	n/a	n/a	18:00	04:00	18:00	04:00	60	Mackie
Skull Ridge Arcade	n/a	n/a	18:00	04:00	18:00	04:00	60	Mackie
Skull Ridge Casino	n/a	n/a	18:00	04:00	18:00	04:00	60	Mackie
<i>Mermaids Lagoon</i>								
Mermaids Beach Stage	18:00	02:00	10:00	02:00	10:00	02:00	700	Funktion 1
Mermaids Cinema	n/a	n/a	18:00	02:00	18:00	02:00	60	Mackie
Mermaids Drag Stage	n/a	n/a	18:00	02:00	18:00	02:00	60	Mackie
Mermaids Cocktail Bar	18:00	02:00	18:00	02:00	18:00	02:00	100	Mackie
Mermaids Hot Tubs	10:00	02:00	10:00	02:00	10:00	02:00	24	None
Mermaids Massage	n/a	n/a	10:00	02:00	10:00	02:00	20	None
<i>Backstage</i>								
Crew and Guest Bar	18:00	02:00	12:00	04:00	12:00	04:00	400	Mackie
Hospitality Tent	10:00	02:00	10:00	02:00	10:00	02:00	50	None

**Table 4: Stage Sound Conditions**

Stage	Mixing Desk Distance /m	Mixing Desk Level /dB(A)	Soundsystem Type	Tent Attenuation
Neverwoods Main Stage	25	100	D&B V Series	None
Neverwoods Live Stage	22	100	D&B V Series	Yes
Neverwoods Treehouse Stage	10	90	Mackie	None
Neverwoods Main Bar	10	90	Mackie	Yes
Skull Ridge DJ Stage	10	100	Funktion One	None
Skull Ridge Live Stage	12	100	RCF Line Array	Yes
Skull Ridge Cabaret Stage	10	90	Mackie	Yes
Skull Ridge Arcade	10	90	Mackie	Yes
Skull Ridge Casino	10	90	Mackie	Yes
Mermaids Beach Stage	10	90	Funktion One	None
Mermaids Cinema	10	90	Mackie	Yes
Mermaids Drag Stage	10	90	Mackie	Yes
Mermaids Cocktail Bar	10	90	Mackie	None
Crew and Guest Bar	10	90	Mackie	None

**Figure 3: Model Showing Propagation of Noise From Neverwoods Main Stage**

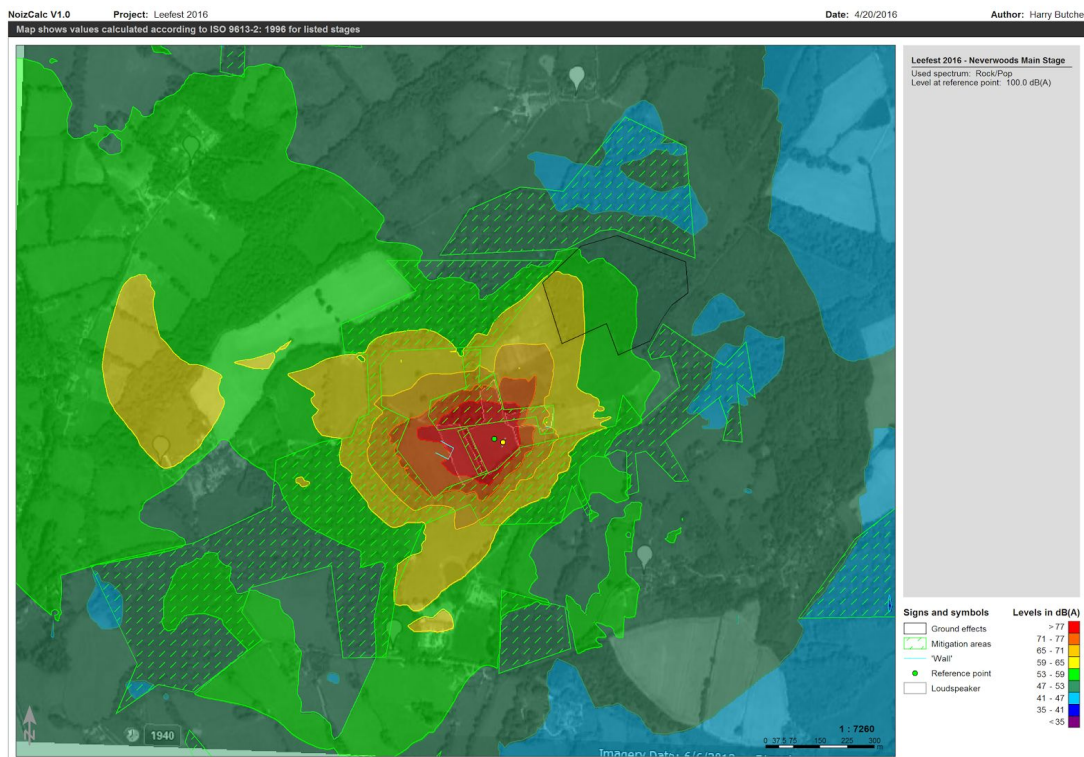


Figure 4: Model Showing Propagation of Noise From Neverwoods Live Stage

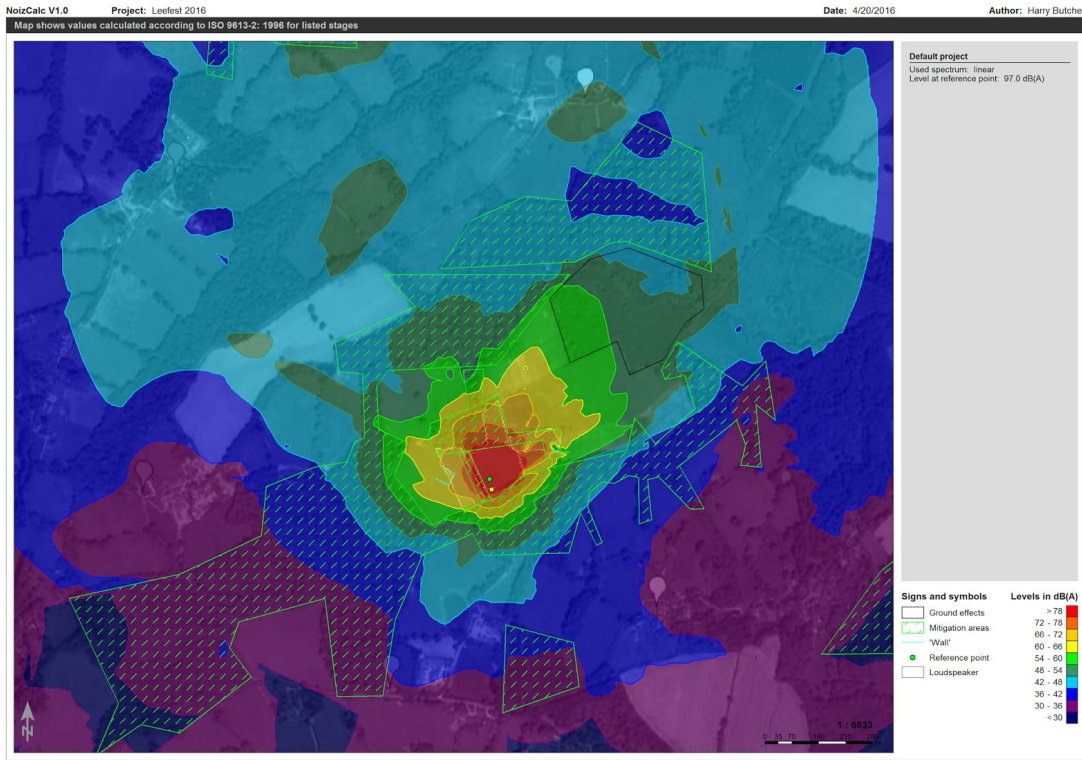


Figure 5: Model Showing Propagation of Noise From Neverwoods Treehouse Stage

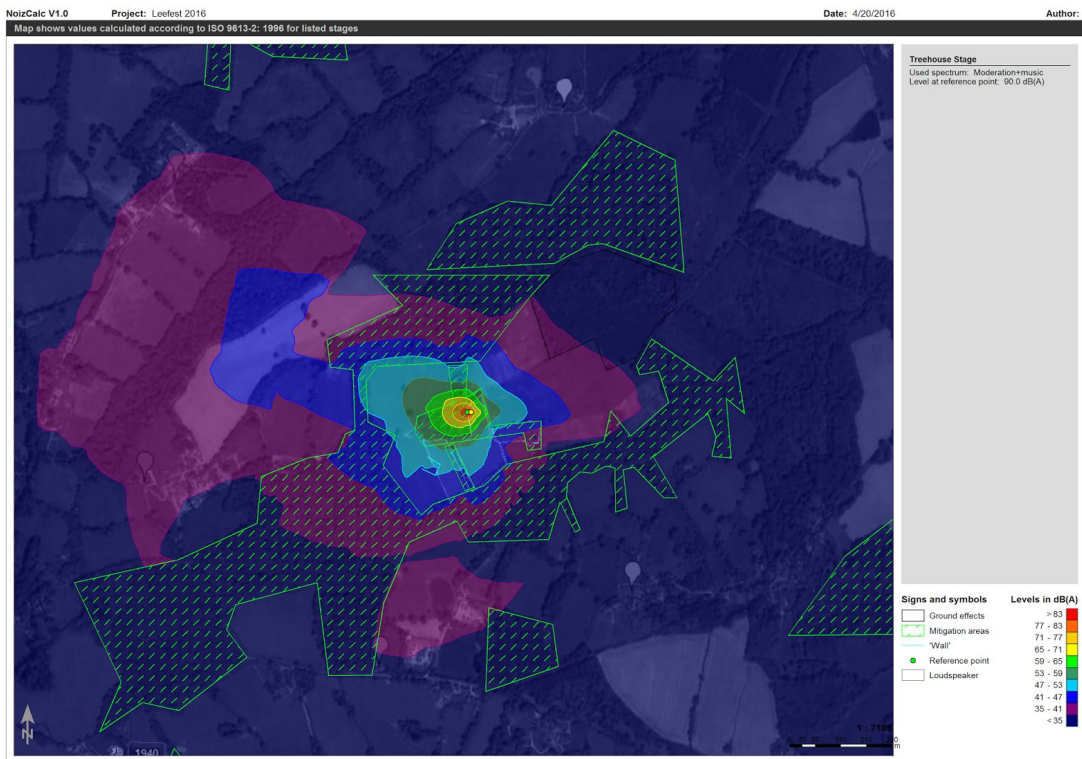


Figure 6: Model Showing Propagation of Noise From Neverwoods Main Bar

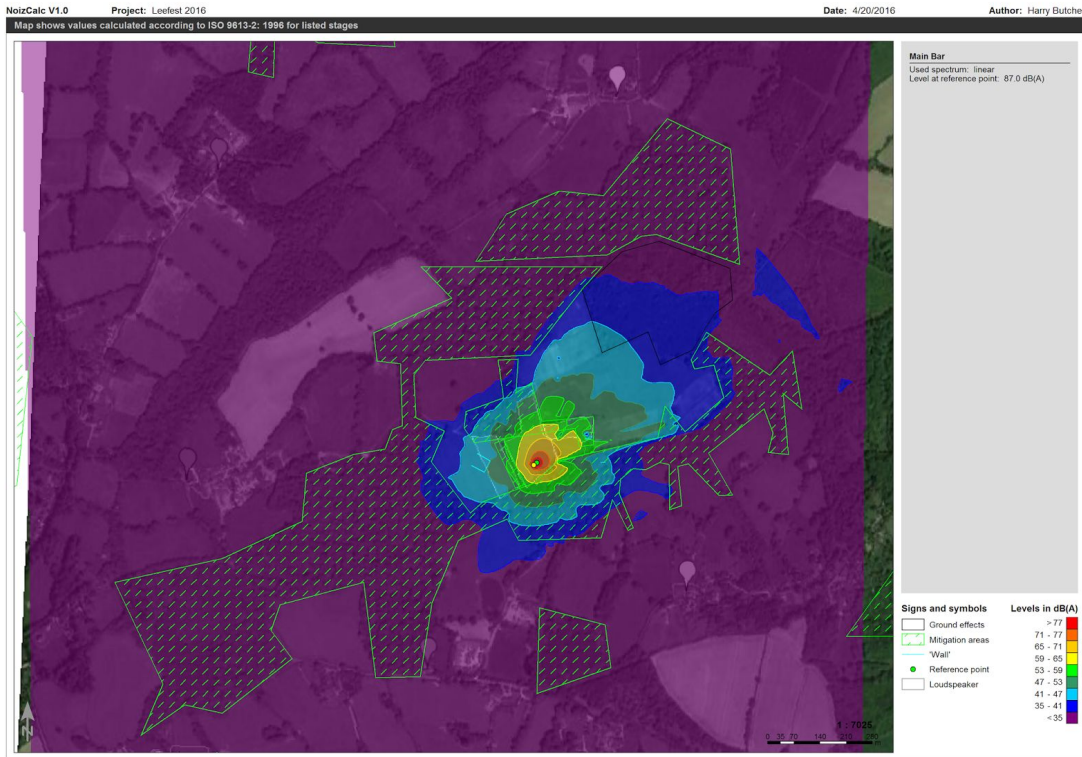


Figure 7: Model Showing Propagation of Noise From Skull Ridge DJ Stage

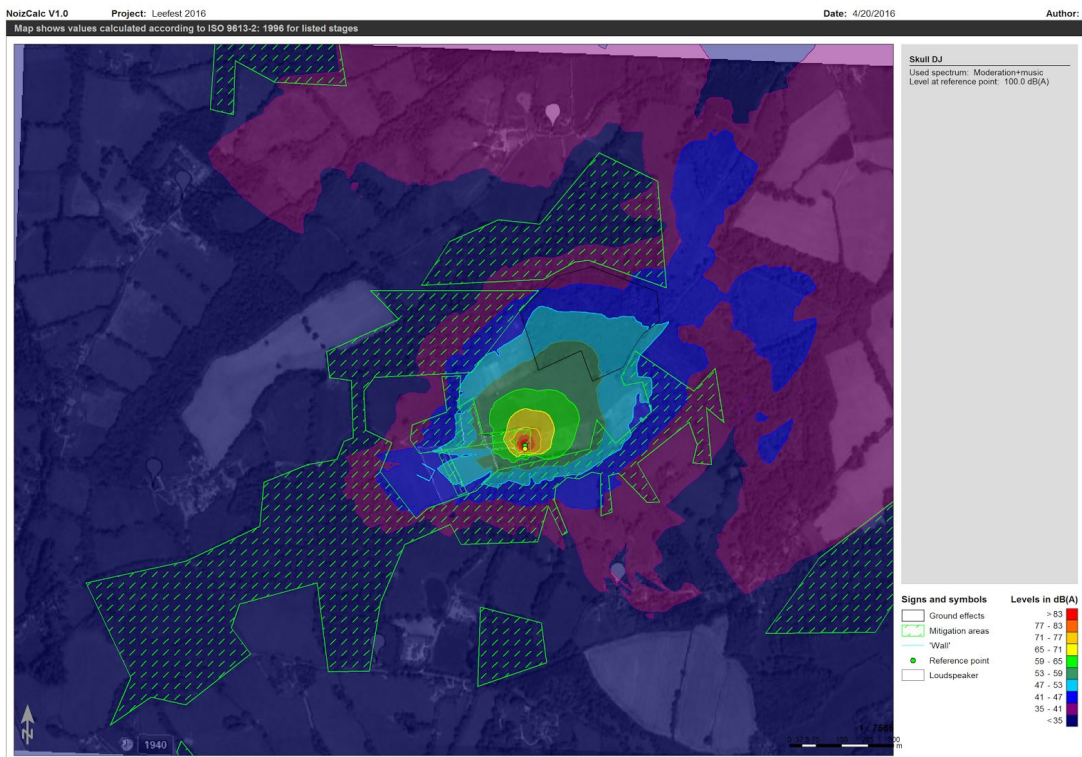


Figure 8: Model Showing Propagation of Noise From Skull Ridge Live Stage

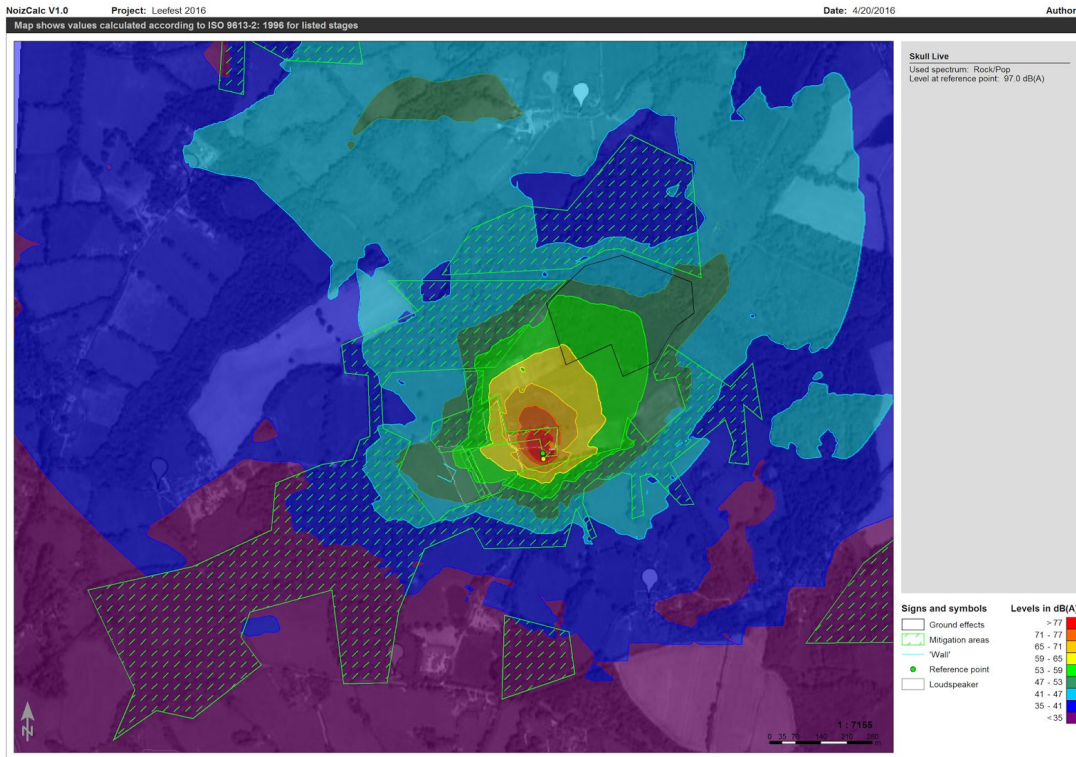


Figure 9: Model Showing Propagation of Noise From Skull Ridge Cabaret Stage

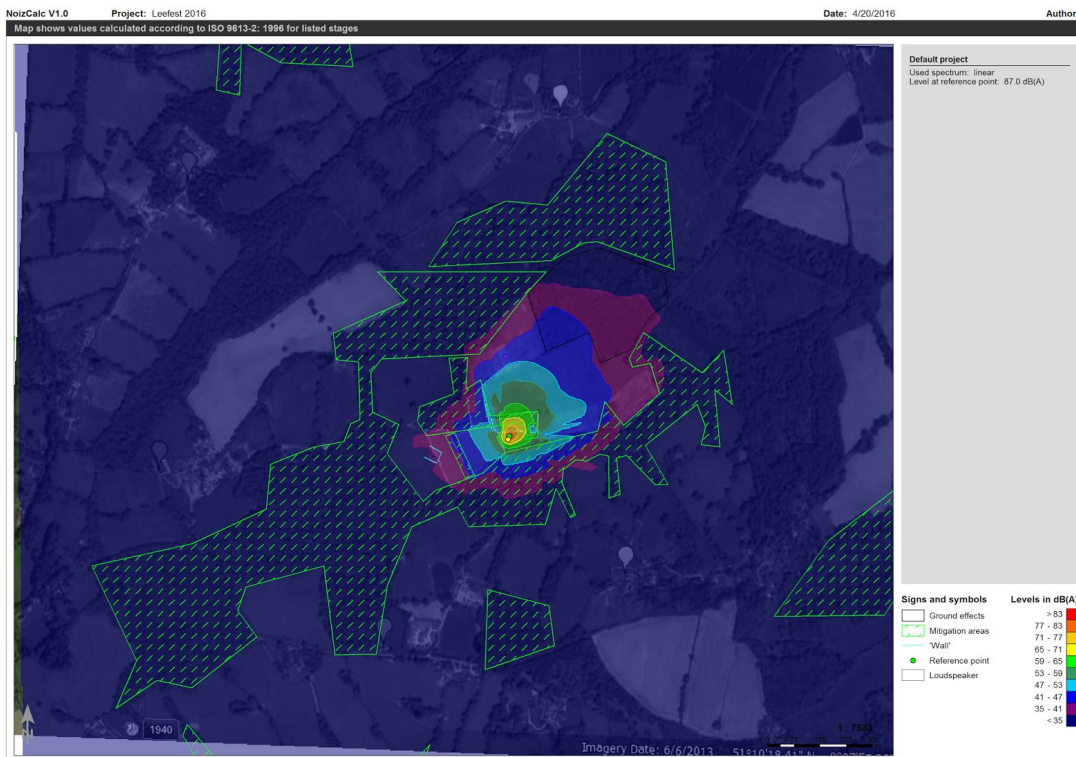


Figure 10: Model Showing Propagation of Noise From Skull Ridge Arcade



Figure 11: Model Showing Propagation of Noise From Skull Ridge Casino

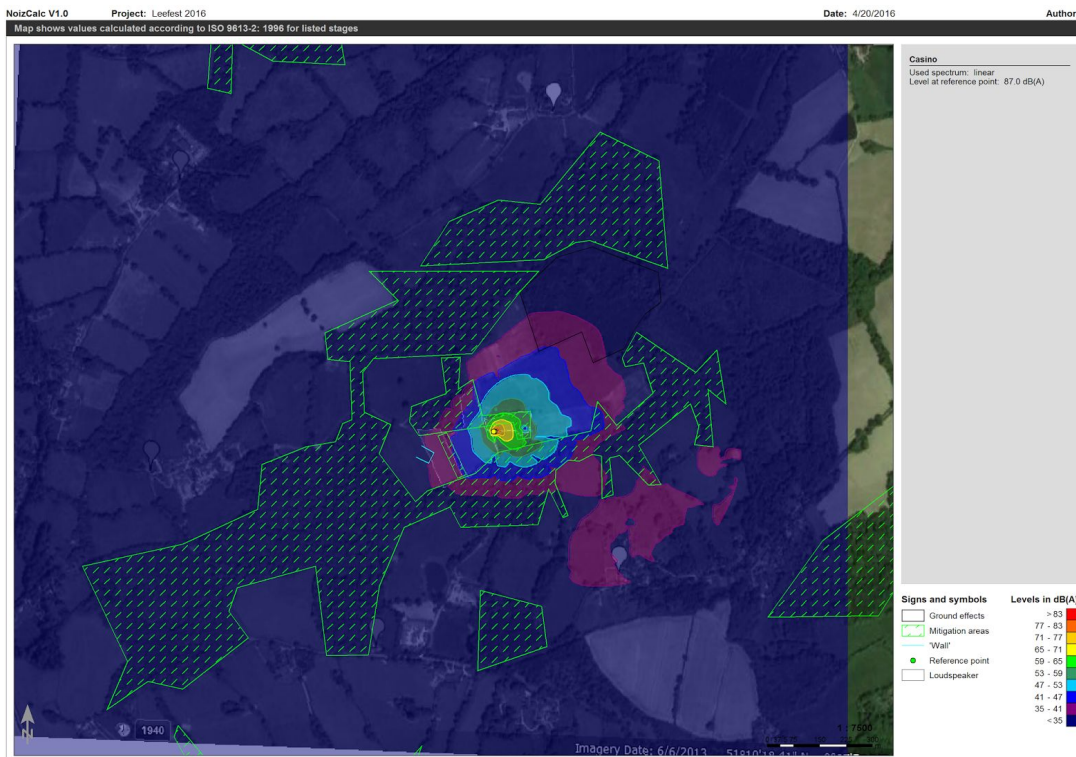


Figure 12: Model Showing Propagation of Noise From Mermaids Beach Stage

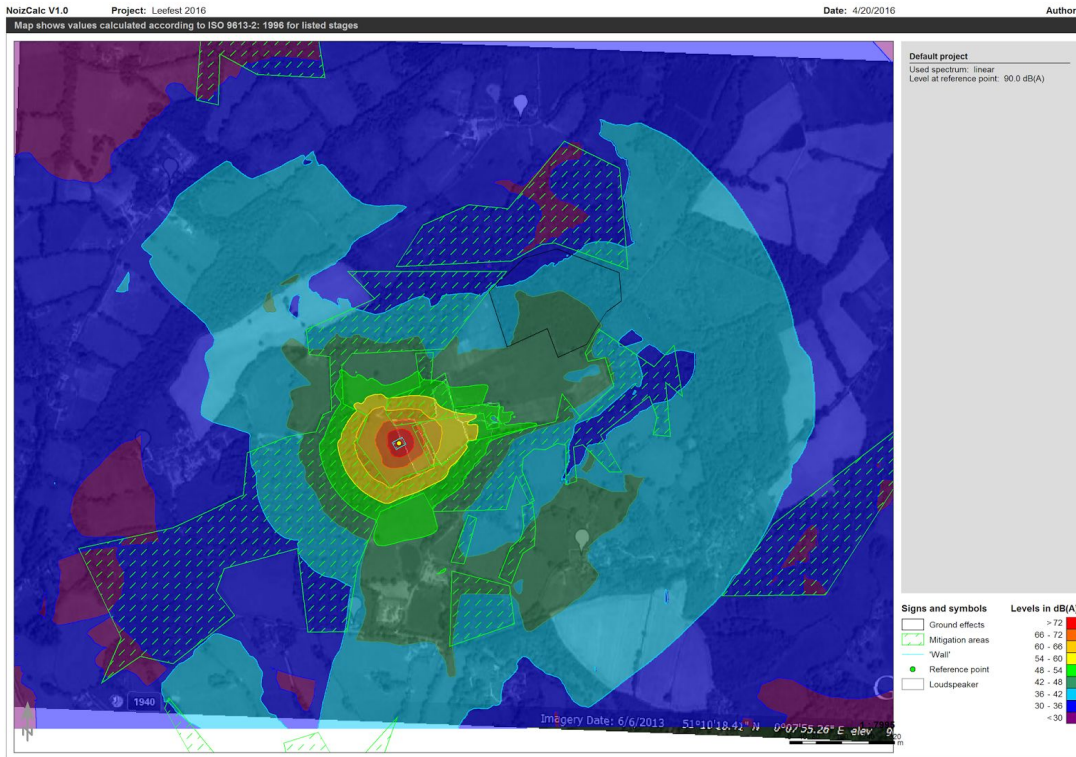


Figure 13: Model Showing Propagation of Noise From Mermaids Cinema

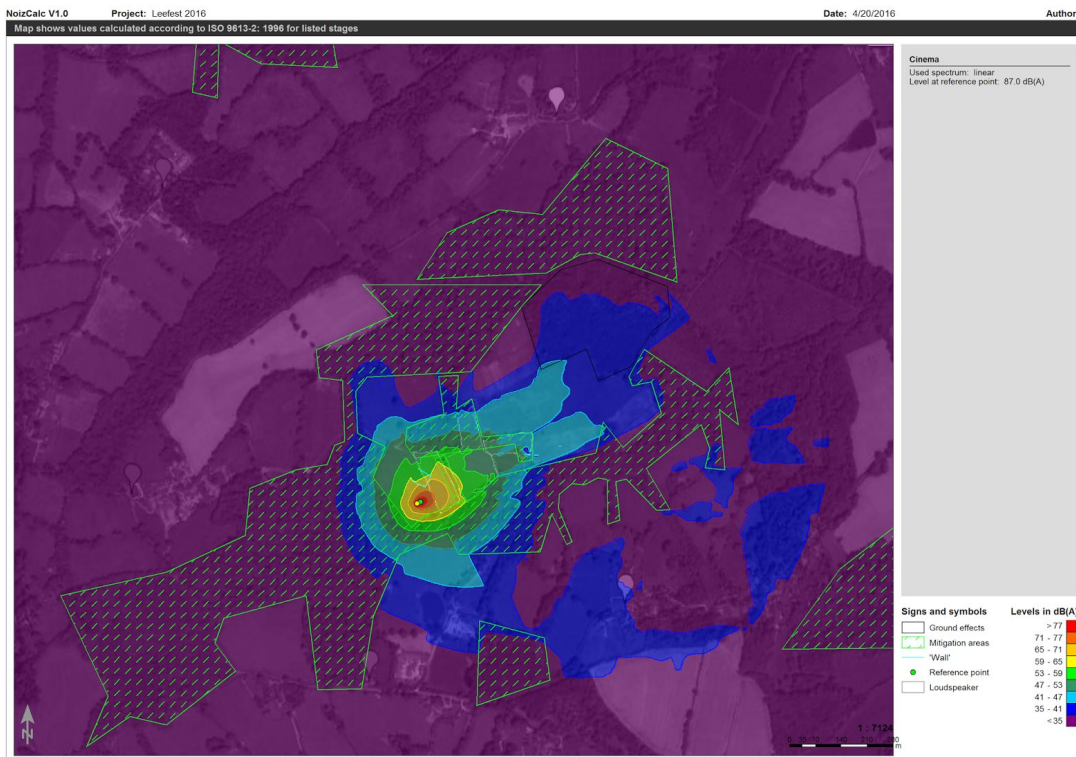




Figure 14: Model Showing Propagation of Noise From Mermaids Drag Stage

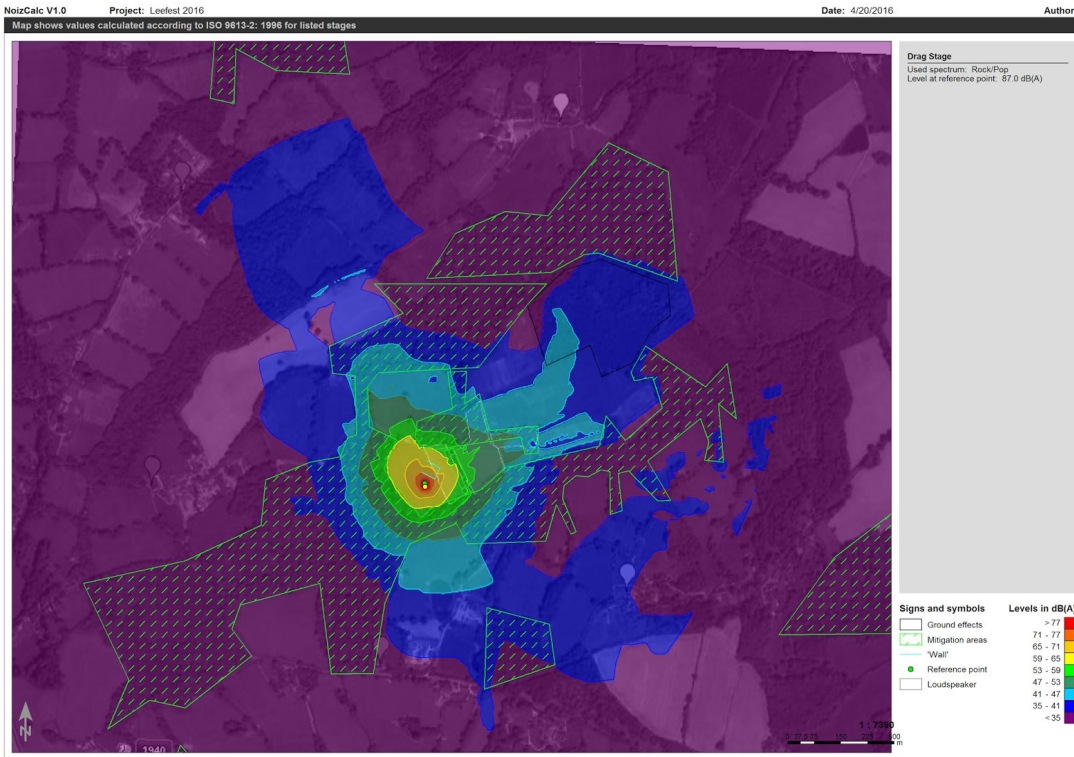
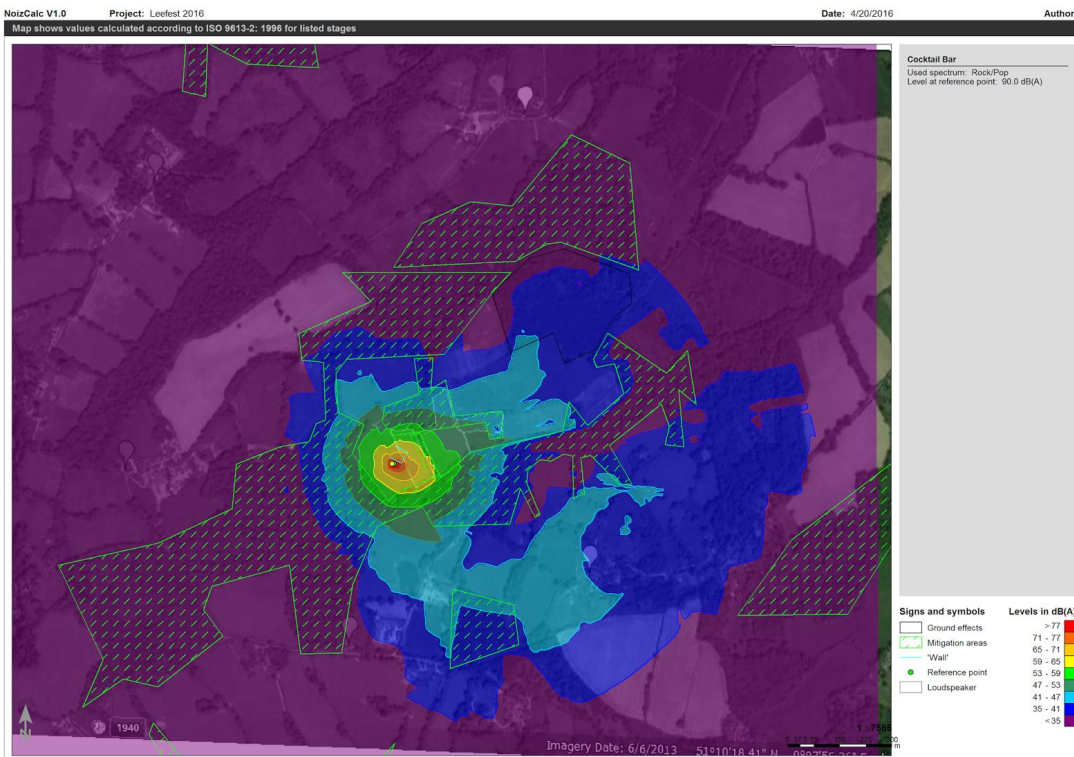
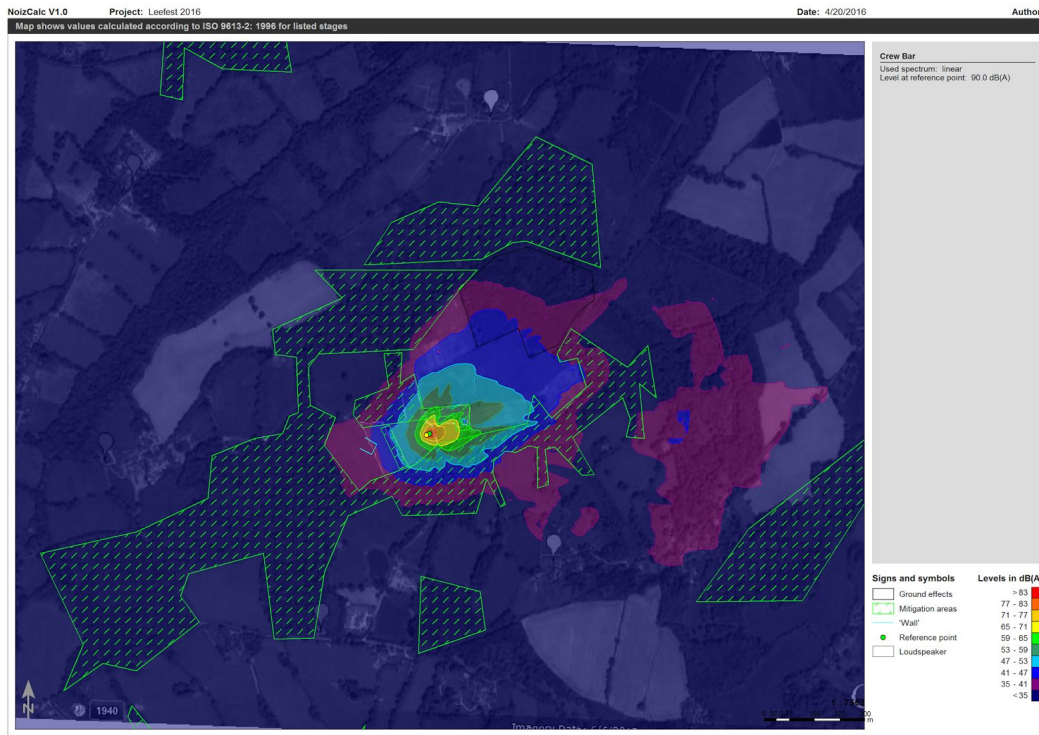


Figure 15: Model Showing Propagation of Noise From Mermaids Cocktail Bar



**Figure 16: Model Showing Propagation of Noise From Crew and Guest Bar**



**Table 3: Maximum Cumulative Predicted Noise Levels 09:00 to 23:00**

Noise Sensitive Premises	Newtye Hurst Farm /dB(A)	Truggers Lane /dB(A)	Lockskinners /dB(A)	North Pigdown Lane /dB(A)	Wilderness Farm /dB(A)
Neverwoods Main Stage	58	52	52	58	59
Neverwoods Live Stage	36	34	48	44	33
Neverwoods Treehouse Stage	33	29	27	36	36
Neverwoods Main Bar	28	28	30	24	24
Skull Ridge DJ Stage	28	36	37	34	32
Skull Ridge Live Stage	31	36	45	41	38
Skull Ridge Cabaret Stage	22	25	29	19	21
Skull Ridge Arcade	19	23	25	23	26
Skull Ridge Casino	23	36	23	14	19
Mermaids Beach Stage	40	42	35	35	31
Mermaids Cinema	30	35	30	25	19
Mermaids Drag Stage	34	36	35	35	26
Mermaids Cocktail Bar	33	40	30	28	24
Crew and Guest Bar	25	33	28	18	23
<b>Total Noise Level</b>	<b>58</b>	<b>53</b>	<b>54</b>	<b>58</b>	<b>59</b>

**Table 4: Maximum Cumulative Predicted Noise Levels 23:00 to 02:00**

<b>Noise Sensitive Premises</b>	<b>Newtye Hurst Farm /dB(A)</b>	<b>Truggers Lane /dB(A)</b>	<b>Lockskinners /dB(A)</b>	<b>North Pigdown Lane /dB(A)</b>	<b>Wilderness Farm /dB(A)</b>
Neverwoods Main Stage	0	0	0	0	0
Neverwoods Live Stage	0	0	0	0	0
Neverwoods Treehouse Stage	33	29	27	36	36
Neverwoods Main Bar	28	28	30	24	24
Skull Ridge DJ Stage	29	35	34	32	37
Skull Ridge Live Stage	0	0	0	0	0
Skull Ridge Cabaret Stage	22	25	29	19	21
Skull Ridge Arcade	19	23	25	23	26
Skull Ridge Casino	23	36	23	14	19
Mermaids Beach Stage	40	42	35	35	31
Mermaids Cinema	30	35	30	25	19
Mermaids Drag Stage	34	36	35	35	26
Mermaids Cocktail Bar	0	0	0	0	0
Crew and Guest Bar	25	33	28	18	23
<b>Total Noise Level</b>	<b>42</b>	<b>45</b>	<b>41</b>	<b>41</b>	<b>40</b>

**Table 5: Maximum Cumulative Predicted Noise Levels 02:00 to 05:00**

<b>Noise Sensitive Premises</b>	<b>Newtye Hurst Farm /dB(A)</b>	<b>Truggers Lane /dB(A)</b>	<b>Lockskinners /dB(A)</b>	<b>North Pigdown Lane /dB(A)</b>	<b>Wilderness Farm /dB(A)</b>
Neverwoods Main Stage	0	0	0	0	0
Neverwoods Live Stage	0	0	0	0	0
Neverwoods Treehouse Stage	33	29	27	36	36
Neverwoods Main Bar	28	28	30	24	24
Skull Ridge DJ Stage	29	35	34	32	37
Skull Ridge Live Stage	0	0	0	0	0
Skull Ridge Cabaret Stage	22	25	29	19	21
Skull Ridge Arcade	19	23	25	23	26
Skull Ridge Casino	23	36	23	14	19
Mermaids Beach Stage	0	0	0	0	0
Mermaids Cinema	0	0	0	0	0

Mermaids Drag Stage	0	0	0	0	0
Mermaids Cocktail Bar	0	0	0	0	0
Crew and Guest Bar	25	33	28	18	23
<b>Total Predicted Noise Level</b>	<b>36</b>	<b>40</b>	<b>37</b>	<b>38</b>	<b>40</b>

Figure 17: Noise Sensitive Wedding Venues and Theatre Locations

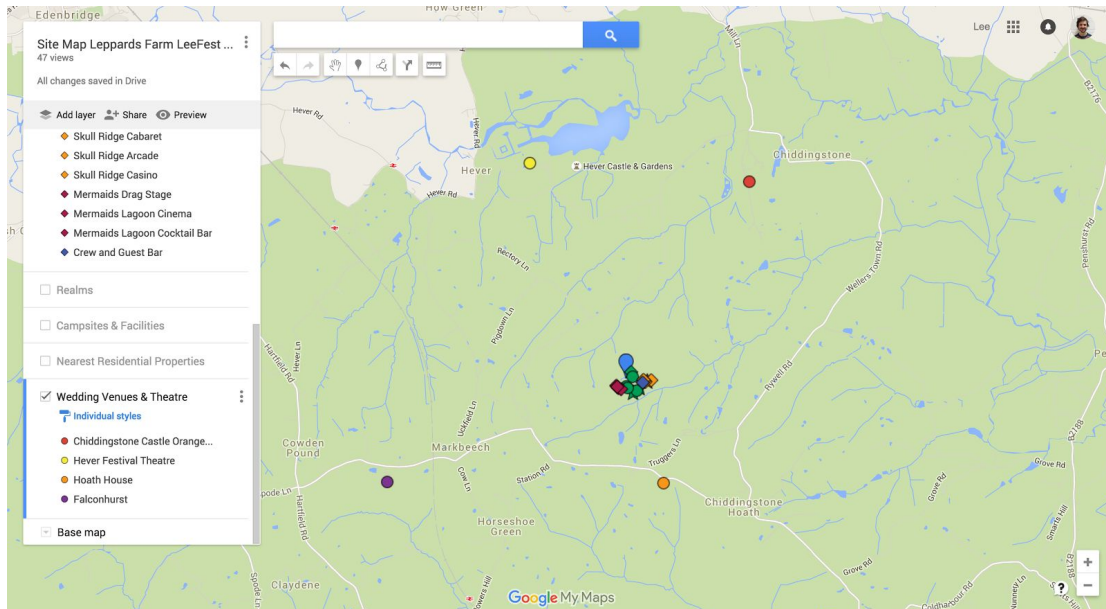


Table 6: Maximum Cumulative Predicted Noise Levels At Wedding Venues and Theatre

Noise Sensitive Premises	Chiddingstone Castle /dB(A)	Hever Festival Theatre /dB(A)	Falconhurst /dB(A)	Hoath House /dB(A)
Neverwoods Main Stage	44	47	47	44
Neverwoods Live Stage	41	38	28	27
Neverwoods Treehouse Stage	18	23	26	27
Neverwoods Main Bar	22	20	16	19
Skull Ridge DJ Stage	34	29	18	23
Skull Ridge Live Stage	38	39	28	27
Skull Ridge Cabaret Stage	22	19	12	17
Skull Ridge Arcade	19	18	13	12
Skull Ridge Casino	16	12	10	21
Mermaids Beach Stage	30	27	28	37
Mermaids Cinema	23	20	17	25
Mermaids Drag Stage	27	28	24	31
Mermaids Cocktail Bar	25	23	22	34

Crew and Guest Bar	24	16	16	20
<b>Total Predicted Noise Level</b>	<b>47</b>	<b>48</b>	<b>47</b>	<b>46</b>

### **3. Noise Assessment**

#### **3.1. Noise between 09:00 and 23:00**

The guidance from the Noise Council Code Of Practice advises that for rural areas used for 1-3 event days per calendar year, taking place between 09:00 and 23:00, a music noise limit of 65 dB(A) over a fifteen minute period at the nearest noise sensitive premises is recommended to prevent public nuisance.

For the planned entertainment at the event between 09:00 and 23:00, the predicted noise levels at all the residential prediction locations show that a noise level of not more than 65dB(A) is achievable.

For the planned entertainment at the event between 09:00 and 23:00, the predicted noise levels at the wedding venue and theatre prediction locations show that the noise level will be much lower than the 65dB(A) limit at the nearest residential premises, reaching a peak of 48dB(A) when the main stage is in operation at its maximum intended level which only happens during the headline performances on the Friday and Saturday night.

#### **3.2. Noise between 23:00 and 09:00**

The guidance of the Noise Council Code Of Practice (1995) advises that for events continuing between the hours of 23:00 and 09:00 the music noise level should not be audible within noise sensitive premises with windows open in a typical manner for ventilation.

The Noise Council Code of Practice (1995) includes a supporting note to the guideline of inaudibility explaining that 'The use of inaudibility as a guideline is not universally accepted as an appropriate method of control. This guideline is proposed as there is insufficient evidence available to give more precise guidance'

The WHO Guidelines For Community Noise (1999) offer more precise guidance on the admissible noise limits at the facade of residential premises that will not adversely affect the environment within a bedroom. This guidance suggests that a music noise limit of 45dB(A) is sufficient to ensure that restful sleep is not disturbed.

The IOA Technical Paper and Defra Noise From Pubs and Clubs (2006) study provide further evidence that for this type of event the music noise level of 45dB(A) suggested by the WHO Guidelines is a sufficient condition to prevent a statutory public nuisance between the hours of 23:00 and 09:00.

For the planned entertainment at the event between 09:00 and 23:00, the predicted

noise levels at all the prediction locations show that a noise level of not more than 45dB(A) is achievable and that after 02:00 the level will reduce even further to 40dB(A) or less.

It should be noted that the predictions are based on the worst-case scenario of all stages operating simultaneously.

## **4. Noise Management Plan**

Careful consideration will be given to implementing and exercising a noise control program during sound checks and event to control entertainment noise from the venue.

This noise management plan follows procedures that have been successfully adopted at outdoor events of this size throughout the UK, including other events by the same organisers.

### **4.1. Pre Event Information**

A suitably experienced sound engineer will be solely responsible for the management of noise during the event (Noise Management Engineer).

The Noise Management Engineer will have direct communication with all parties through site radios.

A direct telephone complaints line to the event production office will be made publicly available and manned for the duration of the event.

A letter will be circulated to local residents at risk of disturbance at least 5 days prior to the event, informing them of the details of the event and including start and finish times of both the event and any sound-checks and include the direct telephone number for noise complaints.

Should any noise complaints be received, the noise management engineer will investigate the complaint by taking noise readings at the affected property. If noise levels are above those specified in the licence conditions, immediate action would be taken to reduce the levels at the noise source.

A complaints log will be maintained throughout the event, detailing addresses of complaints, times and actions taken by the Noise Management Engineer.

The organisers will advise the Environmental Health Department of the likely times of rehearsals and sound-checks when available..

## 4.2. Noise Control Procedures

### *Sound Propagation Tests*

Before the event begins the production team will carry out short sound propagation tests in association with local environmental health officers. These tests are undertaken in order to correlate the music noise levels at the mixing desk with those observed at the nearest noise sensitive premises. The results of these tests will be used to 'fine tune' the sound system in order to maximise the containment of music and set an appropriate noise monitoring limit at the mixing desk position of each stage.

### *Sound Control within the Venue*

Sound engineers working at the mixing desk position of each stage will be informed of the maximum sound limit set by the propagation tests and instructed to ensure that those limits are not exceeded.

Should a noise complaint be received by the production office or the local authority the noise level at the mixing desk position in the venue will be measured and recorded. If it is above the level set in the sound propagation tests it will be reduced.

### *Noise Monitoring outside of the Venue*

Should a noise complaint be received a noise measurement will be taken from the location of the complaint by the Noise Management Engineer. If any noise limit is found to be exceeded immediate action will be taken to reduce the noise level. Instructions will be transmitted by radio to the sound engineers at the mixing desk positions to reduce the level onsite until a satisfactory offsite reading is achieved.

A summary report will be produced after the event which will include any noise level measurements taken in response to complaints. This will be made available to the local authority.

## 5. Glossary

Noise is defined as unwanted sound. The range of audible sound is from 0dB to 140dB, which is taken to be the threshold of pain. The sound pressure detected by the human ear covers an extremely wide range. The decibel (dB) is used to condense this range into a manageable scale by taking the logarithm of the ratio of the sound pressure and a reference sound pressure.

The unit of frequency is Hz. 1 Hz is one pressure fluctuation in one second. The frequency response of the ear is usually taken to be about 16Hz (number of oscillations per second) to 18,000Hz. The ear does not respond equally to different



frequencies at the same level. It is more sensitive in the mid-frequency range than at the lower and higher frequencies, and because of this, the low and high frequency component of a sound are reduced in importance by applying a weighting (filtering) circuit to the noise measuring instrument. The weighting which is most used and which correlates best with the subjective response to noise is the dB(A) weighting. This electronic filter matches the variation in the frequency sensitivity of the meter to that of the human ear. This is an internationally accepted standard for noise measurements.

The ear can just distinguish a difference in loudness between two noise sources when there is a 3dB(A) difference between them. Also when two sound sources of the same noise level are combined the resultant level is 3dB(A) higher than the single source. When two sounds differ by 10dB(A) one is said to be twice as loud as the other.

The subjective response to a noise is dependent not only upon the sound pressure level and its frequency, but also its intermittency. Various statistical indices have been developed to try and correlate annoyances with the noise level and its fluctuations in a changing noise environment. The indices and parameters used in this report are defined below:

$LA_{eq}$ : Equivalent Continuous Sound Pressure Level. The A-weighted sound pressure level of a steady sound that has, over a given period, the same energy as the fluctuating sound under investigation. It is in effect the energy average level over the specified measurement period (T) and is the most widely used indicator for environmental noise.

$L_{night, outside}$ : The night-time noise indicator ( $L_{night}$ ) of Directive 2002/49/EC of 25 June 2002: the A-weighted long-term average  $LA_{eq}$  sound level as defined in ISO 1996-2: 1987, determined over all the night periods of a year; in which: the night is eight hours (usually 23.00 – 07.00 local time), a year is a relevant year as regards the emission of sound and an average year as regards the meteorological circumstances, the incident sound is considered, the assessment point is the same as for  $L_{den}$ . See Official Journal of the European Communities, 18.7.2002, for more details.

A table of typical decibel comparisons:

Sound Level, dB(A)	Environmental Condition
0 – 10	Threshold of hearing
10 - 20	Broadcasting Studio
20 – 30	Bedroom at night
30 – 40	Library
40 – 50	Living room urban area
50 – 60	Typical Business Offices
60 – 70	Conversation Speech
70 – 80	Average traffic on street corner
80 – 90	Inside bus
100 – 110	Alarm Clock (1m away)
110 – 120	Loud car horn (1m away)

120 – 130	Pneumatic drill (1m away)
130 - 140	Threshold of pain