DINING

Noise Impact Assessment

Reference: 13150.RP01.NIA.2
Prepared: 26 January 2024
Revision Number: 2

Planning Potential
Magdalen House
148 Tooley Street
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Revision	Comment	Date	Prepared By	Approved By
0	First issue of report	20 December 2023	Robert Harris-Marshall	Torben Andersen
1	Revised assessment section	24 January 2024	Robert Harris-Marshall	Torben Andersen
2	Minor amendments	26 January 2024	Robert Harris-Marshall	Torben Andersen

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The recommendations within this report relate to acoustics performance only and will need to be integrated within the overall design by the lead designer to incorporate all other design disciplines such as fire, structural integrity, setting-out, etc. Similarly, any sketches appended to this report illustrate acoustic principles only and again will need to be developed in to full working drawings by the lead designer to incorporate all other design disciplines.

In line with our Environmental Policy, up to two hard copies of the report will be provided upon request. Additional copies of the report, or further hard copies of revised reports, would be subject to an administrative cost of £20.00 (+VAT) per copy.

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1. INTRODUCTION

An extension to the operating hours at Malverleys Farm & Dining in Newbury is proposed as part of a planning submission.

As part of the planning submission, RBA Acoustics have been commissioned to undertake an assessment of the noise impact resulting from the proposals on the immediate residential neighbours.

Noise associated with current operations at the venue has been assessed and compared with the measured noise levels at the site during the current hours and the proposed extended hours.

This report presents the results of the noise assessment.

2. SITE DESCRIPTION

2.1 Existing Site Context

The site known as Malverleys Farm & Dining is a mixed-use establishment consisting of a farm shop, bakery, gift shop, café/restaurant and lecture/education space in Newbury set on the edge of the Wessex Downs.

The site is accessed from East End Road to a path leading to a 2-storey building. The site has external seating areas for customer use close to the north and east of the main building; the farm belonging to the site is located approximately 50 meters west of the main building.

The local area consists of a rural village with residential properties and farms surrounding the site. Additionally, [redacted]C of E is located just south-west of the main site building.

The surrounding road network predominantly consists of country lanes with infrequent road traffic; the nearest main road, the A343, is located approximately 1.5 miles to the east and connects to the A34 approximately 2.2 miles east of the site.

2.2 Prevailing Noise Climate

The noise climate is generally quiet, as to be expected with a rural village setting, and the main noise sources observed in the area are listed below:

- Occasional road traffic noise due to cars and agricultural vehicles travelling along the local road network [redacted]
- Agricultural works noise emanating from surrounding farms, including Malverleys Farm [redacted]C of E primary school during break times
- External patron noise from customers of Malverleys Farm & Dining was heard on the site (albeit a low level of patron noise was observed, likely due to the time of year)

2.3 Proposals

As part of the projected scheme, the following items requiring acoustic consideration are proposed:

Extension to the permitted opening hours [redacted] plant, patron ingress and egress, internal noise breakout and external patron noise impact has been considered.

For reference, the current opening hours for the main building are outlined below. The external terrace shall not open before 08:00 hours or remain open after 19:00 hours on any day.

- 8am to 7pm Mon to Thurs
- 8am to 9pm Fri
- 9am to 9pm Sat
- 10am to 4pm Sun

The proposed extended opening hours for the mixed-use building and external seating areas are outlined as follows:

Mixed-use building

- 8am to 7pm Mon and Tues
- 8am to 10pm Weds and Thurs
- 8am to 11pm Fri and Sat
- 8am to 9pm Sun

External terrace

- 8am to 7pm Mon and Tues
- 8am to 10pm Weds to Sat
- 8am to 9pm Sun

3. ENVIRONMENTAL NOISE SURVEY

3.1 General

Monitoring of the prevailing background noise was undertaken over the following period:

14:00 hours Friday 17 November to 12:15 hours Tuesday 21 November 2023.

As the survey was unattended it is not possible to comment with certainty regarding meteorological conditions throughout the entire survey period, however based on observations during the site visits, and weather reports for the area, it was generally considered suitable for obtaining representative noise measurements, it being predominantly dry with little wind for the most part and occasional light showers.

Measurements were made of the L_{Aeq} and L_{A90} noise levels over sample periods of 1-hour and 15-minutes duration.

3.2 Measurement Locations

To determine the existing noise climate around the site measurements were undertaken at the following locations.

The measurement positions are also illustrated on the attached Location Plan (Figure 1 in Appendix C).

Measurement Position 1 (MP1) [redacted] East End Road

Measurements were taken at the residential property to the south-east of Malverleys Farm & Dining. The microphone was mounted on a pole approximately 4 metres above ground level overlooking East End Road.

The prevailing noise climate was noted to mainly consist of occasional direct road traffic noise from East End Road, noise emanating from distant agricultural work sites, birdsong and distant playground noise from St [redacted]

This measurement position is considered representative of noise levels experienced by receptors directly overlooking the main road network.

Measurement Position 2 (MP2) [redacted] North of Site

Measurements were taken at the site boundary to the north of the Malverleys Farm & Dining main building. The microphone was mounted on a pole affixed to a fence approximately 1.25m above ground level.

The prevailing noise climate was noted to mainly consist of occasional road traffic noise from East End Road and the surrounding road network, patron/ conversational noise from customers of Malverleys Farm & Dining noise emanating from distant agricultural work sites, birdsong and distant playground noise from St [redacted]

This measurement position is considered representative of noise levels experienced by receptors to the north.

Measurement Position 3 (MP3) – South of Site

Measurements were taken near the site boundary to the south of the Malverleys Farm & Dining main building. The microphone was mounted on a pole affixed to a fence approximately 1.25m above ground level.

The prevailing noise climate was noted to mainly consist of occasional road traffic noise from East End Road, the surrounding road network and direct road traffic noise from cars accessing the site, pa conversational noise from customers of Malverleys Farm & Dining noise emanating from distant break times.

This measurement position is considered representative of noise levels experienced by receptors to the south.

3.3 Instrumentation

For information regarding the equipment used for the measurements please refer to Appendix B.

The sound level meters were calibrated both prior to and on completion of the survey with no calibration drifts observed.

4. RESULTS

The measured L_{Aeq} and L_{A90} 15-min period levels are shown as time-histories on the attached Graphs 1-6.

A summary of the period-averaged and lowest-hourly measured L_{Aeq} noise levels, and L_{A90} noise levels over 1-hour intervals during the proposed operational periods (See Section 2.3) are presented below.

Table 1 Proposed Operational Period Measured Results

Measurement Position	Measurement Date	Measured Noise Level Period-averaged over Proposed Operational Period (dB, L_{Aeq})	Lowest Hourly Ambient Background Noise Level (dB, L_{Aeq})	Lowest Hourly Background Noise Level (dB, L_{A90})
MP1: East End Road	Friday 17 November 2023	50	41	26
	Saturday 18 November 2023	52	43	30
	Sunday 19 November 2023	52	43	36
	Monday 20 November 2023	52	40	31
	Tuesday 21 November 2023	54	52	40
	Minimum (worst-case)	50	40	26
MP2: North of Site	Friday 17 November 2023	41	36	30
	Saturday 18 November 2023	42	36	30
	Sunday 19 November 2023	46	40	35
	Monday 20 November 2023	47	36	32
	Tuesday 21 November 2023	56	43	40
	Minimum (worst-case)	41	36	30
MP3: South of Site	Friday 17 November 2023	46	40	30
	Saturday 18 November 2023	49	35	30
	Sunday 19 November 2023	47	38	34
	Monday 20 November 2023	53	36	32
	Tuesday 21 November 2023	58	51	37
	Minimum (worst-case)	46	35	30

The minimum lowest hourly background noise levels have been reported to enable a worst-case noise impact assessment.

In order to compare the difference in measured noise levels for the current hours of operation against the proposed extended hours, Table 2 summarises and presents the minimum period-averaged and lowest-hourly ambient background noise levels, in terms of L_{Aeq}, measured across each of the existing and proposed operational periods (see Section 2.3).

Table 2 Difference in Measured Levels Across Current Hours & Extended Hours

Measurement Position	Operational Period	Measured Noise Level Period-averaged over Relevant Operational Period (dB, L_{Aeq})	Lowest Hourly Ambient Background Noise Level (dB, L_{Aeq})	Lowest Hourly Background Noise Level (dB, L_{A90})
MP1: East End Road	Currently Permitted	51	45	27
	Proposed Extended Hours	50	40	26
	Difference	-1	-5	-1
MP2: North of Site	Currently Permitted	42	36	30
	Proposed Extended Hours	41	36	30
	Difference	-1	0	0
MP3: South of Site	Currently Permitted	47	37	30
	Proposed Extended Hours	46	35	30
	Difference	-1	-2	0

The results of the comparison between the noise levels over the current hours and the proposed extended hours noise levels show the following:

The most significant decrease in noise levels equates to a 5dB difference between the lowest-hourly background L_{eq} noise levels when considering the noise levels measured during the currently permitted operational period against the noise levels measured during the proposed extended hours. This occurs at Position 1 which generally receives greater contributions from road traffic noise compared to the remaining two measurement positions.

At Positions 2 and 3, the period-averaged noise level and the lowest-hourly background noise levels over the existing and proposed hours of operation are comparable.

The measured results at Positions 1 and 2 have been used in the noise impact assessment as these a representative of the nearest noise-sensitive receptors.

5. ASSESSMENT CRITERIA

5.1 National Planning Policy Framework

The Department for Levelling Up, Housing and Local Communities *National Planning Policy Framework* (NPPF) 2023 [redacted] respect of noise, Paragraphs 174, 185 and 187 of the NPPF state the following:

[redacted] *Planning policies and decisions should contribute to and enhance the natural and local environment by:*

(e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river bas management plans.

185) Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:

(a) mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development [redacted] and avoid noise giving rise to significant adverse impacts on health and the quality of life;

(b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.

[redacted] evelopment and we have therefore, for the purposes of this assessment, referred to the following documents.

5.2 Planning Practice Guidance (Noise)

The Ministry of Housing, Communities and Local Government (2014) *Planning Practice Guidance (Noise)* [redacted] *dvises on how planning can manage potential noise impacts in new development* [redacted] guidelines that are in line with the NPPF. The guidance is an online resource and was last updated on 22 July 2019.

The PPG(N) states that local planning authorities should:

[redacted]

Whether or not a significant adverse effect is occurring or likely to occur;
Whether or not an adverse effect is occurring or likely to occur; and
[redacted]

The guidance uses the same concepts of adverse effect levels as the NPSE, and these are provided in full in Table 3 below.

necessarily be appropriate in determining the effects of noise exposure. Rather, factors to be considered in determining whether noise is a concern can include the absolute noise level of the source, the existing ambient noise climate, time of day, frequency of occurrence, duration, character of the noise and cumulative effects .

Table 3 Noise Exposure Hierarchy Table from PPG(N)

Perception	Examples of Outcomes	Increasing Effect Level	Action
No Observed Effect Level			
Not noticeable	No effect	No Observed Effect	No specific measures required
No Observed Adverse Effect Level			
Noticeable and not intrusive	Noise can be heard, but does not cause any change in behaviour or attitude. Can slightly affect the acoustic character of the area but not such that there is a perceived change in the quality of life.	No Observed Adverse Effect	No specific measures required
Lowest Observed Adverse Effect Level			
Noticeable and intrusive	Noise can be heard and causes small changes in behaviour and/or attitude, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
Significant Observed Adverse Effect Level			
Noticeable and disruptive	The noise causes a material change in behaviour and/or attitude, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	Significant Observed Adverse Effect	Avoid through use of appropriate mitigation whilst taking into account the social and economic benefit
Unacceptable Observed Adverse Effect Level			
Noticeable and very disruptive	Extensive and regular changes in behaviour and/or an inability to mitigate effect of noise leading to psychological stress or physiological effects, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory.	Unacceptable Adverse Effect	Prevent through use of appropriate mitigation

5.3 Institute of Environment Management & Assessment (IEMA) and Institute of Acoustics Guidelines on Noise Impact Assessment

When assessing the subjective impact of any development it is important to consider the spec circumstances of the site. The characteristics of the various sources must therefore be considered in addition to factors common to all noise impact assessments such as existing background noise level comparisons.

Table 4 has been adopted to categorise the difference between the measured levels as identified in the guidelines published jointly by the IOA and IEMA. This identifies the impact of different levels of noise above the prevailing background noise.

Table 4 - Significance of Noise Level Change

Noise Change (dBA)	Category
0	No Impact
0.1 - 2.9	Slight Impact
3.0 [redacted] 4.9	Moderate Impact
5.0 [redacted] 9.9	Substantial Impact
10.0 and above	Severe Impact

5.4 Subjective Impact

In addition to the comparison of the difference in background noise levels in line with the above guidelines, it is important to understand the potential subjective effect of such changes in the noise level. Table 5 compares the generally accepted subjective response of typical subjects to variations in sound pressure level.

Table 5 [redacted] Subjective Response to Noise Levels

Change In Sound Level (dB)	Change in Power		Apparent Change in Loudness
	Decrease	Increase	
3	1/2	2	Just Perceptible
5	1/3	3	Clearly Noticeable
10	1/10	10	Half or Twice as Loud
20	1/100	100	Much Quieter or Louder

5.5 Summary

Based on the above guidance, we consider it appropriate that the following increases of the existing measured background noise levels resulting from the proposals will fall in the following effect level categories.

Table 6 Categorisation of Effect Level Categories

Background Noise Level Increase $L_{eq,\ T}$ (dBA)	Effect(s)	PPG(N) Assessment	Subjective Response
0.1 – 2.9	Slight / Not Significant	No Observed Adverse Effect	Imperceptible
3.0 – 4.9	Moderate	Lowest Observed Adverse Effect	Perceptible
5.0 – 9.9	Substantial	Significant Observed Adverse Effect	Clearly Noticeable
10.0 and above	Very Substantial	Unacceptable Adverse Effect	Twice as Loud

6. ASSESSMENT METHODOLOGY

6.1 Description of Assessments

As part of the projected scheme, the following items requiring acoustic consideration are proposed:

Extension to the permitted opening hours [redacted] plant, patron ingress and egress, internal noise breakout and external patron noise impact has been considered.

The assessment methodologies for the above acoustic considerations are summarised below:

6.2 Atmospheric Plant Noise Emissions Assessment

In order to determine whether an increased noise impact occurs with the current plant installations when considering an extension to the permitted opening hours, a review of the L_{A90} background noise levels assessed to within the currently permitted hours in the original plant noise assessments has been undertaken and compared to our measured L_{A90} background noise levels over the extended hours.

Should the background noise levels be comparable, this would indicate that no increased impact occurs due to the current plant installations.

6.3 Patron Ingress & Egress Assessment

Patrons Accessing Site on Foot

In order to determine whether an increased noise impact occurs due to patrons walking to and from site, predictions have been made which utilise human speech noise levels and used in an assessment against the L_{Aeq} ambient background noise levels over the extended hours.

It is understood that the restaurant/ café can accommodate 45-50 internal covers, and the internal function space can accommodate 16-20 people. Although the likelihood of such a scenario is low or minimal, to enable a worst-case assessment our predictions assume 70 patrons will walk to or from the site via the access road over the course of an hour.

The assessment also assumes that 1 person is speaking at any one time in a conversation between 2 people as a worst-case scenario.

Patrons Accessing Site in Cars (Vehicle Movements Assessment)

In order to determine whether an increased noise impact occurs based on vehicle movements, i.e. cars accessing the site, when considering an extension to the permitted opening hours, predictions have been made of the noise levels resulting from vehicle movements and used in an IEMA assessment against the L_{Aeq} ambient background noise levels over the extended hours.

This assessment has been based on the following assumptions:

The vehicular movements assessment has been based on the information provided in the original Transport Statement by RGP (Ref: PLAP/19/4875/TS01 dated October 2019) for the initial development of Sungrove Farm.

The assessment considers car movements from customers to the site only. No assessment has been made for deliveries as it is believed that these will not be affected by the extended hours and will run in line with current operations.

The Transport Statement by RGP indicates that a peak demand of 23 vehicles over an hourly period at [redacted] case assessment.

It would typically be expected that peak demand would occur during daytime where background noise levels are higher than early morning or late evening periods. However, to facilitate a worst-case assessment the levels associated with vehicle movements will be compared against the lowest hourly background noise level measured at site.

As such, it has been assumed that, over the course of an hour, 24 car movements from East End Road [redacted] case scenario.

The assessment also considers the noise levels generated by car door slams within the car park. Two car door slams are assumed for each of the 24 car parking spaces, and the resultant noise levels represent all car door slams occurring simultaneously as a worst-case scenario.

6.4 Internal Noise Breakout Assessment

In order to determine whether an increased noise impact occurs based on noise breakout from internal areas, i.e. the restaurant/ café, predictions have been made based on relevant internal reverberant noise levels and sound reduction indices of external glazed elements and doors taken from our database and used in the calculation of resultant noise levels.

6.5 External Patron Noise Assessment

In order to determine whether an increased noise impact occurs due to patrons using external seating areas, predictions have been made which utilise human speech noise levels and used in an IEMA assessment against the L_{Aeq} ambient background noise levels over the extended hours.

The site is currently operational however no measurements of existing patron noise would have been [redacted] confirmed that the outdoor tables currently on site are all in use typically during summertime.

As such, our assessment utilises a noise model to predict the existing patron noise level, based on the maximum number of patrons that can occupy tables outside. The normal voice source noise levels have been extrapolated to correspond with the maximum number of patrons allowed in the external seating areas, which has been confirmed as 46no. in total, and separated into the following areas:

5 small tables which can each accommodate 6 people (30 in total)
1 large table which can accommodate 10 people.
1 pizza oven bench which can accommodate 6 people.

The assessment also assumes that 1 person is speaking at any one time in a conversation between 2 people as a worst-case scenario.

6.6 Noise Predictions Methodology

A 3-dimensional environmental noise model has been created to assess external noise levels at the site using CadnaA environmental noise prediction software, a calculation tool for the prediction and assessment of environmental noise. The software calculates the propagation of noise using the methods set out in ISO 9613-2: 1996 Attenuation of sound during propagation outdoors. It allows the computation of noise levels taking into account effects such as edge diffraction, reflections, barrier attenuation and atmospheric conditions.

6.7 Locations of Noise-Sensitive Receptors

We consider that the nearest noise-sensitive windows affected by operational noise levels from [redacted] will be the rear windows of The Gate House, approximately 80m to the north, and the rear upper floor windows of Dormer Cottage, approximately 45m to the south-east. No screening from residential garden fences has been accounted for.

The receptor locations are also indicated on the Site Plan (Figure 1) in Appendix C.

6.8 Source Noise Levels

As car movements are formed of several different discrete events, we have used a combination of measured noise level events from our database to form the resultant noise level of road traffic accessing the site. The following Table 8 summarises the data used in this calculation.

Table 7 [redacted]oise Data of Vehicle Movements Used in Acoustic Model

Activity	Sound Pressure SEL (dBA)	Measurement Distance (m)
Car door slams	81	3
Car starting/pulling away*	64	3

As mentioned in Section 6.3, two car door slams are assumed for every car parking space within the car park. 24 vehicle movements from East End Road to the car park have been assessed over a 1-hour period and treated as a moving line source in the noise model.

The human speech noise levels used in the acoustic model are based on a single person speaking at normal conversation level and source of the noise data is presented below. These noise levels have been extrapolated as per the external seating area capacities referred to in Section 6.5.

As per the vehicle movements assessment, 70 patrons walking on foot have been assessed over a 1-hour period and treated as a moving line source in the noise model.

It should be noted, the speech noise data used correlates well with noise data published in other documents and is widely used for these types of assessment. In addition, we would note the data used in our assessment correlates well with speech noise levels previously measured by RBA Acoustics.

Table 8 [redacted]oise Data of Speech Used in Acoustic Model[1]

Source	Sound Power Level (dB) at Octave Band Centre Frequency (Hz)								Overall L_{wA} (dB)
	63	125	250	500	1k	2k	4k	8k	
Normal Voice	45	55	65	69	63	56	50	45	68

REFERENCE USED FOR NOISE DATA:

(1) ANSI 3.5-1997 (1997). American National Standard [redacted]*Methods for Calculation of the Speech Intelligibility Index*

The internal noise level source data used in the acoustic model associated with restaurant use is also presented below. It should be noted that the noise levels below represent a busy restaurant, whereas the restaurant/café at Malverleys would not entirely represent these noise levels and would be quieter than assumed below. This can therefore be considered as a worst-case assessment.

Table 9 Noise Data of Restaurant Noise Used in Acoustic Model[2]

Source	Sound Pressure Level (dB) at Octave Band Centre Frequency (Hz)								$L_{Aeq,T}$ (dB)
	63	125	250	500	1k	2k	4k	8k	
Busy Restaurant	60	70	75	75	75	75	75	--	80

REFERENCE USED FOR NOISE DATA:

(2) Institute of Acoustics Draft Guidance Document *Good Practice Guide on the Control of Noise from Places of Entertainment*

6.9 Sound Reduction Index (SRI) Data

Table 10 below presents the sound reduction indices for glazed external elements and doors taken from the RBA database of SRI values and utilised in the assessment. The sound reduction index is used to measure the level of sound insulation provided by a structure or element.

Table 10 SRI Data used in Noise Model

Element	Sound Pressure Level (dB) at Octave Band Centre Frequency (Hz)								R_w (dB)
	63	125	250	500	1k	2k	4k	8k	
Glazed external doors	15	20	24	28	29	26	30	30	28
Glazed external elements	21	26	29	34	39	40	39	39	38

N.B. The values at 63Hz and 8kHz have been extrapolated for each element based on sound reduction performances of similar elements extracted from the RBA database.

7. ASSESSMENT RESULTS

7.1 Atmospheric Plant Noise Emissions Assessment

In terms of the noise impact due to current plant installations over the extended hours, the following documents have been reviewed which contain the original plant noise assessment reports for the current plant installations located at the site:

Sungrove Farm – East End – Noise Impact Assessment (Ref. BD/CS/P20-1983/01 Rev F) by Create Consulting Engineers Limited dated July 2020.

Sungrove Farm, East End, Newbury – Plant Noise Assessment Technical Note (Ref. BD/CS/P20-1983/03TN Rev B) by Create Consulting Engineers dated October 2021

Upon review of these documents, it was determined that the L_{A90} background noise levels which were measured and reported in Section 4.0 are comparable to the measured L_{A90} background noise levels in the original plant noise assessment reports.

As such, it is considered that there will be no increased noise impact due to the current plant installations over the extended hours.

7.2 Noise Model Predictions

Predictions have been made of noise levels resulting from patrons walking to or from site and vehicle movements, noise breakout from internal areas, patrons using external areas (based on the current number of tables outside), into the site assessed to the nearest noise-sensitive receptors.

A cumulative assessment has also been provided. It should however be noted that some assessments are mutually exclusive from one another. For example, there would not be 46 patrons sitting in the external terrace while the restaurant/café serves 50 customers internally. Additionally, there would not be 70 customers arriving on foot while 48 customers arrived by car. This cumulative assessment can therefore be considered as a worst-case assessment.

The results of the predictions are presented in Table 11.

Table 11 – Existing and Proposed Operational Noise Level Predictions

Assessment Scenario	Predicted Noise Level (dB, $L_{Aeq,T}$)	
	Receptor 1 – The Gate House	Receptor 2 – Dormers Cottage
Patrons Accessing Site on Foot	16	23
Patrons Accessing Site in Cars	21	25
Internal Noise Breakout (Busy Restaurant)	18	16
External Patron Noise	32	31
Cumulative	33	33

7.3 Current and Extended Hours Resultant Noise Levels

A comparison has been made of the resultant noise levels and *change-in-levels* predicted over the current hours and the extended hours.

The resultant noise levels are determined by combining the predicted noise levels in Table 9 and the worst-case hourly noise levels measured over the current hours and the extended hours.

The *change-in-level* is defined as the difference between the resultant noise levels and the ambient background noise levels.

Table 12 Resultant Noise Levels & Change in Levels Receptor 1

Assessment Scenario	Predicted Noise Level (dB, $L_{Aeq,1hour}$)	Worst-Case Ambient Background Noise Level (dB, $L_{Aeq,1hour}$)	Resultant Noise Level (dB, $L_{Aeq,1hour}$)	Change in Level (dB, L_{Aeq})
Current Hours				
Patrons Accessing Site on Foot	16	36	36	0
Patrons Accessing Site in Cars	21	36	36	0
Internal Noise Breakout	18	36	36	0
External Patron Noise	32	36	37	1
Cumulative	33	36	38	2
Extended Hours				
Patrons Accessing Site on Foot	16	36	36	0
Patrons Accessing Site in Cars	21	36	36	0
Internal Noise Breakout	18	36	36	0
External Patron Noise	32	36	37	1
Cumulative	33	36	38	2

As seen in Table 10, the change-in-level from the predicted assessment scenarios remains the same over the current hours and the extended hours. As such, this indicates that no further noise impact occurs with operations continuing into the proposed extended hours at Receptor 1.

Table 13 [redacted]Resultant Noise Levels & Change in Levels [redacted]Receptor 2

Assessment Scenario	Predicted Noise Level (dB, $L_{Aeq,1hour}$)	Worst-Case Ambient Background Noise Level (dB, $L_{Aeq,1hour}$)	Resultant Noise Level (dB, $L_{Aeq,1hour}$)	Change in Level (dB, L_{Aeq})
Current Hours				
Patrons Accessing Site on Foot	23	37	37	0
Patrons Accessing Site in Cars	25	37	37	0
Internal Noise Breakout	16	37	37	0
External Patron Noise	31	37	38	1
Cumulative	33	37	38	1
Extended Hours				
Patrons Accessing Site on Foot	23	35	35	0
Patrons Accessing Site in Cars	25	35	35	0
Internal Noise Breakout	16	35	35	0
External Patron Noise	31	35	36	1
Cumulative	33	35	37	2

As seen in Table 10, the change-in-level from the predicted assessment scenarios remains the same over the current hours and the extended hours, except for the cumulative assessment scenario.

The difference between the change-in-level for this assessment scenario equates to a difference, or further increase during the extended hours, of 1dBA.

As per the guidance set out in Table 6 (Section 5.5), a 1 dBA increase is considered as a subjectively [redacted] further increase of 1 dBA would be considered acoustically acceptable.

8. COMMENTARY ON NOISE IMPACT

The assessment results are summarised as follows:

In terms of the noise impact due to current plant installations over the extended hours, see Section 7.1 which concludes that no increased noise impact occurs due to current plant installations.

No increased noise impact occurs at Receptor 1 for any of the assessment scenarios, including the cumulative assessment scenario. This is because there is no change to the ambient background noise levels over the current hours and the extended hours (both equate to 36dB $L_{Aeq,1hour}$).

No increased noise impact occurs at Receptor 2 for the following assessment scenarios:

Patrons accessing site on foot.
Patrons accessing site in cars.
Internal noise breakout.
External patron noise.

With regards to the cumulative assessment at Receptor 2, the following change-in-levels have been predicted for the current and the extended hours:

During the current hours, the cumulative operational noise would marginally increase the lowest hourly ambient noise level by 1 dBA.

During the extended hours, the cumulative operational noise would marginally increase the lowest hourly ambient noise level by 2 dBA.

The difference between these two levels equates to an *increased noise impact* of 1 dBA.

The cause of this increased noise impact is because the ambient background noise level reduces from 37 dBA to 35 dBA which, in turn, reduces the resultant noise level from 38 dBA to 37 dBA in the cumulative operational noise assessment.

As per the guidance set out in Table 6 (Section 5.5), a 1 dBA increase is considered as a subjectively imperceptible [redacted]lo [redacted]

As mentioned in Section 7.2, the likelihood that all assessment scenarios occur simultaneously is low or minimal. As such, the actual noise impact is likely to be lesser than stated as part of our worst-case assessment.

As such, an increased noise impact of 1 dBA from the current hours to the extended hours would be considered acoustically acceptable.

9. CONCLUSION

RBA Acoustics have undertaken noise monitoring at [redacted] The measured noise levels are presented herein.

The survey results have been used to assess the noise impact from the following items of acoustic consideration over the proposed extended hours:

- Current plant installations
- Patron ingress and egress
- Noise breakout from internal areas
- External patron noise

The assessment concludes that no adverse noise impact is expected over the proposed extended hours.

As such, the scheme proposals can be considered acceptable in terms of noise.

Appendix A - Acoustic Terminology

dB	Decibel - Used as a measurement of sound pressure level. It is the logarithmic ratio of the noise being assessed to a standard reference level.
dB(A)	The human ear is more susceptible to mid-frequency noise than the high and lo frequencies. To take account of this when measuring noise, the 'A' weighting scale is used so that the measured noise corresponds roughly to the overall level of noise that is discerned by the average human. It is also possible to calculate the 'A' weighted noise level by applying certain corrections to an un-weighted spectrum. The measured or calculated 'A' weighted noise level is known as the dB(A) level. Because of being a logarithmic scale noise levels in dB(A) do not have a linear relationship to each other. For similar noises, a change in noise level of 10dB(A) represents a doubling or halving of subjective loudness. A change of 3dB(A) is just perceptible.
L_{eq}	L_{eq} is defined as a notional steady sound level which, over a stated period of time, would contain the same amount of acoustical energy as the actual, fluctuating sound measured over that period (1 hour).
L_{Aeq}	The level of notional steady sound which, over a stated period of time, would have the same A-weighted acoustic energy as the A-weighted fluctuating noise measured over that period.
L_{An} (e.g L_{A10}, L_{A90})	If a non-steady noise is to be described it is necessary to know both its level and the degree of fluctuation. The L_n indices are used for this purpose, and the term refers to the level exceeded for n% of the time, hence L_{10} is the level exceeded for 10% of the time and as such can be regarded as the 'average maximum level'. Similarly, L_{90} is the average minimum level and is often used to describe the background noise.
$L_{max,T}$	The instantaneous maximum sound pressure level which occurred during the measurement period, T. It is commonly used to measure the effect of very short duration bursts of noise, such as for example sudden bangs, shouts, car horns, emergency sirens etc. which audibly stand out from the general level of, say, traffic noise, but because of their very short duration, maybe only a very small fraction of a second, may not have any effect on the L_{eq} value.

Appendix B [redacted]nstrumentation

The following equipment was used for the measurements

Manufacturer	Model Type	Serial No.	Calibration	
			Certificate No.	Expiry Date
Norsonic Type 1 Sound Level Meter	Nor140	1406970	U44407	05 June 2025
Norsonic Pre Amplifier	1209	21205		
[redacted]	1225	271055	44406	05 June 2025
Norsonic Sound Calibrator	1251	35020	U44405	05 June 2024
Norsonic Type 1 Sound Level Meter	Nor140	1406971	U45246	31 August 2025
Norsonic Pre Amplifier	1209	21571		
[redacted]	40AF	207393	45245	31 August 2025
Norsonic Sound Calibrator	1251	35016	U45244	31 August 2025
Norsonic Type 1 Sound Level Meter	Nor140	1403226	U42991	18 January 2025
Norsonic Pre Amplifier	1209A	12066		
[redacted]	1225	168180	42990	18 January 2025
Norsonic Sound Calibrator	1251	31988	U42989	18 January 2025

Appendix C Graphs and Site Plans

Malverleys Farm & Dining

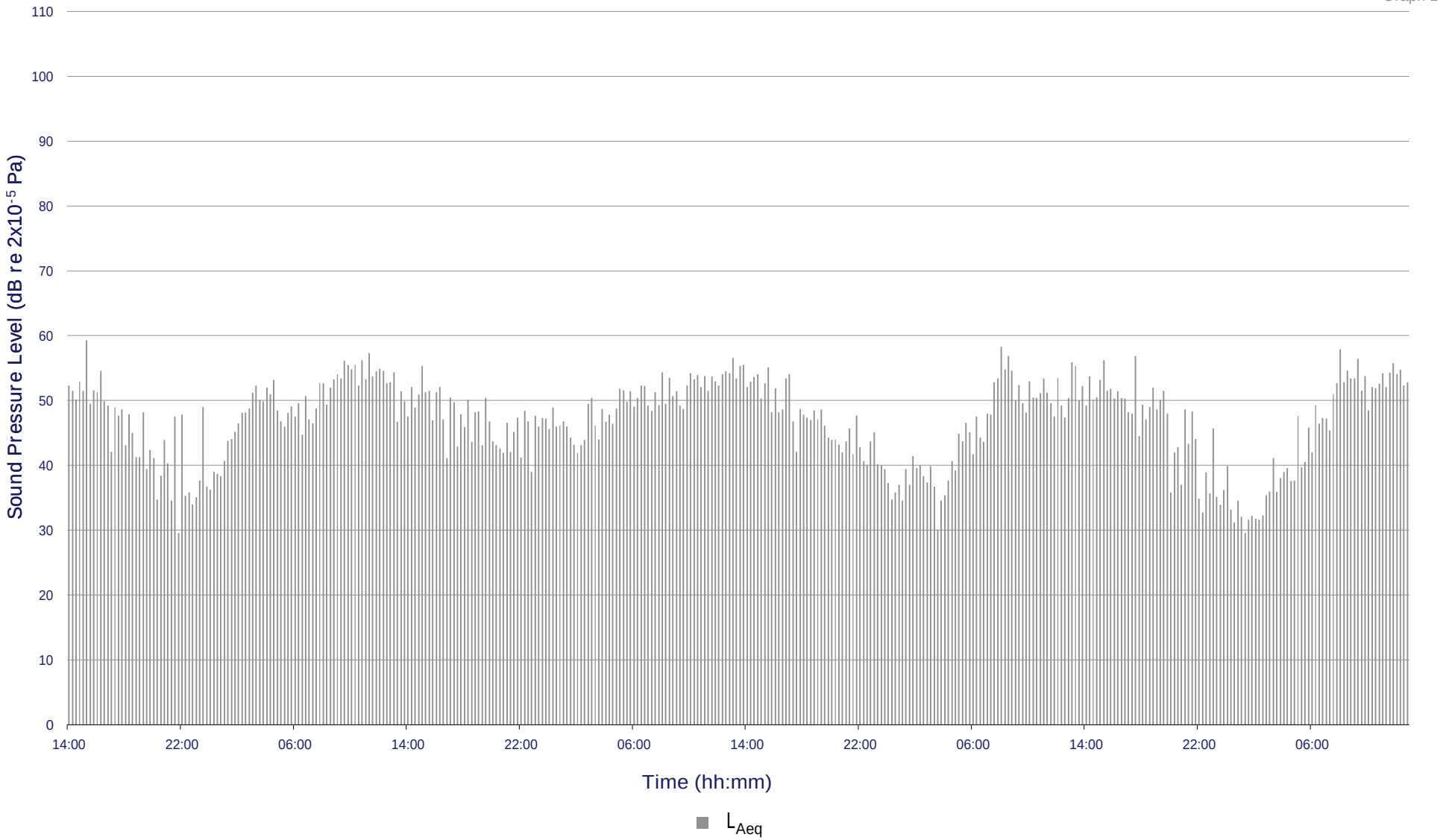
L_{Aeq} (15mins) Time History

(MP1) East End Road - Friday 17 November to Tuesday 21 November 2023

RBA ACOUSTICS

Project: 13150

Graph 1



Malverleys Farm & Dining

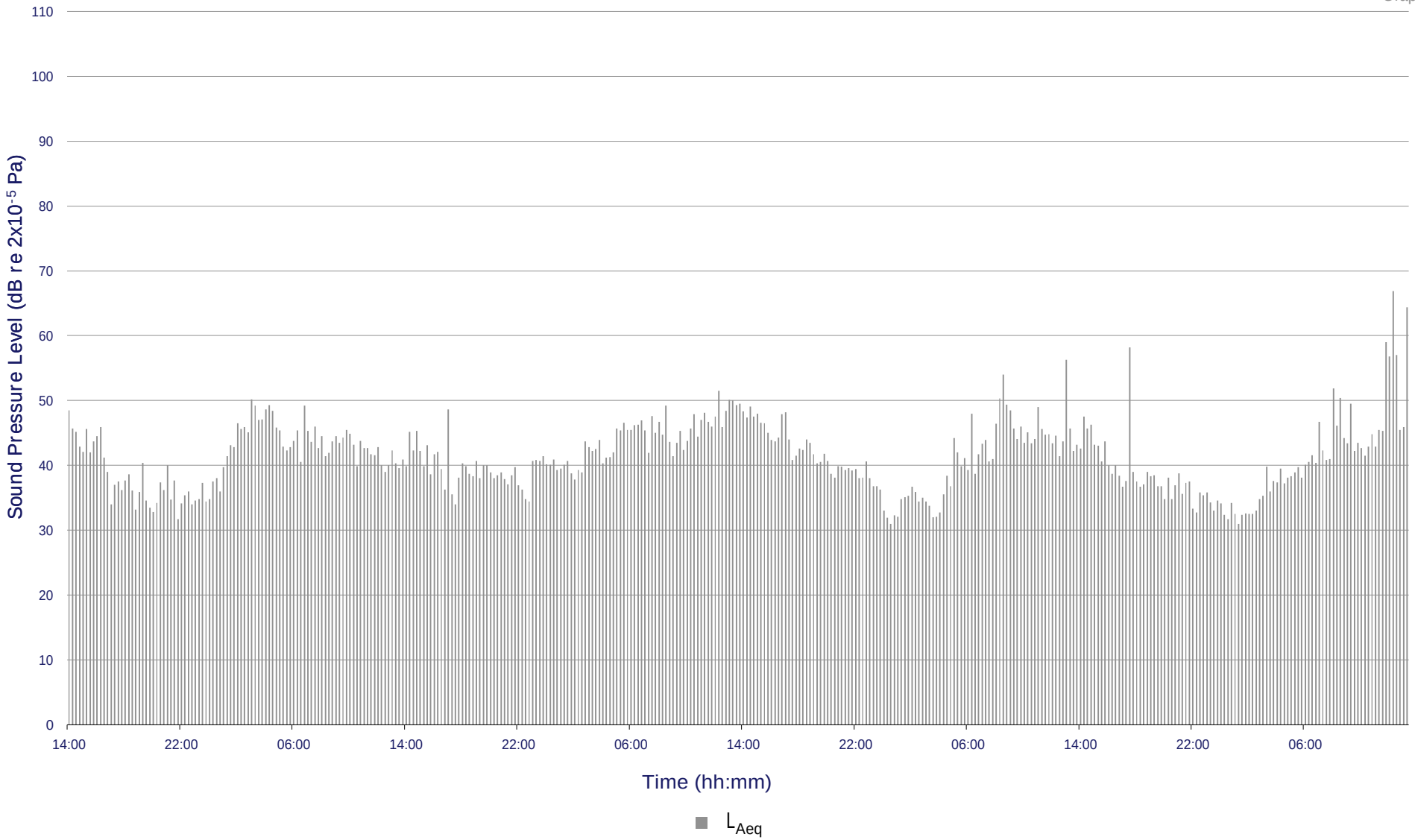
L_{Aeq} (15mins) Time History

MP2 (North of Site) - Friday 17 November to Tuesday 21 November 2023

RBA ACOUSTICS

Project: 13150

Graph 2



Malverleys Farm & Dining

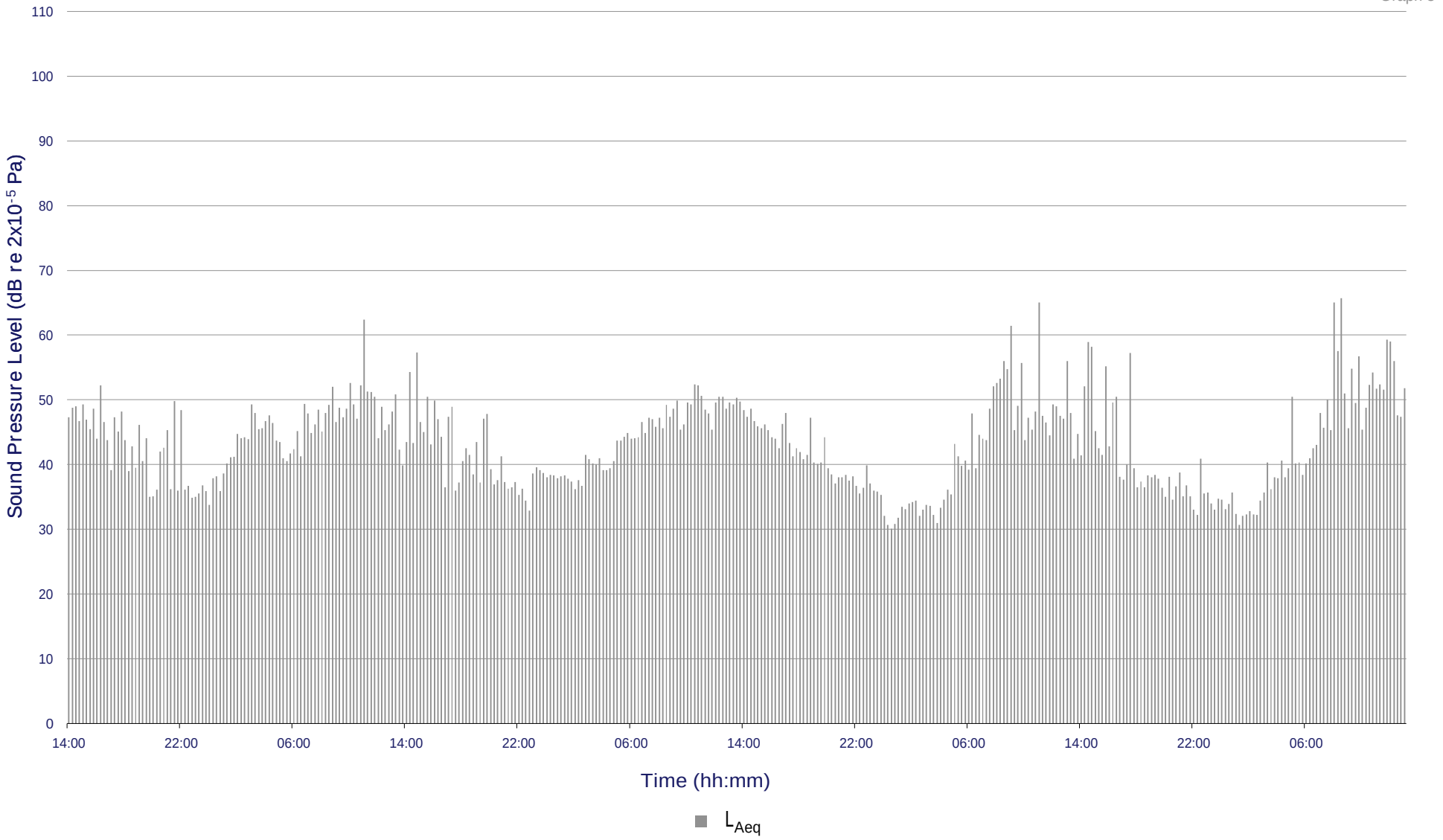
L_{Aeq} (15min) Time History

(MP3) South of Site - Friday 17 November to Tuesday 21 November 2023

RBA ACOUSTICS

Project: 13150

Graph 3



Malverleys Farm & Dining

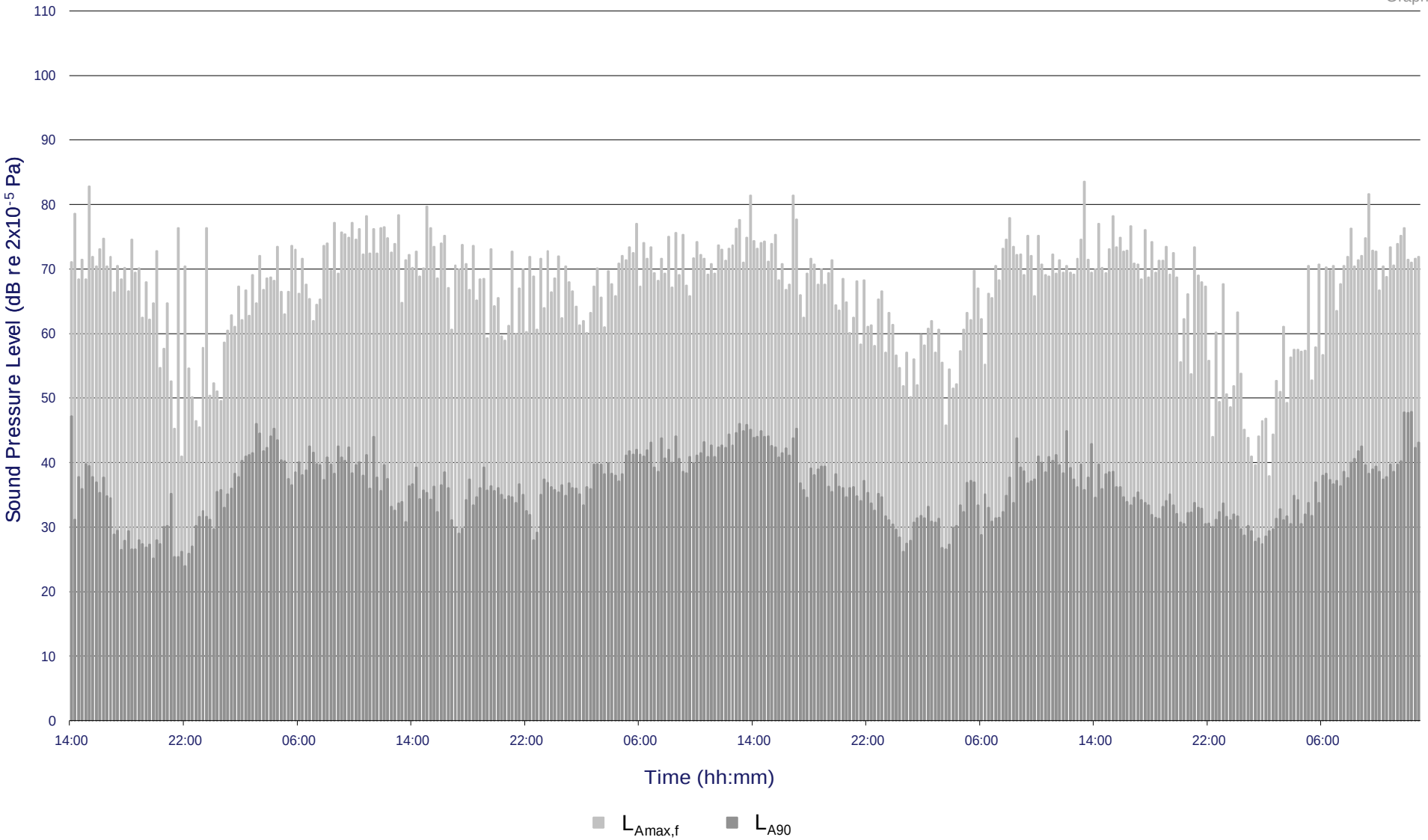
$L_{Amax,f}$ and L_{A90} (15mins) Time History

(MP1) East End Road - Friday 17 November to Tuesday 21 November 2023

RBA ACOUSTICS

Project: 13150

Graph 4



Malverleys Farm & Dining

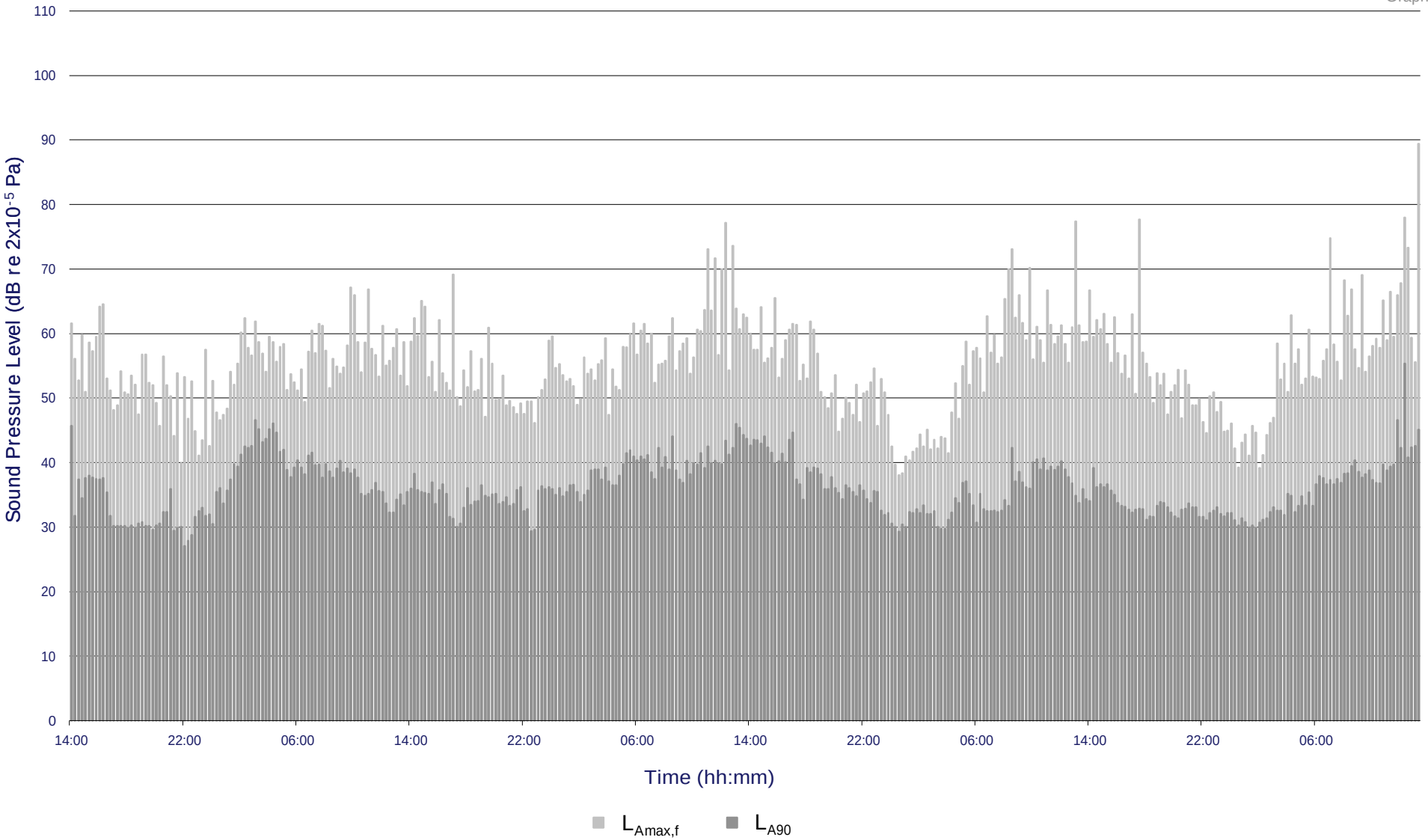
$L_{Amax,f}$ and L_{A90} (15mins) Time History

MP2 (North of Site) - Friday 17 November to Tuesday 21 November 2023

RBA ACOUSTICS

Project: 13150

Graph 5



Malverleys Farm & Dining

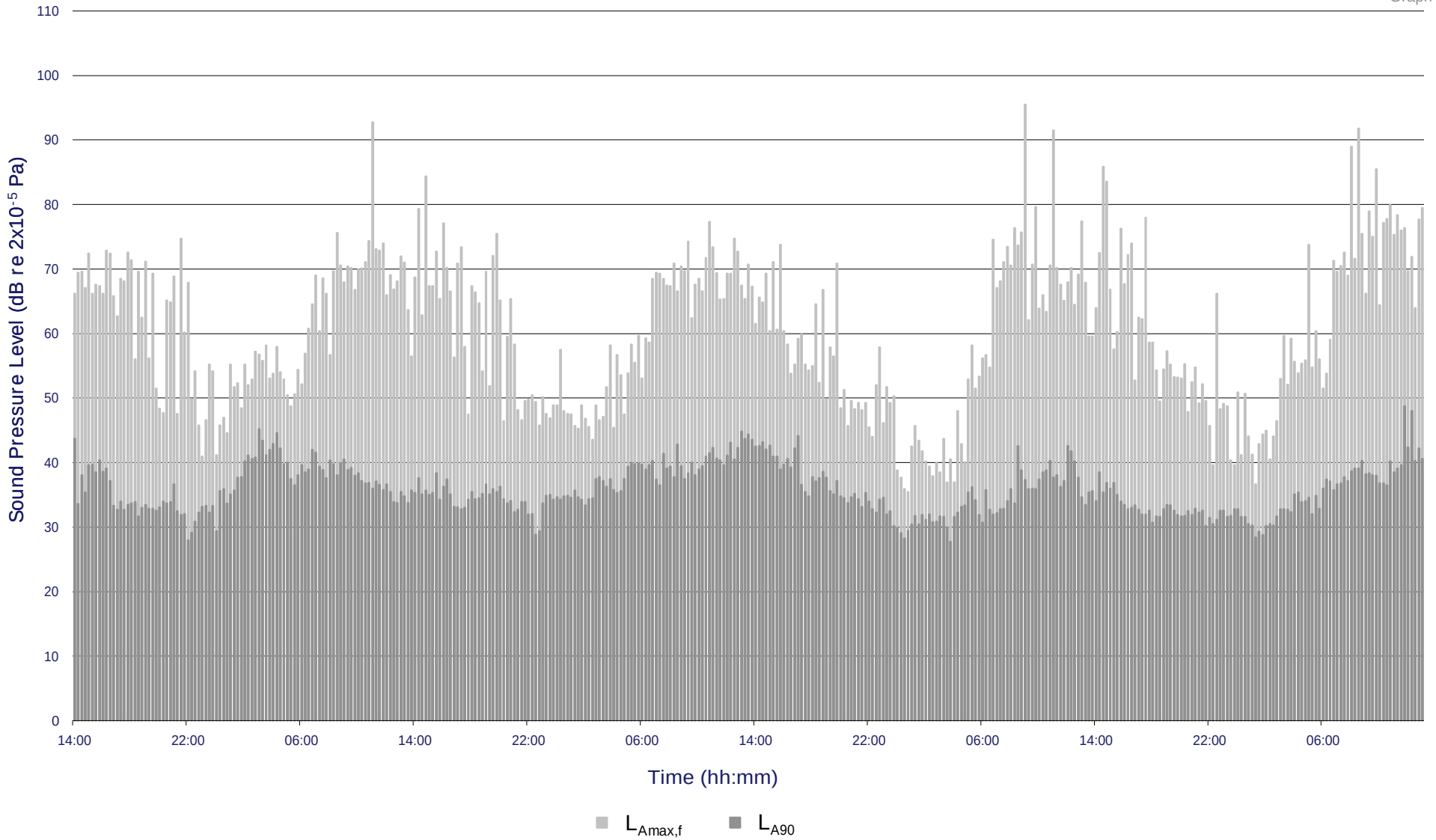
$L_{Amax,f}$ and L_{A90} (15min) Time History

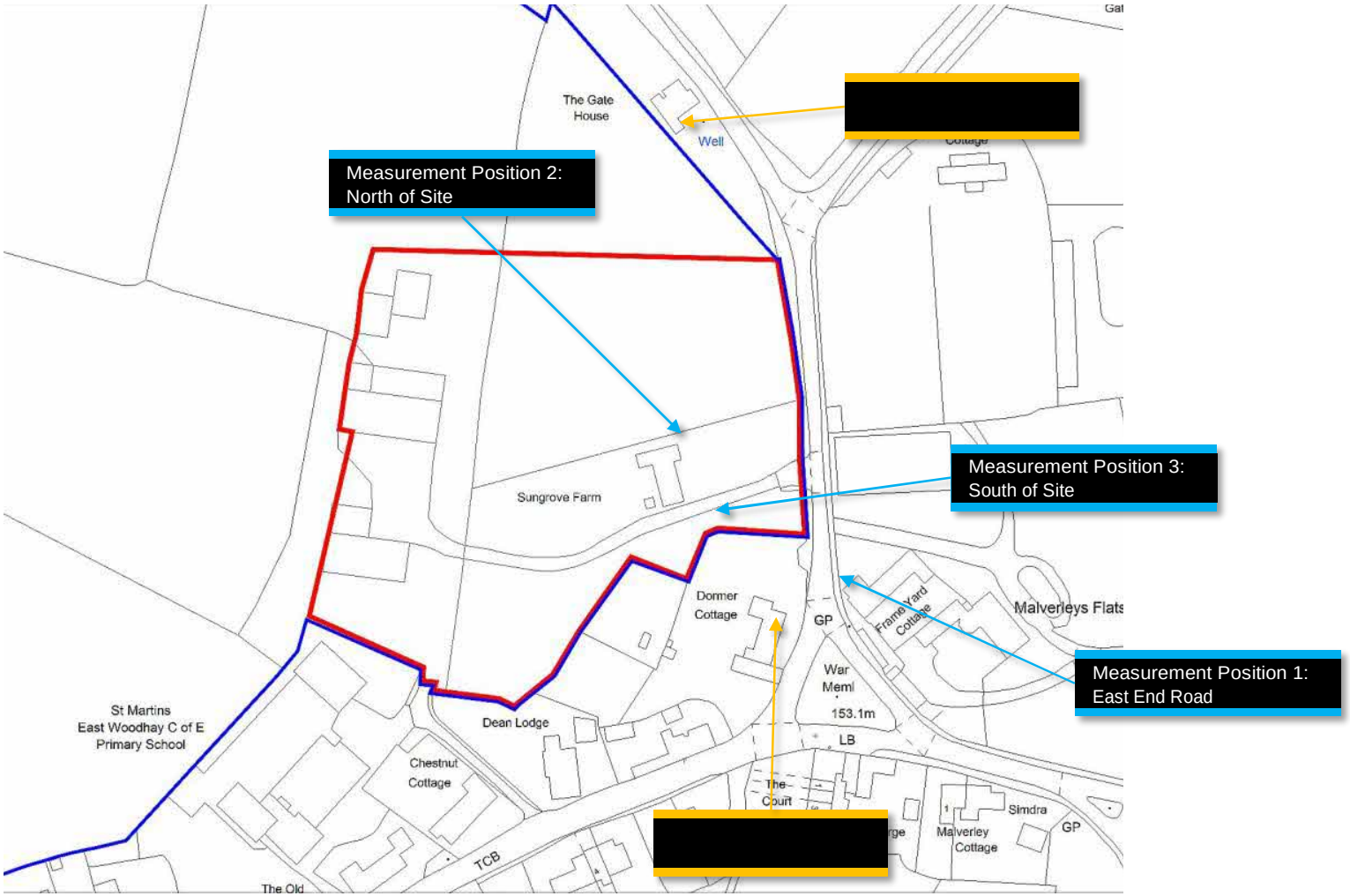
(MP3) South of Site - Friday 17 November to Tuesday 21 November 2023

RBA ACOUSTICS

Project: 13150

Graph 6





[redacted]

Location Plan
Project 13150

Figure 1
26 January 2024
Not to Scale

RBA ACOUSTICS

Photograph of Measurement Position 1
Project 13150

Figure 2
26 January 2024
Not to Scale

RBA ACOUSTICS

Photograph of Measurement Position 2
Project 13150

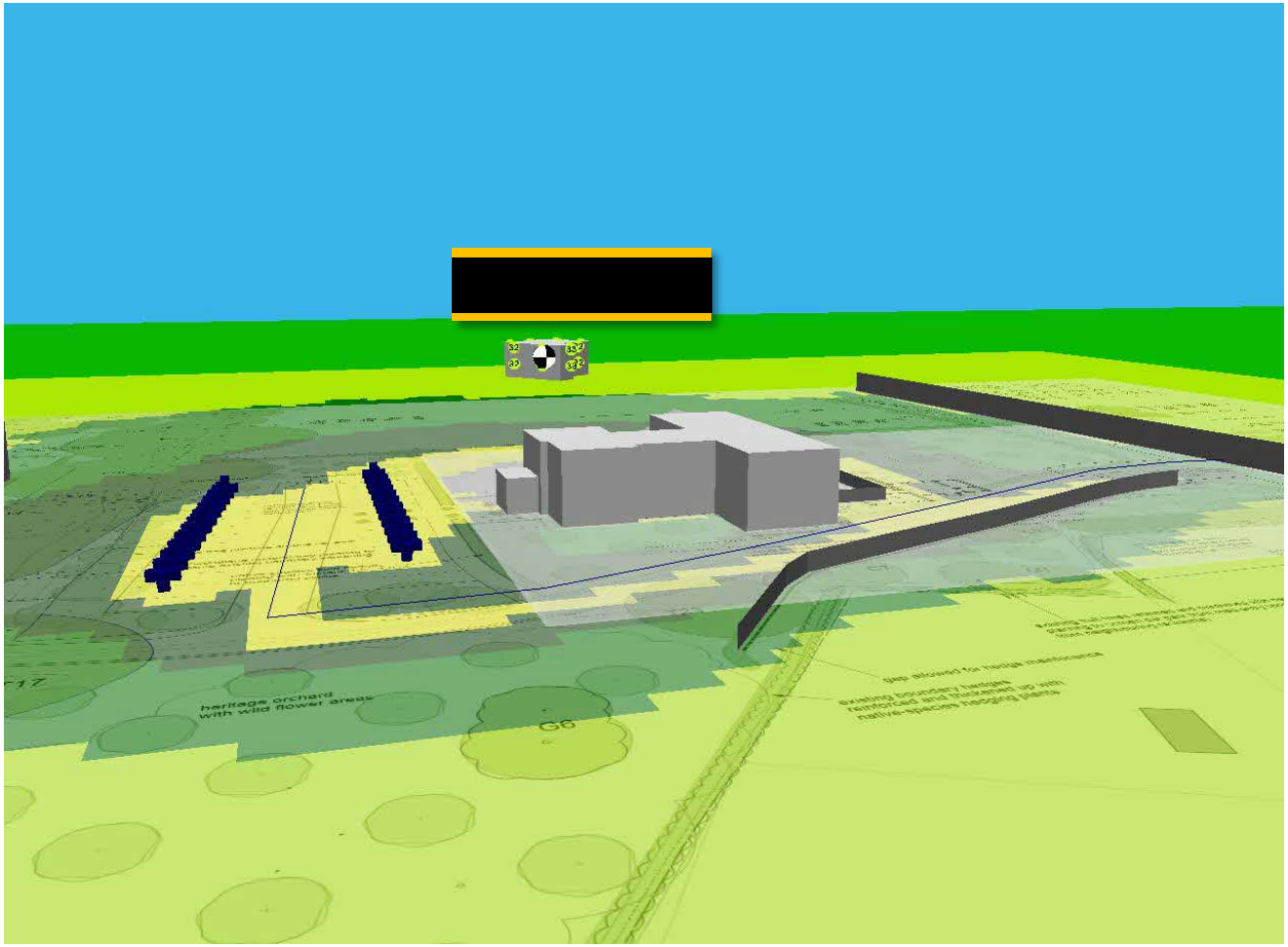
Figure 3
26 January 2024
Not to Scale

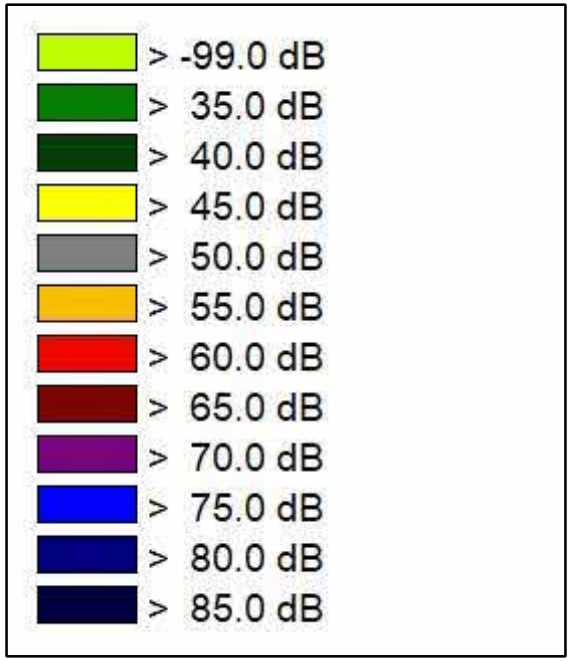
RBA ACOUSTICS

3D View of Noise Model (SW): Cumulative Noise Levels (80no. capacity)
Project 13150

Figure 5
26 January 2024
Not to Scale

RBA ACOUSTICS



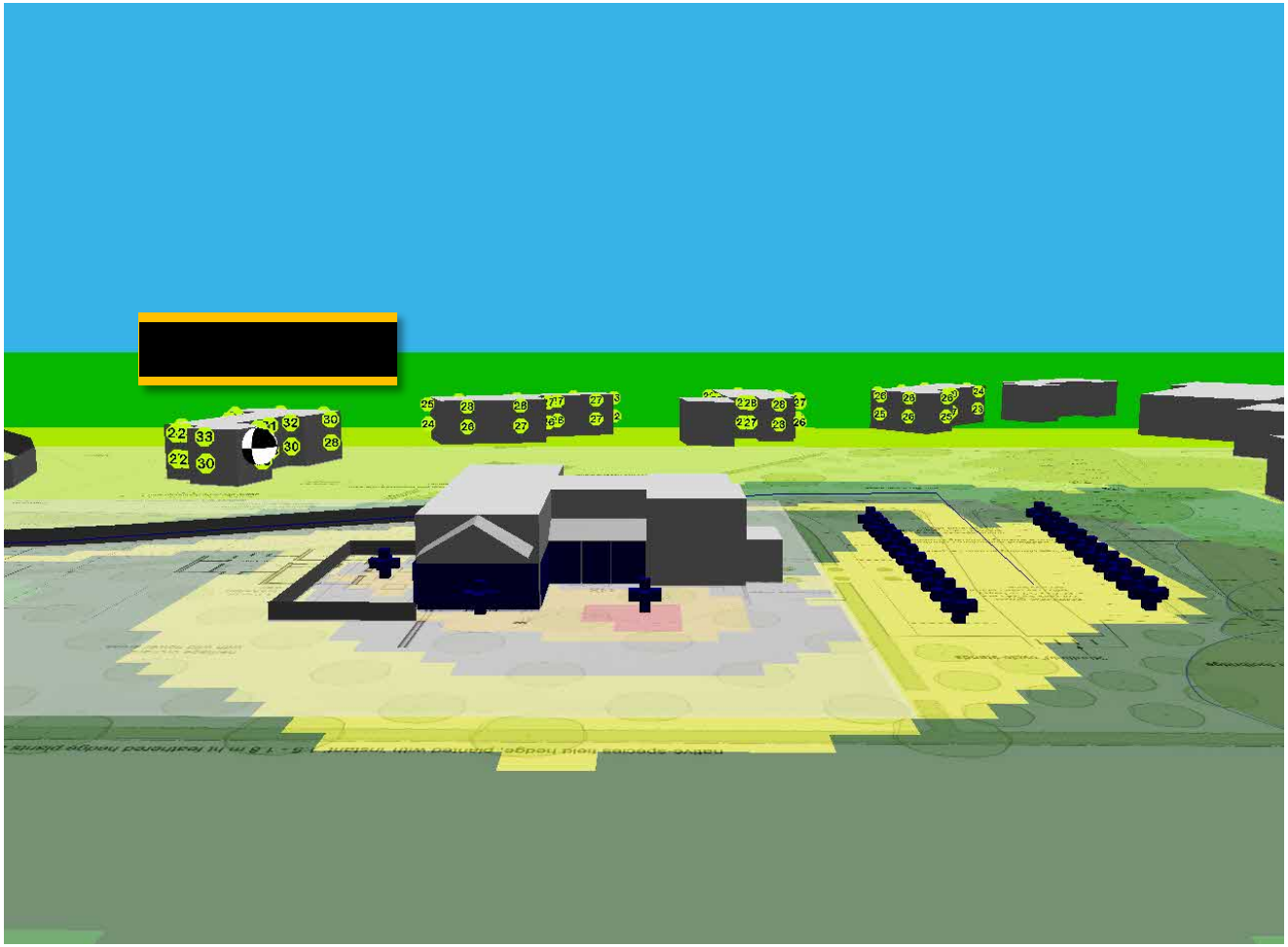


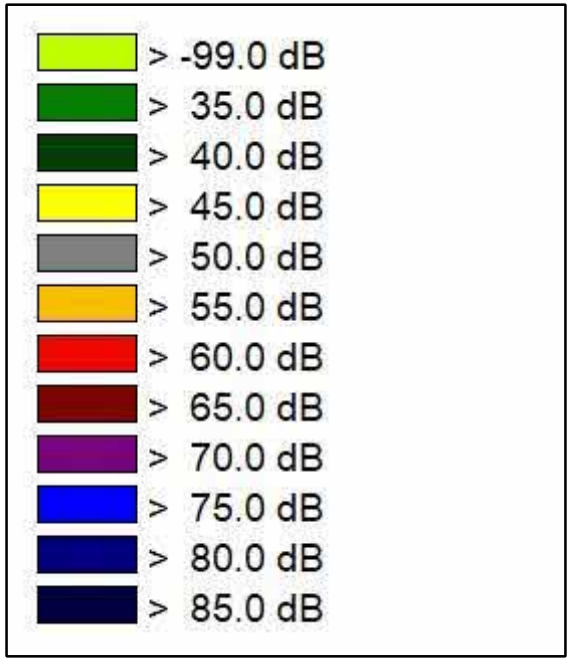
[redacted]

3D View of Noise Model: Cumulative Noise Levels at Receptor 1
Project 13150

Figure 6
26 January 2024
Not to Scale

RBA ACOUSTICS





[redacted]

3D View of Noise Model: Cumulative Noise Levels at Receptor 2
Project 13150

Figure 7
26 January 2024
Not to Scale

RBA ACOUSTICS

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