



Ellen Road Farm, Rochdale

Noise impact assessment

11830.1

9th August 2024

Revision A



Ellen Road Farm, Rochdale

Noise impact assessment

11830.1

Revision	Description	Issued by	Date
A	First issue	RL	9 th Aug 24

This report has been prepared for the sole benefit, use and information of the client for the purposes set out in the report or instructions commissioning it. The liability of Apex Acoustics Limited in respect of the information contained in the report will not extend to any third party. All concepts, data and proposals are copyright © 2024. Issued in commercial confidence.

Prepared for

YLEM Energy Limited

Edison House, Daniel Adamson Rd, Salford M50 1DT

Prepared by



Ross Latue BSc MIOA

Checked by



Nick Dobinson BSc MIOA

Apex Acoustics Limited Reg. in England no. 05656507
Design Works, William Street, Gateshead, NE10 0JP

T 0191 620 0750
E info@apexacoustics.co.uk
W www.apexacoustics.co.uk

Contents

1	Summary	3
2	Introduction.....	4
3	Planning policy and noise criteria	5
4	Existing acoustic environment	6
5	Noise sources.....	7
6	Assessment results	8
7	Conclusion	10
8	References.....	10
	Appendix A Noise exposure hierarchy.....	11
	Appendix B Residual and background sound levels.....	12
	Appendix C Noise transmission and propagation	13
	Appendix D Professional qualifications and competence	14

1 Summary

- 1.1 This report has been prepared in support of a Planning Application for a battery storage facility on a parcel of land previously occupied by Ellen Road Farm, Rochdale.
- 1.2 Background sound levels have been measured at a position considered representative of the identified noise-sensitive receptors.
- 1.3 Plant details have been provided by the client.
- 1.4 Noise emission from the proposed plant has been determined and noise propagation modelled with proprietary software CadnaA.
- 1.5 The potential noise impact is calculated and rated in accordance with BS 4142.
- 1.6 The assessment results indicate that noise from the proposed development will be at least 10 dB below the background sound level during both daytime and night time assessment periods.
- 1.7 Considering the context of the existing acoustic environment the assessment result indicates the likelihood of a low impact. This impact is considered to align with 'No Observable Effect Level' in the context of the NPPF and NPSE, and such noise should not be a constraint for the planning proposals.

2 Introduction

- 2.1 The development of a Battery Energy Storage System has been proposed on a parcel of land formerly occupied by Ellen Road Farm, Rochdale; the site location is shown in Figure 1.
- 2.2 Apex Acoustics has been commissioned to undertake a noise survey and assessment of the noise from the development in support of a Planning Application.
- 2.3 The scope of our instruction includes:
- Measurement of the existing noise environment over a 24-hour period at a location representative of the nearest noise-sensitive receptors;
 - Analysis of proposed source noise levels, using manufacturers' data provided by the client;
 - Calculate noise propagation using proprietary noise modelling software to the noise-sensitive receptor and assess the impact in accordance with BS 4142: 2014;
 - If required, advise on a scheme for noise mitigation to satisfy Local Authority requirements;
 - An assessment of road traffic / other sources is not included.
- 2.4 This report presents the evaluation of the potential noise impact from plant associated with the proposed development on the identified nearest noise-sensitive receptors (NSR), in support of a Planning Application.
- 2.5 The NSR are identified as the residential properties associated with Garside Farm to the west of the site and residential properties on Whitebeam Close to the east of the proposed site.
- 2.6 This assessment is based on the proposed plant details identified by the client.
- 2.7 The potential noise impact from the sources identified is calculated and rated according to the BS 4142 methodology, Reference 1.

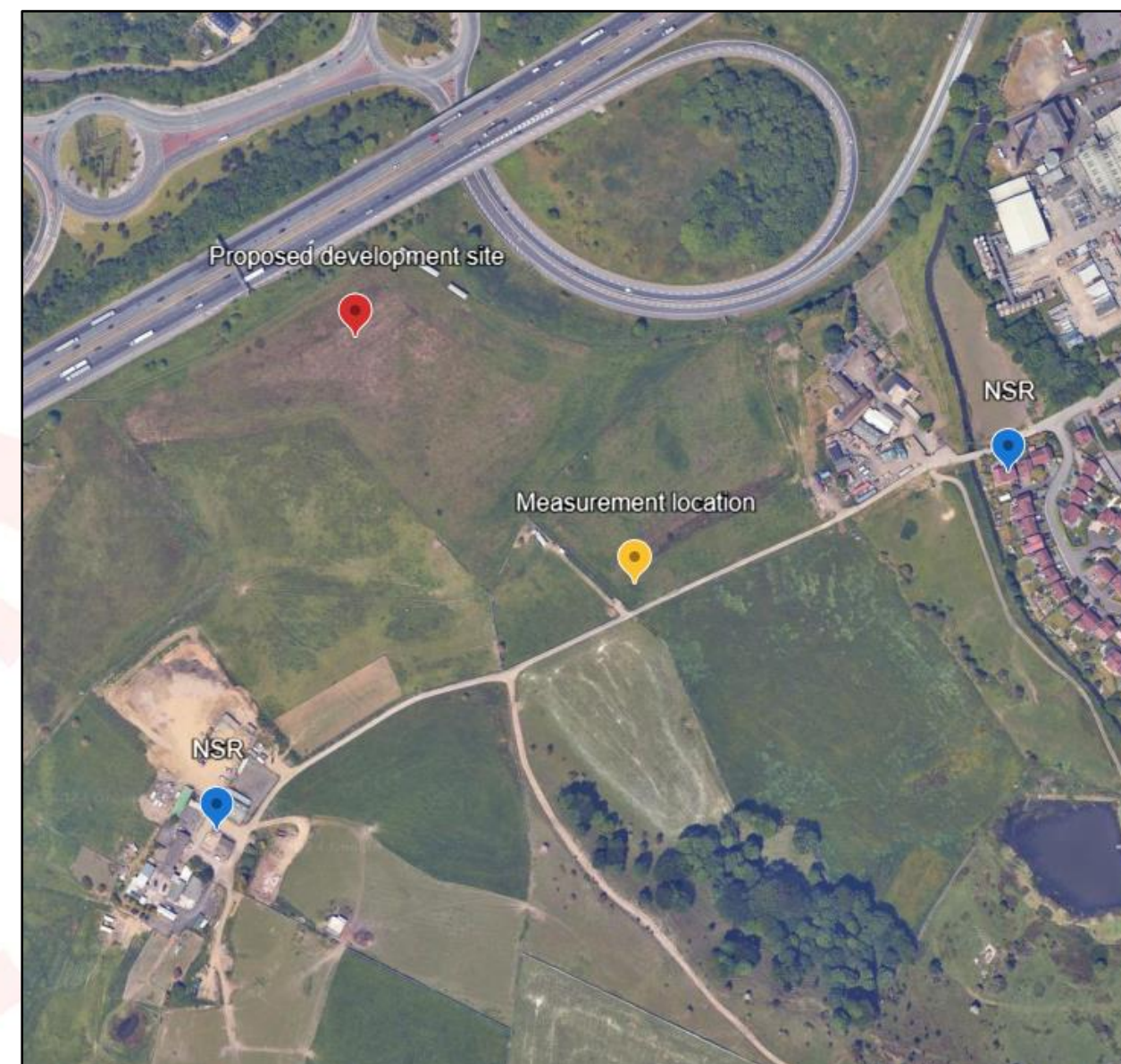


Figure 1: Proposed site, measurement position and identified NSR

3 Planning policy and noise criteria

3.1 National Planning Policy Framework (NPPF)

3.2 The National Planning Policy Framework (NPPF) Reference 2, sets out the Government's planning policies for England and how these should be applied. It provides a framework within which locally-prepared plans for housing and other development can be produced. In respect of noise, Paragraph 180, 191 and 193 of the NPPF states the following:

3.3 Paragraph 180:

"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..."

3.4 Paragraph 191:

"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 – and avoid noise giving rise to significant adverse impacts on health and the quality of life⁶⁵ [See Explanatory Note to the Noise Policy Statement for England];

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;

3.5 Paragraph 193:

"Planning policies and decisions should ensure that new development can be integrated effectively with existing businesses and community facilities (such as places of worship, pubs, music venues and sports clubs). Existing businesses and facilities should not have unreasonable restrictions placed on them as a result of development permitted after they were established. Where the operation of an existing business or community facility could have a significant adverse effect on new development (including changes of use) in its vicinity, the applicant (or 'agent of change') should be required to provide suitable mitigation before the development has been completed."

3.6 Noise Policy Statement for England (NPSE)

3.7 The Noise Policy Statement for England, Reference 3, states three policy aims as follows:

"Through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development:

- avoid significant adverse impacts on health and quality of life;
- mitigate and minimise adverse impacts on health and quality of life; and
- where possible, contribute to the improvement of health and quality of life."

3.8 The NPSE defines adverse noise impact as follows:

- No Observed Effect Level (NOEL)
This is the level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to the noise.
- Lowest Observed Adverse Effect Level (LOAEL)
This is the level above which adverse effects on health and quality of life can be detected.
- Significant Observed Adverse Effect Level (SOAEL)
This is the level above which significant adverse effects on health and quality of life occur

3.9 The first two aims of the NPSE require that no significant adverse impact should occur and that, where a noise level which falls between a level which represents the lowest observable adverse effect and a level which represents a significant observed adverse effect, then according to the explanatory notes in the statement:

"... all reasonable steps should be taken to mitigate and minimise adverse effects on health and quality of life whilst also taking into consideration the guiding principles of sustainable development. This does not mean that such effects cannot occur."

3.10 Planning Practice Guidance – Noise

3.11 Further Government guidance on how planning can manage potential noise impact in new development is outlined in Planning Practice Guidance (PPG-N) notes on the Government website: www.gov.uk/guidance/noise--2

3.12 BS 4142

3.13 The terminology used in BS 4142 to describe the various levels of potential adverse impact is respect to the PPG-N noise hierarchy, are summarised Appendix A.

4 Existing acoustic environment

- 4.1 The existing acoustic environment was measured over a 24 hour period from 11:15 hours on the 1st August 2024.
- 4.2 The measurement position is shown in Figure 1.
- 4.3 A proxy position was selected to be representative of the existing acoustic environment at the NSR, due to access restrictions. A position is chosen that is approximately equidistant to the M62 motorway, as anticipated to be the most dominant noise source at this location.
- 4.4 The microphone was located 1.5 metres above ground level and away from other reflecting surfaces such that the measurements are considered free-field.
- 4.5 Data was recorded in single-octave band frequencies at one-second intervals throughout the measurement period.
- 4.6 The most significant noise source was noted to be road traffic from the M62.
- 4.7 The equipment used is listed in Table 1.

Equipment	Model	Serial no.
Sound Level Meter	NTi XL2	A2A-14205-E0
Calibrator	Larson Davis CAL 200	15308

Table 1: Equipment used

- 4.8 Both meter and calibrator have current calibration certificates traceable to national standards. The sound level meter has been calibrated within the last two years and calibrator has been calibrated within the last year in accordance with the guidance of BS 4142; calibration certificates are available on request.
- 4.9 The equipment was field-calibrated before and after the measurements with no significant drift in sensitivity noted.
- 4.10 **Residual and background sound levels**
- 4.11 As the specific sound source under assessment is not yet operating on-site during the noise survey period, the existing acoustic environment measured during the survey period is the residual sound level L_r .
- 4.12 A time history of the measured L_r is shown in Appendix B.
- 4.13 Statistical analysis is undertaken of the results of all the $L_{A90, 15min}$ data following the guidance of BS 4142, to determine a background sound level considered to be representative of the daytime and night time assessment periods. Results of the analysis are shown in Figure 4 and Figure 5 in Appendix B.

- 4.14 Based on the statistical analysis results, the background sound level considered representative of the daytime and night time assessment periods are shown in Table 2.

Assessment period	L_{A90} (dB)
Daytime (07:00 – 23:00 hrs)	51
Night time (23:00 – 07:00 hrs)	50

Table 2: Background sound levels representative of the assessment periods

5 Noise sources

5.1 Proposed plant and associated noise levels

5.2 The mechanical plant is assessed based on plant details supplied by the mechanical engineers.

5.3 The location of the all the units have been taken from the clients drawings, Reference 4.

5.4 The proposed plant is understood to comprise of that summarised in Table 3.

Plant	Manufacturer	Model	No. proposed
Battery Cabinets	Canadian Solar	SolBank BESS	8
Inverters	Sunny Central UP	SC 4600 UP	4

Table 3: Proposed plant

5.5 Manufacturer supplied noise levels are shown in Table 4.

Plant	Data type	dB(A)
Battery Cabinet	$L_p @ 1 \text{ m}^1$	75
Inverter (unit only)	L_w	93
Inverter with noise reduction kit	$L_p @ 10 \text{ m}^2$	62

Table 4: Manufacturers noise levels

¹Data provided does not describe measurement methodology; assumed to be the measured surface averaged sound pressure level at 1 m as measured in an anechoic chamber.

²Assumed to be measured in free field conditions.

5.6 To calculate the sound power from the surface average sound pressure levels at 1 m, the following equation is used:

$$L_w = L_p + 10 \log_{10}(S)$$

Where S is the measurement surface area (m^2), at a specified distance from the unit.

5.7 If plant emitting higher noise levels than those accounted for in this report is proposed, or additional plant also proposed, the impact should be reassessed to check compliance with the Planning Condition limits.

5.8 Operation times

5.9 All plant is assumed to operate continuously during the daytime 1-hour and night-time 15-minute assessment periods; this is a prudent assumption.

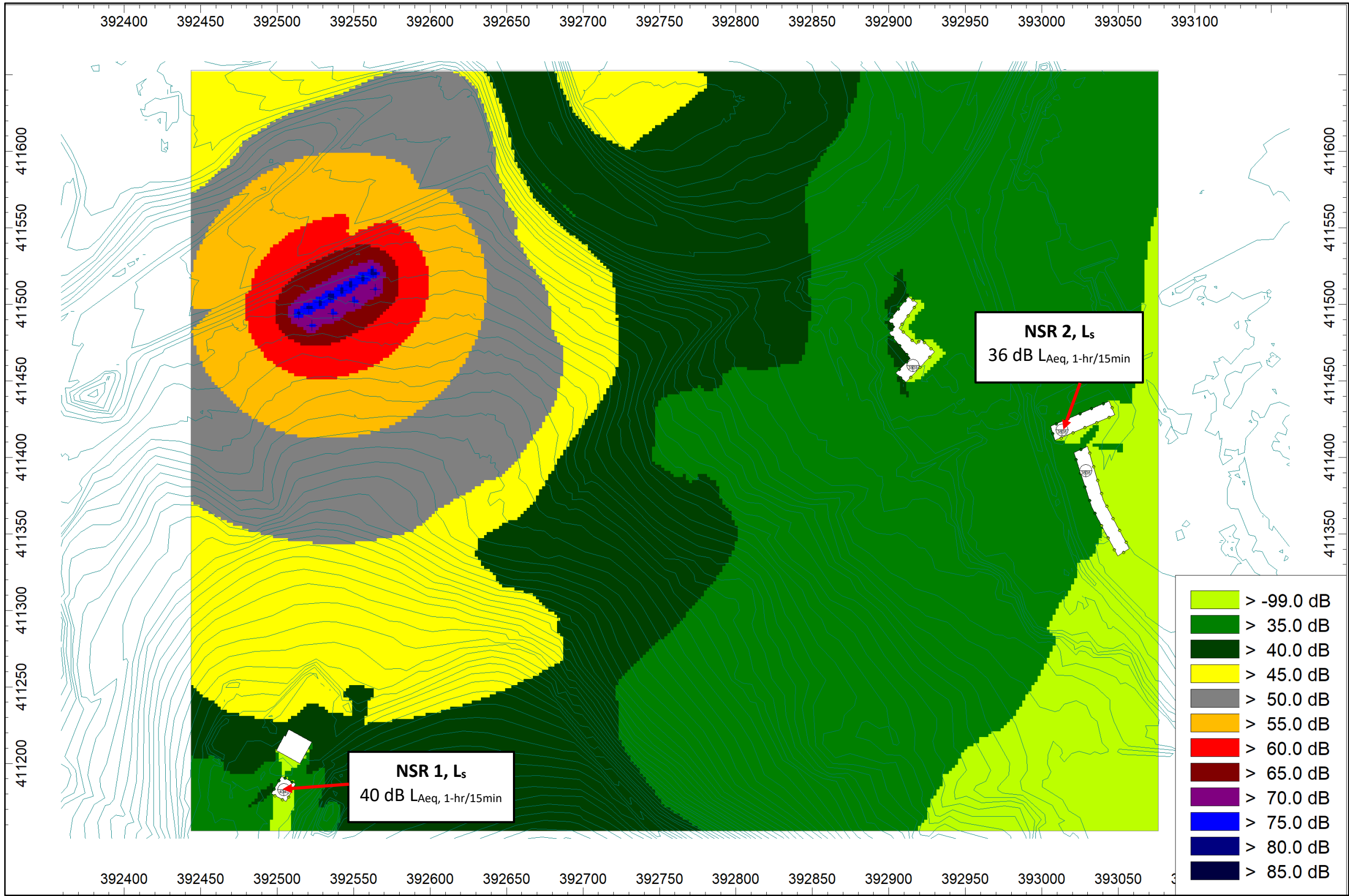
5.10 Noise transmission and propagation

5.11 Noise transmission and propagation is modelled to the NSR based on the noise source data detailed, using proprietary software, CadnaA, Reference 5.

5.12 This models noise propagation outdoors according to ISO 9613, Reference 6.

5.13 The model parameters and assumptions are summarised in Appendix C.

6 Assessment results



Parameter	Daytime assessment	Night-time assessment	Relevant clause of BS 4142	Commentary
Background sound level	51 dB $L_{A90, 15min}$	50 dB $L_{A90, 15min}$	8.1.4	Considered representative of the assessment period based on statistical analysis detailed in Appendix B.
Specific sound level L_s , due to all sources for the required assessment interval	40 dB $L_{Aeq, 1-hr}$	40 dB $L_{Aeq, 15-min}$	7.2 7.3.6	The on-time for the sources during the assessment period are discussed in Section 5.8. The calculated L_s contours across the site due to all sources during the assessment period are shown in Figure 2; the L_s assessed is the highest calculated level at NSR 1 to the west of the development site.
Acoustic feature correction	0 dB	0 dB	9.2	A subjective assessment to determine acoustic features is undertaken, and the following penalties are considered applicable. Due to the exceedance of the background sound level over the residual sound level during both daytime and night time periods, no characteristic penalties are considered to be applicable.
Rating level, $L_{Ar,Tr}$	40 dB	40 dB		
Uncertainty of assessment	-	-	10	Background data was obtained over a 24-hr period, accounting for the changing acoustic environment. Uncertainty in the calculated impact has been reduced by the use of a calculation method in accordance with ISO 9613-2.
Consideration of context	-	-	11	The residual sound levels are noted to be high from road traffic noise on the M62, potentially causing an increased noise tolerance for nearby residents. Road traffic at the receptor locations is noted to be continuous and broadband and such, is likely to provide good level of masking to any source characteristics that could be audible at the receptor location.
Excess of $L_{Ar,Tr}$ over background sound level	-11 dB	-10 dB		Considering the context, the assessment result indicates the likelihood of a low impact during both day and night time assessment periods.

Table 5: BS 4142 assessment results, based on current proposals

7 Conclusion

- 7.1 An assessment of the potential noise impacts from the proposed development site has been undertaken.
- 7.2 The assessment results indicate that noise from the proposed development will be at least 10 dB below the background sound level during both daytime and night time assessment periods.
- 7.3 Considering the context of the existing acoustic environment the assessment result indicates the likelihood of a low impact. This impact is considered to be a NOEL in alignment with the NPPF and NPSE aims.

8 References

- 1 BS 4142 2014: A1+2019, Method for rating and assessing industrial and commercial sound.
- 2 National Planning Policy Framework, Ministry of Housing, Communities & Local Government, December 2023.
- 3 Noise Policy Statement for England, Department for Environment, Food and Rural Affairs, March 2010.
- 4 YLEM Energy, Ellen Road Farm, Rochdale, 30MW BESS SITE LAYOUT, April 2024.
- 5 CadnaA environmental noise modelling software, version 2024, Datakustik GmbH.
- 6 ISO 9613:1996 Acoustics - Attenuation of sound during propagation outdoors.
- 7 ISO 12913-1:2014 Acoustics, Soundscape, Part 1: Definition and conceptual framework

Appendix A Noise exposure hierarchy

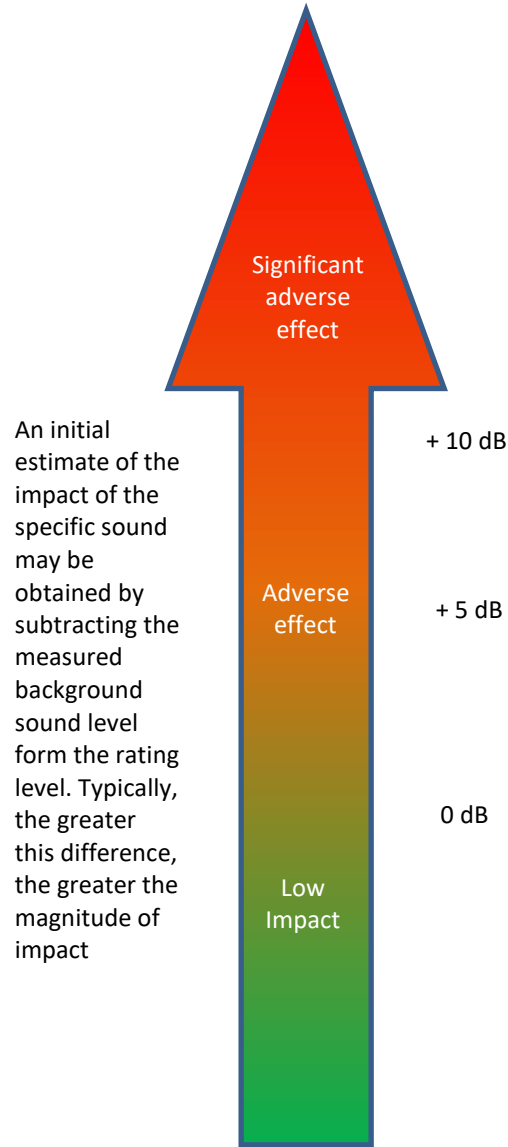
Planning Practice Guidance - Noise				 An initial estimate of the impact of the specific sound may be obtained by subtracting the measured background sound level from the rating level. Typically, the greater this difference, the greater the magnitude of impact
Noise	Example of outcomes	Increasing effect level	Action	
Present and very distributive	Extensive and regular changes in behaviour, attitude or other physiological response and/or an inability to mitigate effect of noise leading to psychological stress, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory	Unacceptable Adverse Effect	Prevent	
Present and distributive	The noise causes a material change in behaviour, attitude or other physiological response, 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	
Significant Observed Adverse Effect Level (SOAEL)				
Present and intrusive	Noise can be heard and causes small changes in behaviour, attitude or other physiological response, 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 small actual or perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum	
Lowest Observed Adverse Effect Level (LOAEL)				
Present and not intrusive	Noise can be heard, but does not cause any change in behaviour, attitude or other physiological response. Can slightly affect the acoustic character of the area but not such that there is a change in the quality of life.	No Observed Adverse Effect	No specific measures required	
No Observed Adverse Effect Level (NOAEL)				
Not present	No effect	No Observed Effect	No specific measures required	
No Observed Effect Level (NOEL)				

Table 6: PPG-N Noise Exposure Hierarchy and BS 4142 initial estimate of impact

Appendix B Residual and background sound levels

B.1 Residual sound level time history, $L_{Aeq, 5min}$

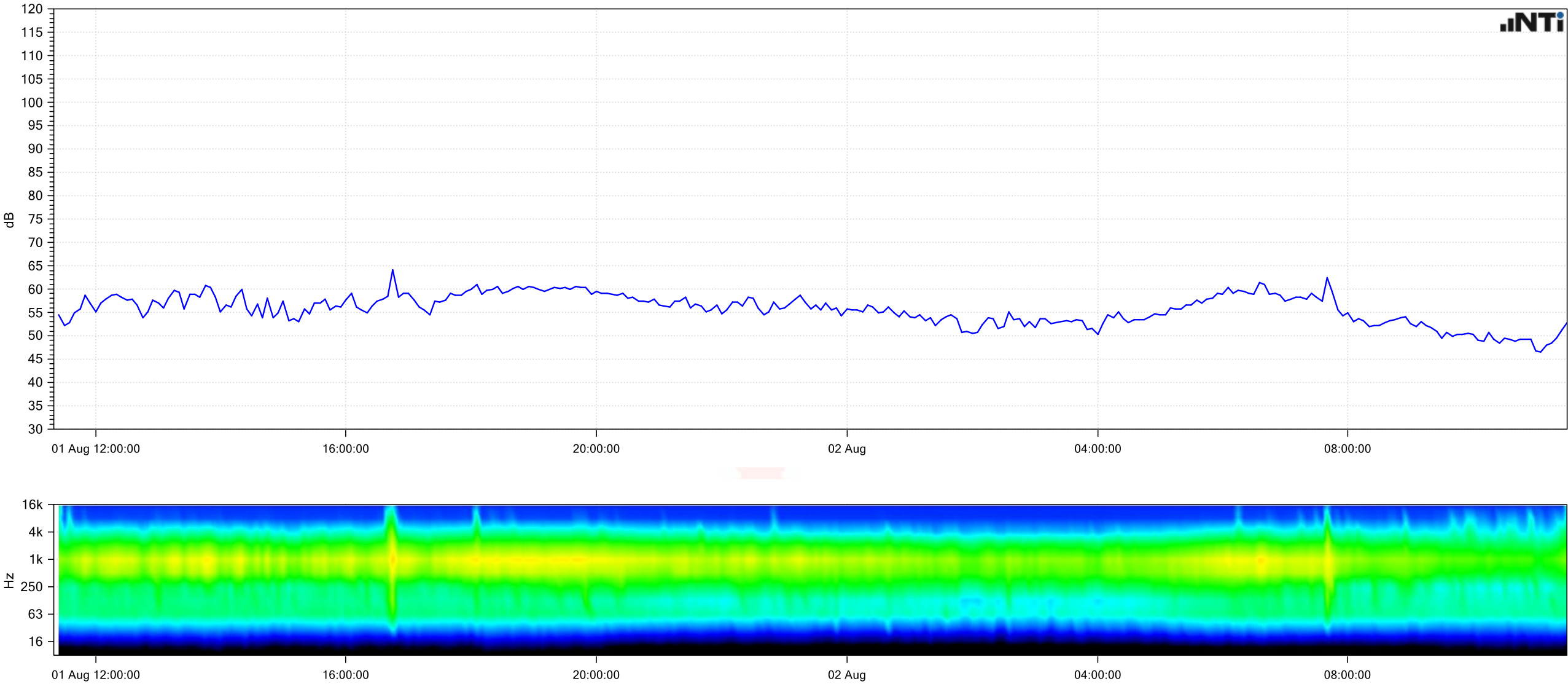


Figure 3: Residual sound level time history, dB $L_{Aeq, 5min}$

B.2 Background sound level data, L_{A90} , 15min

B.3 Analysis to determine the typical background sound level representative of the daytime and night-time period is undertaken following the guidance of BS 4142, with results shown in Figure 4 and Figure 5 respectively.

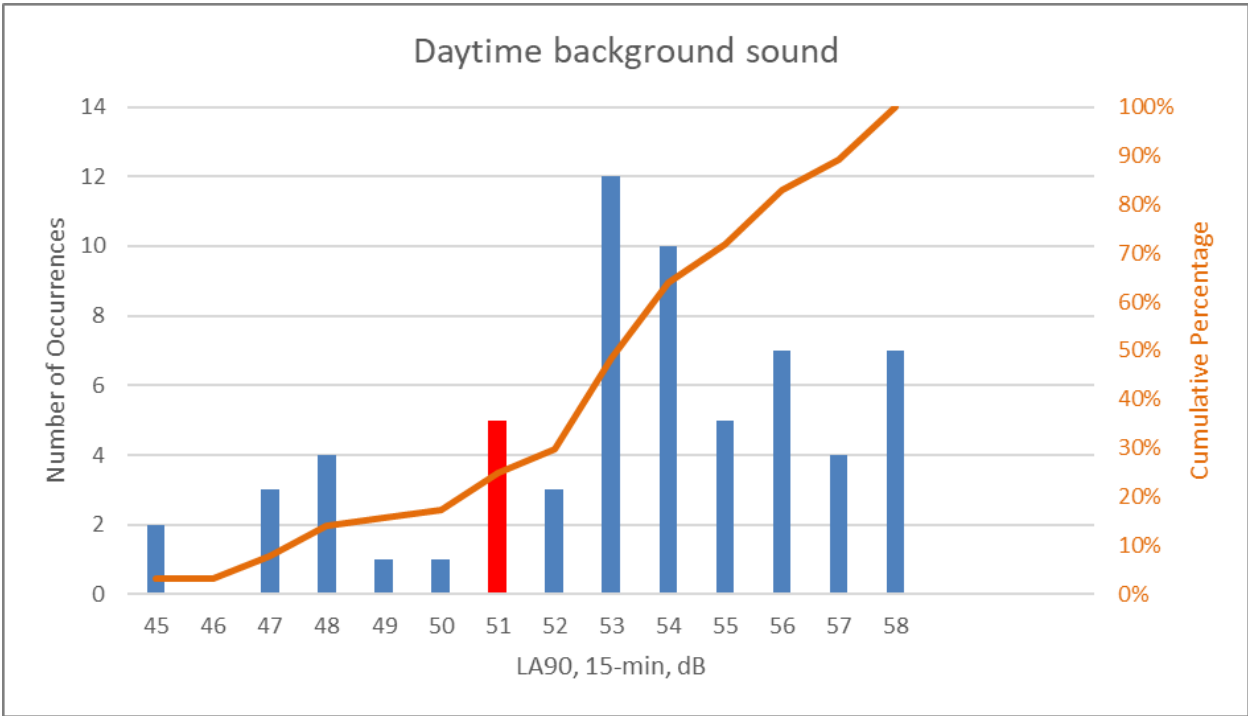


Figure 4: Analysis of daytime background levels, L_{A90} , 15min

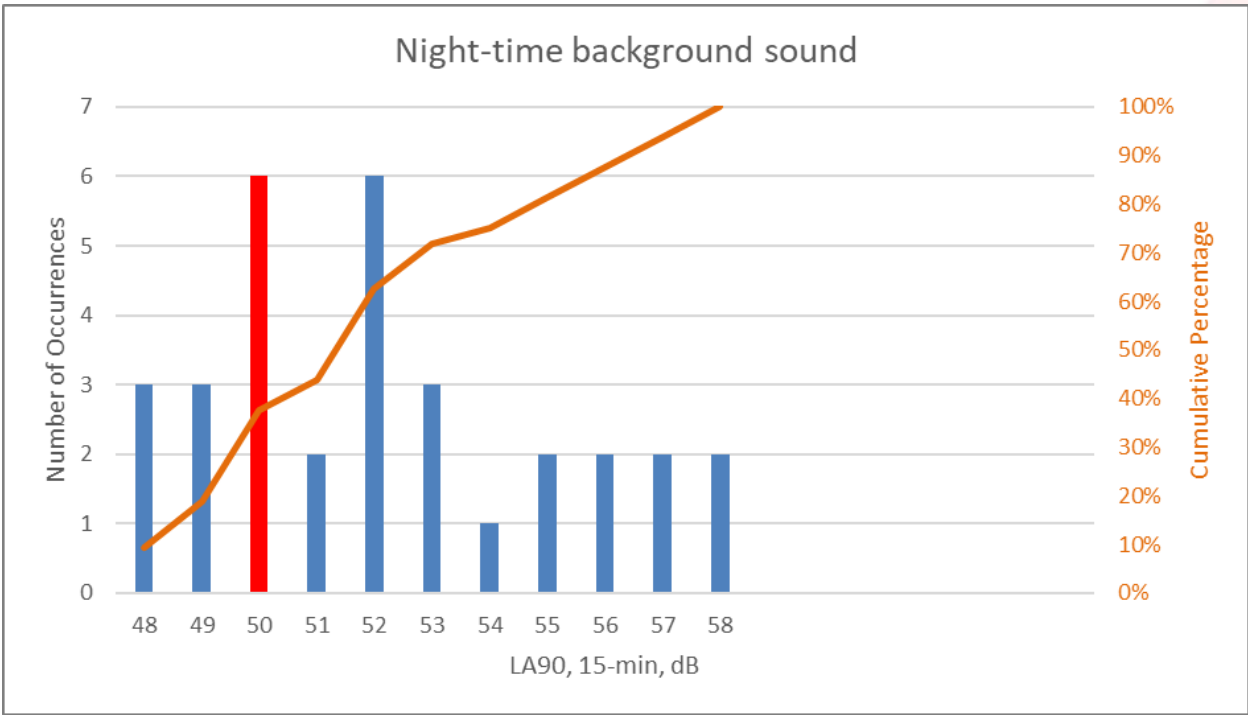


Figure 5: Analysis of night-time background levels, L_{A90} , 15min

Appendix C Noise transmission and propagation

C.1 Noise transmission and propagation is modelled using proprietary software, CadnaA. This models noise propagation outdoors according to ISO 9613. The parameters used, source of data and details are described in Table 7.

Parameter	Source	Details
Model dimensions	Google Earth	British Transverse Mercator coordinates
Site location and layout	Client drawings	Client drawings
Topography	Environment Agency height data	LIDAR Digital Terrain Model, DTM. 1m resolution.
Building heights – outside of site	Site observations and Google Street view	3 m per storey + 3 m roof (residential properties)
Receptor positions	Site observations and Google Street view	On the NSR façade closest to the source at a height of 4 m to represent first floor window height.
Building and barrier absorption coefficient	ISO 9613-2	0.21 to represent a reflection loss of 1 dB
G, Ground factor	ISO 9613-2	Hard ground, G = 0; Porous ground, G = 1 (locally on model)
Max. order of reflections	Apex Acoustics	Three

Table 7: Modelling parameters and assumptions

C.2 A plan view and a 3D perspective of the CadnaA model are shown in Figure 6 and Figure 7 respectively.



Figure 6: Plan view of the CadnaA model



Figure 7: 3D view of the CadnaA model

Appendix D Professional qualifications and competence

- D.1 All Apex Acoustics consultants work under the close supervision of a member who holds qualification in acoustics and is a member of the IOA.
- D.2 This can be verified by searching the Institute of Acoustics' list of Members, available here, with the surname of the consultant.
<http://www.ioa.org.uk/membership-check>
- D.3 Apex Acoustics is a member of the Association of Noise Consultants (ANC). The ANC is a trade organisation which seeks to raise the standards of acoustic consultancy and as such there are barriers to entry to ensure member's competency.
- D.4 This report has been completed and checked by appropriately qualified and experienced acoustic consultants.