

Noise Impact Assessment

Cleggswood Farm, Littleborough



Presented to: Ashfold Quality Meats Limited

Issued: August 2025

Lucion Contract Reference: 133840.681709

Report Details

Client	Ashfold Quality Meats Limited
Report Title	Noise Impact Assessment
Site Address	Cleggswood Farm, Littleborough
Contract Reference	133840.681709
Lucion Contact	Dan Boote (dan.boote@luciongroup.com)

Quality Assurance

Issue No.	Status	Issue Date	Comments	Author	Technical Review	Authorised
1	Final	29 th August 2025		Dan Boote Principal	Martyn Parker Principal	Martin Lucass Director

About Us

Lucion Delta-Simons is part of Lucion, a technology-led environmental services company dedicated to protecting people and the planet. With expert advice, guidance, and a comprehensive array of services, we support you at every stage of your asset lifecycle, helping you mitigate regulatory impact, improve business practices, and ensure safety and environmental protection.

As part of Lucion's group of companies, we can support you with a broader range of holistic services. Through our pool of multidisciplinary experts, we help you navigate complex regulatory frameworks, saving you time and money.

Being part of your sustainable supply chain is a key goal for our team. As a member of the UN Global Compact and a commitment to sustainability, we are the partner of choice for businesses looking to make informed decisions and mitigate risks across your portfolio.

Lucion is carbon neutral. We annually measure and report our Scope 1, Scope 2 and specified Scope 3 carbon emissions, and offset 100% of residual emissions through verified carbon credits, supporting carbon reduction and prevention projects overseas. We are taking steps to reduce our carbon emissions and have committed to setting and achieving near-term and Net Zero Science-Based carbon reduction targets in line with the goals of the Paris Agreement to limit global warming to 1.5°C above pre-industrial levels. Lucion is a signatory of Pledge to Net Zero and Members of the United Nations Global Compact.

If you would like support in understanding your carbon emissions, or those of your supply chain, please get in touch with your Lucion contact above who will be happy to help.

Executive Summary

Site and Report Context	Lucion Delta-Simons Ltd ('Lucion') was instructed by Ashfold Quality Meats Limited (the 'Client') to prepare a Noise Impact Assessment in support of a planning application for a livestock building (the 'Proposed Development') located at Cleggswood Farm, Littleborough (the 'Site'). This assessment has been undertaken to identify the key noise sources associated with the proposal and which may have the potential to impact the closest sensitive residential dwellings. Accordingly, this assessment has been completed with due regard to: • National Planning Policy Framework (NPPF); • Planning Policy Guidance (PPG); and • BS 4142:2014+A1:2019 'Methods for rating and assessing industrial and commercial sound'.
Summary	This assessment has been informed by a noise survey to quantify the existing background noise environment at the sensitive receptors. The operational assessment results have shown that the rated level of noise, falls below the typical daytime and night-time background sound levels at the closest receptors and therefore no mitigation would be required.
Recommendations	No mitigation measures are proposed based on the operation of the Proposed Development. If changes are made to the Proposed Development, this may invalidate the conclusions of this report and a new assessment may be required.
This is intended as a summary only. Further detail and limitations of the assessment are provided within the main body of the Report.	

Table of Contents

1.0 INTRODUCTION	1
1.1 Appointment.....	1
1.2 Site Location and Context.....	1
2.0 LEGISLATION AND POLICY	2
2.1 Planning Policy	2
2.2 Local Planning Policy.....	3
2.3 Guidance	4
3.0 SCOPE AND METHODOLOGY	7
3.1 Scope	7
3.2 Identification of Sensitive Receptors	7
3.3 Operational Noise	7
4.0 BASELINE SURVEY.....	9
4.1 Measurement Locations	9
4.2 Survey Equipment.....	9
4.3 Weather Conditions.....	9
4.4 Survey Summary Results	10
5.0 ASSESSMENT	11
5.1 BS4142 Assessment	11
6.0 SUMMARY AND CONCLUSIONS	12
6.1 General	12
6.2 BS4142 Assessment	12

Figures

Figure 1 – Site Location, Sensitive Receptor Locations, and Measurement Locations

Figure 2 – Measured Time History: L1

Appendices

Appendix A – Limitations

Appendix B – Glossary

Appendix C – BS 4142 Calculations

1.0 Introduction

1.1 Appointment

- 1.1.1 Lucion Delta-Simons Ltd ('Lucion') was instructed by Ashfold Quality Meats Limited (the 'Client') to prepare a Noise Impact Assessment to support an outline planning application for a livestock building (the 'Proposed Development'), located on land Cleggswood Farm, Littleborough (the 'Site').

1.2 Site Location and Context

- 1.2.1 The Site is currently an agricultural field, north of Hollingworth Lake. There are isolated residential properties to the south-west of the Site.
- 1.2.2 The soundscape around the Site is dominated by:
- Road Traffic Noise;
 - Agricultural noise; and
 - Birdsong.
- 1.2.3 Reference should be made to **Figure 1** for a map of the Site and surrounding area.
- 1.2.4 The standard limitations associated with this assessment are presented in **Appendix A**.
- 1.2.5 A glossary of terms used in this report is provided in **Appendix B**.

2.0 Legislation and Policy

2.1 Planning Policy

2.1.1 A summary of the national and local planning policy relevant to the Proposed Development is provided below.

National Planning Policy Framework and Planning Practice Guidance

2.1.2 The Government published the revised National Planning Policy Framework (NPPF, December 2024) and the Planning Practice Guidance (PPG) in July 2019¹. Together, the NPPF and PPG set out what the Government expects of local authorities. The overall aim is to ensure the planning system allows land to be used for new homes and jobs, while protecting valuable natural and historic environments.

2.1.3 The PPG adds further context to the NPPF and it is intended that the two documents should be read together.

2.1.4 Noise needs to be considered when new developments may create additional noise and when new developments would be sensitive to the prevailing acoustic environment, including cumulative effects. When preparing local or neighbourhood plans, or taking decisions about new development, there may also be opportunities to consider improvements to the acoustic environment.

2.1.5 Local planning authorities' plan-making and decision making should take account of the acoustic environment and in doing so consider:

- 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
- Whether or not a good standard of amenity can be achieved.

2.1.6 In line with the Explanatory Note of the Noise Policy Statement for England, this would include identifying whether the overall effect of the noise exposure (including the impact during the construction phase wherever applicable) is, or would be, above or below the significant observed adverse effect level and the lowest observed adverse effect level for the given situation.

2.1.7 The Observed Effect Levels are as follows:

- Significant observed adverse effect level: This is the level of noise exposure above which significant adverse effects on health and quality of life occur;
- Lowest observed adverse effect level: This is the level of noise exposure above which adverse effects on health and quality of life can be detected; and
- No observed effect level: This is the level of noise exposure below which no effect at all on health or quality of life can be detected.

2.1.8 **Table 1** summarises the noise exposure hierarchy, based on the likely average response.

Table 1 - Noise Exposure Hierarchy

Perception	Examples of Outcomes	Increasing Effect Level	Action
No Observed Adverse Effect Level			
Not Noticeable	No Effect	No Observed Effect	No specific measures required

¹ Parts of PPG were updated in February 2024; however, the Noise section was updated in July 2019.

Perception	Examples of Outcomes	Increasing Effect Level	Action
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 Effect	Avoid
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

2.2 Local Planning Policy

Rochdale Core Strategy

- 2.2.1 The Rochdale Core Strategy was adopted in October 2016 and sets out the development strategy in the borough to 2028. There are a number of policies contained within the document that are relevant to the Proposed Development and noise.

Policy G9 - Reducing the impact of pollution, contamination and land instability

- 2.2.2 This policy states:

“We will reduce all forms of pollution, contamination and land instability in the borough, by:[...]”

b. Requiring that development does not have impacts that lead to an unacceptable increase in air, water, noise, light or other pollution; [...]”

Policy DM1 - General development requirements

- 2.2.3 This policy states:

“All development proposals, including changes of use of land and buildings, extensions and alterations, will be expected to demonstrate that they: [...]

d. Mitigate against any impacts due to noise, air, dust, light and odour pollution, traffic generation or inadequate access, where such mitigation is identified as being necessary; [...]”

Policy DM2 - Delivering planning contributions and infrastructure

2.2.4 This policy states:

"1. General approach

We will require developers to:

a. Provide, or contribute towards the cost of providing, any physical and social infrastructure that is needed because of proposed development; and/or

b. Mitigate the impact of development, through planning obligations and agreements, if the development would otherwise have a negative impact on the delivery of a Strategic Objective. [...]

3. All types of development

For all types of development, including housing, we will seek contributions for any infrastructure or other measures necessary to mitigate any on site or off-site impacts from the development. These contributions may cover, dependent on need: [...]

e. Mitigation or compensation against environmental impacts e.g. noise, air quality (particularly in Air Quality Management Areas); [...]"

2.3 Guidance

BS 4142:2014+A1:2019 'Methods for rating and assessing industrial and commercial sound'

2.3.1 This Standard (hereafter referred to as 'BS 4142') describes methods for rating and assessing sound of an industrial or commercial nature which includes:

- Sound from industrial and manufacturing processes;
- Sound from fixed installations which comprise mechanical and electrical plant and equipment;
- Sound from the loading and unloading of goods and materials at industrial and / or commercial premises; and
- Sound from mobile plant and vehicles that is an intrinsic part of the overall sound emanating from processes or premises, such as that from forklift trucks, or that from train or ship movements on or around an industrial or commercial Site.

2.3.2 The procedure detailed in the Standard compares the measured or predicted noise level 'the specific noise level' from any of the above detailed noise sources with the background sound level at a residential dwelling. The measured background sound level at a receptor should be reliable and should not necessarily ascertain a lowest measured background sound level, but rather to quantify what is 'typical'.

2.3.3 The specific noise level also acknowledges the following reference time intervals depending upon whether the noise source operates during daytime or night-time periods:

- Daytime (07:00 - 23:00): 1 hour; and
- Night-time (23:00 - 07:00): 15 minutes.

- 2.3.4 There are a number of 'character corrections' which can be attributed to the specific sound level, either subjectively or objectively, depending upon the 'acoustic features' of the sound level under investigation. These character corrections vary in their weighting depending upon the severity of the acoustic feature, as follows (with regards to the subjective method):

Table 2 - BS 4142 Subjective Character Correction

Acoustic Feature	Correction (dB)	Comments
Tonality	+2	Where the tonality is just perceptible
	+4	Where the tonality is clearly perceptible
	+6	Where the tonality is highly perceptible
Impulsivity	+3	Where the impulsivity is just perceptible
	+6	Where the impulsivity is clearly perceptible
	+9	Where the impulsivity is highly perceptible
Intermittency	+3	Where the intermittency is readily distinctive against the acoustic environment
Other sound characteristics	+3	Where a sound exhibits characteristics that are neither tonal nor impulsive, though is readily distinctive against the acoustic environment at the receptor

- 2.3.5 Where the assessment is carried out using the objective method, the tonality character correction is either 0dB or 6dB and the impulsivity character correction can range from 0dB up to 9dB in increments of 1dB, depending on the level of impulsivity identified.
- 2.3.6 BS 4142 goes on to state that the rating level is equal to the specific sound level if there are no such features present or expected to be present.
- 2.3.7 Assessment of the rating level relative to the background noise level can yield the following commentary:
- Typically, the greater this difference (between the rating level and the background sound level), the greater the magnitude of impact;
 - A difference of around +10dB or more is likely to be an indication of a significant adverse impact, depending on the context;
 - A difference of around +5dB is likely to be an indication of an adverse impact, depending on the context; and
 - The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact.
- 2.3.8 Whilst the Standard does make various references to it not being intended to assess noise impacts at indoor locations, Section 1.1 of the Standard does state:
- 'The methods described in this British Standard use outdoor sound levels to assess the likely effects of sound on people who might be inside or outside a dwelling or premises used for residential purposes upon which sound is incident'.*
- 2.3.9 Example 6 in the Standard states:
- 'In addition to the rating/background sound level comparison shown in Table A.6, the primary concern is the potential for disturbance of residents who could be sleeping with open bedroom windows. Other guidance, such as BS 8233, might also be applicable in this instance'.*

2.3.10 Furthermore, Example 8, which considers night-time commercial noise impacts at a dwelling, states:

'BS 8233 indicates that 40 dBA sound level from the plant, equating to an internal level of around 30 dBA or possibly lower, but with some acoustically distinguishing characteristics, may not be suitable for a bedroom.'

2.3.11 With the above in mind, and for a clear need to ensure that any potential commercial or industrial noise impacts do not give rise to sleep disturbance in bedrooms, this assessment will ensure that the predicted rating level (specific sound level including any character corrections) does not exceed 30dB in bedrooms.

3.0 Scope and Methodology

3.1 Scope

3.1.1 The scope of the assessment has been determined in the following way:

- Analysis of the Site and the surrounding area was completed using available aerial photography in order to identify the location of the closest existing noise sensitive receptors to the Site;
- A Baseline Noise Survey has been undertaken to establish the existing background sound environment at the closest Noise Sensitive Receptors (NSRs); and
- Measured sound levels have informed an assessment in line with BS 4142:2014+A1:2019 whereby the rated level of noise is compared against the background sound level at the closest noise sensitive receptor to the Site.

3.2 Identification of Sensitive Receptors

3.2.1 Using online mapping services, the following sensitive receptors have been identified and subsequently assessed. The table below also states the time periods where each receptor is sensitive to noise.

3.2.2 The location of these receptors is shown in **Figure 1**.

Table 3 - Sensitivity of Receptors

ID	Receptor	Direction and Distance from Site	Sensitive Time Period
R1	Residential dwellings	South-west, 100m	Daytime and Night-time

3.3 Operational Noise

3.3.1 An assessment of operational sound impacts has been undertaken using guidance and methodologies set out in BS 4142. This methodology compares the rated sound level of the operations against the existing background sound levels to determine the magnitude of impact.

3.3.2 **Table 4** below sets out the assessment criteria for the operational phase.

Table 4 - Operational Assessment Magnitude of Impact

Magnitude of Impact	Difference between rating level and background sound levels, dB
High	≥+10
Medium	≥+5 and <+10
Low	≥+1 and <+5
Very Low	<10 below background sound levels and <+1
Negligible	≥10 below background sound levels

3.3.3 This assessment considers an $L_{Aeq,1hr}$ reference time for the daytime period and for the night period considers $L_{Aeq,15min}$ reference time, assuming continuous operation.

3.3.4 In order to assess the noise levels associated with the proposed development at the closest receptors, spreadsheet calculations have been undertaken.

- 3.3.5 To determine the impact of noise levels that could be produced from the proposed operations of the Site, the assessment has been undertaken using methods from BS 4142: 2014+A1:2019. The noise levels of the operational processes are assessed against the background noise level at the identified receptors.

4.0 Baseline Survey

4.1 Measurement Locations

4.1.1 Measurements were undertaken at the following location.

Table 5 - Measurement Locations

Measurement Location	British National Grid Coordinates		Date and Time	Observations
	X	Y		
L1	393923	415490	15:00 15 th August 2025 to 12:30 18 th August 2025	Distant road traffic audible. Agricultural sounds audible. Birdsong.

4.1.2 The measurement location is shown in **Figure 1**.

4.2 Survey Equipment

4.2.1 The following noise monitoring equipment was used throughout the survey. Measurements were taken in general accordance with BS 7445-1:2003 'The Description and Measurement of Environmental Noise: Guide to quantities and procedures.

Table 6 – Noise Measurement Equipment

Measurement Location	Equipment	Model Type	Serial Number	Date of Last Laboratory Calibration before Survey
L1	Sound Level Meter	01dB Fusion	14431	04 December 2024
	Pre-amplifier	01dB PRE22	2135148	
	Microphone	GRAS 40CD	556112	
	Calibrator	01dB CAL-31	93438	04 December 2024

4.2.2 The measurement equipment was checked against the appropriate calibrator at the beginning and end of the measurements, in accordance with recommended practice. Calibration certificates for which are available on request.

4.3 Weather Conditions

4.3.1 Weather conditions during the survey were generally considered suitable to obtain representative baseline noise indices. Periods of high wind speeds (as noted on **Figure 2**) have been excluded from the dataset before analysis.

4.4 Survey Summary Results

4.4.1 The L_{Aeq} levels presented in the tables below are the logarithmic average of each measurement period. The L_{A90} and L_{A10} are the arithmetic average for each measurement period. The modal average $L_{A90,1h}$ and $L_{A90,15min}$ have also been calculated for the daytime and night-time periods respectively.

4.4.2 A graphical representation of the survey data is shown in **Figure 2**.

Table 7 – Survey Summary Results

Measurement Location	Period	Measured Levels, dB				
		$L_{Aeq,T}$	$L_{Amax,T}$	$L_{A10,T}$	$L_{A90,T}$	Modal $L_{A90,T}$
L1	Daytime	41.4	80.2	42.6	38.2	40
	Night-time	40.2	72.9	43.0	37.4	39

5.0 Assessment

5.1 BS4142 Assessment

5.1.1 To provide a worst-case assessment the closest receptors to the Site are chosen, as identified in **Table 3** Error! Reference source not found..

5.1.2 **Table 8** allocates character corrections to the specific noise sources.

Table 8 - Operational Noise - Allocation of Character Corrections

Noise Source	Tonality Penalty dB	Impulsivity Penalty dB	Intermittency Penalty dB	Other sound characteristics Penalty dB
Site Operations	+4	0	+3	0
Total Overall Penalty	+7			

5.1.3 As the noise from cattle would be both tonal and intermittent, corrections of +4dB for tonality and +3dB for intermittency have been applied to the calculated specific noise levels.

5.1.4 **Table 9** completes the BS 4142 Assessment for both the daytime and night-time periods. Supporting calculations are included in **Appendix C**.

Table 9 - BS 4142 Assessment: Operational Site Noise

Receptor	Period	Specific Noise Level at Receptor, L _{Aeq,T} (dB)	Total Acoustic Character Correction (dB)	Calculated Rating Level (dB)	Measured Modal Background Sound Level, L _{A90,T} (dB)	Difference +/- (dB)
R1	Daytime	26	+7	33	40	-7
	Night-time	13	+7	20	39	-19

5.1.5 The assessment indicates that, during daytime and night-time periods, the rated level of sound will be below the existing background sound level at sensitive receptors, and no mitigation measures would be required.

6.0 Summary and Conclusions

6.1 General

- 6.1.1 Lucion Delta-Simons Ltd ('Lucion') was instructed by Ashfold Quality Meats Limited to prepare a Noise Impact Assessment to support an outline planning application for a livestock building, located on land Cleggswood Farm, Littleborough.
- 6.1.2 This assessment has been undertaken to identify the key noise sources associated with the proposal and which may have the potential to impact upon the closest sensitive residential dwellings. Accordingly, this assessment has been completed with due regard:
- National Planning Policy Framework (NPPF);
 - Planning Policy Guidance (PPG)
 - BS 4142:2014+A1:2019 'Methods for rating and assessing industrial and commercial sound'; and
 - BS 8233:2014 'Guidance on sound insulation and noise reduction for buildings'.
- 6.1.3 This assessment has been informed by a noise survey to quantify the existing background noise environment at the sensitive receptors.

6.2 BS4142 Assessment

- 6.2.1 The operational assessment results have shown that the rated level of noise, falls below the typical daytime and night-time background sound levels at the closest receptors and therefore no mitigation would be required.

Figure 1 – Site Location, Sensitive Receptor Locations, and Measurement Locations

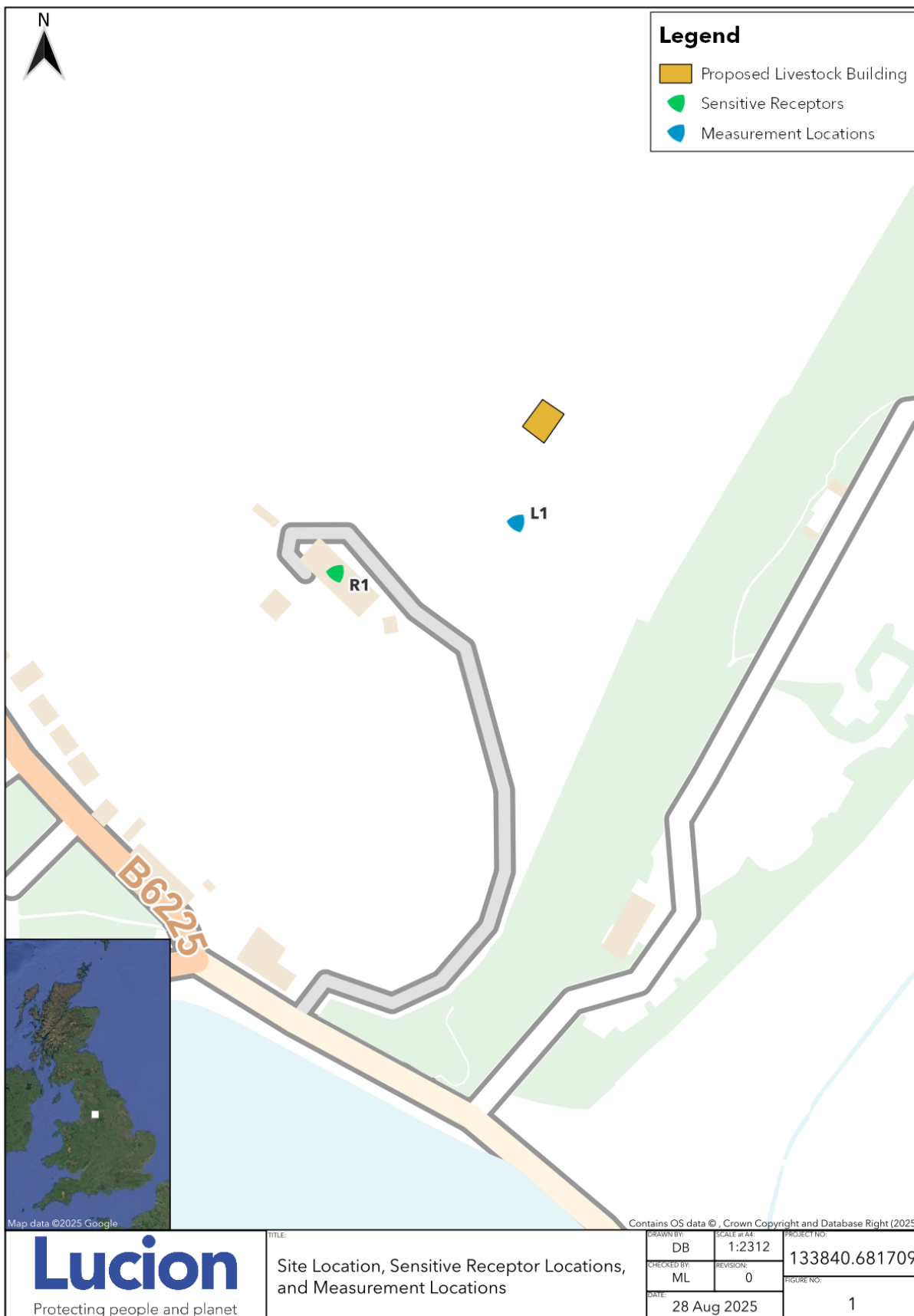
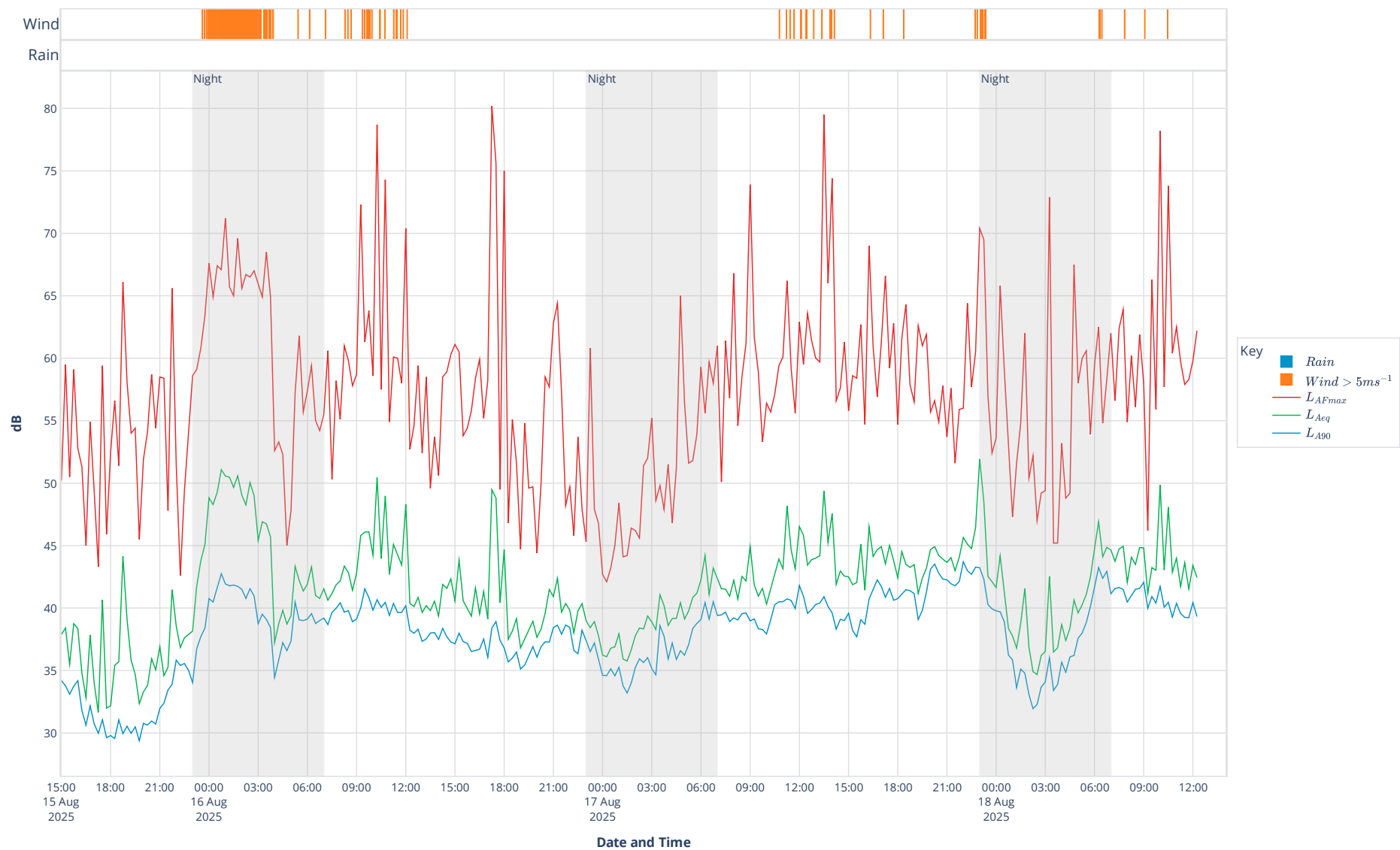


Figure 2 – Measured Time History: L1



Appendix A – Limitations

Limitations

The recommendations contained in this Report represent Lucion's professional opinions, based upon the information listed in the Report, exercising the duty of care required of an experienced Environmental Consultant. Lucion does not warrant or guarantee that the Site is free of hazardous or potentially hazardous materials or conditions.

Lucion obtained, reviewed and evaluated information in preparing this Report from the Client and others. Lucion's conclusions, opinions and recommendations has been determined using this information. Lucion does not warrant the accuracy of the information provided to it and will not be responsible for any opinions which Lucion has expressed, or conclusions which it has reached in reliance upon information which is subsequently proven to be inaccurate.

This Report was prepared by Lucion for the sole and exclusive use of the Client and for the specific purpose for which Lucion was instructed. Nothing contained in this Report shall be construed to give any rights or benefits to anyone other than the Client and Lucion, and all duties and responsibilities undertaken are for the sole and exclusive benefit of the Client and not for the benefit of any other party. In particular, Lucion does not intend, without its written consent, for this Report to be disseminated to anyone other than the Client or to be used or relied upon by anyone other than the Client. Use of the Report by any other person is unauthorised and such use is at the sole risk of the user. Anyone using or relying upon this Report, other than the Client, agrees by virtue of its use to indemnify and hold harmless Lucion from and against all claims, losses and damages (of whatsoever nature and howsoever or whensoever arising), arising out of or resulting from the performance of the work by the Consultant.

Appendix B – Glossary

Glossary

Noise is defined as unwanted sound. Human ears are able to respond to sound in the frequency range 20 Hz (deep bass) to 20,000 Hz (high treble) and over the audible range of 0 dB (the threshold of perception) to 140 dB (the threshold of pain). The ear does not respond equally to different frequencies of the same magnitude but is more responsive to mid-frequencies than to lower or higher frequencies. To quantify noise in a manner that approximates the response of the human ear, a weighting mechanism is used. This reduces the importance of lower and higher frequencies, in a similar manner to the human ear.

Furthermore, the perception of noise may be determined by a number of other factors, which may not necessarily be acoustic. In general, the impact of noise depends upon its level, the margin by which it exceeds the background level, its character and its variation over a given period of time. In some cases, the time of day and other acoustic features such as tonality or impulsiveness may be important, as may the disposition of the affected individual. Any assessment of noise should give due consideration to all of these factors when assessing the significance of a noise source.

The most widely used weighting mechanism that best corresponds to the response of the human ear is the 'A'-weighting scale. This is widely used for environmental noise measurement, and the levels are denoted as dB(A) or L_{Aeq} , L_{A90} etc., according to the parameter being measured.

The decibel scale is logarithmic rather than linear, and hence a 3 dB increase in sound level represents a doubling of the sound energy present. Judgement of sound is subjective, but as a general guide a 10 dB(A) increase can be taken to represent a doubling of loudness, whilst an increase in the order of 3 dB(A) is generally regarded as the minimum difference needed to perceive a change under normal listening conditions.

An indication of the range of sound levels commonly found in the environment is given in the following table.

Table B1 - Typical Sound Pressure Levels

Sound Pressure Level (dB)	Location/Example
0	Threshold of hearing
20 - 30	Quiet bedroom at night
30 - 40	Living room during the day
40 - 50	Typical office
50 - 60	Inside a car
60 - 70	Typical high street
70 - 90	Inside factory
100 - 110	Burglar alarm at 1 m away
110 - 130	Jet aircraft on take off
140	Threshold of pain

Table B2 - Terminology

Descriptor	Explanation
dB (decibel)	The scale on which sound pressure level is expressed. It is defined as 20 times the logarithm of the ratio between the root-mean-square pressure of the sound field and a reference pressure (2×10^{-5} Pa).
dB(A)	A-weighted decibel. This is a measure of the overall level of sound across the audible spectrum with a frequency weighting (i.e. 'A' weighting) to compensate for the varying sensitivity of the human ear to sound at different frequencies.
$L_{Aeq, T}$	L_{Aeq} is defined as the notional steady sound level which, over a stated period of time (T), would contain the same amount of acoustical energy as the A - weighted fluctuating sound measured over that period.
L_{Amax}	L_{Amax} is the maximum A - weighted sound pressure level recorded over the period stated. L_{Amax} is sometimes used in assessing environmental noise where occasional loud noises occur, which may have little effect on the overall L_{eq} noise level but will still affect the noise environment. Unless described otherwise, it is measured using the 'fast' sound level meter response.
L_{10} & L_{90}	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. It is common practice to use the L_{10} index to describe traffic noise.
Free-field Level	A sound field determined at a point away from reflective surfaces other than the ground with no significant contributions due to sound from other reflective surfaces. Generally, as measured outside and away from buildings.
Fast	A time weighting used in the root mean square section of a sound level meter with a 125 millisecond time constant.
Slow	A time weighting used in the root mean square section of a sound level meter with a 1000 millisecond time constant.

Appendix C – BS 4142 Calculations

Source Noise Levels

The Proposed Development will house 180 cattle at a time. Lucion holds noise data for 50 cattle in a single enclosure; this data has been used as the basis for the source noise in the assessment, with corrections made based on the number of cattle to be held in the Proposed Development.

Table C1 - Noise Level Data (50 cattle at 1m)

Period	Measured Noise Levels, dB		
	L _{Aeq}	L _{A90}	L _{AFmax}
Daytime	60	39	102
Night-time	47	35	78

Daytime Source Noise Level

The following formulae have been used to derive the daytime source noise levels for 180 cattle

$$\frac{180}{50} = 3.6$$
$$\text{Daytime } L_{Aeq} = 60 + 10\log_{10}(3.6)$$
$$\text{Daytime } L_{Aeq} = 66\text{dB}$$

Night-time Source Noise Level

The following formulae have been used to derive the night-time source noise levels for 180 cattle

$$\frac{180}{50} = 3.6$$
$$\text{Night - time } L_{Aeq} = 47 + 10\log_{10}(3.6)$$
$$\text{Night - time } L_{Aeq} = 53\text{dB}$$

Specific Noise Level Calculations

$$\text{Distance} = 100\text{m}$$

$$\text{Distance Correction} = 20\log_{10}\left(\frac{100}{1}\right) = 40\text{dB}$$

$$\text{Daytime Specific Noise Level} = 66 - 40 = 26\text{dB}$$

$$\text{Night - time Specific Noise Level} = 53 - 40 = 13\text{dB}$$