



Noise Impact Assessment Proposed Industrial Development

Site:
Everill Gate Lane
Wombwell
Barnsley
S73 0YL

Client:
Everill Gate Properties Ltd

Date:
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1. INTRODUCTION

Overview

- 1.1 Environmental Noise Solutions Ltd (ENS) has been commissioned by Everill Gate Properties Ltd to undertake a noise survey and assessment for a proposed industrial development at Everill Gate Lane, Wombwell, Barnsley, S73 0YL (hereafter referred to as 'the site').
- 1.2 This report details:
- The methodology and results of a baseline noise survey conducted at the site.
 - The impact assessment of noise sources, associated with the site operation, upon existing neighbouring noise sensitive receptors.
- 1.3 The report has been prepared for Everill Gate Properties Ltd for the sole purpose described above and no extended duty of care to any third party is implied or offered. Third parties referring to the report should consult Everill Gate Properties Ltd and ENS as to the extent to which the findings may be appropriate for their use.
- 1.4 A glossary of acoustic terms used in the main body of the text is contained in Appendix A.

Site Description

- 1.5 The site is located to the south-east of Everill Gate Lane and to the north-east of Valley Road (A633) in Wombwell, as shown in Figure 1.1.

Figure 1.1: Site and Surrounding Area



2. NOISE ASSESSMENT GUIDANCE AND CRITERIA

National Planning Policy Framework

2.1 The National Planning Policy Framework¹ (NPPF) was updated in July 2018 and sets out the Government's planning policies for England and how these are expected to be applied.

2.2 Where issues of noise impact are concerned the NPPF provides brief guidance in paragraph 170 where it states that planning policies and decisions should contribute to and enhance the natural and local environment by:

'preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of.....noise pollution'.

2.3 Paragraph 180 advises that:

'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.....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 life'.

2.4 The NPPF also refers to the 2010 DEFRA publication, the Noise Policy Statement for England (NPSE) which reinforces and supplements the NPPF.

Noise Policy Statement for England

2.5 The Noise Policy Statement for England² (NPSE) sets out the long-term vision of promoting good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development. This long-term vision is supported by the following aims:

- Avoid significant adverse impacts on health and quality of life.
- Mitigate and minimise adverse impacts on health and quality of life.
- Where possible, contribute to the improvement of health and quality of life.

2.6 NPSE describes the following levels at which noise impacts may be identified:

- NOEL – No Observed Effect Level. 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.
- LOAEL – Lowest Observed Adverse Effect Level. This is the level above which adverse effects on health and quality of life can be detected.

¹ Ministry of Housing, Communities and Local Government. National Planning Policy Framework. July 2018.

² Government Department for Environment, Food and Rural Affairs. Noise Policy Statement for England. March 2010.

- SOAEL – Significant Observed Adverse Effect Level. This is the level above which significant adverse effects on health and quality of life occur.

- 2.7 According to the explanatory notes in the statement, where a noise level falls between the lowest observable adverse effect level (LOAEL) and a level which represents a significant observable adverse effect level (SOAEL):

‘...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.’

Planning Practice Guidance – Noise

- 2.8 In December 2014, *Planning Practice Guidance*³ (PPG) was updated online which provides additional guidance and elaboration on the NPPF. It advises that the Local Planning Authority should consider the acoustic environment in relation to:

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

- 2.9 In line with the Explanatory Note of the NPSE, the PPG references the LOAEL and SOAEL in relation to noise impact. It also provides examples of outcomes that could be expected for a given perception level of noise, plus actions that may be required to bring about a desired outcome. However, in line with the NPSE, no objective noise levels are provided for LOAEL or SOAEL although the PPG acknowledges that:

‘...the subjective nature of noise means that there is not a simple relationship between noise levels and the impact on those affected. This will depend on how various factors combine in any particular situation’.

- 2.10 The PPG also provides general advice on the typical options available for mitigating noise. It goes on to suggest that Local Plans may include noise standards applicable to proposed developments within the Local Authority’s administrative boundary, although it states that:

‘Care should be taken, however, to avoid these being implemented as fixed thresholds as specific circumstances may justify some variation being allowed’.

British Standard 4142:2014

- 2.11 BS4142:2014⁴ presents methods for rating and assessing the potential impact of commercial and industrial sound upon noise sensitive receptors. The foreword states that:

³ Planning Practice Guidance (2014) – Noise <http://planningguidance.planningportal.gov.uk/blog/guidance/noise/>

⁴ British Standard 4142:2014 Methods for rating and assessing industrial and commercial sound, BSI (2014)

‘response to sound can be subjective and is affected by many factors, both acoustic and non-acoustic. The significance of its impact, for example, can depend on such factors as the margin by which a sound exceeds the background sound level, its absolute level, time of day and change in the acoustic environment, as well as local attitudes to the source of the sound and the character of the neighbourhood. This edition of the standard recognizes the importance of the context in which a sound occurs.....sound can be measured by a sound level meter or other measuring system. Noise is related to a human response and is routinely described as unwanted sound, or sound that is considered undesirable or disruptive’.

- 2.12 The scope of BS4142:2014 specifically includes sound from industrial and manufacturing processes, sound from fixed plant, sound from loading and unloading of goods at industrial and commercial sites and mobile plant forming an intrinsic part of the overall sound from a premises or process.

- 2.13 Section 11 of BS4142:2014 introduces the concept of ‘context’ to the process of identifying noise impact and explains that:

‘The significance of sound of an industrial and/or commercial nature depends upon both the margin by which the rating level of the specific sound source exceeds the background sound level and the context in which the sound occurs (my emphasis). An effective assessment cannot be conducted without an understanding of the reason(s) for the assessment and the context in which the sound occurs/will occur. When making assessments and arriving at decisions, therefore, it is essential to place the sound in context.’

- 2.14 A rating penalty can be applied to account for the character of the noise, namely tonality, impulsivity and intermittency. All of these corrections can be added together in linear fashion where appropriate.

- 2.15 Tonality can be determined objectively (using adjacent third octave band analysis / the Joint Nordic method) or subjectively as listed below:

- +2 dB penalty: Just perceptible.
- +4 dB penalty: Clearly perceptible.
- +6 dB penalty: Highly perceptible.

- 2.16 Impulsivity (the rapidity of the change in sound level) can be determined objectively (using Fast Fourier Transform analysis) or subjectively as listed below:

- +3 dB penalty: Just perceptible.
- +6 dB penalty: Clearly perceptible.
- +9 dB penalty: Highly perceptible.

- 2.17 Where intermittency is present (i.e. when the specific noise has identifiable on/off conditions) a +3 dB penalty can be applied.

- 2.18 Where the specific sound feature characteristics are neither tonal nor impulsive but distinguishable against the residual noise than a +3 dB penalty can be applied.

- 2.19 All of the above corrections can be added together in linear fashion where appropriate.
- 2.20 In order to assess the impact, the 'Rating level' of the new noise source is compared with the existing 'Background level' and the following analysis made:
- Typically, the greater this difference, the greater the magnitude of the impact.
 - A difference of around + 10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.
 - A difference of around + 5 dB is likely to be an indication of an adverse impact, depending on the context.
 - 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 or a significant 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, depending on the context.
- 2.21 BS4142 requires separate analysis for day and night time periods. For the assessment of noise impacts, BS4142 advises evaluating the specific sound over an appropriate reference time interval (T_r) of:
- 1 hr during the day (between 07:00 - 23:00 hrs).
 - 15 min during the night (between 23:00 - 07:00 hrs).

3. BASELINE NOISE SURVEY AND RESULTS

Overview

- 3.1 Noise monitoring was carried on Monday 13th and Tuesday 14th August 2018 to determine prevailing ambient and background noise levels at the nearest NSRs to the proposals.
- 3.2 The following noise monitoring positions were adopted (see Appendix B for approximate locations):
- MP1 – 4m from the northern boundary to dwelling at Wath Road (NSR1). This position is also considered to be representative of Badsworth Close (NSR3).
 - MP2 – 4m to the eastern boundary fence to dwelling on Everill Gate Lane (NSR2).

Equipment

- 3.3 Noise measurements were undertaken using a Bruel & Kjaer 2250 Type 1 integrating sound level meter. The meter was connected to a windshield covered microphone and positioned in free field conditions (i.e. > 3.5 metres distance from a vertical reflective surface) at a height of 1.5 metres above ground.
- 3.4 The measurement system calibration was verified immediately before and after the survey period using a Bruel & Kjaer Type 4231 calibrator. No drift in calibration levels greater than 0.5 dB was noted.
- 3.5 Measurements consisted of A-weighted broadband parameters including L_{Aeq} and L_{A90} together with linear octave and third octave band data.

Weather

- 3.6 During the survey the noted weather conditions were sunny and dry with average wind speeds < 2 m/s. Weather conditions were therefore considered appropriate for noise monitoring.

Results

- 3.7 Table 3.1 presents a summary of the noise data for each measurement session, at each measurement position, rounded to the nearest decibel.

Table 3.1: Summary of Baseline Noise Measurement Data

Position	Date	Time (hh:mm)	L _{Aeq} (dB)	L _{A90} (dB)	Comments
MP1	13/08/2018	09:33 – 09:48	51	48	Distant road traffic noise; vehicle movements and impulsive events at nearby commercial units.
		10:59 – 11:14	51	49	
		11:14 – 11:29	51	48	
		12:57 – 13:12	48	47	
		13:12 – 13:27	49	46	
	14/08/2018	01:15 – 01:30	44	40	Distant road traffic noise; vegetation rustling in breeze; overhead aircraft.
		02:06 – 02:21	40	36	
		02:50 – 03:05	40	36	
MP2	13/08/2018	10:08 – 10:23	53	37	Distant road traffic noise; occasional vehicle movements on Everill Gate Lane; distant impulsive events and reversing alarms at commercial units to the south.
		11:38 – 11:53	54	39	
		11:53 – 12:08	55	38	
		13:34 – 13:49	53	40	
	14/08/2018	00:52 – 01:07	38	35	Distant road traffic noise; vegetation rustling in breeze.
		01:45 – 02:00	37	34	
		02:28 – 02:43	36	33	

3.8 Measured daytime background noise levels, at the nearest NSRs to the proposed development, were:

- 46 – 49 dB L_{A90} (15min) at MP1.
- 37 – 40 dB L_{A90} (15min) at MP2.

3.9 Measured night-time background noise levels were:

- 36 – 40 dB L_{A90} (15min) at MP1.
- 33 – 35 dB L_{A90} (15min) at MP2.

4. INTERNAL OPERATIONS

Overview

- 4.1 The proposed site layout drawing shows 4 no. units proposed for the site. Table 4.1 presents the distances between each NSR and the nearest façade of each unit.

Table 4.1: Distances between NSRs and Nearest Façade of Each Unit

NSR	Distance to Block A (m)	Distance to Block B (m)	Distance to Block C (m)	Distance to Block D (m)
1	194	163	138	55
2	243	258	154	142
3	91	62	146	140

Source Noise Levels

- 4.2 At this stage, the final occupants of the proposed units are to be determined; therefore, it is not possible to predict a precise internal noise level for the proposed units. However, in order to assist with the assessment of noise break-out from units at the proposed development, a relatively high internal reverberant noise level of 80 dB $L_{Aeq, T}$ has been robustly adopted based on the following:

- Reverberant internal noise levels of up to 80 dB $L_{Aeq, T}$ have been measured previously by ENS inside a fabricators unit (B2).
- Reverberant internal noise levels of 68 – 72 dB $L_{Aeq, T}$ have been measured previously by ENS inside a busy distribution unit (B8).

Propagation

- 4.3 Noise propagation to each NSR, from the nearest façade of the unit, has been calculated using the following equation:

$$SPL_2 = SPL_1 - R + 10 \log S - 20 \log r - 14$$

Where:

SPL_2 = Sound pressure level at the NSR, dB(A)

SPL_1 = Assumed internal sound pressure level in the unit, dB(A)

R = Composite sound reduction performance of unit façade, dB R_w

S = Surface area of nearest unit façade, m^2 , determined from elevation drawings

r = Distance from NSR to nearest façade of unit, m

- 4.4 Calculations also incorporate a barrier attenuation correction, where appropriate (i.e. where there is a break in the line of sight between a façade and NSR).
- 4.5 For the purpose of the calculations, the sound reduction performance of the building envelope is assumed to be ≥ 25 dB R_w based on the sound reduction performance of standard single-skin insulated cladding.

4.6 The calculated site noise levels are presented in Table 4.2.

Table 4.2: Calculated Site Noise Levels at Receptor Locations

NSR	Block A Noise Level $L_{Aeq,T}$ (dB)	Block B Noise Level $L_{Aeq,T}$ (dB)	Block C Noise Level $L_{Aeq,T}$ (dB)	Block D Noise Level $L_{Aeq,T}$ (dB)	Cumulative Noise Level $L_{Aeq,T}$ (dB)
1	14	23	17	39	39
2	22	9	28	31	33
3	31	33	19	28	36

Impact Assessment

4.7 At this stage, the exact nature of commercial / industrial operation within the proposed units is not known; therefore, it is not possible to determine whether or not the site noise will be tonal or impulsive in nature. For the purpose of assessment, a 3 dB penalty has been applied on the assumption that the noise emission from the units may be distinguishable against the residual acoustic environment.

4.8 At this stage, the hours of operation of the proposed units are to be determined. For the purpose of assessment, it is assumed that the units could potentially operate during the day or night.

4.9 The results of the BS4142 assessment are presented in Tables 4.3 to 4.5.

Table 4.3: BS4142 Assessment of Noise Break-out from Units – NSR1

Parameter	Day (07:00 – 23:00 hrs)	Night (23:00 – 07:00 hrs)
Lowest measured background sound level (MP1)	46 dB L_{A90} (15min)	36 dB L_{A90} (15min)
Specific noise level. (See Table 4.2 – no corrections for % on time deemed necessary)	39 dB L_{Aeq} (1hr)	39 dB L_{Aeq} (15min)
Acoustic feature correction.	+ 3 dB	+ 3 dB
Rating level	42 dB $L_{Ar,Tr}$	42 dB $L_{Ar,Tr}$
Excess of rating over background sound level	-4 dB	6 dB
Assessment	Low impact	Adverse impact

4.10 The BS4142 assessment at NSR1 (Wath Road) indicates that the Rating level is:

- 4 dB below the daytime background sound level (low impact).
- 6 dB above the night-time background sound level (adverse impact).

Table 4.4: BS4142 Assessment of Noise Break-out from Units – NSR2

Parameter	Day (07:00 – 23:00 hrs)	Night (23:00 – 07:00 hrs)
Lowest measured background sound level (MP2)	37 dB L_{A90} (15min)	33 dB L_{A90} (15min)
Specific noise level. (See Table 4.2 – no corrections for % on time deemed necessary)	33 dB L_{Aeq} (1hr)	33 dB L_{Aeq} (15min)
Acoustic feature correction.	+ 3 dB	+ 3 dB
Rating level	36 dB $L_{Ar,Tr}$	36 dB $L_{Ar,Tr}$
Excess of rating over background sound level	-1 dB	3 dB
Assessment	Low impact	Low-adverse impact

4.11 The BS4142 assessment at NSR2 (Everill Gate Lane) indicates that the Rating level is:

- 1 dB below the daytime background sound level (low impact).
- 3 dB above the night-time background sound level (low-adverse impact).

Table 4.5: BS4142 Assessment of Noise Break-out from Units – NSR3

Parameter	Day (07:00 – 23:00 hrs)	Night (23:00 – 07:00 hrs)
Lowest measured background sound level (MP1)	46 dB L_{A90} (15min)	36 dB L_{A90} (15min)
Specific noise level. (See Table 4.2 – no corrections for % on time deemed necessary)	36 dB L_{Aeq} (1hr)	36 dB L_{Aeq} (15min)
Acoustic feature correction.	+ 3 dB	+ 3 dB
Rating level	39 dB $L_{Ar,Tr}$	39 dB $L_{Ar,Tr}$
Excess of rating over background sound level	-7 dB	3 dB
Assessment	Low impact	Low-adverse impact

4.12 The BS4142 assessment at NSR3 (Badsworth Close) indicates that the Rating level is:

- 7 dB below the daytime background sound level (low impact).
- 3 dB above the night-time background sound level (low-adverse impact).

Recommendations / Mitigation

4.13 As stated above, the hours of operation of the proposed units are to be determined.

4.14 It can be seen that, in all instances, low impacts are expected during the daytime. Therefore, if the proposed hours of operation are during daytime hours only (07:00 – 23:00 hrs), no mitigation will be required.

4.15 It can also be seen that adverse impacts are expected during the night with rating levels exceeding background noise levels by 3 – 6 dB at the NSRs. Therefore, if the proposed units are to operate at night (23:00 – 07:00 hrs), it is recommended that noise break-out levels are reduced by at least 6 dB.

- 4.16 Earlier in this section, for the purpose of the calculations, the sound reduction performance of the building envelope was assumed to be ≥ 25 dB R_w based on the sound reduction performance of standard single-skin insulated cladding. It follows that, in order to avoid adverse impacts, the design of the proposed units incorporates façade and roof material with a sound insulation performance of ≥ 31 dB R_w .
- 4.17 Calculations assume that the sound insulation of the façade will not be compromised by penetrations such as louvres or doors. Where any louvres or doors are proposed within the façade of the building, they should therefore be designed with a sound insulation performance of ≥ 31 dB R_w .

5. SERVICE YARD OPERATIONS

Overview

- 5.1 The proposed site layout drawing shows 3 no. external service yard areas proposed for the site as follows:
- 1 no. service yard between Blocks A and B (assumed to be shared).
 - 1 no. service yard to north-east of Block C.
 - 1 no. service yard to north-east of Block D.
- 5.2 Table 5.1 presents the distances between each NSR and the service yards.

Table 5.1: Distances between NSRs and Service Yards

NSR	Distance to Block A and B Shared Service Yard (m)	Distance to Block C Service Yard (m)	Distance to Block D Service Yard (m)
1	194	162	130
2	292	156	187
3	85	218	288

- 5.3 It is assumed that activity within the service yards will consist of intermittent Heavy Goods Vehicle (HGV) movements and Forklift Truck (FLT) movements associated with loading/unloading operations.

HGV and FLT - Source Noise Levels

- 5.4 In order to assess the impact of HGV and FLT movements within the service yards, the Sound Exposure Level (SEL) has been used. The SEL of a single discrete noise event is the level which if maintained constant for a period of one second would contain as much A-weighted sound energy as is contained in the actual noise event.
- 5.5 The SEL of HGV movements at low speed has previously been measured by ENS at circa 78 dB(A) at 10 metres.
- 5.6 The SEL of a FLT Loading Operation has previously been measured at approximately 67 dB(A) at 10 metres.

Noise Propagation

- 5.7 Noise levels associated with HGV and FLT movements have been determined at the nearest NSRs using a basic propagation calculation incorporating a distance attenuation correction. Calculations also incorporate a barrier attenuation correction, where appropriate (i.e. where there is a break in the line of sight between the service yard and NSR).
- 5.8 The calculated HGV and FLT movement SEL noise levels at each NSR are presented in Tables 5.2 to 5.7.

Table 5.2: SEL of HGV Movements at NSR1

Service Yard	Separation Distance (m)	SEL at 10 m (dB(A))	Distance Attenuation (dB)	Screening Attenuation (dB)	SEL at NSR (dB(A))
Blocks A and B	194	78	-26	-10	42
Block C	162	78	-24	-10	44
Block D	130	78	-22	0	56

Table 5.3: SEL of HGV Movements at NSR2

Service Yard	Separation Distance (m)	SEL at 10 m (dB(A))	Distance Attenuation (dB)	Screening Attenuation (dB)	SEL at NSR (dB(A))
Blocks A and B	292	78	-29	-10	39
Block C	156	78	-24	0	54
Block D	187	78	-25	0	53

Table 5.4: SEL of HGV Movements at NSR3

Service Yard	Separation Distance (m)	SEL at 10 m (dB(A))	Distance Attenuation (dB)	Screening Attenuation (dB)	SEL at NSR (dB(A))
Blocks A and B	85	78	-19	0	59
Block C	218	78	-27	-10	41
Block D	288	78	-29	-10	39

Table 5.5: SEL of FLT Movements at NSR1

Service Yard	Separation Distance (m)	SEL at 10 m (dB(A))	Distance Attenuation (dB)	Screening Attenuation (dB)	SEL at NSR (dB(A))
Blocks A and B	194	67	-26	-10	31
Block C	162	67	-24	-10	33
Block D	130	67	-22	0	45

Table 5.6: SEL of FLT Movements at NSR2

Service Yard	Separation Distance (m)	SEL at 10 m (dB(A))	Distance Attenuation (dB)	Screening Attenuation (dB)	SEL at NSR (dB(A))
Blocks A and B	292	67	-29	-10	28
Block C	156	67	-24	0	43
Block D	187	67	-25	0	42

Table 5.7: SEL of FLT Movements at NSR3

Service Yard	Separation Distance (m)	SEL at 10 m (dB(A))	Distance Attenuation (dB)	Screening Attenuation (dB)	SEL at NSR (dB(A))
Blocks A and B	85	67	-19	0	48
Block C	218	67	-27	-10	30
Block D	288	67	-29	-10	28

- 5.9 As previously stated, at this stage the hours of operation of the proposed units are to be determined. For the purpose of assessment, it is assumed that HGV and FLT activity in the external service yard areas could potentially occur during the day or night.
- 5.10 In lieu of detailed delivery / collection schedule information, it is assumed that each service yard could accommodate 4 no. HGV movements (with associated FLT activity) within a single hour (i.e. 1 no. every 15 minutes).
- 5.11 The following formula may be used for calculating the L_{Aeq} level from the SEL:

$$L_{Aeq,T} = 10 \log_{10} [(n \times 10^{SEL/10}) / T]$$

where:

SEL = the Single Event / Sound Exposure Level
 n = number of event occurrences
 T = reference time period, in seconds

- 5.12 Processing the above formula, the calculated specific noise levels, due to activity (i.e. HGV and FLT movements) in the external service yard areas are presented in Table 5.8.

Table 5.8: HGV and FLT Movements at NSRs

Receptor	Cumulative SEL dB(A)	Specific Noise Level (dB)	
		Day L_{Aeq} (1hr)	Night L_{Aeq} (15min)
NSR1	57	27	27
NSR2	57	27	27
NSR3	59	30	30

Impact Assessment

- 5.13 For the purpose of assessment, a 6 dB penalty has been applied on the assumption that the noise emission from the service yard will be clearly impulsive.
- 5.14 The results of the BS4142 assessment are presented in Tables 5.9 to 5.11.

Table 5.9: BS4142 Assessment of Service Yard Operations – NSR1

Parameter	Day (07:00 – 23:00 hrs)	Night (23:00 – 07:00 hrs)
Lowest measured background sound level (MP1)	46 dB L_{A90} (15min)	36 dB L_{A90} (15min)
Specific noise level. (See Table 5.8 – no corrections for % on time deemed necessary)	27 dB L_{Aeq} (1hr)	27 dB L_{Aeq} (15min)
Acoustic feature correction.	+ 6 dB	+ 6 dB
Rating level	33 dB $L_{Ar,Tr}$	33 dB $L_{Ar,Tr}$
Excess of rating over background sound level	-13 dB	-3 dB
Assessment	Low impact	Low impact

5.15 The BS4142 assessment at NSR1 (Wath Road) indicates that the Rating level is:

- 13 dB below the daytime background sound level (low impact).
- 3 dB below the night-time background sound level (low impact).

Table 5.10: BS4142 Assessment of Service Yard Operations – NSR2

Parameter	Day (07:00 – 23:00 hrs)	Night (23:00 – 07:00 hrs)
Lowest measured background sound level (MP2)	37 dB L_{A90} (15min)	33 dB L_{A90} (15min)
Specific noise level. (See Table 5.8 – no corrections for % on time deemed necessary)	27 dB L_{Aeq} (1hr)	27 dB L_{Aeq} (15min)
Acoustic feature correction.	+ 6 dB	+ 6 dB
Rating level	33 dB $L_{Ar,Tr}$	33 dB $L_{Ar,Tr}$
Excess of rating over background sound level	-4 dB	0 dB
Assessment	Low impact	Low impact

5.16 The BS4142 assessment at NSR2 (Everill Gate Lane) indicates that the Rating level is:

- 4 dB below the daytime background sound level (low impact).
- Equal to the night-time background sound level (low impact).

Table 5.11 BS4142 Assessment of Service Yard Operations – NSR3

Parameter	Day (07:00 – 23:00 hrs)	Night (23:00 – 07:00 hrs)
Lowest measured background sound level (MP1)	46 dB L_{A90} (15min)	36 dB L_{A90} (15min)
Specific noise level. (See Table 5.8 – no corrections for % on time deemed necessary)	30 dB L_{Aeq} (1hr)	30 dB L_{Aeq} (15min)
Acoustic feature correction.	+ 6 dB	+ 6 dB
Rating level	36 dB $L_{Ar,Tr}$	36 dB $L_{Ar,Tr}$
Excess of rating over background sound level	-10 dB	0 dB
Assessment	Low impact	Low impact

5.17 The BS4142 assessment at NSR3 (Badsworth Close) indicates that the Rating level is:

- 10 dB below the daytime background sound level (low impact).
- Equal to the night-time background sound level (low impact).

6. PLANT NOISE LIMITS

- 6.1 Detailed information regarding any proposed item(s) of external plant was not available at the time of writing. However, this section has been included to aid in the specification of any external plant associated with the proposed units.
- 6.2 Proposed external plant should be designed so that rating levels (as determined using the guidance of BS4142:2014) do not exceed the existing background noise level at the nearest NSRs in order to avoid an adverse impact.
- 6.3 Table 6.1 provides the highest permissible free-field rating noise levels from external plant when measured at the nearest NSRs. These are based on the measured background noise levels presented in Section 3.

Table 6.1: Limiting Rating Noise Levels from External Plant at Site

NSR	Limiting Daytime Plant Rating Noise Level at NSR $L_{Ar,Tr}$ (dB)	Limiting Night-time Plant Rating Noise Level at NSR $L_{Ar,Tr}$ (dB)
1	46	36
2	37	33
3	46	36

- 6.4 It should be noted that the limits presented in Table 6.1 are rating levels i.e. plant noise levels when appropriate acoustic feature corrections have been applied, in accordance with the penalties described in Section 2 of this report.
- 6.5 It should also be noted that the plant noise limits quoted in Table 6.1 are the highest allowable noise levels from all proposed fixed plant. Care should be taken to see that these limits are met with all proposed plant in operation simultaneously.
- 6.6 It is recommended that the Client reviews any considered plant against the sound pressure level criteria above. It is also recommended that the Client refers acoustic data (including octave band spectra) for considered plant to the Acoustic Consultant in order to assess compliance with the criteria.

7. SUMMARY AND CONCLUSIONS

- 7.1 A noise survey and assessment has been performed for a proposed industrial development at Everill Gate Lane, Wombwell, Barnsley, S73 0YL.
- 7.2 Noise monitoring was undertaken on Monday 13th and Tuesday 14th August 2018 in order to determine existing ambient and background noise levels at the nearest noise sensitive receptors (NSRs) to the site.
- 7.3 Noise levels associated with internal operations within the units have been assessed using BS4142. The BS4142 assessment has determined that low impacts are expected during the daytime at all NSRs assessed. Therefore, if the proposed hours of operation are during daytime hours only (07:00 – 23:00 hrs), no mitigation will be required. However, low-adverse to adverse impacts are expected during the night with unmitigated rating levels exceeding background noise levels by 3 – 6 dB at the NSRs. Therefore, if the proposed units are to operate at night (23:00 – 07:00 hrs), it is recommended that the sound reduction performance of the building envelope was is ≥ 31 dB R_w in order to avoid adverse impacts.
- 7.4 Noise levels associated with HGV collections / deliveries at the site have been determined at the nearest NSRs. Calculated noise levels have been assessed using BS4142. The BS4142 night assessment indicates a low impact at all NSRs assessed.
- 7.5 Section 6 provides highest permissible free-field noise levels, from any external plant that may be associated with the proposals, at the nearest noise sensitive receptors. The limits for external plant are recommended to avoid an adverse impact as per the guidance of BS4142:2014.

APPENDIX A – Noise Parameters

Sound Pressure Level (L_p)

The basic unit of sound measurement is the sound pressure level. As the pressures to which the human ear responds can range from 20 μ Pa to 200 Pa, a linear measurement of sound levels would involve many orders of magnitude. Consequently, the pressures are converted to a logarithmic scale and expressed in decibels (dB) as follows:

$$L_p = 20 \log_{10}(p/p_0)$$

Where L_p = sound pressure level in dB; p = rms sound pressure in Pa; and p_0 = reference sound pressure (20 μ Pa).

A-weighting Network

A frequency filtering system in a sound level meter, which approximates under defined conditions the frequency response of the human ear. The A-weighted sound pressure level, expressed in dB(A), has been shown to correlate well with subjective response to noise.

Equivalent continuous A-weighted sound pressure level, $L_{Aeq, T}$

The value of the A-weighted sound pressure level in decibels of continuous steady sound that within a specified time interval, T , has the same mean-square sound pressure as a sound that varies with time. $L_{Aeq, 16hr}$ (07:00 - 23:00 hrs) and $L_{Aeq, 8hr}$ (23:00 - 07:00 hrs) are used to qualify daytime and night time noise levels.

$L_{A10, T}$

The A-weighted sound pressure level in decibels exceeded for 10% of the measurement period, T . $L_{A10, 18hr}$ is the arithmetic mean of the 18 hourly values from 06:00 - 24:00 hrs.

$L_{A90, T}$

The A-weighted sound pressure level of the residual noise in decibels exceeded 90% of a given time interval, T . L_{A90} is typically taken as representative of background noise.

Rating Level ($L_{Ar, Tr}$)

The specific noise level plus any adjustment for characteristic features of the noise.

Weighted Sound Reduction Index (R_w)

Single number quantity which characterises the airborne sound insulation properties of a material or building element over a defined range of frequencies (R_w is used to characterise the insulation of a material or product that has been measured in a laboratory).

APPENDIX B – Baseline Noise Measurement Positions



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