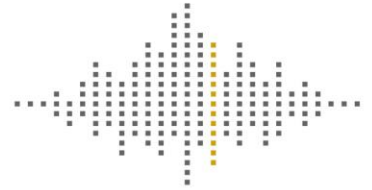


SHARPS REDMORE

ACOUSTIC CONSULTANTS ▪ Established 1990



Report

PSL Thurnscoe, Barnsley
Environmental Noise
Assessment of Proposed
Industrial Site

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1.0 Executive summary

- 1.1 A noise assessment has been carried out on a plot of land, former Hinkleton Colliery, proposed for industrial (B1, B2 or B8) use at Thurnscoe, Barnsley.
- 1.2 This report refers to a proposal to build and operate 15 industrial units at the site and comments on potential off-site noise levels as a result of these proposed units. The report advises on mitigation options, considering relevant planning policy and derivation of appropriate assessment criteria.
- 1.3 A review has been carried out of government policy and guidance to determine the appropriate assessment methodology and criteria. The assessment is based on a realistic worst-case scenario.
- 1.4 The two noise sources identified with the potential to produce an impact are:
 - Noise from activities on site (assuming a busy 24 hour period, involving HGVs arriving departing and loading/unloading) plus associated staff cars;
 - Noise from external plant or equipment
- 1.5 Based on the proposed design and building orientation, there would be no significant adverse noise impact to occupiers of nearby dwellings and there would be no need for additional noise mitigation measures.

2.0 Introduction

- 2.1 Sharps Redmore has been instructed by Stuart Willows of William Saunders on behalf of Priority Space Limited to undertake an environmental noise assessment of the planned industrial site off Barrowfield Road, Thurnscoe.
- 2.2 The site, currently empty, is situated in a mixed industrial, commercial and residential area among industrial and commercial units within Thurnscoe Business Park. The area is dominated by road traffic noise on Lidget Lane throughout the day and night, with commercial and industrial noises present throughout the day at the nearest residential dwelling.
- 2.3 A plan of the proposed development (16 units) is shown in Figure A2 in Appendix A. The nearest residential buildings are two story houses situated approximately 55m north of the site boundary.
- 2.4 General industrial site noise sources have been considered based on the site dimensions/design and a worst-case hour has been assessed using Sharps Redmore library data.
- 2.5 A noise survey has been conducted at the nearest sensitive premises to establish existing environmental conditions. Plans showing the measurement positions and site location are included in Appendix A and Appendix B includes a noise survey details and results and calculations.
- 2.6 The details of the survey methodology are in Section 4 and the results are discussed in Section 5. Section 3 discusses the Government's Planning Policy and relevant guidance and standards relevant to the case.

3.0 Assessment Methodology and Criteria

National Policy

- 3.1 The National Planning Policy Framework (NPPF 2018) sets out the Government's economic, environmental and social planning policies for England and, in relation to noise (in paragraph 180), requires 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:

- 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 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..."*

- 3.2 It can be seen that the NPPF reinforces the March 2010 DEFRA publication, "Noise Policy Statement for England" (NPSE), which 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."

- 3.3 Together, the first two aims 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."

3.4 It is possible to apply objective standards to the assessment of noise and the effect produced by the introduction of a certain noise source may be determined by several methods, as follows:

- i) The effect may be determined by reference to guideline noise values. British Standard (BS) 8233:2014 and World Health Organisation (WHO) “*Guidelines for Community Noise*” contain such guidelines.
- ii) Alternatively, the impact may be determined by considering the change in noise level that would result from the proposal, in an appropriate noise index for the characteristic of the noise in question. There are various criteria linking change in noise level to effect. This is the method that is suited to, for example, the assessment of noise from road traffic because it is capable of displaying impact to all properties adjacent to a road link irrespective of their distance from the road.
- iii) Another method is described within BS 4142:2014 to determine the significance of sound impact from sources of industrial and/or commercial nature. The sources that the newly revised standard is intended to assess are sound from industrial and manufacturing processes, sound from fixed plant installations, sound from loading and unloading of goods at industrial and/or commercial premises and the sound from mobile plant and vehicles, such as forklift, train or ship movements.

Guideline noise values

3.5 There are a number of guidance documents that contain recommended guideline noise values. These are discussed below.

3.6 British Standard 8233:2014 is principally intended to assist in the design of new dwellings; however, the Standard does state that it may be used in the assessment of noise from new sources being brought to existing dwellings. BS 8233 guideline noise values are summarised in the Table 3.1 below:

Table 3.1: BS 8233 guideline noise values

Level	Guidance
$L_{AeqT} = 55 \text{ dB}$	Upper limit for external steady noise. (gardens and patios).
$L_{AeqT} = 50 \text{ dB}$	Desirable limit for external steady noise. (gardens and patios).
$L_{Aeq \text{ 16 hours}} = 35 \text{ dB}$	Resting, living room day. (Internal – steady noise)
$L_{Aeq \text{ 16 hours}} = 40 \text{ dB}$	Dining, dining room day. (Internal – steady noise)
$L_{Aeq \text{ 16 hour}} = 35 \text{ dB}$	Sleeping, bedroom day (Internal – steady noise)
$L_{Aeq \text{ 8 hours}} = 30 \text{ dB}$	Sleeping, bedroom night (Internal – steady noise)

- 3.7 For L_{AeqT} criteria the time base (T) given in the documents is 16 hours for daytime limits and 8 hours for night time limits.

Changes in noise level

- 3.8 Changes in noise levels of less than 3 dBA are not perceptible under normal conditions and changes of 10 dBA are equivalent to a doubling of loudness. This guidance has been accepted by inspectors, at inquiry, to encompass changes in noise levels in the index L_{AeqT} .
- 3.9 Table 3.2 below shows the response to changes in noise (known as a semantic scale); this table has been developed from general consensus opinion of acousticians.

Table 3.2: Change in noise level

Change in noise level L_{AeqT} , dB	Response	Impact
<3	Imperceptible	None
3 – 5	Perceptible	Slight/moderate
6 – 10	Up to a doubling	Moderate/significant
11 – 15	More than a doubling	Substantial
>15	-	Severe

- 3.10 Where the existing ambient noise level is already above the criteria developed from the various guidance documents, it may be considered unreasonable to adopt such criteria. It would be reasonable, however, given the above statement, to consider criteria which do not exceed the existing noise climate, thus giving rise to an overall 3 dB increase i.e. the minimum perceptible. If it is less than the minimum perceptible it cannot be described as disturbing or to affect the amenity of residents.

British Standard 4142:2014

- 3.11 This British Standard enables the significance of sound impact to be determined in relation to industrial and commercial sources. The significance of sound impact is to be determined according to the following two stage process:
- 1) Assess background and residual noise levels; predict new noise levels, apply correction to predicted levels, as appropriate to arrive at a rating level and compare this rating level to the existing background level. Use this to make an initial estimate of impact; and
 - 2) Consider this level difference in the context of the site.

- 3.12 Matters which the standard recommends are relevant in order to consider context are, as shown in Table 3.3 below:

Table 3.3: BS 4142 notes on context

Factor	BS 4142 commentary	Notes
Absolute level of sound	<i>For a given difference between the rating level and the background sound level, the magnitude of the overall impact might be greater for an acoustic environment where the residual sound level is high than for an acoustic environment where the residual sound level is low.</i> <i>Where background sound levels and rating levels are low, absolute levels might be as, or more, relevant than the margin by which the rating level exceeds the background. This is especially true at night.</i> <i>Where residual sound levels are very high, the residual sound might itself result in adverse impacts or significant adverse impacts, and the margin by which the rating level exceeds the background might simply be an indication of the extent to which the specific sound source is likely to make those impacts worse.</i>	Guidance on appropriate or significant absolute levels such as L_{Aeq} values for day or night or L_{Amax} values for night time can be found in the World Health Organisation's "Guidelines for Community Noise" and in British Standard BS 8233: 2014 "Guidance on sound insulation and noise reduction for buildings". When existing levels are low, particularly at night, absolute levels will often provide a better assessment tool. At night, the L_{Amax} factor will often be the key parameter to assess potential sleep disturbance.
The character and level of the residual sound compared to the character and level of the specific sound.	<i>Consider whether it would be beneficial to compare the frequency spectrum and temporal variation of the specific sound with that of the ambient or residual sound, to assess the degree to which the specific sound source is likely to be distinguishable and will represent an incongruous sound by comparison to the acoustic environment that would occur in the absence of the specific sound. Any sound parameters, sampling periods and averaging time periods used to undertake character comparisons should reflect the way in which sound of an industrial and/or commercial nature is likely to be perceived and how people react to it.</i>	Experience and judgement will generally provide an excellent guide to determine the extent to which a specific sound might stand out or be in keeping with the existing surroundings. Whilst a technical assessment of character is sometimes desirable, it is also possible to consider character without the need for technical comparisons.

Factor	BS 4142 commentary	Notes
Sensitivity of receptor	<i>The sensitivity of the receptor and whether dwellings or other premises used for residential purposes will already incorporate design measures that secure good internal and/or outdoor acoustic conditions, such as:</i> <i>i) facade insulation treatment;</i> <i>ii) ventilation and/or cooling that will reduce the need to have windows open so as to provide rapid or purge ventilation; and</i> <i>iii) acoustic screening.</i>	If the existing noise sensitive premises (NSP) already have good quality windows (acoustically) and alternative means of ventilation or screening, then this needs to be considered. The intrinsic sensitivity of a particular use is also relevant. For example, whether the NSP is a school, office or dwelling is relevant.

3.13 Potentially noisy site activities would comprise:

- Noise from unloading/loading;
- Noise from mechanical services plant
- Noise from lorry and forklift movements

3.14 The most appropriate methods of assessing the potential impact of noise from these operations is by reference to the methodology in BS 4142:2014.

3.15 HGVs travelling down public roads as a result of the development have been assessed using the change in level method as determined in Table 3.2 above.

4.0 Survey Details

- 4.1 A combination of attended and unattended monitoring was undertaken over a 24 hour period between Monday and Tuesday, 8th – 9th October 2018. The measurement locations (shown in Figure A1 in Appendix A) were chosen to be representative of the nearest sensitive buildings to the Priority Space development. The noise meters were set to gather existing ambient, background and maximum noise levels. Spot measurements were made throughout the day and night at Position 1, with a meter left continually monitoring at Position 2 unattended, from 19:15 hours on the 8th to 07:00 hours on the 9th; this second location was chosen purely as it provided a canopy in which to hide the logging device from theft or tampering.
- 4.2 All measurements were made with Type 1 precision sound level meters (SLMs). The instrument used to carry out the continuous measurements was a Cirrus: Optimus Green, with a microphone set at a height of 2m above ground level. Attended measurements were made with a B&K 2236, set at a height of approximately 1.5m above ground; both in free field locations.
- 4.3 The SLMs were set to measure the following “A” weighted parameters: L_{Aeq} , L_{A10} , L_{A90} and L_{Amax} . The measurement sample period was typically 15 minutes. Immediately before and after the measurements were carried out, the SLMs were calibrated using an acoustic calibrator with no noticeable drift.
- 4.4 The weather during the survey period was suitable for noise monitoring; dry with medium speed wind gusts, occasionally disturbing nearby trees (this did not affect noise measurements to any significant degree).
- 4.5 Observations of the noise climate were made and can be found within the attended measurement details in Appendix B, Table B1. Road traffic noise (mainly from Lidget Lane) dominates the area, both day and night with other distant road traffic from the south-east audible in the quietest hours.
- 4.6 Results of continuous data is shown graphically in Figure B1 and attended measurements in Table B1 Appendix B. A summary of the noise levels measured over the 24 hour period are shown in Table 4.1 below:

Table 4.1: Summary of measurements

Survey results summary (8-9/10/2018)				
Typical $L_{Aeq, 16hr}$ day, dB	Typical $L_{Aeq, 8hr}$ night, dB	Typical lowest daytime background level ($L_{A90, 1hour}$), dB	Typical lowest night-time background level ($L_{A90, 15min}$), dB	Typical night L_{Amax} , dB
63	53	50	44	76

- 4.7 Noise levels measured at Position 1 are generally higher than those at Position 2 due to its proximity to the road. L_{Amax} levels measured at Position 1 therefore represent the worst-case incident on the residential building.

5.0 Assessment

Derivation of LOAELs and SOAELs

- 5.1 Baseline noise measurements inform the suitable LOAEL and SOAEL values for noise sensitive receptors in relation to the site; namely the residential properties to the north.
- 5.2 Typical existing noise levels measured at Position 1 are representative of the nearest residential dwelling (with a façade correction of +3 dB applied to the ambient level).
- 5.3 As summarised in Table 4.1 above, daytime ambient noise levels here are 63 dB $L_{Aeq,T}$ (66 dB with façade correction) and 50 dB $L_{A90,T}$ typical background. Based on this, a robust LOAEL for industrial site noise during the day would be the background level + 0 (50 dB) and as existing ambient levels are medium to high in the area the SOAEL would be 60 dB in accordance with the guidance in BS 4142:2014.
- 5.4 Typical night-time ambient levels at the receptor were 53 dB $L_{Aeq,T}$ (56 dB with façade correction) with a typical lowest background level of 44 dB $L_{A90,T}$. Prior to considering context, the LOAEL would therefore be 44 dB, L_{Ar} (which is 0 dB above background) and the SOAEL would be 54 dB, L_{Ar} .
- 5.5 It is important to note that the night-time LOAEL is based on levels incident on the dwelling's external façade to ensure acceptable internal noise levels. As summarised in Table 3.1 above, the most sensitive receptor at night would be a south-facing bedroom window (which are generally located on the first floor). As measured levels were taken at approximately 1.5m above ground (and due to the position of the key noise source) experience suggests that the L_{A90} at a first floor window are generally between 4 and 7 dB above levels measured at ground floor height. However, to ensure a robust assessment, the lower (measured) level has been assumed in this case.
- 5.6 The LOAEL and SOAEL values for these receptors are summarised in the following table:

Table 5.1: Summary of derived LOAELs and SOAELs

Time Period	LOAEL	SOAEL	Parameter
Daytime (07:00 – 23:00)	50 dB	60 dB	$L_{Ar, 1\text{hour}}$
Night-time (23:00 – 07:00)	44 dB	54 dB	$L_{Ar, 15\text{min}}$

Noise from Industrial Units

- 5.7 The proposed B1, B2 and B8 units vary in size, from 116m² to 232m² but to ensure a degree of robustness, it has been assumed in this assessment that all businesses will use HGVs and may have some external loading/unloading (even though some may not use this form of distribution).
- 5.8 The design of the units imply that unloading and loading of HGVs could occur either by tail-lift or side loading (using forklifts or similar). For the purposes of this assessment, the latter is assumed as this would represent the worst-case noise source.

- 5.9 The majority of noise at the site would therefore arise from external service yard activities, such as HGV and forklift movements and external loading/unloading occurring near the warehouses' openings (loading bays).
- 5.10 Using library data (based on measurements taken at similar sites over a number of years by Sharps Redmore) and the estimated vehicle numbers; noise levels were predicted at the sensitive buildings. The resulting values are shown in Table 5.2 below:

Table 5.2: Predicted noise levels at nearest receptors

Baseline Noise (façade corrected)			Site Yard Noise (façade corrected)		
Day $L_{Aeq, T}$	Night $L_{Aeq, T}$	Typical night L_{Amax}	Day L_{Ar}	Night L_{Ar}	Typical night L_{Amax}
dB			dB		
66	56	79	50	47	51

- 5.11 An average source-receiver distance of 100m was assumed (providing 40dB of attenuation over distance) as well as an overall barrier attenuation from unit buildings of 16 dB (see Figure B2 in Appendix B). A character correction of 3 dB was applied to account for just perceptible impulsivity.
- 5.12 Baseline noise levels were predicted over a 16 hour period (07:00-23:00) and 8 hours (23:00-07:00) for night. Site yard noise has been assessed based on BS4142:2014, with the reference time interval, 'T' being:

- 1 hour during the day; and
- 15 minutes during the night

Results are taken for the busiest hour of the day and the busiest 15 minutes of the night.

- 5.13 As a worst-case it was assumed that, in a busiest hour, a delivery would take place at every unit (i.e. 16 loading/unloading events) with noise occurring for half of this time. In a worst-case 15 minutes in the night it has been assumed that four loading events may take place simultaneously and occur throughout the entire 15 minute assessment period.
- 5.14 The nearest residential dwelling would, in the worst-case hour, be subject to levels of 50 dB, L_{Ar} in the day and 47 dB, L_{Ar} at night. This is the LOAEL for daytime hours but 3 dB above for night. Although noise levels at night are above the desirable LOAEL they are still 6 dB below the level at which impact could be significant, this is deemed acceptable as defined in BS 4142:2014 based on the context of the area (with an ambient level of 56 dB).

Assumptions Made

- 5.15 In order to calculate the predicted levels at receptors, the following conditions have been assumed:

- All loading/unloading would happen within a loading area; and either:
 - Level loading bays are used in all dock spaces; or
 - Side-loading takes place using forklift trucks
- No tonal reversing alarms would be used on site during night-time hours;
- No refrigerated vehicles (if required, on board refrigeration units would need to be would be connected to an electric hook up during loading/unloading);
- No vehicle (or other) radios on in the yard at night; and
- Forklift trucks are either electric or gas powered;

Noise from HGVs on public roads

- 5.16 At this stage it is not known how many (if any) HGVs would access the site on a given day, and from which direction these vehicles might approach. If the site were to be accessed solely from the south (along Barrowfield Road) it is highly unlikely that any existing residential properties would be significantly affected. However if there were more than 20 HGV movements in the 8 hour night-time period on Lidget Lane, then this would result in a significant adverse impact on adjacent residential façades.

Noise from fixed plant and equipment

- 5.17 Plant should be placed facing south wherever possible, away from any residential receptors and should operate under the following condition:

“The noise rating level emitted by all fixed plant on the site shall not exceed 49 dBA, between 2300 and 0700 hours or 55 dBA at any other time. These noise levels shall relate to a location one metre from the window to a habitable room of any nearby residential premises for night time or the centre of a garden area for the day time. The measurement and assessment shall be made according to BS 4142:2014.”

- 5.18 Given the distances, layout and screening involved and the scope for simple on-site noise control measures (such as selection of quieter plant, careful siting and orientation, enclosure and additional screening), if needed, these limit values would be readily achievable without the need for any novel or complex mitigation schemes.

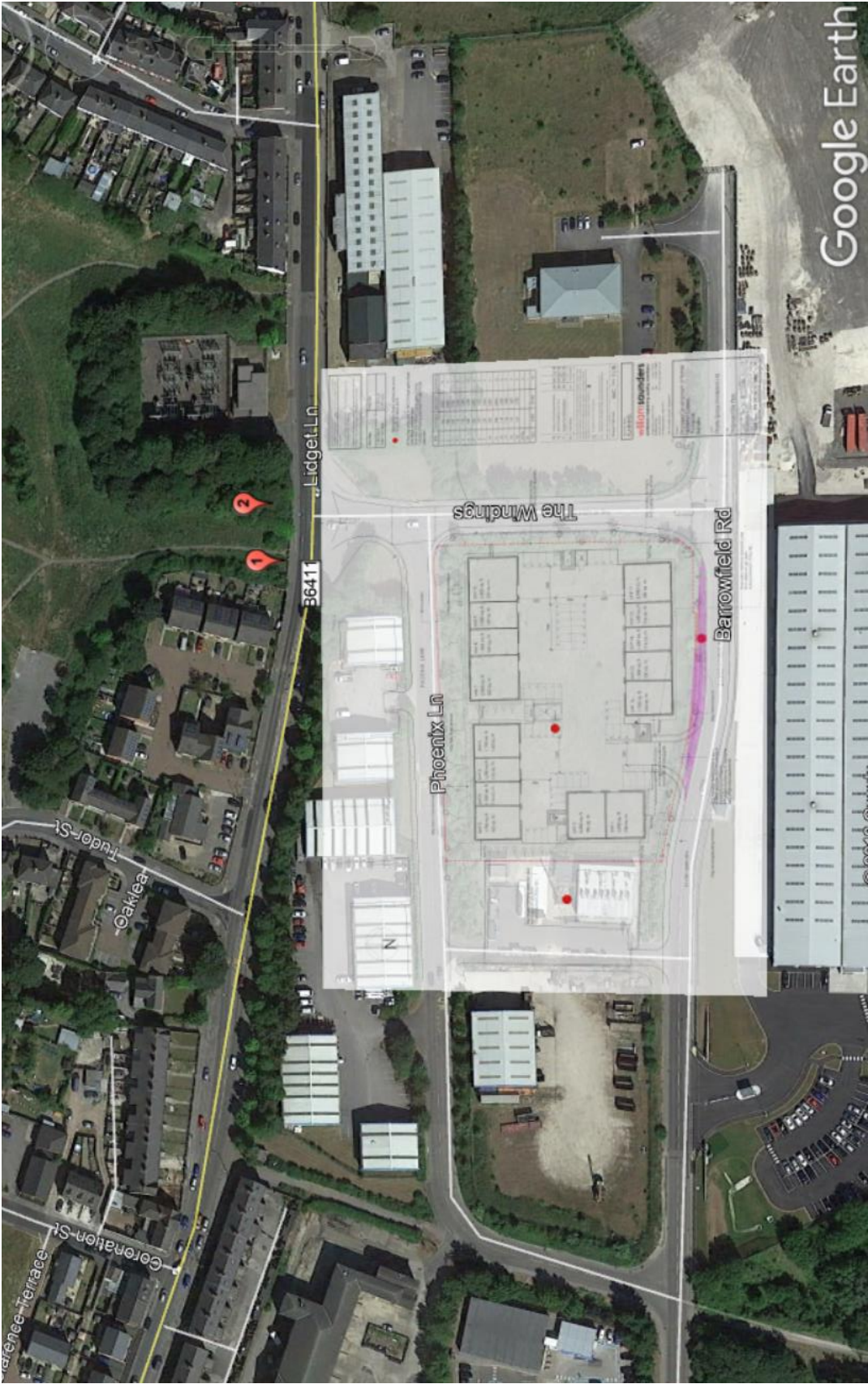
Conclusions

- 5.19 The site has been assessed using BS 4142:2014 as the most appropriate method for rating and assessing industrial sound. Based on the results obtained and levels predicted it can be demonstrated that the site can operate throughout both the day and night without any significant adverse impact from noise at the nearest residential properties; provided the site operates in accordance with assumptions set out in 5.15.
- 5.20 It is therefore concluded that noise from the proposed development would not cause a significant adverse impact on the health and quality of life of existing residents when assessed in accordance with the policy aims and guidance in the NPPF, NPSE, BS 8233:2014 and BS 4142: 2014.

APPENDIX A

PLANS

Figure A1: Satellite view indicating noise survey measurement position (with site plan overlay)



[illegible]

Site Area.	Total G.A.
2.130 Acres	25,750 sq.ft.
0.862 Hectares	2,392 sq.m.

Existing Mine Shaft - dotted line shows no build exclusion zone.

All fencing and gates to be 2.1m high galvanised steel black palisade type.
Note that the manual sliding gate is to be capable of being upgraded to electrically operated.

Unit	Area Scm	Area Sq Ft	Cov Faving
1	186	2,000	4
2	186	2,000	4
3	163	1,750	3
4	163	1,750	3
5	116	1,250	3
6	163	1,750	3
7	232	2,500	5
8	139	1,500	3
9	139	1,500	3
10	232	2,500	5
11	186	2,000	4
12	116	1,250	3
14	116	1,250	3
15	139	1,500	3
16	163	1,750	3
SH Dlt			
SH			3
Total	2,392	25,750	56

P3	Fencing, unit & parking amendments	SW	NAC12/18
P2	Additional parking for units 4 & 5.	SW	NAC07/18
P1	Issued for Information.	SW	NAC07/18

Rev.	Description	Drn	Wfd Date

Drawing Status
PLANNING.

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Project
Proposed Development at former
Hickleton Colliery,
Thurnscoe,
Barnsley.

Client
Priority Space (Hickleton) Ltd.

Title
Proposed Site Plan.

11525	SW	07/18	1:250	Scale	Sheet
Drawing/Document Reference					
Project	Originals	Date	Level	Type	Sub Number
11525 - WMS	XXX - XX	XX - XX	DR - A	1000!	S8 - P3

APPENDIX B

Noise Survey Details and Calculations

Figure B1: Continuous Noise Measurements (19:15 - 07:00 08-09/10/18)

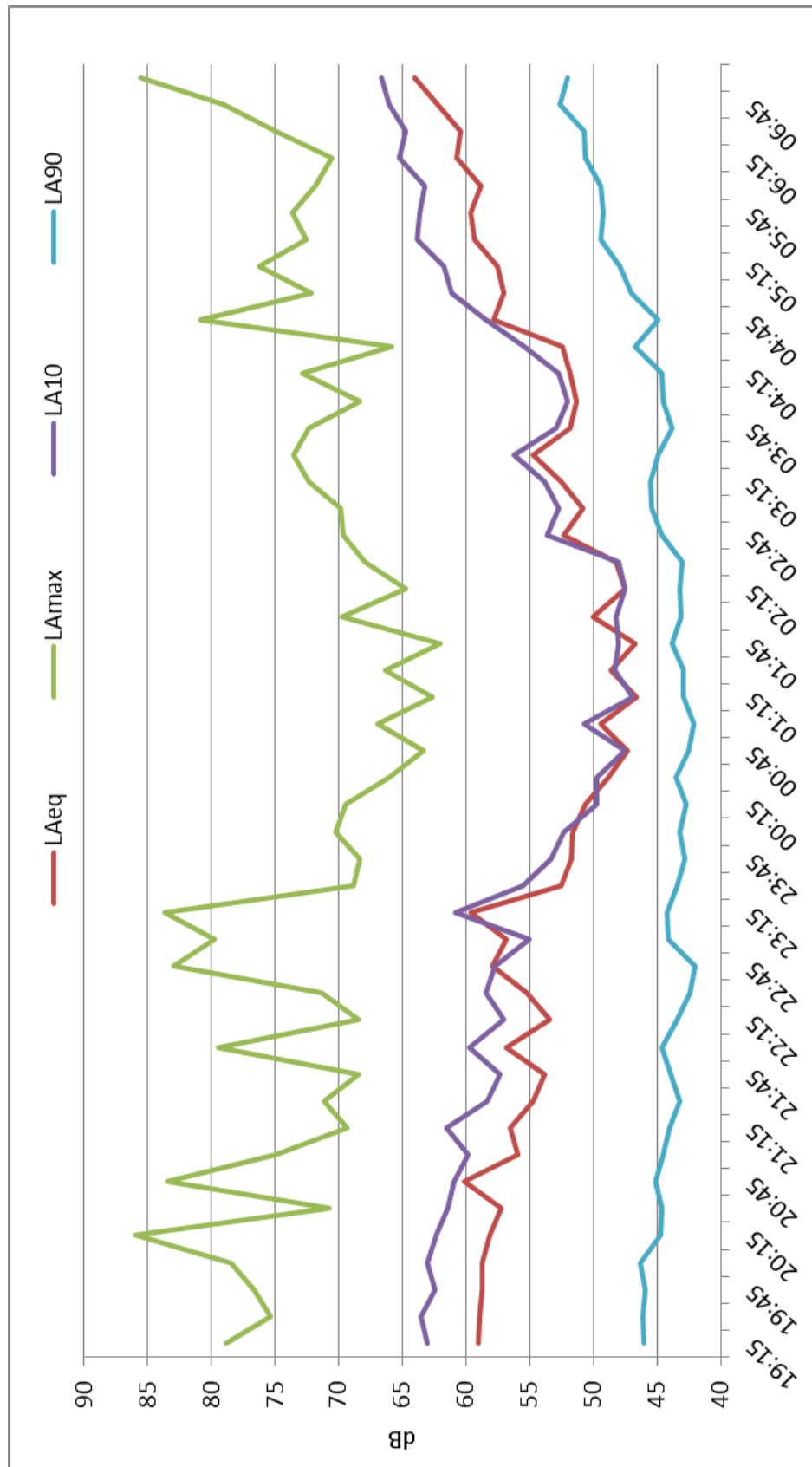
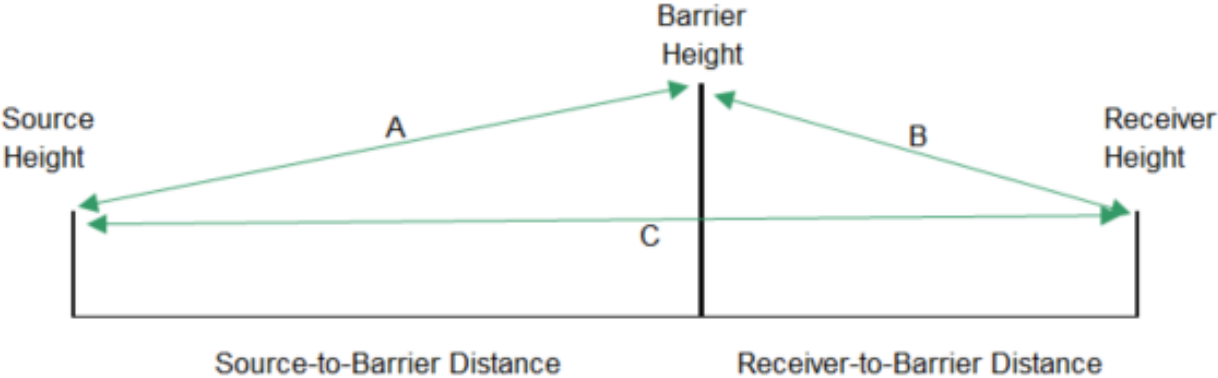


Table B1: Survey Notes (13:22 - 03:35 08-09/10/18)

Manned Measurements: Survey Notes						
Time	Weather: 18deg with light wind gusts (north east) / cloud cover 7/8 oktas	L _{Aeq}	L _{Amax}	L _{A90}	L _{A10}	L _{Amin}
13:22	Depot opposite: HGVs / car horns / loud voices / delivery clatters In between road traffic him from southern units can be made out above wind in trees Sound of clatters from dropped metal and reverse sirens occasionally audible from these units too L_{Amax} levels typically around 74 - 80 from general road traffic noise with some higher results from HGVs on junction and motorcycles passing on Lidget Lane HGVs out of junction = 6 (Largely skip lorries and buses) Busy road (Lidget Lane) Speed = 30mph but cars tend to speed	64	80	51	68	48
13:37	HGVs out of junction = 2 Large crashes from South (construction noise or typical operations?): 83 dB L_{Amax} Sound of LGV reversing in units adjacent receptor (tonal reverse sirens)	66	83	53	70	50
13:52	Cars tend to travel over the 20/30mph limit leading to higher incident noise levels	65	79	52	70	46
14:08	HGVs out of junction = 3 At beginning of measurement sound of hammering on metal from nearby units adjacent residential receptor L_{Amax} of 80dB from bus hiss	66	81	53	70	50
14:23	Road traffic noise continues to dominate / L _{Amax} (81 dB) from HGV travelling on Lidget Lane	67	81	55	71	51
19:15	Road traffic noise still dominant - cars and motorcycles still frequent but a notable drop in HGVs Paused our noise from pedestrians playing music	64	82	48	68	44
19:25	Car being jump-started over by junction (lots of revving for 5s) Between road traffic on Lidget Lane distant road traffic is audible as constant broadband noise to the south ~40-42 dB Bus on Lidget Lane and HGV out of junction (L_{Amax} = 79 dB) No sign of industrial activities in area at this time (no distinctive industrial noises present at receptor) Notable drop in road traffic on Lidget Lane since last measurement	62	79	43	66	40
19:40	More cars in this period than previous Noise levels in period entirely dependent on density of Lidget Lane road traffic - largely quiet in between vehicle passes L_{Amax} of 76 dB from HGV coming out of junction	64	76	47	69	44
03:05	Constant low hum from southern units Wind in trees (high wind gusts more prevalent than previous observations) - partially masks distant southern road noise Rail noise to west/south west? 4 cars in 15 mins on Lidget Lane	54	76	51	45	43
03:20	Wind in trees tends to dominate (stronger in this period than previous) Cars passing on Lidget Lane cause L_{Amax} of 60 dB	50	60	54	46	45

Figure B2: Barrier Calculations



Source-to-Barrier Distance	20.0 m
Receiver-to-Barrier Distance	85.0 m

Source Height	1.0 m
Receiver Height	4.5 m
Barrier Height	8.0 m

Path difference = 1.203 m
(a + b) - c

Frequency - Hz	63	125	250	500	1K	2K	4K	8K	Attenuation
Attenuation - dB	11	13	16	19	22	25	28	31	16.1 dBA