

DOGS TRUST, MERSEYSIDE

NOISE IMPACT ASSESSMENT

On behalf of:

Dogs Trust

Report No: P23-111-R01v1
April 2023

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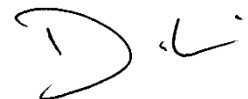
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1.0 INTRODUCTION

- 1.1 Hepworth Acoustics Ltd has been commissioned by Dogs Trust, to carry out a noise impact assessment in connection with a proposed planning application for alterations to their existing buildings and construction of new buildings at their site on Whiston Lane, Huyton, Merseyside.
- 1.2 The proposals will modernise the existing facility, bringing it up to the latest levels of animal welfare which have been in development by Dogs Trust over the intervening years. They include the removal of some existing buildings and the construction of new intake, rehoming and booked kennel buildings. The existing reception will be converted to a 'vet prep' area and the existing car park will be reconfigured to include a new road along the north-western boundary.
- 1.3 The proposals will not result in an intensification of the use of the site and instead simply reflect a modernisation of the animal welfare standards. Furthermore, no additional vehicle movements are anticipated as a result of the proposals. As such, this assessment focuses on the potential noise impact associated with dogs in the new buildings, along with any necessary building services equipment, and the new outdoor runs adjacent to the existing main kennel building.
- 1.4 The noise assessment has included:
- An inspection of the site and surrounding area;
 - Measurement of baseline noise levels at locations representative of the noise climate at the nearest dwellings over a 24-hour weekday period;
 - An assessment of the likely noise impact of use of the proposed new intake building and alterations by reference to source noise measurements that Hepworth Acoustics have undertaken at other Dogs Trust sites;
 - Recommendation of appropriate noise mitigation measures; and
 - Recommending appropriate noise limits for any new fixed plant/equipment to be installed at the site.
- 1.5 The various noise units and indices referred to in this report are described in **Appendix I**. All noise levels mentioned in the text have been rounded to the nearest decibel, as fractions of decibels are imperceptible.

2.0 SITE DESCRIPTION & PROPOSALS

- 2.1 The Dogs Trust Merseyside site is located adjacent to Whiston Lane in Huyton. The site is approximately 250m west of the M57 motorway and adjacent to the railway line between Prescott and Huyton stations.
- 2.2 The site is bounded by Whiston Lane to the west, the M57 to the east, a wooded area to the south and the high railway embankment to the north. The site vehicle access is off Whiston Lane with the main car park adjoining the Whiston Lane boundary, with the reception block and kennel blocks further to the east. There is staff accommodation located towards the south-western corner of the site, but this is intrinsically linked to the operation of the site and so is not considered to be a sensitive receptor for the purposes of this assessment.
- 2.3 The nearest unconnected dwellings are along the opposite side of Whiston Lane approximately 25m to the west of the site boundary. In other directions, the nearest dwellings are significantly further away and beyond either the M57 or the adjacent railway embankment.

Proposals

- 2.4 Proposals are for removal of the existing circular kennel blocks and construction of a new rectangular intake kennel building in the middle of the site, a new rehoming building to the southwest of the site near the car park, a training barn and a booked building to the furthest north-eastern end of the site. Two outdoor runs for use by dogs have also been proposed to the north and west of the new intake building. The existing reception building will be converted to a vet prep.
- 2.5 The proposed layout (and the topography of the intervening land to the north) is such that there will be no clear view of the new intake building or outdoor runs from nearby dwellings. In particular, the locations of the new outdoor runs are such that they will be generally screened from nearby dwellings by the buildings themselves. The proposed layout for the site is presented as **Figure 2**.
- 2.6 The outdoor runs will be used in the daytime only and all dogs will be located indoors overnight.

3.0 GUIDANCE

3.1 There is no nationally adopted or government guidance available on the assessment of potential noise impact associated with dog kennels or training facilities. British Standard 4142: 2014+A1:2019 '*Methods for rating and assessing industrial and commercial sound*' provides methods for rating and assessing sound of an industrial and/or commercial nature, but the scope of the guidance specifically excludes the assessment of noise from domestic animals. Nevertheless, the main thrust of BS 4142 which requires the noise from the new proposed development to be compared to the pre-existing background noise levels to determine potential impact is useful in this case. In order to determine potential noise impact from dogs we have therefore compared the potential average noise levels (in L_{Aeq}) from barking dogs with the pre-existing background noise levels. In addition, short-term peaks of noise (in L_{Amax}) from barking dogs have been compared with existing peaks of noise in the area.

3.2 In respect of new fixed plant/equipment noise, BS 4142 is directly applicable and so is described further below:

BS 4142

3.3 British Standard 4142:2014+A1:2019, *Methods for rating and assessing industrial and commercial sound* (referred to hereafter as BS 4142), is the appropriate guidance for assessing and controlling the potential noise impact at residential locations from noise sources such as new mechanical services plant installations.

3.4 BS 4142 requires a 'rating' level ($L_{Ar,Tr}$) to be calculated from the operation of the noise source and compared with the background sound level ($L_{A90,7}$) which is measured in the absence of the noise source, evaluated over a 1-hour period for daytime operations and a 15-minute period for night-time operations.

3.5 In respect of the representative background sound level, BS 4142 states that 'the objective is not simply to ascertain a lowest measured background sound level, but rather to quantify what is typical during particular time periods'.

3.6 The rating level ($L_{Ar,Tr}$) is based on the 'specific' sound level ($L_s = L_{Aeq,Tr}$) attributed to the operating noise source, with 'character corrections' added for sound sources where 'certain acoustic features can increase the significance of impact' at the residential locations.

- 3.7 The character correction applied to the specific sound level in order to obtain the rating level can take into account tonality, intermittency, impulsivity and characteristics otherwise distinctive against the prevailing noise climate in the area of the residential properties.
- 3.8 An initial estimate of the potential noise impact from the operating noise source is determined by comparing the difference between the background sound level and the rating level.
- 3.9 Regarding the outcome of the initial estimate, BS 4142 states that:
- Typically, the greater this difference, the greater the magnitude of the 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
 - The lower the 'rating' level is relative to the measured background level, the less likely it is that the operation 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.
- 3.10 Where the initial estimate of the impact needs to be modified due to the context, BS 4142: 2014 states that all pertinent factors should be taken into account regarding the context in which the noise occurs, including but not limited to:
- The absolute level of sound.
 - The character and level of the residual sound compared to the character of the specific sound; and,
 - The sensitivity of the receptor and whether dwellings or other premises used for residential purposes will incorporate design measures that ensure good internal and/or outdoor acoustic conditions such as acoustic screening.

4.0 NOISE SURVEY

- 4.1 A noise survey has been carried out to quantify the baseline environmental noise climate at the site.
- 4.2 The noise survey was carried out over 24 hours between the afternoon of Monday 17 April 2023 and the afternoon of Tuesday 18 April 2023 using automated data-logging equipment and so included daytime and night-time periods. Noise measurements were taken at two positions as described below and shown in **Figure 1**:
- A. At the south-eastern side of the site boundary in front of the existing staff flats to be representative of the dwellings further south/south-west on Whiston Lane; and
 - B. At the north-western site boundary within the car park, to be representative of the dwellings immediately opposite on Whiston Lane.
- 4.3 Noise measurements were taken as a series of consecutive 15-minute periods over the full duration of the survey and included one-third octave band analysis and audio recording. The measurements were taken with two NTi Audio XL2 sound analysers (serial nos. A2A-20361-E0 and A2A-20228-E0) with environmental enclosures, microphone and windshield. The microphones were mounted onto tripods/poles approximately 1.4m above local ground level in free-field conditions. Both sound analysers were field-calibrated before and after the survey with no variance observed. Weather conditions during the survey were generally dry, cloudy and calm with a daytime temperature of approximately 14°C and so considered to be suitable for the noise measurements.
- 4.4 The full results of the noise survey are shown in **Appendix II** and summarised in **Table 1** and **Table 2** below.
- 4.5 We have analysed the results to obtain the range of peaks of noise, the average residual noise and the mean and mode (most commonly occurring) background noise level during each daytime (07:00 – 19:00), evening (19:00 – 23:00) and night-time (23:00 – 07:00) period respectively.

Table 1: Summary of measured existing baseline noise levels at Location A.

Period	Summary of measured noise levels (dB)			
	Peaks of noise L_{AFmax}	Residual noise $L_{Aeq,T}$	Background noise L_{A90}	
			Mean	Mode
Daytime (0700-1900)	68 - 85	60	53	56
Night (2300-0700)	60 - 74	54	46	41

Table 2: Summary of measured existing baseline noise levels at Location B

Period	Summary of measured noise levels (dB)			
	Peaks of noise L_{AFmax}	Residual noise $L_{Aeq,T}$	Background noise L_{A90}	
			Mean	Mode
Daytime (0700-1900)	65 - 82	58	51	53
Night (2300-0700)	55 - 74	53	45	43

- 4.6 The main sources of noise at the site were found to be intermittent but regular road traffic on Whiston Lane, along with steady distant road traffic from the M57 to the east, and intermittent rail traffic on the railway line to the north. It is noted that whilst train pass-bys and vehicles manoeuvring in the car park influenced the measured peaks of noise levels at Location B to some extent, the passing trains and vehicle manoeuvres were not frequent enough to influence the background noise levels. There was no significant noise from dog barking at either of the measurement positions.

5.0 SOURCE NOISE LEVELS

5.1 Hepworth Acoustics has carried out numerous source measurements of noise from dogs barking in kennels, outdoor runs and training areas at other Dogs Trust sites. Of particular relevance to these proposals are the measurements we have taken in the vicinity of a modern intake kennel building and associated outdoor runs at the Shrewsbury Dogs Trust site as indicated in **Table 3**. The intake building at Shrewsbury is of similar size and design to that proposed at Merseyside and, whilst the outdoor runs are located further from the intake building, this layout means that it was possible to simultaneously measure combined noise levels from the intake building kennels and the outdoor runs each at a distance of 10m.

5.2 Noise levels were measured in consecutive 15-minute periods over a 48-hour midweek period at 10m back from kennel side of the building. With the results determined as follows:

Table 3: Measured typical worst-case intake block and outdoor run source noise levels (dB)

Location	L_{Amax}	$L_{Aeq,T}$
10m back from Intake block kennels and outdoor runs	63	47

5.3 It is noted that the average (i.e. L_{Aeq}) values were dictated by noise break-out from the intake kennels. At a measurement distance of 10m, the noise propagation from the row of kennels was equivalent to a 'line noise source'. The separation distance to the nearest dwellings at the Merseyside site are sufficiently high that the noise propagation will be equivalent to a 'point noise source'. Hence a line source propagation correction must be applied to the measured L_{Aeq} source noise levels to obtain the equivalent source level at 1m prior to calculating the corresponding value at the nearest dwellings using point source attenuation of sound. All peaks of noise are considered to attenuate as point sources. Peaks of noise are generally significantly lower at night because all dogs are indoors.

6.0 NOISE ASSESSMENT

Noise from Barking Dogs

- 6.1 Using the source noise levels measured at the Shrewsbury rehoming centre and taking account of the separation distances and any screening, we have calculated the likely resulting noise levels from the new/adjusted layout at the nearest dwellings to the Merseyside site.
- 6.2 The proposed new intake building, and outdoor runs are of very similar scale/size to that at Shrewsbury and so the measured source noise levels have been adopted as representative for this area. We have used combined source noise levels for kennels and outdoor runs measured at Shrewsbury as a basis for our calculations as a worst-case.
- 6.3 In respect of noise propagation to the dwellings opposite on Whiston Lane, we have included a nominal correction of -5 dB for partial screening of noise from the kennels and outdoor runs for each sensitive receptor location. For the new kennels and outdoor runs on the north/north-eastern sides of the buildings, the buildings themselves will act as effective acoustic barriers for the dwellings opposite on Whiston Lane and so a -10 dB screening correction has been applied. For the dwellings to the south on Whiston lane a nominal correction of -5 dB has been applied for partial screening attenuation.
- 6.4 No corrections have been applied for restricted angle of view (which is particularly the case in respect of new intake building kennel noise propagation to the south).
- 6.5 Attenuation of noise over distance has been applied as follows:
- For average noise levels in terms of L_{Aeq} , the separation distance from the centre of the source to the dwellings has been used; and
 - For peaks of noise in terms of L_{AFmax} , the separation distance between the nearest part of each area to the dwellings.
- 6.6 Our calculations, which are set out in **Appendix III**, have indicated the following resulting noise levels:

Table 4: Calculated noise levels outside nearby dwellings (dB)

Location	L_{Amax}	$L_{Aeq,T}$
Dwellings to the south on Whiston Lane	38	14
Dwellings opposite on Whiston Lane	44	19

- 6.7 The calculated noise levels are very low. The calculated peaks of noise associated with dogs in outdoor runs during the daytime are at least 21 dB below the corresponding lowest existing daytime peaks of noise, and lower than even the existing night-time peaks of noise (note that actual peaks of noise will be significantly lower at night because all dogs will be indoors). Also, the calculated average noise levels are at least 24 dB below the lowest representative night-time background noise levels.
- 6.8 As such, we conclude that there will be no significant noise impact from barking dogs as a result of the proposals.

Plant & Equipment Noise

- 6.9 No details of proposed plant and equipment to be installed as part of the proposals are available at this stage. We do however understand that a sustainable approach is proposed such that equipment is likely to be limited to a small number of plant items including air source heat pumps, etc.
- 6.10 We consider that in order to adequately control the impact of new plant/equipment noise, the combined noise from all new plant items should be controlled to a rating level no higher than the representative background noise level (i.e. a BS 4142 initial numerical assessment of 'low impact'). To obtain the representative background sound level, we have adopted the lowest of the mode or mean for each period throughout the survey. On this basis, the appropriate noise design limits for control of plant noise are as follows:

Table 5: Recommended noise limits for new fixed plant/equipment

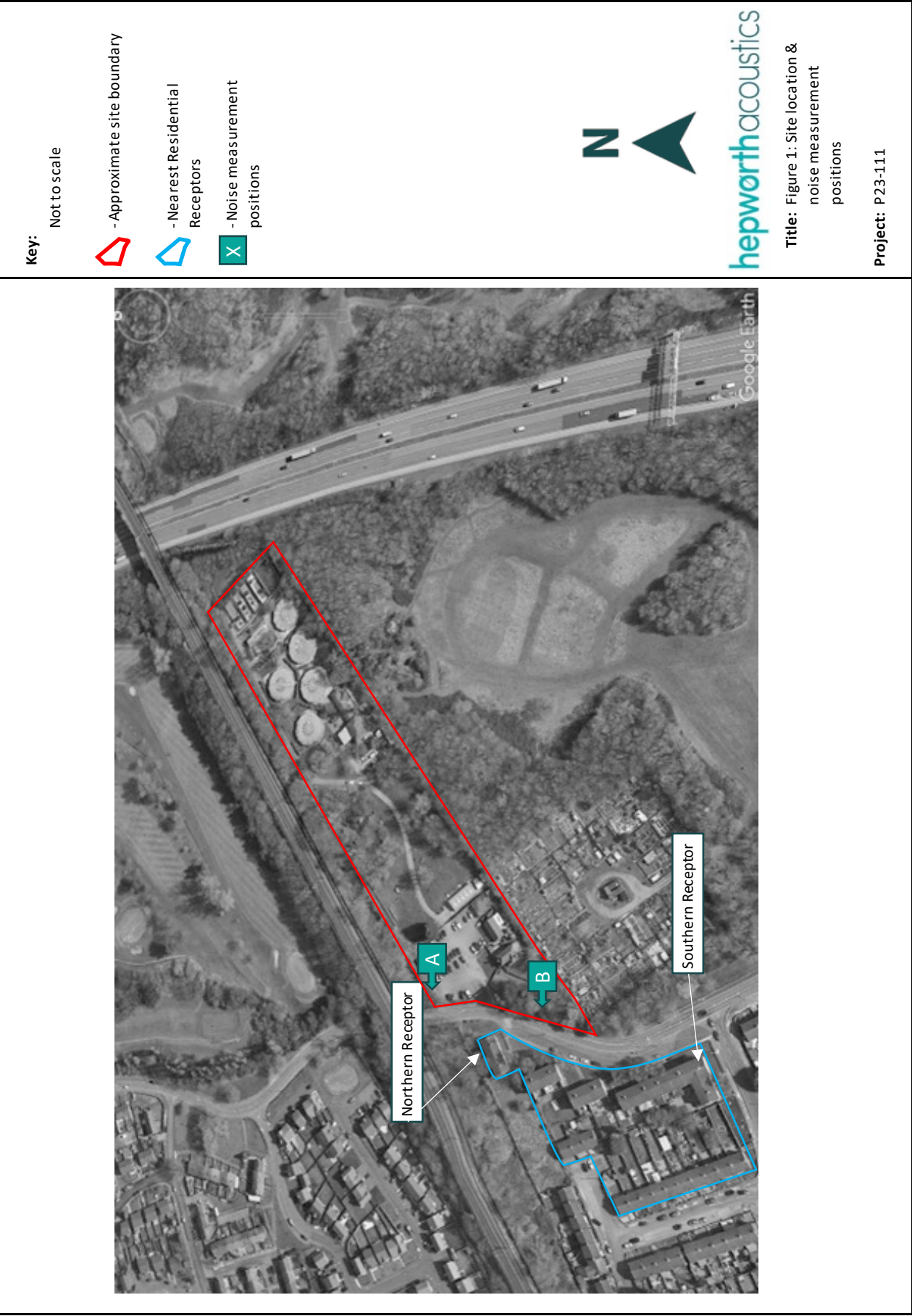
Location	Noise rating level limits for all new plant combined (dB)	
	All items that operate in the daytime (07:00 – 23:00)	All items that operate at night (23:00 – 07:00)
Dwellings opposite on Whiston Lane	51	43
Dwellings further south on Whiston Lane	53	41

- 6.11 These noise limits should be fairly straight-forward to achieve, subject to careful selection and siting of equipment. If necessary, proprietary acoustic enclosures or screens can be used to reduce noise propagation to the nearest dwellings.
- 6.12 If necessary, the need to ensure that noise from new plant/equipment is controlled to within the above limits can be secured with an appropriate planning condition.

- 6.13 We therefore conclude that subject to appropriate control of plant/equipment noise, there will be no unacceptable noise impact associated with the proposals.

7.0 SUMMARY

- 7.1 Hepworth Acoustics Ltd was commissioned by Dogs Trust, to carry out a noise impact assessment in connection with a proposed planning application for alterations to their existing building and construction of a new intake kennel building at their site off Whiston Lane, Huyton, Merseyside. The proposals are intended to bring the site up to modern animal welfare standards and do not reflect an intensification of the use of the site.
- 7.2 The assessment has included an inspection of the site and undertaking a baseline noise survey to establish the existing noise climate at appropriate locations covering daytime and night-time periods for 24-hours during the week.
- 7.3 Using source noise levels measured by Hepworth Acoustics at another Dogs Trust site, we have calculated the likely resulting noise levels outside the nearest dwellings associated with barking dogs. The findings have indicated that the noise from operation of the new kennels and associated outdoor runs will be well below the existing prevailing noise climate of the area.
- 7.4 No details of proposed fixed/plant equipment are available at this stage, so we have recommended appropriate noise design limits to ensure that there is no unacceptable noise impact. The need to ensure that noise from new plant/equipment is controlled to within the above limits can be secured with an appropriate planning condition.
- 7.5 We therefore conclude that subject to appropriate control of plant/equipment noise, there will be no unacceptable noise impact associated with the proposals.





Appendix I: Noise Units & Indices

Sound and the decibel

A sound wave is a small fluctuation of atmospheric pressure. The human ear responds to these variations in pressure, producing the sensation of hearing. The ear can detect a very wide range of pressure variations. In order to cope with this wide range of pressure variations, a logarithmic scale is used to convert the values into manageable numbers. Although it might seem unusual to use a logarithmic scale to measure a physical phenomenon, it has been found that human hearing also responds to sound in an approximately logarithmic fashion. The dB (decibel) is the logarithmic unit used to describe sound (or noise) levels. The usual range of sound pressure levels is from 0 dB (threshold of hearing) to 120dB (threshold of pain).

Due to the logarithmic nature of decibels, when two noises of the same level are combined together, the total noise level is (under normal circumstances) 3 dB(A) higher than each of the individual noise levels e.g. 60 dB(A) plus 60 dB(A) = 63 dB(A). In terms of perceived 'loudness', a 3 dB(A) variation in noise level is a relatively small (but nevertheless just noticeable) change. An increase in noise level of 10 dB(A) generally corresponds to a doubling of perceived loudness. Likewise, a reduction in noise level of 10 dB(A) generally corresponds to a halving of perceived loudness.

The ear is not equally sensitive to sound at all frequencies. It is less sensitive to sound at low and very high frequencies, compared with the frequencies in between. Therefore, when measuring a sound made up of different frequencies, it is often useful to 'weight' each frequency appropriately, so that the measurement correlates better with what a person would actually hear. This is usually achieved by using an electronic filter called the 'A' weighting, which is built into sound level meters. Noise levels measured using the 'A' weighting are denoted dB(A) or dBA.

Frequency and Hertz (Hz)

As well as the loudness of a sound, the frequency content of a sound is also very important. Frequency is a measure of the rate of fluctuation of a sound wave. The unit used is cycles per second, or hertz (Hz). Sometimes large frequency values are written as kiloHertz (kHz), where 1 kHz = 1000 Hz.

Young people with normal hearing can hear frequencies in the range 20 Hz to 20 kHz. However, the upper frequency limit gradually reduces as a person gets older.

Glossary of Terms

When a noise level is constant and does not fluctuate, it can be described adequately by measuring the dB(A) level. However, when the noise level varies with time, the measured dB(A) level will vary as well. In this case it is therefore not possible to represent the noise climate with a simple dB(A) value. In order to describe noise where the level is continuously varying, a number of other indices can be used. The indices used in this report are described below.

$L_{Aeq,T}$ This is the A-weighted 'equivalent continuous noise level' which is an average of the total sound energy measured over a specified time period. In other words, $L_{Aeq,T}$ is the level of a continuous noise which has the same total (A-weighted) energy as the real fluctuating noise, measured over the same time period. It is increasingly being used as the preferred parameter for all forms of environmental noise.

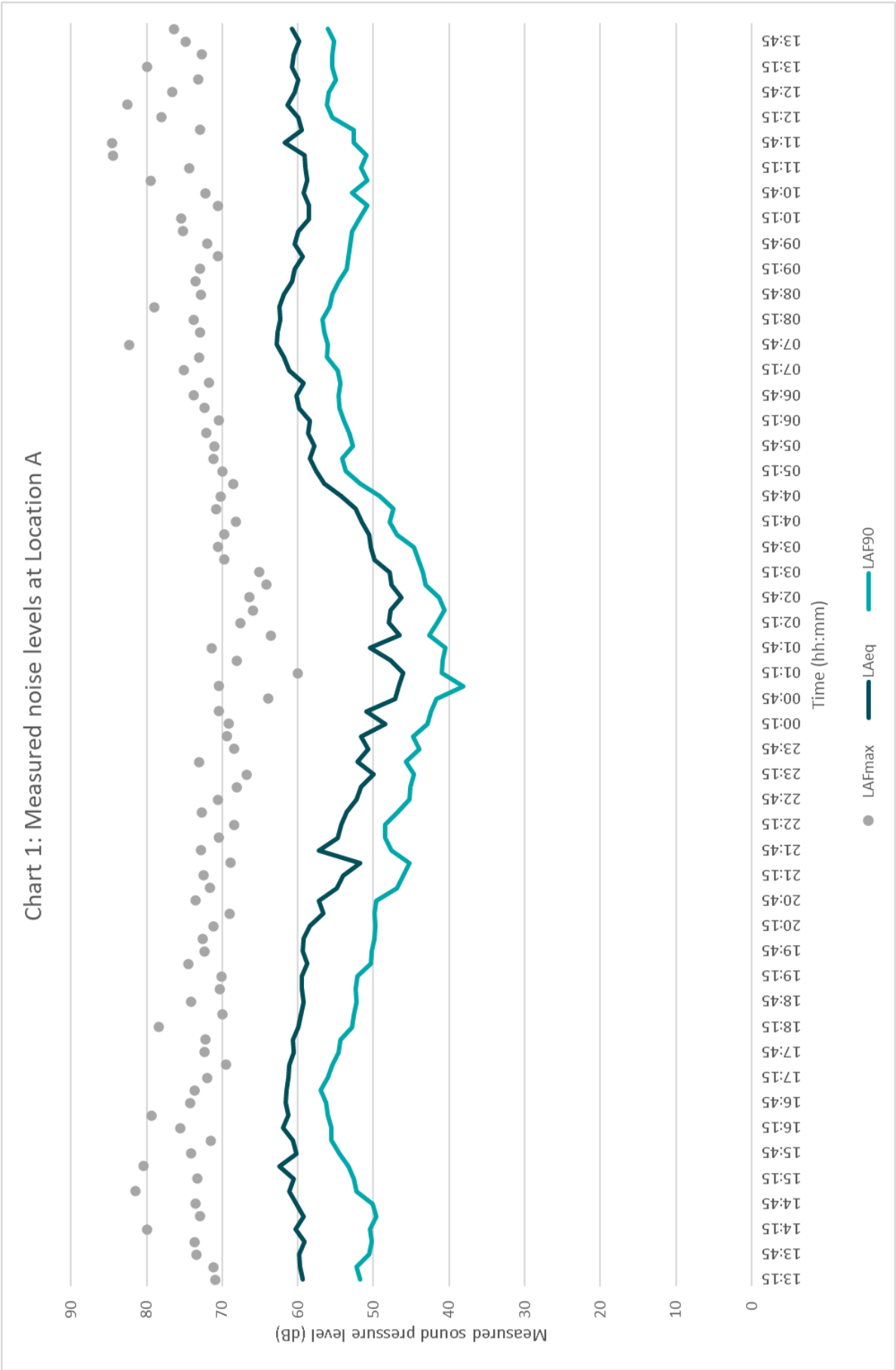
L_{AFmax} This is the maximum A-weighted noise level that was recorded during the measurement period in terms of 'Fast' time weighting.

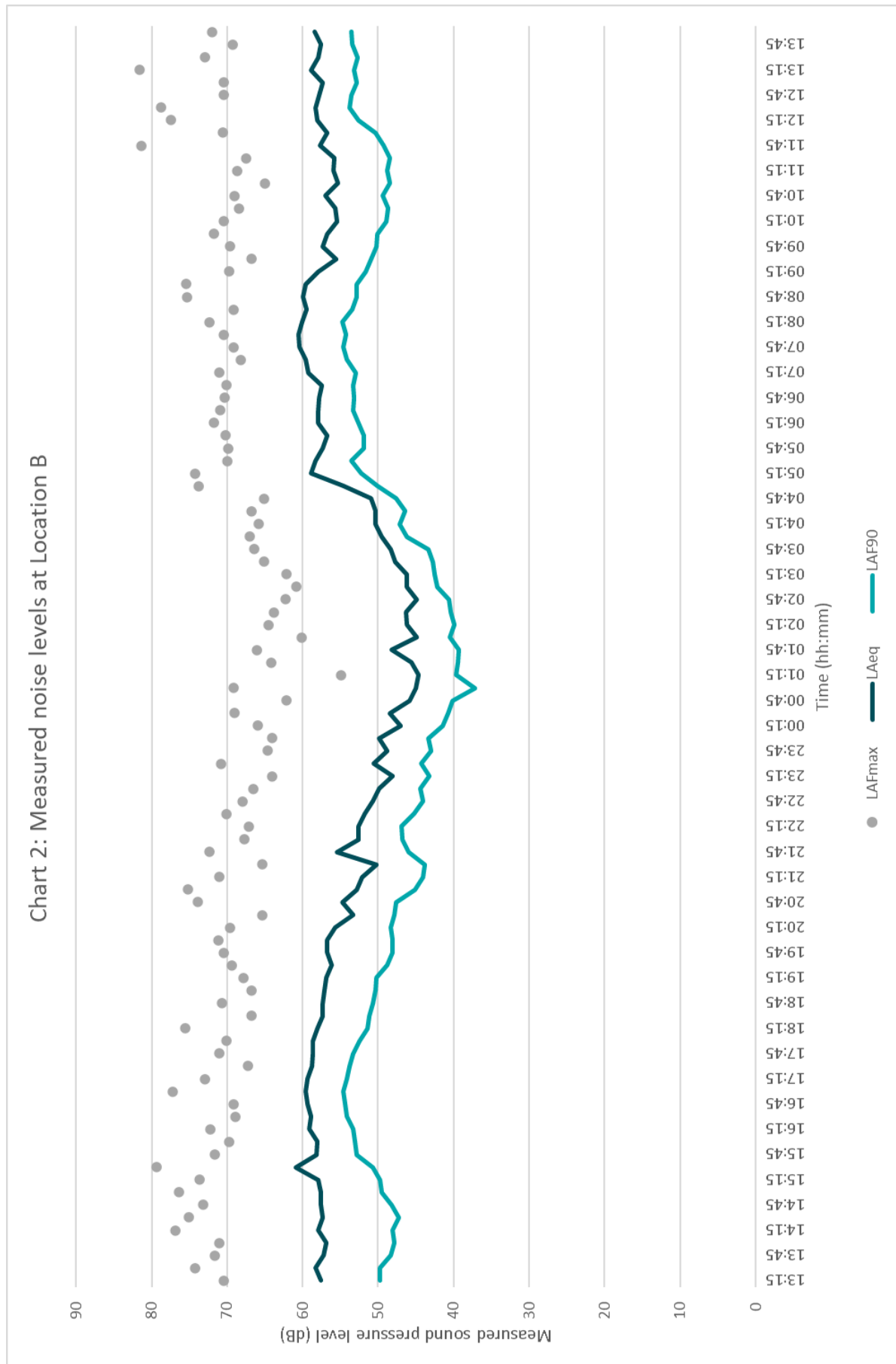
$L_{A90,T}$ This is the A-weighted noise level exceeded for 90% of the time period. $L_{A90,T}$ is used as a measure of background noise.

Appendix II: Noise Survey Results

Date(s):	Monday 17 April 2023 – Tuesday 18 April 2023
Weather	Generally dry, cloudy, generally calm and cold (14°C)
Equipment	Two NTi XL2 'Class 1' sound level meters (s/n: A2A-20361-E0 & A2A-20228-E0) with associated calibrator and environmental outdoor monitoring kit

Please see charts overleaf:





Appendix III: Noise Calculations

Calculations to northern dwelling on Whiston Lane

Source	Source noise levels at 10m		Distance (m)		Screening correction (dB)	Resulting noise levels	
	dB L _A F _{max}	dB L _A eq	To nearside edge	To centre		dB L _A F _{max}	dB L _A eq
New intake building and runs (northeast)	63	47	195	200	-10	27	1
New intake building and runs (northwest)	63	47	215	220	-5	31	5
New intake building and runs (southeast)	63	47	220	230	-10	26	0
New rehoming building and runs (northeast)	63	47	115	120	-10	32	5
New rehoming building and runs (northwest)	63	47	90	100	0	44	17
New rehoming building and runs (southeast)	63	47	105	115	-5	38	11
New booked building and runs (northeast)	63	47	280	290	-10	24	-2
New booked building and runs (southwest)	63	47	270	275	-5	29	3
New booked building and runs (southeast)	63	47	280	290	-10	24	-2
Overall						44	19

Calculations to southern dwelling on Whiston Lane

Source	Source noise levels at 10m		Distance (m)		Screening correction (dB)	Resulting noise levels	
	dB L _A F _{max}	dB L _A eq	To nearside edge	To centre		dB L _A F _{max}	dB L _A eq
New intake building and runs (northeast)	63	47	260	265	-5	30	<0
New intake building and runs (northwest)	63	47	290	295	-5	29	3
New intake building and runs (southeast)	63	47	260	270	0	35	<1
New rehoming building and runs (northeast)	63	47	175	180	-10	28	2
New rehoming building and runs (northwest)	63	47	160	170	-5	34	<2
New rehoming building and runs (southeast)	63	47	175	180	0	38	12
New booked building and runs (northeast)	63	47	370	390	-10	22	<3
New booked building and runs (southwest)	63	47	360	365	0	32	6
New booked building and runs (southeast)	63	47	350	360	-5	27	<4
Overall						38	14