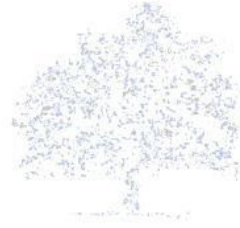


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**Proposed variation of hours of use and vehicle movements,
Holmes Lane Stores, Holmes Lane, Winterton, Scunthorpe**

BS4142:2014+A1:2019 Sound Assessment Report

Document ref. 03860-130102

16/04/2025

**On behalf of
Woodyfuel Ltd**

**Prepared by
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1.0 INTRODUCTION

- 1.1 Blue Tree Acoustics has been appointed by Woodyfuel Ltd to carry out a noise assessment for a proposed variation of hours of use and vehicle movements at the existing Woodyfuel Ltd wood-processing and biomass facility at Holmes Lane Stores, Holmes Lane, Winterton, Scunthorpe.
- 1.2 We understand that the proposal is to vary Condition 6 and Condition 11 of the existing permission (ref. PA/2020/1748) to change the operating hours and the tonnage of wood processed onsite, respectively.
- 1.3 We understand that pre-existing Condition 6 and Condition 11 state:

“Condition 6:

The hours of operation for the wood processing and biomass facility hereby permitted shall be as follows:

- 07:00 – 18:00 hrs Monday to Friday
- 07:00 – 14:00 hrs on Saturdays
- No operation Sundays, Public and Bank Holidays
- No HGV movements shall take place on site outside of the following hours.

All deliveries shall take place during hours of operation.

Reason: To define the terms of the permission and in the interests of safeguarding residential amenity.

[...]

Condition 11:

A maximum of 13,000 tonnes per annum of wood shall be processed on site.

Reason: To define the terms of the permission and in the interests of safeguarding residential amenity.”

- 1.4 We understand that the proposed variation of the Condition 6 operating hours is:

“The hours of operation for the wood processing and biomass facility hereby permitted shall be as follows:

- 07:00 – 19:00 hrs Monday to Friday
- 07:30 – 14:30 hrs on Saturday
- No operation Sundays, Public and Bank Holidays

HGV movements shall take place during the following hours:

- 06:00 – 19:00 hrs Monday to Friday
- 07:30 – 14:30 hrs on Saturday
- No HGV movements Sundays, Public and Bank Holidays”

- 1.5 We understand that there is no nighttime working, other than the proposed vehicle movements between 0600-0700 hours, and that working hours during weekends and bank holidays will be unchanged.
- 1.6 We understand that the proposed variation of Condition 11 is to increase processed wood tonnage from 13,000 tonnes to 50,000 tonnes per annum.
- 1.7 This Woodyfuel Ltd site is situated around 1km east of Winterton and around 8km northeast of Scunthorpe. The premises comprise former agricultural buildings and external hardstanding/yard areas in use for storing and drying chipped wood material. The main yard area situated to the west of the buildings is used for HGV access, storage of chipped wood, and operation of a screener/grader. The main yard is enclosed by walls formed using large concrete blocks stacked to a height of around 3.0m.
- 1.8 The noise impact assessment has included:
- a) Inspection of the site and surroundings.
 - b) Review of the proposed operational variations as provided by the Client.
 - c) Background sound monitoring survey undertaken at the site.
 - d) Measurements of typical operating sound levels undertaken at the site.
 - e) Consideration of noise impact and sound control measures required to reduce sound impact in accordance with *British Standard 4142:2014+A1:2019 'Methods for rating and assessing industrial and commercial sound'* (BS4142:2014).
- 1.9 A glossary of technical terminology and parameters used in this report is provided in Appendix 1.

2.0 NOISE SURVEY

2.1 The assessment of sound from industrial and commercial sources (including BS4142 assessment) typically requires quantification and consideration of the following key aspects:

- a) Specific sound source – This is the sound source to be assessed.
- b) Specific sound level – This is the sound level of the specific sound source at the assessment location, which is typically the nearest noise-sensitive receptor, such as a nearby dwelling. The specific sound level can be derived by direct measurement of the specific sound sources, or from manufacturer's data. Described in terms of L_{Aeq} .
- c) Ambient sound level – This is the totally encompassing sound at the assessment location at a given time. This usually comprises many sources, near and far, as well as the specific sound where present. Described in terms of L_{Aeq} .
- d) Residual sound level – This is the ambient sound remaining at the assessment location in the absence of the specific sound, e.g. when the specific sound source is turned off or suppressed to such a degree that it does not contribute to the ambient sound. Residual sound levels can be used to correct ambient sound levels as a means of removing the other sound levels from the total, so as to derive the specific sound level. Described in terms of L_{Aeq} .
- e) Background sound level – This is the sound pressure level during the quietest times, in the absence of the specific sound source. It is the level exceeded for 90% of the measurement time during the period to be assessed. Described in terms of L_{A90} .
- f) Reference time interval – This is the specified interval over which the specific sound is assessed. BS4142 defines this as 1 hour during daytime (0700-2300 hours) and 15 minutes during nighttime (2300-0700 hours).

2.2 Unattended environmental sound level monitoring was undertaken by Blue Tree Acoustics from Monday 09/12/2024 through Thursday 19/12/2024. These measurements were taken at a secure, accessible location (Location 1, indicated in Figure 1) at the eastern boundary of the Woodyfuel Ltd site, which is opposite the garden of the nearest residential property to the site (situated on Holmes Lane). Location 1 is therefore considered to be suitably representative of the nearest noise-sensitive receptor.

- 2.3 The unattended logging measurements were made at Location 1 over a series of contiguous 15-minute periods. The instrument used for these measurements was 1no Rion NL-52 Type 1/Class 1 integrating sound level meter. The meter was within a valid period of laboratory calibration. Calibration checks were carried out both before and after the measurements, with minimal variance observed and values being within 0.2dB of the stated reference value. A proprietary environmental windshield was fitted to the microphone, and the measurements were made with the microphone mounted on a tripod at 1.5m height above local ground level. Noise was measured in terms of broadband A-weighted indices, and at 1/3 octave bands from 50Hz to 10kHz.
- 2.4 Attended sound level measurements were also taken at the Woodyfuel Ltd premises on Thursday 19/12/2024 to obtain source sound level data for the existing site operation.
- 2.5 The instrument used for this attended survey was 1no Rion NA-28 Type 1/Class 1 integrating sound level meter. The meter was within a valid period of laboratory calibration. Calibration checks were carried out both before and after the measurements, with minimal variance observed and values being within 0.2dB of the stated reference value. A proprietary environmental windshield was fitted to the microphone. The measurements were made with the microphone mounted on a tripod at approximately 1.5m height above local ground level, except for the drying fan louvre measurements, where the microphone was elevated above head height to achieve 1m distance from the sound source. Noise was measured in terms of broadband A-weighted indices, and at 1/3 octave bands from 50Hz to 10kHz.
- 2.6 The weather conditions during the noise surveys were variable, and measurements taken during periods of rainfall or high windspeeds have been excluded from this assessment. Archival weather data from a local weather station is presented in Appendix 3.
- 2.7 The measurement results are detailed in Appendix 2, with the unattended logging survey data being summarised in the table below.

Table 1: Free-field external sound levels at Location 1

| Time period | dB L _{Aeq,15min} | dB L _{Amax,15min} | dB L _{A10,15min} | dB L _{A90,15min} |
|--------------------------------|---------------------------|----------------------------|---------------------------|---------------------------|
| Daytime (0700-2300 hours) | 30 - 61 | 45 - 92 | 33 - 59 | 21 - 47 |
| Nighttime (2300-0700 hours) | 21 - 58 | 30 - 91 | 21 - 61 | 19 - 42 |

- 2.8 Being a rural location, the prevailing sound levels were generally low, with occasional noisy events. The average daytime ambient sound level was 47dB $L_{Aeq,0700-2300hours}$, and the average nighttime ambient sound level was 43dB $L_{Aeq,2300-0700hours}$. Ambient sound levels during the current operating hours were 48dB $L_{Aeq,0700-1800hours}$. Residual sound levels during the proposed extended operating hours were 49dB $L_{Aeq,0600-0700hours}$ and 47dB $L_{Aeq,1800-1900hours}$.
- 2.9 As well as noise generated by the Woodyfuel Ltd site operation, other typical existing sources of environmental sound include distant traffic, occasional aircraft, occasional passing local vehicles and/or agricultural machinery, and wildlife. Historically, there would have been noise generated by previous uses of the Holmes Lane Stores site, most recently understood to be as a farm workshop with potato storage and grading – i.e. noise generation of an industrial or commercial character from the site is long-established. The most prominent noise source from the current Woodyfuel Ltd operation impacting upon the Location 1 measurements was occasional use of the yard area at the eastern end of the site for parking HGVs.

3.0 OPERATIONAL SOUND SOURCE ASSESSMENT

- 3.1 Measurements were taken of source sound levels during typical work activity onsite, as presented in Appendix 2. These represent the most significant external noise-generating activities understood to take place at the site. Figure 2 indicates where these work activities occur around the site, and photographs of activities witnessed are presented in Appendix 2.
- 3.2 Deliveries of chipped wood are made by HGVs accessing the main yard entrance from Holmes Lane (as indicated in Figure 2), and they usually proceed to the weighbridge. Material is either tipped in the yard or unloaded via walking floor into the main building. The Hyundai wheeled loader is active in the yard throughout the day in a variety of roles, including moving/sorting chipped wood storage, loading the screener, and loading HGVs. The boilers operate with the drying floors when drying of material is required. There is a louvre in each of the front and rear elevations of the building to the drying fans. We understand that acoustic attenuators have been fitted behind the louvres. Additionally, most of the operation takes place with roller shutters open to the internal storage areas. The Kramer wheeled loader was observed loading a DAF tipper via an open doorway to the front yard/hardstanding area. We understand that these various activities could potentially take place simultaneously within a 1-hour operating period. These activities are representative of the works expected for the proposed increase in operational capacity to 50,000 tonnes per annum.
- 3.3 We understand that the increased operating hours and associated operational capacity will necessitate HGV movements between 0600-0700 hours. There will be no use of the drying floors and boilers, or operation of the screener, during this period.
- 3.4 Based on the above, calculations have been undertaken to predict the operational sound levels expected at the nearest residential property on Holmes Lane during the current working hours and proposed extended 1800-1900 hours operation and proposed extended 0600-0700 hours operation. The calculations are presented in Appendix 4, and allow for distance and screening attenuation to the nearest residential property on Holmes Lane, as well as 'on-time' for activities that do not operate continuously throughout the assessment period. The Appendix 4 calculation results for the different calculation scenarios are summarised in the following table.

Table 2: Calculated operational external sound levels at the nearest residential receptor

| Calculated operating level scenario | | dB L _{Aeq} |
|-------------------------------------|---|---------------------|
| Table A4.1: | Weekday daytime working hours – All sources operating | 34 |
| Table A4.2: | Weekday daytime working hours – All sources operating, excluding screener / grader | 27 |
| Table A4.3: | Weekday nighttime working hours – Vehicle sources only | 28 |

- 3.5 The calculated total sound level during current weekday working hours is found to be 34dB L_{Aeq}. This is 14dB below the prevailing ambient sound level at the nearby house during the proposed 0600-0700 hours operation, and 4dB below the representative background sound level at the nearest house during these proposed hours of weekday operation. The calculated noise impact during the currently permitted hours is therefore low, and unlikely to be intrusive at the noise-sensitive receptor.
- 3.6 We understand it is requested that comparison be made with the predicted sound levels in the noise report provided for planning submission – Environmental Noise Solutions (ENS) report ref. NIA/9538/21/9539/v3/Holmes Lane Stores, dated 01/03/2021. The ENS report does not fully follow the BS4142 methodology, and provides separate assessments for plant noise, service yard noise, and HGV movements. The report also states that shredder noise is not included in the assessment, as proposals at the time were for this to be a temporary item.
- 3.7 The total noise predicted for plant, service yard, and HGV movements stated in the ENS report is therefore 40dB L_{Aeq} at NSR1, which is understood to represent the nearest dwelling on Holmes Lane. This value can be compared with the Table A4.2 calculation result presented in Table 2 of the present report, which predicts a level of 27dB L_{Aeq} at this receptor – i.e., this indicates that current sound levels are 13dB lower than those predicted in 2021. This is considered partly due to the mitigation measures recently implemented on the site (e.g. attenuators fitted to the fan louvres and concrete block wall around the yard), although it should be noted that there will be some difference due to uncertainty in the different calculations between the ENS report and the present report.
- 3.8 The predicted total sound level during current weekday working hours of 34dB L_{Aeq} is also representative of operational sound levels expected during the proposed 1800-1900 hours

operation. This is 13dB below the prevailing ambient sound level at the nearby house during the proposed 1800-1900 hours operation, and equal to the representative background sound level at the nearest house during these proposed hours of weekday operation. The predicted noise impact during the proposed 1800-1900 hours operation period is therefore generally low in terms of absolute sound levels, but likely to be discernible at times at the noise-sensitive receptor.

- 3.9 The predicted total sound level during the proposed 0600-0700 hours operation is found to be 28dB L_{Aeq} . This is 21dB below the prevailing ambient sound level at the nearby house during the proposed 0600-0700 hours operation, and 7dB below the representative background sound level at the nearest house during these proposed hours of weekday operation. The predicted noise impact during the proposed 0600-0700 hours operation period is therefore low, and unlikely to be intrusive at the noise-sensitive receptor.
- 3.10 It should be noted that the above assessment is based on the dwelling location nearest to the Woodyfuel Ltd site. Other residential properties in the area are at greater distances from the site, and therefore the predicted noise impact upon them will be lower.
- 3.11 The following section considers the predicted noise impact with regard to BS4142:2014 for the proposed extended operating periods.

4.0 BS4142:2014+A1:2019 COMMERCIAL/INDUSTRIAL SOUND ASSESSMENT

4.1 The most relevant British Standard for assessing sound impact from commercial and industrial premises upon residential property is *British Standard 4142:2014+A1:2019 'Methods for rating and assessing industrial and commercial sound'* (BS4142:2014). This requires the level of sound radiating from the proposed, new, modified or additional source(s) of sound of an industrial and/or commercial nature (in L_{Aeq}) to be compared with the existing Background Sound Level (L_{A90}) at any nearby residential property.

4.2 The scope of BS4142 states:

"1.1 This British Standard describes methods for rating and assessing sound of an industrial and/or commercial nature, which includes:

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

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.

1.2 This standard is applicable to the determination of the following levels at outdoor locations:

- a) rating levels for sources of sound of an industrial and/or commercial nature;*
and
- b) ambient, background and residual sound levels, for the purposes of:*
 - 1) investigating complaints;*
 - 2) assessing sound from existing, proposed, new, modified or additional source(s) of sound of an industrial and/or commercial nature; and*

- 3) *assessing sound at proposed new dwellings or premises used for residential purposes.*

1.3 The determination of noise amounting to a nuisance is beyond the scope of this British Standard.

Sound of an industrial and/or commercial nature does not include sound from the passage of vehicles on public roads and railway systems.

The standard is not intended to be applied to the rating and assessment of sound from:

- a) recreational activities, including all forms of motorsport;*
- b) music and other entertainment;*
- c) shooting grounds;*
- d) construction and demolition;*
- e) domestic animals;*
- f) people;*
- g) public address systems for speech; and*
- h) other sources falling within the scopes of other standards or guidance.*

The methodology set out in Clauses 7, 8, and 9 of this standard is not intended to be used to assess the extent of the impact at indoor locations. Internal sound levels can be taken into account as outlined in Clause 11.

The standard is not intended to be applied to the assessment of indoor sound levels.

The standard is not applicable to the assessment of low frequency noise.”

4.3 The standard describes various methods for determining whether a correction or corrections should be applied to reflect the prominence of characteristic features in the industrial/commercial specific sound experienced at the assessment location. In subjective assessment, if the industrial/commercial sound has a tonal element that is just perceptible at the receptor, a 2dB penalty can be applied. If the tone is clearly perceptible, a 4dB penalty can be applied. If the tone is highly perceptible, a 6dB penalty can be applied. The standard also describes two objective methods for assessing tonal sound which may apply a penalty of up to 6dB.

4.4 Similarly, a penalty of 3dB can be applied for a sound that has impulsivity that is just perceptible. If the impulsivity is clearly perceptible, a 6dB penalty can be applied. If the impulsivity is highly

perceptible, a 9dB penalty can be applied. The standard also describes an objective method for assessing impulsivity which may apply a penalty of up to 9dB.

- 4.5 If the sound has clearly identifiable on/off conditions during the reference period and this is readily distinctive against the residual acoustic environment during the reference period, a 3dB penalty for intermittency can be applied. No objective method is given in the standard for assessing intermittency.
- 4.6 Where characteristic features of the specific sound are neither tonal nor impulsive, nor intermittent, but are readily distinctive against the residual acoustic environment, a 3dB subjective penalty can be applied.
- 4.7 Therefore, depending on the circumstances, a total penalty of between 0dB and 18dB could potentially be applied to allow for characteristic features of the industrial/commercial sound. However, BS4142:2014 does state that, if any single feature is dominant to the exclusion of others, then it may be appropriate to apply a reduced or zero correction for the minor characteristic. Also, the subjective prominence of the character of the specific sound at the noise-sensitive receptor should be considered, and the extent to which such characteristics will attract attention and/or be masked by residual sound at that location.
- 4.8 The level of the industrial/commercial sound measured or calculated in L_{Aeq} terms, plus any penalty as described above, provides the Rating Level.
- 4.9 BS4142 states 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. 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.

Obtain an initial estimate of the impact of the specific sound by subtracting the measured background sound level (...) from the rating level (...).

NOTE 1. More than one assessment might be appropriate.

- a) *Typically, the greater this difference, the greater the magnitude of the impact.*
- b) *A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.*
- c) *A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.*
- d) *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.*

NOTE 2. Adverse impacts include, but are not limited to, annoyance and sleep disturbance. Not all adverse impacts will lead to complaints and not every complaint is proof of an adverse impact.

Where the initial estimate of the impact needs to be modified due to the context, take all pertinent factors into consideration, including the following.

- 1) *The absolute level of sound. 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.*

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.

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.

- 2) *The character and level of the residual sound compared to the character and level of the specific sound. 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.

NOTE 3 Consideration ought to be given to evidence on human response to sound and, in particular, industrial and/or commercial sound where it is available. (...)

- 3) *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) facade insulation treatment;*
 - ii) ventilation and/or cooling that will reduce the need to have windows open so as to provide rapid or purge ventilation; and*
 - iii) acoustic screening.”*

4.10 BS4142:2014 lists the following information to be reported when assessing sites to the standard.

Table 3: BS4142:2014+A1:2019 – Required information

| |
|--|
| a) Statement of qualifications, competency, professional memberships and experience directly relevant to the application of this British Standard of all personnel contributing to the assessment: |
| Owen Downey BSc(Hons) Audio Technology, Member of the Institute of Acoustics, over 20 years' experience in acoustic consultancy, including undertaking many BS4142 assessments previously. |
| Blue Tree Acoustics is a member of the Association of Noise Consultants (ANC). |

| | |
|--|--|
| b) Source being assessed as follows: | |
| 1) description of the main sound sources and of the specific sound; | As described in Section 2.0, Section 3.0, and Appendix 2 of this report. |
| 2) hours of operation; | Extended weekday working hours are understood to be 1800-1900 hours and 0600-0700 hours, as described in this report. |
| 3) mode of operation (e.g. continuous, twice a day, only in hot weather); | Various sources operating simultaneously, some continuous and some intermittent. As described in Section 2.0, Section 3.0, Appendix 2, and Appendix 4. |
| 4) statement of operational rates of the main sound sources (e.g. maximum load setting, 50% max rate, low load setting); and | We understand that the fixed, continuous sources such as boilers and fans run at a single fixed rate. |
| 5) description of premises in which the main sound sources are situated (if applicable). | As described in Section 3.0 and as shown in Figure 2. |
| c) Subjective impressions, including: | |
| 1) dominance or audibility of the specific sound; and | The specific sound sources were not particularly distinct at the nearest receptor. |
| 2) main sources contributing to the residual sound. | As described in Section 2.0, Section 3.0, Appendix 2, and Appendix 4. |
| d) The existing context (see Clause 4 and Clause 11), including an assessment of the sensitivity of the receptor: | |
| The sensitive receptor is as described in this report, being the nearest dwelling to the operational site. There are other dwellings in the wider area at greater distance from the site. As such, this assessment considers impact at the receptor most exposed to the specific sound source; the impact experienced at more distant dwellings will be lower. | |

e) Measurement locations, their distance from the specific sound source, the topography of the intervening ground and any reflecting surface other than the ground, including a photograph, or a dimensioned sketch with a north marker. A justification for the choice of measurement locations should also be included.

Location 1 was selected to be suitably representative of the nearest residential receptor to the operational site. This is a free-field location at the eastern boundary of the site.

A photograph of measurement Location 1 is presented below:



f) Sound measuring systems, including calibrator or pistonphone used:

| Measurement sessions: | Unattended, from Monday 09/12/2024 through Thursday 19/12/2024 | Attended, on Friday 19/12/2024 |
|---|---|---|
| 1) type and/or model; | Class 1/Type 1 sound level meter. Rion NL-52. | Class 1/Type 1 sound level meter. Rion NA-28. |
| 2) manufacturer; | Rion | Rion |
| 3) serial number (S/N); and | 01021309 | 01070579 |
| 4) details of the latest verification test including dates. | Calibrated by ANV on 08/11/2023 | Calibrated by ANV on 21/02/2024 |

| | | |
|--|---|---|
| g) Operational tests: | | |
| 1) reference level(s) of calibrator, multi-function calibrator or pistonphone; and | 94.0dB Bruel & Kjaer 4230 (S/N 1411221), calibrated by ANV on 08/11/2023 | 94.0dB Bruel & Kjaer 4230 calibrator (S/N 686445), calibrated by ANV on 21/02/2024 |
| 2) meter reading(s) before and after measurements with calibrator, multi-function calibrator or pistonphone applied. | 93.9dB pre-measurement 93.8dB post-measurement | 93.9dB pre-measurement 93.9dB post-measurement |
| h) Weather conditions, including: | | |
| 1) wind speed(s) and direction(s); | Variable, as supported by archival data from a local weather station (reproduced in Appendix 3); periods with high windspeeds excluded from dataset. | |
| 2) presence of conditions likely to lead to temperature inversion (e.g. calm nights with little cloud cover); | Temperature inversion improbable given the proximity of the assessment location to the specific sound source. | |
| 3) precipitation; | No significant precipitation over extended periods was experienced onsite, as supported by archival weather data; periods with precipitation excluded from dataset. | |
| 4) fog; | None | |
| 5) wet ground; | None | |
| 6) frozen ground or snow coverage; | None | |
| 7) temperature; and | As presented in Appendix 3. | |
| 8) cloud cover. | Variable during unattended monitoring. 95% cloud cover on Monday 09/12/2024. 0% cloud cover on Thursday 19/12/2024. | |
| i) Dates and times of measurements | | |
| As set out in this report. | | |
| j) Measurement time intervals: | | |
| As set out in this report. | | |

| | |
|--|---|
| k) Reference time interval(s). | |
| 1 hour in the daytime for proposed 1800-1900 hours extended operating period. 15 minutes in the nighttime for proposed 0600-0700 hours extended operating period. | |
| l) Measured sound level(s): | |
| 1) residual sound level(s) and method of determination; | Determined by measurement, as described in Section 2.0, Section 3.0, and Appendix 2. 47dB L_{Aeq} during proposed 1800-1900 hours extended operating period, and 49dB L_{Aeq} during proposed 1800-1900 hours extended operating period. |
| 2) ambient sound level(s) and method of determination; | Ambient sound levels as measured at Location 1 were 47dB L_{Aeq} during daytime and 43dB L_{Aeq} at night. See Section 2.0 and Appendix 2 for more information. |
| 3) specific sound level(s) and method of determination; | It was not possible to determine the specific sound level by measurement at the site location, as operation during the proposed extended hours does not currently take place. Further, the specific sound level is of insufficient magnitude to be measured accurately at the nearest receptor location. Measurements of typical operational sound levels were taken at the site to facilitate calculation of noise impact during the proposed extended operating hours. See Section 3.0 and Appendix 4 for more information. |
| 4) justification of methods; and | Method follows BS4142 procedure for determining specific sound level from measurement. |
| 5) details of any corrections applied. | Corrections applied in the calculation for distance, barrier attenuation, and 'on-time', as described in Section 3.0 and Appendix 4. |
| m) Background sound level(s) and measurement time interval(s) and, in the case of measurements taken at an equivalent location, the reasons for presuming it to be equivalent: | |
| 15-minute measurements were made at Location 1 as described in this report, with the representative background sound level found to be 34dB L_{A90} during the proposed 1800-1900 hours weekday operating period, and 35dB L_{A90} during the proposed 0600-0700 hours weekday operating period, as shown in Appendix 2. | |

| | |
|--|---|
| n) Rating level(s): | |
| 1) specific sound level(s); | 34dB during the proposed 1800-1900 hours weekday operating period, and 28dB during the proposed 0600-0700 hours weekday operating period (see Section 3.0 and Appendix 4). |
| 2) any acoustic features of the specific sound; and | From the source measurements taken of the equipment in operation, the boilers and fans operated at a steady level and were broadband in character. The sound source items were not considered to be sufficiently distinct at the receptor location to warrant application of a correction for prominent acoustic features. A correction of +3dB has been applied for intermittency. |
| 3) rating level(s). | 37dB at the receptor location during the proposed weekday extended working hours of 1800-1900 hours. 31dB at the receptor location during the proposed weekday extended working hours of 0600-0700 hours. |
| o) Excess of the rating level(s) over the measured background sound level(s) and the initial estimate of the impacts: | |
| <p>+3dB at the receptor location during the proposed weekday extended working hours of 1800-1900 hours.</p> <p>-4dB during the proposed weekday extended working hours of 0600-0700 hours.</p> <p>The BS4142 level difference during the proposed extended weekday working hours of 1800-1900 hours is +3dB. Therefore, the magnitude of the operating noise at this time is approaching the threshold deemed likely to be of adverse effect by the Standard.</p> <p>BS4142 states, <i>“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.”</i></p> <p>In BS4142 difference terms, the predicted nighttime noise impact during the proposed extended weekday working hours of 0600-0700 hours is notably less than the measured background sound levels, and therefore well below the BS4142 threshold of ‘low impact’.</p> | |

p) Conclusions of the assessment after taking context into account:

As described in Paragraph 3.5 and Paragraph 3.6 above, the predicted daytime operational sound levels are significantly lower than the prevailing ambient sound level at the receptor location, and therefore would not be particularly prominent above other general noise events in the area. Given this and the very low impact of the operation of the boilers and fans, the context provides no reason to alter the BS4142 initial estimate result.

In terms of context, it should be noted that, as with the previous agricultural use of the application site, the existing Woodyfuel Ltd operation also generates sound of an industrial nature, with similar operational characteristics. This was likely experienced at the assessment location during the previous use of the site, and thus the proposed extended operational hours are not considered to introduce sound of a notably different character to the pre-existing local acoustic climate.

Notwithstanding the above, the assessment for operation during the proposed extended 1800-1900 weekday period indicates that noise levels are at the threshold where adverse impact is possible. It is therefore recommended that measures to reduce noise impact in that period be considered. The screener was found to be the noisiest item of equipment, and operates continuously during the day; suitable mitigation of this source would therefore be sufficient to reduce the BS4142 Rating Level to an outcome of 'low impact'.

q) The potential impact of uncertainty:

Measurements have been undertaken in accordance with relevant standards and guidelines to minimise measurement uncertainty. Class 1/Type 1 instruments have been used for all measurements.

Ambient and residual sound levels were measured at a suitable, representative location. In terms of absolute sound levels, the predicted operational sound level is below the residual sound level during the proposed extended weekday working hours.

It is feasible that there could be some fluctuation in background sound levels, but this is unlikely to significantly alter the outcome of the assessment.

- 4.11 Considering the above, the magnitude of expected noise impact during the proposed extended weekday nighttime operating hours of 0600-0700 hours is within the range deemed to be of 'low impact', and would not result in adverse effect on residential amenity.

- 4.12 As such, further noise mitigation measures are not necessary during that time period. However, it is recommended that the eastern hardstanding area used for parking HGVs not be used during the extended working hours.
- 4.13 The magnitude of expected noise impact during the proposed extended weekday daytime operating hours of 1800-1900 hours is found to approach 'adverse impact', and therefore noise mitigation during that time period is recommended. Operation of the screener was found to be the single sound source of greatest impact, and therefore mitigation of this item is expected to be sufficient to reduce overall sound levels during this period to 'low impact' in BS4142 terms.
- 4.14 A minimum reduction of 3dBA should be sufficient to reduce the BS4142 outcome to +0dB – i.e. to be of low impact according to the standard. The simplest option to achieve this would be to not operate the screener after 1800 hours. The calculation in Table A4.2 shows that this would reduce operational sound levels to 27dB L_{Aeq} at the nearest residential receptor, and would result in a BS4142 outcome of -4dB – i.e. 4dB below the background sound level, and therefore comfortably below the BS4142 threshold of 'low impact'. We understand that this measure is acceptable to Woodyfuel Ltd, and that it can be implemented.
- 4.15 BS4142 assessment of the current operation is not possible as background sound levels during daytime in the absence of the works is required. However, on the assumption that the background sound level of 38dB L_{A90} measured at Location 1 during current operating hours is representative of that at the nearest residential receptor, then the BS4142 outcome would be -1dB, i.e. around 0dB and therefore indicating low impact.

5.0 SUMMARY AND CONCLUSIONS

- 5.1 A noise assessment has been carried out on behalf of Woodyfuel Ltd for a proposed variation of hours of use and vehicle movements at the existing Woodyfuel Ltd wood-processing and biomass facility at Holmes Lane Stores, Holmes Lane, Winterton, Scunthorpe.
- 5.2 The proposal is to vary Condition 6 and Condition 11 of the existing permission (ref. PA/2020/1748 to change the operating hours and the tonnage of wood processed onsite, respectively. The proposal is to extend weekday operating hours to 0700-1900 hours, which in turn would necessitate HGV movements between 0600-0700 hours. We understand that there is no nighttime working other than the proposed additional vehicle movements between 0600-0700 hours, and that working hours during weekends and bank holidays will be unchanged.
- 5.3 The assessment has included measurement of external sound levels at the site to determine background sound levels at nearby sensitive receptors, as well as sample sound source measurements of existing operational sound levels and subsequent calculation of noise impact.
- 5.4 Comparison has been made of current operational sound levels with those assessed in the noise report provided in 2021 for the Woodyfuel Ltd planning submission for the site. This indicates that the noise mitigation measures recently implemented on the site (e.g. attenuators fitted to the fan louvres and concrete block wall around the yard) have reduced noise emissions, with current operational sound levels at the nearest residential receptor being 13dB lower than those predicted in 2021.
- 5.5 The results of the assessment show that operational impact during the proposed extended 1800-1900 hours daytime period will generate a sound impact of +3dB at the nearest noise-sensitive receptor, when assessed with regard to BS4142:2014. This magnitude of impact is approaching the threshold deemed likely to be of adverse impact by the Standard, and therefore noise mitigation during this period is advised. Operation of the screener was found to be the item of equipment having the greatest individual noise impact, and therefore recommendations have been made for the mitigation of screener noise. Once implemented, it is expected that noise levels during the proposed extended 1800-1900 hours weekday daytime operation will be of low impact in BS4142 terms, and therefore suitable.
- 5.6 The proposed weekday HGV movements between 0600-0700 hours are predicted to result in a BS4142:2014 sound impact of at least -4dB at the nearest noise-sensitive receptor. This

indicates a low level of impact in BS4142:2014 terms, and therefore this activity will be of minimal sound impact and additional noise mitigation during this period is not necessary.

- 5.7 Based on the above, the proposed variation of hours of use is considered to be acceptable in terms of sound impact once suitable mitigation of the screener is implemented. The proposed variation of Condition 6 can be considered acceptable on this basis.
- 5.8 The operational activities that have been assessed are representative of the works expected for the proposed increase in operational capacity to 50,000 tonnes per annum, and therefore the proposed variation of Condition 11 can be considered acceptable in terms of sound impact.

6.0 DISCLAIMER

- 6.1 This document is limited to addressing the specific acoustic issues contained herein, and its content is based on drawings and information provided to date by our Client/their Design Team.
- 6.2 All findings, comments, recommendations, etc., in this document are for acoustic purposes only; any and all other considerations and requirements, e.g. structural, airflow, thermal, fire safety, CDM compliance, determination of whether materials are dangerous, hazardous, deleterious, etc. (non-exhaustively), are the responsibility of other such suitably qualified specialists to check and advise on.
- 6.3 All findings, comments, recommendations, etc., in this document have been prepared with reasonable skill and care by BTA, within the scope of our Client's brief and timescales. Calculations and estimates upon which BTA's findings are elaborated are based on reasonable assumptions and industry practice that, by their nature, involve uncertainties that could cause future onsite results to differ materially from those predicted. BTA does not guarantee or warrant any calculation or estimate made, especially those based on data measured by third parties or information provided by third parties to BTA or otherwise relied upon by third parties. Any third-party information required and/or provided for the purpose of completing this document should not be considered as verified by BTA.
- 6.4 BTA's work may occasionally involve provision of acoustic performance advice and acoustic design recommendations that others may choose to regard as a "specification" under CDM 2015 (and thus others may occasionally choose to regard BTA to be a "Designer" under CDM 2015). Notwithstanding this, it is always the responsibility of others (Principal Designer) to approve/incorporate into their final design – or not – their final specification selections; although these may be based on BTA's acoustic performance advice, as BTA neither has control over how or whether BTA's acoustic advice is incorporated into the final design by others, nor any power to enforce that any such final specification selections made by others based on BTA's advice are appropriate in any regard beyond their acoustic performance qualities, it also remains the responsibility of others under CDM 2015 to ensure that any ancillary (non-acoustic) considerations in the course of selection, installation, maintenance, etc. of final specifications are advised upon by such relevantly qualified specialists (non-acoustic, and therefore non-BTA), and that any safety precautions identified in the course of their consideration by others are taken by others (the Principal Designer, Designers, Contractors, Client, etc.).
- 6.5 Products and materials that perform well acoustically tend to be heavier than standard products. Use of these products and materials may increase the weight of the element, and the CDM

Principal Designer, Client, etc. must take care to ensure that this risk is mitigated as far as possible with appropriate changes to their design, and the Client, Principal Contractor, Contractor, Installer, Fitter, etc. must ensure that appropriate and safe lifting and installation techniques, maintenance, etc. are used to reduce any remaining risk. Wherever BTA advises that works such as acoustic barriers are desirable to attenuate noise, care must be taken by the CDM Principal Designer, Client, etc. to ensure that the risks associated with constructing and maintaining bunds, walls, fences, etc. are mitigated as far as possible with appropriate changes to their design, and the Client, Principal Contractor, Contractor, Installer, Fitter, etc. must ensure that appropriate and safe construction and installation techniques, maintenance, etc. are used to reduce any remaining risk.

- 6.6 This document has been prepared for the sole use, benefit, and information of our direct Client for the purposes agreed at the time of their formal instruction, and the information contained herein is the sole property of, and confidential to, our direct Client. The liability of BTA in respect of the information contained herein will not extend to any third party.

FIGURE 1 – SITE AERIAL VIEW AND APPROXIMATE MEASUREMENT LOCATION

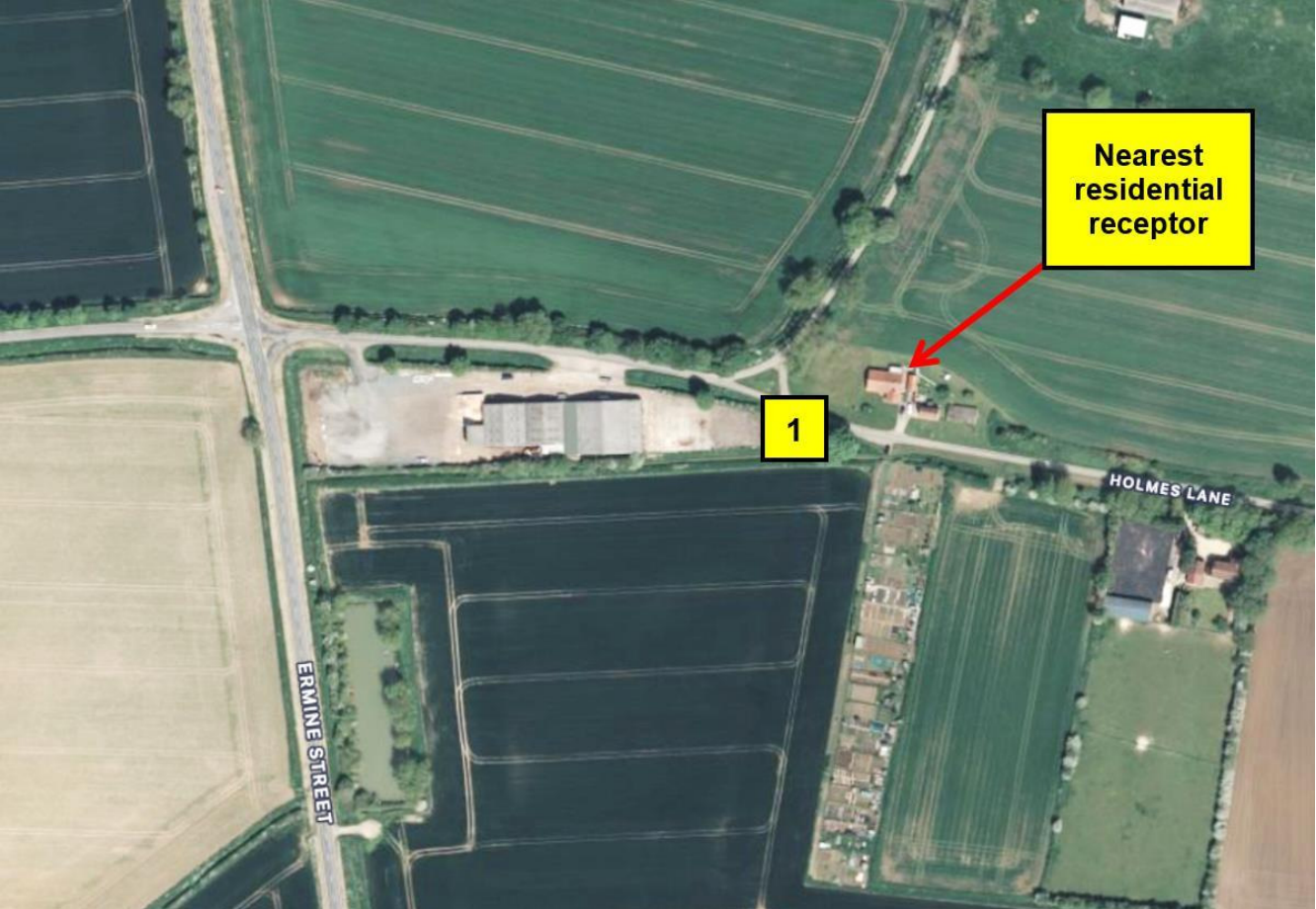
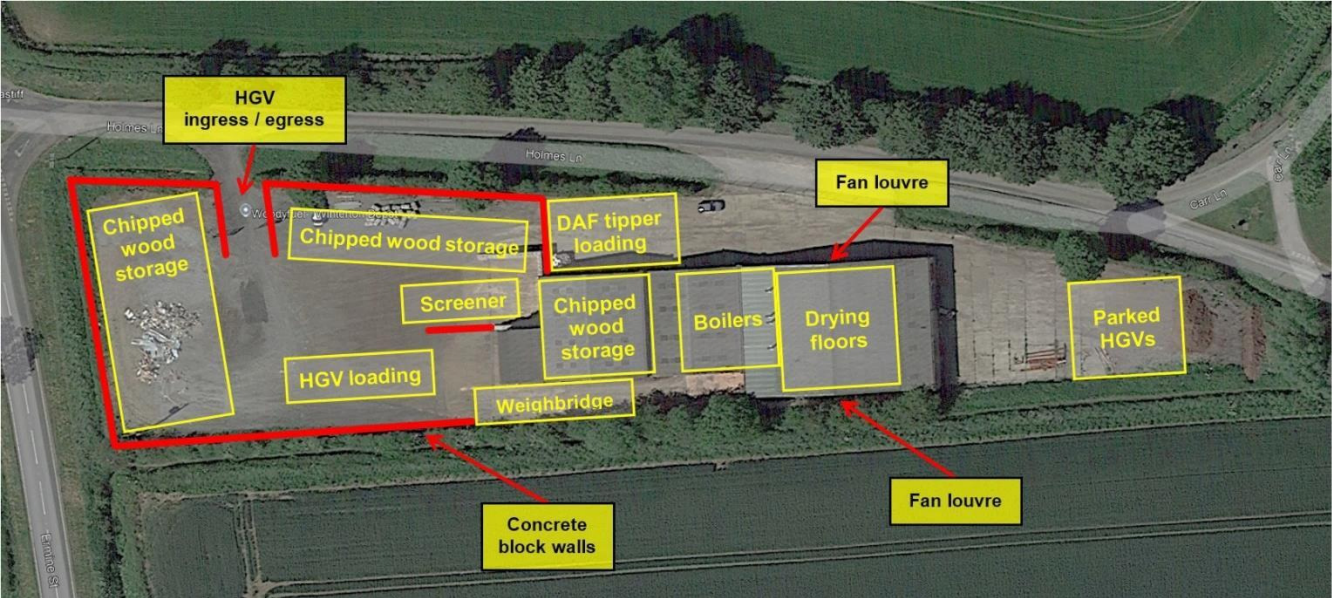


FIGURE 2 – SITE OPERATION PLAN MARKUP



APPENDIX 1 – TECHNICAL UNITS AND INDICES

a) Sound Pressure Level and the decibel (dB)

A sound wave is a small fluctuation of pressure in air. 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. Due to the wide range of pressure variations detectable by the ear, a logarithmic scale is used to convert the values into manageable numbers. 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 120 dB (threshold of pain).

b) Frequency and Hertz (Hz)

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 frequencies are often written as kilohertz (kHz), where 1kHz = 1000Hz.

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

As the ear hears some frequencies better than others, the A-weighting scale is used to mimic human hearing. A-weighting applies a correction to the sound level at a given frequency depending on how well the ear hears that frequency.

c) Glossary of Terms

In order to describe noise where the level is continuously varying, a number of other indices, including statistical parameters, are used. The indices used in this report are described below.

L_{Aeq} This is the A-weighted equivalent continuous sound level which is an average of the total sound energy measured over a specified time period. In other words, L_{Aeq} 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.

L_{Amax} This is the maximum A-weighted sound level that was recorded during the monitoring period.

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

L_{A10} This is the A-weighted sound level exceeded for 10% of the time period and is often used in the assessment of road traffic noise.

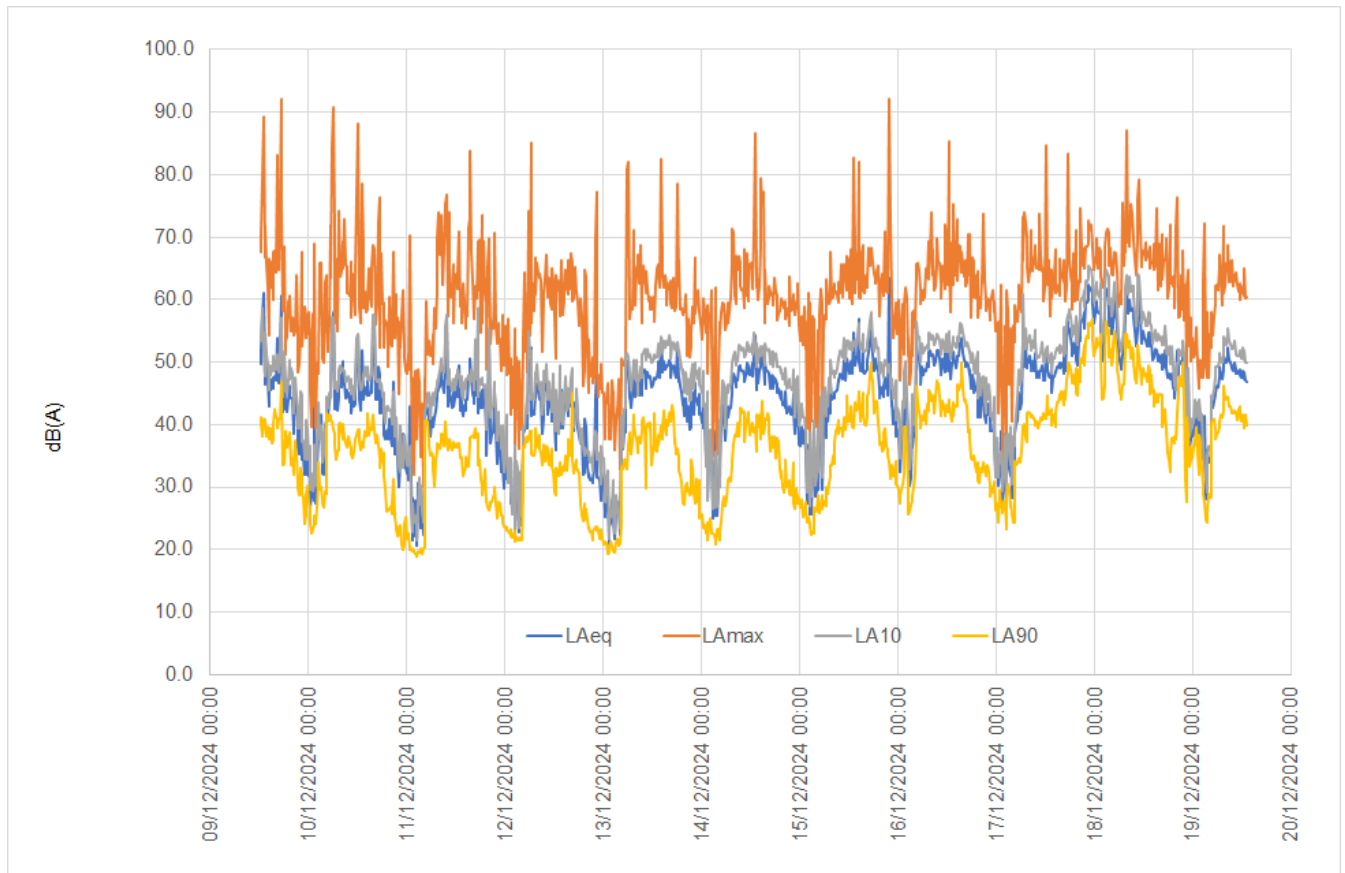
- NR Measured noise levels in each octave band are compared to the NR curve reference values. The overall NR value is the lowest NR curve that has not been exceeded.
- $D_{nT,w}$ Weighted standardised level difference, a single figure generated by comparing the D_{nT} with a reference curve. The reference curve is shifted in 1dB steps until the sum of adverse deviation of the test curve, compared to the reference curve, is as large as possible, but no more than 32.0 dB. The value of the shifted reference curve at 500Hz is taken as the $D_{nT,w}$. N.B. As $D_{nT,w}$ for airborne transmission represents a level difference, an improvement generates a larger figure – used in airborne tests.
- R_w Similar to the $D_{nT,w}$ term, but a measure of the airborne sound insulation performance of a separating element, when tested in laboratory conditions. As such the build is essentially perfect, and has no flanking noise routes. $D_{nT,w}$ values measured onsite will always be of a significantly lower value than the R_w value for a structure.

APPENDIX 2 – SOUND SURVEY DATA AND SOUND SOURCE PHOTOGRAPHS

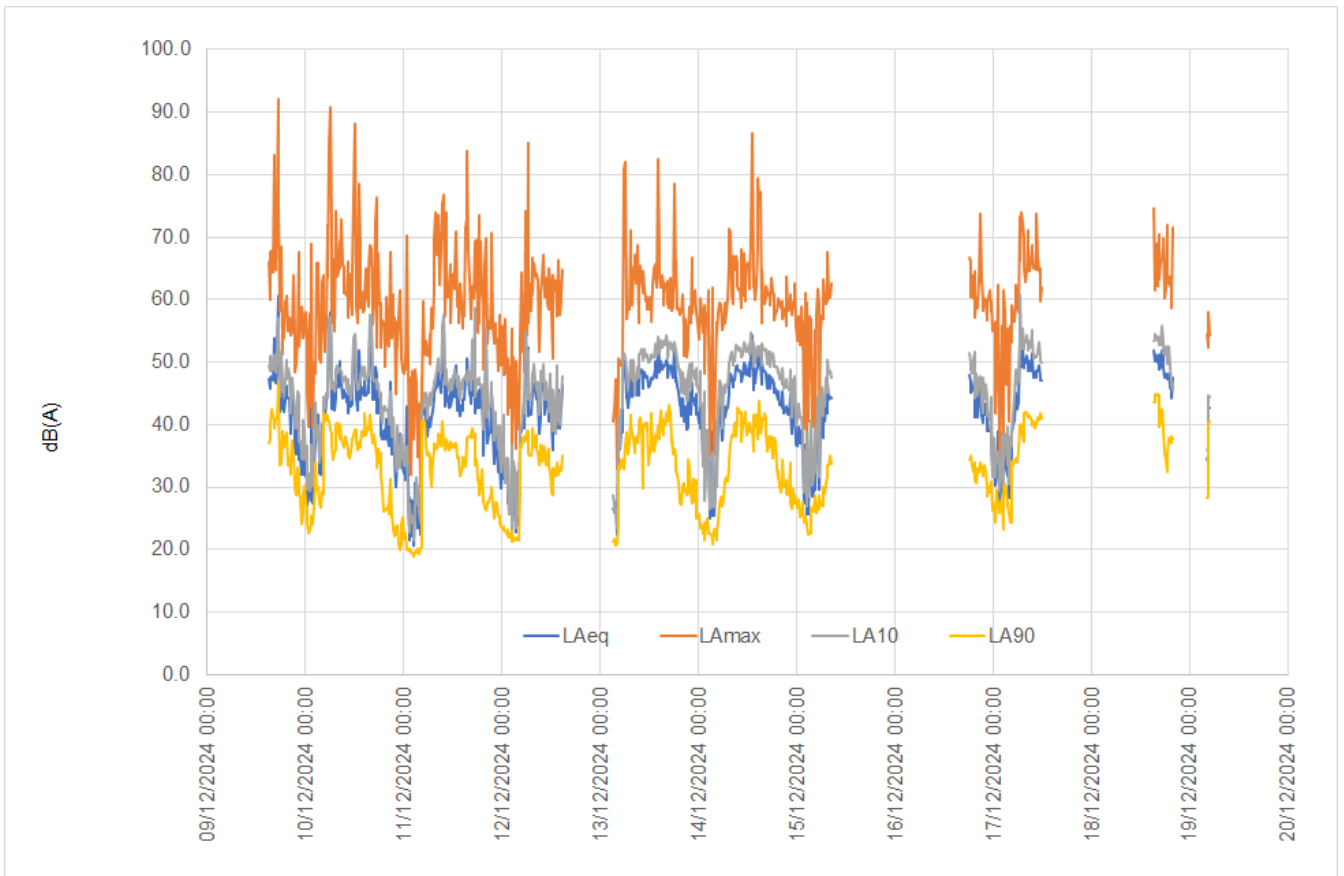
Unless stated otherwise, measurements were taken under ‘free-field’ conditions, i.e. suitably distant from acoustically reflecting surfaces and structures (other than the ground) to minimise the influence of reflections.

Location 1: Monday 09/12/2024 through Thursday 19/12/2024 – All data

Rion NL-52 sound level meter (S/N 01021309). All values dB(A), free-field, 15-minute duration.

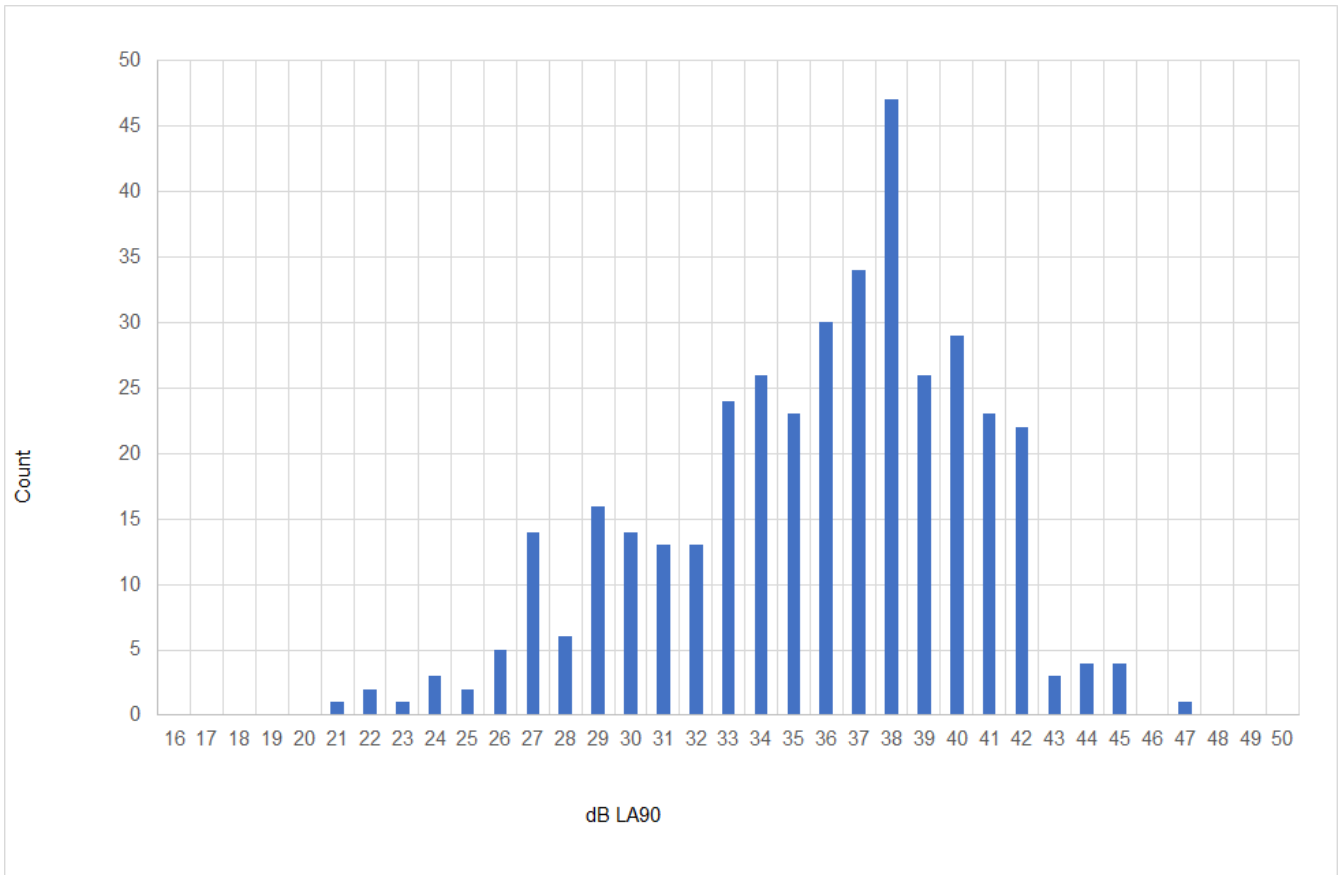


Location 1: Monday 09/12/2024 through Thursday 19/12/2024 – Dataset with adverse weather periods excluded



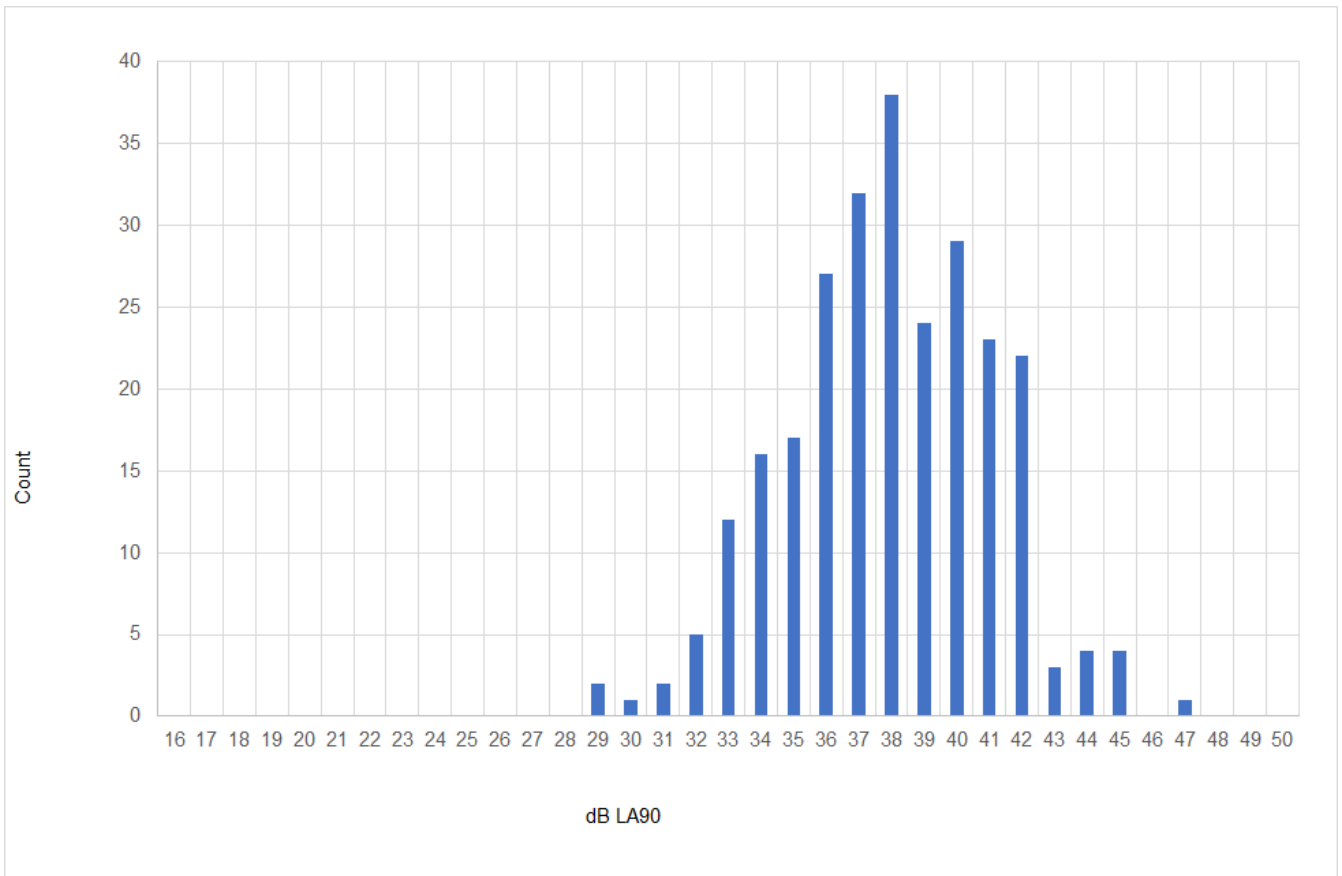
Sound level measurements taken during periods of adverse weather have been excluded from the assessment dataset.

Location 1: Representative free-field background L_{A90} analysis – Daytime (0700-2300 hours)



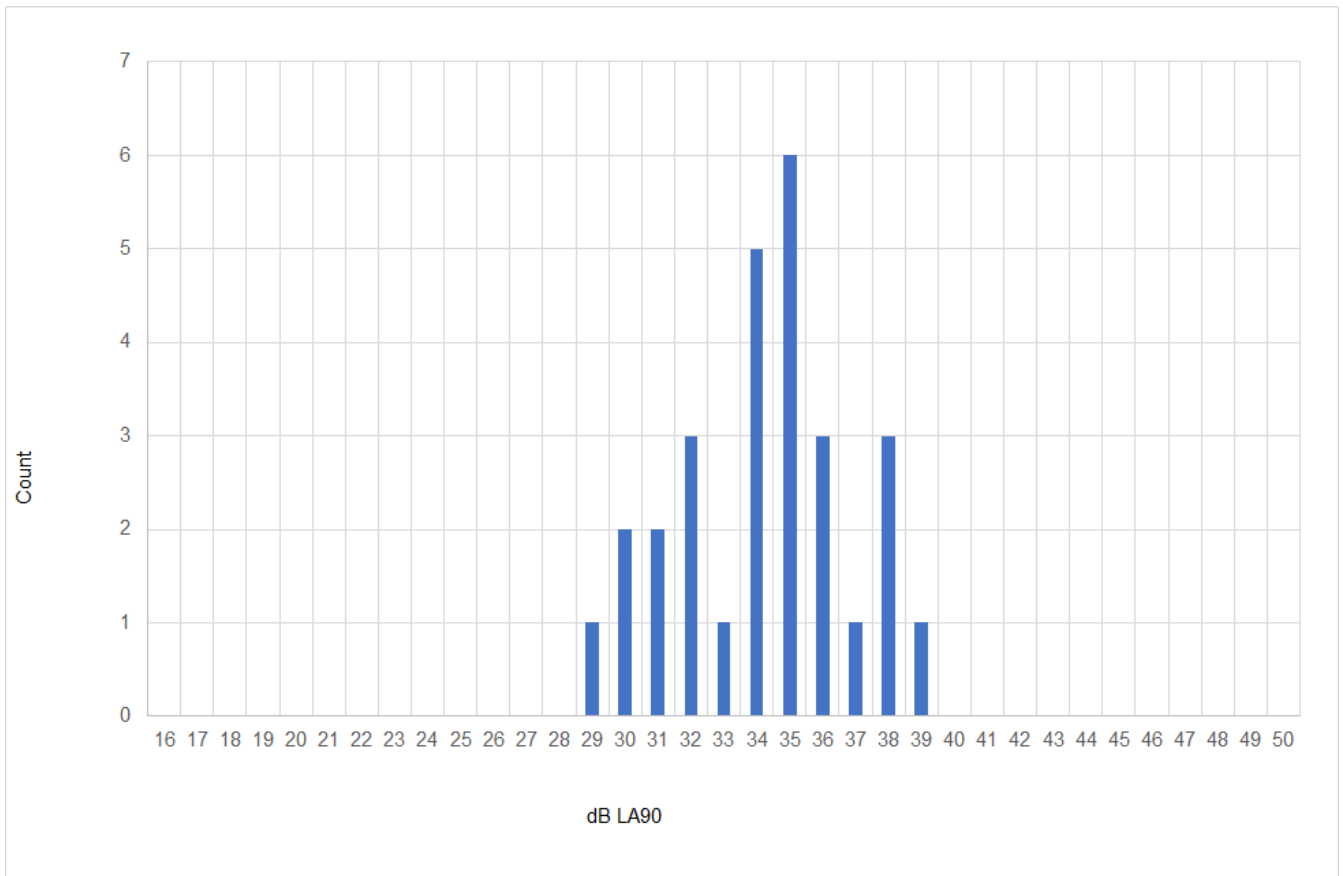
Representative background sound level taken to be 36dB L_{A90} , with 42% of the measured data values being lower than that value.

Location 1: Representative free-field background L_{A90} analysis – Current weekday daytime working hours (0700-1800 hours)



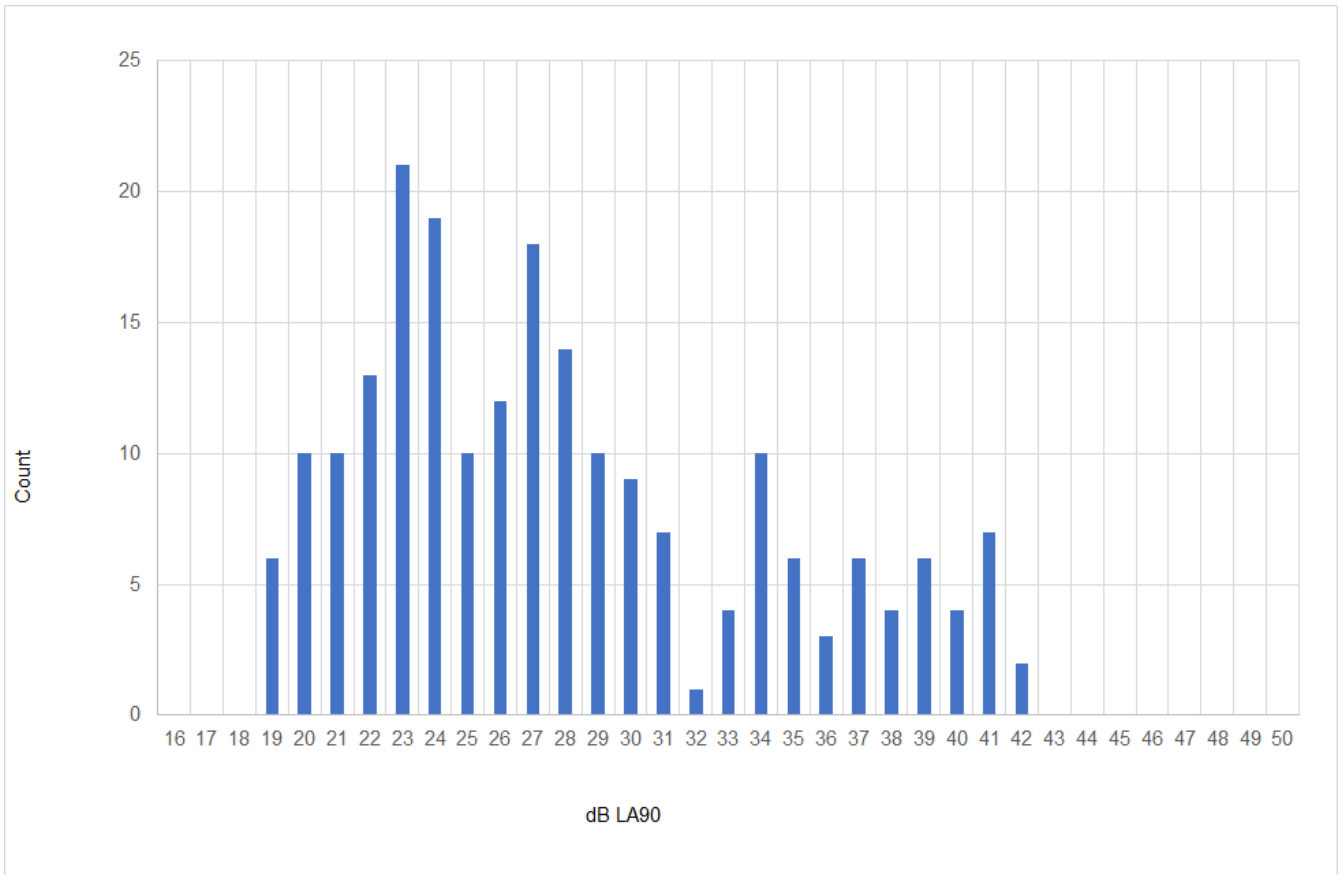
Representative background sound level taken to be 38dB L_{A90} , with 44% of the measured data values being lower than that value.

Location 1: Representative free-field background L_{A90} analysis – Daytime extended working hours (1800-1900 hours)



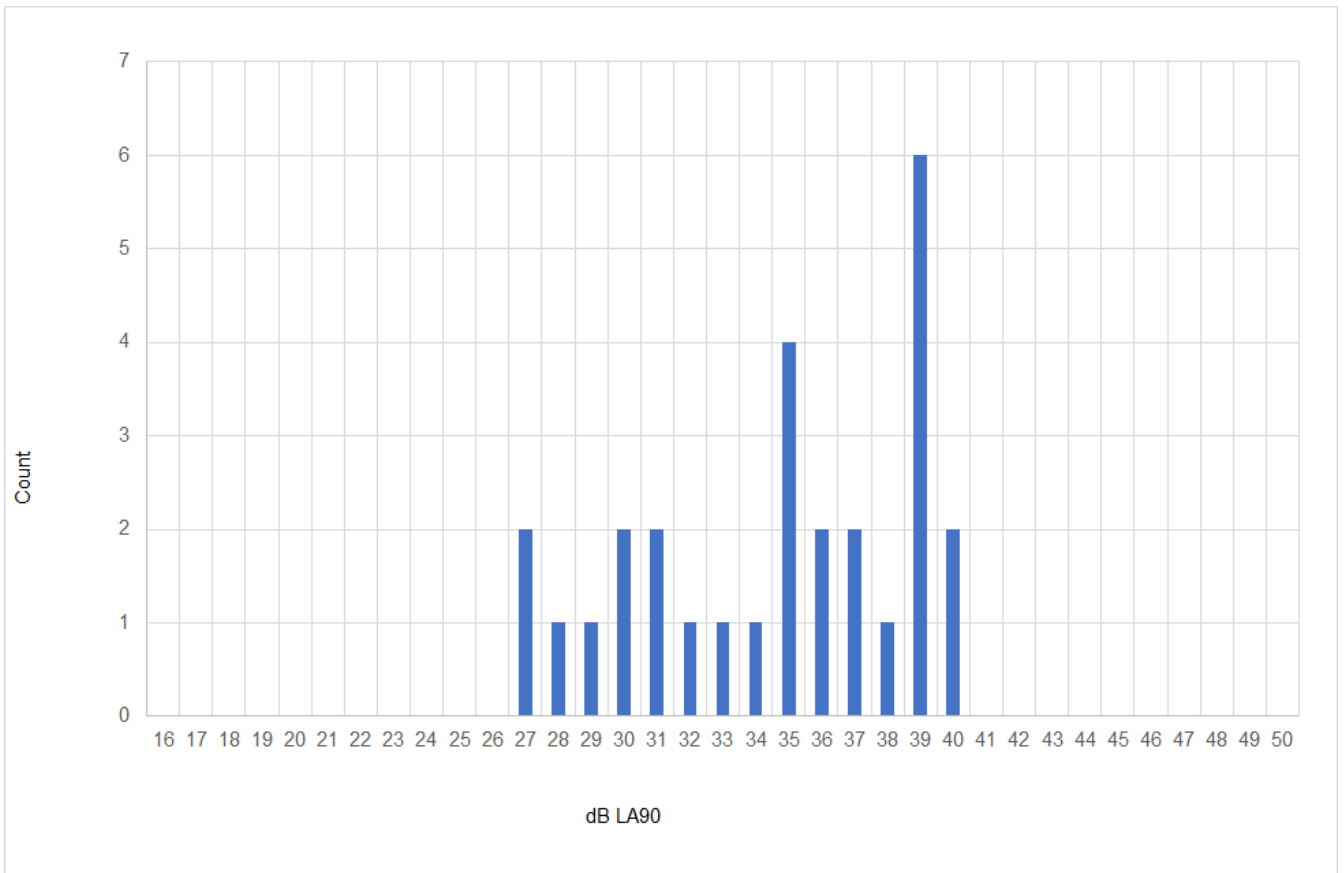
Representative background sound level taken to be 34dB L_{A90} , with 32% of the measured data values being lower than that value.

Location 1: Representative free-field background L_{A90} analysis – Nighttime (2300-0700 hours)



Representative background sound level taken to be 23dB L_{A90} , with 18% of the measured data values being lower than that value.

Location 1: Representative free-field background L_{A90} analysis – Nighttime extended working hours (0600-0700 hours)



Representative background sound level taken to be 35dB L_{A90} , with 39% of the measured data values being lower than that value.

Source sound measurements**Woodyfuel Ltd premises, Holmes Lane Stores, Winterton – Thursday 19/12/2024**

Rion NA-28 sound level meter (S/N 01070579). All measurements taken at 1m distance.

| Item | dB L _{Aeq} | dB L _{Amax} | Sec. | dB L _{eq} @ Octave band centre frequency (Hz) | | | | | | | |
|--|------------------------|-------------------------|------|--|------|------|------|------|------|------|------|
| | | | | 63 | 125 | 250 | 500 | 1k | 2k | 4k | 8k |
| Boiler room open doorway | 66.4 | 70.5 | 60 | 65.4 | 61.1 | 66.4 | 62.0 | 62.4 | 58.2 | 50.9 | 44.2 |
| Drying fan louvre front | 48.3 | 62.0 | 60 | 62.7 | 57.5 | 53.4 | 46.9 | 38.8 | 26.4 | 32.3 | 24.6 |
| Drying fan louvre rear | 53.3 | 60.2 | 60 | 61.7 | 55.8 | 51.5 | 48.1 | 50.8 | 43.9 | 31.6 | 23.2 |
| Kramer wheeled loader loading DAF tipper | 70.3 | 85.0 | 45 | 71.9 | 67.9 | 69.8 | 69.4 | 64.0 | 61.1 | 59.5 | 54.7 |
| Kramer wheeled loader reverse | 69.7 | 72.4 | 13 | 69.6 | 65.8 | 68.1 | 68.8 | 65.2 | 60.2 | 57.3 | 49.6 |
| DAF tipper wagon reverse | 70.5 | 73.9 | 17 | 69.2 | 66.0 | 63.3 | 63.7 | 66.2 | 64.6 | 61.3 | 47.6 |
| DAF tipper wagon levelling load | 75.0 | 83.2 | 34 | 71.2 | 66.5 | 65.6 | 68.0 | 71.7 | 68.6 | 63.8 | 57.6 |
| DAF tipper wagon loader drive off | 75.5 | 80.7 | 28 | 71.2 | 70.5 | 66.6 | 69.3 | 71.9 | 69.7 | 63.4 | 55.3 |
| HGV walking floor unloading open doorway | 66.3 | 77.2 | 60 | 68.4 | 67.2 | 65.2 | 61.5 | 60.4 | 59.7 | 55.8 | 50.9 |
| Screener/grader | 91.4 | 94.9 | 60 | 89.9 | 84.9 | 91.9 | 87.9 | 85.8 | 83.6 | 79.6 | 73.9 |
| Hyundai wheeled loader loading HGV | 74.5 | 83.3 | 21 | 76.5 | 72.8 | 74.5 | 71.3 | 69.5 | 65.6 | 62.3 | 58.2 |
| Hyundai wheeled loader drive | 74.2 | 78.3 | 11 | 76.6 | 75.8 | 72.6 | 71.9 | 69.6 | 65.6 | 59.8 | 53.7 |
| Hyundai wheeled loader reverse | 73.0 | 75.6 | 7 | 75.3 | 76.1 | 71.8 | 68.9 | 68.8 | 65.1 | 59.2 | 53.5 |
| Hyundai wheeled loader scraping ground | 73.7 | 79.9 | 12 | 77.9 | 74.6 | 72.8 | 71.3 | 69.1 | 64.4 | 60.6 | 59.1 |
| HGV idling | 74.6 | 76.5 | 60 | 78.0 | 69.7 | 70.6 | 71.6 | 69.6 | 68.0 | 62.4 | 53.6 |
| HGV tipper reverse | 76.6 | 84.3 | 20 | 80.0 | 68.7 | 67.7 | 69.8 | 70.8 | 71.3 | 68.3 | 54.3 |
| HGV tipping | 75.5 | 82.6 | 60 | 78.6 | 70.8 | 69.7 | 70.6 | 71.7 | 69.2 | 62.6 | 55.7 |
| HGV tipping drive forward | 75.2 | 78.2 | 11 | 77.6 | 69.1 | 66.8 | 70.2 | 71.2 | 69.1 | 62.7 | 57.2 |
| HGV reverse | 72.0 | 78.7 | 12 | 76.1 | 69.1 | 65.2 | 68.0 | 68.3 | 65.0 | 58.3 | 48.3 |
| HGV drive off | 78.5 | 83.8 | 13 | 79.7 | 77.5 | 76.0 | 75.5 | 73.8 | 71.3 | 65.3 | 57.0 |
| HGV on weighbridge | 74.6 | 87.2 | 20 | 79.7 | 62.4 | 60.9 | 65.9 | 67.7 | 70.1 | 66.5 | 56.9 |

Holmes Lane elevation containing drying fan louvre and open doorways to boilers and storage areas



Kramer wheeled loader loading DAF tipper



HGV walking floor unloading



Screener/grader



Hyundai loading material into screener/grader



HGV on weighbridge



Hyundai loading material into HGV



HGV tipping material into yard storage area

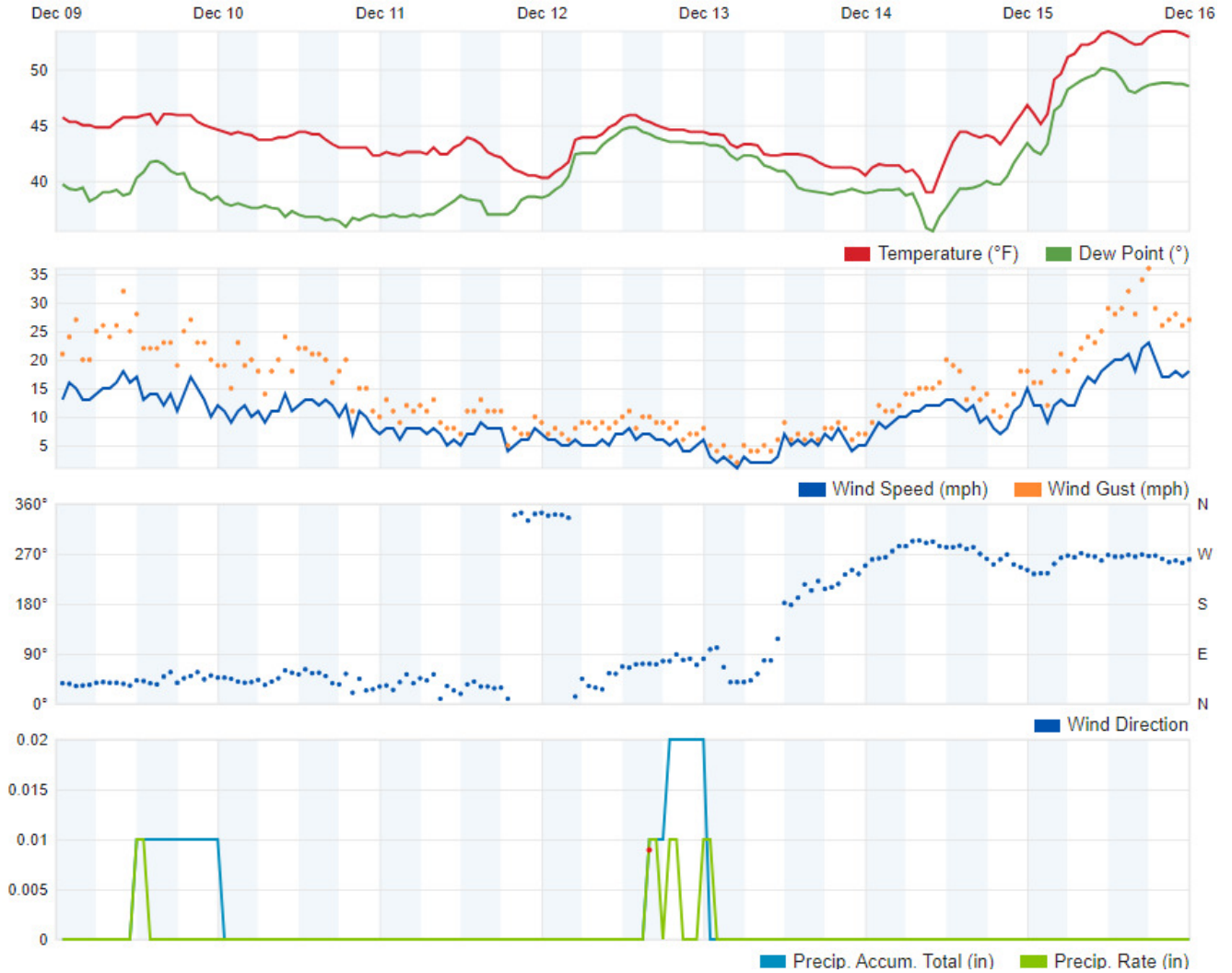


View of yard and material storage

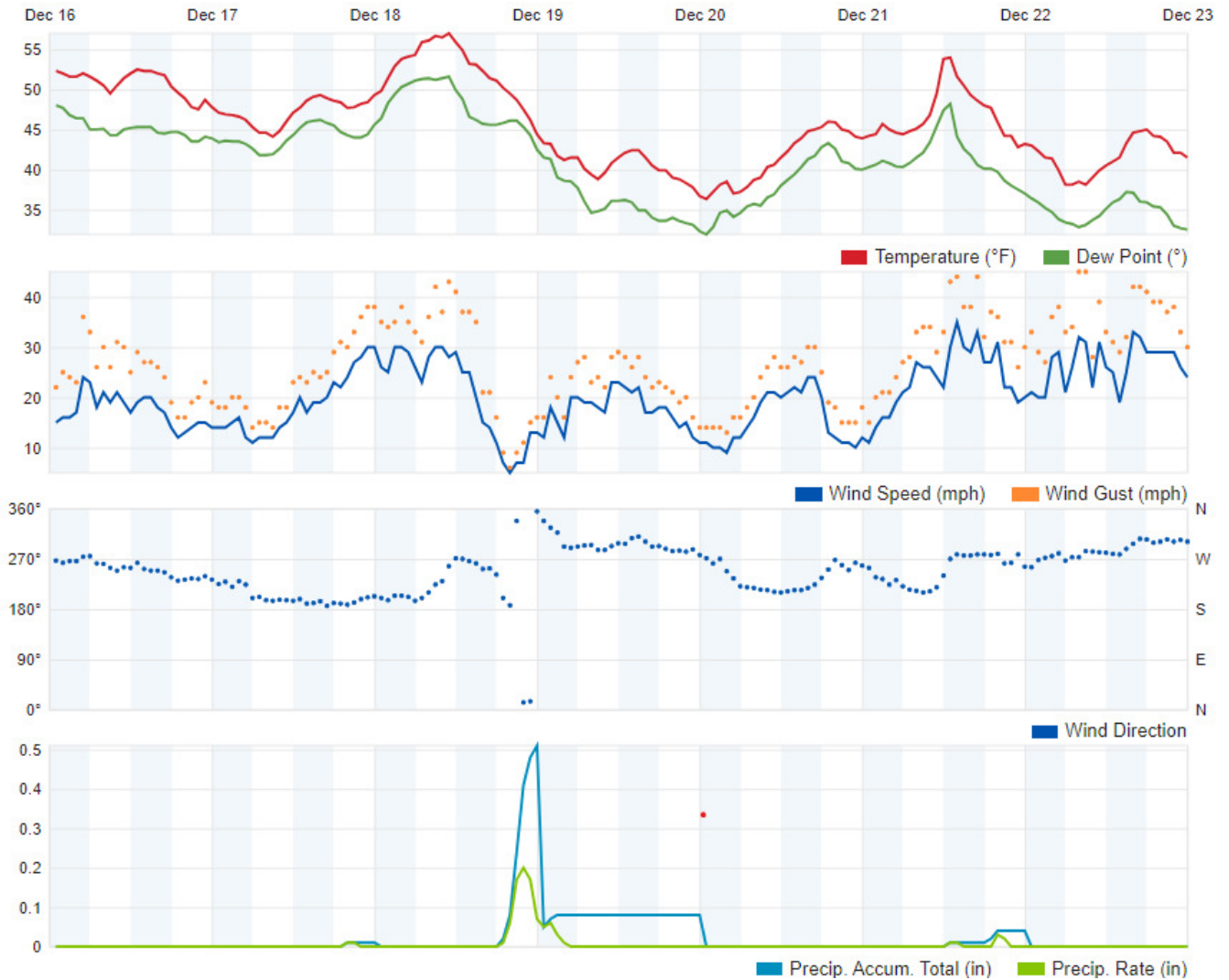


APPENDIX 3 – WEATHER DATA

Monday 09/12/2024 – Sunday 15/12/2024



Monday 16/12/2024 – Sunday 22/12/2024 (surveys concluded on Thursday 19/12/2024)



APPENDIX 4 – SOUND LEVEL CALCULATIONS

Table A4.1: Weekday daytime working hours – All sources operating

| | dB Leq | | | | | | | | Distance (m) | Barrier attenuation, dB | | | | | | | | On-time (dB) | LAeq at receptor | | | | |
|--|--------|-------|-------|-------|------|------|------|------|-----------------|-------------------------|-------|-------|-------|-------|-------|-------|-------|-----------------|---------------------|-------|-------|--------------------------|------|
| | 63Hz | 125Hz | 250Hz | 500Hz | 1kHz | 2kHz | 4kHz | 8kHz | | 63Hz | 125Hz | 250Hz | 500Hz | 1kHz | 2kHz | 4kHz | 8kHz | | | | | | |
| Boiler open doorway | 65.4 | 61.1 | 66.4 | 62.0 | 62.4 | 58.2 | 50.9 | 44.2 | 132.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 23.8 | | |
| Front fan louvre | 62.7 | 57.5 | 53.4 | 46.9 | 38.8 | 26.4 | 32.3 | 24.6 | 117.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 7.8 | | |
| Rear fan louvre | 61.7 | 55.8 | 51.5 | 48.1 | 50.8 | 43.9 | 31.6 | 23.2 | 120.0 | -6.9 | -8.4 | -10.3 | -12.7 | -15.3 | -18.1 | -21.0 | -24.0 | 0.0 | 0.0 | 0.0 | -1.8 | | |
| Kramer wheeled loader loading DAF tipper | 71.9 | 67.9 | 69.8 | 69.4 | 64.0 | 61.1 | 59.5 | 54.7 | 160.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | -10.8 | 15.6 | |
| Kramer wheeled loader reverse | 69.6 | 65.8 | 68.1 | 68.8 | 65.2 | 60.2 | 57.3 | 49.6 | 160.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | -13.0 | 12.9 | |
| DAF tipper wagon reverse | 69.2 | 66.0 | 63.3 | 63.7 | 66.2 | 64.6 | 61.3 | 47.6 | 160.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | -20.8 | 5.6 | |
| DAF tipper wagon levelling load | 71.2 | 66.5 | 65.6 | 68.0 | 71.7 | 68.6 | 63.8 | 57.6 | 155.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | -20.8 | 10.4 | |
| DAF tipper wagon loader drive off | 71.2 | 70.5 | 66.6 | 69.3 | 71.9 | 69.7 | 63.4 | 55.3 | 140.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | -20.8 | 11.8 | |
| HGV walking floor unloading open doorway | 68.4 | 67.2 | 65.2 | 61.5 | 60.4 | 59.7 | 55.8 | 50.9 | 160.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | -3.0 | 19.1 | |
| Screeener/grader | 89.9 | 84.9 | 91.9 | 87.9 | 85.8 | 83.6 | 79.6 | 73.9 | 175.0 | -6.9 | -8.2 | -10.1 | -12.5 | -15.1 | -17.9 | -20.8 | -23.8 | 0.0 | 0.0 | 0.0 | 0.0 | 32.6 | |
| Hyundai wheeled loader loading HGV | 76.5 | 72.8 | 74.5 | 71.3 | 69.5 | 65.6 | 62.3 | 58.2 | 200.0 | -5.4 | -6.0 | -6.9 | -8.4 | -10.3 | -12.7 | -15.3 | -18.1 | -7.8 | -7.8 | -7.8 | 11.0 | | |
| Hyundai wheeled loader drive | 76.6 | 75.8 | 72.6 | 71.9 | 69.6 | 65.6 | 59.8 | 53.7 | 200.0 | -5.4 | -6.0 | -6.9 | -8.4 | -10.3 | -12.7 | -15.3 | -18.1 | -10.0 | -10.0 | -10.0 | 8.8 | | |
| Hyundai wheeled loader reverse | 75.3 | 76.1 | 71.8 | 68.9 | 68.8 | 65.1 | 59.2 | 53.5 | 200.0 | -5.4 | -6.0 | -6.9 | -8.4 | -10.3 | -12.7 | -15.3 | -18.1 | -10.0 | -10.0 | -10.0 | 7.4 | | |
| Hyundai wheeled loader scraping ground | 77.9 | 74.6 | 72.8 | 71.3 | 69.1 | 64.4 | 60.6 | 59.1 | 220.0 | -5.2 | -5.6 | -6.3 | -7.4 | -9.1 | -11.2 | -13.7 | -16.4 | -10.8 | -10.8 | -10.8 | 7.7 | | |
| HGV idling | 78.0 | 69.7 | 70.6 | 71.6 | 69.6 | 68.0 | 62.4 | 53.6 | 220.0 | -5.2 | -5.6 | -6.3 | -7.4 | -9.1 | -11.2 | -13.7 | -16.4 | -7.8 | -7.8 | -7.8 | 11.0 | | |
| HGV tipper reverse | 80.0 | 68.7 | 67.7 | 69.8 | 70.8 | 71.3 | 68.3 | 54.3 | 235.0 | -5.1 | -5.5 | -6.1 | -7.1 | -8.5 | -10.5 | -12.9 | -15.6 | -17.8 | -17.8 | -17.8 | 1.7 | | |
| HGV tipping | 78.6 | 70.8 | 69.7 | 70.6 | 71.7 | 69.2 | 62.6 | 55.7 | 235.0 | -5.1 | -5.5 | -6.1 | -7.1 | -8.5 | -10.5 | -12.9 | -15.6 | -14.8 | -14.8 | -14.8 | 4.5 | | |
| HGV tipping drive forward | 77.6 | 69.1 | 66.8 | 70.2 | 71.2 | 69.1 | 62.7 | 57.2 | 235.0 | -5.1 | -5.5 | -6.1 | -7.1 | -8.5 | -10.5 | -12.9 | -15.6 | -17.8 | -17.8 | -17.8 | 1.0 | | |
| HGV reverse | 76.1 | 69.1 | 65.2 | 68.0 | 68.3 | 65.0 | 58.3 | 48.3 | 220.0 | -5.2 | -5.6 | -6.3 | -7.4 | -9.1 | -11.2 | -13.7 | -16.4 | -17.8 | -17.8 | -17.8 | -1.8 | | |
| HGV drive off | 79.7 | 77.5 | 76.0 | 75.5 | 73.8 | 71.3 | 65.3 | 57.0 | 220.0 | -5.2 | -5.6 | -6.3 | -7.4 | -9.1 | -11.2 | -13.7 | -16.4 | -17.8 | -17.8 | -17.8 | 5.1 | | |
| HGV on weighbridge | 79.7 | 62.4 | 60.9 | 65.9 | 67.7 | 70.1 | 66.5 | 56.9 | 170.0 | -7.9 | -9.7 | -12.0 | -14.5 | -17.3 | -20.2 | -23.1 | -26.1 | -7.8 | -7.8 | -7.8 | 3.5 | | |
| | | | | | | | | | | | | | | | | | | | | | | Total LAeq at receptor = | 33.6 |

Table A4.2: Weekday daytime working hours – All sources operating, excluding screener / grader

| | dB Leq | | | | | | | | Distance (m) | Barrier attenuation, dB | | | | | | | | On-time (dB) | LAeq at receptor | | | | |
|--|--------|-------|-------|-------|------|------|------|------|-----------------|-------------------------|-------|-------|-------|-------|-------|-------|-------|-----------------|---------------------|-------|-------|--------------------------|------|
| | 63Hz | 125Hz | 250Hz | 500Hz | 1kHz | 2kHz | 4kHz | 8kHz | | 63Hz | 125Hz | 250Hz | 500Hz | 1kHz | 2kHz | 4kHz | 8kHz | | | | | | |
| Boiler open doorway | 65.4 | 61.1 | 66.4 | 62.0 | 62.4 | 58.2 | 50.9 | 44.2 | 132.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 23.8 | | |
| Front fan louvre | 62.7 | 57.5 | 53.4 | 46.9 | 38.8 | 26.4 | 32.3 | 24.6 | 117.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 7.8 | | |
| Rear fan louvre | 61.7 | 55.8 | 51.5 | 48.1 | 50.8 | 43.9 | 31.6 | 23.2 | 120.0 | -6.9 | -8.4 | -10.3 | -12.7 | -15.3 | -18.1 | -21.0 | -24.0 | 0.0 | 0.0 | 0.0 | -1.8 | | |
| Kramer wheeled loader loading DAF tipper | 71.9 | 67.9 | 69.8 | 69.4 | 64.0 | 61.1 | 59.5 | 54.7 | 160.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | -10.8 | 15.6 | |
| Kramer wheeled loader reverse | 69.6 | 65.8 | 68.1 | 68.8 | 65.2 | 60.2 | 57.3 | 49.6 | 160.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | -13.0 | 12.9 | |
| DAF tipper wagon reverse | 69.2 | 66.0 | 63.3 | 63.7 | 66.2 | 64.6 | 61.3 | 47.6 | 160.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | -20.8 | 5.6 | |
| DAF tipper wagon levelling load | 71.2 | 66.5 | 65.6 | 68.0 | 71.7 | 68.6 | 63.8 | 57.6 | 155.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | -20.8 | 10.4 | |
| DAF tipper wagon loader drive off | 71.2 | 70.5 | 66.6 | 69.3 | 71.9 | 69.7 | 63.4 | 55.3 | 140.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | -20.8 | 11.8 | |
| HGV walking floor unloading open doorway | 68.4 | 67.2 | 65.2 | 61.5 | 60.4 | 59.7 | 55.8 | 50.9 | 160.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | -3.0 | 19.1 | |
| Hyundai wheeled loader loading HGV | 76.5 | 72.8 | 74.5 | 71.3 | 69.5 | 65.6 | 62.3 | 58.2 | 200.0 | -5.4 | -6.0 | -6.9 | -8.4 | -10.3 | -12.7 | -15.3 | -18.1 | -7.8 | -7.8 | -7.8 | 11.0 | | |
| Hyundai wheeled loader drive | 76.6 | 75.8 | 72.6 | 71.9 | 69.6 | 65.6 | 59.8 | 53.7 | 200.0 | -5.4 | -6.0 | -6.9 | -8.4 | -10.3 | -12.7 | -15.3 | -18.1 | -10.0 | -10.0 | -10.0 | 8.8 | | |
| Hyundai wheeled loader reverse | 75.3 | 76.1 | 71.8 | 68.9 | 68.8 | 65.1 | 59.2 | 53.5 | 200.0 | -5.4 | -6.0 | -6.9 | -8.4 | -10.3 | -12.7 | -15.3 | -18.1 | -10.0 | -10.0 | -10.0 | 7.4 | | |
| Hyundai wheeled loader scraping ground | 77.9 | 74.6 | 72.8 | 71.3 | 69.1 | 64.4 | 60.6 | 59.1 | 220.0 | -5.2 | -5.6 | -6.3 | -7.4 | -9.1 | -11.2 | -13.7 | -16.4 | -10.8 | -10.8 | -10.8 | 7.7 | | |
| HGV idling | 78.0 | 69.7 | 70.6 | 71.6 | 69.6 | 68.0 | 62.4 | 53.6 | 220.0 | -5.2 | -5.6 | -6.3 | -7.4 | -9.1 | -11.2 | -13.7 | -16.4 | -7.8 | -7.8 | -7.8 | 11.0 | | |
| HGV tipper reverse | 80.0 | 68.7 | 67.7 | 69.8 | 70.8 | 71.3 | 68.3 | 54.3 | 235.0 | -5.1 | -5.5 | -6.1 | -7.1 | -8.5 | -10.5 | -12.9 | -15.6 | -17.8 | -17.8 | -17.8 | 1.7 | | |
| HGV tipping | 78.6 | 70.8 | 69.7 | 70.6 | 71.7 | 69.2 | 62.6 | 55.7 | 235.0 | -5.1 | -5.5 | -6.1 | -7.1 | -8.5 | -10.5 | -12.9 | -15.6 | -14.8 | -14.8 | -14.8 | 4.5 | | |
| HGV tipping drive forward | 77.6 | 69.1 | 66.8 | 70.2 | 71.2 | 69.1 | 62.7 | 57.2 | 235.0 | -5.1 | -5.5 | -6.1 | -7.1 | -8.5 | -10.5 | -12.9 | -15.6 | -17.8 | -17.8 | -17.8 | 1.0 | | |
| HGV reverse | 76.1 | 69.1 | 65.2 | 68.0 | 68.3 | 65.0 | 58.3 | 48.3 | 220.0 | -5.2 | -5.6 | -6.3 | -7.4 | -9.1 | -11.2 | -13.7 | -16.4 | -17.8 | -17.8 | -17.8 | -1.8 | | |
| HGV drive off | 79.7 | 77.5 | 76.0 | 75.5 | 73.8 | 71.3 | 65.3 | 57.0 | 220.0 | -5.2 | -5.6 | -6.3 | -7.4 | -9.1 | -11.2 | -13.7 | -16.4 | -17.8 | -17.8 | -17.8 | 5.1 | | |
| HGV on weighbridge | 79.7 | 62.4 | 60.9 | 65.9 | 67.7 | 70.1 | 66.5 | 56.9 | 170.0 | -7.9 | -9.7 | -12.0 | -14.5 | -17.3 | -20.2 | -23.1 | -26.1 | -7.8 | -7.8 | -7.8 | 3.5 | | |
| | | | | | | | | | | | | | | | | | | | | | | Total LAeq at receptor = | 26.7 |

Table A4.3: Weekday nighttime working hours – Vehicle sources only

| | dB Leq | | | | | | | | Distance (m) | Barrier attenuation, dB | | | | | | | | On-time (dB) | LAeq at receptor | |
|--|--------|-------|-------|-------|------|------|------|------|-----------------|-------------------------|-------|-------|-------|-------|-------|-------|-------|-----------------|--------------------------|------|
| | 63Hz | 125Hz | 250Hz | 500Hz | 1kHz | 2kHz | 4kHz | 8kHz | | 63Hz | 125Hz | 250Hz | 500Hz | 1kHz | 2kHz | 4kHz | 8kHz | | | |
| Boiler open doorway | | | | | | | | | | | | | | | | | | | | |
| Front fan louvre | | | | | | | | | | | | | | | | | | | | |
| Rear fan louvre | | | | | | | | | | | | | | | | | | | | |
| Kramer wheeled loader loading DAF tipper | 71.9 | 67.9 | 69.8 | 69.4 | 64.0 | 61.1 | 59.5 | 54.7 | 160.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | -4.8 | 21.6 | |
| Kramer wheeled loader reverse | 69.6 | 65.8 | 68.1 | 68.8 | 65.2 | 60.2 | 57.3 | 49.6 | 160.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | -7.0 | 18.9 | |
| DAF tipper wagon reverse | 69.2 | 66.0 | 63.3 | 63.7 | 66.2 | 64.6 | 61.3 | 47.6 | 160.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | -14.8 | 11.6 | |
| DAF tipper wagon levelling load | 71.2 | 66.5 | 65.6 | 68.0 | 71.7 | 68.6 | 63.8 | 57.6 | 155.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | -14.8 | 16.4 | |
| DAF tipper wagon loader drive off | 71.2 | 70.5 | 66.6 | 69.3 | 71.9 | 69.7 | 63.4 | 55.3 | 140.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | -14.8 | 17.8 | |
| HGV walking floor unloading open doorway | 68.4 | 67.2 | 65.2 | 61.5 | 60.4 | 59.7 | 55.8 | 50.9 | 160.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 22.1 | |
| Screener/grader | | | | | | | | | | | | | | | | | | | | |
| Hyundai wheeled loader loading HGV | 76.5 | 72.8 | 74.5 | 71.3 | 69.5 | 65.6 | 62.3 | 58.2 | 200.0 | -5.4 | -6.0 | -6.9 | -8.4 | -10.3 | -12.7 | -15.3 | -18.1 | -4.8 | 14.0 | |
| Hyundai wheeled loader drive | 76.6 | 75.8 | 72.6 | 71.9 | 69.6 | 65.6 | 59.8 | 53.7 | 200.0 | -5.4 | -6.0 | -6.9 | -8.4 | -10.3 | -12.7 | -15.3 | -18.1 | -7.0 | 11.8 | |
| Hyundai wheeled loader reverse | 75.3 | 76.1 | 71.8 | 68.9 | 68.8 | 65.1 | 59.2 | 53.5 | 200.0 | -5.4 | -6.0 | -6.9 | -8.4 | -10.3 | -12.7 | -15.3 | -18.1 | -7.0 | 10.4 | |
| Hyundai wheeled loader scraping ground | 77.9 | 74.6 | 72.8 | 71.3 | 69.1 | 64.4 | 60.6 | 59.1 | 220.0 | -5.2 | -5.6 | -6.3 | -7.4 | -9.1 | -11.2 | -13.7 | -16.4 | -8.8 | 9.7 | |
| HGV idling | 78.0 | 69.7 | 70.6 | 71.6 | 69.6 | 68.0 | 62.4 | 53.6 | 220.0 | -5.2 | -5.6 | -6.3 | -7.4 | -9.1 | -11.2 | -13.7 | -16.4 | -1.8 | 17.0 | |
| HGV tipper reverse | 80.0 | 68.7 | 67.7 | 69.8 | 70.8 | 71.3 | 68.3 | 54.3 | 235.0 | -5.1 | -5.5 | -6.1 | -7.1 | -8.5 | -10.5 | -12.9 | -15.6 | -14.8 | 4.7 | |
| HGV tipping | 78.6 | 70.8 | 69.7 | 70.6 | 71.7 | 69.2 | 62.6 | 55.7 | 235.0 | -5.1 | -5.5 | -6.1 | -7.1 | -8.5 | -10.5 | -12.9 | -15.6 | -11.8 | 7.5 | |
| HGV tipping drive forward | 77.6 | 69.1 | 66.8 | 70.2 | 71.2 | 69.1 | 62.7 | 57.2 | 235.0 | -5.1 | -5.5 | -6.1 | -7.1 | -8.5 | -10.5 | -12.9 | -15.6 | -14.8 | 4.0 | |
| HGV reverse | 76.1 | 69.1 | 65.2 | 68.0 | 68.3 | 65.0 | 58.3 | 48.3 | 220.0 | -5.2 | -5.6 | -6.3 | -7.4 | -9.1 | -11.2 | -13.7 | -16.4 | -14.8 | 1.2 | |
| HGV drive off | 79.7 | 77.5 | 76.0 | 75.5 | 73.8 | 71.3 | 65.3 | 57.0 | 220.0 | -5.2 | -5.6 | -6.3 | -7.4 | -9.1 | -11.2 | -13.7 | -16.4 | -14.8 | 8.1 | |
| HGV on weighbridge | 79.7 | 62.4 | 60.9 | 65.9 | 67.7 | 70.1 | 66.5 | 56.9 | 170.0 | -7.9 | -9.7 | -12.0 | -14.5 | -17.3 | -20.2 | -23.1 | -26.1 | -4.8 | 6.5 | |
| | | | | | | | | | | | | | | | | | | | Total LAeq at receptor = | 28.0 |