# Noise Impact Assessment

Site Address: Land at Hole Farm, Westfield Lane, Westfield, Hastings, TN35 4SA

Client Name: Oaktree Environmental Ltd.

Project Reference No: NP-010510-2

## Authorisation and Version Control

| Revision | Reported By | Checked By |
|---|---|---|
| 03 | T Watkin, MSc, MIOA | M Caley, MSc, MIOA |

## Amendment History

| Revision | Date | Summary of Amendments |
|---|---|---|
| 01 | 25/01/2024 | NP-010510 |
| 02 | 08/04/2024 | Scheme of mitigation updated to reflect feasibility (NP-010510) |
| 03 | 08/07/2024 | Proposed permit variation updated (NP-010510-2). |

## Disclaimer



## Contact Details

NOVA Acoustics Ltd,
Suite 13, Crown House,
94 Armley Road,
Leeds,
LS12 2EJ

0113 322 7977

www.novaacoustics.co.uk

technical@novaacoustics.co.uk

*Delivering sustainable development by promoting good health and well-being through effective management of noise.*

# Contents

## List of Figures



## List of Tables

# 1. Introduction

NOVA Acoustics Ltd has been commissioned to prepare a noise impact assessment for the installation of new equipment and plant as part of an environmental permit variation ('the Proposed Development') on land at Hole Farm off Westfield Lane, Westfield, Hastings, TN35 4SA ('the Site'). The Site is understood to be operated by Eco Skip Waste & Recycling Ltd at present.

The end client is preparing to submit an application to vary environmental permit No. EPR/JB3937WR to the Environment Agency ('EA'). This report has been compiled to accompany the permit variation.

A noise survey has been undertaken to establish the prevailing background and ambient sound levels at the closest Noise Sensitive Receptors ('NSRs'). The report details the existing background and ambient sound climate and the predicted noise emissions associated with the Proposed Development. Measures required to mitigate noise impact have been recommended where necessary and assessed in accordance with the relevant performance standards, legislation, policy and guidance. This noise assessment is necessarily technical in nature; therefore, a glossary of terms is included in Appendix A to assist the reader.

## 1.1 Standards, Legislation, Policy & Guidance

The following performance standards, legislation, policy and guidance have been considered to ensure good acoustic design in the assessment:

- The Environmental Permitting (England and Wales) Regulations 2016 (as amended).
- The Environment Agency Guidance 'Noise and Vibration Management: Environmental Permits (Jan 2022)'.
- The Environment Agency Guidance 'Method Implementation Document (MID) for BS4142 (Dec 2023).
- National Planning Policy Framework (2023).
- Noise Policy Statement for England (2010).
- BS4142:2014+A1:2019 – 'Methods for rating and assessing commercial and industrial sound'.

Further information on the legislation can be found in Appendix B.

## 1.2 Proposal Brief and Site History

The site currently has an environmental permit which allows for the acceptance, storage, and processing of construction and demolition waste. Materials accepted at the site include, but are not limited to, soils, concrete, and stone. These can then be sorted, separated, screened, crushed, and/or blended for recovery as a soil, soil substitute or aggregate dependent on the previous origin. The site also has permission for up to 10,000 tonnes of waste to be accepted per year.

As part of the proposals, the EA permit would be altered to include the following:

- Acceptance and tipping of skip waste, comprising mainly from householders and builders;
- Retention of the existing treatment activities to be used alongside new additional treatment facilities, including the screening and trommelling of waste; and
- An increase to the annual throughput of the site from 10,000 tonnes of waste to up to 75,000 tonnes of waste per annum.

Use of the site would be strictly limited to daytime use only, with the proposed operating hours being 08:00 – 18:00, Monday to Friday, and 08:00 to 13:00 on Saturdays. There are no provisions for work to take place on Sundays, Bank Holidays or Public Holidays.

The figure below shows a draft layout of the site and the proposed operations.

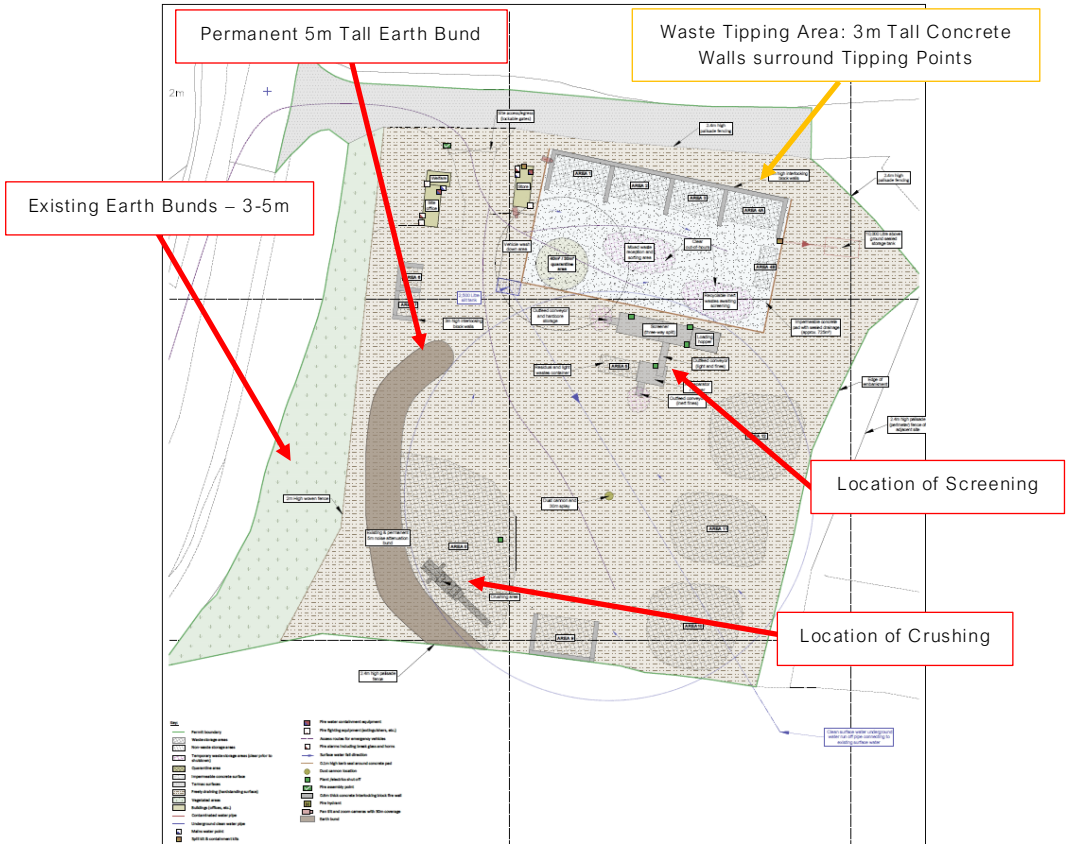


*Figure 1 – Proposed Development Layout*

The site has planning permission for the existing activities which was granted in October 2022 (District Ref: RR/2012/1764). Planning condition 3 requires the noise rating level emitted from the site to not exceed 43 dB $L_{Aeq,1hr}$ when measured in accordance with BS4142:1997. It should be noted that this standard has since been superseded, and as this condition was imposed 12 years ago, the fixed limit may now be too onerous when compared to the current background sound level. It is understood that the end client shall be submitting a new application to the Local Planning Authority ('LPA') to include the updates to the proposed usage of the site, however, this condition has still been referenced within the assessment.

A noise impact assessment was produced in 2013 by Waterman Energy, Environment & Design Limited for the site (report ref: EED12597-103-R-1.1.6-LE). It is thought that plant and processes included in the report are reflective of current operations.

It is understood that the site currently receives waste via HGVs that enter the site through the main entrance off Westfield Lane. The HGVs enter the site from a small access road to the north before then driving approximately 30m to the unloading area. Once the waste has been delivered, HGVs then immediately exit the site using the same entry point and continue back out onto Westfield Lane. A stationary excavator is then used to sort through the waste before it is processed by mobile plant which traverses the site.

# 2. Environmental Noise Survey

## 2.1 Measurement Methodology

The following table outlines the measurement dates and particulars. All equipment was fitted with its proprietary environmental kit complete with a 130mm diameter windshield suitable for windspeeds up to 8m/s. Technical issues prohibited the use of a localised weather station, and as such, met office weather data of the area, specifically the closest weather station, has been consulted. Details regarding the equipment used and the meteorological conditions during the survey are available in Appendix D.

Multiple measurement positions were utilised to accurately capture the existing noise climate both at the site and at the nearby NSRs. These consisted of short-term attended measurements and a concurrent long-term measurement to derive a background sound level.

| Location | Survey Dates | Measurement Particulars |
|---|---|---|
| MP1 | 05-09/01/2024 | Equipment affixed to a telegraph pole along Baldslow Down, representative of the environment at nearby NSRs in the absence of site-specific noise emissions. The microphone was approximately 3.5m above the ground and at least 3.5m from any other large reflective surface. |
| MP2 | 05/01/2024<br>09:00 – 10:15 | Microphone attached to a tripod approximately 1.5m above local ground and 9m from the centre of Westfield Lane. Position representative of the closest NSR due to the measurement position being shielded from onsite activities by a large earth bund along the east of the site. |
| MP3 | 05/01/2024<br>10:45 – 12:30 | Equipment mounted on a tripod 1.5m above local ground and 6m from the centre of Westfield Lane. General position representative of the NSR to the north of the Site. |

*Table 1 – Measurement Methodology*

The figure below outlines the site surroundings and measurement locations:

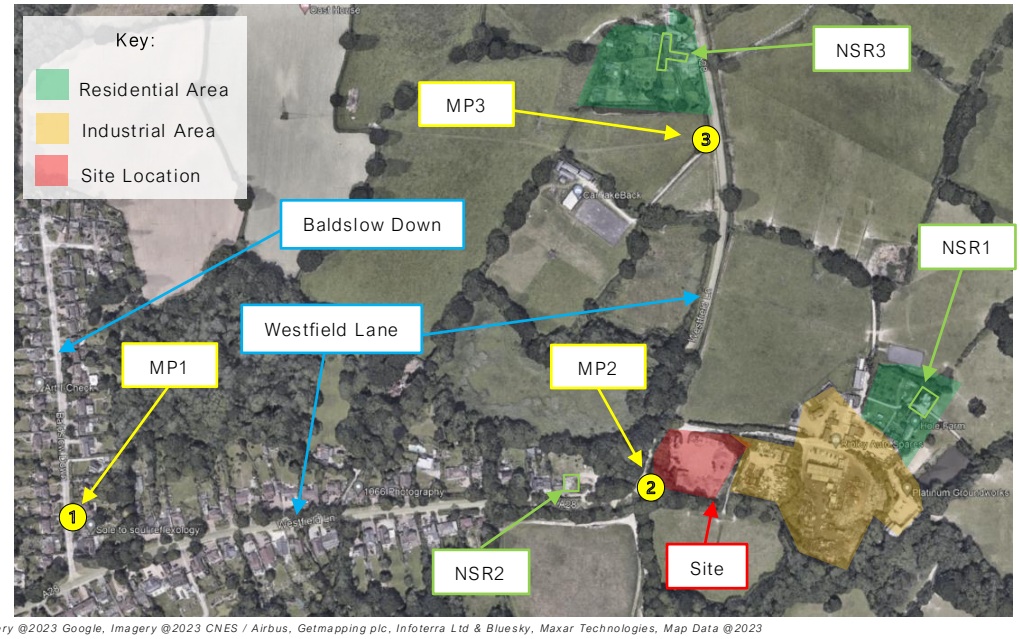


*Figure 2 – Measurement Locations and Site Surroundings*

## 2.2 Context & Subjective Impression

The area surrounding the site is semi-rural, located within an area of outstanding natural beauty known as the High Weald. The area is mixed in nature, with a more densely populated residential area to the west off Westfield Lane and Baldslow Down, and industrial / commercial premises to the immediate east of the site. The remaining surrounding land is either arable farmland or retained woodland.

The site itself is owned by Hole Farm, which is labelled as NSR1 in the figure above. The farm also owns the land that the following businesses occupy:

- 'H. Ripley & Co Ltd' - Waste management business. Operates 08:00 – 17:00, Monday to Friday, 08:00 – 12:00, Saturdays and closed on Sundays.
- 'Ripley Auto Spares' - Used vehicle parts shop. Operates 08:00 – 17:00, Monday to Friday, 08:00 – 12:00, Saturdays and closed on Sundays.
- 'Platinum Groundworks' – Construction Company. Operates 08:00 – 18:00, Monday to Saturday, closed on Sundays.

NSRs 1, 2 and 3 are located approximately 165m, 95m, and 380m from the site boundary, respectively. Existing earth bunds ranging from 1.5m to 5m tall are positioned along the eastern boundary. The bunding provides significant screening, attenuating noise emissions from the site to the west. NSR1 does not benefit from any shielding provided by the natural topography; however, screening is provided by various buildings situated on the intervening land between the site and the receptor. NSR1 is arguably less sensitive than NSR2 and NSR3 due to its attachment to the businesses operating within their land, and the element of control they have over the tenants that operate from there.

During the site visits, the acoustic environment surrounding the site and the closest NSRs was generally found to be low to moderate in level and dominated by road traffic noise from Westfield Lane. Traffic flows were observed to be relatively consistent with breaks in traffic not generally lasting more than 10 seconds. The acoustic environment at MP1 was found to be typical of a quiet residential area, and was again dominated by road traffic noise emissions from Westfield Lane. Birdsong from seagulls was also clearly audible, particularly during lulls in road traffic flow.

Noise emissions from the site were significantly masked by road traffic noise, with site-specific noise emissions only discernible during long, infrequent breaks in traffic.

An annotated satellite view of the site showing the current operations and proposed location of the shredding works is presented in the figure below.

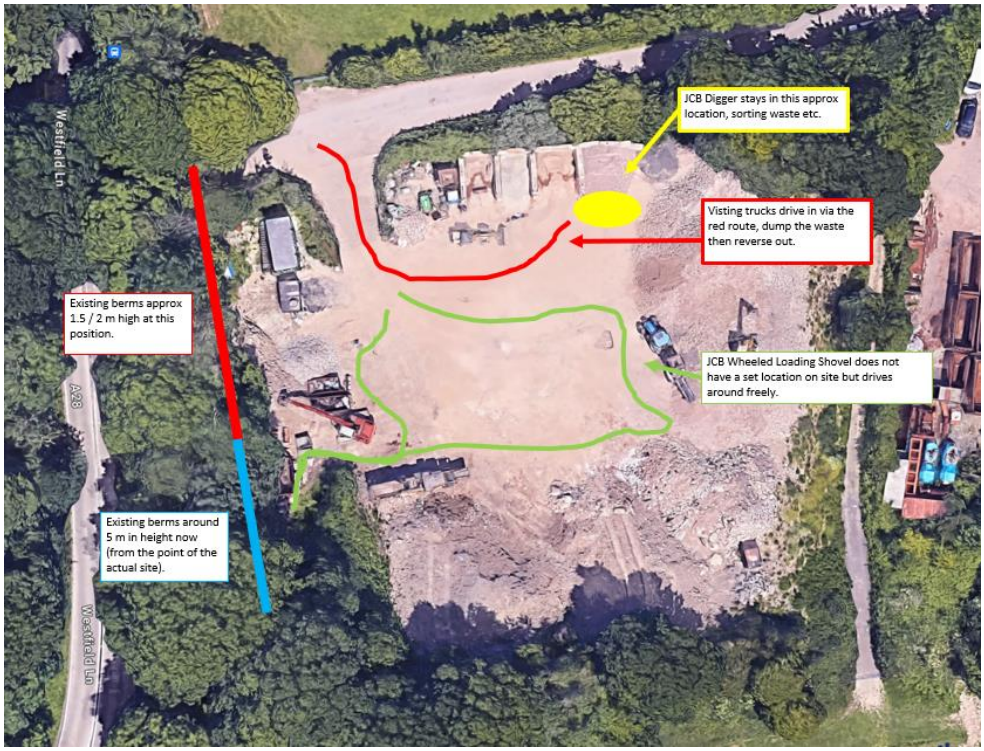


*Figure 3 – Existing Site Layout and Plant Routes*

The noise sources present on-site during the survey included a stationary JCB sorting through waste, loading, and unloading skips, a JCB wheeled loader shovelling and transporting waste around the site, and HGV movements.

## 2.3 Environmental Noise Survey Results

***Background & Ambient Sound Level Results Summary***

The following section outlines the measured background sound levels that have been used as the baseline for the subsequent BS4142 noise assessments.

The background sound levels measured at MP1 have been derived from the operational time periods of:

- 08:00 to 18:00 hours, Monday to Friday, and 08:00 to 13:00 hours on Saturdays.

Existing operations at the site remained active during the surveyed period, however, any site-specific noise emissions were inaudible at MP1.

The table below outlines the background and ambient sound levels used as the baseline for the noise impact assessments. Full time histories and statistcal analysis can be seen in Appendix C.

| Description | Lowest $L_{Aeq,1hr}$ (dB) | $L_{A90,15min}$ (dB) |
|---|---|---|
| MP1:<br>08:00 – 18:00 hours Monday to Friday,<br>08:00 – 13:00 hours on Saturday. | 54<br>(Saturday: 08:00 – 09:00) | 45 |

*Table 2 – Background & Ambient Sound Level Results Summary – Long-term*

*Short-Term Ambient & Background Sound Level Results Summary*

The table below outlines the ambient and background sound levels measured at MP2 and MP3 during the attended monitoring on 05/01/2024.

| Description | Lowest $L_{Aeq,1hr}$ (dB) | $L_{A90,15min}$ (dB) |
|---|---|---|
| MP2: 09:00 – 10:15 hours (Friday) | 70 | 61 |
| MP3: 10:45 – 12:30 hours (Friday) | 76 | 52 |

*Table 3 – Background & Ambient Sound Level Results Summary – Attended Monitoring*

During the attended monitoring at MP2, road traffic noise emissions were fairly steady-state and dominated the noise profile. However, during lulls in road traffic flow site specific noise emissions were just perceptible. The noise emissions included 'squeaking' and 'crashing' characteristics which were later found to be an under-oiled JBC traversing the site and manoeuvring inert waste.

During the attended monitoring at MP3, site specific noise emissions were inaudible.

# 3. BS4142 NIA of Existing Operations

In the following section of the report, the impact of the noise emissions generated by the site's current operations is assessed.

## 3.1 Summary of On-Site Measurements – Existing Operations

For all onsite measurements the following measurement methodology was adhered to:

- Ambient measurements were taken at 1.5m above the ground in free-field conditions of mobile plant when in use.
- Where residual sound levels could not be measured due to the nature of operations, measurements were instead taken at a location where the noise source of interest was dominant. In all cases, a minimum difference of at least 10 dB was preferred.
- All measurements were taken using a fast time-weighting and the sound level meter was set to log every 0.1s.

*Short-Term Sound Level Results Summary*

The following table outlines the results summary of the spot measurements taken on-site of all existing equipment and processes.

| Description | 1/1 Octave Frequency Band (Hz, $L_{eq}$, dB) | | | | | | | | Overall (dBA) |
|---|---|---|---|---|---|---|---|---|---|
| | 63 | 125 | 250 | 500 | 1k | 2k | 4k | 8k | |
| JCB sorting material with Bucket at 3.5m | 85 | 78 | 79 | 74 | 72 | 71 | 67 | 59 | 78 |
| JCB Wheeled Loader Moving Waste (Collecting & Tipping) at 4m | 91 | 90 | 86 | 82 | 76 | 74 | 70 | 66 | 84 |

*Table 4 – On-Site Spot Measurement Results Summary*

*Archived Noise Data*

During the attended monitoring periods there were no skip wagons tipping waste. Consequently, noise data recorded by NOVA Acoustics for a similar development has been utilised.

The table below outlines the $L_{eq}$ sound levels measured at 4m from a SIP wagon tipping waste, lasting 3-minutes.

| Description | 1/1 Octave Frequency Band (Hz, $L_{eq}$, dB) | | | | | | | | Overall (dBA) |
|---|---|---|---|---|---|---|---|---|---|
| | 63 | 125 | 250 | 500 | 1k | 2k | 4k | 8k | |
| Skip Wagon Tipping Waste at 4m | 70 | 73 | 73 | 75 | 73 | 74 | 65 | 58 | 79 |

*Table 5 – Archived Skip Wagon Noise Data*

## 3.2 Specific Sound Levels & Noise Modelling Data

*Sound Power Levels of External Noise Sources*

The table below outlines the sound power levels of all external operations (corrected for residual noise where applicable) and the on-time corrections over a typical 1-hour reference period. Full calculations can be found in Appendix D and all on-time corrections have been applied within the noise modelling software.

| Description | 1/1 Octave Frequency Band (Hz, Lw dB) | | | | | | | | Overall Lw (dBA) | Time Correction |
|---|---|---|---|---|---|---|---|---|---|---|
| | 63 | 125 | 250 | 500 | 1k | 2k | 4k | 8k | | |
| JCB sorting material with Bucket (3.5m, Q2) | 104 | 97 | 98 | 93 | 91 | 90 | 86 | 78 | 97 | 100% |
| JCB Wheeled Loader Moving Waste (4m, Q2) | 111 | 110 | 106 | 102 | 96 | 94 | 90 | 86 | 104 | 100% |
| Skip Wagon Tipping Waste (4m, Q2) | 90 | 93 | 93 | 95 | 93 | 94 | 85 | 78 | 99 | 9-mins / hour (15%) |

*Table 6 – $L_W$ of External Noise Sources*

*Noise Modelling*

The following assumptions have been made within the SoundPlan 9.0 noise modelling software:

- To accurately model the land surrounding the Site, the topographical data has been taken from the EA's 'National LIDAR Programme' on the DEFRA Data Services Platform.
- For the purpose of the assessment, the ground between the source and receivers is considered to consist of primarily acoustically 'hard' surfaces.
- Where source data was provided with octave band data, it was used to facilitate noise modelling in accordance with ISO 9613-2. ISO 9613-2 assumes a 'downwind' model to the NSRs.
- The sound map grid height has been set to 1.5m, however, the noise levels used in the assessment have been taken from the most exposed point of each façade or within the centre of gardens.
- The site and all other buildings and any intervening objects have been modelled according to measurements taken on-site and those provided by the LIDAR data.
- A 'worst-case' 1-hour period has been assessed.
- The on-time corrections seen in Table 6 have been calculated within the noise modelling histograms.
- The JCB sorting waste is in a fixed position when in use, despite it being mobile plant. A point source emitter modelled at 1.5m above the ground has been inputted to the model.
- A point source emitter modelled at 1.5m above the ground has been used to represent the skip wagons tipping waste.
- The JCB wheeled loader is limited to a 10mph speed limit and is used evenly across the site over a full working day. For this, an area source has been modelled at 1.5m above the ground.

The sound map showing the specific sound levels emissions from the sites' existing operations can be seen in the following figure.

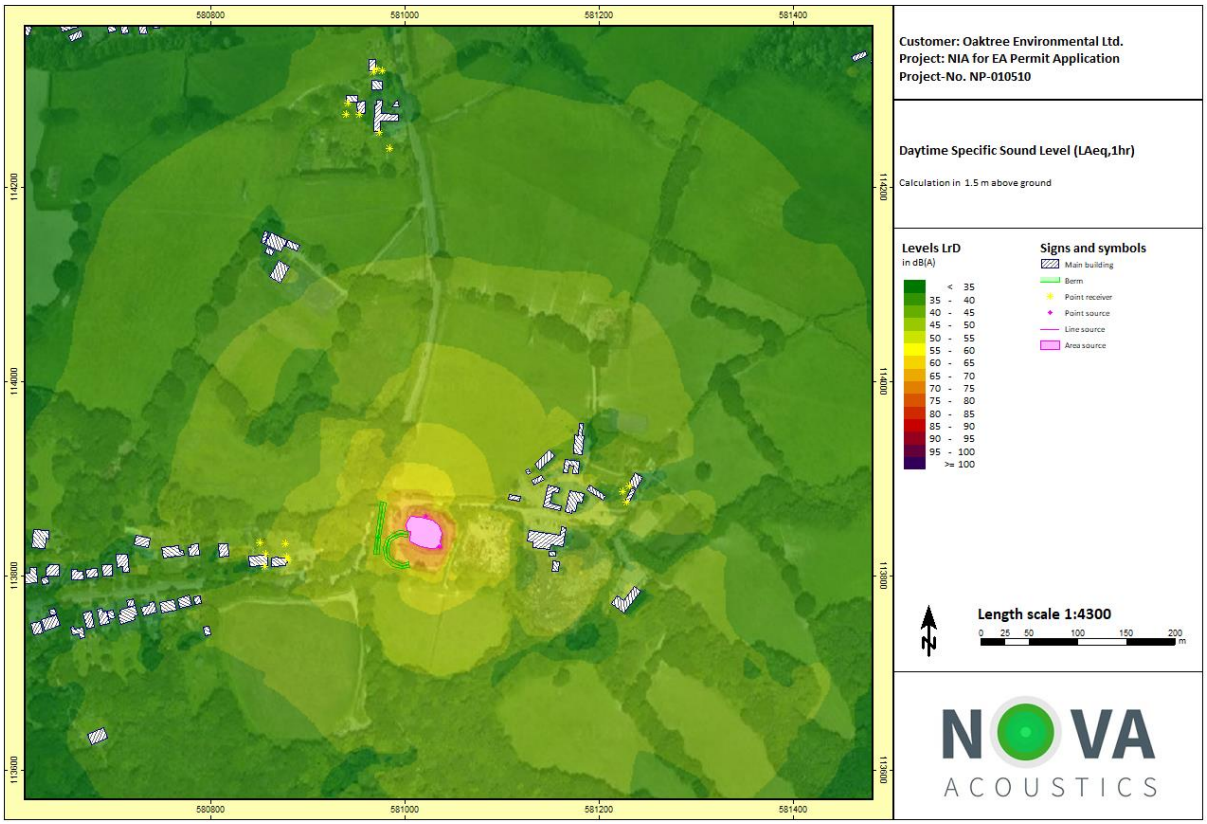


*Figure 4 – Specific Sound Level Map (Existing Daytime Operations)*

## 3.3 BS4142 Noise Impact Assessment of Existing Operations

*Most Affected NSR (NSR2)*

The BS4142 noise impact assessments are conducted at the most affected NSRs in the following tables.

| Daytime Noise Impact Assessment at Most Affected NSR (NSR2) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Description | 1/1 Octave Frequency Band (Hz, dB) | | | | | | | | Overall (dBA) |
| | 63 | 125 | 250 | 500 | 1k | 2k | 4k | 8k | |
| Specific Sound Level at NSR2 ($L_{eq}$ at most affected NSR) | 57 | 53 | 49 | 47 | 43 | 41 | 33 | 16 | 49 |
| Acoustic Feature Correction | In accordance with the subjective method of BS4142, a +3 dB penalty has been applied to account for impulsivity that is 'just perceptible' at the most affected NSRs. The impulsivity is as a result of the collection and tipping of waste from the mobile plant. | | | | | | | | +3 |
| Rating Sound Level ($L_{Ar,Tr}$) | Specific Sound Level + Above Penalties | | | | | | | | 52 |
| Background Sound Level | $L_{A90,15min}$ at MP1 during daytime operational hours (Figure 3). | | | | | | | | 45 |
| Exceedance of $L_{A90}$ | $L_{Ar,Tr} - L_{A90,15min}$ | | | | | | | | +7 |
| BS4142 Assessment Outcome | 'Adverse Impact, dependent on context'. | | | | | | | | |
| NPPF & NPSE Outcome | 'Lowest Observed Adverse Effect Level' ('LOAEL'). | | | | | | | | |
| **See discussion below.** | | | | | | | | | |

*Table 7 – BS4142 Noise Impact Assessment of Existing Operations – Most Affected NSR (NSR2)*

The BS4142 assessment above indicates that the site is currently causing adverse impact (dependent on context) at the most affected NSR(2). Whilst site specific noise emissions from the moving/sorting of waste were just perceptible adjacent to NSR2, the assessment is thought to present a 'worst-case' scenario as 100% on-times have been assumed. This was rarely found to be the case during the site visits.

| Daytime Noise Impact Assessment at NSR (NSR1) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Description | 1/1 Octave Frequency Band (Hz, dB) | | | | | | | | Overall (dBA) |
| | 63 | 125 | 250 | 500 | 1k | 2k | 4k | 8k | |
| Specific Sound Level at NSR1 ($L_{eq}$) | 54 | 51 | 44 | 41 | 38 | 35 | 26 | 4 | 44 |
| Acoustic Feature Correction | In accordance with the subjective method of BS4142, a +3 dB penalty has been applied to account for impulsivity that is 'just perceptible' at the most affected NSRs. The impulsivity is as a result of the collection and tipping of waste from the mobile plant. | | | | | | | | +3 |
| Rating Sound Level ($L_{Ar,Tr}$) | Specific Sound Level + Above Penalties | | | | | | | | 47 |
| Background Sound Level | $L_{A90,15min}$ at MP1 during daytime operational hours (Figure 3). | | | | | | | | 45 |
| Exceedance of $L_{A90}$ | $L_{Ar,Tr} - L_{A90,15min}$ | | | | | | | | +2 |
| BS4142 Assessment Outcome | Low likelihood of 'adverse Impact, dependent on context'. | | | | | | | | |
| NPPF & NPSE Outcome | 'No Observed Adverse Effect Level' ('NOAEL'). | | | | | | | | |
| **See discussion below.** | | | | | | | | | |

*Table 8 – BS4142 Noise Impact Assessment of Existing Operations – NSR1*

The BS4142 assessment above indicates that there is a low likelihood of adverse impact (dependent on context) at NSR1. As previously stated, NSR1 is arguably less sensitive than NSR2 and NSR3 due to its attachment to the businesses operating within their land, and the element of control they have over the tenants that operate from there. As such, it is thought the level of impact would be classed as 'No Observed Adverse Effect Level' ('NOAEL') when assessed with the NPPF and NPSE.

*NSR3*

The cumulative specific sound level calculated at NSR3 is in the order of 38 dBA. This corroborates with the subjective impression that the site was inaudible within the vicinity of this receptor. No acoustic features were deemed perceptible and as such, the BS4142 rating sound level of 38 dBA would not exceed the background sound level (45 dBA). This is an indication of 'low impact' in accordance with BS4142 and would be classed as a 'No Observed Effect Level' ('NOEL') when assessed in accordance with the NPSE and NPPF.

*Discussion*

As stated in Condition 3 of the approved application for the site, rating noise levels should not exceed 43 dB $L_{Aeq,1hr}$ when measured in accordance with BS4142:1997. This is an indication that the existing operations may require mitigation as noise impact would be possible.

# 4. BS4142 NIA of Proposed Permit Variation

In the following section of the report, the impact from the proposed permit variation is assessed.

## 4.1 Adopted Criteria

Considering that noise emissions from the site are currently causing a level of 'adverse impact', the following criteria have been adopted:

- The BS4142 rating sound levels of the permit variation alone shall not exceed the background sound level by greater than 5 dB.
- The specific sound levels from the permit variation shall not constructively add to the existing ambient sound levels at each NSR by a substantial degree.

## 4.2 Specific Sound Levels & Noise Modelling Data

The following new processes and machinery are proposed:

- Skip wagon tips will increase from 3 per 1-hour period to 6. It is assumed that these are split evenly between the aggregate crushing area and light waste area with the trommel.
- The JCB shall be moved to the crushing area (surrounded by the 5m bund) and remain stationary to sort inert waste.
- A Terex 833+ crusher shall be situated within the earth bunded area 8. The crusher is expected to operate continuously over a 1-hour period as a 'worst-case' scenario.
- A Terex Finlay 833 screener shall be located adjacent to the concrete hardstanding at area 5. The screener is also assumed to operate continuously over a 1-hour period.
- An area of concrete hard standing shall be bedded allowing for the stockpile of lighter waste. 3 m tall concrete walls are to be erected around each stockpile and the permitter of the hard standing.

*Archived Noise Data*

The sound pressure level data collected by Oaktree Environmental has been used to calculate the sound power levels of each noise source (outlined in the table below). All measurements were taken during favourable weather conditions at 1.5m above local ground level. Each source was dominant at the measurement position and the sound level meter was set to a 'fast' time weighting.

Noise data collected for McCloskey J45 screener is assumed to be akin to the Terex Finlay 833 model proposed by the client.

| Description | 1/1 Octave Frequency Band (Hz, $L_{eq}$, dB) | | | | | | | | Overall (dBA) |
|---|---|---|---|---|---|---|---|---|---|
| | 63 | 125 | 250 | 500 | 1k | 2k | 4k | 8k | |
| McCloskey J45 Screener at 2m (aggregate) | 95 | 95 | 92 | 88 | 86 | 85 | 82 | 77 | 92 |
| Terex 833+ Crusher at 2.5m (aggregate) | 90 | 89 | 88 | 85 | 84 | 84 | 80 | 72 | 90 |

*Table 9 – $L_{eq}$ Noise Levels of Proposed Equipment*

*Sound Power Levels of External Noise Sources*

The table below outlines the sound power levels of all external operations (corrected for residual noise where applicable) and the relevant on-time corrections. Full calculations can be found in Appendix D and all on-time corrections have been applied within the noise modelling software.

| Description | 1/1 Octave Frequency Band (Hz, Lw dB) | | | | | | | | Overall Lw (dBA) | Time Correction |
|---|---|---|---|---|---|---|---|---|---|---|
| | 63 | 125 | 250 | 500 | 1k | 2k | 4k | 8k | | |
| JCB sorting material with Bucket (3.5m, Q2) | 104 | 97 | 98 | 93 | 91 | 90 | 86 | 78 | 97 | 100% |
| Skip Wagon Tipping Waste by Crushing Pile (4m, Q2) | 90 | 93 | 93 | 95 | 93 | 94 | 85 | 78 | 99 | 9-mins (15%) |
| Skip Wagon Tipping Waste on Hardstanding (4m, Q2) | 90 | 93 | 93 | 95 | 93 | 94 | 85 | 78 | 99 | 9-mins (15%) |
| Screener (2m, Q2) | 109 | 109 | 106 | 102 | 100 | 99 | 96 | 91 | 106 | 100% |
| Terex 833+ Crusher (2.5m, Q2) | 106 | 105 | 104 | 101 | 100 | 100 | 96 | 88 | 106 | 100% |

*Table 10 – Lw of Proposed External Noise Sources*

*Noise Modelling*

The following assumptions have been made within the SoundPlan 9.0 noise modelling software:

- The same environmental standards and noise map particulars have been assumed.
- The JCB sorting waste is moved to the crushing stockpile area and is stationary. A point source emitter modelled at 1.5m above the ground, has been inputted into the model.
- A point source emitter modelled at 1.5m above the ground has been used to represent the skip wagons tipping waste.
- Point source emitters modelled at 1.5m above the ground have been used to represent all sources. A height of 1.5m is deemed to be the average height of each source considering there are no dominant noise generating elements greater than 2m above the ground for each source.

The sound map showing the specific sound levels emissions from the site can be seen in the following figure.

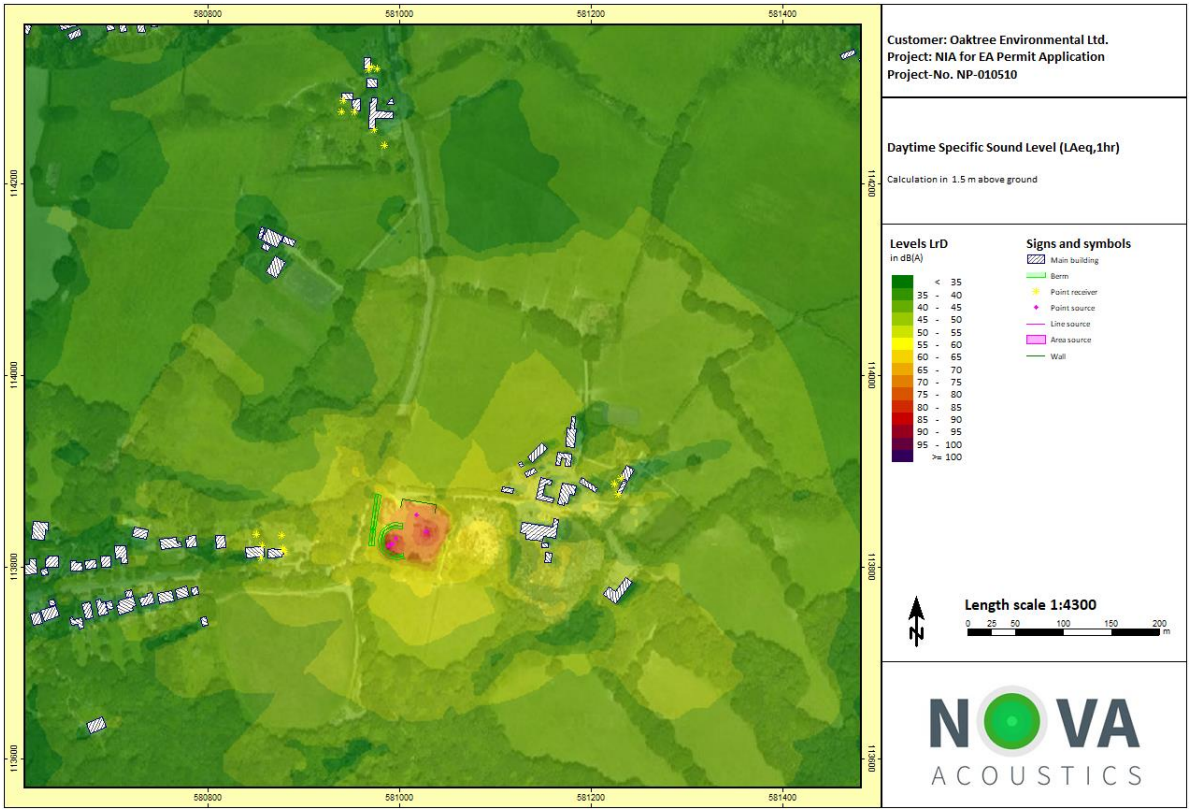


*Figure 5 – Specific Sound Level Map (Proposed Operations)*

## 4.3 BS4142 Noise Impact Assessment of Proposed Operations

The BS4142 noise impact assessments are conducted at the most affected NSRs in the following tables.

| Daytime Noise Impact Assessment at Most Affected NSR (NSR2) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Description | 1/1 Octave Frequency Band (Hz, dB) | | | | | | | | Overall (dBA) |
| | 63 | 125 | 250 | 500 | 1k | 2k | 4k | 8k | |
| Specific Sound Level at NSR2 ($L_{eq}$ at most affected NSR) | 55 | 51 | 48 | 46 | 44 | 42 | 35 | 17 | 49 |
| Acoustic Feature Correction | In accordance with the subjective method of BS4142, a +3 dB penalty has been applied to account for impulsivity that may be 'just perceptible' at the most affected NSRs. The loading of the crusher and screener and subsequent processing is typically impulsive. However, the penalties are thought to be a 'worst-case' scenario given the acoustic characteristics are akin to those already emitted from the site; therefore, perceptibility of the new once may be less so. | | | | | | | | +3 |
| Rating Sound Level ($L_{Ar,Tr}$) | Specific Sound Level + Above Penalties | | | | | | | | 52 |
| Background Sound Level | $L_{A90,15min}$ at MP1 during daytime operational hours (Figure 3). | | | | | | | | 45 |
| Exceedance of $L_{A90}$ | $L_{Ar,Tr} - L_{A90,15min}$ | | | | | | | | +7 |
| BS4142 Assessment Outcome | 'adverse Impact, dependent on context'. | | | | | | | | |
| NPPF & NPSE Outcome | 'Lowest Observed Adverse Effect Level' ('LOAEL'). | | | | | | | | |
| **See discussion below.** | | | | | | | | | |

*Table 11 – BS4142 Noise Impact Assessment of Proposed Operations – Most Affected NSR (NSR2)*

The assessment above indicates the potential for adverse impact in accordance with BS4142. Whilst it is understood that the site has been operating for some time and there have been no known noise complaints, the introduction of the screener (which is predicted to be dominant as it is to be situated in relatively open space) poses issues.

The acoustic environment is currently dominated by road traffic noise emissions which mask mobile plant engines, and occasional 'crashing' and 'banging' is currently only 'just perceptible' at the closest NSRs. Notwithstanding the above, the rating sound levels do not achieve the adopted criteria, and consequently, mitigation measures must be implemented to reduce the noise impact.

| Daytime Noise Impact Assessment at NSR(1) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Description | 1/1 Octave Frequency Band (Hz, dB) | | | | | | | | Overall (dBA) |
| | 63 | 125 | 250 | 500 | 1k | 2k | 4k | 8k | |
| Specific Sound Level at NSR1 ($L_{eq}$) | 53 | 51 | 46 | 42 | 43 | 41 | 32 | 9 | 47 |
| Acoustic Feature Correction | In accordance with the subjective method of BS4142, a +6 dB penalty has been applied to account for impulsivity that may be 'just perceptible' at the most affected NSRs. Impulsivity would arise from the crushing and shredding of inert waste; NSR1 is not screened by the 5m tall earth bunding.<br>The penalty is deemed conservative given the existing acoustic characterises within the noise emissions emitted from the site. | | | | | | | | +3 |
| Rating Sound Level ($L_{Ar,Tr}$) | Specific Sound Level + Above Penalties | | | | | | | | 50 |
| Background Sound Level | $L_{A90,15min}$ at MP1 during daytime operational hours (Figure 3). | | | | | | | | 45 |
| Exceedance of $L_{A90}$ | $L_{Ar,Tr} - L_{A90,15min}$ | | | | | | | | +5 |
| BS4142 Assessment Outcome | 'Adverse Impact, dependent on context'. | | | | | | | | |
| NPPF & NPSE Outcome | 'No Observed Adverse Effect Level' ('NOAEL') to 'Lowest Observed Adverse Effect Level' ('LOAEL'). | | | | | | | | |
| See discussion below. | | | | | | | | | |

*Table 12 – BS4142 Noise Impact Assessment of Proposed Operations – NSR1*

The BS4142 assessment above indicates the potential for adverse impact (dependent on context) at NSR1. Whilst NSR1 is arguably less sensitive as previously discussed, the level of impact is considered on the edge of the adopted criteria, and mitigation measures should be implemented to reduce the noise impact.

***NSR3***

The cumulative specific sound level calculated at NSR3 is in the order of 38 dBA. A 'worst-case' scenario would be to assume that impulsivity is 'just perceptible' (+3 dB), meaning the BS4142 rating sound level of 41 dBA would not exceed the background sound level (45 dBA). This is an indication of 'low impact' in accordance with BS4142 and would be classed as a 'No Observed Effect Level' ('NOEL') when assessed in accordance with the NPSE and NPPF.

## 4.4 Recommendations & Mitigation Measures

The following section of the report outlines the mitigation measures necessary to reduce the noise impact from the proposed operations.

The following mitigation measures should be implemented and retained thereafter:

- The J45 screener should be fitted with a polyurethane sieve plate. These plates are said to reduce the overall noise emissions by 5 dBA; however, this must be validated prior to the first operation of the site. According to government advice, a further 1 dBA reduction in overall noise emissions can be achieved by installing rubber isolators, as seen at the following document address: https://www.cdc.gov/niosh/mining/userfiles/works/pdfs/navroa.pdf. Considering this, it is assumed that a total reduction of 5 dBA can be achieved, resulting in an overall sound power level of 101 dBA.

*Noise Modelling*

The following assumptions have been made within the SoundPlan 9.0 noise modelling software:

- The same environmental standards and noise map particulars have been assumed.
- The J45 screener has an overall sound power level 101 dBA should the mitigation measures be installed.

The sound map showing the specific sound levels emissions from the site considering the proposed mitigation measures can be seen in the following figure.

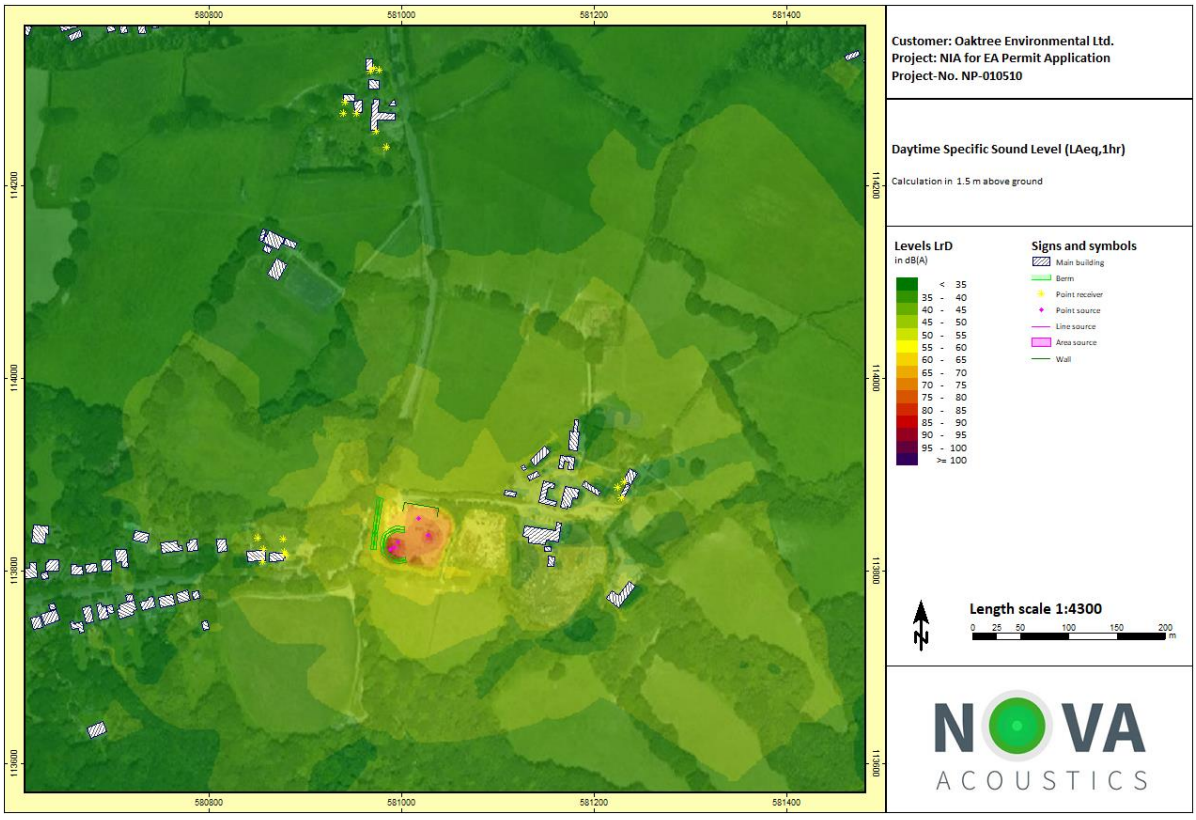


*Figure 6 – Specific Sound Level Map (Proposed Mitigated Operations)*

*BS4142 Noise Impact Assessment of Proposed Mitigated Operations*

The BS4142 noise impact assessments are conducted at the NSRs in the following tables.

| Daytime Noise Impact Assessment at Most Affected NSR2 – Post-Mit | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Description | 1/1 Octave Frequency Band (Hz, dB) | | | | | | | | Overall (dBA) |
| | 63 | 125 | 250 | 500 | 1k | 2k | 4k | 8k | |
| Post-Mit Permit Application Specific Sound Level at NSR2 ($L_{eq}$ at most affected NSR) | 53 | 48 | 44 | 42 | 40 | 38 | 31 | 12 | 45 |
| Acoustic Feature Correction | In accordance with the subjective method of BS4142, a +3 dB penalty has been applied to account for impulsivity in the noise emissions from the crushing and screening that may be 'just perceptible' at times. | | | | | | | | +3 |
| Rating Sound Level ($L_{Ar,Tr}$) | Specific Sound Level + Above Penalties | | | | | | | | 48 |
| Background Sound Level | $L_{A90,15min}$ at MP1 during daytime operational hours (Figure 3). | | | | | | | | 45 |
| Exceedance of $L_{A90}$ | $L_{Ar,Tr} - L_{A90,15min}$ | | | | | | | | +3 |
| BS4142 Assessment Outcome | Low likelihood of 'adverse Impact, dependent on context' | | | | | | | | |
| NPPF & NPSE Outcome | 'No Observed Adverse Effect Level' ('NOAEL') to 'Lowest Observed Adverse Effect Level' ('LOAEL') | | | | | | | | |
| **See discussion below.** | | | | | | | | | |

*Table 13 – BS4142 Noise Impact Assessment of Proposed Operations – Post-Mit – NSR2*

The assessment above indicates the potential for a low likelihood of 'adverse impact, dependent on context' at the most affected NSR2. The proposed mitigation measures are predicted to reduce the rating sound level by 4 dB at NSR2 and achieve the adopted criteria.

| Daytime Noise Impact Assessment at NSR1 – Post-Mit | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Description | 1/1 Octave Frequency Band (Hz, dB) | | | | | | | | Overall (dBA) |
| | 63 | 125 | 250 | 500 | 1k | 2k | 4k | 8k | |
| Post-Mit Permit Application Specific Sound Level at NSR1 ($L_{eq}$) | 51 | 48 | 43 | 40 | 40 | 38 | 28 | 4 | 45 |
| Acoustic Feature Correction | In accordance with the subjective method of BS4142, a +3 dB penalty has been applied to account for impulsivity in the noise emissions from the crushing and screening that may be 'just perceptible' at times. | | | | | | | | +3 |
| Rating Sound Level ($L_{Ar,Tr}$) | Specific Sound Level + Above Penalties | | | | | | | | 48 |
| Background Sound Level | $L_{A90,15min}$ at MP1 during daytime operational hours (Figure 3). | | | | | | | | 45 |
| Exceedance of $L_{A90}$ | $L_{Ar,Tr} - L_{A90,15min}$ | | | | | | | | +3 |
| BS4142 Assessment Outcome | Low likelihood of 'adverse Impact, dependent on context' | | | | | | | | |
| NPPF & NPSE Outcome | 'No Observed Adverse Effect Level' ('NOAEL') to 'Lowest Observed Adverse Effect Level' ('LOAEL') | | | | | | | | |
| **See discussion below.** | | | | | | | | | |

*Table 14 – BS4142 Noise Impact Assessment of Proposed Operations – Post-Mit – NSR1*

The assessment above indicates the potential for a low likelihood of 'adverse impact, dependent on context' at NSR1. The proposed mitigation measures are predicted to reduce the rating sound level by 2 dB at NSR1 and achieve the adopted criteria.

As NSR1 is arguably less sensitive, it is thought the impact is favoured towards the lower effect levels as per the NPSE and NPPF.

*BS4142 Noise Impact Assessment of Cumulative Operations*

The BS4142 noise impact assessments are conducted at the NSRs in the following tables based on the combination of the mitigated permit variation and the existing operations.

| Cumulative Daytime Noise Impact Assessment at Most Affected NSR2 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Description | 1/1 Octave Frequency Band (Hz, dB) | | | | | | | | Overall (dBA) |
| | 63 | 125 | 250 | 500 | 1k | 2k | 4k | 8k | |
| Existing Specific Sound Level (Table 7) | 57 | 53 | 49 | 47 | 43 | 41 | 33 | 16 | 49 |
| Post-Mit Permit Application Specific Sound Level at NSR2 (Table 13) | 53 | 48 | 44 | 42 | 40 | 38 | 31 | 12 | 45 |
| Cumulative Specific Sound Level | 58 | 54 | 50 | 48 | 45 | 43 | 35 | 17 | 51 |
| Acoustic Feature Correction | In accordance with the subjective method of BS4142, a +3 dB penalty has been applied to account for impulsivity that is 'just perceptible'. | | | | | | | | +3 |
| Rating Sound Level ($L_{Ar,Tr}$) | Specific Sound Level + Above Penalties | | | | | | | | 54 |
| Background Sound Level | $L_{A90,15min}$ at MP1 during daytime operational hours (Figure 3). | | | | | | | | 45 |
| Exceedance of $L_{A90}$ | $L_{Ar,Tr} - L_{A90,15min}$ | | | | | | | | +9 |
| BS4142 Assessment Outcome | 'Adverse Impact' when considering the site context. | | | | | | | | |
| NPPF & NPSE Outcome | 'Lowest Observed Adverse Effect Level' ('LOAEL') when considering the site context. | | | | | | | | |
| **See discussion below.** | | | | | | | | | |

*Table 15 – BS4142 Noise Impact Assessment of Cumulative Operations – NSR2*

The assessment above indicates the potential for 'adverse impact, dependent on context' at the most affected NSR. The rating sound level is predicted to increase by 2 dB; however, the perceptibility of the acoustic features is thought to remain the same.

It is prudent to note that the majority of impact is caused by the existing site operations, which are circa 4 dB higher at NSR2. It should also be recognised that the all the BS4142 assessments have assumed situations where BAT was/is lacking and 100% on-times; a lower degree of noise impact is anticipated.

| Cumulative Daytime Noise Impact Assessment at NSR1 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Description | 1/1 Octave Frequency Band (Hz, dB) | | | | | | | | Overall (dBA) |
| | 63 | 125 | 250 | 500 | 1k | 2k | 4k | 8k | |
| Existing Specific Sound Level (Table 8) | 54 | 51 | 44 | 41 | 38 | 35 | 26 | 4 | 44 |
| Post-Mit Permit Application Specific Sound Level at NSR1 (Table 14) | 51 | 48 | 43 | 40 | 40 | 38 | 28 | 4 | 45 |
| Cumulative Specific Sound Level | 56 | 53 | 47 | 44 | 42 | 40 | 30 | 7 | 47 |
| Acoustic Feature Correction | In accordance with the subjective method of BS4142, a +3 dB penalty has been applied to account for impulsivity that is 'just perceptible'. | | | | | | | | +3 |
| Rating Sound Level ($L_{Ar,Tr}$) | Specific Sound Level + Above Penalties | | | | | | | | 50 |
| Background Sound Level | $L_{A90,15min}$ at MP1 during daytime operational hours (Figure 3). | | | | | | | | 45 |
| Exceedance of $L_{A90}$ | $L_{Ar,Tr} - L_{A90,15min}$ | | | | | | | | +5 |
| BS4142 Assessment Outcome | 'Adverse Impact, dependent on context' | | | | | | | | |
| NPPF & NPSE Outcome | 'No Observed Adverse Effect Level' ('NOAEL') to 'Lowest Observed Adverse Effect Level' ('LOAEL') | | | | | | | | |
| **See discussion below.** | | | | | | | | | |

*Table 16 – BS4142 Noise Impact Assessment of Cumulative Operations – NSR1*

The BS4142 assessment above indicates the potential for 'adverse impact, dependent on context' at NSR1. The rating sound level is predicted to increase by 3 dB; however, it is thought that the level of impact would be tolerated by a greater degree due to the attachment of the property to the site.

*NSR3*

The cumulative specific sound level calculated at NSR3 is in the order of 40 dBA. A 'worst-case' scenario would be to assume that impulsivity is 'just perceptible' (+3 dB), a the BS4142 rating sound level of 43 dBA would not exceed the background sound level (45 dBA). This is an indication of 'low impact' in accordance with BS4142 and would be classed as a 'No Observed Effect Level' ('NOEL') when assessed in accordance with the NPSE and NPPF.

# 5. Conclusion and Action Plan

The site has been assessed against the requirements of BS4142 and the EA's policies and guidance. A mitigation scheme has been provided to reduce the noise impact from the proposed environment permit variation.

The BS4142 assessment of existing operations has shown that 'low impact' to 'adverse impact, dependent on context' is taking place at the surrounding NSRs.

Should the mitigation measures specified within the report be adhered to, the noise emissions from the permit variation alone are predicted to cause a low likelihood of 'adverse impact, dependent on context' in accordance with BS4142 at surrounding NSRs. The following should be taken into consideration:

- Provided the mitigation measures are implemented, the acoustic features present in the site-specific noise emissions are thought to be no more perceptible than the current operations. Furthermore, the acoustic features are thought to be akin to those already emitted from the site.
- For the majority of the day, road traffic noise emissions adequately mask the site-specific noise emissions and it is thought that this would largely remain the same following the permit variation.
- The BS4142 rating sound levels of the mitigated permit variation are 4 dB below the existing rating sound levels at the most sensitive NSR2.
- NSR1 is arguably less sensitive than NSR2 and NSR3 due to its attachment to the businesses operating within their land, and the element of control they have over the tenants that operate from there.
- The high rating sound levels of the cumulative operations are largely due to the existing operations.
- The BS4142 assessments have assumed situations where BAT was/is lacking and 100% on-times; a lower degree of noise impact is anticipated.
- The chosen background sound level is towards to the bottom of the measured range is thought to be representative of a more conservative residual acoustic climate.

The following 'Action Plan' is outlined to ensure the design considerations and specifications from this report are duly implemented:

1. The proposed mitigation measures specified in Section 4.4 should be implemented in full, retained thereafter and maintained throughout their lifetime. It is advised that the measures for the screener are validated prior to the first operation of the permit variation.
2. The noise management plan outlined in Section 6 must be adhered to throughout the site's lifetime.
3. All plant should be regularly and properly maintained to ensure that it is working optimally. Poorly maintained equipment can lead to excess noise emissions.

The findings of this report will require written approval from the Local Planning Authority and Environment Agency prior to work commencing.

# 6. Noise Management Plan

This noise management plan outlines the methods by which the site operator will systematically assess and minimise the potential impacts of noise generated by the site. The noise management plan is a working document with the specific aim to ensure that:

- Noise impact is considered as part of routine inspections.
- Noise is primarily controlled at source by good operational practices and 'Best Available Techniques ('BAT'), including physical and management control measures.
- All appropriate measures are taken to prevent or, where that is not reasonably practical, to reduce noise emissions from the site.

The noise management plan addresses the impact of noise and the control measures employed to mitigate the risk. These are supported through monitoring procedures to identify elevated levels and review complaints should they arise. The complaints management procedure is also addressed, which includes the management responsibilities.

## 6.1 Hours of Operation

- All external operations will take place between 08:00 to 18:00 hours, Monday to Friday, and 08:00 to 13:00 hours on Saturdays.
- No work shall take place on Sundays, Bank Holidays or Public Holidays.

## 6.2 Equipment Maintenance

All failed/broken plant and equipment will be replaced with equivalents that produce equal or lower levels of noise. This will be verified with manufacturers technical datasheets or on-site noise measurements.

All plant and machinery will be regularly and properly maintained in accordance with the preventative maintenance schedule of which the appropriate staff will be trained in.

## 6.3 Operator Monitoring Plan

Monitoring of noise emissions from the site will be undertaken both subjectively and objectively.

*Continuous Subjective Noise Monitoring*

- All operational staff will, as part of their induction, be made aware of their roles and responsibility. It is the responsibility of all staff to be aware of noise on site and to report any potential noise issues to the sites Operations Manager at the earliest opportunity.
- All staff will have refresher training on noise issues, prevention and management at six-monthly intervals.
- If members of staff report any instances of elevated noise, this should be investigated immediately. In the event that increased noise levels are verified, the source of the noise should be taken out of commission and must be fixed/corrected prior to the equipment being put back into commission.
- A visual inspection of all equipment should be made before use to ensure that there are no obvious faults or malfunctions that could lead to elevated noise levels.

- It will be ensured that all noise mitigation measures (e.g., enclosures) are installed as per manufacturer's guidance and maintained throughout their lifetime.

*Objective Noise Monitoring*

- A class 2 sound level meter will be purchased to measure sound levels on site. This will take place during typical operations when the site is in use and associated plant vehicles are operating as normal.

*Monthly Measurements*

Noise levels will be measured at monthly intervals at the site perimeter in the location shown below.


*Figure 7 – NMP Monthly Measurement Positions*

- $L_{Aeq,1hour}$ and $L_{Aeq,15min}$ (A-weighted noise levels averaged over the 1-hour daytime and 15minute nighttime assessment periods) and $L_{AFmax}$ noise levels will be recorded. Measurements taken on site will be compared with previous measurements. If $L_{Aeq,T}$ noise levels increase by more than 3 dB from the previous month then the cause of the increase shall be investigated.
- When the source of the elevated noise levels is discovered, remedial work shall be undertaken to reduce noise emissions to 'normal' levels. If complex remedial work is required, the offending equipment will be taken out of commission until repair work is completed. This will be logged in an IMS (Issue Management System).

## 6.4 BAT Control Measures

*Mobile Plant*

- Any associated reversing alarms should be non-tonal white noise.
- Engines will be switched off when not in use. Vehicles will not be left idling.
- Ensure plant and machinery are regularly well maintained.
- Avoid unnecessary horn usage and revving of engines.
- Switch off equipment and engines from the waste distribution vehicles when not required.
- Keep access roads clear and well maintained. Avoid the formation of potholes and other uneven road surfaces which can generate excessive noise.
- Minimise drop heights of materials where possible.
- On-site vehicles should be fitted with exhaust silencers.

## 6.5 Management Control Measures

- Users of on-site plant and equipment complete a daily defect log at the beginning of the working day if they observe that their vehicle is not working to its optimum. An on-site mechanic actions the defect log on the same working day and machines are not used until this action has been completed.
- Tool-box talks are provided by site management on a regular basis to site operatives. These talks include all aspects of the management plans for this site.
- Plant maintenance schedules using the manufacturer's recommendations where vehicles are serviced after 500 hours of operation.
- Pre-use checks are completed prior to using plant and equipment daily.
- Defects are reported and actions are taken to rectify the problem or remove the offending item from service until such time as the issue is resolved.
- All plant and equipment are visually inspected by the operator at the end of the working day.
- Throughout the day operators are vigilant in checking vulnerable areas like exhausts and engine bays.
- Specialist contractors are used to perform maintenance outside the scope and expertise of the site management and operatives.
- All documentation relating to plant and equipment maintenance is retained in the site office for inspection.

## 6.6 Noise Complaint Investigation

An issue management system (IMS) will be implemented and completed by the site manager, this will include a site diary, plus forms and records of complaints. Further to this, a complaints procedure will be implemented; this procedure will allow for all complaints, feedback and requests made by third parties regarding the site's operational activities, health and safety performance or quality of service/product.

A phone number for the head office can be obtained online in order to allow for any member of the public to lodge a complaint without entering the operational site. The operations manager will be specifically assigned to deal with complaints.

All complaints received from third parties including statutory authorities, statutory consultees, members of the general public and representatives of the company will be forwarded to the operations manager to action as below within 2 hours (where feasible). The complaint will be logged in the incident database within 72 hours.

- The operations manager will ensure that:
- The complaint is investigated to identify the cause, if necessary, this may involve direct communication with the complainant.
- The noise source will be measured using a class 2 sound level meter and compared with monthly objective monitoring records.
- In the event of elevated noise being detected, the presence of 'abnormal' onsite activity is assessed and if necessary, action is taken immediately to prevent a reoccurrence of the same problem. These actions must be documented.
- The complainant will be contacted and given information on the investigations conducted and actions taken as appropriate.
- All complaints are reported to regional directors and discussed at site meetings.
- Details of other complaints are sent to the other company personnel as appropriate.

If the investigation indicates that the complaint has not been justified this will be clearly recorded on the incident report. All complaints will be logged.

*Reporting Measures*

In the event of elevated levels of noise being identified, the event will be reported into an issue management system (IMS) by a member of operational staff. Upon notification of an environmental incident, the site manager will complete an incident reporting form. The completed form is then distributed throughout the company for review at operational, management and health and safety meetings.

All performance failures will be categorised for input into the IMS as follows:

- Minor event: quick fix possible, locally resolved.
- Medium event: brief disruption to service, management intervention required.
- Major event: significant disruption to service.

Each non-conformance category must have a given deadline for rectification. The deadline for each category is:

- Minor Event: within 24 hours
- Medium Event: within 6 hours
- Major Event: within 1 hour

The IMS will record any actions taken to rectify the issue, ensure that any necessary actions or review are recorded onto the IMS and ensure that the person reporting the incident is notified. The site manager will investigate the performance failure within a reasonable time frame (ideally 2 hours). Once the issue has been resolved, the corrective action will be entered onto the system and the issue will be closed.

# Appendix A – Acoustic Terminology

| | |
|---|---|
| A-weighted sound pressure level, $L_{pA}$ | Quantity of A-weighted sound pressure given by the following formula in decibels (dBA). $L_{pA} = 10 \log_{10} (pA/p_0)^2$. Where: pA is the A-weighted sound pressure in pascals (Pa) and $p0$ is the reference sound pressure (20 µPa) |
| Background Sound | Underlying level of sound over a period, $T$, which might in part be an indication of relative quietness at a given location |
| Equivalent continuous A-weighted sound pressure level, $L_{Aeq,T}$ | Value of the A-weighted sound pressure level in decibels (dB) of a continuous, steady sound that, within a specified time interval, $T$, has the same mean-squared sound pressure as the sound under consideration that varies with time |
| Facade level | Sound pressure level 1 m in front of the facade |
| Free-field level | Sound pressure level away from reflecting surfaces |
| Indoor ambient noise | Noise in a given situation at a given time, usually composed of noise from many sources, inside and outside the building, but excluding noise from activities of the occupants |
| Noise Criteria | Numerical indices used to define design goals in a given space |
| Noise Rating (NR) | Graphical method for rating a noise by comparing the noise spectrum with a family of noise rating curves |
| Octave Band | Band of frequencies in which the upper limit of the band is twice the frequency of the lower limit |
| Percentile Level, $L_{AN,T}$ | A-weighted sound pressure level obtained using time-weighting “F”, which is exceeded for $N$% of a specified time interval |
| Rating Level, $L_{Ar,Tr}$ | Equivalent continuous A-weighted sound pressure level of the noise, plus any adjustment for the characteristic features of the noise |
| Reverberation time, $T$ | Time that would be required for the sound pressure level to decrease by 60 dB after the sound source has stopped |
| Sound Pressure, $p$ | root-mean-square value of the variation in air pressure, measured in pascals (Pa) above and below atmospheric pressure, caused by the sound |
| Sound Pressure Level, $L_p$ | Quantity of sound pressure, in decibels (dB), given by the formula: $L_p = 10\log_{10}(p/p_0)^{2.}$ Wherehere: $p$ is the root-mean-square sound pressure in pascals (Pa) and $p0$ is the reference sound pressure (20 µPa) |
| Weighted sound reduction index, $R_w$ | Single-number quantity which characterizes the airborne sound insulating properties of a material or building element over a range of frequencies |

# Appendix B – Standards, Legislation, Policy, and Guidance

This report is to be primarily based on the following standards, legislation, policy and guidance.

## B.1 – National Planning Policy Framework (2023)

Government policy on noise is set out in the National Planning Policy Framework (NPPF), published in 2021. This replaced all earlier guidance on noise and places an emphasis on sustainability. In section 15, Conserving and enhancing the natural and local environment, paragraph 180, it states:

*Preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans;*

Paragraph 191 states:

*Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:*

a) *Mitigate and reduce to a minimum potential adverse impact resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life;*
b) *Identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason; and*
c) *Limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation.*

## B.2 – Noise Policy Statement for England (2010)

Paragraph 191 of the NPPF also refers to advice on adverse effects of noise given in the Noise Policy Statement for England (NPSE). This document sets out a policy vision to:

Promote good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development.

To achieve this vision the Statement identifies the following three aims:

Through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development:

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

In achieving these aims the document introduces significance criteria as follows:

### SOAEL – Significant Observed Adverse Effect Level

This is the level above which significant adverse effects on health and quality of life occur. It is stated that "significant adverse effects on health and quality of life should be avoided while also considering the guiding principles of sustainable development".

### LOAEL – Lowest Observed Adverse Effect Level

This is the level above which adverse effects on health and quality of life can be detected. It is stated that the second aim above lies somewhere between LOAEL and SOAEL and requires that: "all reasonable steps should be taken to mitigate and minimise adverse effects on health and quality of life while also considering the guiding principles of sustainable development. This does not mean that such adverse effects cannot occur."

### NOEL – No Observed Effect Level

This is the level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to the noise. This can be related to the third aim above, which seeks: "where possible, positively to improve health and quality of life through the pro-active management of noise while also considering the guiding principles of sustainable development, recognising that there will be opportunities for such measures to be taken and that they will deliver potential benefits to society. The protection of quiet places and quiet times as well as the enhancement of the acoustic environment will assist with delivering this aim."

The NPSE recognises that it is not possible to have a single objective noise-based measure that is mandatory and applicable to all sources of noise in all situations and provides no guidance as to how these criteria should be interpreted. It is clear, however, that there is no requirement to achieve noise levels where there are no observable adverse impacts but that reasonable and practicable steps to reduce adverse noise impacts should be taken in the context of sustainable development and ensure a balance between noise sensitive and the need for noise generating developments.

Any scheme of noise mitigation outlined in this report will, therefore, aim to abide by the above principles of the NPPF and NPSE whilst recognizing the constraints of the site.

## B.3 – BS4142:2014+A1:2019 – 'Methods for rating and assessing industrial and commercial sound'

### Overview

BS4142:2014 sets out a method to assess the likely effect of sound from factories, industrial premises or fixed installations and sources of an industrial nature in commercial premises, on people who might be inside or outside a dwelling or premises used for residential purposes in the vicinity.

The procedure contained in BS4142:2014 for assessing the effect of sound on residential receptors is to compare the measured or predicted sound level from the source in question, the $L_{Aeq,T}$ 'specific sound level', immediately outside the dwelling with the $L_{A90,T}$ background sound level.

Where the sound contains a tonality, impulsivity, intermittency and other sound characteristics, then a correction depending on the grade of the aforementioned characteristics of the sound is added to the

specific sound level to obtain the $L_{Ar,Tr}$ 'rating sound level'. A correction to include the consideration of a level of uncertainty in sound measurements, data and calculations can also be applied when necessary.

*Rating Penalty*

Section 9 of BS4142:2014 describes how the rating sound level should be derived from the specific sound level, by deriving a rating penalty.

BS4142:2014 states:

*"Certain acoustic features can increase the significance of impact over that expected from a basic comparison between the specific sound level and the background sound level. Where such features are present at the assessment location, add a character correction to the specific sound level to obtain the rating level. This can be approached in three ways:*

*a) subjective method;*
*b) objective method for tonality;*
*c) reference method."*

Due to the nature of the development the subjective method has been adopted to derive the rating sound level from the specific sound level. This is discussed in Section 9.2 of BS4142:2014, which states:

*"Where appropriate, establish a rating penalty for sound based on a subjective assessment of its characteristics. This would also be appropriate where a new source cannot be measured because it is only proposed at that time, but the characteristics of similar sources can subjectively be assessed. Correct the specific sound level if a tone, impulse or other characteristics occurs, or is expected to be present, for new or modified sound sources."*

BS4142:2014 defines four characteristics that should be considered when deriving a rating penalty, namely; tonality; impulsivity; intermittency; and other sound characteristics, which are defined as:

*a) Tonality*

A rating penalty of +2 dB is applicable for a tone which is "just perceptible", +4 dB where a tone is "clearly perceptible", and +6 dB where a tone is "highly perceptible".

*b) Impulsivity*

A rating penalty of +3 dB is applicable for impulsivity which is "just perceptible", +6 dB where it is "clearly perceptible", and +9 dB where it is "highly perceptible".

*c) Other Sound Characteristics*

BS4142:2014 states that where "the specific sound features characteristics that are neither tonal nor impulsive, though otherwise are readily distance against the residual acoustic environment, a penalty of +3 dB can be applied."

*d) Intermittency*

BS4142:2014 states that when the "specific sound has identifiable on/off conditions, the specific sound level ought to be representative of the time period of length equal to the reference time interval which contains the greatest total amount of on time … if the intermittency is readily distinctive against the residual acoustic environment, a penalty of +3 dB can be applied."

*Background Sound Level*

The background sound level is the underlying level of sound over a period, T, and is indicative of the relative quietness at a given location. It does not reflect the occurrence of transient and/or higher sound level events and is generally governed by continuous or semi-continuous sounds.

To ensure the background sound level values used within the assessment are reliable and suitably represent both the particular circumstance and periods of interest, efforts have been made to quantify a 'typical' background sound level for a given period. The purpose has not been to simply select the lowest measured value. Diurnal patterns have also been considered as they can have a major influence on background sound levels, for example, the middle of the night can be distinctly different (and potentially of lesser importance) compared to the start or end of the night-time period for sleep purposes.

Since the intention is to determine a background sound level in the absence of the specific sound that is under consideration, it is necessary to understand that the background sound level can in some circumstances legitimately include industrial and/or commercial sounds that are present as separate to the specific sound.

*Assessment of Impact*

BS4142:2014 states: "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 estimation of the impact of the specific sound can be obtained by the difference of the rating sound level and the background sound level and considering the following:

- "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 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 negligible impact, depending on the context."

Interpreting the guidance given in BS4142:2014, with consideration of the guidance given in the NPSE and NPPG Noise, an estimation of the impact of the rating sound is summarised in the following text:

- A rating sound level that is +10 dB above the background sound level is likely to be an indication of a Significant Observed Adverse Effect Level;
- A rating sound level that is +5 dB above the background sound level is likely to be an indication of a Lowest Observed Adverse Effect Level;
- The lower the rating sound 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 sound level does not exceed the background sound level, this is an

indication of the specific sound source having a negligible impact and would therefore classified as No Observed Adverse Effect Level.

During the daytime, the assessment is carried out over a reference time period of 1-hour. The periods associated with day or night, for the purposes of the Standard, are 07.00 to 23.00 and 23.00 to 07.00, respectively.

## B.4 – Environmental Permitting (England and Wales) Regulations 2016 (as amended)

The regulations require that operators of permitted installations conduct their activities to prevent, or where that is not possible, to reduce to a minimum, pollution arising from their operations. For the processing of food stuffs, noise is a potential significant pollutant. The legislation requires that all pollutants (including noise and vibration) meet the standards required and demonstrate Best Available Techniques (BAT).

Assessment of the impacts of noise from a proposed installation requires an assessment to predict the significance of the potential impacts.

Additional guidance and reference to national standards for the monitoring and evaluation of noise are accepted as appropriate metrics for assessing the significance of impacts. The relevant guidance is detailed below.

*Horizontal Guidance for Noise Part 2 – Noise Assessment and Control (H3)*

Agency Guidance note H3 provides advice on assessing the potential impact of noise from permitted installations. The guidance notes that:

> *"Regulation of noise under IPPC will bring together several legislative regimes with different scope but similar purpose and, in the case of A1 installations, will require a co-ordinated approach between the Regulator and both the Planning functions and the Environmental Health or Environmental Protection Teams of local authorities. At an early stage, lead planning and environmental health/protection officers should be identified to ensure an effective liaison and consultation process."*

It is therefore appropriate to reference guidance used by planning authorities in determining planning applications and, where possible, align compliance requirements to avoid confusion or conflict between similarly required regulatory outcomes.

H3 endorses the use of the following specific guidance and standards for the assessment of noise from permitted installations:

- National Planning Policy Framework 2021 (NPPF)
- Planning Practice Guidance (ProPG)
- British Standard 4142:2014+A1:2019 – 'Methods for rating industrial noise affecting mixed residential and industrial areas'
- British Standard 5228:2009+A1:2014 – 'Noise and vibration control on construction and open sites'
- British Standard 7445:2003 – 'Description and measurement of environmental noise'
- World Health Organisation Guidelines for Community Noise: 1999.

It is expected that controls on noise emissions put in place under the environmental permit requirements should be consistent with those required under other regulatory regimes. It is therefore also appropriate to also consider planning policy when setting appropriate noise controls.

It is normal for permitted installations to demonstrate compliance by preparing a Noise Management Plan (NMP). The NMP addresses physical, operational and management controls exercised by the operator of the installation to comply with 'Best Available Techniques' ('BAT').

# Appendix C – Environmental Survey

## C.1 – Time History Noise Data

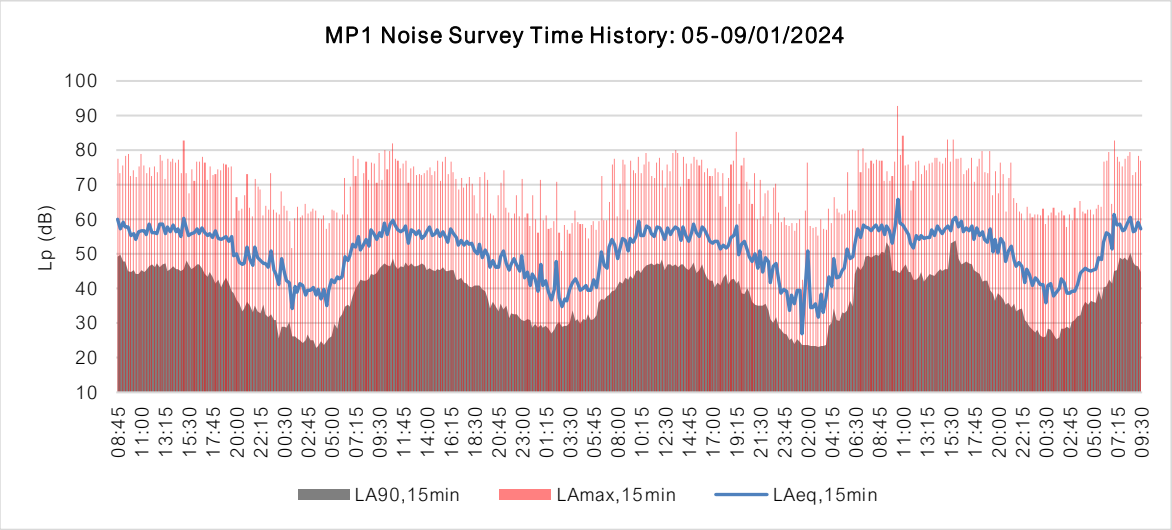


*Figure 8 – MP1 Noise Survey Time History (Full Period)*

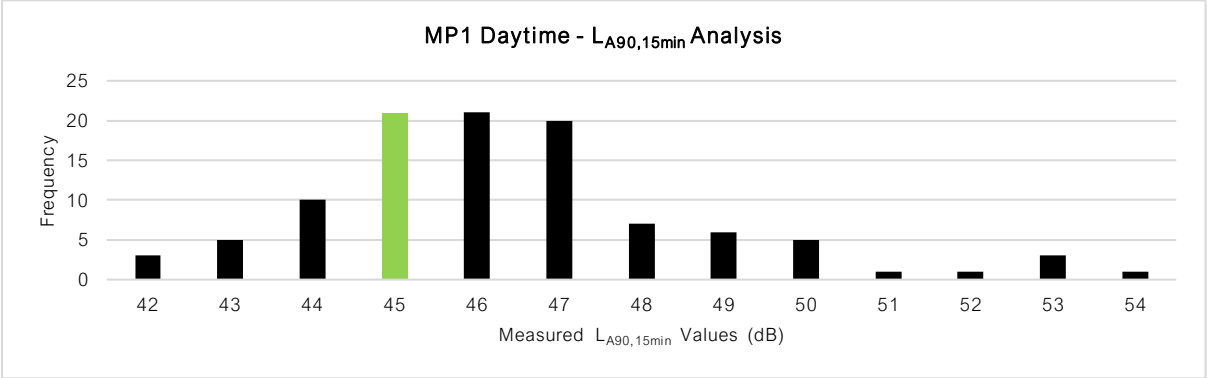


*Figure 9 – MP1 $L_{A90,15min}$ Background Sound Level*

## C.2 – Surveying Equipment

| Piece of Equipment | Serial No. | Calibration Deviation |
|---|---|---|
| Svantek 971 Class 1 Sound Level Meter | 87159 | ≤0.3 |
| CESVA CB006 Class 1 Calibrator | 901911 | |
| Svantek 971 Class 1 Sound Level Meter | 141345 | ≤0.3 |
| CESVA CB006 Class 1 Calibrator | 901911 | |

*Table 17 – Surveying Equipment*

All equipment used during the survey was field calibrated at the start and end of the measurement period with a small deviation of ≤0.3 dB. All sound level meters are calibrated every 24 months and all calibrators are calibrated every 12 months by a third-party calibration laboratory. All microphones were fitted with a protective windshield for the entire measurements period. Calibration certificates can be provided upon request.

## C.3 – Meteorological Conditions

As the environmental noise survey was carried out over a long un-manned period no localised records of weather conditions were taken. However, all measurements have been compared with met office weather data of the area, specifically the closest weather station, and the data from the weather station is outlined in the table below. When reviewing the time history of the noise measurements, any scenarios that were considered potentially to be affected by the local weather conditions have been omitted. The analysis of the noise data includes statistical and percentile analysis and review of minimum and maximum values, which aids in the preclusion of any periods of undesirable weather conditions. The weather conditions were deemed suitable for the measurement of environmental noise in accordance with BS7445 Description and Measurement of Environmental Noise. The table below presents the average temperature, wind speed and rainfall range for each 24-hour period during the entire measurement.

| Weather Conditions – Sidley (Approx. 8.5km SW of Site) | | | | |
|---|---|---|---|---|
| Time Period | Air Temp (ºC) | Rainfall (mm/h) | Prevailing Wind Direction | Wind Speed (m/s) |
| 05/01/24: 00:00 – 23:59 | 4.5 – 9.7 | 0.0 – 1.5 | WNW | 0.0 – 4.9 |
| 06/01/24: 00:00 – 23:59 | 3.1 – 6.8 | 0.0 | WSW | 0.0 – 3.1 |
| 07/01/24: 00:00 – 23:59 | 1.9 – 5.4 | 0.0 | SSE | 0.0 – 3.1 |
| 08/01/24: 00:00 – 23:59 | 1.1 – 3.7 | 0.0 | E | 0.0 – 2.7 |
| 09/01/24: 00:00 – 23:59 | 0.1 – 3.4 | 0.0 | E | 0.0 – 3.1 |

*Table 18 – Weather Conditions*

# Appendix D – Full Calculations

## *Existing Operations*

| Description | Item | Source Term | Parameter | dBA | 1/1 Octave Frequency Band (Hz, dB) 63 | 125 | 250 | 500 | 1k | 2k | 4k | 8k | Lp Dist (m) | Q Factor |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Model / Unit | JCB Digger Moving Waste | Octave-Band Lp | Lp at 3.5m, Q factor (Q=2) | 78 | 85 | 78 | 79 | 74 | 72 | 71 | 67 | 59 | 3.5 | 2 |
| No. of | 1 | | | | | | | | | | | | | |
| Data Type | Emperical Data | | Total Lw | 97 | 104 | 97 | 98 | 93 | 91 | 90 | 86 | 78 | | |

| Description | Item | Source Term | Parameter | dBA | 1/1 Octave Frequency Band (Hz, dB) 63 | 125 | 250 | 500 | 1k | 2k | 4k | 8k | Lp Dist (m) | Q Factor |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Model / Unit | JCB Wheeled Loader Acitvities | Octave-Band Lp | Lp at 4m, Q factor (Q=2) | 84 | 91 | 90 | 86 | 82 | 76 | 74 | 70 | 66 | 4 | 2 |
| No. of | 1 | | | | | | | | | | | | | |
| Data Type | Emperical Data | | Total Lw | 104 | 111 | 110 | 106 | 102 | 96 | 94 | 90 | 86 | | |

| Description | Item | Source Term | Parameter | dBA | 1/1 Octave Frequency Band (Hz, dB) 63 | 125 | 250 | 500 | 1k | 2k | 4k | 8k | Lp Dist (m) | Q Factor |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Model / Unit | 5823AS - Skip Tip | Octave-Band Lp | Lp at 4m, Q factor (Q=2) | 79 | 70 | 73 | 73 | 75 | 73 | 74 | 65 | 58 | 4 | 2 |
| No. of | 1 | | | | | | | | | | | | | |
| Data Type | Emperical Data | | Total Lw | 99 | 90 | 93 | 93 | 95 | 93 | 94 | 85 | 78 | | |
| Source Mitigation Description | No | | | | | | | | | | | | | |
| Time Corrected Lw of Fixed Plant | On-Time (min) 9 | Time Period Day | Correction (dB) -8 | 91 | 82 | 85 | 85 | 87 | 85 | 86 | 77 | 70 | | |

## *Pre-mit Permit Variation*

| Description | Item | Source Term | Parameter | dBA | 1/1 Octave Frequency Band (Hz, dB) 63 | 125 | 250 | 500 | 1k | 2k | 4k | 8k | Lp Dist (m) | Q Factor |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Model / Unit | McCloskey J45 Screener | Octave-Band Lp | Lp at 2m, Q factor (Q=2) | 92 | 95 | 95 | 92 | 88 | 86 | 85 | 82 | 77 | 2 | 2 |
| No. of | 1 | | | | | | | | | | | | | |
| Data Type | Emperical Data | | Total Lw | 106 | 109 | 109 | 106 | 102 | 100 | 99 | 96 | 91 | | |
| Source Mitigation Description | No | | | | | | | | | | | | | |
| Time Corrected Lw of Fixed Plant | On-Time (min) 60 | Time Period Day | Correction (dB) 0 | 106 | 109 | 109 | 106 | 102 | 100 | 99 | 96 | 91 | | |

| Description | Item | Source Term | Parameter | dBA | 1/1 Octave Frequency Band (Hz, dB) 63 | 125 | 250 | 500 | 1k | 2k | 4k | 8k | Lp Dist (m) | Q Factor |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Model / Unit | Terex 833+ Crusher | Octave-Band Lp | Lp at 2.5m, Q factor (Q=2) | 90 | 90 | 89 | 88 | 85 | 84 | 84 | 80 | 72 | 2.5 | 2 |
| No. of | 1 | | | | | | | | | | | | | |
| Data Type | Emperical Data | | Total Lw | 106 | 106 | 105 | 104 | 101 | 100 | 100 | 96 | 88 | | |
| Source Mitigation Description | No | | | | | | | | | | | | | |
| Time Corrected Lw of Fixed Plant | On-Time (min) 60 | Time Period Day | Correction (dB) 0 | 106 | 106 | 105 | 104 | 101 | 100 | 100 | 96 | 88 | | |


NOVA
ACOUSTICS