EA Permitting Noise Impact Assessment

Site Address: Kenny Waste Management, Groby Road North, Manchester, M34 5HT

Client Name: Kenny Waste Management

Project Reference: NP-013499

In partnership with:

Oaktree Environmental
Waste, Planning & Environmental Consultants

Authorisation and Version Control		
Revision	Reported By	Checked By
02	T. Sloan, BSc, MIOA	T. Watkin, MSc, MIOA

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Revision	Date	Summary of Amendments
01	11/12/2025	First draft.
02	09/01/2026	Application proposals altered.

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.

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1. Introduction

NOVA Acoustics Ltd has been commissioned by Oaktree Environmental to prepare a noise impact assessment for a retrospective bespoke permit application ('the application') to be submitted to the Environment Agency ('EA') for a Kenny Waste Management site at Groby Road North, Audenshaw, Manchester, M34 5HT ('the site'). This report has been compiled to accompany the permit application to be submitted to the EA.

A noise survey has been undertaken to establish the prevailing background and ambient sound levels at the closest Noise Sensitive Receptors ('NSRs'). This report details the existing background and ambient sound climate, and the noise emissions associated with the proposed development.

Measures required to mitigate noise impacts have been recommended where necessary and assessed in accordance with the relevant performance standards, legislation, policy and guidance. The 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 Environment Agency Guidance 'Noise and Vibration Management: Environmental Permits (Jan 2022)'
- Environment Agency 'Method Implementation Document ('MID') for BS4142 (2023)
- National Planning Policy Framework (NPPF, 2024)
- Noise Policy Statement for England (NPSE, 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 Background

Kenny Waste Management operates as a processor of a wide range of commercial and general waste products. On this site waste is currently received, stored and then sorted hand sorted or mechanically via an excavator and bucket loader. Sorted waste is then loaded into HGVs or tipper wagons to be exported.

A bespoke permit is required for all proposed activities conducted at the site. The core proposed operation involves the receipt, sorting, and export of waste. Material is to be delivered in waste collection containers, trades bins, and by pallets on HGVs.

It is understood that the site shall retain the existing operating hours:

- Monday to Saturday: 07:00 – 18:00 hours

The figure below illustrates the proposed site layout.

Figure 1 – Site plans

2. Environmental Noise Survey

2.1 Measurement Methodology

An environmental noise survey was carried out by NOVA Acoustics in November of 2025 across the application site and the surrounding area.

All sound level meters were fitted with a proprietary environmental kit complete with a suitable windshield (130mm in diameter for 'long-term' positions). Any measurement position at a height greater than 1.5m was to avoid interference from the public.

A weather station was setup on site, and the data has been tabulated. Any periods deemed to have adversely influenced the noise survey results have been omitted from the datasets.

Outlined in the following table and figures are the measurement dates and particulars and the locations of the nearest NSRs. The larger scale image is a clearer representation of the surrounding area, where as the image focusing on the proposed development site is a more recent representation of the current site layout.

Location	Survey Dates	Measurement Particulars
LT1	20-25/11/2025 ('Long-term')	Equipment tripod mounted 3m above the ground at the northern boundary of the site.
LT3	20-25/11/2025 ('Long-term')	Equipment mounted to a telegraph pole 4m above the ground overlooking Slate Lane.
LT4	21-25/11/2025 ('Long-term')	Equipment tripod mounted 4m above the ground at the southern boundary of the site.
5 Weather Station	20-25/11/2025	Equipment tripod mounted in a cleared area at the northern boundary of the site in free-field conditions.
AM / SM	20&25/11/2025 ('Attended Monitoring') ('Spot Measurement')	Equipment tripod mounted 1.5m above the ground no less than 2m from any reflective façade/surface.

Table 1 – Measurement Methodology

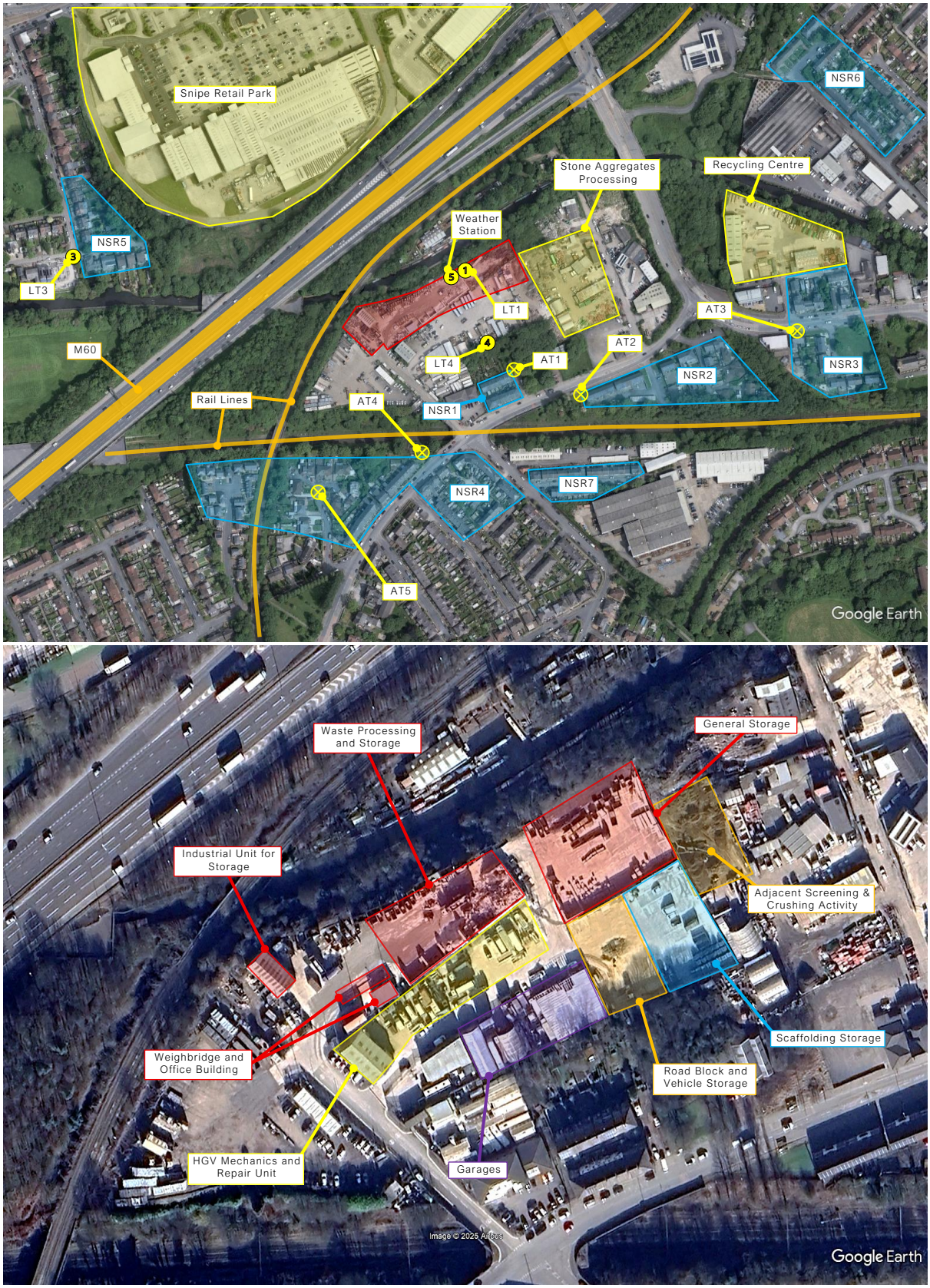

Figure 2 – Measurement Locations, Site Surroundings & Current Site Usage

2.2 Area Description and Context

The area immediately surrounding the site is primarily industrial/commercial usages with the closest residential properties to the south, and further afield in all directions except for north which is a retail park.

The majority of residential NSRs are two-storey properties except for several single-story bungalows which have been modelled accordingly. The NSRs have been grouped into clusters as below.

- NSR1 – Approximately 107m SW of site off Audenshaw Road
- NSR2 – Approximately 165m SE of site off Audenshaw Road
- NSR3 – Approximately 306m E of site off York Street
- NSR4 – Approximately 203m SSE of site off Auden Road
- NSR5 – Approximately 365m W of site off Slate Lane
- NSR6 – Approximately 342m NW of site off Pelham Street
- NSR7 – Approximately 227m S of site off Delta Road

Other industrial/commercial sites are situated nearby who's activity was deemed as intensive as that from the site under assessment. To the immediate east is an aggregate processing site which host a crusher/screener and excavator running simultaneously at times. The noise emissions associated with the neighbouring site where impulsive (metal bucket impacts) and regular.

2.3 Subjective Impression of Noise Environment

It was noted that the acoustic climate was subjectively moderate at all measurement locations and dominated by road traffic noise from the M60 and surrounding road networks. Additionally, during attended monitoring, noise associated with the sites current activity was only audible at the rear of NSR1 (AT1).

2.4 Environmental Noise Survey Results

Long-term Sound Level Results Summary & Baseline Noise Levels

The 'lowest typical' background sound levels and average residual sound levels measured throughout the survey are presented in the table overleaf.

The background sound levels have been derived from statistical analysis of the measured $L_{A90,15min}$ data, and are based on the range and distribution of the $L_{A90,15min}$ measurements. For reference, the data ranges are also presented in brackets beneath.

Full time histories, statistical analysis and weather conditions can be seen in Appendix C.

Period ('T')	Weekdays		Saturday	
	$L_{Aeq,15min}$ (dB)	$L_{A90,15min}$ (dB)	$L_{Aeq,15min}$ (dB)	$L_{A90,15min}$ (dB)
LT1: 1-hour Before 06:00 – 07:00	68 (65 – 70)	66 (63 – 69)	62 (61 – 63)	60 (58 – 61)
LT1: Operational Hours 07:00 – 18:00	73 (65 – 77)	67 (61 – 71)	69 (63 – 72)	65 (61 – 68)
LT1: 1-hour After 18:00 – 19:00	68 (66 – 69)	65 (64 – 68)	66 (65 – 66)	64 (64 – 65)
LT3: 1-hour Before 06:00 – 07:00	58 (56 – 60)	56 (54 – 60)	61 (60 – 62)	58 (56 – 58)
LT3: Operational Hours 07:00 – 18:00	59 (54 – 65)	58 (52 – 62)	61 (58 – 64)	**57** (56 – 62)
LT3: 1-hour After 18:00 – 19:00	59 (54 – 65)	**54** (53 – 60)	59 (59 – 60)	58 (58 – 58)
LT4: 1-hour Before 06:00 – 07:00	63 (60 – 65)	62 (58 – 64)	55 (53 – 56)	**51**[2] (51 – 54)
LT4: Operational Hours 07:00 – 18:00	63 (55 – 67)	63 (53 – 65)	58 (52 – 64)	57 (50 – 58)
LT4: 1-hour After 18:00 – 19:00	62 (58 – 65)	**57** (56 – 63)	55 (54 – 56)	54 (52 – 54)

Notes:
[1] The background sound levels shown in **'bold'** are representative of the modal or 'lowest typical' background sound levels measured during the entire assessment period. Periods of adverse weather have been omitted from the datasets.
[2] The lowest measured $L_{A90,15min}$ in this period is deemed representative of minimal traffic flow after rain had ceased.

Table 2 – Long-term Sound Level Results Summary

At LT1, the background noise level is broadly consistent during the weekdays. Given this location was positioned on site and comparative close to the M60, it may be concluded that outside of operational hours the road noise is dominant. Levels reduced during Saturday as can be expected for an on-site monitoring position.

At LT3, the background noise is largely consistent throughout the whole measurement period. This is consistent with road traffic on the M60 being dominant in this area; site noise emissions were inaudible at this location.

At LT4, the background noise levels were largely consistent throughout the week but dropped significantly during the weekend due to inactivity from nearby businesses. Road traffic noise dominates in the absence of any commercial / industrial activity, however, LT4 is more shielded from the M60 than LT1 due to a large 3.5-4m tall concrete wall that runs along the southern site boundary.

Attended Sound Survey Results Summary

Presented in the following table are the results from the attended survey conducted on the 20/11/25; all measurements were undertaken under free-field conditions.

Only during the measurements at NSR1, activity from the existing site operations were audible. Industrial noise was audible at NSR2 but indistinguishable as to the source. In all other locations, road traffic was dominant.

Description	1/1 Octave Frequency Band (Hz, $L_{eq,T}$ dB)							$L_{Aeq,T}$ (dB)	$L_{A90,T}$ (dB)
	63	125	250	500	1k	2k	4k		
AT1(NSR1): 12:16 – 12:48 (attended)	62	55	53	55	58	51	40	60	58
AT2(NSR2): 12:47 – 13:18 (attended)	70	64	62	63	68	64	54	71	62
AT3(NSR3): 13:21 – 13:36 (attended)	74	69	68	68	71	66	58	74	64
AT4(NSR4): 13:45 – 14:15 (attended)	70	65	64	63	67	63	56	70	62
AT5(NSR4): 09:27 – 09:57 (attended)	56	50	50	49	52	47	42	55	53

Table 3 – Attended Sound Level Results Summary

Adopted BS4142 Background Sound Levels

Based on the sound levels presented in Table 2, a summary of the background sound levels that will be used as the baseline for the BS4142 assessment is shown in the table below.

NSR	Weekdays ($L_{A90,15min}$)	Saturdays ($L_{A90,15min}$)
	07:00 – 18:00	07:00 – 14:00
1	57	51
5 & 6	54	57
2, 3, 4 & 7	54	51

Table 4 – Adopted BS4142 Assessment Background Sound Levels

3. Noise Impact Assessment

3.1 Relevant Standards Guidance & Policies

Environmental Permitting Regulations 2022

Please see Appendix B.4 for the EA guidance followed throughout this assessment.

BS4142:2014+A1:2019

When assessing industrial or commercial noise, acoustic design criteria are commonly set based on the guidance presented within BS4142:2014+A1:2019.

The following summarises the primary steps in the BS4142:2014+A1:2019 assessment methodology:

- A representative background sound level ($L_{A90,Tr}$) is determined based on the noise survey results. The background sound level should not include any contribution from existing site-specific noise emissions.
- The cumulative specific sound level ($L_{Aeq,Tr}$) from the proposed development is predicted outside of the NSRs.
- The rating sound level ($L_{Ar,Tr}$) is determined by applying 'acoustic feature corrections' which correct for the acoustic characteristics of the sound which may be perceptible and potentially cause annoyance at each NSR.
- The predicted rating sound level is compared with the background sound level, and the level of impact is initially estimated in accordance with BS4142:
    - 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 'low impact, depending on the context'.
- Further context can then be provided where necessary which may alter the initially quantified impact level.
- If necessary, mitigation measures are recommended to reduce the predicted noise impact.

3.2 Adopted Criteria

It is required that any site noise emissions causing significant noise impact (classed as 'significant adverse impact, dependent on context' in accordance with BS4142) are mitigated to an acceptable level given the context of the site.

Noise emissions causing an 'adverse impact' must be minimised to as low as practicable also considering context. This does not necessarily mean that such adverse effects cannot occur, providing the

implementation of appropriate measures (may also be Best Available Techniques ('BAT')) can be "rigorously" demonstrated.

Site noise emissions causing 'negligible impact' to 'low impact' may not require any action over the basic appropriate measures or BAT.

Considering the above, all efforts have been made to ensure the BS4142 rating sound level at the most affected NSRs is controlled to avoid 'significant adverse impact', further measures and BAT have been considered to minimise any 'adverse impact' with the aim to reduce to 'low impact' where practicable, dependent on the context of the site.

3.3 Operational Procedures & Permit Proposals

Site Operations

The following main external equipment is being considered:

- HGV passbys and loading
- Hyundai HL960A Bucket Loader
- Liebherr LH24 Excavator
- Bin/Skip truck passbys and unloading

In terms of vehicles in and out of the site, site operators have stipulated that typically 100 skip/truck drop deliveries occur from 07:00 – 18:00 which equates to a 'worst-case' of 10 per 1-hour.

There is also up to 8 HGV loading events per day, the worst case shall be assumed to be 2 HGVs in any given hour.

A summary of the site operations is presented on the figure below and is discussed overleaf.

Figure 3 – Site Layout Procedures Plan

Process	Description
Waste Transfer Operations	
1	Waste is taken by this route and tipped such that it can be sorted then moved into a storage bay.
2	Waste is sorted by bucket loader, excavator or by hand. Sorted materials are moved via bucket loader into storage bays to be loaded into HGVs. HGVs are loaded via excavator.
3	HGVs leave via the weighbridge or direct from the southern exit.

Table 5 – Site Procedures

Measurements were taken of the excavator, bucket loader, and skip truck movements, and as such these levels will be used to model these noise sources.

BS4142 Assessment Periods

The operating periods have been assessed as weekdays & Saturdays (07:00 – 18:00), with all operations taking place.

3.4 Noise Modelling Data & Specific Sound Levels

For all on-site measurements the following measurement methodology was adhered to:

- All measurements of external noise sources were taken at 1.5m above local ground, in a position found to be most influenced by the generated noise emissions if residual noise could not be corrected for.
- Where possible, measurements have been taken at a position where point source propagation is to be expected.
- All measurements were taken using a fast time-weighting and the sound level meter was set to log every 0.1s.
- Measurements were taken in 1/3 octave frequency bands; however, the report details the 1/1 octave band sound levels inputted to the noise modelling software.

Full calculations can be found in Appendix D.

Source Sound Power Levels

Based on the on-site noise survey, a summary of the calculated sound power levels for each item of equipment / process is shown in the following table, the corresponding 1/1 octave band sound levels can be found in Appendix D.

Please note that the sound power levels for mobile plant pass-bys presented are input values only; the speed and the number of events has been applied within the noise modelling software to present a reasonable ‘worst-case’ scenario.

Description	$L_{Aeq,T}$ (dB)	L_{WA} (dB)	On-Time Correction	Source Emitter Type	Source Height
Hyundai HL960A Bucket Loader Moving Heavy Materials[1]	77 at 10m (Q2)	105	50%	Area Source (per/unit)	2m
Bin Truck/Skip Waste Drop Off[2]	78 at 5m (Q2)	100	50%	Point Source	2m
HGV (un)loading via Excavator[1]	78 at 10m (Q2)	106	50%	Point Source	2m
Bin/Skip Truck Pass by	77 at 10m (Q2)	105	20 per hour	Slow-moving Point Source	2m
HGV Pass by[3]	79 at 10m (Q2)	107	2 per hour	Slow-moving Point Source	2m

Notes:
[1] On-time has been set to 50% as the same vehicle is required to operate in two locations on site.
[2] On-time set to 30min/hr as each unloading event takes on average 3min, with up to 10 events per hour.
[3] Clattering of wagon holdall resulted in elevated noise emissions – deemed a worst-case.

Table 6 – Source Noise Levels & Behaviours

Noise Modelling

The following assumptions have been made within the SoundPlan 9.1 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 be a mixture of acoustically 'hard' and 'soft' surfaces that have been modelled according to the ground type.
- Octave band noise data was used to facilitate noise modelling in accordance with ISO 9613-2 (2024). ISO 9613-2 assumes a 'downwind' model to the NSRs.
- The sound map grid heights have been set to 4m (worst-case first floor), however, the noise levels used in the assessment has been taken from the most exposed point of each façade.
- The site and all other buildings and any intervening objects have been modelled according to measurements taken on-site, with Google Earth and those provided by the LIDAR data.
- The source noise levels, behaviours and heights shown in Table 6 have been inputted to the model. The corresponding 1/1 octave band sound levels can be seen in Appendix D.
- It has been assumed that the proposed concrete block walls will be constructed to a height of 4m as examples found presently on site. The appropriate absorption spectrum has been utilised within the noise model.

The sound maps showing the specific sound level emissions from the site can be seen in the following figure.

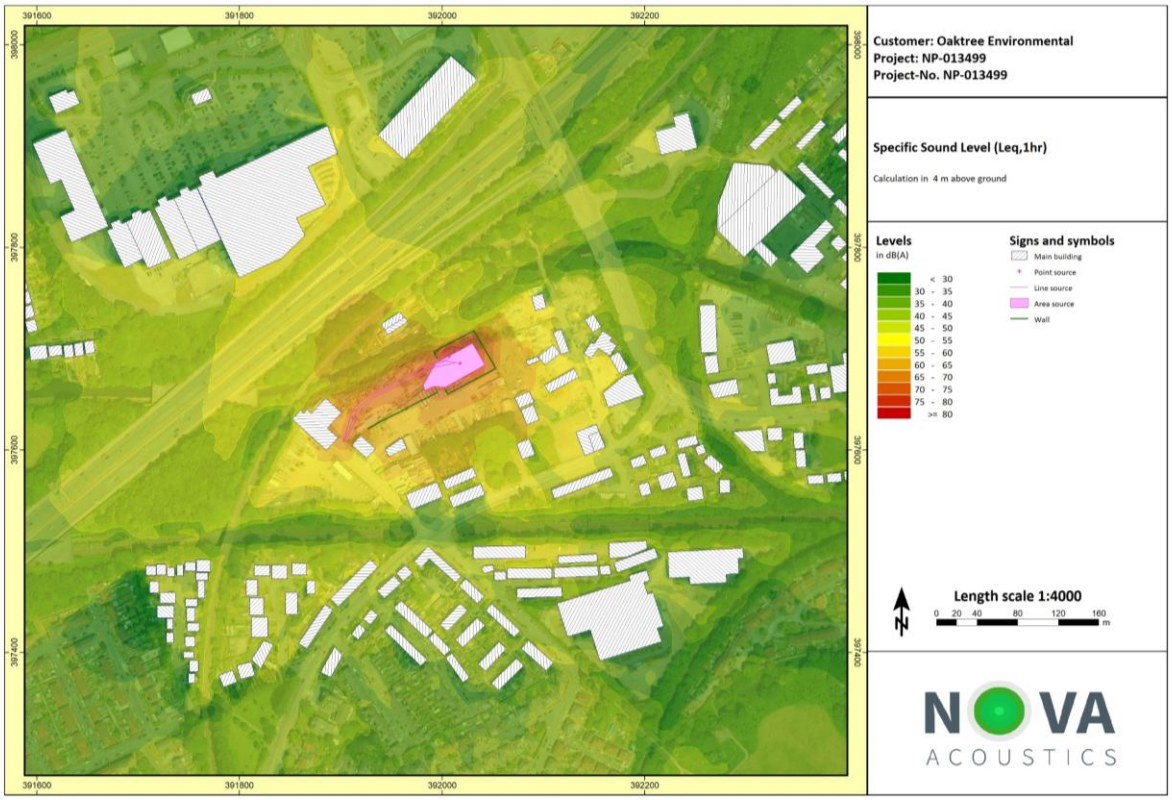

Figure 4 – Specific Sound Level Map – As Proposed

3.5 BS4142 Noise Impact Assessment

The criteria that will be applied to the BS4142 assessment outcomes will be based on the table below. Please note that these are indicative at this stage and require a review of the 'contextual' nature of the site when compared to the background sound level. This is subsequently discussed after the BS4142 assessment. As a result, all discussions presented below are pre-contextual.

Description	Exceedance Levels & Initial Assessment Outcome			
Exceedance of Background (L_{A90})	<0	0 – 4	5 – 9	10+
Initial BS4142 Assessment Outcome	'Low Impact'	'Low Impact' / Low Likelihood of 'Adverse Impact'	'Adverse Impact'	'Significant Adverse Impact'

Table 7 – BS4142 Initial Noise Impact Criteria

The BS4142 noise impact assessments are conducted at the most affected NSRs in the following tables. The highest specific sound levels predicted at each group of NSRs is presented for simplicity.

BS4142 Noise Impact Assessment – Weekday Operations							
Description	NSRs						
	1	2	3	4	5	6	7
07:00 – 18:00 hours							
Specific Sound Level ($L_{Aeq,1hr}$)	54	47	44	50	46	41	49
Subjective Acoustic Feature Correction	+3[1]	+3[1]	+3[1]	+3[1]	+3[1]	+3[1]	+3[1]
Rating Sound Level ($L_{Ar,Tr}$)	57	50	47	53	49	44	52
Background Sound Level ($L_{A90,15min}$)	57	54	54	54	54	54	54
Exceedance of L_{A90}	**0**	**-4**	**-7**	**-1**	**-5**	**-10**	**-2**
Initial BS4142 Assessment Outcome	**LI**	**LI**	**LI**	**LI**	**LI**	**LI**	**LI**

Notes:
[1] A +3dB penalty has been applied to account for impulsivity from (un)loading operations that was subjectively 'just perceptible' against the residual noise climate at the site boundary. This penalty is deemed conservative based on lack of audibility noted at the receptors during the attended surveying.
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SAI = Significant adverse impact, dependant on context.
AI = Adverse impact, dependant on context.
LowAI = A low likelihood of adverse impact, dependent on context.
LI = Low impact, dependant on context.

Table 8 – BS4142 Noise Impact Assessment – Weekdays

BS4142 Noise Impact Assessment – Saturday Operations							
Description	NSRs						
	1	2	3	4	5	6	7
07:00 – 18:00 hours							
Specific Sound Level ($L_{Aeq,1hr}$)	54	47	44	50	46	41	49
Subjective Acoustic Feature Correction	+6[2]	+3[1]	+3[1]	+3[1]	+3[1]	+3[1]	+3[1]
Rating Sound Level ($L_{Ar,Tr}$)	60	50	47	53	49	44	52
Background Sound Level ($L_{A90,15min}$)	51	51	51	51	57	57	51
Exceedance of L_{A90}	**+9**	**-1**	**-4**	**+2**	**-8**	**-13**	**+1**
Initial BS4142 Assessment Outcome	**AI**	**LI**	**LI**	**LowAI**	**LI**	**LI**	**LowAI**

Notes:
[1] A +3dB penalty has been applied to account for impulsivity from (un)loading operations that was subjectively 'just perceptible' against the residual noise climate at the site boundary. This penalty is deemed conservative based on lack of audibility noted at the receptors during the attended surveying.
[2] A +6dB penalty has been applied for impulsivity from (un)loading operations that could be 'clearly perceptible' at these NSRs, based on boundary observations of current operations and the reduced background sound climate. This penalty is deemed conservative given the extent of other impulsive events produced by the neighbouring businesses.
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SAI = Significant adverse impact, dependant on context.
AI = Adverse impact, dependant on context.
LowAI = A low likelihood of adverse impact, dependent on context.
LI = Low impact, dependant on context.

Table 9 – BS4142 Noise Impact Assessment – Saturdays

As can be seen in the BS4142 assessments, as a worst case, a high level "adverse impact" is predicted at NSR1, and a low likelihood of "adverse impact" at NSRs 4 & 7 on Saturdays. For weekdays, the impact is reduced to "low impact" in all locations.

The extant residual noise climate is presently characterful and generally masked the majority of specific noise emissions, other than 'just perceptible' impulsivity. Furthermore, the proposals are not deemed incongruent for the area; an adjacent business conducts external screening and crushing of inert waste and aggregates, thus, receptor sensitivity is thought to be somewhat reduced. Moreover, the acoustic feature corrections applied at NSR1 are thought to be representative of the 'worst-case' periods when there is little activity from the adjacent business.

In light of the above, the overall 'worst-case' noise impacts are thought to align with the threshold for a 'Lowest Observed Adverse Effect Level' ('LOAEL') at NSR1, and a 'No Observed Adverse Effect Level' ('NOAEL') at all others in accordance with the NPSE.

It is stated that at NOAEL, *"noise can be heard, but does not cause any change in behaviour, attitude or other physiological response"*. In addition, noise at this level *"can slightly affect the acoustic character of the area but not such that there is a change in the quality of life"*.

The first aim of the NPSE is to *"avoid 'significant adverse impacts' (SOAEL)"*; this can be achieved. To the best of NOVA Acoustics knowledge there have been no complaints from nearby NSRs and given there are no proposals to alter the site operations from what is currently present, it is possible that the predicted noise impact levels are acceptable.

However, all efforts must be taken to minimise noise where possible and manage noise sources to ensure impact is reduced.

In cases where a LOAEL has been established, it is stated in the NPSE 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."* As such, it is recommended that a noise management plan is put in place to be maintained indefinitely.

4. Recommendations & BAT

4.1 Timeline of Proposals Updates

The proposals have been substantially revised in response to anticipated noise impact levels. The site will not be expanded, and there are no plans for additional equipment or processing. While it was advised that the waste bay compound walls be extended, site operators have notified NOVA Acoustics that this improvement cannot be accommodated. Given the constraints of available space, the predicted noise impacts are considered to represent the lowest achievable pre-BAT levels.

4.2 Best Available Techniques ('BAT')

The assessment has assumed pre-BAT scenarios. It is likely that further reductions in the specific sound levels can be achieved through BAT that are not fully quantifiable at this stage. This would include (but not be limited to):

- Newer and quieter mobile plant models should be selected where possible – it is recommended to consider the use of electric plant.
- Ensure that all skip and HGV traffic is kept in the area depicted in Figure 1. No routes through the southern portion of the owned land shall be used for transportation traffic. It is recommended that the gate separating the two spaces remains closed.
- Drop heights should be reduced where practicable; this would include excavator operations.
- Exhaust silencers should be fitted to all combustion engine powered treatment plant and mobile heavy plant. It may be necessary to contact the equipment manufacturers / suppliers for upgraded silencer options. Verification measurements validating the effectiveness of the silencers should be conducted.
- Rattling of the excavator and loader bucket should be reduced to a minimum.
- Restrict reversing alarms to broadband or "white noise" types.
- Implement a site-specific Noise Management Plan, including staff training, preventative maintenance, monitoring, complaint procedures, and reporting.
- Establish routine noise monitoring to validate compliance and support continuous improvement.
- Reassess noise performance following commissioning of the new plant equipment.
- Where necessary, refine mitigation and operational practices to ensure noise impacts remain within the thresholds consistent with the NPSE and EA permit requirements.

From experience, the above BAT would be expected to reduce specific noise emissions by at least 5dB provided they're all implemented. The BS4142 noise impact would also be expected to reduce as the associated acoustic features would be further controlled.

5. Limitations and Uncertainty

Any measurement of existing ambient and background sound levels will be subject to a degree of inherent uncertainty. Environmental sound levels vary between days, weeks and throughout the year due to the variations in source level and conditions, meteorological effects on sound propagation and other factors.

Therefore, any environmental noise survey can only provide a snapshot of the noise levels. However, all efforts have been made to ensure that the measurements were conducted in a way to provide a 'robust' sample of representative and typical conditions, e.g., avoiding or omitting adverse weather conditions. Nonetheless, a small degree of uncertainty will always remain in the noise levels from surveys.

The impact assessment has been prepared in accordance with source data measured during a site visit. The measurement distances were measured accurately using a laser meter, and the worst-case highest sound levels measured where directivity was at its greatest have been used.

To reduce uncertainty when measuring noise sources that are erratic or variable, longer measurements were taken that included several full cycles rather than a single 'snapshot'.

The measurements were undertaken at distances where noise emissions from operations were thought to be dominant and where they were propagating in point source manner.

The calculations using SoundPlan 9.1 conforms to ISO 9613-2:2024 that has an uncertainty reported as ±3.0 dB. The ISO 9613 calculation methodology assumes wind direction with ±450 of the direction connecting the centre of the dominant sound sources and the centre of the specified receptor region, together with wind speeds of between 1 – 5 ms-1. It should therefore be noted that in practice the eventual longer-term measured levels are invariably lower than predicted levels due to the temporal variation in meteorological conditions.

The 'uncertainty budget' has been derived using the methodology outlined in 'Uncertainties in Noise Measurement' procedure by Kerry and Craven (Craven, N.J., Kerry, G. 2007. '*Uncertainties in Noise Measurement'. University of Salford).* This document requires an uncertainty budget to be calculated based on the following approach:

1. Define the half value (for example, 3 for ±3.0 dB) of each source of uncertainty,
2. Apply a correction for the standard uncertainty for a rectangular distribution (x / √3) for each source of uncertainty,
3. Add together the values found in Point 2, above, for all uncertainties,
4. Take the square root to find the combined uncertainty,
5. Multiply by 2 to calculate the expanded uncertainty to 95% confidence.

The following table outlines the total expanded uncertainty.

Measurement Uncertainty			
Description	**Accuracy**	**Variance**	**Comments**
Instrumentation Accuracy	±1 dB (freq weighting 0.5dB, Level linearity 0.4dB, IEC 61672 calibrator 0.125)	1/√3 = **0.6 dB**	Minimised by use of calibrated traceable instrument.
Use of Wind Shield	±0.2 dB	0.2/√3 = **0.1 dB**	Prevents local wind effects, all meters collecting data used wind shields.
Measurement Distance from Source	±0.1m (worst-case 10cm error of 10m)	20*Log (9.9/10) = -0.01 20*Log (10.1/10) = +0.01 Difference = 0.03 dB 0.03/√3 = **0.02 dB**	Laser meter was used.
Background Sound Level	±1.5 dB	1.5/√3 = **0.9 dB**	Background sound level uncertainty may exist.
Measurement Uncertainty	Measurement Variance = **1.6 dB**	Total Uncertainty: √1.6 = **1.3 dB**	
Modelling Uncertainty			
Description	**Accuracy**	**Variance**	**Comments**
Measurement of Sources to Receptors	±3m (closest receptor 58m from closest source)	20*Log(55/58) = -0.5 20*Log)(61/58) = +0.4 Difference = 0.9 dB 0.9/√3 = **0.5 dB**	Minimised by use of model based on accuracy of maps.
Air Absorption	Temp range considered to be -5◦C to +20◦C	Results for 9◦C = 0.003639 dB/m Results for -5◦C = 0.006381 dB/m Results for 20◦C = 0.004978 dB/m Variance = 0.002704 dB/m Over 400m this is 1 dB 1/√3 = **0.6 dB**	Assumed 101.3 kPa, variable temp (worst absorption temp for air), 70% relative humidity, no precipitation.
ISO 9613 Uncertainty	±3.0 dB	3/√3 = **1.7 dB**	Stated model uncertainty ISO 9613.
Modelling Total Uncertainty	Modelling Variance = **2.8 dB**	Total Uncertainty: √2.8 = **1.7 dB**	
Combined Uncertainty	Total Variance = **4.4 dB**	Total Uncertainty = √4.4 = 2.1 dB Expanded to 95% confidence = 2.1 * 2 = **4.2 dB**	

Table 10 – Expanded Uncertainty of Measurement and Modelling

The table above shows an expanded uncertainty of up to 4dB. Given the 'worst-case' conditions the noise modelling software accounts for, it is likely that the results presented in this report are an overestimate of the actual level of impact.

6. Conclusion and Action Plan

A BS4142 assessment has been undertaken for a bespoke permit application in line with the EA requirements.

Due to the proposed waste transfer operations, a high level 'adverse impact' is initially predicted at NSR1 on Saturdays, with 'low impact' predicted during weekdays. A contextual discussion was formed in the body of the report.

In light of the context, the 'worst-case' weekday noise impacts at NSR1 are thought to align with the threshold for a 'No Observed Adverse Effect Level' ('NOAEL') in accordance with the NPSE. However, despite the context, Saturday noise impacts in accordance with the NPSE are approaching a 'Significant Observed Adverse Effect Level' ('SOAEL') and but initially align with 'Lowest Observed Adverse Effect Level' ('LOAEL').

At NSRs 4 and 7, there is also a "low likelihood of adverse impact" on Saturdays. At all other NSRs during the week and on Saturdays, the 'worst-case' noise impacts in accordance with BS4142 are 'low impact'. In relation to the NPSE, these noise impacts at all other receptors are thought to align with the threshold for a 'No Observed Adverse Effect Level' ('NOAEL').

The first aim of the NPSE is to *"avoid 'significant adverse impacts' (SOAEL)"*; this can be achieved. To the best of NOVA Acoustics knowledge there have been no complaints from nearby NSRs and given there are no proposals to alter the site operations from what is currently present, it is possible that the predicted noise impact levels are acceptable.

However, all efforts must be taken to minimise noise where possible and manage noise sources to ensure impact is reduced.

The proposals have been substantially revised in response to anticipated noise impact levels. The site will not be expanded, and there are no plans for additional equipment or processing. While it was advised that the waste bay compound walls be extended, site operators have notified NOVA Acoustics that this improvement cannot be accommodated. Given the constraints of available space, the predicted noise impacts are considered to represent the lowest achievable pre-BAT levels.

In line with EA requirements a comprehensive noise management ('NMP') should be implemented and adhered to throughout the lifetime of the development.

The findings of this report will require written approval from the Environment Agency prior to the approval of the application.

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: $L_p = 10\log_{10}(p/p_0)^{2.}$ Where: 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 (2024)

Government policy on noise is set out in the National Planning Policy Framework (NPPF), updated in 2024. 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 187e, 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 198 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 198 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."

This is further expanded using the updated "Noise Exposure Hierarchy Table" which includes an additional level of impact referred to as the 'No Observed Adverse Effect Level' ('NOAEL'). It is stated that at this level: *"noise can be heard, but does not cause any change in behaviour, attitude or other physiological response"*. In addition, noise at this level *"can slightly affect the acoustic character of the area but not such that there is a change in the quality of life".*

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 Regulations 2022

Most recently updated in January 2022, the 'Noise and Vibration Management: Environmental Permits' provides advice on how the Environment Agency ('EA') assesses noise from industrial processes, what the law says must be done to manage noise and vibration, how to carry out a noise impact assessment and what should be included in a noise management plan ('NMP'). It replaces Horizontal Guidance for Noise (H3) Parts 1 and 2, and the Scottish Environmental Protection Agency (SEPA) Guidance on the control of noise at Pollution Prevention and Control (PPC) installations.

The guidance lists the reasons why regulation of noise is important, defines when an assessment is needed, and states required competency standards before presenting the approved methodology for undertaking a noise impact assessment, broken into the following four steps:

Step 1: desktop risk assessment:

- Identification of plant or operations that could be audible at any known or proposed NSR, including non-routine noise sources (e.g. emergency pressure relief / venting systems).
- Description and ranking of noise sources in terms of off-site impact, noting what they sound like and when they operate.
- Identification of current and proposed NSRs by name, type, location and distance from source.
- Description of the land between the site and the NSRs and whether any man-made features could increase or decrease the audibility of the sound at the NSRs.

Step 2: off-site monitoring survey, involving baseline measurements at NSRs to the standards defined in BS4142:

- When considering overall site impact, background sound levels at NSRs must not be influenced by site noise.
- In addition to assessment of the 'typical' impact required by BS4142, worst-case impact scenarios should also be considered, e.g. atypical sound sources, low background sound levels, or downwind propagation from the noise source.
- When applying for a variation, the existing noise sources on the site (before changes) must not be included in the baseline background and residual sound levels. The existing and proposed sources should be considered as separate components and combined to give a new total for the specific sound level at the receptor(s).

Step 3: source assessment, involving quantification of the noisiest items of plant or operations identified in Step 1 and estimating / predicting their impact at the receptor using BS4142. Due consideration of uncertainty should be incorporated into the assessment:

- Where modelling or calculation is used, they must comply with the requirements of 'ISO 9613 Acoustics – attenuation of sound during propagation outdoors' and the following must be provided alongside the assessment:
    - Statement of modelling/calculation assumptions.
    - Copy of all modelling/calculation files (models to be submitted in original software format and, where possible, QSI data exchange format).
    - Copy of numerical noise data (excluding terrain data) in a clearly labelled and concise spreadsheet.

Step 4: BAT or appropriate measures justification, involving presentation of Best Available Techniques or appropriate measures and justification for their use in the context of the specific application:

- Demonstration that emissions have been prevented or minimised as far as reasonably practicable with respect to:
    - The dominant noise sources (where necessary considered as sub-components within a system).
    - All existing noise attenuation measures (physical, managerial and maintenance).
    - Consideration of all reduction techniques for dominant noise sources and provide a reasoned determination of what is achievable.
    - As appropriate, prediction of the impact of upgrade works and commitment to a firm timescale.
    - Development of a noise management plan where there will be a noise impact beyond the site boundary.

Further guidance is provided in the 'Method Implementation Document ('MID') for BS4142 (2023)'.

Appendix C – Environmental Survey

C.1 – Time History Noise Data

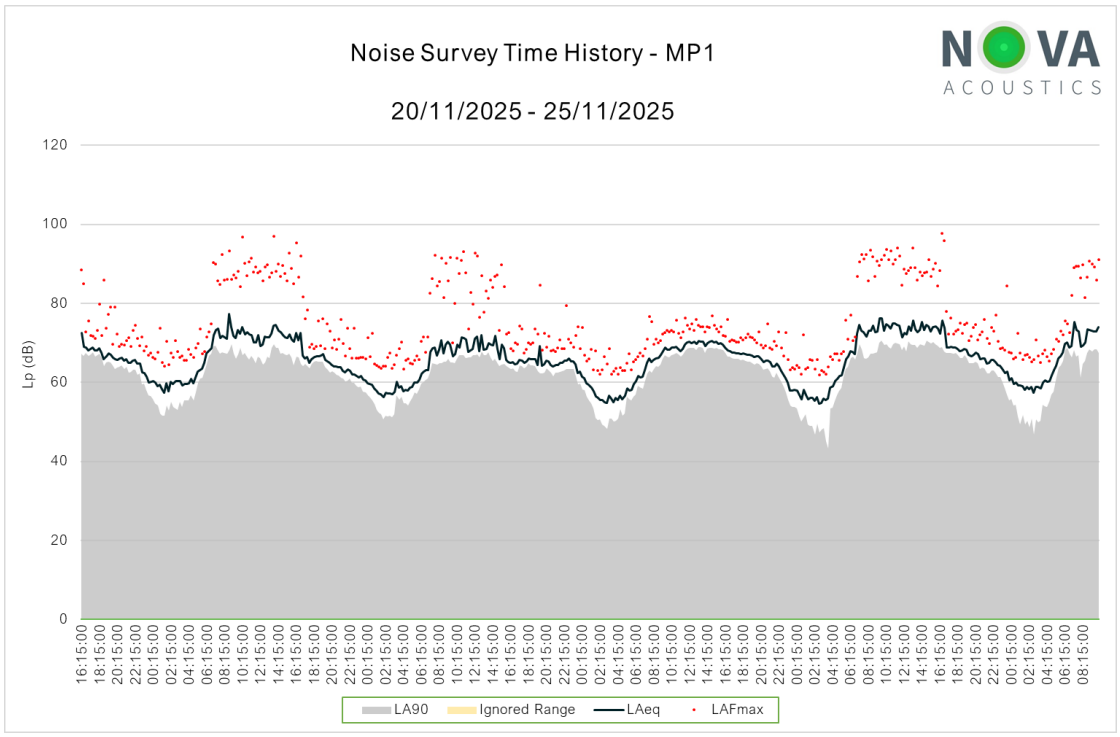

Figure 5 – LT1 Noise Survey Time History (Full Period)

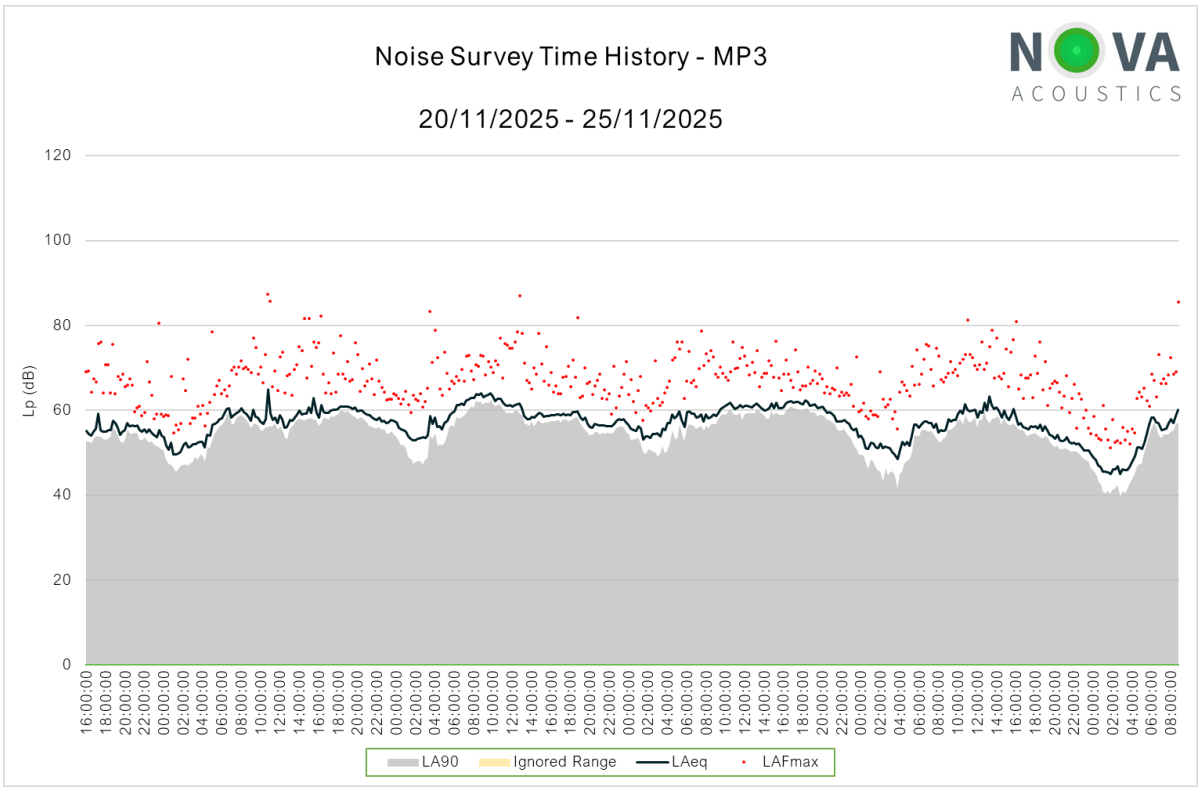

Figure 6 – LT3 Noise Survey Time History (Full Period)

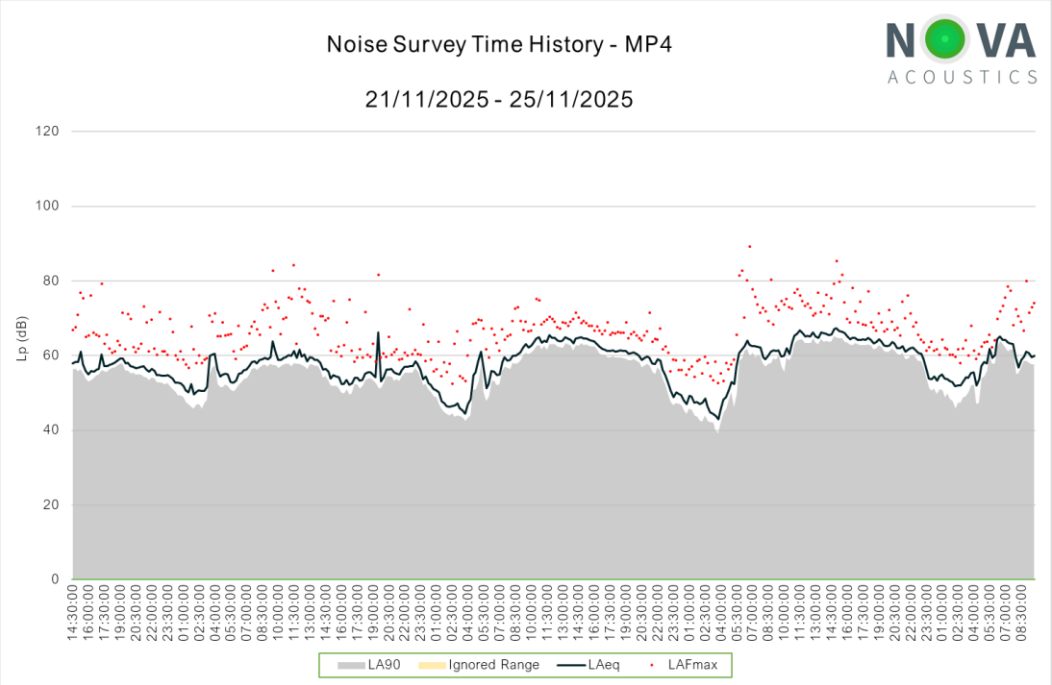

Figure 7 – LT4 Noise Survey Time History (Full Period)

C.2 – Surveying Equipment

Piece of Equipment	Serial No.	Pre Cali (dB)	Post Cali (dB)
Svantek SV971A Class 1 Sound Level Meter	141425	113.98	114.12
Svantek SV971A Class 1 Sound Level Meter	143581	114.12	114.14
Svantek SV971A Class 1 Sound Level Meter	141359	114.09	114.18
Svantek SV36 Class 1 Calibrator	106876	--	--

Table 11 – Surveying Equipment

All equipment used during the survey was field calibrated at the start and end of the measurement period with negligible deviation. 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

A Davis Vantage Vue weather station was installed on-site in free-field conditions and set log data every 15-minutes. However, all measurements have also been compared with met office weather data of the area, specifically the closest weather station. 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. Presented in the following table are the average temperature, wind speed and rainfall range for each 24-hour period during the entire measurement.

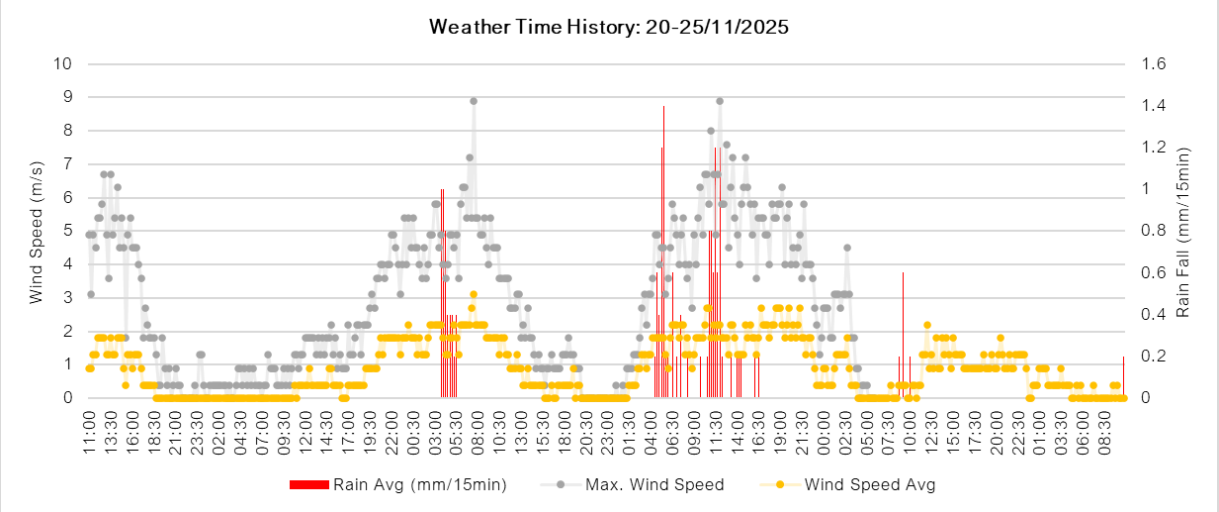

Figure 8 – Weather Time History

Appendix D – Full Sound Power Calculations

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	Loading HGV on Excavator Side (10m)	Octave-Band Lp	Lp at 10m, Q factor (Q=2)	78	81	71	73	73	72	72	69	64	10	2
No. of	1													
Data Type	Emperical Data		Total Lw	106	109	99	101	101	100	100	97	92		

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	Skip truck pass by (10m) Worst Second	Octave-Band Lp	Lp at 10m, Q factor (Q=2)	77	77	71	68	70	71	70	70	65	10	2
No. of	1													
Data Type	Emperical Data		Total Lw	105	105	99	96	98	99	98	98	93		

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	HGV Pass (10m) Worst Second	Octave-Band Lp	Lp at 10m, Q factor (Q=2)	79	71	69	70	67	71	75	72	60	10	2
No. of	1													
Data Type	Emperical Data		Total Lw	107	99	97	98	95	99	103	100	88		

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	Hyundai moving hard material waste (10m)	Octave-Band Lp	Lp at 10m, Q factor (Q=2)	77	78	77	73	71	74	68	64	59	10	2
No. of	1													
Data Type	Emperical Data		Total Lw	105	106	105	101	99	102	96	92	87		

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	Bin Truck waste drop off (5m)	Octave-Band Lp	Lp at 5m, Q factor (Q=2)	78	82	75	76	72	72	72	70	63	5	2
No. of	1													
Data Type	Emperical Data		Total Lw	100	104	97	98	94	94	94	92	85		


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