Hart's Haulage, Redruth

Noise Assessment for Environment Agency

25th April 2026

inacoustic | **truro**
Unit 4, The Dry, Mount Wellington Mine, Chacewater, Truro, Cornwall, TR4 8RJ
01872 672400 | www.inacoustic.co.uk | truro@inacoustic.co.uk

Version	1	2	3
Comments	Noise Assessment	Site Wide Noise Assessment	
Date	12th March 2026	25th April 2026	
Authored By	Antony Best BSc (Hons) MIOA	Antony Best BSc (Hons) MIOA	
Reviewed By	Neil Morgan MSc MIOA	Neil Morgan MSc MIOA	
Project Number	25-366	25-366	

Contents

Figures

Tables

1. INTRODUCTION

1.1. Overview

inacoustic has been commissioned to assess the impact of noise arising from the operation of activities at Hart's Haulage, Redruth, Cornwall.

The assessment has been prepared in support of an Environmental Permit application relating to the site, including the operation of the existing aggregate wash plant. The wash plant is currently operational and the assessment has therefore been informed by measurements undertaken during representative operation, together with additional sound monitoring and noise modelling undertaken to consider cumulative site-wide sound emissions.

Following comments received from the Environment Agency, the assessment has been updated to consider noise from the permitted site activities as a whole. The assessment therefore considers cumulative sound emissions associated with existing site operations, the operational wash plant, mobile plant, HGV movements, material handling and crushing activities, where relevant.

The assessment has been undertaken with reference to the Environment Agency's published guidance on:

- Noise and Vibration Management: Environmental Permits; and
- Noise Impact Assessments Involving Calculations or Modelling.

Accordingly, the following technical noise assessment has been produced for submission to the Environment Agency. The purpose of the assessment is to determine the likely noise impact at nearby noise-sensitive receptors and to demonstrate that appropriate measures are in place, or are proposed, to prevent or minimise noise pollution.

This report is necessarily technical in nature; therefore, a glossary of terms is provided in Appendix A to assist the reader.

1.2. Scope and Objectives

The scope of the noise assessment can be summarised as follows:

- environmental sound monitoring has been undertaken at locations representative of the closest noise-sensitive receptors to the Site;
- attended measurements and source data have been used to characterise the principal noise-generating activities associated with the permitted operations;
- a 3-dimensional noise modelling exercise has been undertaken to quantify cumulative sound emissions from the Site, including fixed plant, mobile plant, HGV movements, material handling, crushing and wash plant operations;
- the assessment has considered potential noise impacts with respect to the prevailing acoustic conditions at existing off-site receptors;
- mitigation and appropriate measures have been considered, including the proposed increase in height of the boundary wall to the north-east of the Site; and
- recommendations have been made, where necessary, to comply with the requirements of the Environment Agency's Noise and Vibration Management: Environmental Permits [1] guidance and BS 4142:2014+A1:2019[2].

[1] Environment Agency, Scottish Environment Protection Agency (SEPA), Natural Resources Wales and Northern Ireland Environment Agency, 2021. Noise and Vibration Management: Environmental Permits.
[2] British Standards Institution, 2019. BS 4142:2014+A1:2019: Method for Rating and Assessing Industrial and Commercial Sound.

2. Assessment Framework

2.1. National Policy

2.1.1. Noise and Vibration Management: Environmental Permits

Environmental Permitting and Noise Control

Environmental permits require operators to manage pollution, including noise and vibration. To support compliance, the Environment Agency, Scottish Environment Protection Agency (SEPA), Natural Resources Wales, and the Northern Ireland Environment Agency have jointly issued updated guidance for permit applicants and holders. This guidance outlines:

- How environmental agencies assess noise from industrial processes;
- Legal obligations for managing noise and vibration;
- Best practices for noise management, including conducting noise impact assessments and preparing noise management plans; and
- This guidance replaces the now-withdrawn Environment Agency Horizontal Guidance for Noise (H3) Parts 1 and 2.

Best Available Techniques (BAT) and Noise Management

Permitting regulations require operators to implement Best Available Techniques (BAT) to minimize environmental impact, balancing noise control with other environmental considerations such as air, land, and water pollution. BAT aims to ensure that noise emissions do not cause unreasonable annoyance beyond the installation boundary.

For noise control, BAT includes:

- Implementing good practice, such as maintaining plant and equipment to prevent noise increases;
- Ensuring noise levels do not cause undue annoyance to nearby communities, aligning with environmental standards beyond statutory nuisance laws; and
- Preventing creeping background noise—the gradual rise in ambient sound levels due to industrial expansion.

While BAT applies to both new and existing activities, new installations must meet BAT standards from the outset, incorporating noise prevention into process design. For existing sites, the focus remains on best practices and ensuring noise does not cause undue disturbance.

Noise Impact Assessment and Standards

Assessing noise impacts typically involves monitoring existing levels and applying adjustments rather than relying solely on predictions. The guidance references BS 4142:2014+A1:2019 as the primary standard for noise impact assessments.

2.2. Assessment Criteria

2.2.1. BS 4142:2014+A1:2019

BS 4142:2014+A1:2019 provides a method for rating and assessing industrial and commercial sound to determine its potential impact on people in nearby dwellings or premises used for residential purposes. It applies to noise from factories, industrial sites, mechanical and electrical installations, and loading/unloading activities. The standard does not apply to transport noise, entertainment, or construction activities.

The BS 4142:2014+A1:2019 methodology compares the measured or predicted *specific sound level* ($L_{Aeq,T}$) from the industrial or commercial source with the *background sound level* ($L_{A90,T}$) at an outdoor assessment location near a dwelling or other noise-sensitive receptor. Adjustments for acoustic characteristics such as tonality, impulsivity, or intermittency may be applied to determine the *rating level* ($L_{Ar,Tr}$). The difference between the rating level and background sound level is then used to assess potential impact.

BS 4142 recognises that measurements and calculations are subject to uncertainty. Factors that can introduce variability include:

- Weather conditions (wind speed, temperature, precipitation);
- Variability in background sound levels (e.g., road traffic fluctuations);
- Measurement position (reflections, screening, distance to source); and
- Instrumentation accuracy (calibration, microphone response).

Annex B of BS 4142 provides guidance on minimising uncertainty, such as using long-term monitoring, multiple measurement locations, and considering different weather conditions.

BS 4142:2014+A1:2019 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 low impact, depending on the context."*

The periods associated with day or night, for the purposes of the Standard, are considered to be 07.00 to 23.00 and 23.00 to 07.00, respectively.

For assessment purposes, BS 4142 defines the following time periods:

- Daytime: 07:00 – 23:00 (reference period = 1 hour).
- Night-time: 23:00 – 07:00 (reference period = 15 minutes).

3. Site Description

3.1. Site and Surrounding Area

The site forms part of the Hart's Haulage operational depot at the former Ladds Yard, Wilson Way, Redruth, Cornwall. The site is located within an established commercial and industrial area and accommodates a range of activities associated with aggregate handling, haulage, waste processing and material recycling.

The Environmental Permit application relates to activities undertaken within the Hart's Haulage site, including the existing aggregate wash plant. The wash plant is situated within the eastern part of the yard and comprises screening, washing and grading equipment used to process quarried and recycled aggregates. The wider permitted activities also include material storage, loading and unloading, HGV movements, mobile plant movements and intermittent crushing.

The surrounding area is mixed in character. Commercial and industrial uses are present to the north, west and east, including other businesses operating from the wider former Ladds Yard and adjacent employment land. Open land and areas of agricultural use are also present in the wider locality. Residential receptors are located to the north-east at Carn Tor View, to the west at Boscarn Caravan Park, and to the south-west at Hillside Farm.

The area subject to this assessment is shown in Figure 1, below.

Figure 1: Site and Surrounding Area

There are numerous residential receptors in close proximity to the Development, however, five properties have been selected as being representative of the nearest noise-sensitive receptors, as detailed below in Table 1.

TABLE 1: NEAREST NOISE-SENSITIVE RECEPTORS

ID	Receptor Name	Direction	Assessment Height (m)	Easting	Northing
R1	Carn Tor View	North-East	4.0	167907	041248
R2	3-4 Carn Tor View	North-East	4.0	167926	041255
R3	1-2 Carn Tor View	North-East	4.0	167942	041261
R4	The Old Workshop	North-East	4.0	167955	041262
R5	Hillside Farm	South-West	4.0	167659	040837
R6	Boscarn Caravan Park	West	1.5	167572	041000
R7	Boscarn Caravan Park	West	1.5	167560	041026
R8	Boscarn Caravan Park	West	1.5	167544	041046
R9	Boscarn Caravan Park	West	1.5	167530	041055

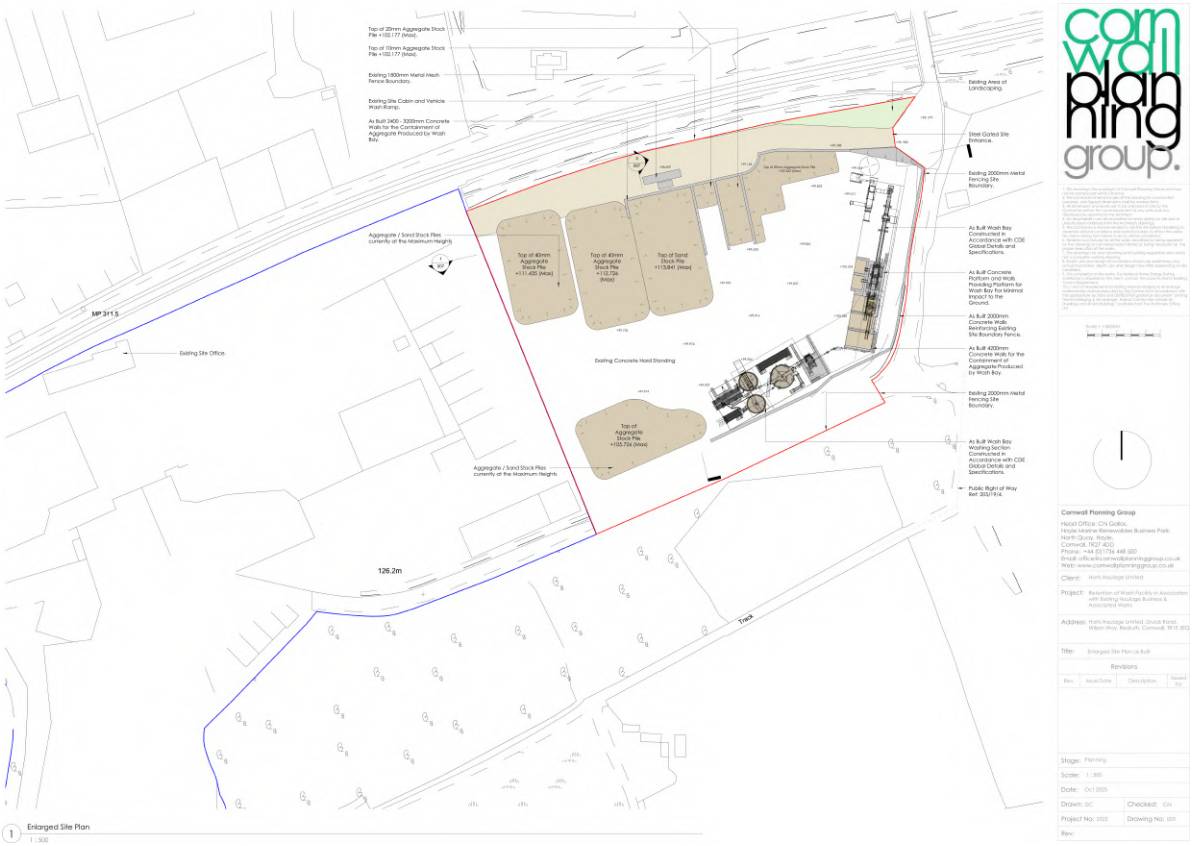
The wash plant area is accessed internally from the main haulage yard and comprises a series of fixed and mobile items of processing equipment, including feed hoppers, conveyor systems, vibrating screens and washing barrels, arranged on hardstanding with associated drainage and settlement infrastructure. Material is delivered to the plant via internal haul routes, with processed aggregate stockpiled within the adjacent yard area prior to distribution.

The wider Hart's Haulage operation includes aggregate and waste handling activities, material stockpiles, mobile plant operations, HGV deliveries and collections, and intermittent crushing using a Terex Finlay J-1160 crusher. Crushing is undertaken on demand, generally during campaign periods when sufficient material has been accumulated, and is not understood to be a continuous daily activity.

The wash plant is of open construction and is partially screened from the wider surroundings by existing boundary structures, including a concrete block wall along the north-eastern perimeter and aggregate stockpiles which provide variable screening at lower elevations. The proposed mitigation includes increasing the height of the relevant boundary wall to approximately 4 m, to improve acoustic screening between the operational yard and the Carn Tor View receptors.

The operational layout of the wash plant and surrounding infrastructure is shown in Figure 2, below.

FIGURE 2: PROPOSED SITE LAYOUT



3.2. Noise Generating Elements

The Site incorporates a mixture of fixed and mobile noise-generating activities associated with aggregate washing, material handling, crushing and vehicle movements. The principal noise-generating elements included within the assessment are summarised in Table 2.

The assessment considers the cumulative contribution from the operational wash plant and the wider Hart's Haulage permitted activities. The operational assumptions adopted in the noise model are set out further in Section 5.

TABLE 2: SUMMARY OF NOISE-GENERATING ELEMENTS

Reference	Description	Location	% On Time	Operational Profile	Grid Coordinates	
					Easting	Northing
1	Primary Screener	External	100	Continuous	167875	041173
2	CDE Primary Shaker	External	100	Continuous	167875	041146
3	CDE Vibro Sync	External	100	Continuous	167875	041145
4	CDE Agg Max	External	100	Continuous	167875	041139
5	CDE Secondary Screener	External	100	Continuous	167875	041134
6	CDE EvoWash	External	100	Continuous	167855	041115

Reference	Description	Location	% On Time	Operational Profile	Grid Coordinates	
					Easting	Northing
7	Agitator	External	100	Continuous	167845	041110
8	Secondary Agitator	External	100	Continuous	167837	041101
9	Diesel Generator	External	100	Continuous	167840	041117
10	Mud Centrifuge	Enclosed	100	Continuous	167825	041102
11	Terex Finlay J-1160 Crusher	External	100	As Required	167784	041089
12	Front-end Loading Shovels	External	20 movements per hour	Continuous	Mobile	
13	Tracked Excavators	External	20	Continuous	167702	041134
14	HGV Movements	External	20 movements per hour	Continuous	Mobile	
15	Material Tipping	External	30	Continuous	167777	041120
16	Loading / Stockpile Handling	External	30	Continuous	167836	041157

4. Measurement Methodology

4.1. General

The prevailing sound conditions in the area have been determined through a combination of attended source and receptor measurements, together with unattended baseline sound monitoring undertaken at locations representative of the nearest noise-sensitive receptors.

Attended measurements were undertaken during representative operation of the wash plant at Hart's Haulage on Friday 17th October 2025. These measurements were used to characterise the specific sound contribution from wash plant operations and to provide reference data for the calibration and development of the noise model.

A further baseline sound monitoring survey was undertaken between Thursday 16th April 2026 and Tuesday 21st April 2026. The purpose of this survey was to determine representative background sound levels at receptor locations around the Site in the absence of Hart's Haulage operations. Monitoring was undertaken at locations representative of receptors to the north-east, west and south of the Site, including Carn Tor View, Boscarn Caravan Park and Hillside Farm.

Weather conditions were monitored during the April 2026 survey. Periods affected by rainfall, elevated wind speeds or Hart's Haulage operations were excluded from the dataset used to determine representative background sound levels.

The measurement data have therefore been used as follows:

- the October 2025 attended measurements have been used to determine and validate the specific sound contribution from wash plant operations;
- the April 2026 unattended survey has been used to determine representative background sound levels for the daytime BS 4142 assessment; and
- attended source measurements and reference source data have been used to inform the cumulative noise model for fixed plant, mobile plant, HGV movements, material handling and crushing activities.

4.2. Measurement Details

All noise measurements were undertaken by a consultant certified as competent in environmental noise monitoring, and, in accordance with the principles of BS 7445[3].

All acoustic measurement equipment used during the noise survey conformed to Type 1 specification of British Standard 61672[4]. A full inventory of this equipment is shown in Table 3 below.

Table 3: Inventory of Sound Measurement Equipment

Measurement Position	Make, Model & Description	Serial Number	Calibration Certificate Number	Calibration Due Date
MP1 and Source Measurements October 2025	Rion NL-53 Sound Level Meter	01041453	CONF012506	20/01/2027
	Rion NH-25 Preamplifier	44408		
	Rion UC-59 Microphone	26330		

[3] British Standard 7445: 2003: Description and measurement of environmental noise. BSI
[4] British Standard 61672: 2013: Electroacoustics. Sound level meters. Part 1 Specifications. BSI.

Measurement Position	Make, Model & Description	Serial Number	Calibration Certificate Number	Calibration Due Date
MP2 October 2025	NTi Audio XL2 Sound Level Meter	A2A-14648-E0	UCRT24/2127	20/08/2026
	NTi Audio MA220 Preamplifier	7599		
	NTi Audio MC230A Microphone	A15871		
October 2025 Survey	Norsonic 1251 Acoustic Calibrator	34676	1170247	28/10/2025
MP1 April 2026	Rion NL-52 Sound Level Meter	00453871	1165092	15/07/2026
	Rion NH-25 Preamplifier	43913		
	Rion UC-59 Microphone	7960		
MP2 April 2026	Brüel & Kjær 2238 Sound Level Meter	2756961	1174056	10/01/2027
	Brüel & Kjær 4188 Microphone	2407240		
MP2 April 2026	Brüel & Kjær 2238 Sound Level Meter	2163634	1189718	28/10/2027
	Brüel & Kjær 4188 Microphone	2200693		
April 2026 Survey	Norsonic 1251 Acoustic Calibrator	34676	1189716	30/10/2026

The sound measurement equipment used during the surveys was field calibrated at the start and end of each measurement period. The field calibrator used had been calibrated by a calibration laboratory within the twelve months preceding the measurements. The calibration drift recorded during the surveys was within acceptable tolerances.

The weather conditions during the attended measurements were suitable for environmental noise measurement, being dry with wind speeds below 5 ms^{-1}. During the April 2026 unattended survey, wind speed and rainfall were monitored at MP3. Periods affected by adverse weather conditions were removed from the dataset prior to analysis.

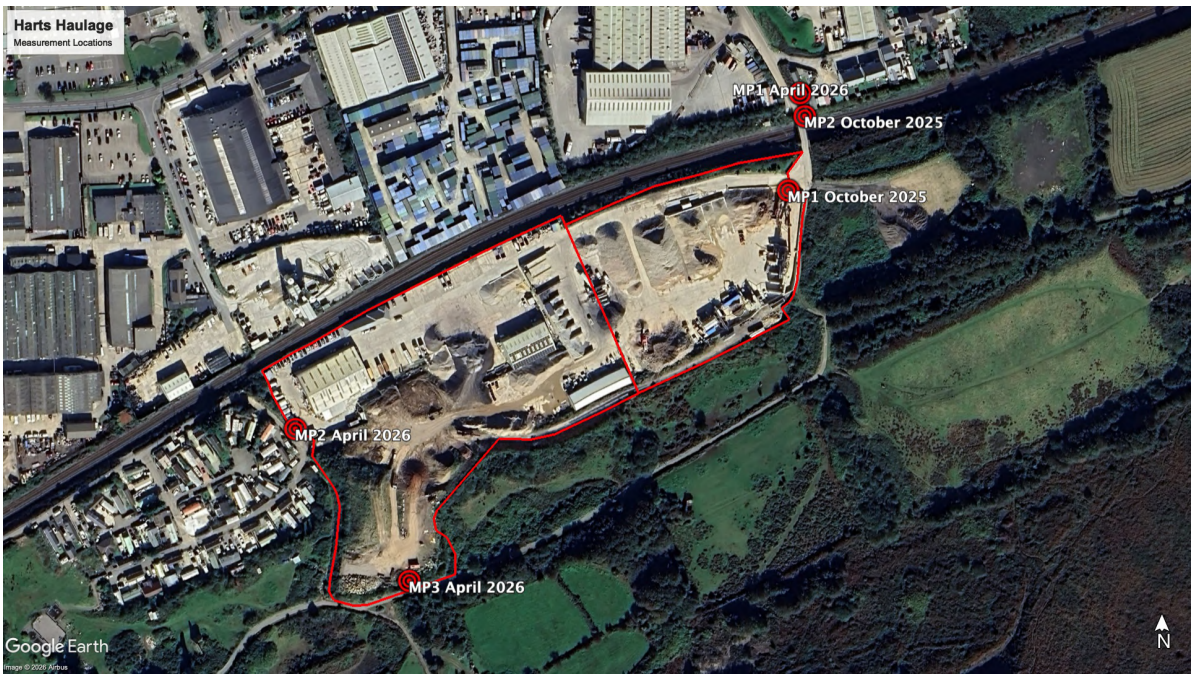
The microphones were fitted with protective windshields for the measurements, which are described in Table 4, with an aerial photograph indicating their respective locations shown in Figure 3.

TABLE 4: MEASUREMENT POSITION DESCRIPTIONS

Measurement Position	Description
MP1 – October 2025	An attended measurement undertaken at the site boundary, positioned to obtain the specific sound level from wash plant operations at a representative mid-point between the site and the nearest noise-sensitive receptors at Carn Tor View. The purpose of this position was to establish a robust reference level for the wash plant under representative operating conditions and to enable calibration of the noise model. The microphone was located at approximately 1.5 metres above local ground level under free-field conditions. In the absence of wash plant operations, the sound environment at this location was influenced primarily by existing industrial activity within the wider estate, intermittent vehicle movements and distant road traffic noise.
MP2 – October 2025	An attended measurement undertaken at a location on the boundary of the Carn Tor View residential development, representative of the nearest noise-sensitive receptors to the north-east of the site. The purpose of this position was to determine the specific sound level associated with wash plant operations at the receptor location,

	accounting for intervening distance and screening. The microphone was positioned at approximately 1.5 metres above local ground level under free-field conditions. In the absence of the specific sound, the prevailing sound environment was influenced by existing industrial activity, local road traffic and natural sounds.
Source Measurements	A series of short-duration attended measurements undertaken at, or in close proximity to, individual items of plant and equipment forming part of the wash plant. These measurements were carried out under representative operating conditions to determine source sound levels for key components, including screening, washing and conveyor processes. The results have been used to populate and inform the noise model, enabling prediction of sound levels at off-site receptor locations and assessment of potential mitigation scenarios.
MP1 – April 2026 Baseline	An unattended baseline monitoring position located at Carn Tor View, representative of the closest residential receptors to the north-east of the Site. This position was used to determine the representative daytime background sound level for receptors at Carn Tor View and The Old Workshop.
MP2 – April 2026 Baseline	An unattended baseline monitoring position located within the Hart's Haulage site boundary, representative of receptors at Boscarn Caravan Park to the west of the Site. This position was used to determine the representative daytime background sound level for the western receptor group.
MP3 – April 2026 Baseline	An unattended baseline monitoring position located within the Hart's Haulage site boundary, representative of receptors at Hillside Farm to the south / south-west of the Site. This position also included wind and rain monitoring equipment used to identify and remove periods of unsuitable weather from the dataset.

FIGURE 3: MEASUREMENT POSITIONS



4.3. Summary Results

4.3.1. Background

Representative background sound levels have been determined from the unattended baseline sound monitoring survey undertaken between Thursday 16th April 2026 and Tuesday 21st April 2026.

The survey was undertaken at three positions representative of the principal receptor groups surrounding the Site. Monitoring was undertaken during weekday and weekend periods, with weekend periods used to assist in determining background sound levels in the absence of Hart's Haulage operations. Periods affected by rainfall, elevated wind speeds and site operations were removed from the dataset prior to analysis.

The sound environment in the vicinity of the Site is influenced by a range of commercial, industrial and transport sources. These include activity associated with the wider commercial and industrial area, concrete batching, waste transfer activities and road traffic on Wilson Way and Dudnance Lane. The measured background sound levels therefore represent the residual sound environment in the absence of Hart's Haulage operations, but not the absence of all commercial and industrial sound in the wider area.

The summarised results of the April 2026 baseline sound monitoring survey are presented in Table 5.

TABLE 5: SUMMARY OF BACKGROUND NOISE MEASUREMENT RESULTS

Measurement Position	Representative Receptor Group	Period	A-weighted Broadband Sound Level, L_{Aeq} dB	Typical Background Noise Level, L_{A90} dB
MP1	Carn Tor View / The Old Workshop	Day	55	45
MP2	Boscarn Caravan Park	Day	54	40
MP3	Hillside Farm	Day	43	36

The adopted background sound levels are considered representative of the daytime periods relevant to the operation of the permitted activities. No evening or night-time waste processing operations are proposed as part of the Environmental Permit application; therefore, separate evening and night-time background sound levels have not been adopted for assessment purposes.

4.3.2. Specifics

The specific sound level associated with the operation of the wash plant has been determined from attended environmental noise measurements undertaken during representative daytime operation at Hart's Haulage. Measurements were undertaken at Measurement Positions MP1 and MP2, enabling both a robust characterisation of the wash plant contribution and calibration of the subsequent noise model.

At MP1, located at the site boundary, measurements were undertaken during periods when the wash plant was operating under steady-state conditions. This position was selected to obtain a representative specific sound level at a mid-point between the source and the nearest noise-sensitive

receptors, minimising the influence of unrelated off-site noise sources and allowing the wash plant contribution to be clearly identified.

At MP2, located at the boundary of the Carn Tor View residential development, measurements were undertaken during the wash plant operation to determine the specific contribution at the receptor location, accounting for distance attenuation and intervening screening.

Where other unrelated noise sources were present during the attended surveys, the specific contribution from the wash plant was identified using observational correlation and temporal analysis, in accordance with BS 4142:2014+A1:2019. Periods affected by transient or non-representative events were excluded from the analysis to ensure that the adopted specific sound levels are representative of typical wash plant operation.

The summarised specific sound level measurements derived from the attended survey are presented in Table 6, below.

TABLE 6: SPECIFIC SOUND LEVELS FROM HART'S HAULAGE WASH PLANT

Measurement Position	Ambient Sound Level, L_{Aeq} (dB)	Residual Sound Level, L_{Aeq} (dB)	Specific Sound Level (dB)	Notes
MP1	68.4	53.5	68.4	Representative steady-state wash plant operation; value used to inform and calibrate the noise model
MP2	56.2	51.9	54.2	Specific sound level at the boundary of Carn Tor View during wash plant operation

The measurements indicate that the wash plant gives rise to a specific sound level of 54 dB $L_{Aeq,1h}$ at the nearest noise-sensitive receptors under representative operating conditions. This value has been adopted for the purposes of the BS 4142 assessment and to inform the prediction of mitigated sound levels using the calibrated noise model.

5. Noise Assessment

5.1. Noise Modelling

5.1.1. General

As described in Section 4, attended and unattended sound measurements have been undertaken to determine the prevailing acoustic conditions around the Site and to characterise the specific sound contribution from the operational wash plant.

Noise modelling has been undertaken to determine the cumulative specific sound level associated with Hart's Haulage permitted activities at the nearest noise-sensitive receptors. The model has been prepared to address the Environment Agency's request for a site-wide assessment, rather than an assessment limited to the wash plant in isolation.

The model therefore includes the principal fixed and mobile noise sources associated with the permitted activities, including the operational wash plant, crushing, material handling, HGV movements, mobile plant movements, loading, tipping and stockpile management.

The modelling has been undertaken to enable:

- prediction of cumulative specific sound levels at the nearest noise-sensitive receptors;
- assessment of upper-storey receptor positions where relevant;
- assessment of Boscarn Caravan Park to the west of the Site;
- consideration of the proposed mitigation measures; and
- assessment of residual effects in accordance with BS 4142:2014+A1:2019.

The assessment presents the residual cumulative scenario, incorporating the proposed mitigation measures. This reflects the operational basis on which the Site is to be managed and the appropriate measures proposed to minimise noise emissions from the permitted activities.

5.1.2. Operational Assumptions

The noise model represents a reasonable worst-case daytime operating scenario for Hart's Haulage. The assessment has been undertaken for the daytime period only, on the basis that waste processing activities are understood to take place during the daytime period, typically within 07:00 to 19:00 Monday to Friday, with no evening or night-time waste processing activities proposed.

The cumulative scenario includes the following principal activities:

- operation of the aggregate wash plant, including screening, washing, grading and conveyor systems;
- operation of the primary screener and associated CDE plant items;
- operation of the diesel generator and mud centrifuge;
- operation of the Terex Finlay J-1160 crusher;
- two front-end loading shovels undertaking material handling, loading and stockpile management;
- tracked excavator moving materials around stockpiles;
- HGV arrivals and departures;
- internal HGV movements;
- tipping of material;

- loading of processed material; and
- use of bays, bunkers and stockpile areas.

For the purposes of the assessment, the model includes 10 inbound and 10 outbound HGV loads during the daytime BS 4142 reference period. The model also includes two HGV movements to the maintenance workshop / parking area and one internal HGV movement to the south-western part of the Site, including tipping.

All principal activities have been assumed to occur during the assessed daytime reference period. This is a conservative assessment basis, as crushing is understood to occur on a campaign basis when sufficient material has been accumulated, rather than as a continuous daily activity.

5.1.3. Source Data

The noise model has been populated using a combination of attended source measurements, measured wash plant data, measured vehicle data and reference source data from BS 5228 where site-specific measurements were not available.

The wash plant source levels are based on measurements undertaken during representative operation. The model has been calibrated with reference to the attended measurements undertaken at the site boundary and at Carn Tor View, as described in Section 4.

The crusher and HGV movements have been informed by site-specific measurements. Source levels for loading shovels, tracked excavators, tipping, bucket loading and stockpile handling have been derived from BS 5228 data. These values are considered appropriate and conservative for the purposes of the assessment.

The source data adopted within the model are summarised in Table 7.

TABLE 7: SOURCE NOISE LEVELS

Source	Sound Power Level, L_{WA} (dB)	Linear Octave Band, Hz, Sound Power Level, L_W (dB)							
		63	125	250	500	1k	2k	4k	8k
Primary Screener	106	103	101	101	107	98	94	89	81
CDE Primary Shaker	94	105	90	86	87	86	86	87	85
CDE Vibro Sync	90	101	87	85	84	85	82	82	80
CDE Agg Max	92	100	92	88	87	88	85	82	79
CDE Secondary Screener	93	98	85	86	90	86	85	87	83
CDE EvoWash	92	105	94	94	87	86	84	80	75
Agitator	95	82	85	88	90	91	88	85	79
Secondary Agitator	95	82	85	88	90	91	88	85	79
Diesel Generator	83	85	86	87	77	76	74	69	63
Mud Centrifuge	93[5]	85	80	83	88	85	84	84	78
Terex Finlay J-1160 Crusher	111	112	113	108	109	107	102	99	95

[5] Internal Reverberant Sound Level

Source	Sound Power Level, L_{WA} (dB)	Linear Octave Band, Hz, Sound Power Level, L_W (dB)							
		63	125	250	500	1k	2k	4k	8k
Front-end Loading Shovel	99	111	100	98	97	93	92	85	77
Tracked Excavator	108	104	107	103	103	104	101	98	93
HGV Movement	98	110	104	96	94	92	92	83	86
Material Tipping	110	120	112	111	105	104	102	99	90
Material Loading / Stockpile Handling	106	117	108	110	101	98	97	92	85

5.1.4. Calculation Process

Calculations were carried out using iNoise 2026, which undertakes its calculations in accordance with guidance given in ISO9613-1:1993 and ISO9613-2:2024.

The model includes the relevant site buildings, stockpiles, boundary features, ground levels and screening elements. Topographical information has been incorporated into the model, together with existing boundary treatments and the proposed 4 m concrete wall to the north-east of the Site.

The following source types have been adopted within the model:

- fixed point sources for static plant and fixed activity locations;
- moving point sources for HGV movements and mobile plant routes; and
- fixed point sources for localised material tipping, loading and stockpile handling activities.

The modelling has been undertaken on a free-field basis at the assessment receptor locations.

5.1.5. Sound Data Assumptions

The land between the Site and the nearest noise-sensitive receptors comprises a mixture of hardstanding, commercial yard areas, industrial land, roads, open ground and landscaped areas. Accordingly, ground absorption has been defined within the model according to the relevant ground types.

Atmospheric conditions assumed within the model are consistent with those prescribed by ISO 9613-2 and represent conditions favourable to sound propagation.

The following receptor heights have been adopted:

- 4.0 m above local ground level for residential dwellings where upper-storey rooms are present; and
- 1.5 m above local ground level for Boscarn Caravan Park, reflecting the single-storey nature of the receptors.

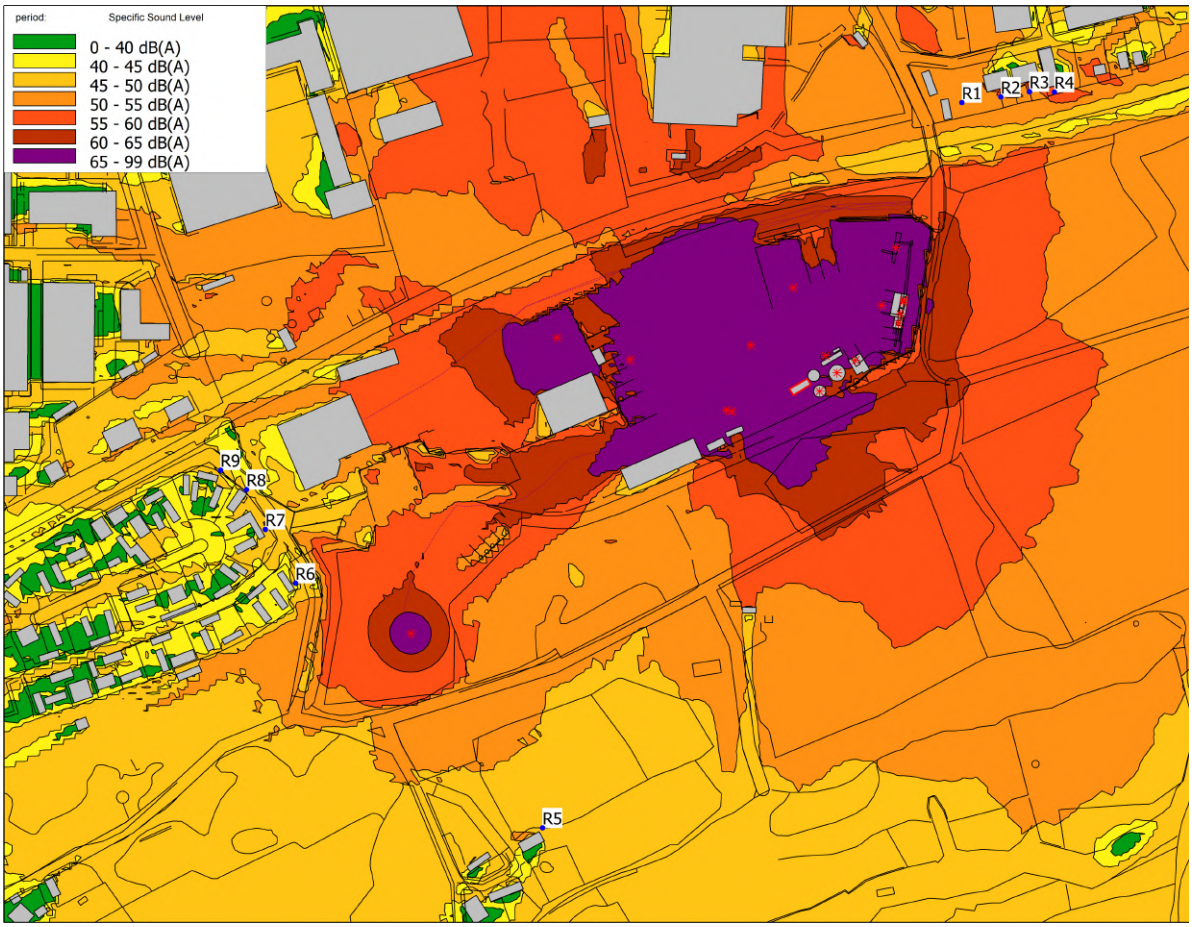
The model incorporates the proposed 4 m concrete boundary wall along the north-eastern boundary of the Site. This wall is proposed as the principal physical mitigation measure to reduce sound propagation towards Carn Tor View and The Old Workshop.

5.1.6. Specific Sound Level Map

A sound map illustrating the predicted cumulative specific sound level from the assessed daytime operations is presented in Figure 4.

The sound map includes existing site operations, the operational wash plant, crushing, mobile plant, HGV movements, material handling activities and the proposed mitigation measures.

FIGURE 4: SPECIFIC SOUND LEVEL MAP OF EXISTING OPERATIONS - DAY



5.1.7. Specific Sound Level Summary

The measured and predicted specific sound level arising from operations at the closest receptors to the Site, as shown on Figure 4, can be seen below in Table 8.

TABLE 8: PREDICTED SPECIFIC SOUND LEVEL SUMMARY

NSRs	Specific Sound Level dB(A)
R1	54
R2	55
R3	55
R4	57
R5	49
R6	42
R7	47
R8	45
R9	45

The predicted values represent the cumulative contribution from the assessed Hart's Haulage activities, incorporating the proposed mitigation measures. The values therefore reflect the residual scenario on which the assessment is based.

5.2. Assessment

5.2.1. Rating Penalty Principle

Section 9 of BS 4142:2014+A1:2019 describes how the rating sound level should be derived from the specific sound level by applying any appropriate acoustic feature correction.

BS 4142:2014+A1:2019 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."

The subjective method has been adopted to derive the rating sound level from the predicted specific sound level. This is considered appropriate in this case, given that the assessment relates to a combination of measured and modelled site activities, including fixed plant, mobile plant and material handling operations.

5.2.2. Rating Penalty Assessment

An assessment has been undertaken to determine whether rating penalties should be applied to the cumulative specific sound from the Site, having regard to the potential for tonality, impulsivity, intermittency or other sound characteristics.

During the attended measurements, the wash plant was audible and recognisable at the nearest receptor locations. The sound was not observed to be tonal or impulsive, and reversing alarms were not identified as being audible at the receptors. Reversing alarms used on site are understood to be broadband in character.

Material handling and tipping activities have the potential to generate short-duration variations in sound level; however, these were not observed to be sufficiently impulsive at the receptors to justify a specific impulsivity correction. Similarly, crushing was not observed to produce a distinctive tonal or impulsive character at the receptor locations.

Notwithstanding the above, the cumulative site sound may be recognisable as commercial / industrial activity at the nearest receptors, particularly during periods when washing, crushing, mobile plant activity and HGV movements occur together. On this basis, a +3 dB penalty has been applied for *'other sound characteristics.'*

This is considered to provide a suitably conservative assessment of the cumulative site noise.

The outcome of the rating penalty assessment is summarised in Table 9, below.

TABLE 9: RATING PENALTY ASSESSMENT

Source	Tonality	Impulsivity	Intermittency	Other Sound Characteristics	Discussion
Cumulative Site Operations	0 dB	0 dB	0 dB	+3 dB	The cumulative sound from the Site is not considered to be tonal or impulsive at the receptors. Reversing alarms are broadband and were not identified as being audible at receptor locations. While the sound is generally consistent with the established industrial character of the area, it may be recognisable as Hart's Haulage activity during periods of simultaneous washing, crushing, material handling and HGV movements. A +3 dB correction for *'other sound characteristics'* has therefore been applied.

In summary, a +3 dB rating penalty has been applied to the cumulative specific sound level for the purposes of the BS 4142 assessment.

5.2.3. Uncertainty

BS4142:2014+A1:2019 requires that the level of uncertainty in the measured data and associated calculations is considered in the assessment. The Standard recommends that steps should be taken to reduce the level of uncertainty.

Measurement Uncertainty

BS4142:2014+A1:2019 states that measurement uncertainty depends on a number of factors, including the following, which are applicable to the Proposed Development:

"

a) the complexity of the sound source and the level of variability in sound emission from the source;
b) the complexity and level of variability of the residual acoustic environment;
...
d) the location(s) selected for taking the measurements;
...
g) the measurement time intervals;
h) the range of times when the measurements have been taken;
i) the range of suitable weather conditions during which measurements have been taken;
...
k) the level of rounding of each measurement recorded; and
l) the instrumentation used."

Each of the relevant measurement uncertainty factors has been considered in the context of the wash plant operations and is discussed in Table 10, below.

TABLE 10: MEASUREMENT UNCERTAINTY FACTORS

Measurement Uncertainty Factor Reference	Level of Uncertainty	Discussion
a)	Low	The sound sources associated with the Site include a combination of steady plant items and variable mobile plant / material handling activities. Attended observations and representative source data have been used to characterise these sources. The assessment scenario is conservative, assuming simultaneous operation of the principal activities.
b)	Low	The residual acoustic environment is influenced by established commercial, industrial and transport sources, including the wider industrial area, concrete batching, waste transfer activity and road traffic on Wilson Way and Dudnance Lane. The April 2026 baseline survey enabled representative background levels to be determined for each receptor group.
d)	Low	Measurements were undertaken at locations representative of the closest noise-sensitive receptors, including Carn Tor View, Boscarn Caravan Park and Hillside Farm. Attended measurements were also undertaken to characterise the wash plant contribution and support model calibration.
g)	Low	Measurement time intervals were selected in accordance with BS 4142:2014+A1:2019 and were sufficient to capture representative operating and background conditions.
h)	Low	Baseline sound monitoring was undertaken between Thursday 16th April 2026 and Tuesday 21st April 2026, capturing weekday and weekend periods. Weekend periods were used to assist in determining representative background sound levels in the absence of Hart's Haulage operations.

i)	Low	Weather conditions were monitored during the unattended survey. Periods affected by rainfall, elevated wind speeds or unsuitable conditions were excluded from the dataset used to determine background sound levels.
k)	Low	Measured values were processed to a suitable resolution and rounded only for presentation purposes. Rounding is not considered to materially affect the outcome of the assessment.
l)	Low	Measurements were undertaken using sound level meters conforming to Type 1 specification of BS EN 61672. The equipment was field calibrated before and after use, with calibration drift within acceptable tolerances.

The measurement programme is considered appropriate for the purposes of the assessment. While the cumulative site operations include variable activity, the adopted assessment scenario is deliberately conservative and is therefore unlikely to underestimate the potential noise impact.

Calculation Uncertainty

BS4142:2014+A1:2019 states that calculation uncertainty depends on a number of factors, including the following, which are applicable to the Proposed Development:

" *...*

b) uncertainty in the operation or sound emission characteristics of the specific sound source and any assumed sound power levels;
c) uncertainty in the calculation method;
d) simplifying the real situation to "fit" the model (user influence on modelling); and
e) error in the calculation process."

Each of the relevant calculation uncertainty factors identified in BS 4142:2014 + A1:2019 has been considered in relation to the noise modelling undertaken for the wash plant operations and is discussed in Table 11, below.

TABLE 11: CALCULATION UNCERTAINTY FACTORS

Calculation Uncertainty Factor Reference	Level of Uncertainty	Discussion
b)	Low	Source levels are based on a combination of attended measurements, measured wash plant data, measured vehicle / crusher data and BS 5228 reference data. Where BS 5228 data have been adopted, they are considered conservative for the purposes of assessment.
c)	Low	Calculations have been undertaken using ISO 9613-2 within iNoise 2026, which is an appropriate and validated prediction method for industrial and commercial sound propagation.
d)	Low	The model includes site buildings, stockpiles, boundary features, landform, ground absorption and the proposed 4 m concrete block boundary wall. The model therefore provides a suitable representation of the source-receptor relationships around the Site.
e)	Low	The model has been checked against attended measurement data where available, including measurements of wash plant sound at the site boundary and at Carn Tor View. No additional correction is considered necessary.

Overall calculation uncertainty is considered to be acceptable for the purposes of the assessment. The use of conservative source assumptions and simultaneous operation of principal site activities means that the model is more likely to overstate, rather than understate, typical site noise emissions.

5.2.4. BS4142:2014+A1:2019 Assessment

The rating sound level, derived from the predicted specific sound level and the applicable rating penalty, has been assessed in accordance with BS 4142:2014 + A1:2019 at the nearest noise-sensitive receptors (NSRs).

The assessment compares the rating sound level arising from the wash plant operations with the representative daytime background sound levels, as established in Section 4.3. The resulting differences between the rating sound level and background sound level during the daytime period are summarised in Table 12, below.

TABLE 12: DAYTIME BS4142:2014+A1:2019 ASSESSMENT SUMMARY

Receptor	Rating Sound Level (dB)	Daytime Background Sound Level (dB)	Excess of Rating over Daytime Background Sound Level (dB)
R1	57	45	+12
R2	58	45	+13
R3	58	45	+13
R4	60	45	+15
R5	52	36	+16
R6	45	40	+5
R7	50	40	+10
R8	48	40	+8
R9	48	40	+8

The results indicate that the rating sound level exceeds the representative daytime background sound level at each of the assessed receptor groups.

In numerical BS 4142 terms, the results indicate the potential for adverse to significant adverse impact, depending on context. The greatest numerical exceedance is predicted at Hillside Farm; however, the absolute predicted rating level at that location is lower than at the Carn Tor View receptors, and the larger exceedance is influenced by the lower background sound level adopted for that receptor group.

At Boscarn Caravan Park, the rating sound level is predicted to exceed the adopted background sound level by approximately +5 to +10 dB, which is at or below the level typically associated with significant adverse impact, but is nevertheless indicative of an adverse impact depending on context.

At Carn Tor View and The Old Workshop, the rating sound level is predicted to exceed the adopted background sound level by approximately +12 to +15 dB. On a numerical basis alone, this is an indication of the potential for significant adverse impact, depending on context.

BS 4142 requires that the significance of the sound is considered in context. The contextual factors relevant to the assessment are therefore considered overleaf.

5.3. Context and Discussion

5.3.1. Context

The outcome of the BS 4142 assessment must be considered in the context within which the sound occurs. BS 4142:2014+A1:2019 makes clear that the significance of sound of an industrial or commercial nature depends upon both the margin by which the rating level exceeds the background sound level and the context in which the sound occurs.

In this case, the numerical BS 4142 comparison indicates the potential for adverse to significant adverse impact at receptor locations. However, that outcome must be considered alongside the nature of the Site, the established acoustic character of the area, the conservatism of the assessment assumptions and the appropriate measures proposed and implemented by the operator.

Hart's Haulage operates from a long-established commercial and industrial site at the former Ladds Yard. The surrounding area is influenced by a range of commercial, industrial and transport sources, including other businesses within the wider yard, concrete batching, waste transfer activities and road traffic on Wilson Way and Dudnance Lane.

The sound environment at nearby receptors is therefore not rural or otherwise dominated by low-level natural sounds. It is an established mixed industrial / commercial soundscape, within which noise from material handling, vehicle movements and plant activity is not uncharacteristic.

The operator has also advised that there is no known history of substantiated noise complaints associated with Hart's Haulage operations. This is relevant context, given the long-standing nature of the Site and the proximity of the surrounding receptors.

5.3.2. Assessment Conservatism

The assessment has been undertaken on a deliberately conservative basis.

The model assumes simultaneous operation of the principal site activities within the same daytime BS 4142 reference period. This includes wash plant operation, crushing, front-end loading shovels, tracked excavators, material handling, tipping and HGV movements.

In practice, not all of these activities would necessarily occur at the modelled intensity throughout each daytime hour. In particular, crushing is understood to be undertaken on a campaign basis, typically when sufficient stockpiled material has been accumulated, rather than as a continuous daily activity. The inclusion of crushing alongside washing and wider mobile plant activity therefore represents a reasonable worst-case assessment scenario.

The HGV movement assumptions are also conservative, with 10 inbound and 10 outbound loads included within the daytime reference period, together with additional internal HGV movements.

Accordingly, while the model provides a robust basis for assessing potential noise impact, the predicted levels should be regarded as representative of a reasonable worst-case daytime scenario rather than typical hour-by-hour operation.

5.3.3. Appropriate Measures

The Environment Agency's Noise and Vibration Management: Environmental Permits guidance requires operators to use appropriate measures to prevent, or where that is not practicable, minimise noise emissions.

The assessment includes a number of physical and operational measures to reduce noise emissions from the Site. These include:

- increasing the height of the concrete boundary wall to approximately 4 m along the north-eastern boundary of the Site;
- locating the crusher in the established operational area to the south-west of the wash plant;
- use of existing buildings, boundary features and stockpiles to provide screening where practicable;
- use of broadband reversing alarms;
- controlled material handling to avoid unnecessary dropping from height;
- maintenance of plant and equipment in good working order;
- management of stockpiles to assist operational efficiency and screening;
- daytime-only waste processing activities; and
- operation in accordance with the Noise Management Plan.

The 4 m concrete is the principal additional physical mitigation measure included within the model. The wall is proposed to provide improved screening between the operational yard and the Carn Tor View receptors, where the highest absolute rating levels are predicted.

Other mitigation measures are operational in nature and are to be secured through the Noise Management Plan. These measures are consistent with the normal operation of a well-managed aggregate and recycling facility and assist in reducing unnecessary or avoidable noise emissions.

5.3.4. Discussion of Residual Effects

The residual cumulative assessment indicates that site sound may remain audible at nearby receptors during representative worst-case daytime operations.

In BS 4142 terms, the numerical assessment indicates the potential for adverse to significant adverse impact, depending on context. However, the predicted sound must be considered in the context of an established industrial / commercial setting, a long-standing operational site, the conservative assumptions adopted in the model and the absence of known substantiated complaints associated with Hart's Haulage operations.

The predicted rating levels are based on the simultaneous operation of activities which do not all represent continuous daily operation. Crushing, in particular, is semi-regular and campaign-based. The assessment therefore represents a robust envelope of daytime operations rather than a typical continuous condition.

No evening or night-time waste processing activities are proposed. This is an important contextual factor, as the operations are limited to the less sensitive daytime period, when background and ambient sound levels are generally higher and receptors are less sensitive than during evening or night-time periods.

The site is also located within an area where commercial and industrial sound forms part of the prevailing acoustic environment. The predicted sound would not introduce a wholly new or

unfamiliar type of sound into an otherwise quiet environment. Rather, it would form part of the established industrial and commercial soundscape surrounding the Site.

Taking these factors together, the residual effect is considered to be adverse in BS 4142 terms during the assessed reasonable worst-case daytime scenario, but not unacceptable in the context of the Site and surrounding area. The proposed physical mitigation and operational controls represent appropriate measures to minimise noise emissions from the permitted activities.

5.3.5. Overall Environmental Context

The assessment demonstrates that cumulative noise from the Site has the potential to be audible and, at times, prominent at nearby receptors during worst-case daytime operations. The numerical BS 4142 comparison indicates the potential for adverse to significant adverse impact, depending on context.

However, the context is material. The Site is long-established, the surrounding area is characterised by commercial and industrial sound, the assessment scenario is conservative, crushing is not a continuous daily activity, no evening or night-time waste processing is proposed, and the operator has advised that there is no known history of substantiated noise complaints associated with Hart's Haulage operations.

The proposed 4 m concrete wall and the operational controls set out in the Noise Management Plan are considered to represent appropriate measures to prevent, or where that is not practicable, minimise noise emissions from the permitted activities.

On this basis, noise is not considered to represent a constraint to determination of the Environmental Permit application, subject to implementation of the proposed mitigation and ongoing operation in accordance with the Noise Management Plan.

6. Conclusion

inacoustic has been commissioned to assess noise emissions associated with the permitted activities at Hart's Haulage, Redruth, Cornwall, in support of an Environmental Permit application for the Site.

The assessment has been updated following comments received from the Environment Agency and now considers cumulative sound emissions from the Site as a whole. The assessment therefore includes existing site operations, the operational wash plant, crushing, mobile plant, HGV movements, material handling, loading, tipping and stockpile management.

The assessment has considered a reasonable worst-case daytime operating scenario, including simultaneous operation of the principal site activities. This includes wash plant operation, crushing, mobile plant activity and HGV movements within the same BS 4142 daytime reference period. The scenario is considered conservative, as crushing is understood to be undertaken on a campaign basis when sufficient material has been accumulated, rather than as a continuous daily activity.

The predicted cumulative specific sound levels have been assessed in accordance with BS 4142:2014+A1:2019 at the nearest noise-sensitive receptors, including upper-storey receptor positions where relevant and Boscarn Caravan Park to the west of the Site. A +3 dB rating penalty has been applied to the cumulative specific sound level for other sound characteristics, providing a conservative assessment of the potential recognisability of site noise.

The numerical BS 4142 assessment indicates the potential for adverse to significant adverse impact at some receptor locations, depending on context. However, BS 4142 requires that the significance of the sound is considered in context and not on the numerical comparison alone.

The Site is located within an established commercial and industrial area, where the prevailing acoustic environment is influenced by industrial and commercial activity, including other operations within the wider locality and road traffic on Wilson Way and Dudnance Lane. Hart's Haulage is also a long-established operation, and the operator has advised that there is no known history of substantiated noise complaints associated with its activities.

The proposed mitigation includes increasing the height of the concrete boundary wall along the north-eastern boundary of the Site to approximately 4 m. This measure has been included in the noise model and is intended to provide improved acoustic screening between the operational yard and the Carn Tor View receptors. In addition, the Site will operate in accordance with the Noise Management Plan, which sets out operational controls relating to plant maintenance, controlled material handling, avoidance of unnecessary dropping from height, broadband reversing alarms, stockpile management and complaint response procedures.

No evening or night-time waste processing activities are proposed as part of the Environmental Permit application. This is an important contextual factor, as the assessed operations are limited to the daytime period, when receptors are less sensitive and the ambient sound environment is generally higher.

Taking these factors together, the residual cumulative sound from the Site may remain audible. However, the predicted sound would occur within an established industrial and commercial context and has been assessed on a conservative basis. Subject to implementation of the proposed boundary wall and ongoing operation in accordance with the Noise Management Plan, the noise emissions from the Site are considered to be appropriately controlled and minimised.

On this basis, noise is not considered to represent a constraint to determination of the Environmental Permit application, subject to implementation of the mitigation and management measures identified in this report and the accompanying Noise Management Plan.

7. APPENDICES

7.1. Appendix A – Definition of Terms

Sound Pressure	Sound, or sound pressure, is a fluctuation in air pressure over the static ambient pressure.
Sound Pressure Level (Sound Level)	The sound level is the sound pressure relative to a standard reference pressure of 20μPa ($20x10^{-6}$ Pascals) on a decibel scale.
Decibel (dB)	A scale for comparing the ratios of two quantities, including sound pressure and sound power. The difference in level between two sounds s1 and s2 is given by 20 log10 (s1 / s2). The decibel can also be used to measure absolute quantities by specifying a reference value that fixes one point on the scale. For sound pressure, the reference value is 20μPa.
A-weighting, dB(A)	The unit of sound level, weighted according to the A-scale, which takes into account the increased sensitivity of the human ear at some frequencies.
Noise Level Indices	Noise levels usually fluctuate over time, so it is often necessary to consider an average or statistical noise level. This can be done in several ways, so a number of different noise indices have been defined, according to how the averaging or statistics are carried out.
$L_{eq,T}$	A noise level index called the equivalent continuous noise level over the time period T. This is the level of a notional steady sound that would contain the same amount of sound energy as the actual, possibly fluctuating, sound that was recorded.
$L_{max,T}$	A noise level index defined as the maximum noise level during the period T. L_{max} is sometimes used for the assessment of occasional loud noises, which may have little effect on the overall L_{eq} noise level but will still affect the noise environment. Unless described otherwise, it is measured using the 'fast' sound level meter response.
$L_{90,T}$	A noise level index. The noise level exceeded for 90% of the time over the period T. L_{90} can be considered to be the "average minimum" noise level and is often used to describe the background noise.
$L_{10,T}$	A noise level index. The noise level exceeded for 10% of the time over the period T. L_{10} can be considered to be the "average maximum" noise level. Generally used to describe road traffic noise.
Free-Field	Far from the presence of sound reflecting objects (except the ground), usually taken to mean at least 3.5m
Facade	At a distance of 1m in front of a large sound reflecting object such as a building façade.
Fast Time Weighting	An averaging time used in sound level meters. Defined in BS 5969.

In order to assist the understanding of acoustic terminology and the relative change in noise, the following background information is provided.

The human ear can detect a very wide range of pressure fluctuations, which are perceived as sound. In order to express these fluctuations in a manageable way, a logarithmic scale called the decibel, or dB scale is used. The decibel scale typically ranges from 0 dB (the threshold of hearing) to over 120 dB. An indication of the range of sound levels commonly found in the environment is given in the following table.

TABLE 13: TYPICAL SOUND LEVELS FOUND IN THE ENVIRONMENT

Sound Level	Location
0dB(A)	Threshold of hearing
20 to 30dB(A)	Quiet bedroom at night
30 to 40dB(A)	Living room during the day
40 to 50dB(A)	Typical office
50 to 60dB(A)	Inside a car
60 to 70dB(A)	Typical high street
70 to 90dB(A)	Inside factory
100 to 110dB(A)	Burglar alarm at 1m away
110 to 130dB(A)	Jet aircraft on take off
140dB(A)	Threshold of Pain

The ear is less sensitive to some frequencies than to others. The A-weighting scale is used to approximate the frequency response of the ear. Levels weighted using this scale are commonly identified by the notation dB(A).

In accordance with logarithmic addition, combining two sources with equal noise levels would result in an increase of 3 dB(A) in the noise level from a single source.

A change of 3 dB(A) is generally regarded as the smallest change in broadband continuous noise which the human ear can detect (although in certain controlled circumstances a change of 1 dB(A) is just perceptible). Therefore, a 2 dB(A) increase would not be normally be perceptible. A 10 dB(A) increase in noise represents a subjective doubling of loudness.

A noise impact on a community is deemed to occur when a new noise is introduced that is out of character with the area, or when a significant increase above the pre-existing ambient noise level occurs.

For levels of noise that vary with time, it is necessary to employ a statistical index that allows for this variation. These statistical indices are expressed as the sound level that is exceeded for a percentage of the time period of interest. In the UK, traffic noise is measured as the L_{A10}, the noise level exceeded for 10% of the measurement period. The L_{A90} is the level exceeded for 90% of the time and has been adopted to represent the background noise level in the absence of discrete events. An alternative way of assessing the time varying noise levels is to use the equivalent continuous sound level, L_{Aeq}.

This is a notional steady level that would, over a given period of time, deliver the same sound energy as the actual fluctuating sound.

To put these quantities into context, where a receiver is predominantly affected by continuous flows of road traffic, a doubling or halving of the flows would result in a just perceptible change of 3 dB, while an increase of more than 25%, or a decrease of more than 20%, in traffic flows represent changes of 1 dB in traffic noise levels (assuming no alteration in the mix of traffic or flow speeds).

Note that the time constant and the period of the noise measurement should be specified. For example, BS 4142 specifies background noise measurement periods of 1 hour during the day and 15 minutes during the night. The noise levels are commonly symbolised as $L_{A90,1hour}$ dB and $L_{A90,15mins}$ dB. The noise measurement should be recorded using a 'FAST' time response equivalent to 0.125 ms.

7.2. Appendix B – Qualifications etc

The company is directed and led by Antony Best BSc (Hons) MIOA, Neil Morgan MSc MIOA and Victor Valeron BEng MSc MIOA, who have a combined experience of over 50 years in the acoustic industry; covering a range of project types and assessment scenarios, including numerous submissions to the Environment Agency.

Antony Best BSc (Hons) MIOA produced this report, and it was reviewed by Neil Morgan MSc MIOA. The site work was undertaken wholly by Antony Best.

Professional Qualifications for Antony Best

- BSc (Hons) in Acoustics from the University of Salford
- Corporate Member of the Institute of Acoustics

Professional Experience for Antony Best

- 2015 to Present — Inacoustic Ltd (Director)
- 2013 to 2015 — MLM Acoustics (Principal Acoustic Consultant)
- 2010 to 2013 — Eddie Jewell Acoustics (Director)
- 2008 to 2009 — Sandy Brown Associates LLP (Acoustic Technician)

Professional Qualifications for Neil Morgan

- MSc in Applied Acoustics from the University of Derby
- Institute of Acoustics Post Graduate Diploma in Acoustics and Noise Control, Institute of Acoustics, University of the West of England
- BSc (Hons) in Surveying for Resource Development from the University of Glamorgan
- Corporate Member of the Institute of Acoustics (MIOA)

Professional Experience for Neil Morgan

- 2017 to Present — Inacoustic Ltd (Director)
- 2013 to 2017 — MLM Acoustics (Technical Director)
- 2009 to 2013 — Innovate Acoustics (Associate Director)
- 2007 to 2009 — SLR Consulting (Senior Consultant)
- 2006 to 2007 — Grontmij (Senior Engineer)
- 1996 to 2006 — Capita Symonds (Various Positions)

7.3. Appendix C – Calibration Certificates

MEASUREMENT SYSTEMS

CERTIFICATE OF CONFORMANCE

Date of Issue	**20 January 2025**
Customer	**InAcoustics**
Certificate Number	**CONF012506**

	Manufacturer	**Type**	**Serial Number**
Sound Level Meter	Rion	NL-53	01041453
Preamplifier	Rion	NH-25	44408
Microphone	Rion	UC-59	26330

This is to certify that the instrument was tested and calibrated at the Manufacturer's factory according to their specification and that the product satisfied all the relevant requirements of the following Standards:

IEC 61672-1:2013 Class 1.

The instrument also received a functional check by ANV Measurement Systems prior to despatch in the UK, in accordance with our standard procedures.

Signed..... Position Date..... 20/01/2025

B. Bogdan Lead Calibration Technician

BEAUFORT COURT, 17 ROEBUCK WAY, MILTON KEYNES, MK5 8HL
☎ 01908 642846 🖹 01908 642814
✉ info@noise-and-vibration.co.uk 💻 www.noise-and-vibration.co.uk

CERTIFICATE OF CALIBRATION

0653

Date of Issue: 20 August 2024 **Certificate Number: UCRT24/2127**

Calibrated at & Certificate issued by:
ANV Measurement Systems
Beaufort Court
17 Roebuck Way
Milton Keynes MK5 8HL
Telephone 01908 642846 Fax 01908 642814
E-Mail: info@noise-and-vibration.co.uk
Web: www.noise-and-vibration.co.uk
Acoustics Noise and Vibration Ltd trading as ANV Measurement Systems

Approved Signatory

K. Mistry

Customer	Inacoustic Ltd Unit 4 The Dry Mount Wellington Mine Chacewater Truro Cornwall, TR4 8RJ			
Order No.	ST-Kit2TRU			
Description	Sound Level Meter / Pre-amp / Microphone / Associated Calibrator			
Identification	*Manufacturer*	*Instrument*	*Type*	*Serial No. / Version*
	NTi	Sound Level Meter	XL2-TA	A2A-14648-E0
	NTi	Firmware		4.84
	NTi	Pre Amplifier	MA220	7599
	NTi	Microphone	MC230A	A15871
	Brüel & Kjær	Calibrator	4231	C001
		Calibrator adaptor type if applicable		UC 0210
Performance Class	1			
Test Procedure	TP 10. SLM 61672-3:2013 *Procedures from IEC 61672-3:2013 were used to perform the periodic tests.*			
Type Approved to IEC 61672-1:2013	Yes *If YES above there is public evidence that the SLM has successfully completed the applicable pattern evaluation tests of IEC 61672-2:2013*			
Date Received	19 August 2024		ANV Job No.	UKAS24/08603
Date Calibrated	20 August 2024			

The sound level meter submitted for testing has successfully completed the periodic tests of IEC 61672-3:2013, for the environmental conditions under which the tests were performed. As evidence was publicly available, from an independent testing organisation responsible for approving the results of pattern-evaluation tests performed in accordance with IEC 61672-2:2013, to demonstrate that the model of sound level meter fully conformed to the class 1 specifications in IEC 61672-1:2013, the sound level meter submitted for testing conforms to the class 1 specifications of IEC 61672-1:2013.

Previous Certificate	*Dated*	*Certificate No.*	*Laboratory*
	10 August 2022	UCRT22/1991	0653

CERTIFICATE OF CALIBRATION

ISSUED BY: **CALIBRATION MAINTENANCE & REPAIR LTD**

DATE OF ISSUE: 28 October 2024 CERTIFICATE NUMBER: **1170247**

BS EN ISO 9001:2015 APPROVED BY **LRQA**

CERT No 10045223

11 Frensham Road
Norwich
Norfolk
NR3 2BT

Tel: +44 (0)1603 279557

Approved Signatory

Electronically Authorised Document

☐ P K CLARK ☐ J FRYER
☐ R J WADE ☐ M FOY
☐ M A FROST
☒ M S PARDOE

Customer	**INACOUSTIC**
Order No	**231024**
Equipment Description	**ACOUSTIC CALIBRATOR**
Manufacturer	**NORSONIC**
Model	**1251**
Serial No	**34676**
Ident No	**NOT KNOWN**
Calibrated By	**Ross Osborne**
Date Of Calibration	**28 October 2024**

INSTRUMENT CONDITION

Adjustments Made	**NO**
Repairs Made	**NO**

ENVIRONMENT

The instrument was placed in the laboratory environment for a minimum period of 4 hours and was operated prior to calibration.

Measurements were made in ambient conditions of 22 ºC ± 3 ºC and 45 %RH ± 15 %RH.

PROCEDURE

Measurements were performed in accordance with the in house laboratory procedure 1095
All equipment used has been calibrated/verified against measurement standards or reference equipment traceable to International or National Measurement Standards as specified in our control procedure WI64
The results attached to this certificate refer to measurements made at the time of test and not to the instrument's ability to maintain calibration.
The attached results are a true record of the levels required to confirm the instrument meets the original stated manufacturer's specification and accuracy where shown.

CERTIFICATE OF CALIBRATION

ISSUED BY: **CALIBRATION MAINTENANCE & REPAIR LTD**

DATE OF ISSUE: 15 July 2024 CERTIFICATE NUMBER: **1165092**

BS EN ISO 9001:2015 APPROVED BY **LRQA**

CERT No 10045223

11 Frensham Road
Norwich
Norfolk
NR3 2BT

Tel: +44 (0)1603 279557

Approved Signatory

Electronically Authorised Document

- ☐ P K CLARK
- ☐ J FRYER
- ☐ R J WADE
- ☐ M FOY
- ☐ M A FROST
- ☒ M S PARDOE

Customer	**INACOUSTIC**
Order No	**AB-TRU-SLM24**
Equipment Description	**SOUND LEVEL METER**
Manufacturer	**RION CO LTD**
Model	**NL-52**
Serial No	**00453871**
Ident No	**NL52 (3)**
Calibrated By	**Ross Osborne**
Date Of Calibration	**15 July 2024**

INSTRUMENT CONDITION

Adjustments Made	**NO**
Repairs Made	**NO**

ENVIRONMENT

The instrument was placed in the laboratory environment for a minimum period of 4 hours and was operated prior to calibration.

Measurements were made in ambient conditions of 22 ºC ± 3 ºC and 45 %RH ± 15 %RH.

PROCEDURE

Measurements were performed in accordance with the in house laboratory procedure 4642
All equipment used has been calibrated/verified against measurement standards or reference equipment traceable to International or National Measurement Standards as specified in our control procedure WI64
The results attached to this certificate refer to measurements made at the time of test and not to the instrument's ability to maintain calibration.
The attached results are a true record of the levels required to confirm the instrument meets the original stated manufacturer's specification and accuracy where shown.

CERTIFICATE OF CALIBRATION

ISSUED BY: **CALIBRATION MAINTENANCE & REPAIR LTD**

DATE OF ISSUE: 13 January 2025 CERTIFICATE NUMBER: **1174056**

BS EN ISO 9001:2015 APPROVED BY **LRQA**

CERT No 10045223

11 Frensham Road
Norwich
Norfolk
NR3 2BT

Tel: +44 (0)1603 279557

Approved Signatory

Electronically Authorised Document

- ☐ P K CLARK
- ☐ J FRYER
- ☐ R J WADE
- ☐ M FOY
- ☐ M A FROST
- ☒ M S PARDOE

Customer	**INACOUSTIC (BS8)**
Order No	**250103**
Equipment Description	**INTEGRATING SOUND LEVEL METER**
Manufacturer	**BRUEL & KJAER**
Model	**2238 MEDIATOR**
Serial No	**2756961**
Ident No	**NOT KNOWN**
Calibrated By	**Ross Osborne**
Date Of Calibration	**10 January 2025**

INSTRUMENT CONDITION

Adjustments Made	**YES**
Repairs Made	**NO**

ENVIRONMENT

The instrument was placed in the laboratory environment for a minimum period of 4 hours and was operated prior to calibration.

Measurements were made in ambient conditions of 22 ºC ± 3 ºC and 45 %RH ± 15 %RH.

PROCEDURE

Measurements were performed in accordance with the in house laboratory procedure 0223
All equipment used has been calibrated/verified against measurement standards or reference equipment traceable to International or National Measurement Standards as specified in our control procedure WI64
The results attached to this certificate refer to measurements made at the time of test and not to the instrument's ability to maintain calibration.
The attached results are a true record of the levels required to confirm the instrument meets the original stated manufacturer's specification and accuracy where shown.

CERTIFICATE OF CALIBRATION

ISSUED BY: **CALIBRATION MAINTENANCE & REPAIR LTD**

DATE OF ISSUE: 30 October 2025 CERTIFICATE NUMBER: **1189718**

BS EN ISO 9001:2015 APPROVED BY **LRQA**

CERT No 10045223

11 Frensham Road
Norwich
Norfolk
NR3 2BT

Tel: +44 (0)1603 279557

Approved Signatory

Electronically Authorised Document

- ☐ P K CLARK
- ☐ R J WADE
- ☐ M A FROST
- ☒ M S PARDOE
- ☐ R LOMAX
- ☐ J FRYER
- ☐ M FOY

Customer	**INACOUSTIC (TR14 9JS)**
Order No	**25-CALTRU-5**
Equipment Description	**INTEGRATING SOUND LEVEL METER**
Manufacturer	**BRUEL & KJAER**
Model	**2238 MEDIATOR**
Serial No	**2163634**
Ident No	**NESC07**
Calibrated By	**Matthew Frost**
Date Of Calibration	**28 October 2025**

INSTRUMENT CONDITION

Adjustments Made	**YES**
Repairs Made	**NO**

ENVIRONMENT

The instrument was placed in the laboratory environment for a minimum period of 4 hours and was operated prior to calibration.

Measurements were made in ambient conditions of 22 ºC ± 3 ºC and 45 %RH ± 15 %RH.

PROCEDURE

Measurements were performed in accordance with the in house laboratory procedure 0223
All equipment used has been calibrated/verified against measurement standards or reference equipment traceable to International or National Measurement Standards as specified in our control procedure WI64
The results attached to this certificate refer to measurements made at the time of test and not to the instrument's ability to maintain calibration.
The attached results are a true record of the levels required to confirm the instrument meets the original stated manufacturer's specification and accuracy where shown.

CERTIFICATE OF CALIBRATION

ISSUED BY: **CALIBRATION MAINTENANCE & REPAIR LTD**

DATE OF ISSUE: 30 October 2025 CERTIFICATE NUMBER: **1189716**

BS EN ISO 9001:2015 APPROVED BY **LRQA**

CERT No 10045223

11 Frensham Road
Norwich
Norfolk
NR3 2BT

Tel: +44 (0)1603 279557

Approved Signatory

Electronically Authorised Document

☐ P K CLARK	☐ R LOMAX
☐ R J WADE	☐ J FRYER
☐ M A FROST	☐ M FOY
☒ M S PARDOE	

Customer	**INACOUSTIC (TR14 9JS)**
Order No	**25-CALTRU-5**
Equipment Description	**ACOUSTIC CALIBRATOR**
Manufacturer	**NORSONIC**
Model	**1251**
Serial No	**34676**
Ident No	**NOT KNOWN**
Calibrated By	**Matthew Frost**
Date Of Calibration	**30 October 2025**

INSTRUMENT CONDITION

Adjustments Made	**NO**
Repairs Made	**YES**

ENVIRONMENT

The instrument was placed in the laboratory environment for a minimum period of 4 hours and was operated prior to calibration.

Measurements were made in ambient conditions of 22 ºC ± 3 ºC and 45 %RH ± 15 %RH.

PROCEDURE

Measurements were performed in accordance with the in house laboratory procedure 1095
All equipment used has been calibrated/verified against measurement standards or reference equipment traceable to International or National Measurement Standards as specified in our control procedure WI64
The results attached to this certificate refer to measurements made at the time of test and not to the instrument's ability to maintain calibration.
The attached results are a true record of the levels required to confirm the instrument meets the original stated manufacturer's specification and accuracy where shown.

inacoustic | **truro**
Unit 4, The Dry, Mount Wellington Mine, Chacewater, Truro, Cornwall, TR4 8RJ
01872 672400 | www.inacoustic.co.uk | truro@inacoustic.co.uk