Noise Assessment – Environmental Permit Application

Proposed Asphalt Recycling Operations at Coxhoe Asphalt Plant, County Durham

TARMAC TRADING LIMITED

R25.12444/1/AP
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REPORT DETAILS

Client	Tarmac Trading Limited
Report Title	Noise Assessment – Environmental Permit Application Proposed Waste Recycling Operations
Site Address	Coxhoe Asphalt Plant, Bradyll Street, Raisby Hill, Durham DH6 4BB
Report Ref.	R25.12444/1/AP
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QUALITY ASSURANCE

Issue No.	Issue Date	Author	Technical Review
1	07/04/25		
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COMPETENCY AND EXPERTISE

The Company

Vibrock Ltd is an established independent environmental consultancy who has been providing noise, dust and vibration consultancy services to industry since 1991. Vibrock Ltd is a member of the Association of Noise Consultants (ANC) and its Consultants are Associate or Corporate Members of the Institute of Acoustics (IOA).

Consultants

Andrew Pickford *BSc, MSc, PgDip, MIOA* has undertaken responsible work in noise impact assessment and acoustics since 2006. Andrew specialises in the measurement and assessment of environmental noise for a wide range of applications within the industrial, commercial, residential, waste disposal and mineral extraction sectors. In addition to a diploma in Acoustics and Noise Control, Andrew holds the IOA Certificate of Competency in Environmental Noise Measurement, an MSc in Environmental Management and is a Member of the Institute of Acoustics.

Russell Smith *BSc (Hons), MSc, MIOA, GradIEMA* has undertaken responsible work in occupational noise, indoor air quality personal assessment, and environmental noise and air quality assessment since 2013. This includes a wide range of application within the industrial, waste management, and mineral extractive sectors. Mr Smith graduated with first class honours of an Institute of Engineering and Technology accredited undergraduate degree programme, and completed an Institute of Environmental Management and Assessment accredited Master's degree. In addition to these academic achievements and experience, Mr Smith holds memberships to the Institute of Acoustics and the Institute of Environmental Management and Assessment.

NON-TECHNICAL SUMMARY

1. Tarmac Trading Limited (Tarmac) are seeking a new bespoke Environmental Permit for asphalt recycling operations at Coxhoe Asphalt Plant site in County Durham. Vibrock Ltd are commissioned to undertake a noise impact assessment of the proposals.

2. As part of the assessment, background noise levels have been measured at locations chosen to represent noise-sensitive premises in the vicinity of the application site. This information has been used to characterise the existing acoustic environment.

3. Predicted noise levels from the site have been calculated at nearby noise-sensitive premises and the proposals has been assessed with reference to BS 4142 '*Methods for rating and assessing industrial and commercial so*und' in line with Environment Agency stipulations.

4. The outcome of the assessment demonstrates that the proposed permit operations are not likely to result in adverse impacts in accordance with BS 4142. It is therefore considered that there will be no significant or unacceptable adverse impacts at noise-sensitive premises in the vicinity of the site.

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1.0 INTRODUCTION

1.1 Vibrock Limited are commissioned to undertake a noise impact assessment in relation to an Environmental Permit application for asphalt recycling operations at the existing Tarmac Coxhoe Asphalt Plant site in County Durham.

1.2 The Site currently holds a Part B permit ref DCC/P221/12 that allows up to 50,000 tonnes of road plannings over any 3-year period with a DAA. Based on current levels of production, the site will exceed this limit to 80,000 tonnes over the 3-year period and as such an application for a bespoke environmental permit from the Environment Agency is being prepared.

1.3 To support this application, an assessment of the potential noise impact of the proposals at identified noise-sensitive premises in the vicinity of the site has been made with reference to the guidance presented within BS 4142 as required by the Environment Agency.

1.4 The permit relates to receipt, processing and storage of road planings and returned asphalt. Material imported to the site would be subjected to a limited series of treatment activities involving breaking, crushing and screening. Crushing will be undertaken at the site on a campaign basis, each campaign taking place over a period of approximately 1 week, when a sufficient quantity of material (circa. 3000 tonnes) is present. The processed material will be stored in stockpiles within a covered shed prior to being utilised within asphalt production.

1.5 Whilst the wider asphalt plant is a 24 hour operation typically taking place during the hours of 0600 – 1600 and 1900 – 0300, it is understood that RAP processing would only take place during the daytime. There is however potential for night-time impacts during periods when RAP is being delivered to the site. RAP deliveries are not particularly routine and take place as required with rarely more than 10 deliveries per night when planings and returned asphalt is available to the site.

1.6 The application site location and layout are shown in Figures 1 and 2. Explanation of the terminology used within this report is provided in Appendix 1.

2.0 GUIDANCE

2.1 Environment Agency Guidance: Noise and vibration management: environmental permits

2.1.1 Operators (or permit applicants) must consider the potential noise impact of their site. They may need to carry out noise impact assessments:

- at the permit application stage
- when applying to vary a permit
- to comply with specific permit conditions

2.1.2 Where noise is possibly causing an impact, the operator must carry out an assessment to determine:

- the level of impact
- how much work needs to be done to prevent or minimise noise pollution

2.1.3 For assessment purposes, '*BS 4142: Methods for rating and assessing industrial and commercial sound*' must be used to quantify the level of environmental noise impact from industrial processes.

2.1.4 Noise impact assessments should be carried out to an appropriate standard and by competent personnel, for example, holders of either an Institute of Acoustics:

- Diploma in Acoustics and Noise Control
- Certificate of Competence in Environmental Noise Measurement, with relevant experience

2.1.5 Operators must prevent significant pollution and also comply with the requirements to use 'appropriate measures' (Waste Framework Directive 2018/851) or 'best available techniques' (BAT) to prevent or minimise noise pollution.

2.1.6 For any particular case, the environment agencies have to decide whether or not you are causing (or are likely to cause) unacceptable noise pollution, even if appropriate measures are used. It is the responsibility of the operator to avoid significant pollution and to demonstrate the use of BAT or appropriate measures to prevent, or where that is not practicable, to minimise noise impact.

2.2 BS 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound

2.2.1 This British Standard was amended in June 2019. BS 4142:2014+A1:2019 supersedes BS 4142:2014, which is withdrawn.

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

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

2.2.3 The methods described in this British Standard use outdoor sound levels to assess the likely effects of sound on people who might be inside or outside a dwelling or premises used for residential purposes upon which sound is incident.

2.2.4 This standard is intended to be used for the purposes of:

a) investigating complaints;
b) assessing sound from existing, proposed, new, modified or additional source(s) of sound of an industrial and/or commercial nature; and
c) assessing sound at proposed new dwellings or premises used for residential purposes.

2.2.5 This standard is not intended to be applied for the following purposes:

- The determination of noise amounting to a nuisance;
- The assessment of indoor sound levels;
- The assessment of low-frequency noise;
- The assessment of sound from the passage of vehicles on public roads and railway systems;
- The assessment of sound from recreational activities, including all forms of motorsport;

- music and other entertainment;
- shooting grounds;
- construction and demolition;
- domestic animals;
- people;
- public address systems for speech;
- The assessment of sound from other sources falling within the scopes of other standards or guidance.

2.2.6 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. When making assessments and arriving at decisions it is essential to place the sound in context.

2.2.7 The sound level from a source when determined as a discrete entity, distinct and free of other influences contributing to the ambient sound, is referred to as the 'specific sound level'. The specific sound level is evaluated, at an identified assessment location, over the appropriate reference time interval which is as follows:

- 1 hour during the daytime (07:00 – 23:00); and
- 15 minutes during the night-time (23:00 – 07:00).

NB. The shorter reference time interval at night means that short duration sounds with an on time of less than 1 hour can lead to a greater specific sound level when determined over the reference time interval during the night than when determined during the day.

2.2.8 The specific noise may be subject to an acoustic character correction if the noise level at the assessment location is subjectively considered to exhibit certain acoustic features that could 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.

2.2.9 This standard requires the assessor to consider the subjective prominence of the character of the specific sound at the noise-sensitive locations and the extent to which such acoustically distinguishing characteristics will attract attention. Such features are taken into account by applying the following corrections to the specific sound level to obtain the rating level as summarised in Table 1.

Table 1: Summary of BS 4142 Acoustic Feature Corrections

Subjective Prominence	Tonality	Impulsivity	Intermittency	Other Sound Characteristic (neither tonal, nor impulsive, nor intermittent)
Just Perceptible	+2 dB	+3 dB	-	-
Clearly Perceptible	+4 dB	+6 dB	-	-
Highly Perceptible	+6 dB	+9 dB	-	-
Readily Distinctive Against Residual Environment	-	-	3 dB	3 dB

2.2.10 If characteristics likely to affect perception and response are present in the specific sound, within the same reference period, then the applicable corrections ought normally to be added arithmetically. However, if any single feature is dominant to the exclusion of the others then it might be appropriate to apply a reduced or even zero correction for the minor characteristics. The rating level is equal to the specific sound level if there are no such features present or expected to be present.

2.2.11 An initial estimate of the impact of the specific sound is obtained by subtracting the measured background sound level from the rating level, and consider the following.

a) Typically, the greater this difference, the greater the magnitude of the impact.

b) A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.

c) A difference of around +5 dB or more is likely to be an indication of an adverse impact, depending on the context.

d) The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.

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

1) The absolute level of sound.

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

3) The sensitivity of the receptor and whether dwellings or other premises used for residential purposes will already incorporate design measures that secure good internal and/or outdoor acoustic conditions.

i) façade insulation treatment;

ii) ventilation and/or cooling that will reduce the need to have windows open so as to provide rapid or purge ventilation; and

iii) acoustic screening.

2.2.13 Response to sound can be subjective and is affected by many factors both acoustic and non-acoustic. The significance of its impact, for example, can depend on such factors as the margin by which a sound exceeds the background sound level, its absolute level, time of day and change in the acoustic environment, as well as local attitudes to the source of the sound and the character of the neighbourhood. This edition of the standard recognises the importance of the context in which a sound occurs.

2.3 Other Relevant Guidance

BS 8233:2014 Guidance on sound insulation and noise reduction for buildings

2.3.1 This Standard provides guidance for the control of noise in and around buildings and is applicable to the design of new buildings, or refurbished buildings undergoing a change of use, but does not provide guidance on assessing the effects of changes in the external noise levels to occupants of an existing building.

2.3.2 For dwellings, the main considerations are:

a) for bedrooms, the acoustic effect on sleep; and
b) for other rooms, the acoustic effect on resting, listening and communicating.

2.3.3 It is desirable that the internal ambient noise level does not exceed the guideline values detailed in Table 2 below.

Table 2: Indoor ambient noise levels for dwellings (From Table 4 of BS 8233)

Activity	Location	07:00 – 23:00	23:00 – 07:00
Resting	Living room	35 dB $L_{Aeq,16hour}$	-
Dining	Dining room/area	40 dB $L_{Aeq,16hour}$	-
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq,16hour}$	30 dB $L_{Aeq,8hour}$

2.3.4 For traditional external areas that are used for amenity space, such as gardens, it is desirable that the external noise level does not exceed 50 dB $L_{Aeq,T}$, with an upper guideline value of 55 dB $L_{Aeq,T}$.

World Health Organisation (WHO)

2.3.5 The World Health Organisation '*Guidelines for Community Noise*' 1999 aims to provide environmental health authorities and professionals with guidance on the adverse health effects of community noise on people.

2.3.6 This document presents a summary of research and opinions on the impacts of noise and recommends guideline values for avoidance of particular effects e.g. annoyance and sleep disturbance. It is the primary reference point for other guidance value based documents, such as BS 8233.

2.3.7 The following guideline values have been derived according to specific environments. The values relevant to residential development are shown in Table 3 below.

Table 3: Guideline values for community noise in specific environments. (From Table 4.1 of WHO Guidelines)

Specific Environment	Critical Health Effect(s)	L_{Aeq} (dB)	Time base (hrs)	$L_{Amax,f}$ (dB)
Outdoor living area	Serious annoyance, daytime and evening	55	16	-
	Moderate annoyance, daytime and evening	50	16	-
Dwelling, indoors	Speech intelligibility and moderate annoyance, daytime and evening	35	16	
Inside bedrooms	Sleep disturbance, night-time	30	8	45

3.0 BACKGROUND NOISE SURVEY

3.1 Survey Methodology

3.1.1 Sound levels were measured over a 5 day period from 13 – 18 March 2025 at locations selected to represent the closest noise-sensitive premises to the application site. A monitoring and receptor location plan is provided in Figure 3.1 with associated grid references provided in Figure 3.2.

3.1.2 Measurements were undertaken with reference to the guidance presented within BS 7445 and BS 4142.

3.2 Instrumentation

3.2.1 Monitoring was undertaken using the equipment detailed in Table 4.

Table 4: Noise Monitoring Equipment

Ref.	Manufacturer	Type	Serial No.	Date of last calibration
L1	Cirrus	Class 1 Integrating Sound Level Meter CR:800	D20518FD	21/02/24
L2	Cirrus	Class 1 Integrating Sound Level Meter CR:800	D20222FD	03/10/23
n/a	Cirrus	Acoustic Calibrator CR:515	78060	20/08/24

3.2.2 During all measurements the microphones were protected with outdoor windshields and mounted on tripods. The monitoring positions were 'free field' (no vertical reflective surfaces within 3.5 metres of the microphone) and at a height of between 1.2 – 1.5 metres above ground level.

3.2.3 The following set-up parameters were used:

- Time Weighting: Fast
- Frequency Weighting: A
- Averaging-Integrating Period: 15 min
- Data Logging: Repeat (contiguous)
- Resolution: 1 second

3.2.4 With the equipment set up in the configuration used during measurement, field calibration checks were performed on site immediately before and after the survey period using a sound calibrator. No significant drift (i.e. no greater than ±0.5 dB) in the calibration value of 93.7 dB was observed between the initial and final checks. Further details are provided in Table 5.

Table 5: Field Calibration Check Details

Location	Serial No.	Calibration Level	Offset
L1	D20518FD	93.7	-0.38
L2	D20222FD	93.7	-0.47

3.3 Observations

3.3.1 The acoustic environment in the vicinity of the site predominantly comprises noise from road traffic along the A177 and other local routes in addition to the more distant A1(M) which is approximately 650m to the south-west of the site entrance. Operations at the existing Tarmac Coxhoe Asphalt Plant site along with those at Raisby Quarry (operated by Breedon) also contribute to the ambient noise levels in the vicinity at times during their respective permitted operating hours. The quarry is immediately adjacent to the asphalt plant and both sites share a common access road from the A177. Occasional aircraft and birdsong were also noted during the survey.

3.3.2 Weather conditions during the survey were measured using a portable Davis Vantage Vue Precision Weather Station located near to the Asphalt Plant Site Office. The data obtained is shown in Figure 4. Conditions were mostly dry and settled with average wind speeds of approximately 1 – 2 ms^{-1}. There were occasional periods of light rain but nothing too heavy or prolonged. Relative humidity varied between 70 – 90% and temperatures ranged from 0 – 10°C.

3.3.3 The weather during the survey was considered suitable for environmental noise monitoring and it is not considered necessary to exclude any of the measured background noise level data due to potential interference from the prevailing meteorological conditions.

3.4 Results

3.4.1 The measurement data collected during the survey is presented in Appendix 2 and summarised in Table 6.

3.4.2 Statistical analysis in line with the example approach presented in Section 8 (Fig. 4) of BS 4142 was also performed to provide further information on the background sound level at each assessment location. This analysis is presented in Figure 5 and shown in Table 6 as the modal value of the background sound.

Table 6: Summary of Measured Sound Levels

Ref	Location	Time Period (T)	Ambient Sound Level Average $L_{Aeq,T}$ dB	Background Sound Level Average $L_{A90,T}$ dB	
				Mean	Mode
L1	Rose Cottage / The Bridge House / 16 Station Rd East	Daytime	59.2	48.5	50
		Night-time	55.5	43.0	43
L2	East House Farm / Sharon Ave. / Bradyll Street (Kelloe) / Bradsway Cottage	Daytime	50.2	44.0	44
		Night-time	45.3	40.1	40

3.4.3 After reviewing the noise data collected during the survey, the background sound levels, for the purposes of this assessment, are considered to be as follows.

Table 7: Representative Background Sound Levels

Noise-Sensitive Premises	Representative Background Sound Level $L_{A90,T}$ (free-field) dB	
	Daytime	Night-time
Rose Cottage / The Bridge House	49	43
16 Station Rd East	49	43
East House Farm	44	40
Sharon Avenue	44	40
Bradyll Street, Kelloe	44	40
Bradsway Cottage	44	40

4.0 POTENTIAL NOISE EMISSIONS

4.1 Introduction

4.1.1 The level of noise in the local environs that arises from a site will depend on a number of factors. The more significant of which are:

(a) the sound level output of the plant or equipment used on site;
(b) the periods of operation of the plant on site;
(c) the distance between the source noise and the receiving position;
(d) the presence of screening due to barriers;
(e) the reflection of sound;
(f) soft ground attenuation.

4.1.2 Noise levels from site operations have been calculated at the identified assessment locations based on the following methodologies and assumptions.

4.2 Calculation Methodology

4.2.1 In order to assist in the calculation of predicted noise levels from the site, CadnaA noise modelling software has been used. The noise prediction software has been configured to undertake the noise calculations in accordance with ISO 9613 '*Acoustics - Attenuation of sound during propagation outdoors*'. Noise model configuration details are outlined in Table 8 below.

Table 8: Noise Model Configuration Details

Parameter	Input
Software	DataKustik GmbH CadnaA v.2025 (build: 209.5501)
Calculation Standards/Guidelines	ISO 9613-2:2024
Model of Terrain	Triangulation
Max. Order of Reflection	2
Ground Attenuation	Spectral
Frequency Band Calculation	Octave Bands (63Hz – 8kHz)
Temperature / Relative Humidity	10°C / 70%
Topographic data	3D contour data – 1.0m DTM EA LiDAR
Ground Absorption	Default 0.90 (Res 1.0m), Site 0.25
Receiver Heights	1.5m above ground level (Day) / 4.0m (Night)

4.2.2 Within the model, HGVs and mobile plant movements have been modelled as line sources. Point sources have been used to represent stationary or quasi-stationary activities such as fixed plant and activities undertaken in a defined area such as the unloading/loading of materials.

4.2.3 For all noise prediction calculations, the ground absorption coefficient has been estimated according to the combination of soft and hard ground conditions present between the source and receiver position. 'Soft' ground is taken to refer to surfaces which are absorbent to sound, e.g. grassland, cultivated land or plantations as opposed to 'hard' ground surfaces which reflect sound such as paving, asphalt and surface water.

4.2.4 The modelling software predictions assume conditions favouring sound propagation from source to receiver. The ISO 9613 calculation methodology assumes wind direction with $\pm 45^0$ 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.

4.2.5 The predictions made by the modelling software are for 'free-field' sound levels to allow for an appropriate comparison with the free-field background sound levels measured during the survey.

4.2.6 The convention applied within BS 4142, and this report, is that all measured or calculated numbers are rounded to the nearest whole number with 0.5 being rounded up.

4.3 Noise Source Details

4.3.1 Information regarding potential operations at the site has been based on discussions with the applicant and proposed permit application plans.

4.3.2 A list of noise generating plant and activities, from which the noise predictions have been made, is presented in Appendix 3 along with a number of assumptions regarding typical operating times and vehicle movements.

4.3.3 The sound levels used within this assessment are based on recent observations and sound pressure level measurements at the existing site. Where necessary these have been supplemented by noise emission data from similar asphalt plant sites across the UK.

4.4 Calculation Results

4.4.1 Table 9 summarise the results of the noise level predictions at the identified assessment locations.

Table 9: Calculation Results

Assessment Location	Calculated Specific Sound Level $L_{Aeq,Tr}$ (free-field) dB			
	Proposed RAP Recycling Operations		Total Site Operations	
	Daytime	Night-time	Daytime	Night-time
16 Station Rd East	36.2	35.6	42.3	38.6
Rose Cottage / The Bridge House	33.5	30.4	39.3	33.4
East House Farm	32.2	21.3	39.9	24.0
Sharon Avenue	31.2	17.6	39.7	20.3
Bradyll Street, Kelloe	36.9	21.0	41.1	23.4
Bradsway Cottage	31.0	27.9	37.3	30.9

5.0 ASSESSMENT

5.1 This assessment has been undertaken with reference to the guidance provided within BS 4142.

5.2 This standard requires the following levels to be established:

- The Background Sound Level
- The Specific Sound Level
- The Rating Level

Background Sound Level

5.3 BS 4142 requires the quantification of typical background sound levels at locations representing the noise-sensitive receptors. The results of the survey are presented in Section 3 of this report.

Specific Sound Level

5.4 The specific sound level has been determined by calculation following the guidance within Section 7 of BS 4142. The method of calculation is explained in Section 4 of this report.

Rating Level

5.5 In determining the Rating Level it is recognised that certain acoustic features can increase the significance of noise impact over that expected from a basic comparison between the specific sound level and the background sound level.

5.6 Noise emissions associated with operations at the site are not considered to contain any significant tonal or intermittent features that would be readily distinguishable, however, it is considered that the sound from activities associated with the operation of the existing asphalt plant at night could contain slight impulsive features associated with the pneumatic systems at the loadout point.

5.7 In terms of the proposed permit operations, it is considered that the operation of the excavator with hydraulic breaker attachment (used to break up the RAP material into smaller pieces that can be fed into the mobile processing plant) could attract a correction for intermittency due to the nature of the sound source. This sound could also be considered to be impulsive but when the characteristics of the sound are considered at the assessment locations, it is the intermittency of the noise from the activities that dominates and could more readily attract attention over other acoustic features during the daytime.

5.8 In accordance with BS 4142 it is considered appropriate to apply corrections of +3 dB for 'intermittency' during the daytime (RAP) and +3 dB for 'just perceptible impulsivity' (Asphalt) at night to the calculated specific sound levels to account for the presence of these characteristics.

Initial Estimate of Impact

5.9 Table 10 presents an 'initial estimate' of the potential impact of the proposals in accordance with BS 4142.

Table 10: Initial Estimate of Impact (BS 4142) – Proposed RAP Recycling Operations

Assessment Location	Background Sound Level $L_{A90,T}$ dB		Specific Sound Level $L_{Aeq,Tr}$ dB	Acoustic Feature Correction dB	Rating Level $L_{Ar,Tr}$ dB	Initial Estimate Excess of rating over background sound level (dB)
Rose Cottage / The Bridge House	Day	49	36	+3	39	**-10**
	Night	43	36	0	36	**-7**
16 Station Rd East	Day	49	34	+3	37	**-12**
	Night	43	30	0	30	**-13**
East House Farm	Day	44	32	+3	35	**-9**
	Night	40	21	0	21	**-19**
Sharon Avenue	Day	44	31	+3	34	**-10**
	Night	40	18	0	18	**-22**
Bradyll Street, Kelloe	Day	44	37	+3	40	**-4**
	Night	40	21	0	21	**-19**
Bradsway Cottage	Day	44	31	+3	34	**-10**
	Night	40	28	0	28	**-12**

5.10 The above assessment is supplemented by Table 11 which consider the other non-waste related site activities and the potential cumulative noise impacts of these existing operations that will continue during the proposed asphalt recycling operations the subject of the Environmental Permit application.

Table 11: Initial Estimate of Impact (BS 4142) – Existing Asphalt Operations + Proposed RAP Recycling Operations

Assessment Location	Background Sound Level $L_{A90,T}$ dB		Specific Sound Level $L_{Aeq,Tr}$ dB	Acoustic Feature Correction dB	Rating Level $L_{Ar,Tr}$ dB	Initial Estimate Excess of rating over background sound level (dB)
16 Station Road East	Day	49	42	0	42	**-7**
	Night	43	39	+3	42	**-1**
Rose Cottage / The Bridge House	Day	49	39	0	39	**-10**
	Night	43	33	+3	36	**-7**
East House Farm	Day	44	40	0	40	**-4**
	Night	40	24	+3	27	**-13**
Sharon Avenue	Day	44	40	0	40	**-4**
	Night	40	20	+3	23	**-17**
Bradyll Street, Kelloe	Day	44	41	0	41	**-3**
	Night	40	23	+3	26	**-14**
Bradsway Cottage	Day	44	37	0	37	**-7**
	Night	40	31	+3	34	**-6**

5.11 Typically, the greater the difference between the rating level and the background sound level, the greater the magnitude of the impact.

5.12 BS 4142 states that where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact. A difference of around +5 dB is likely to be an indication of an adverse impact. A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.

5.13 The initial estimates presented in Tables 10 and 11 provide an indication that the proposed asphalt recycling activities are likely to have a low impact in accordance with BS 4142.

5.14 It should be noted that the initial estimates are not to be considered in isolation and due regard to the following sections on context and uncertainty should also be made.

Context

5.15 In addition to the initial estimate of noise impact which has determined the excess of rating level over background sound level, the following should also be considered as part of the impact assessment process:

- *Operational Period* – The noise sources under assessment, i.e. the operations associated with asphalt recycling, would primarily take place during the daytime when there is a lower likelihood of adverse impact compared to operations which take place during more sensitive periods such as the evening and night-time.

- *Character of the Sound* – As part of the assessment the potential character of the sound has been assessed and an acoustic feature correction applied accordingly in accordance with BS 4142. The existing acoustic environment around the site is influenced predominantly by road traffic but also comprises a range of other industrial and commercial sound sources. Overall, the character of the sound from the proposed recycling operations is not considered incongruous with the residual acoustic environment and it is not expected that the waste activities will exacerbate the prominence of any acoustic features or introduce any new acoustic features at the site.

- *Absolute Level of Sound* – In some circumstances, absolute noise levels can be as, or more, relevant than the margin by which the rating level exceeds the background. With reference to the guide values recommended by BS 8233 and WHO, worst-case external noise levels from the site are such that noise emissions from the site are considered likely to have a low impact on residents using private external amenity areas during the daytime and bedrooms during the night-time.

- *Comparison to the Residual Sound* – Noise emissions from the site are expected to be lower than the residual sound levels at the nearest noise-sensitive premises to the site which are in the region of 50 – 60 dB during the daytime and 45 – 55 dB during the night-time.

- *Setting* – The activities associated with the Permit application already take place at the site with the permit application seeking an increase in the amount of recycled asphalt.

Uncertainty

5.16 Uncertainty can occur throughout all aspects of the noise measurement and assessment process, the approach undertaken at all stages has been adopted with the aim of reducing uncertainty via the implementation of good practice. During this process reference has been made to BS 4142 Annex B '*Consideration of uncertainty and good practice for reducing uncertainty*'.

5.17 The following list details the key steps taken to reduce uncertainty:

- Background sound level measurements were made in close proximity to the assessment locations and over a long duration to ensure that the acoustic environment was accurately characterised;
- Measurement procedures were in accordance with Section 6 of BS 4142 including precautions against interference such as unsuitable weather conditions;
- Monitoring carried out by experienced and qualified acousticians holding full membership of the Institute of Acoustics (MIOA);
- Site noise levels were determined by calculation with reference to Section 7 of BS 4142 and utilising the methodology outlined within ISO 9613 which is a widely accepted standard for the calculation of outdoor sound propagation;
- Operations during the sample measurements at the existing site were considered to be representative of typical operating conditions and the measurement durations were considered to be representative of any longer term fluctuations in the specific sound. The influence of sound from other sources was minimised by measuring at times when the residual sound had subsided to a relatively low level;
- The instrumentation used was in accordance with Section 5 of BS 4142. Use of digital transfer methods and equipment whose conformity and calibration have been checked periodically.

6.0 SUMMARY

6.1 An assessment of potential noise impact associated with the permit application has been made following the guidance presented within BS 4142 and the specific supplementary guidance set out by the Environment Agency.

6.2 Following an initial estimate of noise impact, along with consideration of the context and any potential effects of uncertainty, the proposed waste recycling operations are likely to have a low impact. It is therefore considered that there will be no significant or unacceptable adverse impacts at existing noise-sensitive premises in the vicinity of the site.

7.0 REFERENCES

1. ANC Guidelines: *Environmental Sound Measurement Guide*. ANC. May 2021.

2. BS 4142:2014+A1:2019 *Methods for rating and assessing industrial and commercial sound*, British Standards Institution 2019.

3. BS 7445-1:2003 *Description and measurement of environmental noise – Part 1 Guide to quantities and procedures*. British Standards Institution 2003.

4. *Guidance: Method implementation document (MID) for BS 4142.* Environment Agency. December 2023.

5. *Guidance: Noise impact assessments involving calculations or modelling. Environment Agency.* August 2022.

6. *Guidance: Noise and vibration management: environmental permits*. Environment Agency. January 2022.

7. *Guidance: Risk assessments for your environmental permit.* Environment Agency and Department for Environment, Food and Rural Affairs. January 2025.

8. *Guidelines for Environmental Noise Impact Assessment*, v1.2. Institute of Environmental Management & Assessment. November 2014.

9. ISO 9613-2:2024 *Acoustics - Attenuation of sound during propagation outdoors - Part 2: Engineering method for the prediction of sound pressure levels outdoors.* Edition 2, 2024.

FIGURE 1

Application Site

FIGURE 2

Site Layout

FIGURE 3.1

Monitoring and Receptor Location Plan

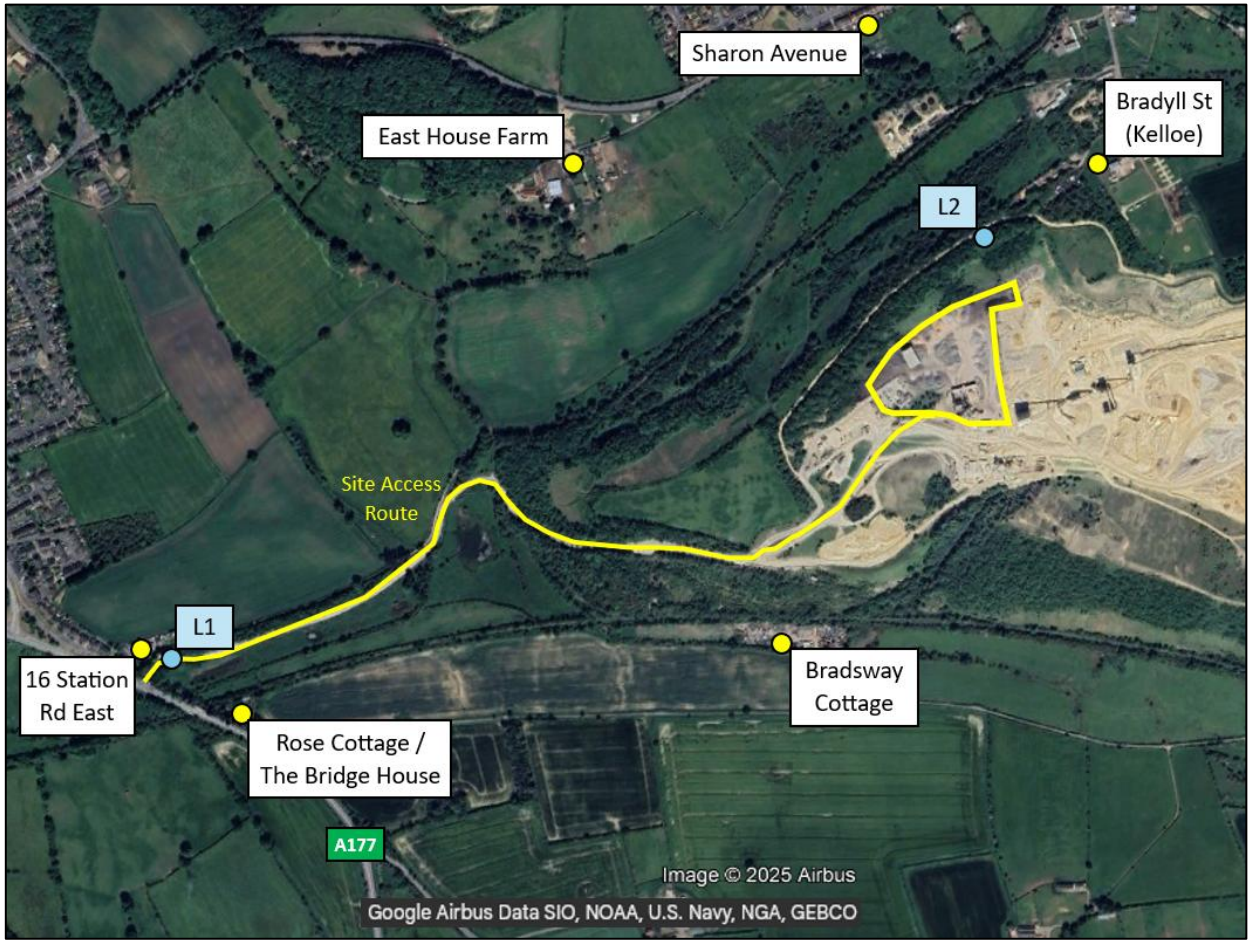


FIGURE 3.2

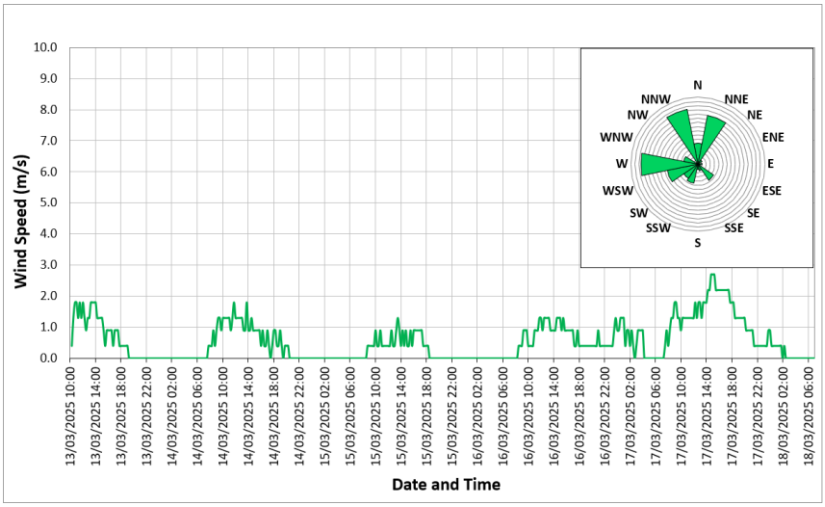
Monitoring and Receptor Grid References

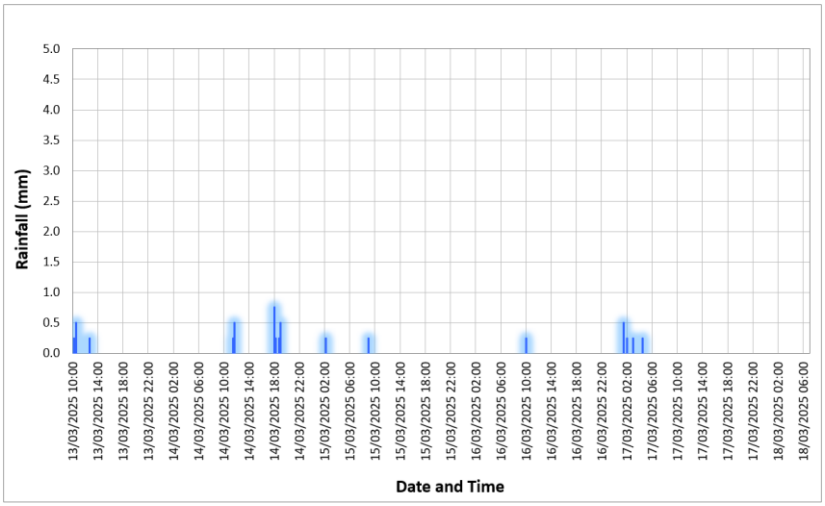
Receptors	Type	Floor	Coordinates (m)		
			X	Y	Z
Rose Cottage / The Bridge House	Residential	Ground	432653	535028	103
		First	432653	535028	106
16 Station Rd East	Residential	Ground	432807	534914	99
		First	432807	534914	101
East House Farm	Residential	Ground	433352	535834	139
		First	433352	535834	141
Sharon Avenue	Residential	Ground	433840	536082	135
		First	433840	536082	137
Bradyll Street, Kelloe	Residential	Ground	434195	535804	146
		First	434195	535804	148
Bradsway Cottage	Residential	Ground	433685	535037	105
		First	433685	535037	108

Monitoring Locations	Coordinates (m)		
	X	Y	Z
Location 1	432687	535017	101
Location 2	434025	535714	148
Weather Station	433983	535400	128

FIGURE 4

Weather Conditions





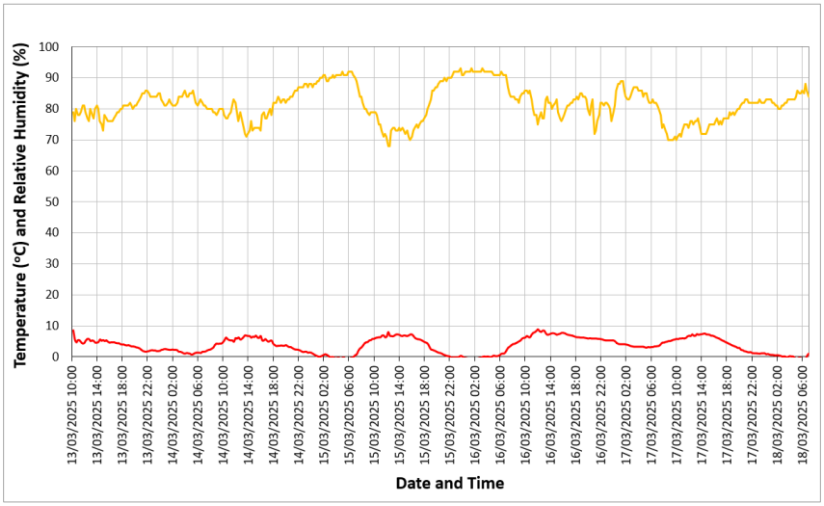
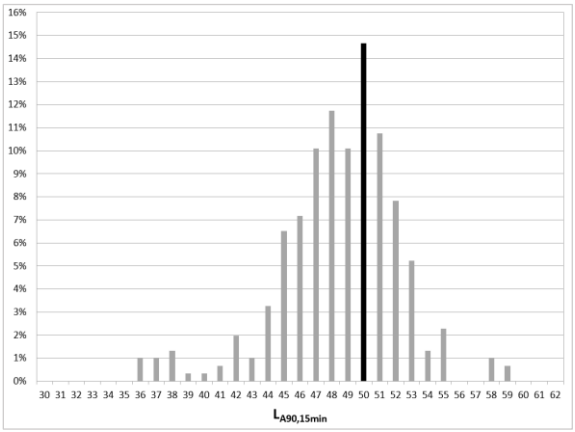


FIGURE 5

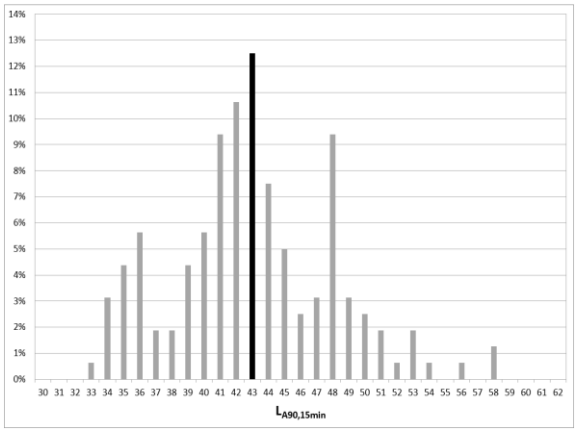
Statistical Analysis to Determine the Background Sound Level

Location 1

Daytime

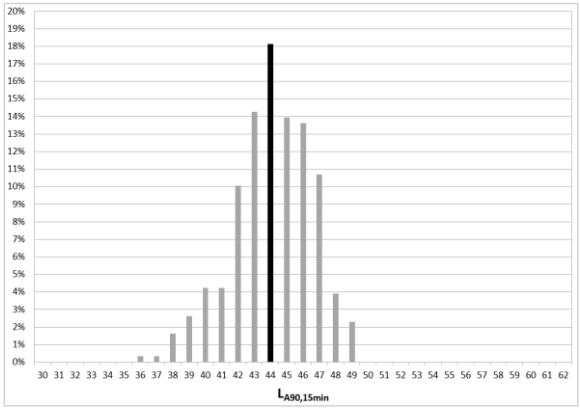


Night-time

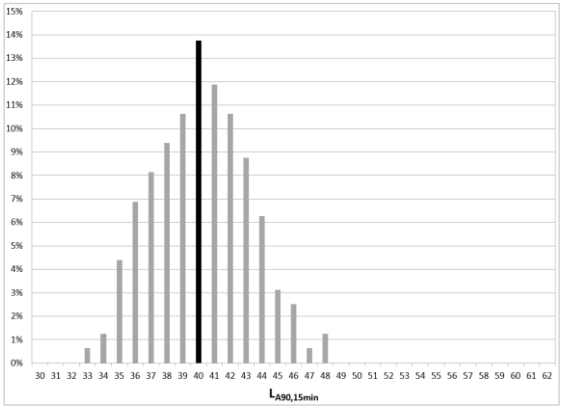


Location 2

Daytime



Night-time



APPENDIX 1

Terminology and Definitions

Acoustic Environment
Sound from all sound sources as modified by the environment.

Ambient Sound Level $L_{Aeq,T}$
Totally encompassing sound in a given situation at a given time usually composed of sound from many sources near and far.

A-weighting
The human ear is most sensitive to frequencies in the range 1 kHz to 5 kHz. On each side of this range the sensitivity falls off. A-weighting is used in sound level meters to replicate this sensitivity and respond in the same way as the human ear.

Background Sound Level $L_{A90,T}$
The A-weighted sound pressure level of the residual sound at the assessment position that is exceeded for 90% of a given time interval, *T*, measured using time weighting F.

Break-out
Noise transmission from inside a structure to the outside.

Equivalent continuous A-weighted sound pressure level $L_{Aeq,T}$
Value of the A-weighted sound pressure level of a continuous, steady sound that, within a specified time interval *T*, has the same mean square sound pressure as a sound under consideration whose level varies with time.

Free-field Level
The sound pressure level away from reflecting surfaces.
NOTE Measurements made 1.2 - 1.5 metres above the ground and at least 3.5 metres away from other reflecting surfaces are usually regarded as free-field.

Measurement time interval, T_m
Total time over which measurements are taken.

Octave band
Band of frequencies in which the upper limit of the band is twice the frequency of the lower limit.

Rating Level $L_{Ar,Tr}$
The specific sound level plus any adjustment for the characteristic features of the sound.

Reference Time Interval, T_r
The specified interval over which the specific sound level is determined.
NOTE This is 1hr during the day (07:00-23:00) and a shorter period of 15 min at night (23:00-07:00).

Residual Sound Level $L_{Aeq,T}$
Ambient sound remaining at a given position in a given situation when the specific sound source is suppressed to a degree such that it does not contribute to the ambient sound.

Sound Power Level, L_{WA}
The total amount of sound energy per unit of time generated by a particular sound source independent of the acoustic environment that it is in. It is a logarithmic measure of the sound power in comparison to a specified reference level.

Specific Sound Level (also referred to as 'site noise') $L_{Aeq,Tr}$
Sound in the neighbourhood of a site that originates from the site i.e. the sound being assessed. The equivalent continuous A-weighted sound pressure level produced by the specific sound source at the assessment position over a given reference time interval.

Specific sound source
Sound source being assessed.

APPENDIX 2

Noise Monitoring Data

Date and Time	L1		L2	
	$L_{Aeq,T}$ (dB)	$L_{A90,T}$ (dB)	$L_{Aeq,T}$ (dB)	$L_{A90,T}$ (dB)
13/03/2025 11:00	-	-	51.6	47.8
13/03/2025 11:15	-	-	51.1	47.3
13/03/2025 11:30	63.0	51.0	51.8	47.1
13/03/2025 11:45	59.9	49.5	51.8	48.3
13/03/2025 12:00	60.3	50.4	52.5	48.4
13/03/2025 12:15	59.2	49.3	52.0	47.7
13/03/2025 12:30	62.1	49.6	52.5	48.1
13/03/2025 12:45	63.1	50.7	51.5	47.3
13/03/2025 13:00	62.7	49.7	51.0	46.9
13/03/2025 13:15	63.3	50.3	52.9	49.1
13/03/2025 13:30	64.1	51.5	53.8	49.1
13/03/2025 13:45	62.8	50.6	48.8	43.1
13/03/2025 14:00	62.6	49.4	50.2	43.3
13/03/2025 14:15	62.7	49.4	50.4	46.3
13/03/2025 14:30	62.1	50.5	50.8	47.0
13/03/2025 14:45	62.4	50.5	49.6	45.5
13/03/2025 15:00	60.6	49.1	46.4	41.3
13/03/2025 15:15	61.0	50.1	49.8	44.6
13/03/2025 15:30	60.9	50.7	50.1	46.2
13/03/2025 15:45	61.3	51.7	50.4	46.5
13/03/2025 16:00	61.2	51.8	50.9	47.4
13/03/2025 16:15	60.3	52.4	51.1	47.7
13/03/2025 16:30	60.6	52.9	51.1	47.6
13/03/2025 16:45	60.6	52.4	46.8	41.0
13/03/2025 17:00	62.6	53.3	48.5	42.5
13/03/2025 17:15	59.0	50.5	48.5	42.4
13/03/2025 17:30	60.9	50.8	46.6	42.6
13/03/2025 17:45	59.1	51.8	47.5	43.7
13/03/2025 18:00	57.1	47.3	50.5	44.3
13/03/2025 18:15	58.1	48.7	51.1	44.1
13/03/2025 18:30	57.3	45.4	46.9	43.2
13/03/2025 18:45	56.3	46.6	47.0	43.4
13/03/2025 19:00	56.1	46.2	46.8	42.9
13/03/2025 19:15	56.0	46.6	46.6	42.7
13/03/2025 19:30	53.7	44.5	44.4	39.0
13/03/2025 19:45	54.0	45.8	44.0	38.9
13/03/2025 20:00	55.0	46.5	42.5	37.5
13/03/2025 20:15	55.1	45.0	41.7	36.9
13/03/2025 20:30	54.9	45.7	43.8	38.2
13/03/2025 20:45	59.0	49.8	46.6	42.9
13/03/2025 21:00	54.9	48.1	46.6	43.0
13/03/2025 21:15	57.5	48.1	46.6	42.8
13/03/2025 21:30	56.7	48.4	46.1	42.3
13/03/2025 21:45	57.6	48.8	45.8	41.9
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13/03/2025 22:30	55.8	47.2	45.1	41.5
13/03/2025 22:45	53.7	47.4	45.0	41.4
13/03/2025 23:00	54.3	47.1	44.6	41.1
13/03/2025 23:15	54.9	47.0	44.8	41.3
13/03/2025 23:30	54.9	45.8	44.9	41.6
13/03/2025 23:45	56.5	47.6	45.9	42.0
14/03/2025 00:00	56.2	46.0	45.3	41.8
14/03/2025 00:15	57.0	44.6	45.1	41.6
14/03/2025 00:30	51.2	41.8	45.0	41.5
14/03/2025 00:45	53.6	41.0	45.1	41.3
14/03/2025 01:00	52.8	42.4	45.3	41.4
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14/03/2025 01:30	57.4	40.4	45.3	41.7
14/03/2025 01:45	53.8	40.2	44.7	39.8
14/03/2025 02:00	56.2	37.9	45.5	40.5
14/03/2025 02:15	53.3	39.0	44.0	38.3
14/03/2025 02:30	46.8	40.1	42.2	36.9
14/03/2025 02:45	49.9	41.3	40.1	37.4
14/03/2025 03:00	48.0	39.2	41.9	38.3
14/03/2025 03:15	49.8	40.8	41.6	37.5
14/03/2025 03:30	48.9	40.8	41.2	38.9
14/03/2025 03:45	51.8	41.4	46.1	38.8
14/03/2025 04:00	55.7	42.5	45.1	39.8
14/03/2025 04:15	58.1	43.9	46.3	40.0
14/03/2025 04:30	55.0	43.7	44.0	40.2
14/03/2025 04:45	53.1	43.1	44.0	40.3
14/03/2025 05:00	55.7	45.4	42.6	40.1
14/03/2025 05:15	59.3	48.0	42.9	39.0
14/03/2025 05:30	59.2	48.2	43.7	40.4
14/03/2025 05:45	60.8	47.2	43.5	40.7
14/03/2025 06:00	58.5	47.7	44.3	41.0
14/03/2025 06:15	61.5	51.1	44.3	41.8
14/03/2025 06:30	60.0	51.0	47.1	43.4
14/03/2025 06:45	62.4	52.8	47.1	43.9

Date and Time	L1		L2	
	$L_{Aeq,T}$ (dB)	$L_{A90,T}$ (dB)	$L_{Aeq,T}$ (dB)	$L_{A90,T}$ (dB)
14/03/2025 07:00	62.1	53.0	48.5	43.1
14/03/2025 07:15	61.6	55.1	48.3	43.8
14/03/2025 07:30	64.1	55.1	47.6	43.0
14/03/2025 07:45	62.7	54.5	50.0	43.4
14/03/2025 08:00	61.9	54.5	49.1	43.6
14/03/2025 08:15	62.8	53.9	49.4	44.1
14/03/2025 08:30	62.5	52.6	49.2	44.4
14/03/2025 08:45	62.1	52.1	48.0	44.2
14/03/2025 09:00	61.2	52.2	47.6	43.5
14/03/2025 09:15	62.4	50.5	47.6	43.7
14/03/2025 09:30	62.2	51.0	46.9	42.5
14/03/2025 09:45	61.7	50.8	48.3	42.9
14/03/2025 10:00	61.1	49.4	47.4	43.2
14/03/2025 10:15	61.3	50.1	46.6	42.3
14/03/2025 10:30	61.6	50.4	47.3	41.9
14/03/2025 10:45	61.8	49.5	46.5	41.9
14/03/2025 11:00	64.0	51.9	46.8	42.2
14/03/2025 11:15	61.2	48.8	46.9	42.2
14/03/2025 11:30	61.2	50.4	46.6	41.1
14/03/2025 11:45	63.8	51.7	46.3	41.7
14/03/2025 12:00	61.6	49.9	47.3	42.2
14/03/2025 12:15	59.0	49.3	47.9	39.0
14/03/2025 12:30	63.1	50.6	45.3	40.2
14/03/2025 12:45	63.1	51.3	46.2	40.0
14/03/2025 13:00	63.5	49.7	46.4	40.9
14/03/2025 13:15	62.1	49.0	45.7	39.8
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14/03/2025 15:30	60.9	50.4	50.5	43.0
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14/03/2025 16:30	60.3	50.9	50.4	46.7
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14/03/2025 17:00	61.2	51.3	51.1	46.1
14/03/2025 17:15	58.2	50.9	50.9	46.7

Date and Time	L1		L2	
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15/03/2025 02:00	52.4	39.7	44.1	41.4
15/03/2025 02:15	55.5	38.5	45.8	40.5
15/03/2025 02:30	55.6	38.1	44.0	38.5
15/03/2025 02:45	52.6	39.5	42.8	37.9
15/03/2025 03:00	51.6	42.5	41.5	38.2
15/03/2025 03:15	50.2	42.4	45.7	39.4
15/03/2025 03:30	47.2	40.7	44.9	39.7
15/03/2025 03:45	46.4	41.1	45.6	41.5

Date and Time	L1		L2	
	$L_{Aeq,T}$ (dB)	$L_{A90,T}$ (dB)	$L_{Aeq,T}$ (dB)	$L_{A90,T}$ (dB)
15/03/2025 04:00	46.8	41.6	43.3	41.0
15/03/2025 04:15	50.5	40.5	43.2	41.7
15/03/2025 04:30	51.3	41.6	43.1	41.0
15/03/2025 04:45	49.4	42.5	43.1	40.3
15/03/2025 05:00	50.4	43.4	41.9	40.0
15/03/2025 05:15	53.7	47.2	42.3	41.3
15/03/2025 05:30	54.5	47.3	43.5	42.4
15/03/2025 05:45	56.2	47.6	42.8	41.6
15/03/2025 06:00	57.7	47.9	44.9	43.1
15/03/2025 06:15	55.4	48.2	45.7	42.7
15/03/2025 06:30	56.1	50.9	43.8	42.2
15/03/2025 06:45	57.2	53.0	45.5	44.0
15/03/2025 07:00	56.8	52.0	45.5	44.9
15/03/2025 07:15	58.9	52.7	45.2	44.5
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15/03/2025 08:15	56.7	50.7	47.9	46.5
15/03/2025 08:30	57.0	50.0	46.9	45.4
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15/03/2025 09:45	56.0	49.5	47.6	44.5
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15/03/2025 10:15	56.6	48.8	45.6	43.8
15/03/2025 10:30	56.9	47.3	46.5	44.4
15/03/2025 10:45	56.1	46.7	46.7	44.4
15/03/2025 11:00	55.5	45.4	46.9	44.8
15/03/2025 11:15	55.0	49.7	47.6	44.5
15/03/2025 11:30	55.9	46.1	45.2	41.9
15/03/2025 11:45	56.3	47.3	46.7	42.9
15/03/2025 12:00	57.6	46.1	45.6	41.0
15/03/2025 12:15	57.6	48.4	43.8	40.3
15/03/2025 12:30	56.3	46.3	45.9	41.9
15/03/2025 12:45	56.0	46.9	45.7	42.2
15/03/2025 13:00	56.1	48.3	45.1	41.9
15/03/2025 13:15	56.0	49.1	45.0	40.7
15/03/2025 13:30	56.0	49.4	48.2	41.6
15/03/2025 13:45	56.0	47.9	51.7	43.7
15/03/2025 14:00	55.4	46.9	48.2	41.5
15/03/2025 14:15	56.4	47.3	46.7	42.5
15/03/2025 14:30	56.3	47.8	46.5	43.0
15/03/2025 14:45	56.0	48.0	47.4	42.3
15/03/2025 15:00	55.4	46.7	45.2	43.2
15/03/2025 15:15	56.0	47.3	46.5	43.4
15/03/2025 15:30	55.9	46.7	52.1	43.6
15/03/2025 15:45	55.4	46.9	53.7	43.1
15/03/2025 16:00	55.6	47.7	45.4	42.8
15/03/2025 16:15	55.6	49.8	46.0	44.1
15/03/2025 16:30	56.0	49.1	46.9	45.0
15/03/2025 16:45	55.9	44.1	47.7	45.7
15/03/2025 17:00	56.5	49.5	48.1	45.1
15/03/2025 17:15	55.9	47.6	48.9	46.8
15/03/2025 17:30	55.4	47.9	49.4	47.4
15/03/2025 17:45	55.5	48.2	49.2	47.2
15/03/2025 18:00	56.0	47.6	48.4	46.7
15/03/2025 18:15	56.9	48.1	49.0	46.2
15/03/2025 18:30	57.8	48.9	48.3	43.6
15/03/2025 18:45	56.5	49.3	50.3	43.0
15/03/2025 19:00	56.0	48.2	46.8	44.4
15/03/2025 19:15	55.7	50.2	49.4	41.7
15/03/2025 19:30	54.7	49.1	46.6	42.1
15/03/2025 19:45	56.6	51.8	54.1	41.4
15/03/2025 20:00	56.2	52.2	49.1	41.7
15/03/2025 20:15	56.5	52.3	47.0	41.6
15/03/2025 20:30	56.4	52.6	49.8	41.7
15/03/2025 20:45	55.0	51.0	46.7	42.2
15/03/2025 21:00	55.3	51.2	46.8	40.9
15/03/2025 21:15	54.6	50.0	44.0	40.4
15/03/2025 21:30	54.5	51.4	47.7	41.6
15/03/2025 21:45	54.8	51.1	45.4	41.1
15/03/2025 22:00	54.9	50.7	43.0	40.4
15/03/2025 22:15	56.1	52.2	45.3	39.1
15/03/2025 22:30	55.3	52.1	42.0	38.8
15/03/2025 22:45	55.1	50.1	45.1	38.9
15/03/2025 23:00	54.1	49.9	43.4	38.3
15/03/2025 23:15	53.2	48.6	50.0	39.0
15/03/2025 23:30	53.5	49.2	40.8	36.9
15/03/2025 23:45	52.9	48.1	39.4	36.6
16/03/2025 00:00	53.3	47.6	38.6	35.1
16/03/2025 00:15	51.2	45.5	40.6	34.7
16/03/2025 00:30	50.4	42.3	47.7	38.2
16/03/2025 00:45	49.9	43.0	41.1	39.4

Date and Time	L1		L2	
	$L_{Aeq,T}$ (dB)	$L_{A90,T}$ (dB)	$L_{Aeq,T}$ (dB)	$L_{A90,T}$ (dB)
16/03/2025 01:00	50.0	42.0	40.2	39.4
16/03/2025 01:15	50.5	42.2	41.2	38.9
16/03/2025 01:30	47.5	42.1	42.2	39.4
16/03/2025 01:45	49.1	44.0	39.6	39.1
16/03/2025 02:00	48.4	40.3	40.9	39.8
16/03/2025 02:15	48.5	41.1	41.3	38.9
16/03/2025 02:30	48.7	43.3	40.5	38.4
16/03/2025 02:45	47.2	38.9	39.6	39.5
16/03/2025 03:00	46.2	39.1	39.5	38.4
16/03/2025 03:15	48.4	42.3	39.1	38.3
16/03/2025 03:30	47.4	39.5	39.6	38.9
16/03/2025 03:45	46.7	40.5	40.7	38.6
16/03/2025 04:00	47.0	37.1	40.9	39.4
16/03/2025 04:15	48.1	41.7	41.5	39.5
16/03/2025 04:30	48.8	41.2	44.4	42.0
16/03/2025 04:45	47.1	40.7	44.6	41.4
16/03/2025 05:00	50.7	42.4	44.1	41.1
16/03/2025 05:15	51.8	44.7	44.7	41.5
16/03/2025 05:30	53.2	47.6	45.6	42.8
16/03/2025 05:45	55.5	47.6	46.0	44.4
16/03/2025 06:00	54.0	47.9	50.2	44.9
16/03/2025 06:15	55.0	49.2	46.8	44.9
16/03/2025 06:30	54.9	49.9	48.3	46.1
16/03/2025 06:45	55.4	50.1	48.2	47.1
16/03/2025 07:00	56.6	48.4	48.4	46.3
16/03/2025 07:15	57.1	48.5	47.5	44.8
16/03/2025 07:30	57.6	49.4	49.5	44.7
16/03/2025 07:45	57.5	49.4	50.1	46.0
16/03/2025 08:00	55.0	49.8	55.7	46.4
16/03/2025 08:15	56.3	49.9	48.1	45.5
16/03/2025 08:30	57.6	50.7	47.5	45.4
16/03/2025 08:45	57.1	49.7	49.1	45.9
16/03/2025 09:00	55.8	47.3	49.0	45.6
16/03/2025 09:15	55.5	45.2	50.0	45.1
16/03/2025 09:30	54.8	45.1	48.3	43.4
16/03/2025 09:45	56.4	47.6	48.7	43.5
16/03/2025 10:00	55.3	47.0	50.3	46.1
16/03/2025 10:15	56.0	47.5	50.7	44.9
16/03/2025 10:30	57.6	48.5	51.1	46.9
16/03/2025 10:45	67.9	49.7	52.0	46.7
16/03/2025 11:00	55.5	47.8	53.0	46.3
16/03/2025 11:15	54.4	46.8	51.0	44.5

Date and Time	L1		L2	
	$L_{Aeq,T}$ (dB)	$L_{A90,T}$ (dB)	$L_{Aeq,T}$ (dB)	$L_{A90,T}$ (dB)
16/03/2025 11:30	54.6	45.7	54.0	47.2
16/03/2025 11:45	54.8	45.9	51.4	45.2
16/03/2025 12:00	58.6	46.0	50.5	45.8
16/03/2025 12:15	54.9	45.2	52.3	45.5
16/03/2025 12:30	54.6	46.6	50.1	44.7
16/03/2025 12:45	54.8	46.3	48.0	44.9
16/03/2025 13:00	56.0	46.7	50.8	44.3
16/03/2025 13:15	60.6	49.6	48.9	44.7
16/03/2025 13:30	54.1	45.6	50.1	44.0
16/03/2025 13:45	54.4	46.4	48.9	43.8
16/03/2025 14:00	54.0	44.9	49.1	43.6
16/03/2025 14:15	54.8	45.4	48.6	43.6
16/03/2025 14:30	53.6	46.3	47.9	43.5
16/03/2025 14:45	53.7	45.7	50.5	43.8
16/03/2025 15:00	54.0	44.9	50.3	43.7
16/03/2025 15:15	53.8	45.2	53.3	45.3
16/03/2025 15:30	54.1	45.4	54.2	46.6
16/03/2025 15:45	54.4	44.0	55.1	47.4
16/03/2025 16:00	53.7	44.1	54.5	45.1
16/03/2025 16:15	53.4	43.8	53.3	45.5
16/03/2025 16:30	53.1	43.7	51.5	45.2
16/03/2025 16:45	53.3	43.6	51.1	46.5
16/03/2025 17:00	54.9	45.8	49.1	45.7
16/03/2025 17:15	52.8	42.4	51.3	45.5
16/03/2025 17:30	52.5	42.1	49.4	43.9
16/03/2025 17:45	51.6	43.1	57.1	45.9
16/03/2025 18:00	52.4	43.2	48.7	43.8
16/03/2025 18:15	52.5	41.5	49.7	44.1
16/03/2025 18:30	51.9	42.3	49.6	43.8
16/03/2025 18:45	53.9	41.3	48.6	44.4
16/03/2025 19:00	51.7	42.3	49.5	43.7
16/03/2025 19:15	53.0	41.8	48.9	43.2
16/03/2025 19:30	54.2	43.1	48.3	42.7
16/03/2025 19:45	51.6	40.0	52.5	42.7
16/03/2025 20:00	49.9	39.4	51.8	41.6
16/03/2025 20:15	50.2	40.7	46.7	40.3
16/03/2025 20:30	50.0	38.2	46.2	40.9
16/03/2025 20:45	49.6	37.7	45.9	40.0
16/03/2025 21:00	50.6	37.9	45.2	39.8
16/03/2025 21:15	49.3	37.4	47.7	39.2
16/03/2025 21:30	51.2	37.2	45.6	38.6
16/03/2025 21:45	45.7	37.1	47.6	40.1

Date and Time	L1		L2	
	$L_{Aeq,T}$ (dB)	$L_{A90,T}$ (dB)	$L_{Aeq,T}$ (dB)	$L_{A90,T}$ (dB)
16/03/2025 22:00	47.2	37.5	43.5	38.4
16/03/2025 22:15	44.0	35.8	43.8	37.5
16/03/2025 22:30	44.5	36.2	44.5	37.8
16/03/2025 22:45	45.2	35.7	41.5	36.1
16/03/2025 23:00	44.4	34.6	41.8	36.3
16/03/2025 23:15	45.8	35.5	44.4	36.7
16/03/2025 23:30	43.4	33.8	39.1	37.0
16/03/2025 23:45	44.6	34.7	38.5	38.0
17/03/2025 00:00	42.0	33.5	40.9	37.0
17/03/2025 00:15	45.2	34.2	41.0	36.4
17/03/2025 00:30	43.4	36.2	39.1	35.1
17/03/2025 00:45	43.7	35.5	39.7	35.7
17/03/2025 01:00	45.6	34.6	41.2	34.4
17/03/2025 01:15	44.6	36.7	40.7	35.3
17/03/2025 01:30	48.1	38.8	40.7	35.7
17/03/2025 01:45	43.8	35.6	40.8	36.4
17/03/2025 02:00	42.6	33.7	39.6	36.5
17/03/2025 02:15	43.8	33.4	37.6	35.5
17/03/2025 02:30	43.5	34.1	37.7	35.0
17/03/2025 02:45	40.4	34.9	39.1	34.4
17/03/2025 03:00	42.7	35.0	36.8	34.9
17/03/2025 03:15	42.8	35.1	36.8	33.4
17/03/2025 03:30	44.7	34.5	39.8	34.9
17/03/2025 03:45	52.3	36.4	41.6	35.9
17/03/2025 04:00	51.2	35.5	46.7	38.2
17/03/2025 04:15	53.5	36.2	47.3	39.1
17/03/2025 04:30	52.4	35.5	48.0	39.6
17/03/2025 04:45	50.0	36.1	46.4	38.6
17/03/2025 05:00	56.0	36.8	45.5	38.3
17/03/2025 05:15	55.4	38.8	48.5	40.0
17/03/2025 05:30	59.8	38.4	48.8	41.4
17/03/2025 05:45	61.0	42.5	51.0	43.5
17/03/2025 06:00	60.3	44.9	52.1	43.9
17/03/2025 06:15	62.9	47.5	52.4	45.1
17/03/2025 06:30	62.6	48.3	52.7	45.9
17/03/2025 06:45	61.6	49.3	52.9	46.5
17/03/2025 07:00	64.7	53.8	51.2	46.3
17/03/2025 07:15	63.9	54.6	52.6	48.6
17/03/2025 07:30	62.3	55.3	52.9	48.7
17/03/2025 07:45	62.7	54.8	54.0	48.5
17/03/2025 08:00	62.6	53.6	52.4	48.8
17/03/2025 08:15	62.0	53.1	51.9	48.2

Date and Time	L1		L2	
	$L_{Aeq,T}$ (dB)	$L_{A90,T}$ (dB)	$L_{Aeq,T}$ (dB)	$L_{A90,T}$ (dB)
17/03/2025 08:30	63.2	52.9	51.6	47.3
17/03/2025 08:45	63.7	53.0	50.8	45.9
17/03/2025 09:00	63.4	53.6	50.9	46.2
17/03/2025 09:15	62.6	52.1	51.7	46.8
17/03/2025 09:30	60.9	49.2	50.8	45.7
17/03/2025 09:45	61.5	47.2	49.7	43.7
17/03/2025 10:00	61.1	48.1	51.0	43.1
17/03/2025 10:15	61.4	48.4	49.8	43.0
17/03/2025 10:30	62.6	46.7	50.5	43.5
17/03/2025 10:45	60.9	47.7	50.2	42.9
17/03/2025 11:00	60.3	45.3	49.0	43.6
17/03/2025 11:15	61.5	48.3	50.1	42.0
17/03/2025 11:30	61.6	49.5	56.8	44.3
17/03/2025 11:45	62.0	48.3	50.0	44.4
17/03/2025 12:00	61.5	46.5	50.9	43.7
17/03/2025 12:15	60.2	48.3	49.9	43.2
17/03/2025 12:30	60.8	46.3	49.1	43.9
17/03/2025 12:45	61.5	49.6	51.0	42.7
17/03/2025 13:00	61.2	49.4	51.6	44.6
17/03/2025 13:15	60.7	47.9	59.8	44.8
17/03/2025 13:30	63.2	51.7	59.2	46.3
17/03/2025 13:45	61.5	50.1	56.9	49.4
17/03/2025 14:00	61.6	49.5	54.8	48.1
17/03/2025 14:15	60.3	49.5	52.3	46.7
17/03/2025 14:30	61.3	49.7	57.9	46.4
17/03/2025 14:45	60.8	49.9	58.6	47.3
17/03/2025 15:00	60.5	51.0	54.3	47.6
17/03/2025 15:15	61.0	51.0	52.6	48.0
17/03/2025 15:30	62.1	51.5	51.7	47.3
17/03/2025 15:45	61.2	51.3	53.1	46.3
17/03/2025 16:00	61.3	50.2	49.7	45.3
17/03/2025 16:15	61.8	51.9	49.9	45.1
17/03/2025 16:30	59.2	49.7	49.4	45.3
17/03/2025 16:45	60.2	50.9	47.9	44.0
17/03/2025 17:00	57.3	50.7	50.4	45.0
17/03/2025 17:15	57.3	53.1	48.4	45.5
17/03/2025 17:30	57.7	52.9	47.6	46.1
17/03/2025 17:45	56.9	52.7	51.8	45.6
17/03/2025 18:00	57.9	52.6	47.5	45.3
17/03/2025 18:15	58.5	50.7	49.2	45.2
17/03/2025 18:30	57.4	50.8	53.8	44.0
17/03/2025 18:45	56.6	49.7	56.8	43.9

Date and Time	L1		L2	
	$L_{Aeq,T}$ (dB)	$L_{A90,T}$ (dB)	$L_{Aeq,T}$ (dB)	$L_{A90,T}$ (dB)
17/03/2025 19:00	55.4	49.2	47.7	44.8
17/03/2025 19:15	56.1	49.8	51.2	45.4
17/03/2025 19:30	55.8	48.8	49.3	47.1
17/03/2025 19:45	56.7	49.1	56.1	46.4
17/03/2025 20:00	56.2	49.0	49.4	46.6
17/03/2025 20:15	55.4	50.2	53.4	46.2
17/03/2025 20:30	55.7	48.8	48.2	46.7
17/03/2025 20:45	54.8	47.0	48.2	46.2
17/03/2025 21:00	56.7	47.9	48.8	44.8
17/03/2025 21:15	57.5	49.5	48.2	44.8
17/03/2025 21:30	57.1	47.6	48.5	45.2
17/03/2025 21:45	54.7	47.7	47.8	44.0
17/03/2025 22:00	55.5	47.9	47.5	44.0
17/03/2025 22:15	54.7	47.7	47.6	44.2
17/03/2025 22:30	53.0	44.1	48.6	45.7
17/03/2025 22:45	54.9	44.5	46.5	43.2
17/03/2025 23:00	55.0	46.2	46.6	42.6
17/03/2025 23:15	51.7	44.0	47.4	43.9
17/03/2025 23:30	55.7	45.3	47.0	43.0
17/03/2025 23:45	56.7	45.3	47.8	43.0
18/03/2025 00:00	54.9	44.0	44.3	42.0
18/03/2025 00:15	57.0	44.3	45.3	43.4
18/03/2025 00:30	56.4	43.4	44.3	42.2
18/03/2025 00:45	56.6	41.6	43.0	40.9
18/03/2025 01:00	53.2	41.4	41.9	39.8
18/03/2025 01:15	54.6	43.1	42.4	40.6
18/03/2025 01:30	56.1	44.0	41.5	39.6

Date and Time	L1		L2	
	$L_{Aeq,T}$ (dB)	$L_{A90,T}$ (dB)	$L_{Aeq,T}$ (dB)	$L_{A90,T}$ (dB)
18/03/2025 01:45	57.2	41.4	41.6	39.5
18/03/2025 02:00	55.8	43.4	41.8	39.9
18/03/2025 02:15	53.6	40.5	42.3	39.8
18/03/2025 02:30	57.4	44.2	42.1	38.0
18/03/2025 02:45	57.3	42.7	40.3	36.7
18/03/2025 03:00	56.0	43.8	39.5	37.0
18/03/2025 03:15	49.3	41.8	39.1	38.0
18/03/2025 03:30	52.3	40.2	38.5	39.0
18/03/2025 03:45	49.1	43.5	38.8	37.0
18/03/2025 04:00	53.5	42.8	39.1	36.1
18/03/2025 04:15	48.6	43.2	39.1	36.0
18/03/2025 04:30	52.5	45.2	39.1	35.9
18/03/2025 04:45	53.7	48.4	39.0	36.2
18/03/2025 05:00	56.4	49.3	40.3	37.1
18/03/2025 05:15	56.2	50.3	43.1	39.8
18/03/2025 05:30	60.4	51.7	44.4	40.7
18/03/2025 05:45	60.3	53.0	49.5	41.1
18/03/2025 06:00	60.1	54.4	47.6	42.1
18/03/2025 06:15	61.8	56.0	50.2	45.6
18/03/2025 06:30	63.8	57.8	50.5	47.9
18/03/2025 06:45	63.3	57.8	49.2	47.5
18/03/2025 07:00	63.9	58.3	54.4	47.1
18/03/2025 07:15	62.8	58.6	50.6	47.3
18/03/2025 07:30	64.2	59.1	50.1	47.6
18/03/2025 07:45	63.1	58.2	48.9	47.0
18/03/2025 08:00	61.3	57.7	50.0	47.4

APPENDIX 3

Noise Source Model Inputs

Plant/ Activity	Octave band sound power levels (dB)								Sound Power Level dB(A)	Source Height relative to ground (m)	Co-ordinates (m)			On-time Assumptions (relative to reference time interval)
	63	125	250	500	1k	2k	4k	8k			X	Y	Z	
RAP OPERATIONS														
Hydraulic Breaker	104.9	107.9	100.6	100.8	105.7	106.2	102.7	96.0	111	2.0	434028	535598	131	75%
Mobile Crushing and Screening Plant	117.1	116.2	107.6	102.4	97.6	95.1	91.2	85.7	106	2.5	434027	535576	133	100%
HGV Tipping into Stockpile	107.2	107.2	98.1	95.0	94.2	92.3	86.4	81.0	100	1.5	433958	535425	129	10%
Loading Shovel (RAP Processing)	105.3	104.6	99.2	96.7	96.5	95.0	93.4	83.1	102	2.0	434017	535571	133	25%
Loading Shovel (RAP Stock)	105.3	104.6	99.2	96.7	96.5	95.0	93.4	83.1	102	2.0	433925	535511	137	25%
HGV idling on Weighbridge	92.1	86.6	84.4	81.9	81.3	78.4	75.7	74.5	86	2.0	433892	535402	133	25%
HGV (RAP)	103.1	98.9	96.1	94.1	94.5	92.2	87.7	79.8	99	1.5	Line source			3 movements per hr Speed 20 mph

Plant/ Activity	Octave band sound power levels (dB)								Sound Power Level dB(A)	Source Height relative to ground (m)	Co-ordinates (m)			On-time Assumptions (relative to reference time interval)
	63	125	250	500	1k	2k	4k	8k			X	Y	Z	
EXISTING ASPHALT PLANT OPERATIONS														
Loading Shovel (Hoppers)	105.3	104.6	99.2	96.7	96.5	95.0	93.4	83.1	102	2.0	433892	535402	133	25%
Loading Shovel (Stock)	105.3	104.6	99.2	96.7	96.5	95.0	93.4	83.1	102	2.0	433892	535402	133	25%
Asphalt Plant (Dryer)	110	110.2	103.2	100.8	98	93.2	87.9	81.3	103	3.0	434010	535438	129	100%
Asphalt Plant (Screen/Mixer/Loadout)	117.1	113.5	114.7	105.1	100.7	97.6	97.6	97.2	110	5.0	434011	535429	131	100%
HGV idling on Weighbridge	92.1	86.6	84.4	81.9	81.3	78.4	75.7	74.5	86	2.0	433892	535402	133	25%
Mobile Plant Movements	105.3	104.6	99.2	96.7	96.5	95.0	93.4	83.1	102	2.0	Line source			10 movements per hr Speed 15 mph
HGV Movements (Asphalt)	103.1	98.9	96.1	94.1	94.5	92.2	87.7	79.8	99	1.5	Line source			8 movements per hr Speed 10 mph
HGV (Deliveries)	103.1	98.9	96.1	94.1	94.5	92.2	87.7	79.8	99	1.5	Line source			2 movements per hr Speed 10 mph