Recover Blaenavon Limited, Blaenavon

Noise Assessment for NRW Permit

17th February 2023

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Version	Comments	Date	Authored By	Checked By	Project Number
1	Noise Impact Assessment for NRW	27th October 2022	Victor Valeron BEng MSc MIOA	Antony Best BSc (Hons) MIOA	22-475
2	NRW Comments	17th February 2023	Victor Valeron BEng MSc MIOA	Neil Morgan MSc MIOA	22-475

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1. INTRODUCTION

1.1. Overview

inacoustic has been commissioned to prepare a Noise Assessment for the Recover Blaenavon Limited's (formerly Capital Valley Plastics & Recycling) operations at Kays & Kears Industrial Estate, Blaenavon, Pontypool, NP4 9AZ, for submission to Natural Resources Wales (NRW) as part of a Permit Application.

The site is currently operational four days a week, but the operator is intending to extend its operations to potentially cover the whole week, in order to provide additional throughput capacity.

This noise assessment is necessarily technical in nature; therefore a glossary of terms is included in Appendix A to assist the reader.

1.2. Scope and Objectives

The scope of the report is summarised as follows:

- Detailed sound measurements at the closest noise-sensitive receptors to the Site;
- A detailed assessment of the suitability of the Site, in accordance with the relevant policy; and
- Recommendation of mitigation measures, where necessary, to comply with the requirements of the Noise and Vibration Management: Environmental Permits[1], and BS4142:2014+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. BS4142:2014+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 permits have conditions that require operators to control pollution; this includes controlling noise and vibration. The Environment Agency, Scottish Environment Protection Agency (SEPA), Natural Resources Wales and Northern Ireland Environment Agency have jointly released guidance to help holders and potential holders of permits apply for, vary, and comply with their permits. The guidance covers:

- how the respective environment agencies will assess noise from certain industrial processes;
- what the law says you must do to manage noise and vibration; and
- advice on how to manage noise – in particular, how to carry out a noise impact assessment and what operators should include in a noise management plan.

This guidance replaces these documents which have been withdrawn:

- Environment Agency Horizontal Guidance for Noise (H3) parts 1 and 2.

It involves determining the appropriate controls for industry to protect the environment through a single permitting process. To gain a Permit, Operators have to show that they have systematically developed proposals to apply the 'Best Available Techniques' (BAT) and meet certain other requirements, taking account of relevant local factors.

In terms of noise specifically, the use of BAT has to be considered and balanced within the wider context of other releases to different media (air, land and water) and taking issues such as usage of energy and raw materials into account. Noise cannot therefore be considered in isolation from other impacts on the environment.

The definition of pollution includes *"emissions which may be harmful to human health or the quality of the environment, cause offence to human senses or impair or interfere with amenities and other legitimate uses of the environment"*. BAT is therefore likely to be similar, in practice, to the requirements of the Statutory Nuisance legislation which requires the use of *"best practicable means"* to prevent or minimise noise nuisance. In the case of noise, *"offence to human senses"* may be judged by the likelihood of complaints. However, the lack of complaint should not necessarily imply the absence of a noise problem. In some cases it may be possible, and desirable, to reduce noise emissions still further at reasonable costs and this may therefore be BAT for noise emissions.

Consequently, the aim of BAT should be to ensure that there is no reasonable cause for annoyance to persons beyond the installation boundary.

In summary, the aim of BAT should be to achieve the following:

- Underpinning of good practice, a basic level of which the operator should employ for the control of noise including adequate maintenance of any parts of plant or equipment whose deterioration may give rise to increases in noise. For example, this would include bearings, air handling plant, the building fabric as well as specific noise attenuation measures associated with plant, equipment or machinery;
- Noise levels should not be loud enough to give reasonable cause for annoyance for persons in the vicinity, which is a more appropriate environmental standard than that of Statutory

Nuisance and is normally the aim of most planning or other conditions applied by Local Authorities; and
- Prevention of 'creeping background' (creeping ambient), which is the gradual increase in sound levels as industry expands and areas develop.

The indicative requirements apply to both new and existing activities but it is more difficult to justify departures from them in the case of new activities.

Indeed, because the requirements for noise are likely to be strongly influenced by the local environmental conditions, new installations are expected to meet BAT from the outset and to demonstrate that noise reduction or prevention has been built into the process design. For most existing plant, especially where there are no existing noise limits, the focus is on good practice (BAT) and the need to ensure that there is no reasonable cause for annoyance. In assessing any noise impact it is more normal to monitor existing levels and apply corrections and calculations, rather than rely on predictions.

The guidance refers to BS4142:2014+A1:2019 as the basis for the majority of noise impact assessments.

2.1.2. Planning Policy Wales

The Government's planning policies for Wales are contained in Planning Policy Wales (Edition 11, February 2021). The policy provides overarching requirements for developments to adequately control noise pollution, to provide appropriate soundscapes and to incorporate good acoustic design.

The policy is supplemented by the Noise and Soundscape Action Plan 2018-2023, which provides more detailed guidance on planning for a new development, but does not set out specific assessment methods or criteria. The guidance in this document has been used to inform a qualitative assessment of the effect the proposed development could have on the local soundscape.

2.1.3. Technical Advice Note (Wales) 11

This note provides advice on how the planning system in Wales can be used to minimise the adverse impact of noise without placing unreasonable restrictions on development or adding unduly to the costs and administrative burdens of business.

It outlines some of the main considerations which local planning authorities should take into account in drawing-up development plan policies and when determining planning applications for development which will either generate noise or be exposed to existing noise sources.

2.2. Assessment Criteria

2.2.1. BS4142:2014+A1:2019

BS4142:2014+A1:2019 sets out a method to assess the likely effect of sound from factories, industrial premises or fixed installations and sources of an industrial nature in commercial premises, on people who might be inside or outside a dwelling or premises used for residential purposes in the vicinity.

The procedure contained in BS4142:2014+A1:2019 for assessing the effect of sound on residential receptors is to compare the measured or predicted sound level from the source in question, the $L_{Aeq,T}$ 'specific sound level', immediately outside the dwelling with the $L_{A90,T}$ background sound level.

Where the sound contains a tonality, impulsivity, intermittency and other sound characteristics, then a correction depending on the grade of the aforementioned characteristics of the sound is added to the specific sound level to obtain the $L_{Ar,Tr}$ 'rating sound level'. A correction to include the consideration of a level of uncertainty in sound measurements, data and calculations can also be applied when necessary.

BS4142:2014+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.

3. Site Description

3.1. Site and Surrounding Area

The site comprises an industrial building, external yard and car park at the Kays & Kears Industrial Estate in Blaenavon.

It should be noted that the building on the western part of the site (labelled as Unit 2 in the image below) was destroyed by a fire in 2021. The area is currently levelled and now comprises a concrete slab with only a small northern section of the building structure remaining standing.

The closest Noise-Sensitive Receptors (NSRs) to the site are residential dwelling on Garn Road, to the north west of the operational building (NSR1) and residential dwellings on West View Terrace, to the south east of the operational building (NSR2). It is noted that due to the topography of the area, NSR1 overlooks the industrial facilities, while NSR2 is at lower level with no direct line of sight to the site.

The prevailing ambient sound environment in the area, in the absence of operations at the site, was noted to be primarily influenced by road traffic noise arising from vehicles using the B4248 Garn Road, along with industrial noise from the wider commercial area.

The site, surrounding area and nearest NSRs are presented in Figure 1.

Figure 1: Location of Site, Surrounding Area and NSRs

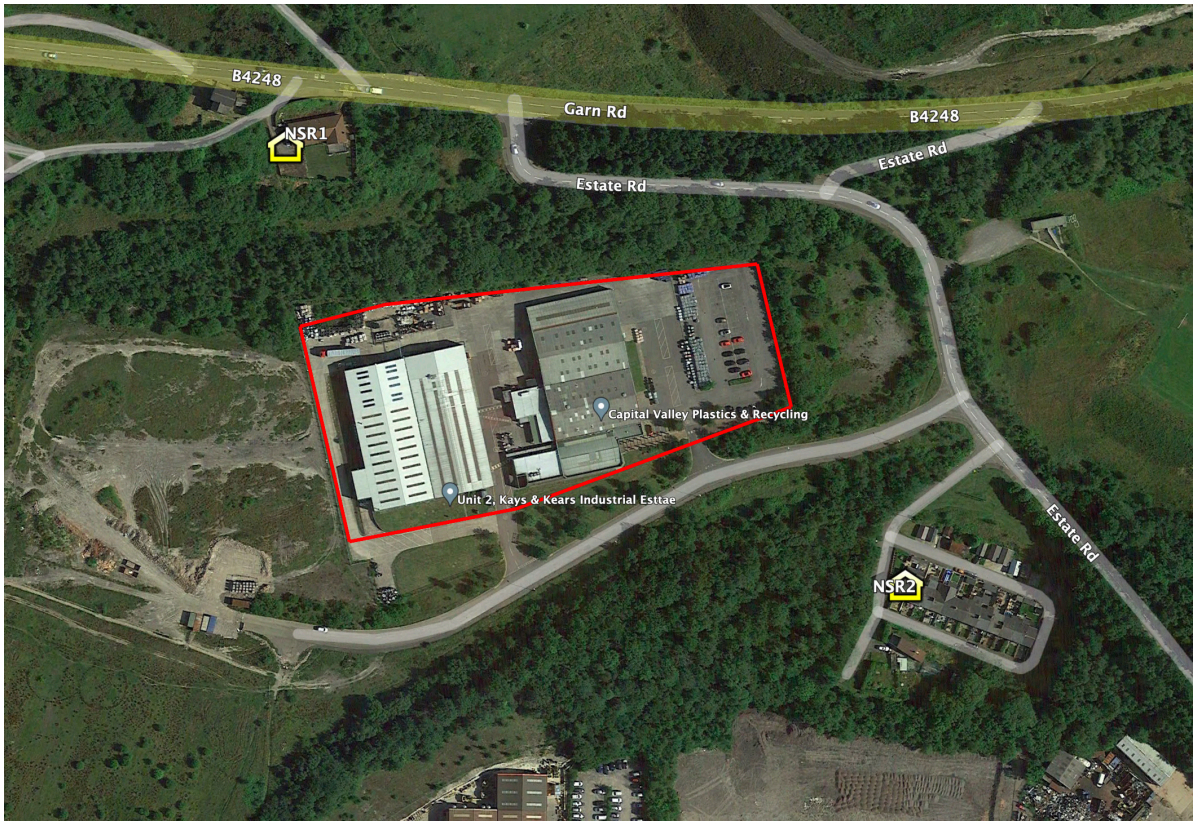


FIGURE 2: SITE PLAN - GENERAL LAYOUT AND FEATURES

3.2. Operations Overview

Recover Blaenavon Limited are a plastic reprocessing company that receives film plastic wastes and uses heat treatment to re-granulate the plastic and reach an end of waste saleable product, currently processing in the order of 52 tonnes per day.

The majority of the plant is fixed and mostly located within the 'Waste treatment building' as shown in Figure 2. Forklifts are the only movable plant used on site to move materials from within the building to the outdoor waste storage area to the east. Three outdoor cooling units to the west of the building provide refrigeration to the plant.

The site operates 24 hours a day between Monday night through to Friday morning, and remains non-operational for the rest of the week.

3.3. Noise Generating Elements

The operations currently comprise the following noise-generating plant, ranked in terms of noise output in Table 1. No new plant is proposed as part of this Environmental Permit Application.

TABLE 1: SUMMARY OF NOISE-GENERATING ELEMENTS

Description	Location	Operational Profile	Grid Coordinates	
			Easting	Northing
1. LEV/Extraction System	Internal Waste Treatment Building	Continuous	324475	209473
2. Chillers	External	On Demand - Regular	324451	209477
3. Diesel-Powered Forklift	Internal and External (yard area east of the building)	On Demand - Regular	324497	209478
4. Electric-Powered Forklift	Internal and External (yard area east of the building)	On Demand - Regular	324500	209452

No other treatment plant was deemed to be acoustically relevant for this assessment.

4. Measurement Methodology

4.1. General

The prevailing sound conditions in the area have been determined by a partially attended environmental noise survey conducted during both daytime and night-time periods between Thursday 20th and Monday 24th of October 2022.

Attended periods on Thursday 20th spanned 18:25 to 19:50 at NSR1 and 19:55 to 20:35 at NSR2 on Friday 22nd, including periods of typical site activities along with periods of orchestrated site shut down.

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 2 below.

Table 2: Inventory of Sound Measurement Equipment

Position	Make, Model & Description	Serial Number	Calibration Certificate Number	Calibration Expiry Date
All	Rion NL-31 Sound Level Meter	00110040	1107106	14/12/2022
	Rion NH-21 Preamplifier	00142	1107106	14/12/2022
	Rion UC-53A Microphone	306449	1107106	14/12/2022
	Cirrus CR:515 Acoustic Calibrator	82506	1131626	23/08/2023

Measurement equipment used during the survey was field calibrated at the start and end of the measurement period, with the following results:

- Before: 94.0 dB After: 93.9 dB (@1kHz)

The weather conditions during the attended survey were conducive to environmental noise measurements, it being dry and with a gentle breeze. For the long-term unattended measurements, however, the survey included periods of unsuitable weather, which were logged with a rain and wind gauge set up on site for the whole survey duration. Wind direction throughout the survey was variable, but with southwestern prevalence. Periods of unsuitable weather were excluded from the dataset used to derive the typical background sound levels, as shown in measurement charts in Appendix B. Full dataset of monitored rain and wind conditions are also presented in Appendix B.

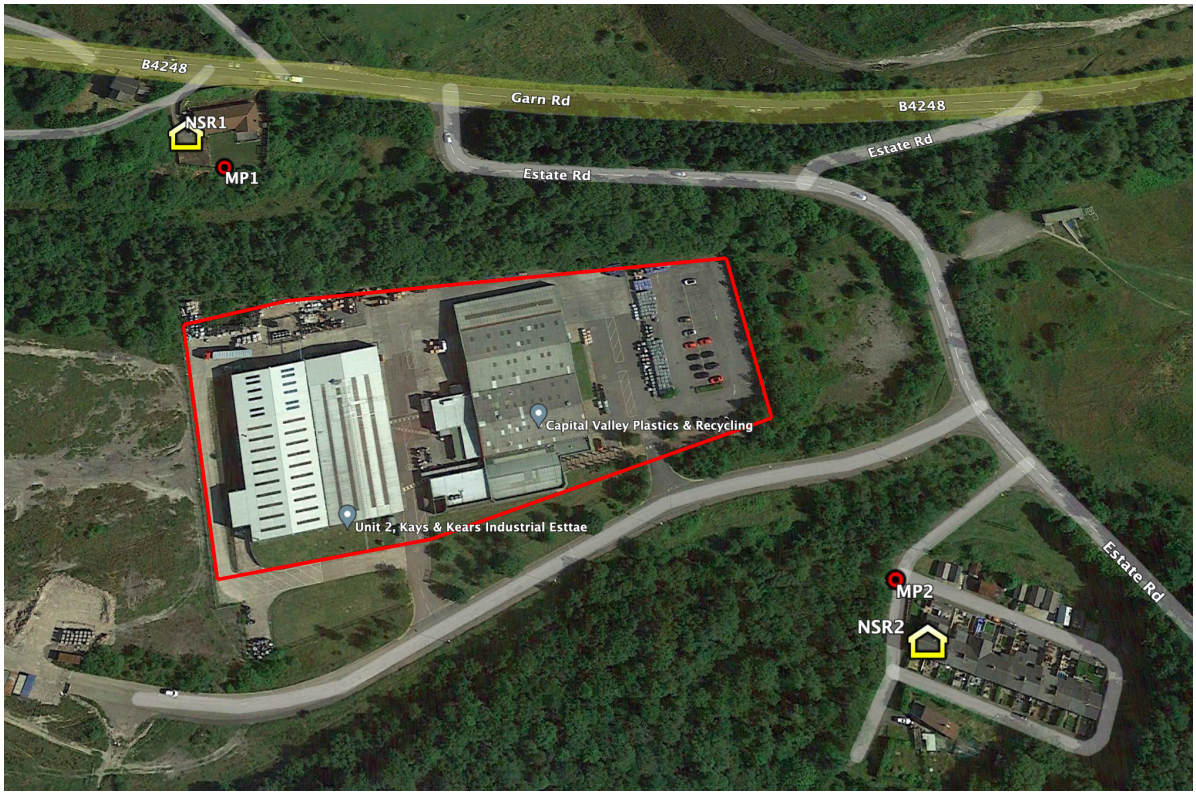
The microphone was fitted with a protective windshield for the measurements, with the static positions described in Table 3 and an aerial photograph indicating their locations shown in Figure 3.

[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.

Table 3: Measurement Positions Description

Measurement Position	Description
MP1	A partially attended daytime, evening and night-time measurement of sound under free-field conditions, at a height of 1.5 metres above local ground level at the garden boundary of NSR1, representing the closest and most affected noise-sensitive receptor to the Permit Application Site. During the attended measurements on the evening of Thursday 20th October 2022, the sound environment was sustained by continuous noise from the Applicant's site, primarily arising from the indoor elements of the extraction system radiating through the external building fabric, with contributions arising from intermittent road traffic noise from the B4248 Garn Road. During the orchestrated shut down of the site, the noise environment was sustained by continuous industrial noise from the south west, with contributions arising from intermittent road traffic noise from the B4248 Garn Road.
MP2	An attended evening measurement of sound under free-field conditions, at a height of 1.5 metres above local ground level at a position representative of the NSR2 group of dwellings. During the attended measurements on the evening of Thursday 20th October 2022, the sound environment was sustained by continuous industrial noise from the west, unrelated to the Applicant's site, with contributions arising from occasional road traffic noise from Estate Road. During our time on-site, operational noise from Recover Blaenavon Limited was not audibly noticeable at this position, against the residual sound environment.

Figure 3: Measurement Positions



4.3. Summary Results

4.3.1. Attended Survey

Attended measurements were undertaken at MP1 and MP2 on Thursday 20th October 2022.

For the determination of the specific sound level, BS4142:2014+A1:2019 advises the following:

- *Measure the ambient sound level, distinguishing the specific sound from the residual sound. Minimize the influence of sound from other sources by measuring at times and during intervals when the residual sound has subsided to typically low levels.*
- *Measure the residual sound level in the absence of the specific sound.*
- *Correct for the effect of the residual sound by using the following formula:*

$$L_s = 10\lg(10^{L_a/10} - 10^{L_r/10})$$

where:
Ls is the specific sound level;
La is the ambient sound level; and
Lr is the residual sound level.

The calculated Specific Sound Level at the monitoring positions are presented in Table 4. Values have been rounded to the nearest whole number.

The measured L_{Aeq} sound levels for the attended periods are presented in a time-history graph in Appendix B.

TABLE 4: MEASURED SOUND LEVELS AND SPECIFIC SOUND LEVEL CALCULATIONS

Measurement Position	Measurement Description	dB(A)
MP1	Ambient Sound Level (18:40-19:10)	53
	Residual Sound Level (19:30-19:45)	44
	Specific Sound Level	**52**
MP2	Ambient Sound Level (20:20-20:35)	44
	Residual Sound Level (20:00-20:15)	44
	Specific Sound Level	-

It is noted that the Specific Sound Level at NSR1 (MP1) is calculated to be 52 dB(A).

It is not possible to determine the Specific Sound Level at NSR2 (MP2) by measurements alone. As with the ambient sound level ($L_{Aeq,T}$), it was noted that the background sound level ($L_{A90,T}$) remained the same during operational and non-operational periods at MP2. Subjectively, the noise from the site was not audible against the residual acoustic environment. Based on the above, it is concluded

that the noise from the site does not constitute any impact at NSR2, and therefore the assessment of impacts is focused on NSR1.

4.3.2. Unattended Survey

The summarised results of the long-term baseline environmental sound measurements undertaken at MP1, during non-operational periods of the week at Recover Blaenavon Limted are presented in Table 5. Values have been rounded to the nearest whole number.

The parameters reported are the average Equivalent Continuous Sound Level, $L_{Aeq,T}$, the statistical index (typical) Background Sound Level, $L_{A90,T}$, as well as the typical Maximum Sound Pressure Level, L_{AFmax}. An explanation of the sound units presented is given in Appendix A.

The measured L_{Aeq}, L_{AFmax}, and L_{AF90} sound levels are presented in a time-history graph in Appendix B, along with the statistical distribution of the measured background sound levels to derive the typical representative $L_{A90,T}$ values.

TABLE 5: SUMMARY OF BASELINE SOUND MEASUREMENT RESULTS

Measurement Position	Period	$L_{Aeq,T}$ (dB)	**$L_{AF90,T}$ (dB)**	L_{AFmax} (dB)
MP1 (Friday 21st October 15:00 to Monday 24th October 07:00)	Day	49	**43**	68
	Night	43	**36**	60

4.4. Assessment

4.4.1. Rating Penalty Principle

Section 9 of BS4142:2014+A1:2019 describes how the rating sound level should be derived from the specific sound level, by determining a rating penalty. BS4142:2014+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 specific sound level, which is discussed in Section 9.2 of BS4142:2014+A1:2019, which states:

"Where appropriate, establish a rating penalty for sound based on a subjective assessment of its characteristics. This would also be appropriate where a new source cannot be measured because it is only proposed at that time, but the characteristics of similar sources can subjectively be assessed.

Correct the specific sound level if a tone, impulse or other characteristics occurs, or is expected to be present, for new or modified sound sources."

BS4142:2014+A1:2019 defines four characteristics that should be considered when deriving a rating penalty, namely; tonality; impulsivity; intermittency; and other sound characteristics, which are defined as:

Tonality

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

Impulsivity

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

Intermittency

BS4142:2014+A1:2019 states that when the *"specific sound has identifiable on/off conditions, the specific sound level ought to be representative of the time period of length equal to the reference time interval which contains the greatest total amount of on time … if the intermittency is readily distinctive against the residual acoustic environment, a penalty of +3 dB can be applied."*

Other Sound Characteristics

BS4142:2014+A1:2019 states that where *"the specific sound features characteristics that are neither tonal nor impulsive, though otherwise are readily distinctive against the residual acoustic environment, a penalty of +3 dB can be applied."*

4.4.2. Rating Penalty Assessment

Considering the content of Section 4.4.1, an assessment of the sound sources associated with the Proposed Development, in terms of whether any rating penalties are applicable, and has been detailed in Table 6 below.

TABLE 6: RATING PENALTY ASSESSMENT

Source	Tonality	Impulsivity	Intermittency	Other Sound Characteristics	Discussion
General Operations	0 dB	0 dB	0 dB	3 dB	The prevailing noise source from the site is building breakout noise from the indoor extraction system. Contribution from the outdoor cooling units might have an influence although was not clearly distinctive during the attended measurements. Forklift movements were not audible at the NSR during the survey. The extraction system and the cooling plant operates continuously or on regular demand for long periods of time, therefore intermittency penalty is not applicable. The noise emissions were found to be fairly broadband with no subjectively distinguishable tonality or impulsivity. The specific sound, however, is readily distinctive against the residual acoustic environment, particularly during evening and night-time periods, so a penalty of +3 dB is applied

Consequently, a +3 dB acoustic feature correction has been applied with the assessment.

4.4.3. 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 measurement uncertainty factors outlined above have been considered and discussed in Table 7 below.

TABLE 7: MEASUREMENT UNCERTAINTY FACTORS

Measurement Uncertainty Factor Reference	Discussion
a)	Sound sources are fairly constant, hence no correction variability in sound emission from the source
b)	Residual acoustic environment is relatively constant, hence no correction for a complex residual acoustic environment.
d)	Measuring at a location representative of the closest affected receptors to the site has enabled the determination of robust ambient, residual and background sound levels.
g)	Measurement time intervals were set in accordance with BS4142:2014+A1:2019, hence no further correction needs to be made.
h)	Residual sound measurements were undertaken over a continuous 3-day period, including a weekend, and therefore is considered robust.
i)	Periods of wind and/or precipitation were logged using a wind and rain gauge on site; these periods have been excluded from the data set used to derive the representative background sound levels. An uncertainty factor of ±1 dB is considered therefore appropriate and proportional
k)	Measured values were rounded to 0.1 dB, therefore rounding would not have had a significant impact on the overall typical background sound levels.
l)	The acoustic measurement equipment accorded with Type 1 specification of British Standard 61672.

The overall uncertainty is considered to be small enough that it would not affect the conclusions of the assessment.

4.4.4. Rating Sound Level

Incorporating the rating penalties detailed in Section 4.4.2 with the derived specific sound level, as detailed in Table 4, the rating sound level has been derived and have been detailed in Table 8 below.

TABLE 8: RATING SOUND LEVELS

NSR	Specific Sound Level (dB)	Rating Sound Level (dB)
1	52	55

4.4.5. BS4142:2014+A1:2019 Assessment

The rating sound level, as calculated from the derived specific sound level, has been assessed in accordance with BS4142:2014+A1:2019, at the closest NSR.

The resultant assessment summary, during the daytime period, can be seen in Table 9 below.

TABLE 9: DAYTIME BS4142:2014+A1:2019 ASSESSMENT SUMMARY

Results	Sound Level (dB)	Notes
Specific Sound Level Daytime	52	As shown in Table 4
Rating Penalty	+3	As discussed in Table 6
Rating Sound Level Daytime	55	-
Daytime Background Sound Level	43	As shown in Table 5
Excess of Rating over Daytime Background Sound Level	+12	Assessment indicates a "**Significant Adverse Impact**".

The resultant assessment summary, during the night-time period, can be seen in Table 10 below.

TABLE 10: NIGHT-TIME BS4142:2014+A1:2019 ASSESSMENT SUMMARY

Results	Sound Level (dB)	Notes
Specific Sound Level Daytime	52	As shown in Table 4
Rating Penalty	+3	As discussed in Table 6
Rating Sound Level Daytime	55	-
Daytime Background Sound Level	36	As shown in Table 5
Excess of Rating over Daytime Background Sound Level	+19	Assessment indicates a "**Significant Adverse Impact**".

It can be seen that the operation of the site in its current form might give rise to a potentially *'Significant Adverse Impact'*, dependent upon the context, which is discussed below, including controls been in place or explored to prevent or minimise impact.

5. Context and Mitigation

5.1. Context

It is noted that Recover Blaenavon Limited is an established industrial facility in Blaenavon, which has been in operation for a number of years, apparently without noise complaints.

Previously they operated within the building immediately to the west (shown as 'Unit 2' in Figure 1). However, following a fire in 2021 that destroyed the facilities, that building has been demolished and the operator moved their operations into to the vacant building to the east, where it continues to operate. This has increased the distance to the most affected NSR (NSR1), thus potentially reducing the operational noise effects that they have historically become habituated to and accepted as a part of the industrial soundscape of the area.

5.2. Best Available Technology

5.2.1. Existing Operations

The site currently operates two forklift vehicles. While one of them is a diesel-powered forklift, the other one is electrically-powered, generating substantially lower levels of noise. Where only one forklift is necessary, the operator encourages the use of the electric unit.

All mechanical equipment is relatively new, regularly serviced and appropriately maintained.

The above measures are considered to represent a good demonstration of BAT.

5.2.2. Further Mitigation

It is acknowledged that upgrading the acoustic performance of the external building fabric is not a financially viable option, and unjustified as the site has been in operation for many years, apparently without noise complaints. Therefore, other more localised, pragmatic mitigations are recommended, where feasible.

The facilities are currently operated with three roller shutter doors on the east facade open due to the ingress and egress of the forklifts. It was noted that the doors on the 'Production Area' were more typically used by the forklift, with limited movements along the 'Storage Area'. Therefore, it was proposed that doors not regularly used are maintained in a closed position, as far as practicable. The operator has confirmed that they have requested quotes for auto open/close system on the doors to the manufacturing area and would look at its he financial feasibility in due course.

It was also noted that two small doors were kept open at the rear of the building. It was recommended that, where possible and not necessary for ventilation, these are kept closed. Following the site visit on 20th October 2022, the operator has confirmed that the doors to the rear have in fact been closed and continue to be when the plant is operational.

It was recommended that a trial is undertaken to assess whether the operating duty of the extraction system can be reduced, as long as it doesn't affect the functionality of the plant, potentially reducing noise generation from this source. Following the site visit on 20th October 2022, the operator has confirmed that the LEV/extraction system is running as designed, but it has been concluded that the design is defective in some areas so they have a new specialist coming in soon to do a professional inspection and recommend some changes.

After those changes are implemented, it is recommended that a new noise survey is carried out to quantify the effectiveness of the actions in terms of noise reduction.

It is also recommended that the existing diesel forklift is phased out in due course and replaced by an electric model.

Although a quantitative assessment in terms of accurate decibel reductions from the above measures is not possible with the currently available information, such a combination of measures would be considered to represent a good demonstration of BAT.

6. CONCLUSION

inacoustic has been commissioned to prepare a Noise Assessment for the Recover Blaenavon Limited operations at Kays & Kears Industrial Estate, Blaenavon, Pontypool, NP4 9AZ, for submission to Natural Resources Wales (NRW) as part of a Permit Application.

The assessment has identified that a *Significant Adverse Impact* might exist at one NSR in BS4142:2014+A1:2019 terms. However, the facilities have been in operation for a number of years, apparently without receiving noise complaints, and they have been moved in recent years further from the affected receptor, which has apparently become habituated to the wider industrial soundscape of the area.

The assessment indicates that when operated in the manner described in this report, the Site can be brought forward in compliance with the requirements of the Noise and Vibration Management: Environmental Permits, demonstrating BAT where possible, as outlined in Section 5.

In light of the above, it is considered that this report provides sufficient information to the grant the Application for a Permit for the Site.

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 11: 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 – Full Measurement Results

7.2.1. Monitoring Position 1

FIGURE 4: UNATTENDED BASELINE SOUND SURVEY AT MP1 (NSR1) – SITE NON-OPERATIONAL

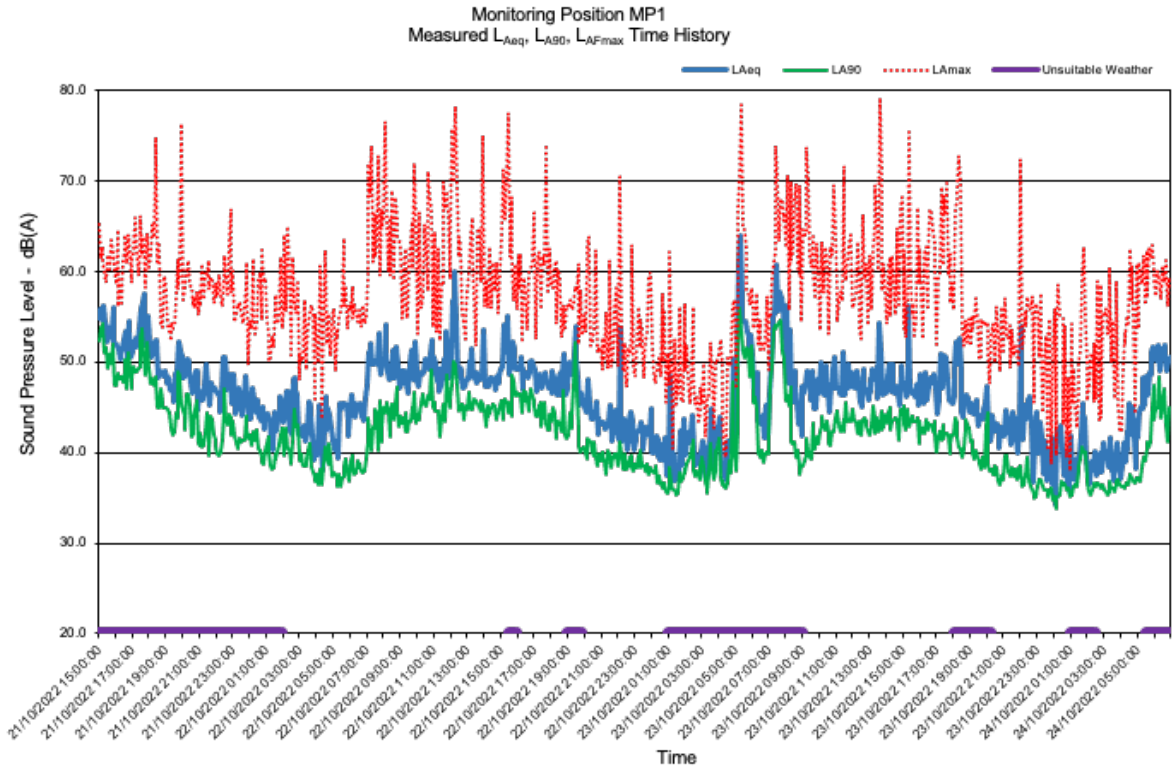


FIGURE 5: STATISTICAL ANALYSIS OF L_{A90} BACKGROUND – DAYTIME - MP1 – SITE NON-OPERATIONAL

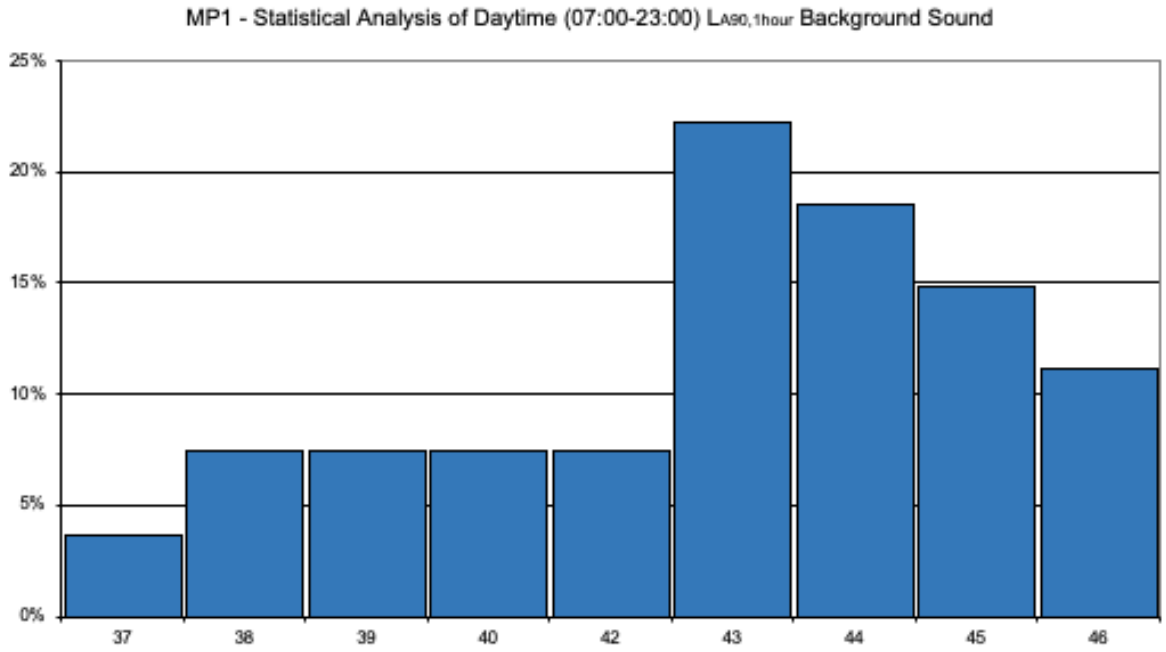


FIGURE 6: STATISTICAL ANALYSIS OF L_{A90} BACKGROUND – NIGHT-TIME - MP1 – SITE NON-OPERATIONAL

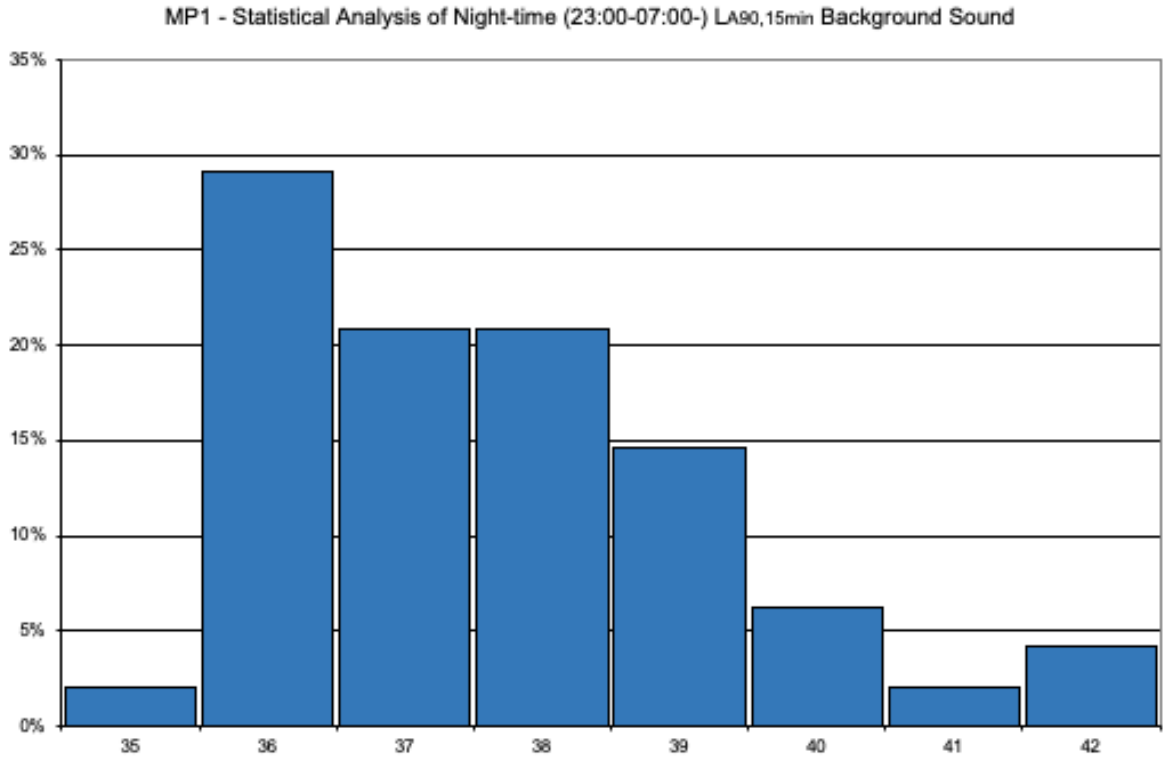
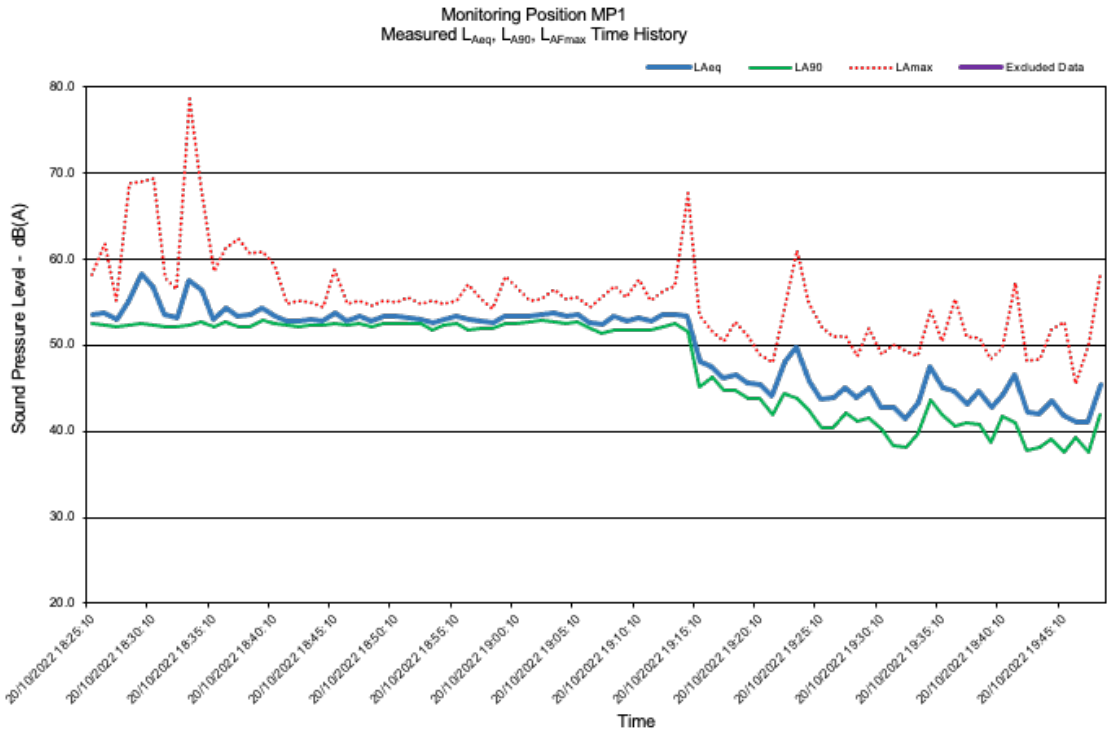
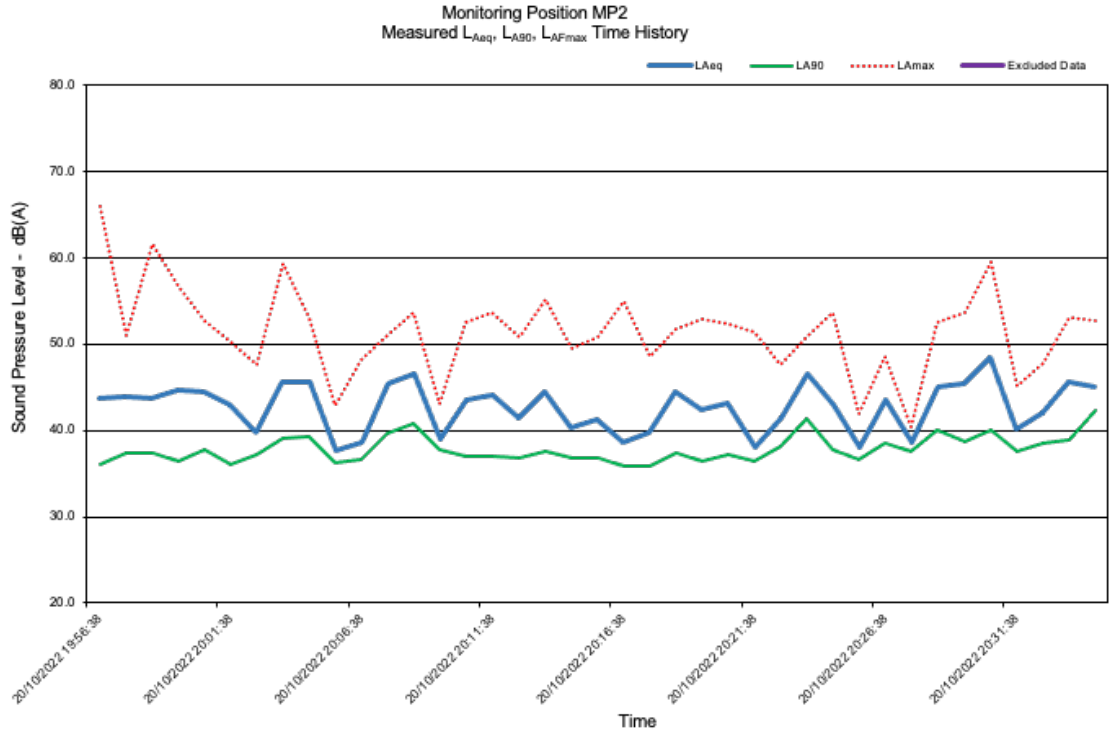


FIGURE 7: ATTENDED SOUND SURVEY AT MP1 (NSR1)



7.2.2. Monitoring Position 2

FIGURE 8: ATTENDED SOUND SURVEY AT MP2 (NSR2)



7.2.3. Weather Monitoring

TABLE 12: RAIN MONITORING

Time	Rain Event
21/10/2022 01:50	Yes
21/10/2022 03:02	Yes
21/10/2022 06:35	Yes
21/10/2022 06:40	Yes
21/10/2022 07:00	Yes
21/10/2022 07:15	Yes
21/10/2022 09:32	Yes
21/10/2022 09:34	Yes
21/10/2022 09:35	Yes
21/10/2022 09:36	Yes
21/10/2022 09:45	Yes
21/10/2022 11:15	Yes
21/10/2022 11:21	Yes
21/10/2022 11:22	Yes
21/10/2022 11:23	Yes
21/10/2022 11:26	Yes
21/10/2022 12:41	Yes
21/10/2022 12:52	Yes
21/10/2022 12:58	Yes
21/10/2022 13:00	Yes
21/10/2022 13:02	Yes
21/10/2022 13:05	Yes
21/10/2022 13:35	Yes
21/10/2022 14:57	Yes
21/10/2022 15:10	Yes
21/10/2022 15:14	Yes
21/10/2022 15:18	Yes
21/10/2022 15:20	Yes
21/10/2022 15:22	Yes
21/10/2022 15:23	Yes
21/10/2022 15:28	Yes
21/10/2022 15:29	Yes
21/10/2022 15:33	Yes
21/10/2022 15:37	Yes
21/10/2022 15:47	Yes
21/10/2022 15:51	Yes
21/10/2022 15:53	Yes
21/10/2022 15:54	Yes
21/10/2022 15:57	Yes
21/10/2022 15:58	Yes
21/10/2022 16:09	Yes
21/10/2022 16:46	Yes

21/10/2022 17:09	Yes
21/10/2022 17:22	Yes
21/10/2022 17:29	Yes
21/10/2022 17:33	Yes
21/10/2022 17:35	Yes
21/10/2022 17:38	Yes
21/10/2022 17:40	Yes
21/10/2022 17:41	Yes
21/10/2022 17:42	Yes
21/10/2022 17:43	Yes
21/10/2022 17:44	Yes
21/10/2022 17:45	Yes
21/10/2022 17:46	Yes
21/10/2022 17:51	Yes
21/10/2022 17:53	Yes
21/10/2022 17:54	Yes
21/10/2022 17:57	Yes
21/10/2022 17:59	Yes
21/10/2022 18:02	Yes
21/10/2022 18:09	Yes
21/10/2022 18:31	Yes
21/10/2022 18:43	Yes
21/10/2022 18:48	Yes
21/10/2022 18:51	Yes
21/10/2022 18:57	Yes
21/10/2022 19:05	Yes
21/10/2022 19:14	Yes
21/10/2022 19:38	Yes
21/10/2022 19:49	Yes
21/10/2022 19:50	Yes
21/10/2022 19:53	Yes
21/10/2022 19:55	Yes
21/10/2022 20:09	Yes
21/10/2022 20:48	Yes
21/10/2022 20:51	Yes
21/10/2022 21:51	Yes
21/10/2022 22:26	Yes
21/10/2022 23:14	Yes
21/10/2022 23:27	Yes
22/10/2022 00:07	Yes
22/10/2022 00:29	Yes
22/10/2022 01:08	Yes
22/10/2022 01:52	Yes
22/10/2022 15:42	Yes
22/10/2022 15:50	Yes
22/10/2022 15:51	Yes
22/10/2022 18:56	Yes

22/10/2022 19:10	Yes
22/10/2022 19:23	Yes
22/10/2022 19:28	Yes
22/10/2022 19:32	Yes
22/10/2022 19:34	Yes
23/10/2022 01:09	Yes
23/10/2022 02:15	Yes
23/10/2022 03:58	Yes
23/10/2022 04:48	Yes
23/10/2022 05:06	Yes
23/10/2022 05:12	Yes
23/10/2022 05:14	Yes
23/10/2022 05:15	Yes
23/10/2022 05:16	Yes
23/10/2022 05:17	Yes
23/10/2022 05:18	Yes
23/10/2022 05:19	Yes
23/10/2022 05:20	Yes
23/10/2022 05:21	Yes
23/10/2022 05:22	Yes
23/10/2022 05:23	Yes
23/10/2022 05:24	Yes
23/10/2022 05:26	Yes
23/10/2022 05:28	Yes
23/10/2022 05:29	Yes
23/10/2022 05:33	Yes
23/10/2022 05:34	Yes
23/10/2022 05:38	Yes
23/10/2022 05:40	Yes
23/10/2022 05:43	Yes
23/10/2022 05:44	Yes
23/10/2022 05:47	Yes
23/10/2022 05:49	Yes
23/10/2022 05:53	Yes
23/10/2022 06:01	Yes
23/10/2022 06:03	Yes
23/10/2022 06:11	Yes
23/10/2022 06:17	Yes
23/10/2022 07:03	Yes
23/10/2022 07:12	Yes
23/10/2022 07:17	Yes
23/10/2022 07:19	Yes
23/10/2022 07:21	Yes
23/10/2022 07:23	Yes
23/10/2022 07:26	Yes
23/10/2022 07:28	Yes
23/10/2022 07:31	Yes

23/10/2022 07:33	Yes
23/10/2022 07:36	Yes
23/10/2022 07:38	Yes
23/10/2022 07:41	Yes
23/10/2022 07:43	Yes
23/10/2022 07:45	Yes
23/10/2022 07:47	Yes
23/10/2022 07:50	Yes
23/10/2022 07:54	Yes
23/10/2022 08:00	Yes
23/10/2022 08:05	Yes
23/10/2022 08:18	Yes
23/10/2022 08:22	Yes
23/10/2022 18:09	Yes
23/10/2022 19:03	Yes
23/10/2022 20:03	Yes
23/10/2022 20:05	Yes
24/10/2022 01:19	Yes
24/10/2022 01:29	Yes
24/10/2022 01:40	Yes
24/10/2022 01:43	Yes
24/10/2022 01:54	Yes
24/10/2022 02:12	Yes
24/10/2022 05:33	Yes
24/10/2022 05:57	Yes
24/10/2022 06:13	Yes
24/10/2022 06:20	Yes
24/10/2022 06:30	Yes
24/10/2022 06:39	Yes
24/10/2022 09:35	Yes
24/10/2022 09:55	Yes

TABLE 13: WIND MONITORING

Time	Wind Direction	Wind Speed (m/s)
20/10/2022 18:00:00	196.85	0.35
20/10/2022 18:15:00	106.39	0.27
20/10/2022 18:30:00	83.63	0.40
20/10/2022 18:45:00	128.80	0.26
20/10/2022 19:00:00	150.36	0.59
20/10/2022 19:15:00	207.71	0.69
20/10/2022 19:30:00	134.85	0.70
20/10/2022 19:45:00	95.72	0.57
20/10/2022 20:00:00	81.17	0.56
20/10/2022 20:15:00	157.56	0.71
20/10/2022 20:30:00	241.20	0.88
20/10/2022 20:45:00	229.13	0.65
20/10/2022 21:00:00	195.54	0.58
20/10/2022 21:15:00	194.09	0.69
20/10/2022 21:30:00	141.39	0.66
20/10/2022 21:45:00	82.34	0.71
20/10/2022 22:00:00	99.80	0.60
20/10/2022 22:15:00	78.31	0.79
20/10/2022 22:30:00	76.49	0.82
20/10/2022 22:45:00	68.20	0.68
20/10/2022 23:00:00	76.58	0.68
20/10/2022 23:15:00	76.74	0.45
20/10/2022 23:30:00	75.87	0.66
20/10/2022 23:45:00	73.11	0.64
21/10/2022 00:00:00	82.18	0.64
21/10/2022 00:15:00	82.67	0.63
21/10/2022 00:30:00	84.36	0.70
21/10/2022 00:45:00	83.71	0.63
21/10/2022 01:00:00	81.64	0.70
21/10/2022 01:15:00	84.80	0.66
21/10/2022 01:30:00	90.68	0.68
21/10/2022 01:45:00	103.05	0.66
21/10/2022 02:00:00	76.39	0.86
21/10/2022 02:15:00	76.29	0.82
21/10/2022 02:30:00	75.06	0.77
21/10/2022 02:45:00	148.84	0.59
21/10/2022 03:00:00	77.67	0.80
21/10/2022 03:15:00	91.01	0.51
21/10/2022 03:30:00	77.58	0.89
21/10/2022 03:45:00	76.22	0.78
21/10/2022 04:00:00	73.36	0.96
21/10/2022 04:15:00	72.80	0.76
21/10/2022 04:30:00	80.07	0.80

21/10/2022 04:45:00	71.29	0.77
21/10/2022 05:00:00	77.09	0.85
21/10/2022 05:15:00	79.61	0.89
21/10/2022 05:30:00	129.07	0.81
21/10/2022 05:45:00	109.31	1.22
21/10/2022 06:00:00	123.42	1.19
21/10/2022 06:15:00	191.39	1.14
21/10/2022 06:30:00	160.37	1.29
21/10/2022 06:45:00	191.08	1.25
21/10/2022 07:00:00	144.53	1.22
21/10/2022 07:15:00	185.58	1.35
21/10/2022 07:30:00	192.03	1.34
21/10/2022 07:45:00	177.05	1.56
21/10/2022 08:00:00	201.97	1.58
21/10/2022 08:15:00	201.89	1.34
21/10/2022 08:30:00	177.16	1.65
21/10/2022 08:45:00	182.35	1.49
21/10/2022 09:00:00	188.62	1.76
21/10/2022 09:15:00	195.41	1.35
21/10/2022 09:30:00	208.91	1.52
21/10/2022 09:45:00	183.76	1.60
21/10/2022 10:00:00	216.79	1.44
21/10/2022 10:15:00	232.62	1.60
21/10/2022 10:30:00	211.21	1.41
21/10/2022 10:45:00	195.68	1.33
21/10/2022 11:00:00	218.49	1.31
21/10/2022 11:15:00	189.81	1.51
21/10/2022 11:30:00	212.19	1.29
21/10/2022 11:45:00	217.86	1.56
21/10/2022 12:00:00	189.91	1.33
21/10/2022 12:15:00	155.72	1.40
21/10/2022 12:30:00	169.94	1.50
21/10/2022 12:45:00	198.50	1.70
21/10/2022 13:00:00	224.63	1.78
21/10/2022 13:15:00	229.60	2.48
21/10/2022 13:30:00	239.87	2.10
21/10/2022 13:45:00	225.49	1.62
21/10/2022 14:00:00	204.58	1.51
21/10/2022 14:15:00	197.63	1.60
21/10/2022 14:30:00	195.31	1.39
21/10/2022 14:45:00	203.18	1.47
21/10/2022 15:00:00	183.71	1.34
21/10/2022 15:15:00	152.06	1.22
21/10/2022 15:30:00	122.94	1.35
21/10/2022 15:45:00	163.26	1.32
21/10/2022 16:00:00	124.24	1.35
21/10/2022 16:15:00	215.50	1.48

21/10/2022 16:30:00	227.06	1.97
21/10/2022 16:45:00	225.84	1.84
21/10/2022 17:00:00	223.36	1.53
21/10/2022 17:15:00	203.69	1.56
21/10/2022 17:30:00	205.36	1.09
21/10/2022 17:45:00	136.09	1.16
21/10/2022 18:00:00	152.87	1.42
21/10/2022 18:15:00	211.53	1.82
21/10/2022 18:30:00	229.42	1.66
21/10/2022 18:45:00	242.07	1.72
21/10/2022 19:00:00	227.58	1.66
21/10/2022 19:15:00	225.98	1.78
21/10/2022 19:30:00	235.78	2.60
21/10/2022 19:45:00	224.17	3.34
21/10/2022 20:00:00	227.02	3.83
21/10/2022 20:15:00	232.69	3.95
21/10/2022 20:30:00	227.93	3.69
21/10/2022 20:45:00	224.49	3.74
21/10/2022 21:00:00	226.60	3.24
21/10/2022 21:15:00	234.94	3.66
21/10/2022 21:30:00	225.64	3.80
21/10/2022 21:45:00	227.91	3.54
21/10/2022 22:00:00	232.61	3.55
21/10/2022 22:15:00	231.56	3.31
21/10/2022 22:30:00	224.71	3.98
21/10/2022 22:45:00	223.89	3.96
21/10/2022 23:00:00	222.81	3.79
21/10/2022 23:15:00	223.69	3.19
21/10/2022 23:30:00	222.98	3.60
21/10/2022 23:45:00	227.54	3.84
22/10/2022 00:00:00	230.26	3.36
22/10/2022 00:15:00	229.03	3.48
22/10/2022 00:30:00	231.25	3.83
22/10/2022 00:45:00	235.01	3.77
22/10/2022 01:00:00	226.23	4.10
22/10/2022 01:15:00	232.04	3.32
22/10/2022 01:30:00	233.24	3.52
22/10/2022 01:45:00	240.62	3.88
22/10/2022 02:00:00	243.58	4.31
22/10/2022 02:15:00	252.32	4.08
22/10/2022 02:30:00	240.04	4.13
22/10/2022 02:45:00	242.32	4.73
22/10/2022 03:00:00	242.32	4.06
22/10/2022 03:15:00	235.48	3.52
22/10/2022 03:30:00	241.15	4.08
22/10/2022 03:45:00	246.45	3.53
22/10/2022 04:00:00	249.08	3.10

22/10/2022 04:15:00	240.19	3.57
22/10/2022 04:30:00	235.37	3.43
22/10/2022 04:45:00	237.31	4.35
22/10/2022 05:00:00	240.47	3.16
22/10/2022 05:15:00	239.02	3.11
22/10/2022 05:30:00	235.53	2.48
22/10/2022 05:45:00	230.84	2.73
22/10/2022 06:00:00	228.67	2.46
22/10/2022 06:15:00	232.38	2.59
22/10/2022 06:30:00	232.30	2.99
22/10/2022 06:45:00	223.05	2.17
22/10/2022 07:00:00	228.46	2.20
22/10/2022 07:15:00	222.89	2.60
22/10/2022 07:30:00	227.32	2.51
22/10/2022 07:45:00	226.92	1.90
22/10/2022 08:00:00	229.19	2.54
22/10/2022 08:15:00	223.21	2.54
22/10/2022 08:30:00	222.77	2.51
22/10/2022 08:45:00	228.33	2.18
22/10/2022 09:00:00	224.25	1.99
22/10/2022 09:15:00	228.58	2.22
22/10/2022 09:30:00	224.26	2.12
22/10/2022 09:45:00	225.36	2.35
22/10/2022 10:00:00	223.99	2.34
22/10/2022 10:15:00	223.79	2.74
22/10/2022 10:30:00	227.43	2.69
22/10/2022 10:45:00	220.39	2.49
22/10/2022 11:00:00	229.89	2.40
22/10/2022 11:15:00	222.97	1.83
22/10/2022 11:30:00	218.99	1.75
22/10/2022 11:45:00	224.60	2.44
22/10/2022 12:00:00	226.89	2.56
22/10/2022 12:15:00	221.07	2.27
22/10/2022 12:30:00	216.68	1.68
22/10/2022 12:45:00	230.09	1.66
22/10/2022 13:00:00	221.61	1.88
22/10/2022 13:15:00	237.61	1.76
22/10/2022 13:30:00	227.69	2.06
22/10/2022 13:45:00	224.34	1.98
22/10/2022 14:00:00	233.39	2.01
22/10/2022 14:15:00	230.46	1.75
22/10/2022 14:30:00	231.84	1.75
22/10/2022 14:45:00	238.19	1.47
22/10/2022 15:00:00	244.08	1.34
22/10/2022 15:15:00	240.09	1.39
22/10/2022 15:30:00	219.78	1.11
22/10/2022 15:45:00	216.95	0.98

22/10/2022 16:00:00	213.83	0.93
22/10/2022 16:15:00	239.80	0.97
22/10/2022 16:30:00	213.95	1.24
22/10/2022 16:45:00	217.53	1.06
22/10/2022 17:00:00	219.33	1.10
22/10/2022 17:15:00	228.88	1.02
22/10/2022 17:30:00	235.41	1.01
22/10/2022 17:45:00	230.82	0.98
22/10/2022 18:00:00	229.03	1.47
22/10/2022 18:15:00	244.69	1.40
22/10/2022 18:30:00	243.87	1.24
22/10/2022 18:45:00	228.92	1.44
22/10/2022 19:00:00	231.73	1.59
22/10/2022 19:15:00	226.14	1.26
22/10/2022 19:30:00	222.43	1.26
22/10/2022 19:45:00	235.90	1.36
22/10/2022 20:00:00	243.45	1.24
22/10/2022 20:15:00	241.83	1.08
22/10/2022 20:30:00	212.95	0.74
22/10/2022 20:45:00	244.61	0.85
22/10/2022 21:00:00	223.44	1.10
22/10/2022 21:15:00	232.72	0.78
22/10/2022 21:30:00	232.00	1.05
22/10/2022 21:45:00	254.19	1.09
22/10/2022 22:00:00	241.76	1.22
22/10/2022 22:15:00	250.04	1.02
22/10/2022 22:30:00	206.67	0.72
22/10/2022 22:45:00	208.98	0.82
22/10/2022 23:00:00	183.46	0.86
22/10/2022 23:15:00	137.32	0.74
22/10/2022 23:30:00	108.39	0.67
22/10/2022 23:45:00	127.96	0.81
23/10/2022 00:00:00	150.87	0.79
23/10/2022 00:15:00	108.31	0.83
23/10/2022 00:30:00	87.85	0.79
23/10/2022 00:45:00	83.89	0.82
23/10/2022 01:00:00	91.16	0.84
23/10/2022 01:15:00	125.29	0.63
23/10/2022 01:30:00	158.85	0.58
23/10/2022 01:45:00	79.79	0.89
23/10/2022 02:00:00	79.38	0.94
23/10/2022 02:15:00	116.75	0.94
23/10/2022 02:30:00	93.68	0.97
23/10/2022 02:45:00	67.68	0.82
23/10/2022 03:00:00	120.06	0.77
23/10/2022 03:15:00	79.41	0.83
23/10/2022 03:30:00	77.98	0.87

23/10/2022 03:45:00	88.71	0.89
23/10/2022 04:00:00	92.00	0.54
23/10/2022 04:15:00	77.34	0.75
23/10/2022 04:30:00	77.42	0.79
23/10/2022 04:45:00	74.94	0.94
23/10/2022 05:00:00	107.63	0.57
23/10/2022 05:15:00	140.66	0.93
23/10/2022 05:30:00	135.01	1.47
23/10/2022 05:45:00	107.79	0.97
23/10/2022 06:00:00	79.16	0.75
23/10/2022 06:15:00	92.02	1.00
23/10/2022 06:30:00	92.38	1.06
23/10/2022 06:45:00	83.69	0.98
23/10/2022 07:00:00	82.01	1.05
23/10/2022 07:15:00	79.03	0.85
23/10/2022 07:30:00	82.74	0.98
23/10/2022 07:45:00	91.41	0.97
23/10/2022 08:00:00	84.08	1.03
23/10/2022 08:15:00	85.27	1.42
23/10/2022 08:30:00	93.08	1.30
23/10/2022 08:45:00	96.64	1.24
23/10/2022 09:00:00	102.98	1.00
23/10/2022 09:15:00	117.19	0.82
23/10/2022 09:30:00	143.84	0.65
23/10/2022 09:45:00	141.96	0.69
23/10/2022 10:00:00	98.18	0.73
23/10/2022 10:15:00	102.89	0.62
23/10/2022 10:30:00	81.22	0.72
23/10/2022 10:45:00	110.88	0.70
23/10/2022 11:00:00	129.81	0.83
23/10/2022 11:15:00	111.42	1.05
23/10/2022 11:30:00	143.19	0.99
23/10/2022 11:45:00	141.25	0.79
23/10/2022 12:00:00	137.13	0.89
23/10/2022 12:15:00	159.12	0.84
23/10/2022 12:30:00	135.04	0.59
23/10/2022 12:45:00	124.89	0.76
23/10/2022 13:00:00	111.25	0.77
23/10/2022 13:15:00	101.93	0.63
23/10/2022 13:30:00	118.01	0.87
23/10/2022 13:45:00	156.86	0.92
23/10/2022 14:00:00	169.11	0.91
23/10/2022 14:15:00	135.24	1.09
23/10/2022 14:30:00	165.32	0.92
23/10/2022 14:45:00	177.27	1.01
23/10/2022 15:00:00	231.61	1.10
23/10/2022 15:15:00	171.51	1.11

23/10/2022 15:30:00	176.89	1.00
23/10/2022 15:45:00	187.63	0.76
23/10/2022 16:00:00	189.30	0.65
23/10/2022 16:15:00	190.56	0.64
23/10/2022 16:30:00	149.73	0.67
23/10/2022 16:45:00	154.48	0.66
23/10/2022 17:00:00	126.75	0.56
23/10/2022 17:15:00	134.96	0.74
23/10/2022 17:30:00	120.64	0.54
23/10/2022 17:45:00	232.79	0.73
23/10/2022 18:00:00	174.34	0.83
23/10/2022 18:15:00	51.70	1.13
23/10/2022 18:30:00	72.54	0.99
23/10/2022 18:45:00	95.72	0.53
23/10/2022 19:00:00	60.33	0.62
23/10/2022 19:15:00	118.54	0.81
23/10/2022 19:30:00	59.60	0.41
23/10/2022 19:45:00	124.58	0.25
23/10/2022 20:00:00	124.22	0.71
23/10/2022 20:15:00	83.44	0.54
23/10/2022 20:30:00	76.70	0.55
23/10/2022 20:45:00	133.79	0.59
23/10/2022 21:00:00	70.97	0.57
23/10/2022 21:15:00	115.52	0.38
23/10/2022 21:30:00	188.02	0.36
23/10/2022 21:45:00	78.42	0.42
23/10/2022 22:00:00	173.19	0.61
23/10/2022 22:15:00	258.24	0.72
23/10/2022 22:30:00	305.95	0.74
23/10/2022 22:45:00	309.59	1.00
23/10/2022 23:00:00	223.25	0.90
23/10/2022 23:15:00	72.36	0.76
23/10/2022 23:30:00	148.87	0.40
23/10/2022 23:45:00	159.96	0.96
24/10/2022 00:00:00	264.04	0.91
24/10/2022 00:15:00	257.81	0.91
24/10/2022 00:30:00	208.80	1.43
24/10/2022 00:45:00	321.76	1.57
24/10/2022 01:00:00	317.53	1.45
24/10/2022 01:15:00	267.58	1.96
24/10/2022 01:30:00	271.98	2.74
24/10/2022 01:45:00	275.27	3.53
24/10/2022 02:00:00	284.71	2.64
24/10/2022 02:15:00	284.83	3.07
24/10/2022 02:30:00	281.82	2.93
24/10/2022 02:45:00	275.37	3.22
24/10/2022 03:00:00	274.18	2.80

24/10/2022 03:15:00	270.50	2.76
24/10/2022 03:30:00	262.24	2.84
24/10/2022 03:45:00	262.02	3.21
24/10/2022 04:00:00	261.87	3.43
24/10/2022 04:15:00	260.89	3.12
24/10/2022 04:30:00	260.13	3.41
24/10/2022 04:45:00	257.13	3.25
24/10/2022 05:00:00	254.06	3.28
24/10/2022 05:15:00	255.82	2.56
24/10/2022 05:30:00	249.49	2.94
24/10/2022 05:45:00	251.71	3.27
24/10/2022 06:00:00	247.21	3.21
24/10/2022 06:15:00	239.88	2.81
24/10/2022 06:30:00	244.71	2.73
24/10/2022 06:45:00	254.72	2.83
24/10/2022 07:00:00	250.48	2.70
24/10/2022 07:15:00	247.47	2.73
24/10/2022 07:30:00	242.82	2.55
24/10/2022 07:45:00	239.93	2.94
24/10/2022 08:00:00	240.65	3.01
24/10/2022 08:15:00	238.60	2.30
24/10/2022 08:30:00	226.74	2.21
24/10/2022 08:45:00	233.58	2.98
24/10/2022 09:00:00	230.01	3.16
24/10/2022 09:15:00	229.49	2.89
24/10/2022 09:30:00	226.18	2.89
24/10/2022 09:45:00	1049.71	2.39

7.3. Appendix C – Qualifications etc

The company is directed and led by Antony Best BSc (Hons) MIOA. Victor Valeron BEng MSc MIOA is Technical Director. They have a combined experience of over 30 years in the acoustic industry; covering a range of project types and assessment scenarios, including numerous submissions to the Environment Agency.

Victor Valeron BEng MSc MIOA, produced this report, and it was reviewed by Antony Best BSc (Hons) MIOA. The on-site noise measurement works were undertaken Victor Valeron.

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 (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 Victor Valeron

- MSc in Architectural and Environmental Acoustics from La Salle Ramon Llull University
- Corporate Member of the Institute of Acoustics

Professional Experience for Victor Valeron

- 2021 to Present inacoustic (Technical Director)
- 2020 to 2021 Sweco (Principal Acoustic Consultant)
- 2014 to 2020 MLM Group (Principal Acoustic Consultant)
- 2012 to 2014 Innovate Acoustics (Senior Acoustic Consultant)
- 2009 to 2012 i2A Acoustic & Audiovisual Engineering
- 2007 to 2009 Notson Acustica
- 2006 to 2007 Audioscan

7.4. Appendix D – Calibration Certificates

CERTIFICATE OF CALIBRATION

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

DATE OF ISSUE: 14 December 2020 CERTIFICATE NUMBER: **1107106**

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

CERT No 10045223

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Page 1 of 3

Approved Signatory

Electronically Authorised Document

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

Customer	**INACOUSTIC**
Order No	**CAL20-FINAL**
Equipment Description	**SOUND LEVEL METER**
Manufacturer	**RION CO LTD**
Model	**NL-31**
Serial No	**00110040**
Ident No	**320/00354**
Date Of Calibration	**14 DECEMBER 2020**

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 22ºC ± 3ºC and 45% ± 15% RH.

PROCEDURE

Measurements were performed in accordance with the in house laboratory procedure 5970
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 return the instrument to the original stated manufacturer's specification and accuracy where known.

CERTIFICATE OF CALIBRATION

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

DATE OF ISSUE: 23 August 2022 CERTIFICATE NUMBER: **1131626**

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

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- ☐ R J WADE
- ☐ M FOY
- ☐ M A FROST
- ☒ M S PARDOE

Customer	**INACOUSTIC**
Order No	**CAL22-LW-BRIS-82506**
Equipment Description	**ACOUSTIC CALIBRATOR**
Manufacturer	**CIRRUS RESEARCH PLC**
Model	**CR:515**
Serial No	**82506**
Ident No	**NOT KNOWN**
Date Of Calibration	**23 AUGUST 2022**

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 2124
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 | **cymru**
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