BYASS WORKS WASTE TRANSFER FACILITY

NOISE MANAGEMENT PLAN (NMP)

Report Number 2099r7v2d1022

Operator: AWD (Group) Ltd
Facility: Byass Works, The Docks, Port Talbot, SA13 1RS
Permit reference: EPR/AB3895CN
Waste returns reference: EPR/AB3895CN

EMS Version	Date	Author	Checked	Version
Bespoke Permit Application	April 2022	Geotechnology	AWD	1
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OCTOBER 2022

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1 INTRODUCTION

1.1 Objectives of Plan

The aim of this Noise Management Plan (NMP) is to integrate the findings of a Noise Impact Assessment (NIA) undertaken for AWD by Inacoustic into day-to-day operation of the site. The assessment identifies noise sources at the site and the plan documents the measures to be taken to ensure that noise continues to not cause problems or annoyance to potentially sensitive receptors.

Horizontal Guidance Note H3 (now withdrawn) titled *Noise Assessment and Control* provided a noise management plan template that set out some of the information expected by NRW to be in a management plan. This plan is based on that template and also the new EA guidance titled *Noise and Vibration Management: environmental permits*, which was updated in January 2022 and replaces H3.

1.2 Management Commitment

AWD recognises that the operation, at times, has the potential to be a source of noise and that it is the responsibility of management to control the potential impact. This will be done by implementation of a safe and well maintained operation, daily checks and developing good relationships with neighbours.

AWD is committed to ensuring that the waste activity and any subcontractors working at the site use noise control equipment that is designed, operated and maintained appropriately so it controls noise effectively at all times.

AWD also recognises that no NMP can cover every eventuality and so management will review the effectiveness of the NMP annually.

1.3 Overview of Conditions

The NIA undertaken by Inacoustic is provided in Appendix 1. This was undertaken at a time when the site was fully functioning apart from the acceptance of roll grinding solids and the processing of paint tin. This survey indicates that the site can be operated in an acoustically sympathetic manner and is not deemed to be audibly intrusive at the closest receptors. To ensure this remains the case the site is to be operated in accordance with an EMS with specific measures to control noise.

2 POTENTIAL NOISE SOURCES

2.1 Location of On-site Noise Sources

AWD recognises that preventing or controlling noise at source is usually the most appropriate and cost-effective way of protecting and improving the environment. For example, rather than retro-fitting noise barriers to reduce a noise problem, AWD would:

- buy quiet equipment
- keep it well maintained
- site it as far away from noise sensitive receptors (NSRs) as possible

Within this context, some of the main sources of noise at the site have been located within buildings and all plant and infrastructure is subject to a preventative maintenance programme. Baling, size separation and separation of different types / sizes of plastic using a float / sink system with granulation is undertaken indoors whilst telehandlers, a fork- lift truck and manual picking is used to sort waste into external temporary storage. Inert concrete / brick is infrequently screened externally for short periods in Byass 2. This is undertaken as far as possible away from northwestern site boundary.

Apart from the external storage of grinding solids and the internal storage and separation of paint tins and float / sink system in Byass 1, all of the other activities (screening, baling, waste handling, plastics separation) have been ongoing for several years under Standard Rules Permit. During this time there have been no formal complaints related to noise and noise has not been identified as an issue by NRW officers during several site inspections.

2.2 Other noise sources

There are other noise sources within the area. These include:

- 24hr vehicular movements and external ordering of food via intercom system at fast food outlet on opposite side of river, directly adjacent to residential properties
- Vehicular noise associated with surrounding main roads, M4 and railway line
- Tyre changing facility using air powered tools
- Plant hire company
- Materials handling at commercial and industrial units including builders yards
- Steelworks to southeast
- River Afan and weir

3 SITE CONTEXT

3.1 Site Location

The site is located between the densely populated residential areas of Aberfan and Port Talbot. Aberavon is some 200m to the west and Port Talbot 250m to the northeast. The closest residential properties are ~75m northwest of the northern site boundary, on the opposite side of the River Afan.

Between the site and the residential areas to the north and northeast are a range of industrial and commercial operations on Harbourside Industrial Estate including a builders yard, open ground and an adjacent site where soil appears to have been placed without regulatory control. To the East is vacant brownfield land and Harbourside Law Courts, to the south are commercial units and another builders yard and to the southwest, a plant hire company. As shown on the aerial imagery in Plates 3-1 and 3-2 a series of main roads serve and pass through the industrial estate and the main Swansea to London railway runs east to west ~250m north of the site. The M4 motorway is to the north of Port Talbot and 900m from the site. The River Afan runs north to south past the western site boundary. Between the boundary and the river, a distance of ~15m, is a public footpath and control system associated with a weir diverting surface water to the docks to the south.

The site is adjoined to other industrial units that are currently vacant and where fly-tipping is occurring. Key sensitive features, receptors and off-site noise sources are shown on Plates 3-1 and 3-2. Port Talbot steelworks is just off the map shown in Plate 3-2, to the southeast.

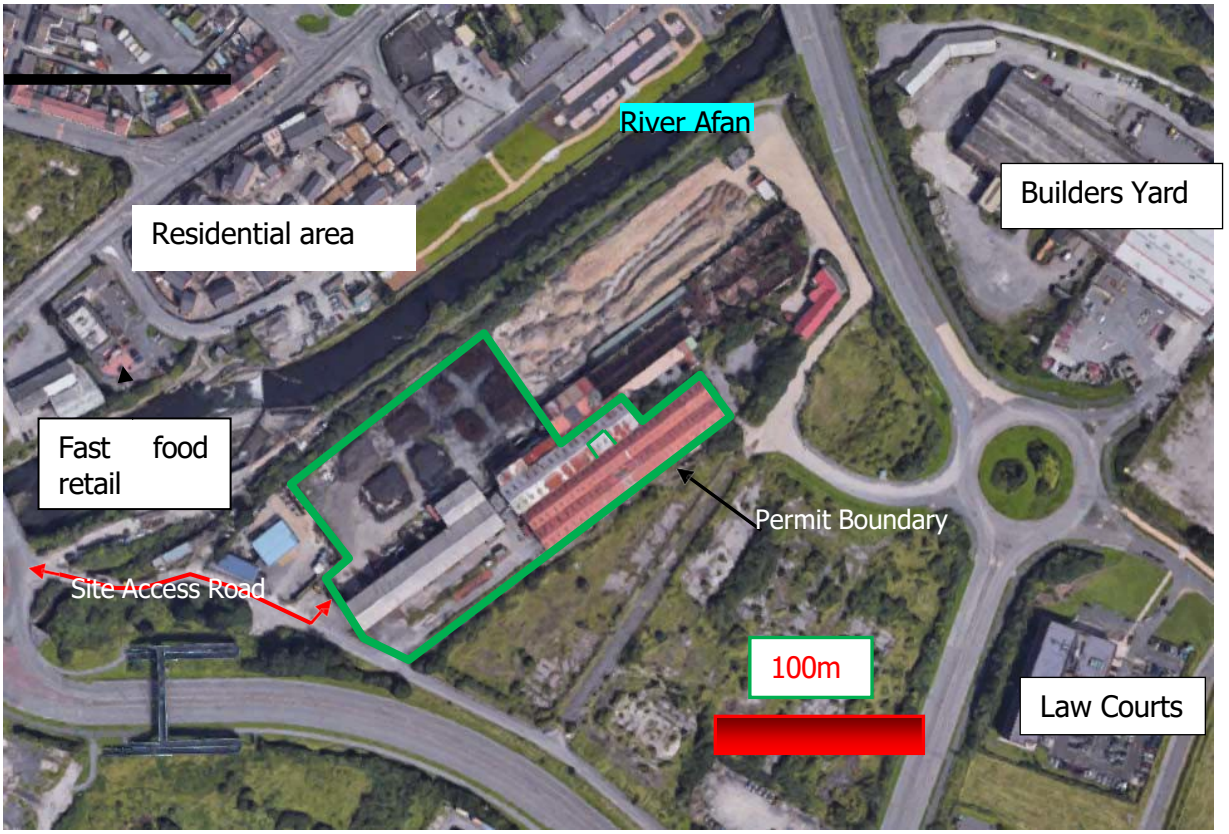

Plate 3-1 Aerial photograph of site and surrounding area

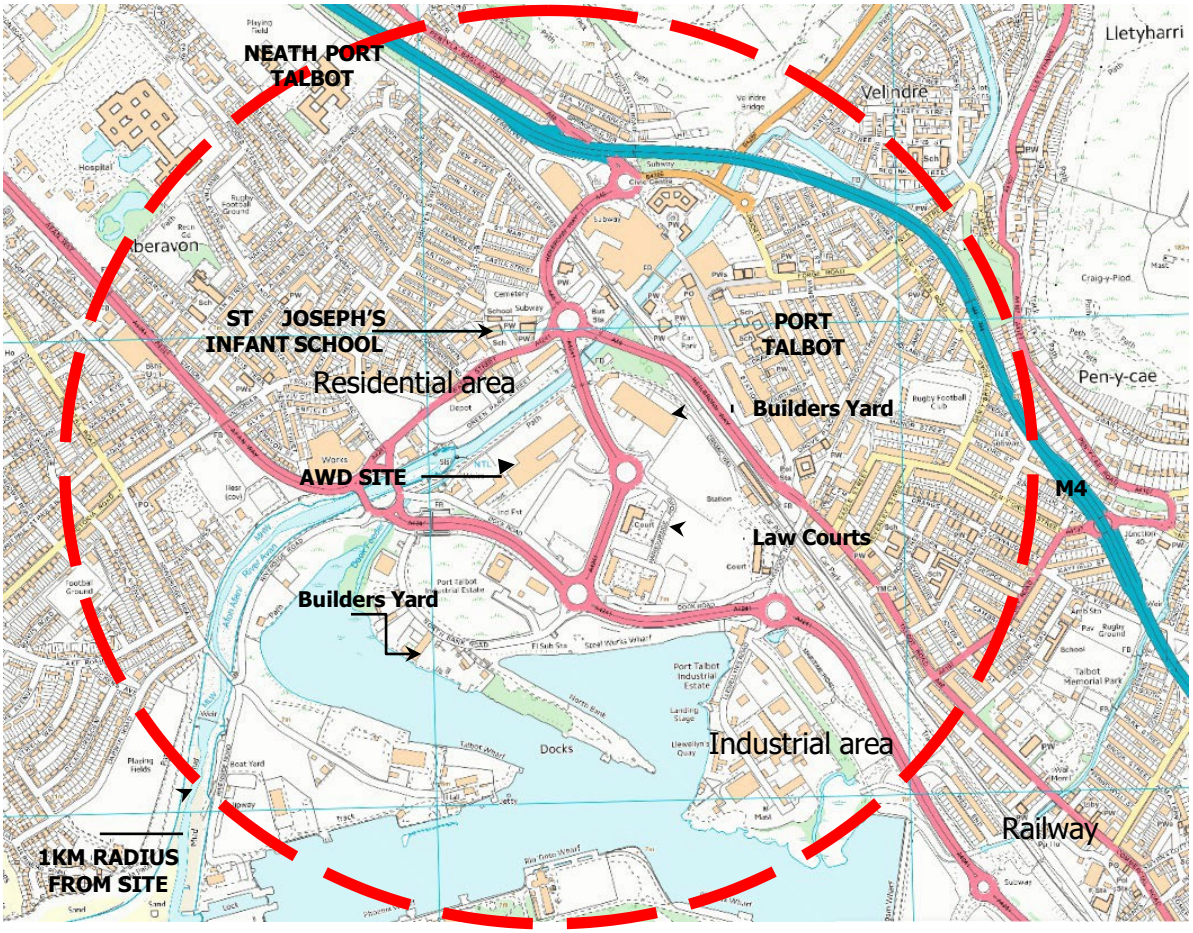

Plate 3-2 Features within 1km of Site

3.2 Sensitive Receptors

The harmful effects associated with noise typically come from the stress reactions it causes in the human body. These can continue during sleep. These reactions can lead to:

- increased heart rate
- high blood pressure
- cardiovascular disease
- premature deaths
- cognitive impairment
- sleep disturbance
- hypertension
- annoyance

There are many potentially sensitive human receptors within approximately 1km of the site as shown by the densely populated residential areas on Plates 3-1 and 3-2.

There are no designated or protected sites within 2km.

4 NOISE ASSESSMENT

To inform the NMP, a NIA has been undertaken and is provided in Appendix 1.

All noise measurements were undertaken by a consultant certified as competent in environmental noise monitoring.

The assessment concluded that the site is not predicted to give rise to a significant adverse impact on the identified receptors. The findings of this numerical assessment would appear to support site observations where noise is not regarded as a nuisance and there have been no complaints from neighbours or noise related observations from NRW officers.

5 NOISE CONTROL MEASURES

AWD acknowledges that it is its responsibility to avoid significant pollution and to demonstrate that appropriate measures to prevent, or where that is not practicable, to minimise noise impact are being effectively implemented. To assist with ensuring that Best Available Technologies are being implemented, AWD has commissioned a NIA that is reproduced in Appendix 1.

5.1 Normal Conditions

AWD recognises that preventing nuisance related to noise and vibration starts with good housekeeping, careful site management and layout and being a considerate neighbour. In this context, several preventative actions are integrated to the operation, as summarised in Table 5-1.

Table 5-1 Noise Control Measures

Potential activity/ noise source	Location on site	Control Measures
Baling and separation of plastics via float / sink	Baling, size reduction (shredding), granulation and flotation processing to be undertaken indoors	Ensure all plant subject to preventative maintenance. Subjective checks of noise levels each day Drop heights to be minimised
External waste handling	External areas	Minimise reversing Minimise drop heights Use manual separation if items are clearly identifiable and manual separation quieter Minimise shouting and background music
Vehicle Movements (e.g. delivery, collection, reversing)	External and internal areas during delivery and off-take	Noise reduction at source: Banksman to be used to minimise use of reversing alarm Broadband reversing alarms to be used if banksman not available Short duration reversing kept to a minimum Vehicle routes to be kept clean and circular Staff to avoid unnecessary revving of engines
Screening of inert concrete / brick	Externally (away from site boundary)	Screen to be used for short periods intermittently Plant subject to preventative maintenance and housekeeping Drop heights to be minimised Only to be undertaken on eastern side of yard as further from sensitive receptors

5.2 Abnormal Conditions

To ensure that abnormal conditions are identified any change to on-site noise levels will be identified by site operatives and management. This will initially be done by subjective on- site assessment of noise levels based on experience and familiarity. As increased noise levels on-site could be indicative of failure of a control measure, the cause will be immediately investigated.

6 COMPLAINTS

6.1 Complaints

AWD recognises that complaints are never a substitute for comprehensive monitoring and waste management practices but they do offer a valuable indicator of potential offsite problems related to the waste activity. For this reason, all complaints will be logged and documented in accordance with existing management systems.

Any complaints received will be promptly investigated and appropriate remedial action taken. AWD will inform the complainant and record the details of the complaint and the actions taken.

6.2 Monitoring

A Noise Level Assessment involving additional noise level monitoring and assessment may be necessary to assess and investigate complaints or changes in noise level identified at site. During these instances, an assessment in accordance with the strategy set out in current EA guidance would be undertaken. This would be aimed at characterising any potential off-site impact and identification of the root cause(s).

6.3 Contingency Action Plans

Where observations, monitoring results or complaints indicate a potential noise problem, the contingency actions set out in Table 6-1 will be adopted.

6.4 Receptor Notification

Following the identification of a significant noise problem, particularly following a noise complaint, AWD will liaise with the persons affected. This is to ensure that they are informed of the investigations being undertaken, relevant findings and mitigation measures.

Table 6-1 Contingency Action Plan

OBJECTIVE To initiate timely mitigation measures to prevent significant off-site noise problems	
Frequency of test	Following receipt of complaint related to noise or identification of significant rise in on-site noise levels

CONTINGENCY ACTION RESPONSES	**Response Time**
Step 1. Investigate Potential Sources Following detection of potential noise problem undertake detailed site inspection. If source of noise is obvious go to Step 2. If source cannot be identified go to Step 4.	Within 1 day or same day where feasible
Step 2. Remove noise source Review working practice and source of noise. Cease relevant operation and implement remedial actions. Go to Step 3.	Within 48 hrs of problem detection
Step 3. Continued Monitoring Repeat routine evaluation of site noise levels based on experience and familiarity once problem has been remedied. If problematic noise levels are still persistently detectable go to Step 4.	Within 1 week of problem initially being identified
Step 4. Further Investigation and Monitoring Ensure obvious noise problems have been remediated. Consider all available information including meteorological records, complaints history, other activities occurring at site / in surrounding area. Undertake detailed site inspections on-site and off-site for noise sources in accordance with H3 guidance. This will likely involve noise level assessment and monitoring at site and at receptor(s). Some operations may need to temporarily cease. **Outcome 1. Waste activity considered to be noise source.** Cease identified problematic activity and identify new mitigation measures. Go to Step 5. **Outcome 2. Waste activity not considered to be noise source.** Document investigations and return to normal operations.	Within 2 weeks of problem being identified
Step 5. Implement Mitigation Measures Review risks to off-site receptors. Implement mitigation measures in consultation with NRW and noise advisors. This may involve temporarily ceasing operations.	Within 4 weeks of problem being identified

7 REVIEW AND MONITORING

7.1 Routine Review

Each year this NMP will be subject to review. This will be aimed at ensuring that the procedures implemented on site match those documented. Improvement programmes will be developed to ensure that risks are always minimised.

7.2 Monitoring

The following Key Performance Indicators will be used to monitor the effectiveness of this NMP:

- Number of complaints related to noise
- Number and nature of enforcement, alterations or prohibition notices from statutory authorities

7.3 Audit

AWD recognises that it is important for the day-to-day activities to implement what is written in the EMS and Management Plans to ensure compliance with the Permit and manage and minimise risks to the environment, humans and property. Therefore, a planned programme of internal and external audit will be implemented. Internal audits will be undertaken quarterly and external audits annually and coupled to the annual review. The findings of all audits will be documented. During the audits, the following aspects will be evaluated:

- Paperwork & Records – complaints, evidence of maintenance programmes
- Procedures – ensuring latest versions are current and still applicable
- Prevention – check of plant age and site layout to ensure noise generating elements are still being appropriately controlled

A compliance assessment may not be limited to these areas, but it gives a good indication of what an assessment may comprise.

7.4 Update following Incident

In addition to the regular annual review, this NMP would be reviewed and updated where necessary following an incident or complaint.

A review would also be prompted if the activities at the site changed, if the waste types accepted changed, if waste volumes accepted increased or if new infrastructure (buildings or plant) was installed.

All aspects of the NMP would be available for review during any update or review. Focussed attention would, however, be made to ensure that the document captures potential changes to the risk profile and additional preventative and management techniques required.

7.5 Communication of Plan

All staff will be trained on the relevant sections of this NMP during their induction training and this training will be refreshed annually or after any amendment to the NMP, whichever occurs soonest. Training will be recorded in each individual employees training records.

All contractors will be made aware of the key elements of the NMP and NIA. This will be recorded in the Site Induction Training file.

All training on the NMP will focus on the actions necessary to:

1. Prevent a noise incident occurring; and
2. Actions necessary if an incident occurs.

BYASS WORKS WASTE TRANSFER FACILITY

Environmental Permit Variation Application

NOISE MANAGEMENT PLAN (NMP)

Appendix 1
Noise Assessment

AWD Waste Recycling, Bypass Works, Port Talbot

Noise Assessment for NRW Permit

25th October 2022

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Version	Comments	Date	Authored By	Checked By	Project Number
1	Noise Impact Assessment for NRW	12th April 2022	Neil Morgan MSc MIOA	Antony Best BSc Hons MIOA	22-134
2	Revised Noise Impact Assessment for NRW	25th October 2022	Neil Morgan MSc MIOA	Antony Best BSc Hons MIOA	22-134

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1. INTRODUCTION

1.1. Overview

inacoustic has been commissioned to prepare a Noise Assessment for the Waste Recycling Operations at AWD Group Limited's premises at Bypass Works, Docks Road, Port Talbot, SA13 1RS, for submission to Natural Resources Wales (NRW) as part of a Permit Application.

This exercise follows on from an initial assessment undertaken in March 2022, where several site and environmental factors were in a state of flux or atypical, resulting in a request from NRW for some additional information. As sufficient time has elapsed for the environmental conditions to normalise and for the potentially acoustically significant site changes to be fully incorporated, a comprehensive revision of the assessment has been undertaken.

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, supplementary 3-dimensional noise modelling exercise;
- 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 consider 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

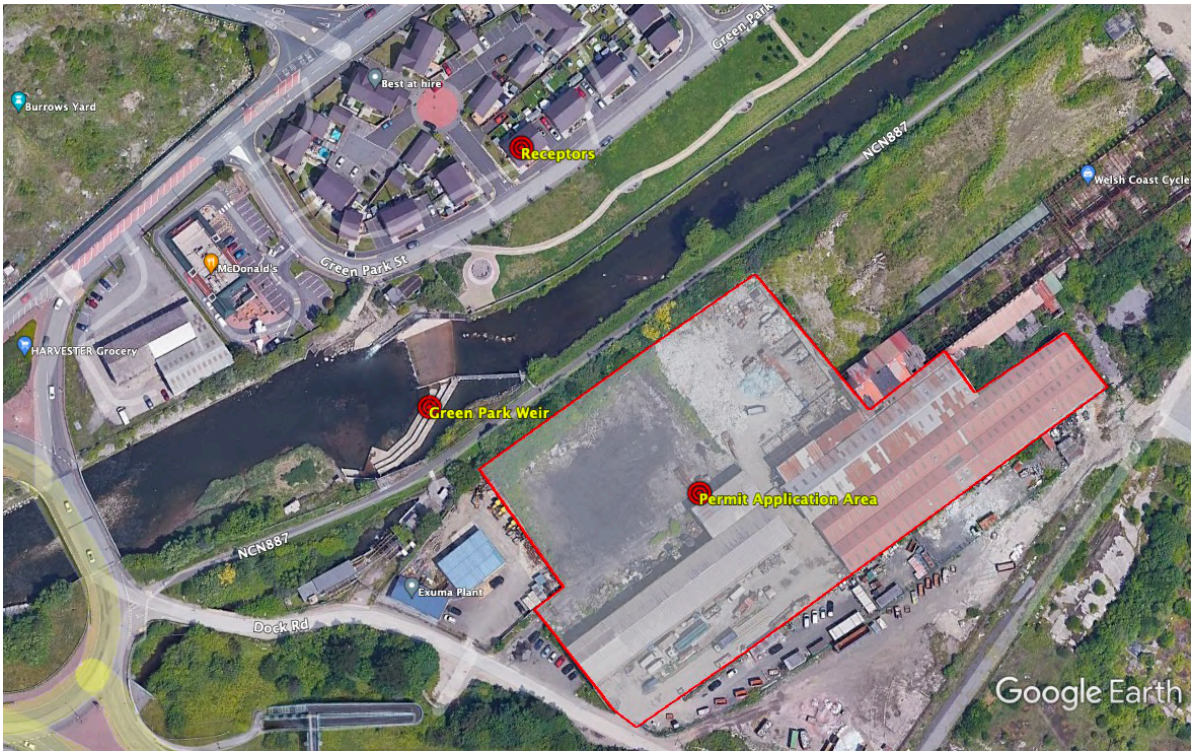
3.1. Site and Surrounding Area

The site is located at Bypass Works, Docks Road, Port Talbot, SA13 1RS, to the north of Dock Road and the south-east of the River Afan. The site currently incorporates an established recycling business, dealing with various material types.

Water flowing over the stepped section of Green Park Weir dominates the soundscape of the receptor area, with audible contributions arising from road traffic noise arising from vehicles using Green Park Street (particularly, connected to use of the nearby McDonald's Restaurant) and the surrounding routes.

The location of the site, relative to key local features, including the closest noise sensitive receptors (NSRs); being the recently constructed residential properties on Green Park Street can be seen in Figure 1, with the layout of the site shown in Figure 3.

Figure 1: Location of Site and Surrounding Area



3.2. Receptor Details

The closest receptors to the site comprise the residential dwellings located on Green Park Street, to the north-west of the Application Site. The planning permission for the residential development was granted by Neath Port Talbot County Borough Council on 17th February 2014 under planning reference P2014/0046.

Despite representing the agent of change, with regard to noise generated by the established commercial activities to the south-east, the planning application was apparently not supported by a

noise assessment and no conditions were applied to the planning permission with regard to existing/potential environmental noise effects upon future residential amenity, or whether the residential development would potentially constrain the future operation of the established commercial uses.

Notwithstanding the above, the design of the residential dwellings has apparently responded to the potential issue of commercial noise from the south-east, with ground floor windows to habitable rooms being sealed shut, with a mechanical ventilation strategy installed (ventilation apertures visible above ground floor window level), as shown in Figure 2.

FIGURE 2: DESIGN FEATURES – RESIDENTIAL PROPERTIES ON GREEN PARK STREET

While 1st floor windows are apparently of a traditional design; openable windows, trickle vents, it is considered that the ground floor design measure does influence the receptor sensitivity and context of any daytime BS4142 assessment outcomes.

3.3. Operations Overview

A full description of the site operations is included within the Environmental Management System (EMS), which accompanies this Permit Application; however, a high-level summary is set out below.

The site is permitted to operate between the hours of 07:00 and 17:00 Monday to Friday and 07:00 – 12:30 on Saturdays, with currently permitted activities as per the current Environmental Management System (EMS). It is understood that the site is proposed to operate primarily between 08:00 and 16:30 Monday to Friday and 07:00 – 12:30 on Saturdays, with the permitted shoulder periods used for start-up and shut-down.

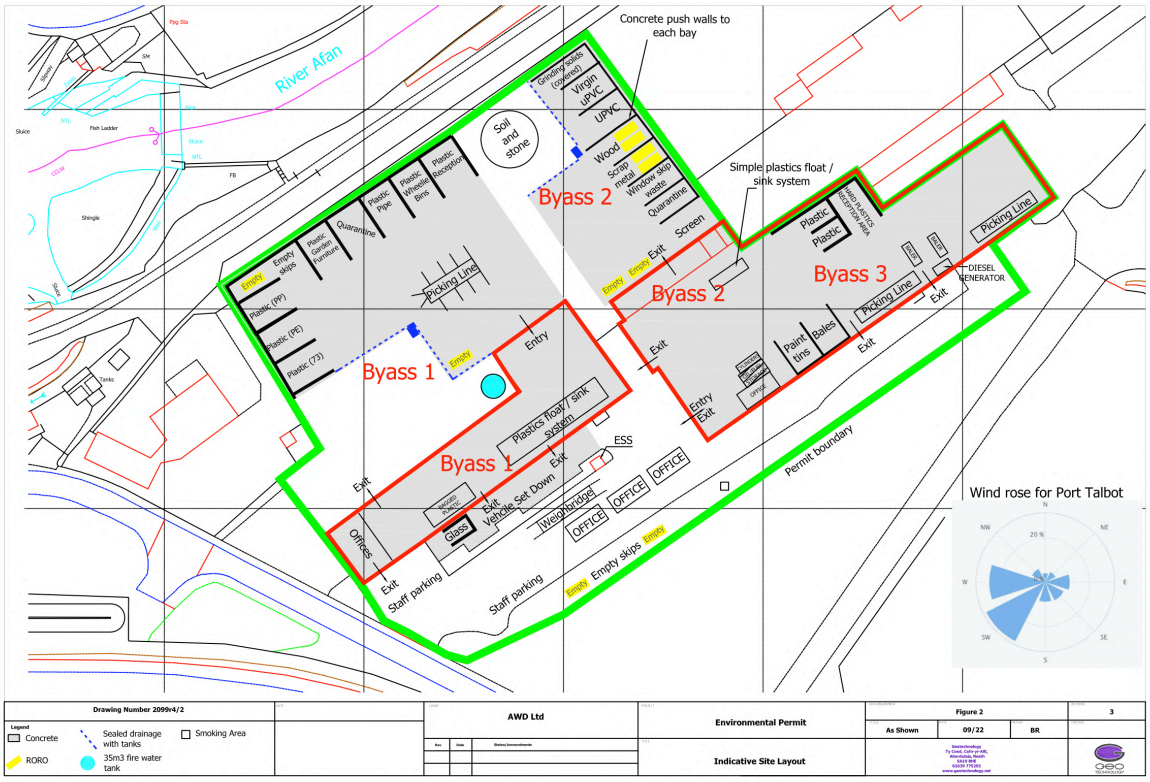
The Environmental Risk Assessment details the proposed site activities, which are summarised as follows:

- Hard plastics - manual sorting indoors and outdoors and granulation, float / sink separation, baling indoors. This process is being expanded into Byass 1, with an additional process line;
- UPVC - manual and mechanical separation outdoors;
- Glass - separation outdoors;
- Skips from window companies / window fitting - manual separation of wood / PVC/ outdoors. Screening of inert brick, concrete into different size fractions - No crushing on site. Screener used very rarely only when we build up an inert stock;

- Metals – receipt and storage of roll grinding solids outdoors (fine materials, with no sonorous properties); and
- Paint tins - manual separation of paint, bulking – indoors – this process currently occurs within Byass 3 with regard to non-conformance waste, but is intended to be regularised as a core process under this permit application.

With regard to noise, the site is currently ostensibly running as per the applied-for permit, as shown in Figure 3, with the only significant change being the regularisation of paint processing, which is an entirely internal activity and not a significant noise generator.

FIGURE 3: SITE LAYOUT



3.4. Noise Generating Elements

The operations will largely comprise the receipt, separating, storage and processing and export of various waste materials, comprising the noise-generating elements summarised in Table 1.

TABLE 1: SUMMARY OF NOISE-GENERATING ELEMENTS

Description	Location	Operational Profile	Grid Coordinates	
			Easting	Northing
Hard Plastics Picking Line	External	On Demand - Frequent	276109	189697
Hard Plastics Picking Line (Byass 3)	Internal	On Demand - Frequent	276255	189725
JCB 540-140 Telehandler	External	On Demand - Occasional	276107	189687
JCB 540-40 Telehandler (x2)	Internal / External	On Demand - Occasional	Throughout Site	
Diesel Forklift (x2)	Internal	On Demand - Infrequent	276190	189694
Case CX290 Back Actor with Grab (Byass 2)	External	On Demand - Occasional	276152	189735
HGV Tipping Material	External	On Demand – Infrequent (<4 per hour)	276146	189729
Granulator/Float Sink Line (Byass 2)	Internal	On Demand - Frequent	276178	189693
Granulator/Float Sink Line (Byass 1)	Internal	On Demand - Frequent	276138	189671
Dryer	Internal	On Demand - Frequent	276123	189664
Generator	External	On Demand - Frequent	276130	189680
Glass Receipt/Handling	External	On Demand - Infrequent	276131	189649

4. MEASUREMENT METHODOLOGY

4.1. General

The noise conditions in the area have been determined by an environmental noise survey conducted during the core daytime of Wednesday 30th March 2022.

Due to the factors discussed earlier in this report and comments from NRW regarding the duration of the March 2022 measurement exercise and the finalisation of changes to the scheme since that time, this exercise has been supplemented by a further measurement exercise undertaken on Monday 17th October 2022.

4.2. Measurement Details – March 2022

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
	Rion NC-74 Acoustic Calibrator	35246906	1115505	17/08/2022

Measurement equipment used during the survey was field calibrated at the start and end of the measurement period. The sound level meter calibrated at 94 dB (at 1kHz) prior to and following the measurements.

A calibration laboratory has calibrated the field calibrator used within the twelve months preceding the measurements.

The weather conditions during the survey were entirely conducive to noise measurement; it being sunny, dry, with no locally discernible wind.

The microphone was fitted with a protective windshield for the measurements, which are described in Table 3, with an aerial photograph indicating their location shown in Figure 4.

[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 Position Description

Position	Description
MP1	A fully attended measurement of ambient, residual and background sound at a height of 1.5m above local ground level, under free-field conditions, in the vicinity of 12 Green Park Street. The prevailing sound environment was influenced by distant and occasional local road traffic noise, with audible contributions from the AWD site, when operating. It was noted, that during the typical operation of the AWD site, that acoustic contributions arising from a screener unit and associated plant, which is associated with the site alteration works (and will not persist in the future) was just audible within the background sound environment. While this may have influenced the L_{A90} during that period it was not sufficient to influence the $L_{Aeq,T}$. The operational measurement period during the afternoon was influenced by the presence of the 360 grab intensively consolidating a newly delivered stock of UPVC window frames, immediately adjacent to the northern site boundary. It is understood that this type of activity will not similarly persist in that form in the future; however, the data is presented for completeness. During this exercise, it was noted that no significant noise was observed to arise from the Green Park Weir, which, as it was the 1st visit to the site, was not viewed as unusual. The reasons for this are/were unclear, but it is known that significant works have been undertaken at the weir, resulting in occasional diversion of the river flow away from the weir steps and over the less turbulent spillway, thus bypassing the usual source of sound generation.
Source	Source measurements were undertaken around the site, as detailed in Table 4.

Figure 4: Measurement Position

4.3. Summary Results

The summarised results of the environmental noise measurements are presented in Table 4, with a tabulated full-time history presented under Appendix B.

TABLE 4: SUMMARY OF NOISE MEASUREMENT RESULTS

Description	Period	Noise Level, dB		
		$L_{Aeq,T}$	L_{A90}	L_{AFmax}
Site Operating (Including transient construction activity)	11:16 to 12:01	56.1	48.0	59.7 to 78.3
Site not Operating (Residual/Background Sound)	12:01 to 12:21	54.0	**47.0**	68.6 to 75.7
Back Actor with Grab Operating within North-east Corner of Site	12:21 to 12:51	57.7	49.0	71.3 to 82.7
Specific Sound Level of Morning Activity		51.9	-	-
Specific Sound Level of Afternoon Activity		55.3	-	-

Source Description	Distance to Source	Noise Level, dB	
		$L_{Aeq,T}$	L_{AFmax}
Within South-Western End of Building 1 during tipping and screening	Internal Reverberant	69.1	77.5
Baler	Internal Reverberant – 1m	82.2	86.0
JCB 540-140 Telehandler – Consolidating Hard Plastics	Internal Reverberant – 10m	84.6	94.2
JCB 540-140 Telehandler – Consolidating Mixed Waste	10m	77.9	86.2
JCB 540-40 Telehandler - Consolidating Waste	Internal Reverberant – 5m	83.1	92.3
Lorry Tipping Hard Plastics (6mins 40secs)	Internal Reverberant – 10m	79.6	93.5
Picking Line – Conveyor Drop Point	Internal Reverberant – 1m	86.3	97.7
Case CX290 Back Actor with Grab – Handling UPVC Window Frames	10m	78.2	91.3
HGV Passby (10secs)	3m	75.5	81.7
Skip Lorry (8m) Tipping UPVC Frames (4mins)	10m	73.3	88.1
Skip Lorry Tipping Wood and 8m Skip Being Collected Simultaneously (3mins 10secs)	10m	77.0	89.3

4.3.1. Discussion of Results

Where sound pressure levels have been measured within an internal reverberant sound environment, they are considered to be at least 3 dB higher than the equivalent free-field external level.

It should be noted that the off-site noise monitoring set out above, considers the site in an interim operational state, where construction activity was ongoing, including the use of external soil screeners, which also resulted in atypical patterns of external materials handling. Consequently, it is considered that the measured activity noise, at the off-site location, was potentially higher than would be experienced under a typical operational profile.

Furthermore, the residual and background sound measurements were undertaken while the Green Park Weir was not flowing in full, presumably as a result of the considerable construction works that were ongoing at the time. It is now known that the weir is a significant component of the typical background sound environment, with its acoustic absence substantially reducing the measured background and residual sound levels.

4.4. Measurement Details – October 2022

This exercise comprised a robust on-off measurement throughout a typical, but busy working day and included the full range of activities normally undertaken at the site. The survey was undertaken on a Monday, which was confirmed to be one of the busiest days, as a result of councils delivering their civic amenity site waste after a weekend of domestic use.

Site activities were noted by the site operator and a summary provided, which is listed below:

08:00 to 11:30

- X6 buckets full of sub 150 mm PEPP run through new rotajet refining line on trial that produced a quarter of a product bag or PEPP. (Please note this was done in conjunction with Rotajet (plant manufacturer) between 08:00 and 09:00;
- X4 council hard plastic deliveries into Byass 3;
- X2 Upvc deliveries tipped out in Byass 2 yard into bays;
- X1 glass delivery into Byass 1 yard bay (near weigh bridge) – entirely screened by Byass 1 building;
- X1 sub 50mm plastic delivery and tipped in Byass 2 yard;
- All x3 plastic picking lines were in operation;
- X1 float sink sub 150 mm plant in operation; and
- X1 artic Upvc walking floor delivery Byass 2 yard.

13:00 to 16:30

- X1 float sink sub 150 mm plant in operation;
- X1 virgin Upvc delivery and tipped into bay in Byass 2 yard (during our walk around);
- X3 council Hard plastic deliveries; and
- X3 additional mixed deliveries prior to 16:30.

All noise measurements were undertaken by a consultant certified as competent in environmental noise monitoring, and, in accordance with the principles of BS 7445[5].

[5] British Standard 7445: 2003: *Description and measurement of environmental noise.* BSI.

All acoustic measurement equipment used during the noise survey conformed to Type 1 specification of British Standard 61672[6]. A full inventory of this equipment is shown in Table 5.

TABLE 5: 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. The sound level meter calibrated at 93.9 dB (at 1kHz) prior to and 94.0 dB (at 1kHz) following the measurements.

A calibration laboratory has calibrated the field calibrator used within the twelve months preceding the measurements.

The weather conditions during the survey were entirely conducive to noise measurement; it being sunny, largely dry, with a south-westerly breeze, which was sustained at 4-5ms^{-1} at the start of the exercise, but reduced to 1-3ms^{-1} during the morning and throughout the afternoon. The early morning period was affected by short rain showers; however, these occurred prior to the commencement of the exercise, with a heavier shower occurring at 09:15, after the first measurement session was concluded.

The microphone was fitted with a protective windshield for the measurements, which are described in Table 6, with an aerial photograph indicating their location shown in Figure 4.

TABLE 6: MEASUREMENT POSITION DESCRIPTION

Position	Description
MP1	A fully attended measurement of ambient, residual and background sound at a height of 1.5m above local ground level, under free-field conditions, in the vicinity of 12 Green Park Street. The prevailing sound environment was dominated by water flowing over Green Park Weir, which was very different to the original survey undertaken in March 2022. It was noted that noise from the weir became much more significant towards the south-western end of Green Park Street, so the position was selected to quantify the noise impact of the site operations at the closest potentially noise-affected location, where background sound levels would be at their lowest. Discussions with local residents confirmed that the acoustic dominance of the weir was typical and that weir alteration/construction works over the last year had resulted in changes in flow and a consequent change to the hydrodynamic noise generation. These discussions also revealed that commercial activities within the AWD site were only normally audible when the 360 grab was operating at the site

[6] British Standard 61672: 2013: *Electroacoustics. Sound level meters*. Part 1 *Specifications*. BSI.

	boundary, as was observed to occur during the March 2022 survey, and that the operator's assertion that this was a rare occurrence was confirmed. AWD-attributed site activities were not audible at the measurement position and only became an audible sound component, when listening intently at the sheet piled wall of eth River Afon. Infrequent audible phenomena were noted to occur, such as excavator bucket clanking (changing) and dropping, but were associated with activity within the adjacent Exuma Plant Hire depot.
Source	A source measurement undertaken within the enclosed area of Byass 2, where a plastic granulator and separator unit was continuously operating. This plant is an older version of the process plant newly installed within Byass 1, (which was not operating beyond the morning shift), so is considered to offer robust source information for Byass 1 and the opportunity to update the noise model for Byass 2.

4.5. Summary Results

The summarised results of the environmental noise measurements are presented in Table 7, with a tabulated full-time history presented under Appendix B.

TABLE 7: SUMMARY OF NOISE MEASUREMENT RESULTS

Description	Period	Noise Level, dB		
		$L_{Aeq,T}$	L_{A90}	L_{AFmax}
Site Not Operating	07:00-08:00	58.0	54.0	77.1
Site Operating	08:00-09:00	58.7	55.0	77.9
Site Operating	10:50-11:30	58.1	53.0	78.7
Site Not Operating	11:30-12:30	58.2	53.0	77.3
Site Operating	12:30-13:00	57.4	53.0	78.0
Site Operating	14:55-15:30	56.7	52.0	73.1
Site Operating	15:30-16:30	57.4	52.0	76.4
Site Not Operating	16:30-17:00	58.4	52.0	76.2
Source Description	Distance to Source	Noise Level, dB		
		$L_{Aeq,T}$		L_{AFmax}
BYASS2 – Granulation, Separation and Materials Handling	Internal Reverberant	79.1		86.1

4.5.1. Discussion of Results

It can be seen from the results set out above, that the operation of the site did not quantifiably influence the sound environment at the receptor location, with no correlation shown between the operation of the site and the ambient, residual or background sound levels. The sound environment was qualitatively noted to be entirely influenced by sound from the weir, wind conditions and the frequency and speed of passing traffic, which was noted to be largely connected to the operation of the McDonald's restaurant, located at the south-western end of Green Park Street.

It was noted that at no point during the survey did the 360 grab operate near the site boundary, as was observed to occur during March 2022.

Consequently, the site was not considered to give rise to any measurable or audible noise impact at the receptor location during the measurement exercise; however, NRW's requirements where ambient-residual differentials are less than 3 dB are noted (as per strict interpretation of BS4142 para: 7.3.5), so a supplementary noise modelling exercise has been undertaken.

5. Supplementary / Predictive Noise Assessment

5.1. Noise Modelling

5.1.1. Introduction

The site was not considered to give rise to any measurable or audible noise impact at the receptor location during the measurement exercise; however, NRW's requirements where ambient-residual differentials are less than 3 dB are noted (as per strict interpretation of BS4142 para: 7.3.5), so a supplementary noise modelling exercise has been undertaken, to replicate the peak site activities occurring during that exercise.

5.1.2. Noise Source Data

The following sources of noise associated with the Proposed Development have been identified and are considered in this assessment:

- External Waste Handling/Processing Operations; and
- Internal Waste Handling/Processing Operations.

5.1.3. Source Data

The sound source data used in the assessment, associated with the various activities/items can be seen below in Table 8.

Table 8: Sound Source Data

Item	Quantity	Sound Pressure Level – dB(A)	Distance from Source	% On-Time	Resultant Sound Power Level – dB(A)
Float-Sink Separation and Granulation – Byass 1 and 2					
Resultant Internal Reverberant Sound Level	-	76.0	-	-	-
Current Waste Processing Building – Byass 2					
Internal Reverberant Sound Level	-	69.0	-	-	-
External Plant					
Generator (to serve new production facility)	1	82	2m	100	96.0
JCB 540-140 Telehandler – Moving Plastics	1	81.6	10m	8 movements	99.6
Picking Line – Conveyor Drop Point	1	83.3	1m	100	91.3
Case CX290 Back Actor with Grab – Handling UPVC Window Frames	1	78.2	10m	50	103.3

HGV Passby	4	75.5	3m	Level for 1 event per hour	88.0
Skip Lorry (8m) Tipping UPVC Frames	1	73.3	10m	Level for 1 event per hour	89.5
Skip Lorry Tipping Wood and 8m Skip Being Collected Simultaneously	1	77.0	10m	Level for 1 event per hour	92.2

5.1.4. Building Envelope

In terms of the acoustic performance of the building envelopes, the sound reduction statistics set out in Table 9 have been adopted.

TABLE 9: SOUND REDUCTION INDEX OF BUILDING COMPONENTS

Component	Type / Material	SRI – dB(A)
Wall to Full Height – Byass 2/3 (North Façade)	Masonry / Old Stonework	50.0
Wall to 2.0m Height – Byass 1	Masonry / Blockwork	52.0
Wall Cladding to Eaves and Roof	Profiled Steel / Mixed Materials	20.0
Roller Shutter Door	Closed	15.0
Door	Open	0

It has been assumed that any proposed ventilation louvres or access doors will be of a design and fit that does not compromise the overall sound insulation performance of the building envelope.

5.1.5. Calculation Process

Calculations were carried out using Cadna/A, which undertakes its calculations in accordance with guidance given in ISO9613-1:1993 and ISO9613-2:1996.

5.1.6. Sound Data Assumptions

Given that the land between Proposed Development and nearest receptors is mixed, the ground factor has been set to 0.4 in the calculation software. That calculation process also considers two orders of reflection.

5.1.7. Specific Sound Level Map

The sound map showing the specific sound level emissions from the Proposed Development can be seen in Figure 5.

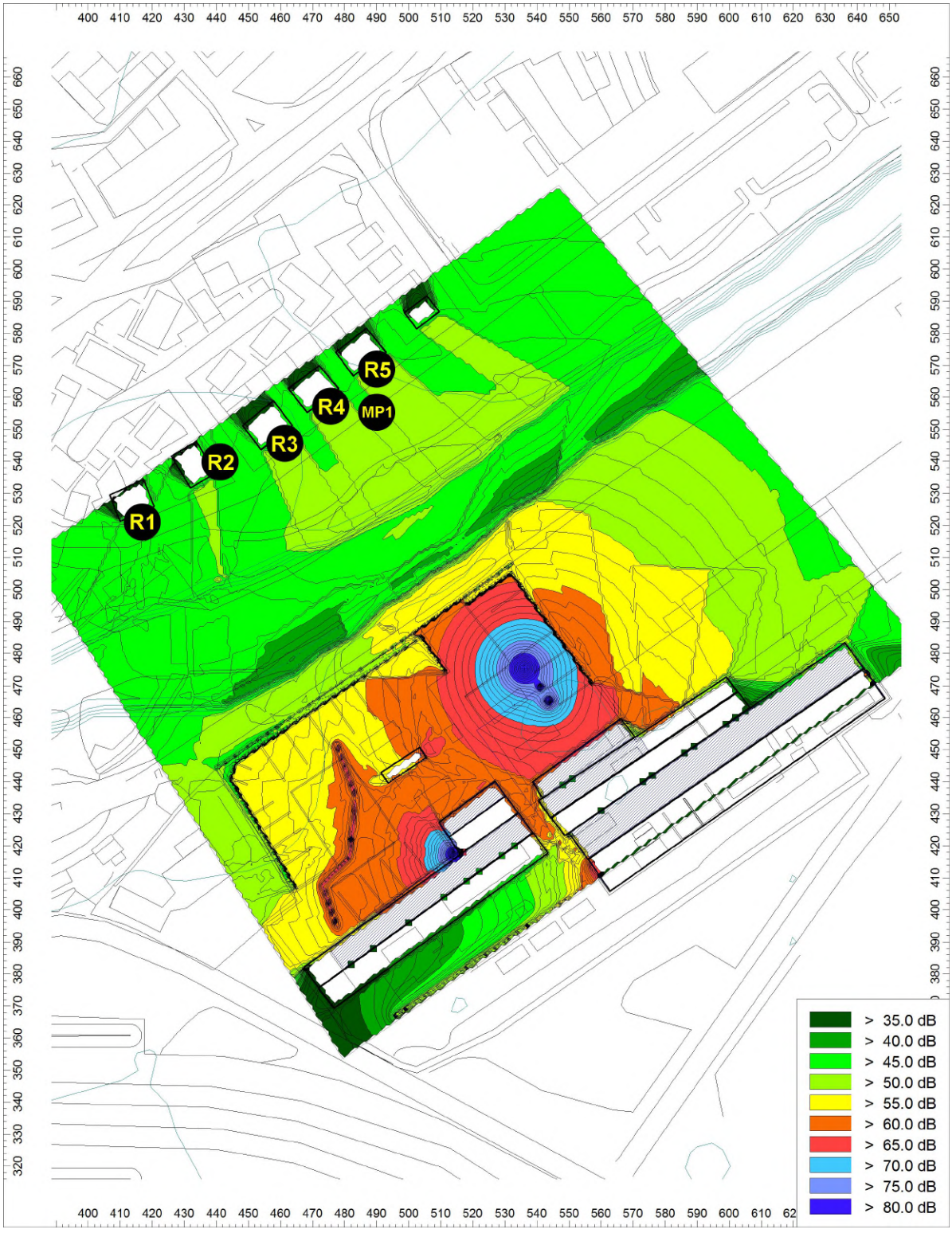
5.1.8. Specific Sound Level Summary

A summary of the predicted specific sound levels at the closest NSRs, based on the sound map shown in Figure 5 can be seen in Table 10.

TABLE 10: PREDICTED SPECIFIC SOUND LEVEL SUMMARY

NSR	Cumulative Specific Sound Level (dB)
1	49.9
2	50.0
3	51.0
4	48.8
5	51.4
MP1 / Validation	50.1

FIGURE 5: SPECIFIC SOUND LEVEL MAP



5.2. Assessment

5.2.1. 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."

Given that the Proposed Development is not operational, the subjective method has been adopted to derive the rating sound level from the specific sound level. This is discussed in Section 9.2 of BS4142:2014+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 distance against the residual acoustic environment, a penalty of +3 dB can be applied."*

5.2.2. Rating Penalty Assessment

Considering the content of Section 5.2.1, an assessment of the various sound sources associated with the Proposed Development, in terms of whether any rating penalties are applicable, has been detailed in Table 11 below.

TABLE 11: RATING PENALTY ASSESSMENT

Source	Tonality	Impulsivity	Intermittency	Other Sound Characteristics	Discussion
Mobile Plant	0 dB	+3 dB	0 dB	0 dB	Tonal reverse alarms fitted to some items of mobile plant do give rise to audible tonality at source; however, was entirely inaudible against the residual sound environment at the off-site receptor locations. The handling of hard plastic and UPVC waste can give rise to an audible impulsivity at the off-site receptor locations, when the grab is operating on the site boundary; however this activity is infrequent and was not observed to occur during the assessment period.
Static Operations	0 dB	0 dB	0 dB	0 dB	The static (housed) operations and the operation of the picking line are not acoustically significant and do not give rise to off-site impacts requiring a feature correction.

In summary, a rating penalty of +0 dB has been included in the assessment, due to the inaudibility of the site activities against the residual sound environment.

5.2.3. Uncertainty

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

Measurement Uncertainty

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

“ ...

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 12.

TABLE 12: MEASUREMENT UNCERTAINTY FACTORS

Measurement Uncertainty Factor Reference	Discussion
b)	Residual acoustic environment is relatively constant, hence no correction for a complex residual acoustic environment.
d)	Measuring at the closest affected receptors to the site has enabled the determination of robust 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)	Measurements were undertaken during a representative daytime period. The background sound determination period was brief, but considered robustly representative.
i)	The survey was fully attended, enabling the observation of weather conditions.
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, and were deployed with appropriate wind shields.

Calculation Uncertainty

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

“ ...

b) uncertainty in the operation or sound emission characteristics of the specific sound source and any assumed sound power levels;

c) uncertainty in the calculation method;

d) simplifying the real situation to “fit” the model (user influence on modelling); and

e) error in the calculation process.”

Each of the calculation uncertainty factors outlined above have been considered and discussed in Table 13.

TABLE 13: CALCULATION UNCERTAINTY FACTORS

Calculation Uncertainty Factor Reference	Discussion
b)	Sound source levels are based on robust on-site source measurements of existing activities to be carried out at the site and manufacturer data provided by the Applicant. Conversion from internal reverberant to free-field noise levels have been undertaken on a conservative basis.
c)	Calculations were undertaken in accordance with ISO 9613-2, which is considered a *"validated method"* by BS4142:2014+A1:2019.
d)	The real situation has not been simplified for the purposes of this assessment.
e)	ISO 9613-2 indicates that there is a ±3 dB accuracy to the prediction method, therefore, an uncertainty factor of ±1 dB is considered appropriate and proportional, given the separation distances involved.

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

5.2.4. BS4142:2014+A1:2019 Assessment

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

The BS4142:2014+A1:2019 assessment at all NSRs, during the proposed operational period, can be seen in Table 14

TABLE 14: OPERATIONAL NOISE ASSESSMENT

Receptor	Sound Level – dB			
	Specific Sound Level: $L_{Aeq,T}$	Rating Level: L_{ArTr}	Background Sound Level: $L_{A90,T}$	Excess of L_{ArTr} above $L_{A90,T}$
1	49.9	50	52	-2
2	50.0	50	52	-2
3	51.0	51	52	-1
4	48.8	49	52	-3
5	51.4	51	52	-1

Table 14 identifies that the operation of the waste recycling facility gives rise to a *"low impact"* at the closest noise-sensitive receptor to the site, in the context of BS4142:2014+A1:2019 assessment criteria.

5.2.5. Discussion

The fully attended nature of the off-site noise survey has yielded a high level of confidence in the determination of the level of impact of the operations, against the context of the typical background sound level in the area.

The supplementary noise modelling exercise, based upon observed on-site operations, reinforces the on-site observations that noise emissions from the site were below the measured background sound level in the area.

It is acknowledged that there may be occasions when the noise generation of the site is potentially higher, for example, when the 360 grab is operating at the site boundary, which previously yielded a specific sound level of 55 dB(A) at the measurement position. This would result in a marginal exceedence of the background sound level, but this activity is rare, as described by the operator and local residents. The grab typically operates further within the site, as was the case during the October measurement exercise, which reduced its noise impact to inaudible levels.

The change in background sound level between the March and October surveys, as a result of the normalization of operation of Green Park Weir has altered the sound environment in the receptor location substantially. Consequently, the sound environment at the Green Park Street receptors is now dominated by hydrodynamic noise arising from the River Afon flowing over the recently constructed steps of the weir, with road traffic, typically observed to be associated with the use of the nearby McDonald's restaurant, being the only other significant factor influencing that.

Furthermore; the AWD site was in a combined state of operation, alteration and construction during the March survey, which yielded noticeably higher levels of noise generation from within the site and a degree of ambiguity as to how the site did and would operate. When coupled to the abnormally low background sound levels, borne of the atypicality of the weir conditions, a Significant Adverse Impact was calculated.

The measured results of the October survey, combined with the supplementary noise modelling evidence, consider a more certain ongoing operational situation against a more typical background sound environment, which has identified that the site constitutes a Low Impact in BS4142 terms, at the closest receptor locations. It is therefore suggested that the AWD site is operating in a manner that should not constitute an impediment to the provision of an environmental permit.

6. MITIGATION

6.1. Best Available Technology

Although the assessment has shown that the site is operating in a manner that does not require further acoustic mitigation, some basic measures are suggested below, which should continue to be incorporated into the site activities to ensure that such levels of noise impact are managed to a minimum:

- Where possible, material drop heights are reduced to a minimum;
- Minimisation of extent of material handling above the height of the materials bay walls, when undertaken near the north-western boundary;
- Maintain roller shutter doors of Byass 1 in a closed position, when operating the float-sink and granulator units; and
- Regular maintenance of the plant to ensure that no squeaks or rattles develop, which may introduce an audible off-site character.

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

7. CONCLUSION

inacoustic has been commissioned to prepare a Noise Assessment for the Waste Recycling Operations at AWD Group Limited's premises at Bypass Works, Docks Road, Port Talbot, SA13 1RS, for submission to Natural Resources Wales (NRW) as part of a Permit Application.

Noise arising from the operation of the site has been measured and predicted and compared considered in the context of the typical background sound conditions in the area. The potential sensitivity of the receptor has also been discussed.

The exercise has identified that a Low Impact is being generated in BS4142:2014+A1:2019 terms, meaning that no further mitigation measures are required beyond those already incorporated into the operation of the site; however, a range of basic operational measures have been recommended, which should continue to be incorporated into the daily operation of the site.

When operated in the manner considered in this report, the Site is considered to be operating in compliance with the requirements of the Noise and Vibration Management: Environmental Permits, demonstrating BAT where possible, as outlined in Section 6.

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.

8. APPENDICES

8.1. 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 15: 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.

8.2. Appendix B – Full Measurement Results

TABLE 16: 30TH MARCH 2022 EXERCISE

Period Description	Period	Noise Level, dB		
		$L_{Aeq,T}$	L_{A90}	L_{AFmax}
Typical Operations	30/03/2022 11:16	55.3	47.8	73.3
	30/03/2022 11:21	56.1	47.3	73.8
	30/03/2022 11:26	49.8	47.6	59.7
	30/03/2022 11:31	54.4	48.0	69.1
	30/03/2022 11:36	57.6	48.4	76.8
	30/03/2022 11:41	57.4	47.0	76.1
	30/03/2022 11:46	56.1	46.6	75.3
	30/03/2022 11:51	58.0	45.9	78.3
	30/03/2022 11:56	56.1	45.5	72.5
No Site Activity	30/03/2022 12:01	51.6	45.2	68.6
	30/03/2022 12:06	54.5	46.5	72.8
	30/03/2022 12:11	56.0	46.6	75.7
	30/03/2022 12:16	52.4	45.6	69.2
Grab Operating Adjacent to NW Boundary	30/03/2022 12:21	59.6	46.7	82.7
	30/03/2022 12:26	57.5	49.0	71.3
	30/03/2022 12:31	57.4	49.0	73.4
	30/03/2022 12:36	57.2	50.3	73.2
	30/03/2022 12:41	57.4	50.0	72.8
	30/03/2022 12:46	55.1	49.1	73.8
	30/03/2022 12:51	58.5	48.6	73.9

TABLE 17: 17TH OCTOBER 2022 EXERCISE

Period Description	Period	Noise Level, dB		
		$L_{Aeq,T}$	L_{A90}	L_{AFmax}
No Site Activity	17/10/2022 06:57	58.1	54.0	77.1
	17/10/2022 07:02	55.0	53.7	64.2
	17/10/2022 07:07	56.1	53.9	77.4
	17/10/2022 07:12	56.0	53.5	71.5
	17/10/2022 07:17	58.7	54.1	73.9
	17/10/2022 07:22	59.0	54.2	76.0
	17/10/2022 07:27	57.7	53.7	73.1

	17/10/2022 07:32	59.6	54.1	73.6
	17/10/2022 07:37	56.6	53.3	71.0
	17/10/2022 07:42	59.6	54.0	77.1
	17/10/2022 07:47	58.8	54.2	76.4
	17/10/2022 07:52	57.1	53.1	74.7
	17/10/2022 07:57	58.8	53.4	75.7
Site Operating	17/10/2022 08:02	57.8	54.5	71.2
	17/10/2022 08:07	59.3	54.5	77.9
	17/10/2022 08:12	61.1	55.5	79.0
	17/10/2022 08:17	57.4	55.0	68.7
	17/10/2022 08:22	56.0	54.6	64.0
	17/10/2022 08:27	57.6	54.9	70.2
	17/10/2022 08:32	57.3	54.5	72.6
	17/10/2022 08:37	58.0	55.2	69.6
	17/10/2022 08:42	59.3	55.0	78.8
	17/10/2022 08:47	59.7	55.0	71.6
	17/10/2022 08:52	59.4	54.7	76.8
	17/10/2022 08:57	58.5	54.5	75.1
Site Operating	17/10/2022 10:49	56.8	53.1	78.6
	17/10/2022 10:54	56.1	52.3	72.0
	17/10/2022 10:59	55.0	52.3	67.5
	17/10/2022 11:04	56.4	52.8	69.4
	17/10/2022 11:09	56.8	52.7	78.7
	17/10/2022 11:14	57.3	52.9	73.8
	17/10/2022 11:19	62.4	53.3	80.1
	17/10/2022 11:24	58.7	53.3	73.4
No Site Activity	17/10/2022 11:29	58.1	53.2	74.0
	17/10/2022 11:34	57.7	53.5	77.3
	17/10/2022 11:39	55.5	53.6	66.5
	17/10/2022 11:44	58.0	53.1	71.0
	17/10/2022 11:49	57.3	52.9	73.0
	17/10/2022 11:54	57.1	52.6	72.2
	17/10/2022 11:59	57.3	53.2	69.9
	17/10/2022 12:04	57.6	53.3	73.7
	17/10/2022 12:09	56.8	53.5	71.7
	17/10/2022 12:14	58.4	53.2	75.7

	17/10/2022 12:19	60.6	53.3	82.9
	17/10/2022 12:24	60.7	53.8	78.1
Site Operating	17/10/2022 12:29	56.4	53.2	71.4
	17/10/2022 12:34	58.9	53.2	78.0
	17/10/2022 12:39	57.2	52.8	70.9
	17/10/2022 12:44	58.2	51.5	79.1
	17/10/2022 12:49	56.7	52.3	72.3
	17/10/2022 12:54	56.5	53.0	70.1
Site Operating	17/10/2022 14:55	57.4	51.7	77.7
	17/10/2022 15:00	56.2	52.0	70.7
	17/10/2022 15:05	53.6	51.9	63.9
	17/10/2022 15:10	58.0	53.1	72.0
	17/10/2022 15:15	56.7	52.4	71.9
	17/10/2022 15:20	56.3	52.8	72.8
	17/10/2022 15:25	57.7	52.6	73.1
	17/10/2022 15:30	57.8	51.7	78.6
	17/10/2022 15:35	54.1	51.8	69.6
	17/10/2022 15:40	54.6	51.5	73.3
	17/10/2022 15:45	55.3	52.1	72.6
	17/10/2022 15:50	56.4	52.4	69.9
	17/10/2022 15:55	59.5	53.3	74.3
	17/10/2022 16:00	59.1	52.5	72.6
	17/10/2022 16:05	59.1	52.4	76.4
	17/10/2022 16:10	60.0	52.5	79.7
	17/10/2022 16:15	54.9	52.1	71.4
	17/10/2022 16:20	56.8	52.0	72.8
	17/10/2022 16:25	55.5	51.7	67.8
No Site Activity	17/10/2022 16:30	62.1	52.2	82.6
	17/10/2022 16:35	53.4	51.7	65.8
	17/10/2022 16:40	57.2	51.9	72.0
	17/10/2022 16:45	55.7	51.6	68.6
	17/10/2022 16:50	57.5	51.9	76.2
	17/10/2022 16:55	59.5	51.8	74.8

8.3. Appendix C – Qualifications etc

The company is directed and led by Antony Best BSc (Hons) MIOA, Neil Morgan MSc MIOA and Victor Valeron BEng MSc MIOA, who have a combined experience of over 45 years in the acoustic industry; covering a range of project types and assessment scenarios, including numerous submissions to the Environment Agency.

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

Professional Qualifications for Neil Morgan

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

Professional Experience for Neil Morgan

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

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)

8.4. 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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☐ 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: 17 August 2021 CERTIFICATE NUMBER: **1115505**

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

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Customer	**INACOUSTIC**
Order No	**CAL21-NL-52(9)**
Equipment Description	**SOUND CALIBRATOR**
Manufacturer	**RION CO LTD**
Model	**NC-74**
Serial No	**35246906**
Ident No	**NOT KNOWN**
Date Of Calibration	**17 AUGUST 2021**

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 22ºC ± 3ºC and 45% ± 15% RH.

PROCEDURE

Measurements were performed in accordance with the in house laboratory procedure 3436
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: 2 March 2022 CERTIFICATE NUMBER: **1124305**

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

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Customer	**INACOUSTIC**
Order No	**CAL22-CR515-22228**
Equipment Description	**ACOUSTIC CALIBRATOR**
Manufacturer	**CIRRUS RESEARCH PLC**
Model	**CR:515**
Serial No	**82501**
Ident No	**NOT KNOWN**
Date Of Calibration	**2 MARCH 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 return the instrument to the original stated manufacturer's specification and accuracy where known.

8.5. Appendix E – Off-Site Noise Measurement Position Photograph

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