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Acoustic Impact Assessment

Fire Extinguisher Recycling at Pontygwindy Industrial Estate, Unit 10B Sir Alfred Owen Way, Caerphilly CF83 3HU.

16 June 2025

Report Reference: 477/Checkfire(NIA)

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Contents

1 Introduction

Checkfire Limited has commissioned Enviroconsult Limited to provide an assessment of the impact of noise in respect of the Fire Extinguisher Recycling facility at Pontygwindy Industrial Estate, Unit 10B Sir Alfred Owen Way, Caerphilly CF83 3HU.

The layout for the Checkfire facility has been provided and is used to demonstrate acceptability of the site in acoustic terms based on the identified plant and equipment in use.

A site survey has been conducted to establish current noise from activities at Checkfire, and background and residual levels at the nearest sensitive receptors.

In line with Environment Agency Guidance on assessing noise from permitted installations (endorsed by Natural Resources Wales) it is noted that:

1. Monitoring of the site to produce representative residual and background sound levels for the area is required as part of a BS4142 assessment,
2. The dominant sources were noted to be road traffic, from the existing road and rail noise and existing industrial noise from Pontygwyndry Industrial Estate.
3. All monitoring and assessment needs to confirm to BS7445:2003, BS4142:2014+A1(2019) and the Method implementation document (MID) for BS 4142 dated 22 December 2023.
4. Guidance advises that the use of modelling software needs to conform to the guidance on Noise impact assessments involving calculations or modelling.
5. The impact of the proposal has been determined by source measurement of plant currently in use in the installation, and then models have been constructed to determine the impact of the facility on identified receptors.
6. Impact assessments have been carried out using BS4142:2014+A1(2019) and placed into context.

1.1 Statement of qualifications

Tony Higgins has over 30 years of regulatory and consultancy experience dealing with noise and nuisance issues and holds a Post Graduate Diploma in Acoustics and Noise Control. He is a Member of the Institute of Acoustics and is also an elected member of the IOA Measurement & Instrumentation Group. He has spoken at (and organised) many IOA training events considering the implementation of BS4142:2014 and the use of noise measurements in both planning and licensing appeals. Tony managed the Public Protection service at Telford and Wrekin Council, including the Licensing Service, noise and statutory nuisance service and the consultation responses to the planning service.

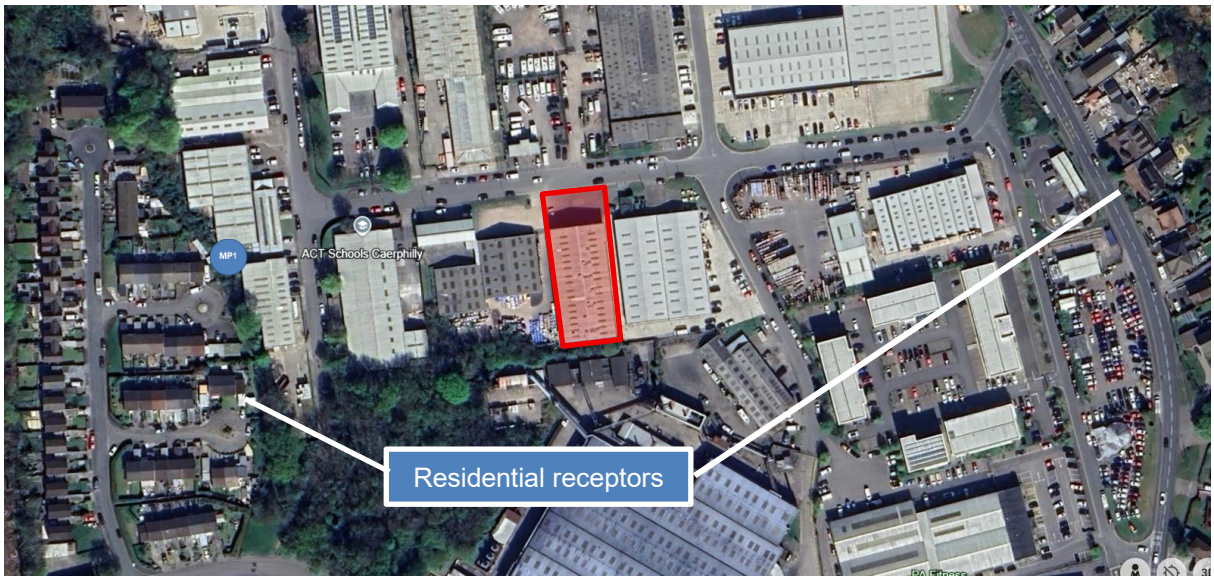
Tony has also prepared and delivered training materials for the EMAQ training package advising local authorities on the implementation of BS4142:2014. Tony has significant experience carrying out and evaluating data in determination of acoustic impact for complaints, licensing, and planning work, in formal and informal hearings as well as court.

1.2 Site Description

The site is located at within the Unit 10B approximately at the centre of the Pontygwindy Industrial Estate, on Sir Alfred Owen Way, Caerphilly (CF83 3HU). The site is surrounded on all sides by other manufacturing industry. The site is approximately 1.3 km from Caerphilly centre.

The site is situated approximately 150 metres from the nearest residential property (Herbet Drive) to the north, and 235m from residential premises on Pontygwindy Road to the south. Fig.1.2 below

Figure 1 Google Image showing site location and relative position of NSRs



Courtesy of Google Earth Image (2025).

Site

MP* Noise Monitoring points

The site comprises a large modern industrial unit with an area of concrete hardstanding to the front of the building. The remaining land comprises approximately 1600 m^2 with the 50m x 25m building comprising the majority of the site.

The building is a modern construction typical of industrial buildings in the area. It is noted to be blockwork to 3m and then insulated profiled steel overclad on steel framework. The structure is 8m to the ridge and 6.5m to the eaves.

The roof is consists of similar insulated profiled steel.

1.3 Checkfire Activities and Layout

The Checkfire facility provides a specialised fire extinguisher recovery activity. The site processes outdated or discharged fire extinguishers of all types except for halide makes.

Spent or outdated extinguishers are delivered to the facility on pallets, and remaining contents discharged into IBC's prior to the extinguisher cannister body being 'de-headed', stripped of brass and plastic fittings, and then transferred into a bulk container for collection and recovery by metal recovery contractors.

All IBC liquid waste is stored securely inside the building in IBC's prior to collection by specified effluent disposal contractors. The site activities were observed as follows:

Vehicle movements

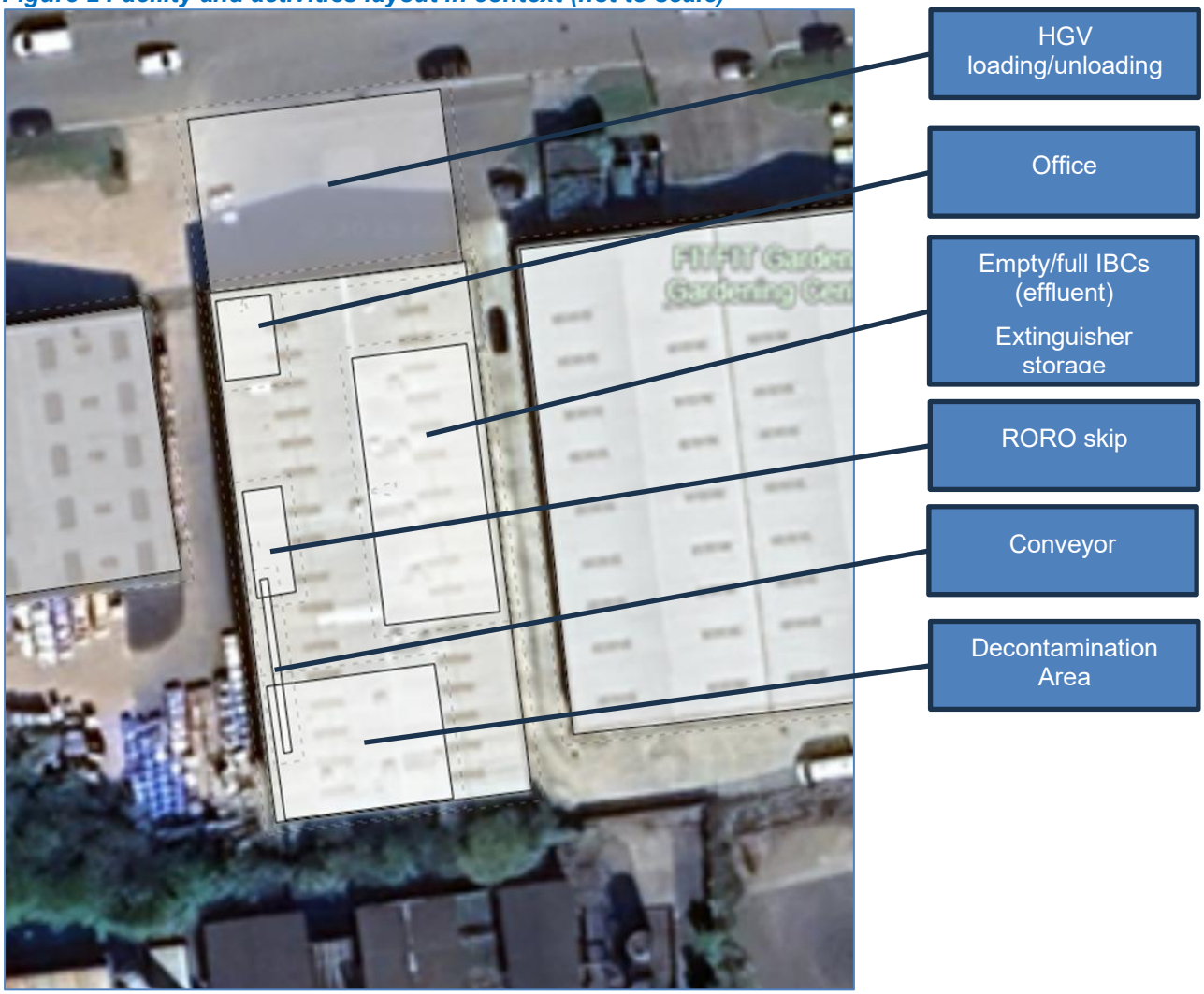
- Cannister delivery (on pallets) HGV/LGV deliveries to site, typically ~45,000 cannisters per month 1,500 per day (40-60 pallets per day) or 1-2 HGV loads per day.
- Bulk metal container skip exchange for cannisters. 1-2 HGV. One exchange of 30'roll-on-roll skip for recycling the degassed/decontaminated cannisters).
- Waste removal HGV for delivery and delivery of empty and removal of full IBC's containing collected residual effluents, 1-2 per week.

Internal Activities

- Stock movement using one of 2 Jungheinrich FLT's operating approximately 50% of the time. Some loading and unloading from front yard and also some use inside building moving pallets of cannisters and IBC's of waste fluids. FLT's operational outside about 30mins in any one hour.
- Degassing and discharge of cannister content to IBC, foam, powder, CO2, note: there are no halide extinguishers processed at this facility.
- De-heading – Manual removal of valves using hammers.
- Stacking of containers on conveyor.
- Discharge of cannisters to RORO skip approx. 200/hour when in use (approximately 20mins in any 1 hour).

The layout in Fig.2 below shows the key locations for plant and machinery.

Figure 2 Facility and activities layout in context (not to scale)



Acoustically the process has been assessed and has the following key steps:

1. Delivery of fire extinguishers occurs on the loading yard in front of the main building. HGV's arrive and park normally parallel to the road to allow forklifts to remove pallets with the extinguishers for recovery. Typically (un)loading takes no more than 30 minutes.
2. All extinguishers to be decontaminated are moved inside the building.
3. Pallets of extinguishers are moved internally from main storage to decontamination processing by forklift trucks.
4. Extinguishers are then processed discharging by hand, (degassing or removing powder, foam or liquid effluents into IBC's.

5. Full IBC's are exchanged for empty using forklift trucks.
6. Empty extinguishers are de-headed manually using a hammer and then stripped of metal and plastic.
7. The decontaminated cannister is then placed into bins by the conveyor.
8. When enough cannisters are present, the conveyor is started and the cannisters manually loaded onto the conveyor.
9. The cannisters are then transferred into the Roll-on-Roll-off skip.
10. The RORO is replaced 1-2 times per day with the activity taking place inside the building.

The acoustic impact assessment considers these activities operating as a worst case. The list of plant and activities is provided in Appendix 1 Source data.

1.4 Existing Acoustic Environment

The existing acoustic environment is substantively industrial noise with some distant road and rail noise noticeable dependent on the location of the receptors.

The industrial estate has a number of large industrial processes (notably Magnera) that operate continually.

Observations from Lewes Drive (northern receptors) noted that significant fan noise (broadband hum) was audible from the industrial estate and was the dominant source. Occasional daytime train noise was noted, but those properties facing the Pontygwindy Industrial Estate were masked from train noise events by broadband hum from the estate.

None of the activities at Checkfire (see section 1.3) above were audible (including the hammering/RORO impulsive activities.)

Observations at Pontygwindy Road were dominated by road traffic and industrial fan noise (in between road traffic events where vehicle levels dropped). Again, the activities at Checkfire were not distinguishable.

Observations carried out during the exchange of the RORO noted that the initial discharge of cannisters were loud impulsive crashes into the RORO and were clearly audible outside the unit 10B and continued to be clearly audible to a distance of 30m from the site, but the level reduced significantly to merely noticeable at the western tee junction of Sir Alfred Own Way and was inaudible at the MP1 monitoring position between the two industrial units.

The crashes associated with an empty RORO were comparatively significantly louder for the first few minutes as metal on steel contacts caused the RORO structure to reverberate, but quickly became much less significant, as the RORO filled to a point that the crashes were only barely audible ~30m from the site above the level of industrial fan noise and local HGV movements.

It was noted that generally the sound from Checkfire's activities could not be distinguished at the receptor locations. The only sound likely to be noticeable was the initial filling of the RORO with cannisters and that activity was relatively short duration before the container filled sufficient to mute the impulsive sound.

Based on observations made, for BS4142 purposes the Checkfire activities are not clearly distinguishable at the receptor and no corrections can be made for perceived character can be made. In line with EA guidelines a generic +3 dB correction has been applied.

2 Legislation and Guidance

2.1 Environmental Permitting

2.1.1 Noise and Soundscape Plan for Wales 2023-2028 (NSPW)

Noise and Soundscape Plan for Wales 2023-2028 [link] provides additional advice in respect of when and how soundscapes should be considered and advises that, where formal assessment is required the approach in ISO12913 should be considered. Paragraph 8.5 of the guidance recommends that for installations requiring environmental permits, the Environment Agency guidance is used (see 2.1.2 below), and paragraph 1.2 of the NSPW addresses how soundscape should be addressed in Wales.

Paragraph 1.2 of the plan states:

> *"…It would be unreasonable and disproportionate to expect these procedures to be followed in full every time a soundscape perspective is desired to inform a decision in Wales. Rather the Welsh Government recommends that the methods outlined in the soundscape standards (such as the soundwalks and questionnaires set out in Annex C of ISO 12913 Part 2) be used in a targeted manner, to deliver whatever information on people's perception of their sound environment is considered of practical benefit to decision-makers on a case-by-case basis."*
> *[emphasis added]*

The implications for soundscapes are therefore more relevant where significant acoustic impacts are expected.

2.1.2 Environment Agency (EA) Noise and Vibration Guidance (January 2022)

National Resources Wales Guidance in respect of noise and vibration for permitted installations in Wales is provided as follows:

> "**Noise and vibration management**
> *Read the relevant Environment Agency noise and vibration management guidance which we are continuing to follow.*
>
> *For most industrial noise impact assessments, we expect you to follow the criteria and reporting requirements of BS 4142:2014+A1:2019 Method for rating and assessing industrial and commercial sound (BS 4142).*
>
> *Read the Method implementation document (MID) for BS 4142 for extra guidance to ensure that you comply with all the requirements of BS 4142, where needed."*

Environment Agency Guidance is now an online reference document ref: Noise and vibration management: environmental permits [Link].

The guidance also embraces the concept of 'soundscape' which it defines as:

> *"To decide which sounds are appropriate for the environmental setting when assessing and predicting soundscape, you must consider:*
>
> - *the activities they may enable, for example, factory noise may symbolise local employment*
> - *what emotions they may evoke*
> - *what impact they may have*
>
> *In some places the existing soundscape may already be poor quality. Adding a further industrial source, even if its sound level is below a defined guidance level, may become a tipping point for an inappropriate soundscape or make it much harder to fix an existing problem.*

In another place, due to an already dull soundscape and low emotional expectations, an additional industrial sound source may not be a burden, as its level may be well masked by other sounds (for example traffic)."

Perception of noise that is not currently present within the soundscape is open to significant interpretation, particularly in areas where there is a high existing level of noise. The potential observed impact within the soundscape is therefore estimated based on the impact assessments carried out and the nature of sounds. The EA guidance document references guidance ISO 12913 as a method that may be suitable where soundscape assessment is carried out. This document is acknowledged to be accepted in Wales, though has no formal standing in policy elsewhere other than as adopted terminology.

The revised EA guidance makes reference to the terminology used in existing environmental permits and acknowledges that they may use different terms depending on their age. For example, the conditions may say that the operator must not cause:

- nuisance
- annoyance
- offensive noises
- offence to human senses
- interference with amenities
- pollution
- exceeding a numeric limit

The guidance also notes that whatever metric is used, the intent is the same, the operator should prevent or minimise noise by using:

- Best Available Techniques (BAT)
- appropriate measures
- due diligence
- all reasonable precautions
- noise management or working plans

In demonstrating BAT, regard should be had to the BS4142 standard for assessing impact and ensuring that the outcome is placed into context in accordance with that standard.

In determination compliance with BAT, this should also avoid confusion or conflict between similarly required regulatory outcomes, for example, statutory nuisance and planning requirements. In assessing the BS4142 impact outcomes, context needs to be provided that may be inferred from other standards but only where the use of these standards is justified, and, bearing in mind the soundscape commentary within the guidance, it is noted that the interpretation of real life outcomes will also need to be stated.

Where required by the outcome of the assessment in accordance with EA guidance, it would be normal for permitted installations to demonstrate BAT compliance for noise by preparing a Noise Management Plan (NMP). The NMP (where necessary) addresses impact of the installation independent of other sources, and puts in place physical, operational and management controls exercised by the operator of the installation to comply with Best Available Techniques (BAT).

Assessment of the impact of a permitted installation therefore requires a baseline assessment in accordance with BS4142 supplemented with other observations or standards as justified in the determination of impact. The methodology and terminology are broadly similar to that listed in the Planning Practice Guidance (see section 2.2 below).

2.2 Noise Impact

Noise impact is normally determined based on measured levels of sound in the environment that are compared to relevant standards. Which standards need to be used depends on the nature of the sound and the acoustic environment within which the sound is perceived. In the absence of an agreed

standard, the English Planning Practice Guidance (PPG) recommends an approach on determining and describing the impact of sounds as follows:

> *"**How to determine the noise impact?***
> *Local planning authorities' plan-making and decision taking should take account of the acoustic environment and in doing so consider:*
> - *whether or not a significant adverse effect is occurring or likely to occur;*
> - *whether or not an adverse effect is occurring or likely to occur; and*
> - *whether or not a good standard of amenity can be achieved.*
>
> *In line with the Explanatory Note of the Noise Policy Statement for England, this would include identifying whether the overall effect of the noise exposure (including the impact during the construction phase wherever applicable) is, or would be, above or below the significant observed adverse effect level and the lowest observed adverse effect level for the given situation. As noise is a complex technical issue, it may be appropriate to seek experienced specialist assistance when applying this policy."*

The PPG is useful as it enables a link between the numerical assessment of noise outlined in BS4142 to be mapped onto a tabulated summary of outcomes and effects as well as the likely personal response to noise in the environment. Whilst not directly endorsed by Welsh Guidance, this approach has been used. The PPG table is referenced below.

Response	**Examples of outcomes**	**Increasing effect level**	**Action**
No Observed Effect Level			
Not present	No Effect	No Observed Effect	No specific measures required
No Observed Adverse Effect Level			
Present and not intrusive	Noise can be heard, but does not cause any change in behaviour, attitude or other physiological response. Can slightly affect the acoustic character of the area but not such that there is a change in the quality of life.	No Observed Adverse Effect	No specific measures required
Lowest Observed Adverse Effect Level			
Present and intrusive	Noise can be heard and causes small changes in behaviour, attitude or other physiological response, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a small actual or perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
Significant Observed Adverse Effect Level			
Present and disruptive	The noise causes a material change in behaviour, attitude or other physiological response, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	Significant Observed Adverse Effect	Avoid
Present and very disruptive	Extensive and regular changes in behaviour, attitude or other physiological response and/or an inability to mitigate effect of noise leading to psychological stress, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory.	Unacceptable Adverse Effect	Prevent

Source: Planning Practice Guidance [link]

Noise impact and the level of effect is normally determined by compliance with appropriate standards see section 2.3 below).

2.3 Standards

Standards for determination of impact are normally based on absolute fixed levels or derived values based on comparisons. They are normally divided into standards set externally to sensitive developments or internally for particular rooms/activities.

The standard most applicable to environmental is an external standard (BS4142) that includes the character of the noise to be assessed, the sensitives of the receptors and the intended use/design of the development. Other external and internal standards, in conjunction with the PPG table above, help provide context.

2.3.1 External Standards

In order to determine the appropriate level of impact, the most appropriate metric for determination of that impact is required.

The **BS4142:2014** Method for rating and assessing industrial and commercial sound, provides a mechanism for evaluating the impact of a specified. The method requires that the level of the sound is averaged over set time periods and then corrections are applied in line with the prescribed acoustic features of the sound under evaluation. The resulting level is then comparing against the background LA90 sound level for the area. The assessment level is then reviewed against the criteria specified within the standard to help determine impact.

BS4142:2014 requires that any results are evaluated and placed into context so that the impact is properly characterised. A result of +10dB or more would indicate significant acoustic impact a result of +5 or more would indicate the potential for an adverse impact. It is normal for BS4142:2014 results to be used as indicators of required mitigation. Where mitigation cannot be carried out, it would be normal to try and prevent exposure to the impact.

Low Impacts, adverse impacts and significant adverse impact outcomes are summarised in the PPG table above.

BS8233:2014 Guidance on sound insulation and noise reduction for buildings, also provides guidance on external noise levels, in particular for amenity areas such as gardens. External noise levels for most development are suggested to not exceed 50dB $L_{Aeq,T}$, and noisier urban environments should not exceed the guideline value of 55 dB $L_{Aeq,T}$.

In this instance, this is an urban location with sensitive receptors a significant distance from the site and existing ambient noise has been determined to be above 50 dB $L_{Aeq,16hour}$. The contribution of the Checkfire activities to the existing ambient noise is therefore of interest.

The **World Health Organisation (WHO)** Guidelines on Community Noise is a document which specifies a number of absolute sound levels which seek to prevent health impacts, including the avoidance of noise and disturbance. The key external noise level standards quoted in the document are:

Specific environment	Critical health effect(s)	L_{Aeq} [dB]	Time base [hours]	$L_{AMax,fast}$ [dB]
Outdoor living area	Serious annoyance, daytime and evening	55	16	-
	Moderate annoyance, daytime and evening	50	16	-
Outside bedrooms	Sleep disturbance, window open (outdoor values)	45	8	60

As noted previously, this instance, this is an urban location with moderate levels of existing industrial noise already present in the acoustic environment.

2.3.2 Internal Standards

In addition to the above values, **BS8233:2014** gives guidance for noise levels *inside* habitable rooms based on their sensitivity. Table 1 Indoor ambient noise levels for dwellings lists the acceptable sound levels inside properties:

Activity	Location	07:00 to 23:00 hours	23:00 to 07:00
Resting	Living Room	35 dBA $L_{Aeq,16hour}$	
Dining Room	Dining Room/Area	40 dBA $L_{Aeq,16hour}$	
Sleeping (daytime resting)	Bedroom	35 dBA $L_{Aeq,16hour}$	30 dBA LAeq,8hour

BS8233:2014 offers additional guidance in the form of notes appended to the above table. In particular:

> *NOTE 5: If relying on closed windows to meet the guide values, there needs to be an appropriate alternative ventilation that does not compromise the façade insulation or the resulting noise level.*
> *NOTE 7: Where development is considered necessary or desirable, despite external noise levels above WHO guidelines, the internal target levels may be relaxed by up to 5 dB and reasonable internal conditions still achieved.*

The standard for long term LAEQ is consistent with the WHO guidelines on Community Noise standards However, WHO also recommends an LAMax standard to account for impulsive noise as shown below:

Specific environment	Critical health effect(s)	L_{Aeq} [dB]	Time base [hours]	$L_{Amax,fast}$ [dB]
Dwelling, indoors	Speech intelligibility and moderate annoyance, daytime and evening	35	16	45
Inside bedrooms	Sleep disturbance, night-time	30	8	

These standards are directly relevant to the proposed site.

3 Assessment Strategy

3.1 Methodology

3.1.1 Background and residual noise survey

Monitoring to establish the typical sound levels in the area comprised a survey of current residual and background noise levels measured between 7th and 12th May 2025 using continuous monitoring at a location on the boundary of the Pontygwindy Industrial Estate adjacent to housing (locations MP1). The monitoring included weekday and weekend levels.

The data from monitoring is used directly to produce statistically relevant background data for the area and establish the existing average noise levels as 15 minute, 1-hour, 8-hour and 16-hour averages to align with appropriate standards.

Attended measurements at internal locations inside the facility were carried out during the normal working day 7th May 2025.

A site walk was also conducted 7th May 2025 and repeated on 12th May 2025 to establish typical sounds in the area surrounding the industrial estate at receptor locations.

Monitoring is undertaken in accordance with BS7445:2003, the requirements of BS4142:2014+A1(2019), and the Method implementation document (MID) for BS 4142 issued by the Environment Agency.

The details of the monitoring and the calculations are provided in Appendix 2.

3.1.2 Assessment methodology

All impact assessments are calculated (modelled) levels based on source noise data from measured data from onsite activities. The source data measurements are provided in Appendix 1, and the data used in the modelling is summarised as indicated in Appendix 1 Source Data.

The attended survey undertaken to establish internal sound levels and sound levels for activities carried out by Checkfire. The attended survey also identified characteristic noise, typical 'ontimes' for activities, and provided subjective assessment of the existing noise climate and ensure that the predictions used are appropriate.

Unattended measurements taken characterise typical background and residual sound levels that are subsequently used as a baseline for determination of impacts (see Appendix 2).

The data is then modelled using SoundPLAN [link] noise modelling software based on the calculated sound levels for the activities noted.

Calculations are provided to determine the typical level and worst case maximum level of impact of proposed source noise on the *measured* background and residual noise in the area.

It should be noted that noise from Checkfire was not distinguishable from other industrial noise at receptor locations.

3.1.3 Impact assessments

Impact assessments have been produced using a SoundPLAN acoustic model (see 3.2 below)

1. A typical operational model with degassing, fork lift truck activity inside and outside the unit (degassing and FLT only).
2. A worst case scenario with the activities in 1 above, the conveyor operating, and an empty RORO container being filled operation to provide a maximum level of daytime noise for worst case activities.

Assessment 1 is used to predict current sound levels affecting the sensitive receptors surrounding the site. Assessment 2 is used to predict a worst case impact.

The impact assessments have been conducted using BS4142:2014+A1(2019). Context has been provided using subjective assessment and comparison to fixed standards and the existing measured data as appropriate.

3.2 SoundPLAN Model

SoundPLAN [link] is noise modelling software designed specifically to provide visual representations of noise level predictions. The model requires a natural topographical digital map to be overlaid with generic man-made feature data such as building heights and widths, roads, local barriers etc. The model is then updated to ensure that model 'surfaces' behave appropriately in respect of absorption and reflection of noise. Lastly noise sources are added, with known sound power or sound pressure levels and frequency spectra data (where available) as noted in Appendix 1. The model then calculates the resulting transit of sound from the source(s) to receptor(s) taking into account the various obstacles, reflections and absorption characteristics that would impede the propagation of sound through the environment.

SoundPLAN is a model that is capable of using multiple different modelling techniques. This assessment (common to most assessments in the UK) utilises the calculation methods for ISO 9613:2024 part 2. This is an Internationally recognised standard for the modelling of noise and is accepted as suitable for assessment of industrial noise sources.

SoundPLAN as a standard acoustic model, would be expected to provide an accuracy of ±3 dB for the modelling aspect, but overall uncertainty is heavily dependent on the quality of the data input. Uncertainty has been minimised by applying a worst-case approach, the results are therefore considered to be higher than may actually be the case, as the source data is conservative. (See section 3.3 for uncertainty assessment).

3.2.1 Model Assumptions

The results for modelling of site-based noise present three difference model scenarios as identified in paragraph 3.1.3 above.

The source data assumptions in respect of each noise model are noted in the Appendix 4 - modelling outputs.

The following assumptions apply to mitigated noise modelling based on the proposed layout plans provided by the client:

- All modelling is carried out with ground conditions as hard reflections to maintain a worst case.
- Existing noise from the industrial estate has not been modelled. The monitoring results for MP1 provide indications of existing industrial estate noise at the edge of the estate next to residential receptors.
- There is some slight variation in height between source and receptors that has been modelled using topographical data (the survey area is not flat). Opensource LIDAR data has been used to model topographical features.
- Boundary mitigation effects for the modelled output to the south of the site include a significant woodland screen of >30m in depth and is likely to have a slight barrier/absorptive effect, however this has not been factored into the model.
- The calculation method used is that in ISO9613-2:2024
- 20°C Temperature and 70% Humidity has been assumed.
- Results are A-weighted.
- Results are rounded to the nearest whole number.
- Second order reflections are included.
- All façade levels have been modelled and displayed as free field results (reflection corrections are applied).
- ISO9613-2 barrier attenuation limit (20/25dB) is applied (where barrier effects are present).

- Vertical edges (lateral paths) are included.
- ISO17534-3 recommendation 5.2 has been applied and ground reflections are not screened (as recommended in ISO17534-3 paragraph 5.3).

3.3 Limitations & Uncertainty

The baseline noise level surveys used equipment and methods that generally would be expected to give results accurate to within ±1 dBA. The inherent uncertainty in measurement was minimised by ensuring measurements carried out complied with appropriate standards.

The monitoring carried out was noted to reflect the residual and background levels and are considered typical for the area, however, monitoring from residential locations was not possible as there were no secure sites available. Continuous monitoring at location MP1 was assessed and the quietest 95%ile of the results used this used as a worst case LA90.

Other sources of potential uncertainty were minimised by ensuring:

- Weather conditions were recorded as generally dry, with maximum wind speeds of approximately <5m/s.
- The ambient temperature during measurements was above 5°C.
- Measurement locations were located 1.5m above ground level and more than 3.5m away from reflective surfaces (see Fig.1.2 above and photographs below).
- Survey periods were carried out in accordance with approved standards and sufficiently characterise the sounds assessed.

Modelling software compliant with ISO9613 is expected to be accurate to ±3 dB (ref: Paragraph 9 Table 5).

3.4 Measurement equipment and conditions

Noise measurements were taken with two Cirrus 171 Class 1 integrating sound level meters located at measurement point MP1 (as noted in 3.4 below) and used to gather source noise data:

- G304686
- G300972

The meters were field calibrated prior to measurements with Cirrus CR515 calibrators ref: 79811 and 74769 respectively. The meters were compliance checked after measurements; no significant drift was noted.

Copies of calibration certificates can be seen in Appendix 3 of this report.

3.5 Measurement location and times

Measurements were made at the location locations as indicated on Fig 1 above below, as follows:

Figure 3 Measurement location MP1

Position MP1: Microphone was Located on a 6m pole (roughly in line with the ground floor of properties on Davies Drive) approximately 16m from the façade of the properties on Davies Drive.

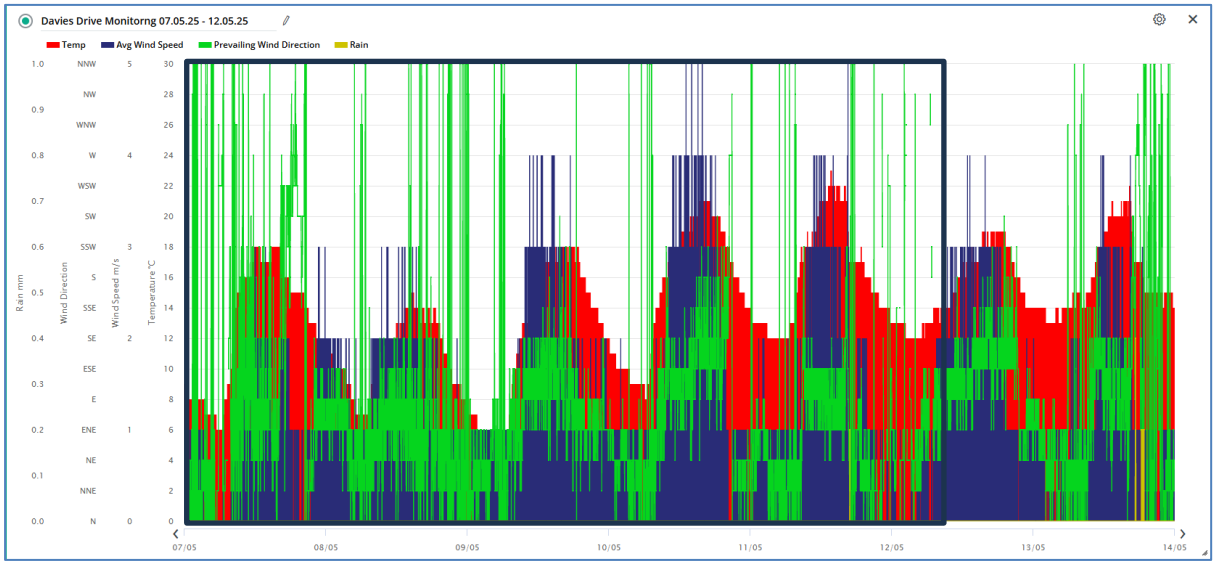
The meter was located between the two industrial buildings and equidistant from both industrial buildings (approx. 4m from each).

The measurement position was dictated by security of the device as the other locations were unsuitable for remote monitoring.

The weather station was located 3.5m from ground level within 3m of the microphone position. Regrettably it was not possible to collocate as the pole mounting was not sufficient to securely affix the weather station. However, both devices were >3.5m distant from the buildings.

3.6 Weather

Measurements and observations were taken on between 7th May 2025 and 12th May 2025, the weather conditions are summarised in the chart and table below. Continuous monitoring of weather data was conducted using a Davis Vantage Pro [link]: The results are displayed below.



In general monitoring wind speed was <4m/s (dark blue) and predominantly from the east, temperature was above 6ºC with a maximum recorded 22ºC, with no rain during the monitoring period (yellow bar). The weather conditions were noted to be acceptable for sound level measurement, with no significant concern for additional uncertainty (see above).

4 Results

The results of the assessment of source from the activities within the Checkfire facility are presented in Appendix 1.

The monitoring results for background monitoring location MP1 provided in the Tables in Appendix 2, and results and commentary are summarised in section 4.1 below.

The source noise data is then collated and forms the basis of the input data into the noise model. The calculated levels for operational noise and worst case are provided in Appendix 3 and are summarised along with commentary in 4.2 below.

The results for modelling and each of the prediction scenarios has been assessed for day and night for impact in a BS4142 assessment based on the worst affected receptor.

4.1 Background and Residual Monitoring

Background and residual levels have been established through direct monitoring and by modelling based on data obtained.

A summary of monitoring results is presented in table 4.1 below alongside the modelled data to establish predicted existing levels at each sensitive receptor.

Table 4.1 Summary of measurement data MP1

Average type	**Daytime (1hour)**			**Nighttime (15mins)**		
	Average L_{Aeq}	**Average L_{A90}**	**L_{A90} Std Deviation**	**Average L_{Aeq}**	**Average* L_{A90}**	**L_{A90} Std* Deviation**
Mode		43			-	
Median		44			45	
Mean	51.6	44.5	2.4	47.8	44.7	2.8

*relates to 06.00 – 07.00hrs only

The average daytime LA90 was ~ 44 dB $L_{A901hour}$ mode and mean, with a 44.5 dB mean average and a relatively low standard deviation. Daytime average residual levels were ~52 dB were again very consistent 3.5 dB standard deviation.

The nighttime result was for the period 06.00 – 07.00 hrs (Checkfire operate between 06.45 – 17.00 hrs daily) was actually slightly higher, with no modal average (42 dB and 47 dB being the most prominent) and a mean/median of 45 dB. The 06.00 – 07.00 hour was assessed to provide a statistically significant sample of results for assessment of the early morning background level.

To ensure a worst case scenario, **a conservative value of 39 dB L_{A90}** has been used as the worst case background level for the area (corresponding to the 95%th percentile of all measured data. As the background levels for daytime and night time are almost identical, a single evaluation for BS4142 for typical and worst case will be provided.

The typical, (average levels of residual noise) are noted to be relatively high, and comprise mainly an industrial hum from the Pontygwyindy Industrial Estate. The average LAeq for 'night time was noted to be 47.8 dB, this value has been used for comparative purposes in order to provide context. It should be noted that Checkfire only operate for 15 minutes prior to 07.00 hrs and the level of night time working is therefore *very limited*.

4.2 Predicted Sound Levels

The predicted sound levels for the application site are provided in Appendix 1 Source Data Table. The model provides results for each scenario as indicated in section 3.1.3 above.

4.2.1 Typical Operation

The results for typical operation relate to the 'normal' operations onsite. Observation of the activities within Checkfire identified that normally only the degassing/emptying of cannisters and their subsequent de-heading are typical. This includes periodic use of forklift trucks to move new containers into positions and deposit of empty/removal of full effluent IBCs and container pallets.

Monitoring inside the factory identified these activities as relatively localised at the south west of the building, and relatively quiet within a larger building. The internal activities for typical operations were distinguishable at the open door of the unit but blended in with existing residual sound outside the unit and were barely audible at 20-30m from the unit with the main door open.

Checkfire normally operate between 6.45am and 5.30pm daily Monday – Friday and a Saturday morning 8am to 1.30pm but they have no restrictions on the hours of operation/use of the premises.

4.2.2 Worst case Operation

Worst case operation assumes that the activities for typical are occurring and that a RORO delivery takes place, along with use initial tipping of cannisters into the RORO skip and then ongoing fill of the skip occurs. The durations of each operation were considered and the overall impact assessed.

Monitoring inside the factory identified these tipping activities as *clearly audible* (loud impulsive crash events) as the conveyor moved cannisters into the skip at the south west part of the building. Noise levels from this activity were initially clearly audible outside the unit and at a distance of 30 – 40m up the road, but only barely audible at the top of Sir Afred Owen Way, and inaudible at the northern boundary of the industrial estate. The noise was also inaudible at Pontygwindy Road.

Appendix 4 provides the detailed modelling outputs for each scenario however the table in section 4.2.3 below summarises the outputs for the key receptors.

4.2.3 Summary of impacts

Table 4.2.2 Summary of modelling outputs

Receiver	Floor	Typical $L_{Aeq,T}$ (dB)	Worst case $L_{Aeq,T}$ (dB)
1 Howard Drive	GF	32.5	39.1
1 Howard Drive	F 1	**32.7**	**39.4**
2 Davies Drive	GF	26.7	34
2 Davies Drive	F 1	28.7	35.9
14 Pantycelyn Drive	GF	29.3	36.1
14 Pantycelyn Drive	F 1	30	36.9
226 Pontygwindy Road	GF	17.7	25.3
240 Pontygwindy Road	GF	21.7	28.9
240 Pontygwindy Road	F 1	24.6	31.7
250 Pontygwindy Road	GF	24.9	32.3
Alder View 2	GF	16.4	24
Alder View 2	F 1	19.5	27

The worst affected receptor is 1 Howard Drive. Typical operations are predicted to give rise to a level of 33 dB whilst worst case operations would increase this to 39 dB. In both cases the predicted level of impact is more than 10 dB below the existing measured residual levels for daytime noise, and the worst case impact is 8 dB below the level for early morning noise.

It is likely, based on the predictions that the activities at Checkfire would be inaudible at the worst affected receptor during the daytime, and would not adversely affect such a receptor at night time (early morning) as most receptors will be inside the home and even with an open window, the level of sound likely to enter the home would be ~24 dB (far less than the existing residual levels).

4.3 BS4142:2014 assessment for Typical Operational Noise

The following BS4142 is the full assessment for the most exposed receptors (highlighted in section 4.2 above.)

Results	Typical	Worst Case	Relevant BS4142 Clause	Comments
Calculated Specific Level	32	39	7.3.2	Based on the measurement taken
Acoustic feature correction	+3	+3	9.2	Some barely noticeable tonal components slightly more noticeable hum at night from continuous plant at night (+2/+4 dB) (worst case)
Rating level	35	42	9.2	
Background sound level	39	39	8.1.1 8.1.3 8.3	An assumed background level was taken from the rear elevation of the premises 10dB less than the front based on TIP observations
Excess of rating over background sound level	-4 dB	+3 dB	11	**Low Impact**
Assessment (context)	**11** The predicted levels of noise at the receptor location are based on typical operations and worst case operations that are short during (~15minutes per day) with a the statistically lowest background level. The results in both cases indicate a low impact according to BS4142. The predicted incident noise level at the façade of the worst affected receptor is 39 dB. The sounds generated are similar to other industrial noises on the industrial estate and are unlikely to be distinguishable from existing residual noise. Observations outside the site note that the typical operation of the site was not noticeable, and that worst case operation (impact noise) was barely audible at a distance of 80m from the site. The closest receptor indicates an assessment level of +3 dB (rating level 39 dB) that is well below the existing daytime ambient level (51.6 dB as established at MP1). It is unlikely that sound from Checkfire will be audible at the receptor locations even when worst case conditions of operation occur. In context it is expected that the impact is expected to be negligible with little or no audibility of the Checkfire activities at receptor locations.			

4.4 Soundscape Assessment

Noise and Soundscape Plan for Wales 2023-2028 provides additional advice in respect of when and how soundscapes should be considered and advises that, where formal assessment is required the approach in ISO12913 should be considered.

Paragraph 1.2 of the plan states:

> *"…It would be unreasonable and disproportionate to expect these procedures to be followed in full every time a soundscape perspective is desired to inform a decision in Wales. Rather the Welsh Government recommends that the methods outlined in the soundscape standards (such as the soundwalks and questionnaires set out in Annex C of ISO 12913 Part 2) be used in a targeted manner, to deliver whatever information on people's perception of their sound*

environment is considered of practical benefit to decision-makers on a case-by-case basis."
[emphasis added]

The draft document provides a screening matrix (reproduced below) advising when such an approach is required.

The modelled noise levels produced by the facility are very low.

In soundscape terms and using the PPG descriptors, noise is either No Observed Effect or at worst, No Observed Adverse Effect. Both are below the threshold for he onset of the Lowest Observed Adverse Effect Level (LOAEL). In soundscape terms at worst, noise from the facility can be heard, but does not cause any change in behaviour, attitude or other physiological response, but can slightly affect the acoustic character of the area but not such that there is a change in the quality of life.

This level is equivalent to below the LOAEL thresholds.

Figure 4 Soundcape Decision Framework

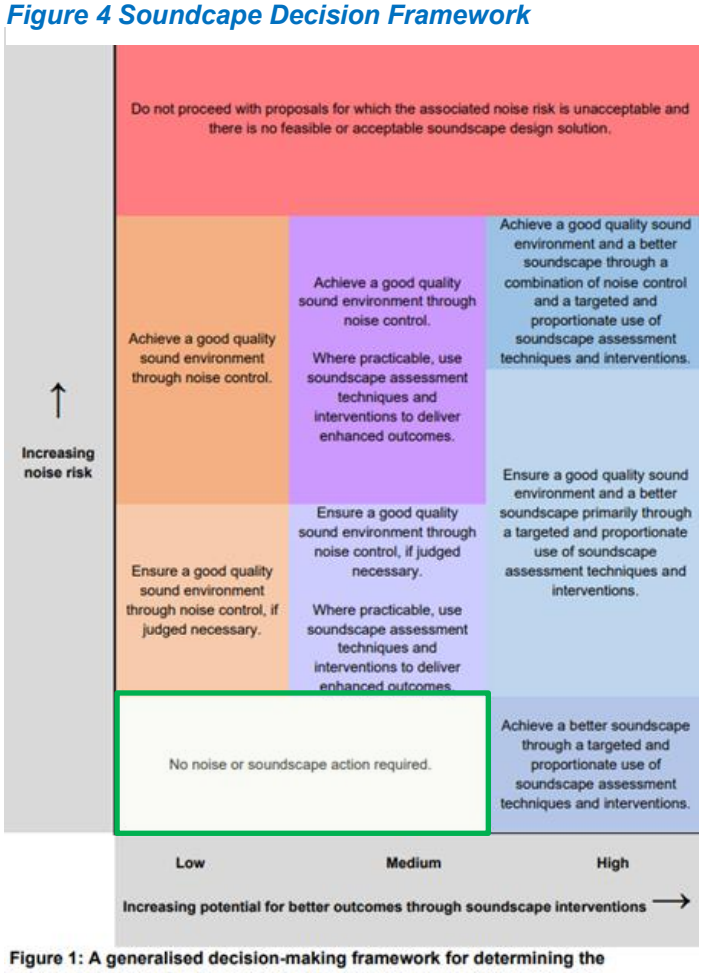


Figure 1: A generalised decision-making framework for determining the appropriate level of noise control and/or soundscape assessment and intervention when exercising functions that may affect soundscapes

The NSPW guidance provides a decision framework based one increased noise level risk and the potential significance of impacts. Using the screening table adjacent, it is suggested that, in line with this guidance, and, as the conclusions above indicate, a negligible or low impact, and compliance with all relevant standards, there is no need for a formal soundscape assessment.

Soundscape comments have been provided in sections 1.4, and 4.1 – 4.3 as part of the assessment of context of the assessed sounds in the area. This approach is considered to be consistent with the requirements of Welsh Government Guidance and provides an appropriate level of detail that should be sufficient for a permit application.

5 Conclusions

The site is located within a busy industrial area, and between the main Pontygwindy Road and the main rail line.

The observations and monitoring carried indicate that existing industrial noise is the dominant source of noise for the area.

Measurements and predictions of noise from Checkfire noise indicate that façades of sensitive receptors in the area would be exposed to levels of noise that be significantly lower than the existing ambient levels and completely masked by the existing industrial sound during typical operations.

It is possible that the sound of dull thumps of impact noise would be audible at receptor locations when worst case activities are taking place (use of the conveyor to load decontaminated containers into a new waste RORO skip). It should be noted that this activity takes less than 15 minutes complete and is inherently mitigated as the skip fills to level where it is be inaudible as observed from the top of the street.

The results of this assessment are summarised below and set the basis for mitigation of the noise levels to ensure that standards are met.

5.1 BS4142/BS8233

An assessment based on all identified noise generating activities operating has been provided as a worst case for both daytime and nighttime using British Standard 4142:2014+A1 (2019). The impact assessment standard is used to demonstrate the acceptability of the new process as it might affect sensitive residential receptors in the community. The assessment is summarised below.

Table 5.1 BS4142:2014 Assessment (worst case) for receptors
(see Section 4.3 for full assessment)

Activity	Specific Level (modelled)	Assessment Level (dB)	Comment
Worst Case operation	39 dB	+3 dB	LOW impact
Typical Operations	32 dB	-4 dB	LOW impact

It should be recognised that facility operates only 5 days a week between the hours of 06.45hrs – 17.30hrs Monday to Friday. Saturday working 06.00hrs – 14.00hrs is reserved for cleaning and maintenance activities only. No deliveries or processing takes place.

The noise generated by the site will not increase the ambient noise levels of the area. Existing noise levels are noted to be 51.6 dB LAeq,16hour during the day, and 47.8 LAeq,1hour for the period 06.00hrs – 07.00hrs.

Worst case operation would raise the 15minute period between 06.45 and 07.00 by 1 dB (barely noticeable) should those events occur before 7am, whilst typical operations would not impact noise levels at receptors.

In context, at worst the receptors may hear very soft clashes/thumps. In soundscape terms this would be not noticeable or barely noticeable.

The operation of the proposed plant is concluded to be acceptable in noise terms which in context, results in impacts being generally very low.

A Noise and Vibration Management Plan (NVMP) would not normally be required, however and outline plan is provided in the section below.

6 Noise Management

The receptor impact assessment is outlined in the impact assessment section above. The outcome of that assessment concludes that the impact of the facility is not significant in respect of noise generated by the facility affecting nearby sensitive receptors.

However, there is a general due diligence requirement to prevent the releasee of emitted pollutants (including noise and vibration) or reduce to a minimum.

The normal process for demonstrating that controls are in place is to devise and implement a noise management plan and ensure the measures identified are in place, and physical infrastructure for those control measures is maintained. These control measures and physical infrastructure are listed below and constitute sensible noise management controls for the entire site, though the NMP is only legally required if there is evidence of noise concerns and would need to be reviewed if complaints were made.

6.1 Physical infrastructure

6.1.1 Building Enclosure

The building structures are aligned so that open sides face either into the industrial site, and away from sensitive receptors. The building has 3 other doors (all of which are blocked and should not be used for access). The building is a modern construction featuring blockwork to 3m and then Kingspan insulated sheeting for walls and roof structures

All the process activities are located within the building. Degassing and decontamination, de-heading of cylinders, removal of metal and plastic and then collection into a roll-on roll-off skip.

Compliance	
Building integrity check	
Annual Visual building integrity check	
Access doors kept closed	

The building effectively contains most noise generated within it. Noisy activities inside the building are prominent only within the open sided area facing away from sensitive receptors providing the building fabric is maintained.

Demonstrating Compliance

An integrity check on the condition of the building fabric is to be carried out every 4 years to ensure that the building structure is intact. The integrity check should include replacement of any defective panels.

A visual inspection of building integrity to be conducted every year.

Any necessary works to repair damage to the building fabric are arranged within as soon as possible.

6.1.2 Maintenance and report of road/yard surfaces

Road ways and yard areas both inside the building and on the front concrete delivery apron within the site boundary should be maintained in good repair to avoid excessive vehicle or machinery noise from clanks or bangs when traversing the areas.

Any delivery activities carried out on unmade road ways should be conducted when such locations are in good repair, and any holes repaired.

Site roads/surfaces should be maintained in a state of good repair to reduce any noise from the passage of vehicles.

Compliance	
Activities within designated areas	
Routine checks on road ways and yard areas (1/month)	
Repairs to road or yard areas recorded.	

Demonstrating Compliance

Activities identified as noisy should be carried out in designated areas as indicated on the site management plan. Records should be retained to positively demonstrate that surfaces are checked, repair records should be kept to demonstrate maintenance of surfaces and compliance with the NMP.

6.1.3 Maintenance of plant and equipment

Compliance	
Routine maintenance of plant/equipment	
Records of maintenance of key plant	

The site uses limited plant and equipment, most tasks are manual and require only the use of manual hand tools, hammers, pliers, spanners screwdrivers etc.

The only significant plant is the Damotek Powder Powder Extraction plant, the (unnamed) cardboard compactor collection and a (currently decommissioned) Atlas Copco compressor.

The only other plant in regular use are the two Jungheinrich A320 Forklift trucks.

All plant and equipment is checked before use to ensure operation is within normal specifications. Vehicular plants are checked to ensure silencers are working normally, other plants are maintained in accordance with the manufacturer's instructions to ensure proper use.

Demonstrating Compliance
A maintenance plan schedule should be prepared for key noisy plant.

Plant maintenance records should be kept.

Records should be kept of incidents of plant failure/noise and the corrective action taken to demonstrate compliance with the NMP.

6.2 Control Measures Management Plan

The following measures are management controls intended to minimise potential noise impacts;

6.2.1 Deliveries/vehicle movements

Compliance	
Hours of delivery/vehicle use	
Vehicle maintenance	
Vehicle silencers	
Reversing alarms	

Deliveries of goods to, as far as practicable, occur only during the normal working day 07.00hrs – 17.30 hrs.

Whilst hours are not restricted per se, custom and practice has been to ensure no significant deliveries, or import/export of goods are carried out outside the normal hours, as listed.

Internal vehicle movements, as far as practicable to occur only during the normal working day.

(Un)loading of waste extinguishers and import/export of wastes from the site should be carried out in accordance with good practice to avoid excessive waiting times with engines on tick over, avoid engine revving and excessive reversing, and avoid double handling of containers, pallets of other materials to reduce the duration of deliveries.

Demonstrating Compliance
All vehicle used on the site will be routinely maintained, have appropriate silencers, and, where possible use broadband reversing alarms to prevent excessive disturbance.

Any malfunctions in vehicles to be reported to the driver immediately. All internal vehicles to be maintained in accordance with the manufacturers instructions.

Any visiting vehicles with excessive noise noted shall be reported to the driver immediately and to the company supplying the vehicle.

6.2.2 Staff Training

All operator staff receive training on environmental noise awareness. Operators responsible for the operation of vehicles or equipment, have been provided with basic noise awareness training, and are trained to understand and minimise the extent of the acoustic impact of those activities. In summary this means staff are instructed to:

- Ensure activities are carried out in designated areas,
- Ensure all machinery is used as directed and in accordance with good practice,
- Understand the key requirements to minimise triggers for excessive noise based operation of the process,
- Understand the need for keeping appropriate records and recording/reporting of abnormal events,
- Understand the complaints procedure and the need for good community liaison in the event of complaint,
- Ensure cooperation with any investigation into a complaint,
- Understand basic noise awareness and control principles.

compliance	
Staff awareness training	
Reporting of abnormal events	
Compliance with operational time limits	
Recording of information requested	
Complaints procedure	

Demonstrating BPM
All operator staff will are trained in noise awareness.

All records associated with abnormal events should be recorded.

All staff to be made aware of the complaint process and their role within any investigation.

6.2.3 Basic Noise awareness

Basic noise awareness as it applies to Operator staff and comprises the following items:

- Instructing staff in the operation and use of the tools needed for each task,
- Ensuring that activities take place only in designated areas preferably inside buildings,
- Ensuring that noisy activities are undertaken during the day as far as reasonably possible and ideally not before 7am,
- Ensuring that staff are aware of the need to identify any problems and report those as necessary,
- Ensuring that staff keep appropriate records.

Staff are provided with on the job training and familiarisation as necessary to ensure compliance with basic noise awareness.

6.2.4 Complaints procedure

Any noise complaints received are logged, recorded and retained for inspection in a complaint log. The details of the complaint must include:

- Time and date of notification,
- Name of complainant,
- Address of complainant,
- Nature of incident (identifying equipment or machines or people if possible),
- Time incident occurred.

BPM compliance	
Complaint procedure	
Investigations process	
Community liaison	
Recording of information requested	

The complaint log should be completed by the individual receiving the complaint and then immediately brought to the attention of the operator.

The operator (or any person delegated by him – for example environmental consultant) will then investigate the incident(s) leading to the complaint. The outcome of the investigation shall be recorded by the operator in the complaint log, along with any measures taken to reduce or eliminate the noise. The complainant shall then be notified of the outcome of the complaint.

If a complainant is not satisfied with the outcome of the investigation, the operator should advise the complainant of what further measures are to be taken. If no other measures are possible or appropriate, the operator should advise the complainant of their right to make a formal complaint to the regulator.

There will be circumstances where no immediate mitigation measures are possible. In such cases the site operator will record the reasons for this and ensure that all noisy activities are kept to an absolute minimum.

Demonstrating BPM

A formal written complaint procedure is maintained.

All complaints (or notifications from staff of events) to be investigated and actioned as necessary.

At the conclusion of any investigation, all complainants to be notified of the outcome of the investigation as soon as is practicable.

All information to be recorded.

6.3 Community Liaison

At the request of the regulator or following justified complaint, the operator will engage in community liaison meetings as may be required. The value of good community relations is considered paramount and a good standard of communication between the operator and potentially affected parts of the community is considered necessary if site-based activities become noticeable in the community.

6.4 Formal noise monitoring and compliance

Formal noise monitoring and assessment could be carried out periodically if required. However, the screening impact assessment indicates that there is a negligible impact.

Quantitative noise assessment will be performed if required (e.g. in response to complaints).

It is not considered necessary to carry out routine quantitative noise monitoring, as the level of impact has been determined to be negligible.

All complaints, major noise impacts and incidents received or detected are recorded on the event log. Details of these incidents and complaint are available for inspection at any time by the regulator.

Any detailed logs can be analysed and used to detect common failure points that will, in turn, be used to update management or control measures as necessary.

Glossary of terms

Sound – an acoustic effect perceived by an individual. Sound is perceived differently by individuals and is highly subjective. Acoustically for sound to be perceived it has to be above the threshold of hearing (typically taken to be 0dB) but this threshold varies between individuals.

Noise – noise is defined as unwanted sound. The level at which noise is present will indicate the potential impact. In order for a sound to become noise, it has to be perceivable by the individual. Technically noise can be described in terms of its acoustic profile, typically though noise at or below the ambient levels is rarely loud enough to be considered significant.

Acoustic environment sound from all sound sources as modified by the environment [BS ISO 12913-1:2013]

'A' Weighting – This function modifies the linear frequency response of the meter sound profile to attempts to simulate the characteristics of human hearing. Hence a dB(A) reading is a subjective evaluation of what we actually hear whereas dB(LIN) (now written dBZ), is an objective reading of what is actually present. A weightings are normally used in environmental and occupational measurements

Ambient – This is the general level of sound in an area. It is usually composed of sound from many sources near and far, that together make the 'average' noise for an area. Ambient noise is normally described using a long term average sound level (typically LAEQ).

Ambient sound – totally encompassing sound in a given situation at a given time, usually composed of sound from many sources near and far. *NOTE The ambient sound comprises the residual sound and the specific sound when present.*

ambient sound level, LAeq,T – equivalent continuous A-weighted sound pressure level of the totally encompassing sound in a given situation at a given time, usually from many sources near and far, at the assessment location over a given time interval, *T*. *NOTE The ambient sound level is a measure of the residual sound and the specific sound when present.*

Attenuation – The loss in energy level of the sound usually used in relation to the loss due to sound passing through a structure or enclosure.

Background Noise Level – The underlying level of sound in the absence of the source is normally measured as an LA90, the level which is exceeded by 90% of sound present. This measurement effectively screens out transient noises. Occasionally LA99 is used which is the level which is exceeded by 99% of the sound present.

Background sound level, LA90,T – A-weighted sound pressure level that is exceeded by the residual sound at the assessment location for 90% of a given time interval, *T*, measured using time weighting F and quoted to the nearest whole number of decibels

Decibel (dB) – a unit or level, derived from the logarithm of the ratio between the sound pressure measured and a reference value. For sound pressure level the reference quantity is 20μPa, the threshold of normal hearing is in the region of 0 dB and 140 dB is the threshold of pain. A change of 1 dB is only barely perceptible whilst a change of 10dB is considered significant. Sound pressure levels are noted as SPL, sound power can also be measured as a ratio of energy values, and is normally noted as SWL.

dB(A) (See A weighting above) – decibels measured on a sound level meter weighted by a scale which is designed to reflect the perception by the human ear. A noise meter incorporates a frequency weighting device to create this differentiation. Measurements in dB(A) broadly agree with people's assessment of loudness for broadband noise. A change of 3 dB(A) is the minimum perceptible under normal conditions, and a change of 10 dB(A) corresponds roughly to halving or doubling the loudness of a sound. The background noise level in a living room may be about 30 dB(A); normal conversation about 60 dB(A) at 1 metre; a busy factory may have a level around 85dB(A); the level near a pneumatic drill about 100 dB(A).

Equivalent continuous A-weighted sound pressure level, LAeq,T – value of the A-weighted sound pressure level in decibels of continuous steady sound that, within a specified time interval, $T = t2 - t1$, has the same mean-squared sound pressure as a sound that varies with time. *NOTE The equivalent continuous A-weighted sound pressure level is normally quoted to the nearest whole number of decibels.*

Frequency – This is the number wavelengths passing a given point per second. The unit is the hertz (Hz). Frequency is the normal variation in pitch that most sounds have over time. Sound is normally made up of many different frequencies, and they behave differently within the environment. For example, moderate and high frequencies are damped out easily by barriers, screens or enclosures while low frequencies are more difficult to attenuate, which explains why loud music from a neighbour perceived through a wall often only sounds like a dull base thumping noise.

Impulse Noise – Single or repeated sound of short duration such as a bang or crash.

LA90 – The A weighted noise level exceeded for 90% of the specified measurement period. It is a statistical measurement. Used in BS 4142:2014 as the baseline for impact assessment and more generally it is used to define background noise level. Example, if a sound measurement carried out each second over 100 seconds the LA90 result would be the level representing the quietest 10% of the readings i.e. 10seconds.

LAeq – The equivalent continuous sound level - the sound level of a notionally steady sound having the same energy as a fluctuating sound over a specified measurement period. LAeq is used to describe many types of noise and can be measured directly with an integrating sound level meter. It is obtained by continuously integrating ('adding up the energy of') a fluctuating sound signal and dividing by the elapsed time, to give the true mathematical average of any time varying signal. An Leq reading must always be related to a time period, it should not be read as an instantaneous value of sound pressure.

LAmax – The highest A weighted noise level recorded during a noise event. The time weighting used (F or S) should be stated. Almost all environmental measurements are 'Fast' weighted.

Logarithmic – A scale where the exponent indicating the power to which a fixed number, the base, must be raised to produce a given number. The base used in acoustics is 10. Thus, the logarithm of 10 = 1, the logarithm of 100 = 2 and the logarithm of 1000 = 3. Logarithms are used to convert very spans of pressure or energy measurements into usable scales.

Loudness – An observer's auditory impression of the strength of a sound. It is a subjective effect which is a function of the way we hear, and psychoacoustic response as well as the amplitude and frequency of the sound.

Masking – The process by which the threshold of hearing of one sound is reduced due to the presence of another which 'masks' the first.

Measurement Periods (T) – is the period over which the measurement is taken, normally varies between 5mins to an hour. More commonly 'real time' analysis and new data storage capabilities has allowed measurement times to be reduced to 1 second

Measurement time interval, Tm – total time over which measurements are taken. *NOTE This may consist of the sum of a number of non-contiguous, short-term measurement time intervals.*

Meter response and time weightings – Sound Level Meters are provided with a sampling reference time weightings dependent on the sounds to be assessed. The variable time response control with settings are:- 'S' Slow; 'F' Fast; 'I' Impulse; 'P' Peak.

'S' Slow – meter response is over damped with a time constant of approximately 1000ms. The setting tends to average out variations in sound levels in the readings.

'F' Fast – meter responses sample over a response of 125ms. i.e. the measurement for variable sound will respond each 1/8th of a second showing a value.

'I' Impulse – uses a special electrical circuit with a time constant of about 35ms (of the same order as the response time of the human ear) to permit a very rapid response for investigating very sudden, short duration - impulsive - sounds. This setting incorporates a detector which in effect stores the signal for sufficient time to allow it to be displayed. Also a slow decay rate is incorporated with time response of approx. 1500ms to allow more easy reading of the maximum value as the indicator moves back relatively slowly.

Peak – Sound Level Meters often incorporate this setting which enables the **absolute peak** (as opposed to the rms) value of an impulsive waveform to be measured. A time constant of the order of 20 - 50 micro seconds is now involved to permit the following of very sharp impulsive events. Evidently electrical signal storage is also required to permit the meter to register the peak of such very fast events.

Rating Level – The specific noise level of a source when measured at receiver location (usually averaged over a time interval) plus any adjustment (penalty or weighting) for the characteristic features of the noise. It is used in BS4142 to rate the likelihood of complaints.

Reference time interval, Tr – specified interval over which the specific sound level is determined. *NOTE This is 1 h during the day from 07:00 h to 23:00 h and a shorter period of 15 min at night from 23:00 h to 07:00 h.*

Residual sound – ambient sound remaining at the assessment location when the specific sound source is suppressed to such a degree that it does not contribute to the ambient sound

Residual sound level, Lr = LAeq,T – equivalent continuous A-weighted sound pressure level of the residual sound at the assessment location over a given time interval, *T*

Specific sound level, Ls = LAeq,Tr – equivalent continuous A-weighted sound pressure level produced by the specific sound source at the assessment location over a given reference time interval, *Tr*

Specific sound source – sound source being assessed

WHO – World Health Organisation

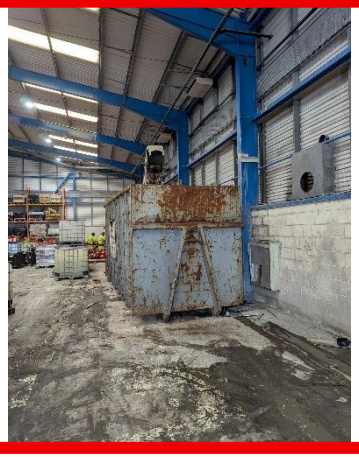
References

1. BS 7445-1:2003: Description and measurement of environmental noise. Guide to quantities and procedures
2. BS 4142:2014+A1(2019) Method for rating and assessing industrial and commercial sound
3. BS 8233:2014 Guidance on sound insulation and noise reduction for buildings
4. WHO Guidelines on Community Noise 1999
   http://www.who.int/docstore/peh/noise/guidelines2.html
5. WHO Noise Guidelines for Europe 2009
   http://www.euro.who.int/__data/assets/pdf_file/0017/43316/E92845.pdf
6. WHO Environmental Noise Guidelines for the European Region (2018)
   www.euro.who.int/en/media-centre/sections/press-releases/2018/press-information-note-on-the-launch-of-the-who-environmental-noise-guidelines-for-the-european-region

Appendix 1 Source Data

Internal Activity Assessments

Activity	Description	Images
1	Degassing + Forklift Truck movements (internal)	 
2	Roll on Roll off collection and delivery and (reduced) degassing, acoustically no significant change and levels overall lower than Activity 1 (screened out internally). The loudest sound was the vehicle reversing along and a slight thump associated with deposit of the container. Final movement and adjustments were via forklift truck. Activity occurs 1/2 per week.	

3	Typical operations with conveyor operating and discharge of cannisters to RORO including Activity 1.	
4	Cannister discharge into empty RORO including Activity 1.	

Source data table

	Source Data				Time Corrected Levels			Worst Case
	Degassing + FLT	Initial Fill	Fill Operation	RORO Delivery Note 2	Degassing + FLT	Initial Fill	Operations	**Hourly Level**
OCTAVES	Source		+RoRO Fill	Screened out			+RORO Fill	
On time[Note1] min / hr	43	2	15					
Band								
31.5 Hz	65.2	83.7	73.3		63.8	68.9	67.3	**71.9**
63 Hz	66.7	89.2	76.2		65.3	74.4	70.2	**76.2**
125 Hz	67.5	91.5	78.1		66.1	76.7	72.1	**78.3**
250 Hz	68.0	92.8	80.2		66.6	78.0	74.2	**79.7**
500 Hz	72.5	92.8	82.8		71.1	78.0	76.8	**80.9**
1 kHz	73.9	90.9	83.8		72.5	76.1	77.8	**80.7**
2 kHz	72.5	87.5	79.9		71.1	72.7	73.9	**77.5**
4 kHz	68.4	83.6	74.4		67.0	68.8	68.4	**72.9**
8 kHz	61.2	73.0	65.7		59.8	58.2	59.7	**64.0**
16 kHz	48.1	55.4	51.1		46.7	40.6	45.1	**49.5**
Lin	**79.5**	**99.2**	**89**					87.3
A-Wtd								**83.7**

Note 1: Time corrections based on measurement of activities over a continuous 1.5 hour period. Activities exclude construction works being carried out at the front of the building.

Note 2: RORO delivery quieter than normal degassing operations and not modelled separated. it is included in the delivery plus initial fill and operation and occurs only 15 mins per day for short period, screened out – normal fill operations used.

General Assumptions

- Internal noise levels calculated on basis of main activity within south eastern corner of building (assumed area source)
- Internal noise levels corrected to the above level at a distance of 10 metres from activity.

- Building blockwork on lower 3m (53 dB R_W)
- Upper walls and roof clad with Kingspan KS1000 (25 dB R_W)
- Internal facades assumed hard (metal walls / concrete floor)
- Front roller shutter door open

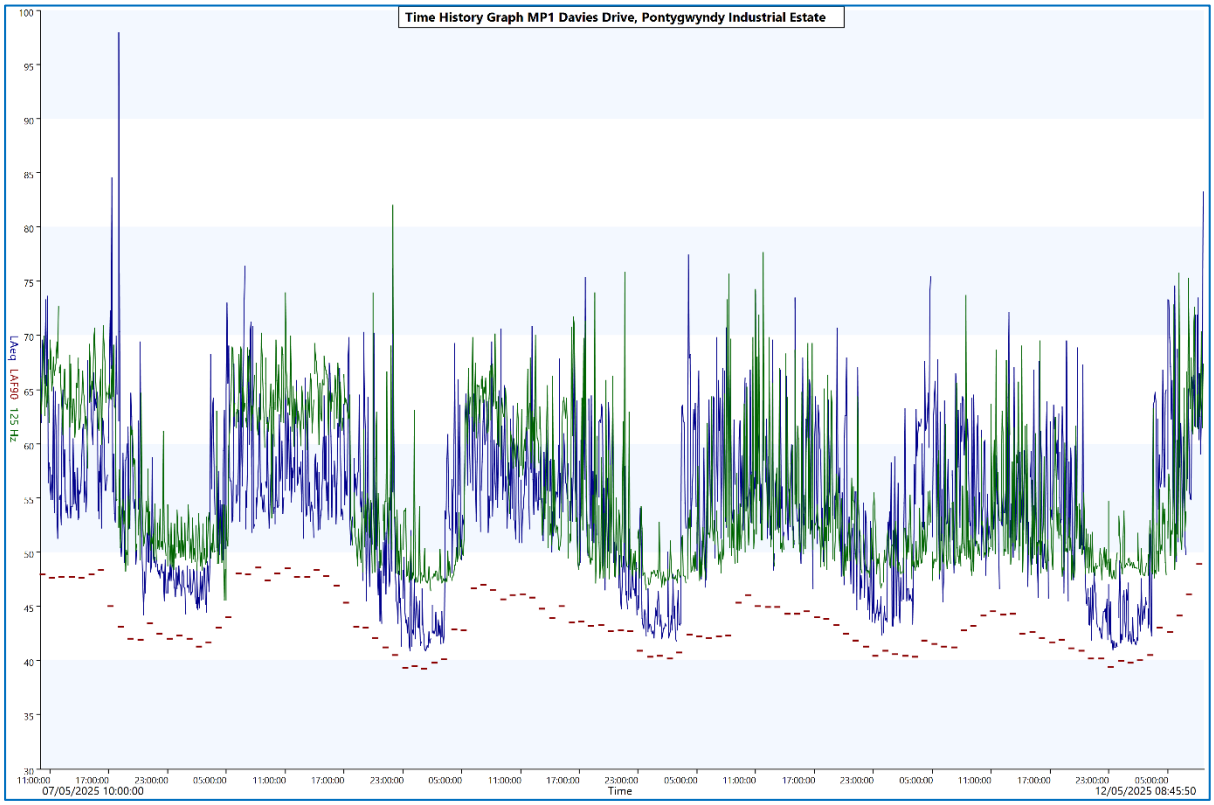
Vehicles

- Junghenrich 320 Fork lift Trucks 106 dB(A) SWL:
- Forklifts assumed to operate outside 10% of the time and assume 10kph whilst outside (approximately 6 mins of external activity for loading/unloading) most of the FLT traverse path is inside the building and accounted for in normal operations.
- HGV deliveries use reference data from BS8233:2014 and are assumed to delivery 6 times per day and operate manoeuvre onto the yard at less than 10 kph with a reversing alarm for 2mins each (12 minutes per day). HGV deliveries have been screened out as the maximum impact is unloading of the vehicles by fork lift trucks.

Appendix 2 Monitoring data MP1

MP1 Davies Drive

Monitoring carried out at MP1 comprised principally of industrial noise from the Pontygwyndy Industrial Estate.



Daytime

Time	Duration	LAeq (dB)	LAFMax (dB)	LA90 (dB)
07/05/2025 10:00	01:00:00	55.1	78.1	47.9
07/05/2025 11:00	01:00:00	50.6	71.8	47.6
07/05/2025 12:00	01:00:00	50.3	69.5	47.7
07/05/2025 13:00	01:00:00	50.1	66.9	47.7
07/05/2025 14:00	01:00:00	50.7	72.2	47.6
07/05/2025 15:00	01:00:00	52.6	72.4	47.9
07/05/2025 16:00	01:00:00	51	64.8	48.3
07/05/2025 17:00	01:00:00	56.1	87.9	45
07/05/2025 18:00	01:00:00	66.8	101.3	43.1
07/05/2025 19:00	01:00:00	46.3	70	42
07/05/2025 20:00	01:00:00	45.4	75.1	41.9
07/05/2025 21:00	01:00:00	45.7	59.7	43.4
07/05/2025 22:00	01:00:00	44.7	50.8	42.5
08/05/2025 07:00	01:00:00	52.6	77.2	47.9
08/05/2025 08:00	01:00:00	50.8	70	48.6
08/05/2025 09:00	01:00:00	50.3	65.5	47.4
08/05/2025 10:00	01:00:00	50.3	67.2	48
08/05/2025 11:00	01:00:00	51.4	68.5	48.5
08/05/2025 12:00	01:00:00	50.8	68.6	47.7
08/05/2025 13:00	01:00:00	50.4	70.7	47.7
08/05/2025 14:00	01:00:00	50.5	64.8	48.3
08/05/2025 15:00	01:00:00	50.8	71.8	47.8
08/05/2025 16:00	01:00:00	49.6	71.5	46.9
08/05/2025 17:00	01:00:00	50.2	73.3	45.3
08/05/2025 18:00	01:00:00	47.3	69	43.1
08/05/2025 19:00	01:00:00	48.6	75.7	43

08/05/2025 20:00	01:00:00	45.8	72.7	42.1
08/05/2025 21:00	01:00:00	43.8	62.2	41.2
08/05/2025 22:00	01:00:00	47.5	78.3	40.5
09/05/2025 07:00	01:00:00	50.2	68.2	47
09/05/2025 08:00	01:00:00	49.7	74	46.5
09/05/2025 09:00	01:00:00	51.2	75.8	45.6
09/05/2025 10:00	01:00:00	48.5	67.4	46
09/05/2025 11:00	01:00:00	48.6	66	46.1
09/05/2025 12:00	01:00:00	49.4	74.6	45.8
09/05/2025 13:00	01:00:00	48.2	63.2	44.8
09/05/2025 14:00	01:00:00	47.3	65.3	43.9
09/05/2025 15:00	01:00:00	50.3	70.8	45
09/05/2025 16:00	01:00:00	47.5	71.7	43.5
09/05/2025 17:00	01:00:00	48.7	79.4	43.6
09/05/2025 18:00	01:00:00	46.8	66.5	43.2
09/05/2025 19:00	01:00:00	47.6	67.1	43.3
09/05/2025 20:00	01:00:00	48.1	65.5	42.7
09/05/2025 21:00	01:00:00	43.9	60	42.8
09/05/2025 22:00	01:00:00	43.8	53.8	42.7
10/05/2025 07:00	01:00:00	48	71.4	42.2
10/05/2025 08:00	01:00:00	49.7	74.4	42.3
10/05/2025 09:00	01:00:00	49.4	70.1	45.3
10/05/2025 10:00	01:00:00	49.4	71.1	46
10/05/2025 11:00	01:00:00	50.4	76.5	45
10/05/2025 12:00	01:00:00	48.4	72.4	44.9
10/05/2025 13:00	01:00:00	48.1	71.3	44.9
10/05/2025 14:00	01:00:00	47.2	72.1	44.3
10/05/2025 15:00	01:00:00	47.9	77.6	44.3
10/05/2025 16:00	01:00:00	49.4	68.8	44.5
10/05/2025 17:00	01:00:00	49	67	44
10/05/2025 18:00	01:00:00	47	66.1	43.8
10/05/2025 19:00	01:00:00	45.8	72.7	43.3
10/05/2025 20:00	01:00:00	47.9	69.5	42.5
10/05/2025 21:00	01:00:00	45.4	68.2	41.8
10/05/2025 22:00	01:00:00	42.7	55.8	41.3
11/05/2025 07:00	01:00:00	47	70.2	41.2
11/05/2025 08:00	01:00:00	48.6	68	42.8
11/05/2025 09:00	01:00:00	47.6	68.1	43.2
11/05/2025 10:00	01:00:00	47.7	65.1	44.1
11/05/2025 11:00	01:00:00	46.9	61.8	44.5
11/05/2025 12:00	01:00:00	48	74.6	44.2
11/05/2025 13:00	01:00:00	47.4	69.8	44.3
11/05/2025 14:00	01:00:00	46.5	63.5	42.5
11/05/2025 15:00	01:00:00	49.4	72	42.6
11/05/2025 16:00	01:00:00	47	67.6	42.1
11/05/2025 17:00	01:00:00	48.3	66.9	41.7
11/05/2025 18:00	01:00:00	47	72.2	41.9
11/05/2025 19:00	01:00:00	46.3	74.1	41.1
11/05/2025 20:00	01:00:00	43.5	71.1	40.9
11/05/2025 21:00	01:00:00	41.2	52	40.2
11/05/2025 22:00	01:00:00	41.1	48.1	40.2
12/05/2025 07:00	01:00:00	51.9	73.8	46.1
12/05/2025 08:00	00:45:50	55.3	87.3	48.9
	Average	51.6		44.5
	Stdev	3.5		2.4

Nighttime

Start Time	Duration	LAeq (dB)	LAFMax (dB)	LA90 (dB)
07/05/2025 23:00	00:15:00	43.3	47.9	41.8
07/05/2025 23:15	00:15:00	44.9	49.1	43
07/05/2025 23:30	00:15:00	44.5	48.8	42.3
07/05/2025 23:45	00:15:00	43.8	48.5	42
08/05/2025 00:00	00:15:00	44.6	48.1	43.2
08/05/2025 00:15	00:15:00	44.7	48.8	42.9
08/05/2025 00:30	00:15:00	44	48.3	42.1
08/05/2025 00:45	00:15:00	43.4	46.8	42.2
08/05/2025 01:00	00:15:00	44.5	48.8	42.7
08/05/2025 01:15	00:15:00	44	48.4	41.8
08/05/2025 01:30	00:15:00	43.3	46.3	41.9
08/05/2025 01:45	00:15:00	44	48.4	42.2

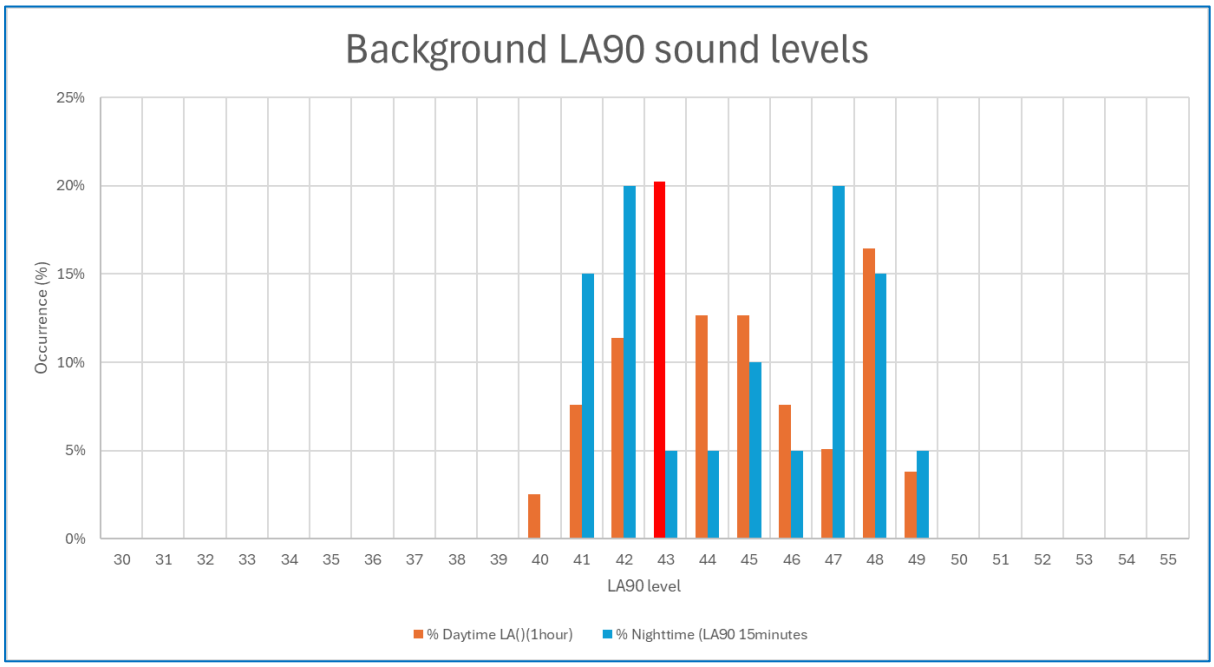
08/05/2025 02:00	00:15:00	43.2	48.6	41.1
08/05/2025 02:15	00:15:00	42.4	45.8	41.3
08/05/2025 02:30	00:15:00	43.9	48.2	41.8
08/05/2025 02:45	00:15:00	43.5	48.6	41.5
08/05/2025 03:00	00:15:00	43.6	49.2	41.7
08/05/2025 03:15	00:15:00	42.9	48.6	41.4
08/05/2025 03:30	00:15:00	53.7	68.2	42.2
08/05/2025 03:45	00:15:00	54	64.2	44.1
08/05/2025 04:00	00:15:00	48.2	58	43.9
08/05/2025 04:15	00:15:00	45.6	57.4	42.7
08/05/2025 04:30	00:15:00	46.1	54.7	43
08/05/2025 04:45	00:15:00	46.4	63.1	43.8
08/05/2025 05:00	00:15:00	52	72.9	43.1
08/05/2025 05:15	00:15:00	51.4	69	44.9
08/05/2025 05:30	00:15:00	49.8	56.5	48.1
08/05/2025 05:45	00:15:00	50.6	67.3	47.8
08/05/2025 06:00	00:15:00	50.2	56.2	48.8
08/05/2025 06:15	00:15:00	50.3	63	48.2
08/05/2025 06:30	00:15:00	51.7	68.4	47.8
08/05/2025 06:45	00:15:00	56.8	76.4	48.2
08/05/2025 23:00	00:15:00	42.3	49.5	39.8
08/05/2025 23:15	00:15:00	40.3	44.8	39.6
08/05/2025 23:30	00:15:00	40.1	44	39.4
08/05/2025 23:45	00:15:00	40.8	52	39
09/05/2025 00:00	00:15:00	40.4	42.8	39.6
09/05/2025 00:15	00:15:00	40.7	47.5	39.6
09/05/2025 00:30	00:15:00	40.3	45.1	39.6
09/05/2025 00:45	00:15:00	40.5	45.5	39.7
09/05/2025 01:00	00:15:00	40.3	46.6	39.5
09/05/2025 01:15	00:15:00	40.1	42.4	39.6
09/05/2025 01:30	00:15:00	39.6	41.4	39
09/05/2025 01:45	00:15:00	40	42.6	39.2
09/05/2025 02:00	00:15:00	40.6	45.1	39.6
09/05/2025 02:15	00:15:00	40.6	44.5	39.8
09/05/2025 02:30	00:15:00	40.9	43.7	40.2
09/05/2025 02:45	00:15:00	40.6	43.2	40
09/05/2025 03:00	00:15:00	40.8	44.5	40.1
09/05/2025 03:15	00:15:00	40.7	49.8	40
09/05/2025 03:30	00:15:00	50.4	60.8	40.8
09/05/2025 03:45	00:15:00	49.2	60.6	43.7
09/05/2025 04:00	00:15:00	47	56.7	42.7
09/05/2025 04:15	00:15:00	51.5	69.2	42.7
09/05/2025 04:30	00:15:00	48	65.9	43.9
09/05/2025 04:45	00:15:00	48.8	63.5	43.5
09/05/2025 05:00	00:15:00	44.4	52.6	42.4
09/05/2025 05:15	00:15:00	45.7	61.9	42.6
09/05/2025 05:30	00:15:00	51	64.5	47.5
09/05/2025 05:45	00:15:00	50.8	64.7	47.8
09/05/2025 06:00	00:15:00	50.2	64.3	47.3
09/05/2025 06:15	00:15:00	50.6	64.7	47.1
09/05/2025 06:30	00:15:00	49.2	61	46.9
09/05/2025 06:45	00:15:00	50	64	46.6
09/05/2025 23:00	00:15:00	42.6	45.9	41.5
09/05/2025 23:15	00:15:00	42.6	54	41.3
09/05/2025 23:30	00:15:00	41.5	43.9	40.8
09/05/2025 23:45	00:15:00	41.7	44.7	40.8
10/05/2025 00:00	00:15:00	41.1	46.5	40.4
10/05/2025 00:15	00:15:00	41	43.3	40.3
10/05/2025 00:30	00:15:00	41.1	42.7	40.4
10/05/2025 00:45	00:15:00	41.3	44.8	40.7
10/05/2025 01:00	00:15:00	41.3	45.3	40.6
10/05/2025 01:15	00:15:00	41.5	46.4	40.8
10/05/2025 01:30	00:15:00	41.1	43.1	40.4
10/05/2025 01:45	00:15:00	41.1	43.5	40.4
10/05/2025 02:00	00:15:00	40.9	50	40.2
10/05/2025 02:15	00:15:00	41.1	44.1	40.3
10/05/2025 02:30	00:15:00	41.2	48	40.5
10/05/2025 02:45	00:15:00	40.8	45	40.3
10/05/2025 03:00	00:15:00	41.4	46.4	40.6
10/05/2025 03:15	00:15:00	41.2	43.3	40.5
10/05/2025 03:30	00:15:00	55.3	63.5	41.6

10/05/2025 03:45	00:15:00	50.1	62.1	43.5
10/05/2025 04:00	00:15:00	57.6	77.4	42.7
10/05/2025 04:15	00:15:00	50.7	68.2	42.6
10/05/2025 04:30	00:15:00	45.9	57.1	42.8
10/05/2025 04:45	00:15:00	47.7	63.7	42.6
10/05/2025 05:00	00:15:00	46.2	63.4	42.3
10/05/2025 05:15	00:15:00	47.7	66.7	42.3
10/05/2025 05:30	00:15:00	43.9	51.8	42.4
10/05/2025 05:45	00:15:00	46.1	59.6	42.4
10/05/2025 06:00	00:15:00	44.6	58.9	42.5
10/05/2025 06:15	00:15:00	44.8	64	41.9
10/05/2025 06:30	00:15:00	46	57.6	42.2
10/05/2025 06:45	00:15:00	49.3	64.3	42.3
10/05/2025 23:00	00:15:00	42.4	52.1	40.8
10/05/2025 23:15	00:15:00	41.3	45.2	40.4
10/05/2025 23:30	00:15:00	41.3	45.5	40.4
10/05/2025 23:45	00:15:00	41.2	45.9	40.3
11/05/2025 00:00	00:15:00	41.7	44.8	40.9
11/05/2025 00:15	00:15:00	41.8	45	41
11/05/2025 00:30	00:15:00	43.1	52.7	41.1
11/05/2025 00:45	00:15:00	44.3	58.2	41.2
11/05/2025 01:00	00:15:00	42.1	50.2	40.9
11/05/2025 01:15	00:15:00	43.7	58.8	41
11/05/2025 01:30	00:15:00	42.5	56.3	41
11/05/2025 01:45	00:15:00	41.2	47.6	40.2
11/05/2025 02:00	00:15:00	41.5	50.2	40.4
11/05/2025 02:15	00:15:00	44.6	63.2	41
11/05/2025 02:30	00:15:00	42.3	46.6	41
11/05/2025 02:45	00:15:00	41.5	46	40.1
11/05/2025 03:00	00:15:00	41.1	46.6	40.1
11/05/2025 03:15	00:15:00	48.8	63.2	40.4
11/05/2025 03:30	00:15:00	51.8	62.2	40.9
11/05/2025 03:45	00:15:00	53.5	62.3	43.4
11/05/2025 04:00	00:15:00	48	60	42
11/05/2025 04:15	00:15:00	49	67.6	41.5
11/05/2025 04:30	00:15:00	51.7	62.5	42
11/05/2025 04:45	00:15:00	55	75.4	42.4
11/05/2025 05:00	00:15:00	46.3	62	41.7
11/05/2025 05:15	00:15:00	46.9	65.7	41.5
11/05/2025 05:30	00:15:00	46.9	67.8	41.6
11/05/2025 05:45	00:15:00	45.2	62.9	41.7
11/05/2025 06:00	00:15:00	43.9	55.7	41.7
11/05/2025 06:15	00:15:00	46.6	63.9	41.3
11/05/2025 06:30	00:15:00	45.3	58.6	41.4
11/05/2025 06:45	00:15:00	44	54.5	41.3
11/05/2025 23:00	00:15:00	41.7	47	40.1
11/05/2025 23:15	00:15:00	40.5	45.4	40
11/05/2025 23:30	00:15:00	40.1	41.8	39.7
11/05/2025 23:45	00:15:00	39.8	41.6	39.2
12/05/2025 00:00	00:15:00	41.2	49.2	40.2
12/05/2025 00:15	00:15:00	40.7	42.4	40.2
12/05/2025 00:30	00:15:00	41.2	46.5	40
12/05/2025 00:45	00:15:00	40.6	46.5	39.9
12/05/2025 01:00	00:15:00	40.9	47.1	40.2
12/05/2025 01:15	00:15:00	40.6	42.7	39.7
12/05/2025 01:30	00:15:00	40.3	44	39.6
12/05/2025 01:45	00:15:00	40.6	42.1	40.1
12/05/2025 02:00	00:15:00	40.8	45.2	40.1
12/05/2025 02:15	00:15:00	41.1	47.5	40.3
12/05/2025 02:30	00:15:00	40.7	44.4	39.8
12/05/2025 02:45	00:15:00	41.1	45.8	40.2
12/05/2025 03:00	00:15:00	41.2	44.7	40.4
12/05/2025 03:15	00:15:00	41.8	51.6	40.5
12/05/2025 03:30	00:15:00	52.1	63.6	41.1
12/05/2025 03:45	00:15:00	56.6	64.8	45.2
12/05/2025 04:00	00:15:00	50.5	62.3	42.7
12/05/2025 04:15	00:15:00	46.3	59	43
12/05/2025 04:30	00:15:00	49.7	66.8	43.4
12/05/2025 04:45	00:15:00	48.6	65	43.4
12/05/2025 05:00	00:15:00	54.4	73.2	43.4
12/05/2025 05:15	00:15:00	50.4	69.8	43.3

12/05/2025 05:30	00:15:00	47.2	65.9	42.9
12/05/2025 05:45	00:15:00	53.4	74.6	42.2
12/05/2025 06:00	00:15:00	51.9	68.7	43.5
12/05/2025 06:15	00:15:00	47.9	64.9	44.5
12/05/2025 06:30	00:15:00	47.5	61.9	45
12/05/2025 06:45	00:15:00	48.4	60.6	46.3
	Average	47.8		41.9
	Stdev	4.5		2.2

Background Level

The background level observed on the application site was noted to include industrial noise from local units. The underlying levels are reproduced in graphical form below:



The average levels measured onsite are reproduced below:

Average type	Daytime (1hour)			Nighttime (15mins)		
	Average L_{Aeq}	Average L_{A90}	L_{A90} Std Deviation	Average L_{Aeq}	Average* L_{A90}	L_{A90} Std* Deviation
Mode		43			-	
Median		44			45	
Mean	51.6	44.5	2.4	47.8	44.7	2.8

*relates to 06.00 – 07.00hrs only

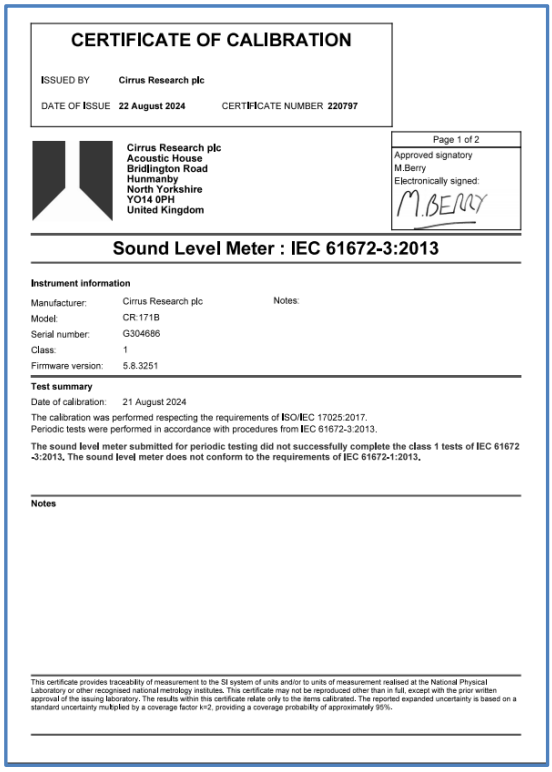
The average daytime LA90 was ~ 44 dB $L_{A901hour}$ mode and mean, with a 44.5 dB mean average and a relatively low standard deviation. Daytime average residual levels were ~52 dB were again very consistent 3.5 dB standard deviation.

The nighttime result was for the period 06.00 – 07.00 hrs (Checkfire operate between 06.45 – 17.00 hrs daily) was actually slightly higher, with no modal average (42 dB and 47 dB being the most prominent) and a mean/median of 45 dB. The 06.00 – 07.00 hour was assessed to provide a statistically significant sample of results for assessment of the early morning background level.

A conservative value of 39 dB (44.7 – (2x2.8) = 39) is considered to be the lowest significant background sound level within 95% of confidence and this value has been used as a worst case in BS4142 assessments.

Appendix 3 Calibration Certificates

G304686 Cirrus 171B



CERTIFICATE OF CALIBRATION

ISSUED BY Cirrus Research plc

DATE OF ISSUE 22 August 2024 CERTIFICATE NUMBER 220797

Cirrus Research plc
Acoustic House
Bridlington Road
Hunmanby
North Yorkshire
YO14 0PH
United Kingdom

Page 1 of 2
Approved signatory
M.Berry
Electronically signed:
M.BERRY

Sound Level Meter : IEC 61672-3:2013

Instrument information

Manufacturer:	Cirrus Research plc	Notes:
Model:	CR:171B	
Serial number:	G304686	
Class:	1	
Firmware version:	5.8.3251	

Test summary

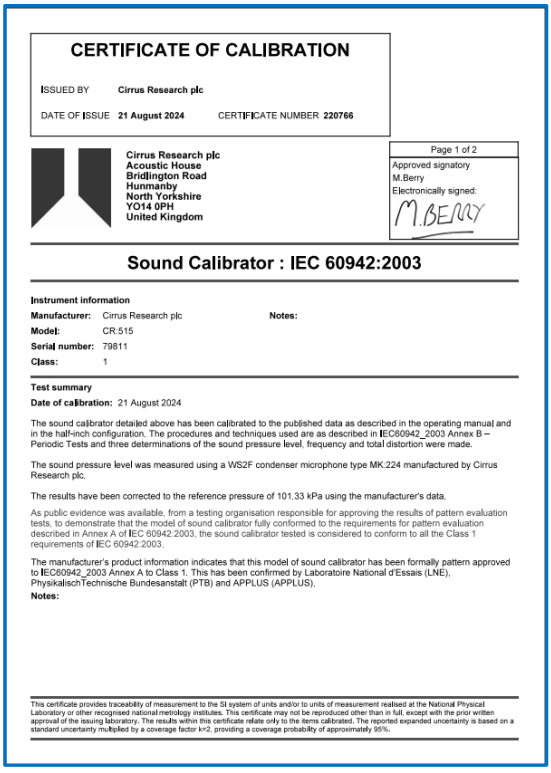
Date of calibration: 21 August 2024

The calibration was performed respecting the requirements of ISO/IEC 17025:2017.
Periodic tests were performed in accordance with procedures from IEC 61672-3:2013.

The sound level meter submitted for periodic testing did not successfully complete the class 1 tests of IEC 61672-3:2013, The sound level meter does not conform to the requirements of IEC 61672-1:2013.

Notes

This certificate provides traceability of measurement to the SI system of units and/or to units of measurement realised at the National Physical Laboratory or other recognised national metrology institutes. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory. The results within this certificate relate only to the items calibrated. The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a coverage probability of approximately 95%.



CERTIFICATE OF CALIBRATION

ISSUED BY Cirrus Research plc

DATE OF ISSUE 21 August 2024 CERTIFICATE NUMBER 220766

Cirrus Research plc
Acoustic House
Bridlington Road
Hunmanby
North Yorkshire
YO14 0PH
United Kingdom

Page 1 of 2
Approved signatory
M.Berry
Electronically signed:
M.BERRY

Sound Calibrator : IEC 60942:2003

Instrument information

Manufacturer:	Cirrus Research plc	**Notes:**
Model:	CR:515	
Serial number:	79811	
Class:	1	

Test summary

Date of calibration: 21 August 2024

The sound calibrator detailed above has been calibrated to the published data as described in the operating manual and in the half-inch configuration. The procedures and techniques used are as described in IEC60942_2003 Annex B – Periodic Tests and three determinations of the sound pressure level, frequency and total distortion were made.

The sound pressure level was measured using a WS2F condenser microphone type MK:224 manufactured by Cirrus Research plc.

The results have been corrected to the reference pressure of 101.33 kPa using the manufacturer's data.

As public evidence was available, from a testing organisation responsible for approving the results of pattern evaluation tests, to demonstrate that the model of sound calibrator fully conformed to the requirements for pattern evaluation described in Annex A of IEC 60942:2003, the sound calibrator tested is considered to conform to all the Class 1 requirements of IEC 60942:2003.

The manufacturer's product information indicates that this model of sound calibrator has been formally pattern approved to IEC60942_2003 Annex A to Class 1. This has been confirmed by Laboratoire National d'Essais (LNE), PhysikalischTechnische Bundesanstalt (PTB) and APPLUS (APPLUS).

Notes:

This certificate provides traceability of measurement to the SI system of units and/or to units of measurement realised at the National Physical Laboratory or other recognised national metrology institutes. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory. The results within this certificate relate only to the items calibrated. The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a coverage probability of approximately 95%.

G300972 Cirrus 171C

CERTIFICATE OF CALIBRATION

ISSUED BY Cirrus Research plc

DATE OF ISSUE 12 June 2024 CERTIFICATE NUMBER 216172

Cirrus Research plc
Acoustic House
Bridlington Road
Hunmanby
North Yorkshire
YO14 0PH
United Kingdom

Page 1 of 2
Approved signatory
T.Goodrich
Electronically signed:
T. A. Goodrich

Sound Calibrator : IEC 60942:2003

Instrument information

Manufacturer:	Cirrus Research plc	**Notes:**
Model:	CR:515	
Serial number:	74769	
Class:	1	

Test summary

Date of calibration: 12 June 2024

The sound calibrator detailed above has been calibrated to the published data as described in the operating manual and in the half-inch configuration. The procedures and techniques used are as described in IEC60942_2003 Annex B – Periodic Tests and three determinations of the sound pressure level, frequency and total distortion were made.

The sound pressure level was measured using a WS2F condenser microphone type MK:224 manufactured by Cirrus Research plc.

The results have been corrected to the reference pressure of 101.33 kPa using the manufacturer's data.

As public evidence was available, from a testing organisation responsible for approving the results of pattern evaluation tests, to demonstrate that the model of sound calibrator fully conformed to the requirements for pattern evaluation described in Annex A of IEC 60942:2003, the sound calibrator tested is considered to conform to all the Class 1 requirements of IEC 60942:2003.

The manufacturer's product information indicates that this model of sound calibrator has been formally pattern approved to IEC60942_2003 Annex A to Class 1. This has been confirmed by Laboratoire National d'Essais (LNE), PhysikalischTechnische Bundesanstalt (PTB) and APPLUS (APPLUS).

Notes:

This certificate provides traceability of measurement to the SI system of units and/or to units of measurement realised at the National Physical Laboratory or other recognised national metrology institutes. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory. The results within this certificate relate only to the items calibrated. The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a coverage probability of approximately 95%.

CERTIFICATE OF CALIBRATION

ISSUED BY Cirrus Research plc

DATE OF ISSUE 12 June 2024 CERTIFICATE NUMBER 216171

Cirrus Research plc
Acoustic House
Bridlington Road
Hunmanby
North Yorkshire
YO14 0PH
United Kingdom

Page 1 of 2
Approved signatory
T.Goodrich
Electronically signed:
T. A. Goodrich

Sound Level Meter : IEC 61672-3:2013

Instrument information

Manufacturer:	Cirrus Research plc	Notes:
Model:	CR:171C	
Serial number:	G300972	
Class:	1	
Firmware version:	5.8.3251	

Test summary

Date of calibration: 12 June 2024

The calibration was performed respecting the requirements of ISO/IEC 17025:2017.
Periodic tests were performed in accordance with procedures from IEC 61672-3:2013.

The sound level meter submitted for testing successfully completed the class 1 periodic tests of IEC 61672-3:2013, for the environmental conditions under which the tests were performed.

However, no general statement or conclusion can be made about conformance of the sound level meter to the full specifications of IEC 61672-1:2013 because (a) evidence was not publicly available, from an independent testing organisation responsible for pattern approvals, to determine that the model of sound level meter fully conformed to the class 1 specifications in IEC 61672-1:2013 or correction data for acoustical test of frequency weighting were not provided in the Instruction Manual and (b) because the periodic tests of IEC 61672-3:2013 cover only a limited subset of the specifications in IEC 61672-1:2013.

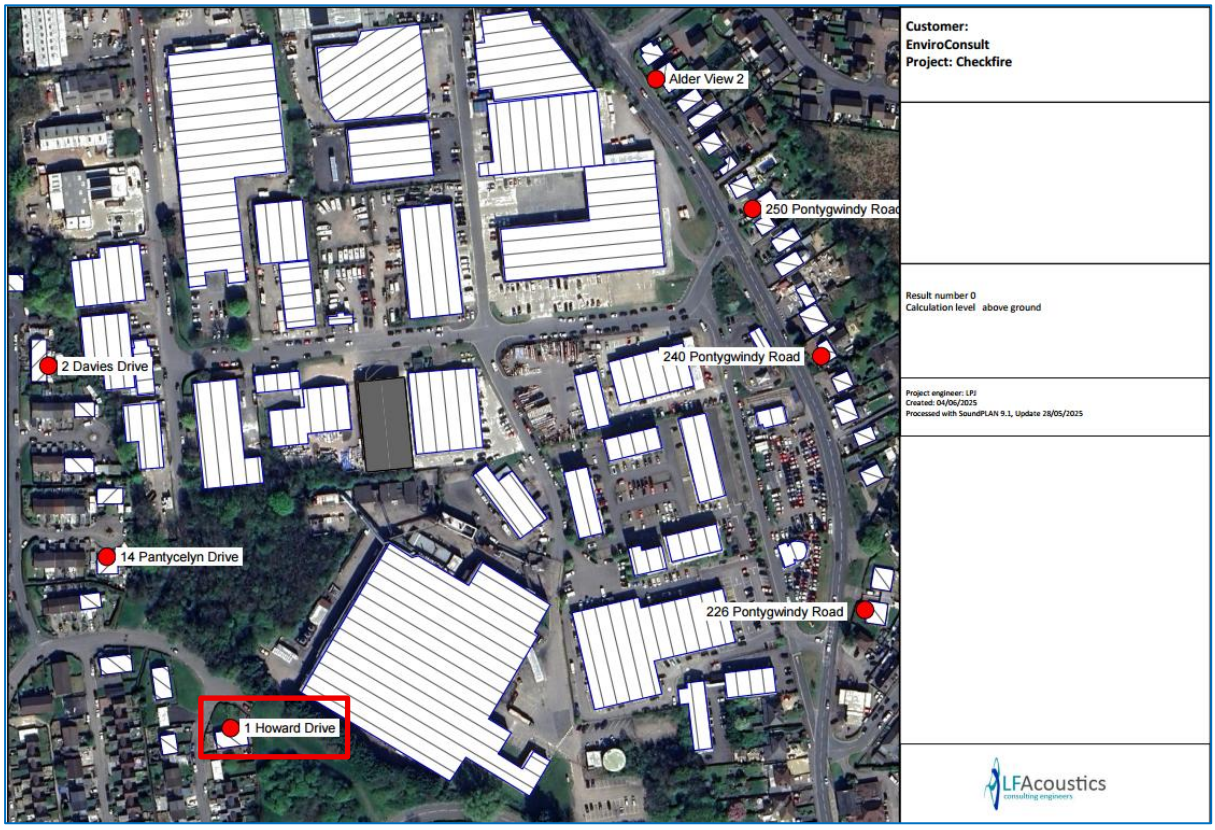
Notes

This certificate provides traceability of measurement to the SI system of units and/or to units of measurement realised at the National Physical Laboratory or other recognised national metrology institutes. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory. The results within this certificate relate only to the items calibrated. The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a coverage probability of approximately 95%.

Appendix 4 Modelling

Model outputs

Receptors



Receptors are located to the south, east and west of the site.

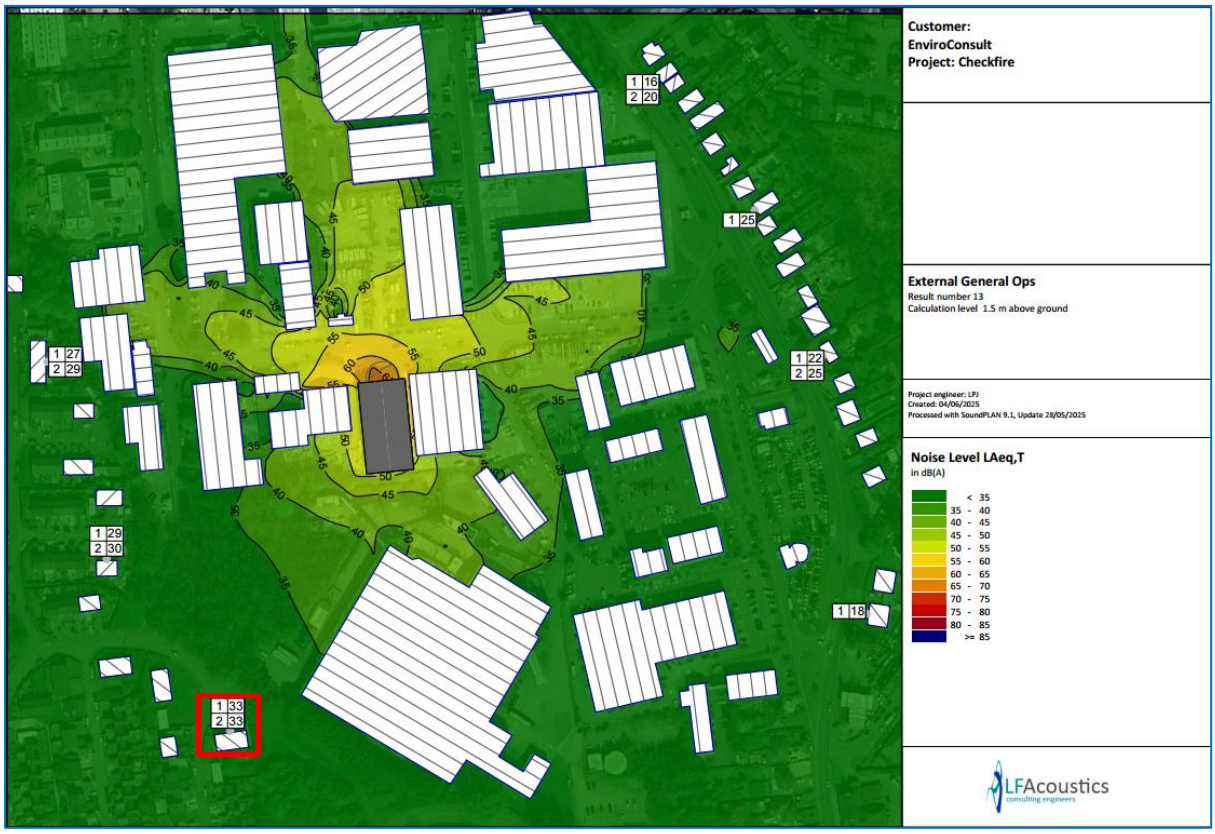
Receptors to the east are at an elevated position approximately 8m above the Checkfire site, but are heavily screened from it by intervening industrial buildings.

Receptors to the south have a direct line of sight with the Checkfire building, but there is significant woodland between the two locations. Additionally prominent noise from the intervening industrial premises (fan noise) was clearly audible.

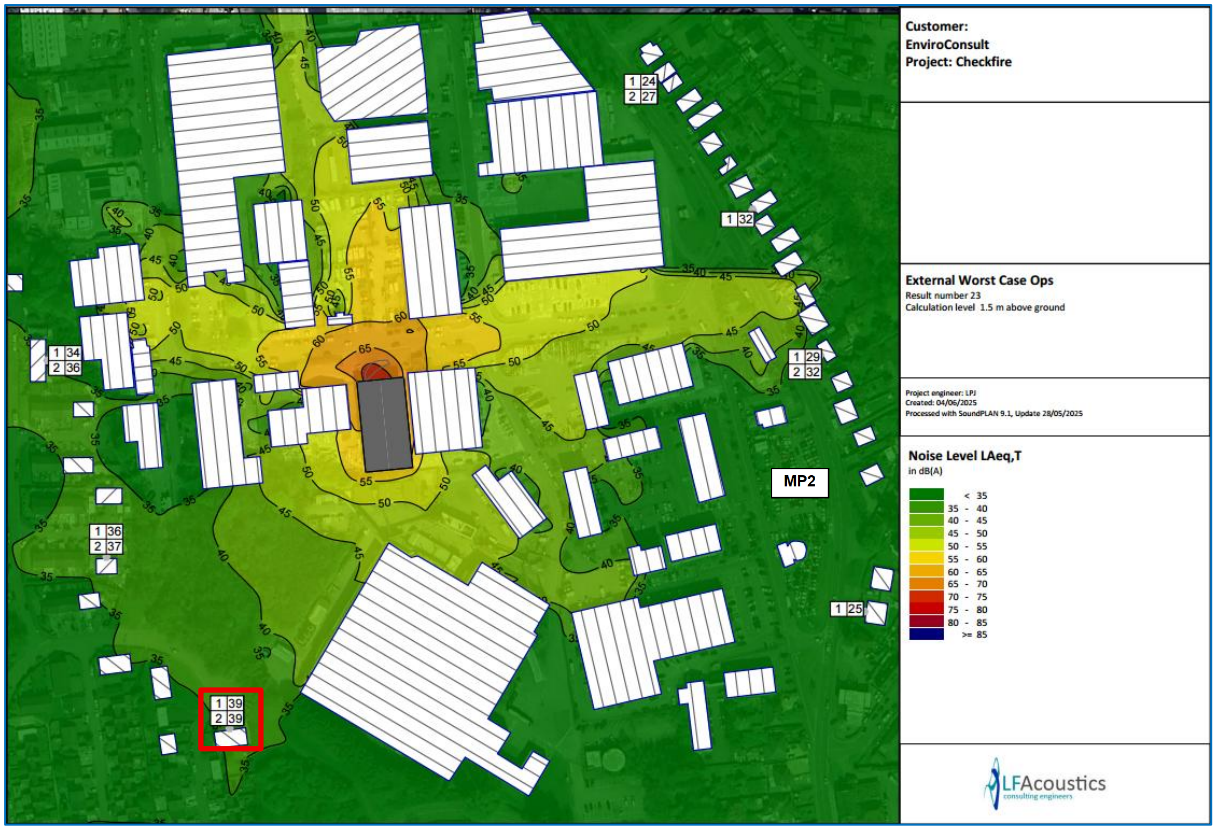
Premises to the east of the Checkfire building are heavily screened by intervening industrial buildings and are the most distant of the receptors.

The most exposed receptor is 1 Howard Drive (marked **red**). All impact assessments assume the worst case levels identified at this location.

Normal Operations



Worst case (with deliveries and first fill of RORO)



Modelling Summary table

Receiver	Floor	Typical $L_{Aeq,T}$ (dB)	Worst case $L_{Aeq,T}$ (dB)
1 Howard Drive	GF	32.5	39.1
1 Howard Drive	F 1	32.7	39.4
2 Davies Drive	GF	26.7	34
2 Davies Drive	F 1	28.7	35.9
14 Pantycelyn Drive	GF	29.3	36.1
14 Pantycelyn Drive	F 1	30	36.9
226 Pontygwindy Road	GF	17.7	25.3
240 Pontygwindy Road	GF	21.7	28.9
240 Pontygwindy Road	F 1	24.6	31.7
250 Pontygwindy Road	GF	24.9	32.3
Alder View 2	GF	16.4	24
Alder View 2	F 1	19.5	27

The highest result for nighttime operation was noted to be 39.4 dB at 1 Howard Drive.
The highest result for daytime operation was noted to be 32.7 dB at 1 Howard Drive.

These results are used in the BS4142 assessments for day and night time (06.00 – 07.00hrs).

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