



Air Quality, Odour and Environmental Noise

Environmental Noise Assessment for
Proposed Timber Yard
Westloch Farm
by Peebles

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Executive Summary

Pentland Biomass, Loanhead, EH20 9QG is proposing to relocate its timber yard to Westloch Farm, by Peebles. The unit is proposed to be located on rough grazing land to the north of the minor road to the east of Falla Toll. Noisy operations will include wood-chipping, off-loading of roundwood logs and dispatch of wood-chips. The applicant has appointed Airshed to conduct the noise impact assessment.

Site operations will take place between 07:00 and 19:00. Without control measures, sound from the proposed development has the potential to adversely affect the amenity of existing noise-sensitive receptors near the development. No night-time operations are proposed, so that sleep disturbance is not a material consideration.

A baseline sound survey was conducted at two locations in January 2023 to obtain typical existing ambient and background sound exposure during the daytime (07:00 – 19:00). This indicates that the typical background sound level during daytime is relatively low (32 dB LA₉₀ 1-hour).

Sound from the proposed development has been predicted in accordance with ISO 9613. Sound sources are based on measurements at similar operations elsewhere, and procurement specifications. The impacts have been assessed in accordance with the Scottish Government's TAN assessment framework and BS 4142:2014+A1:2019.

Sound from the proposed installation is predicted to be of Low Adverse impact in terms of BS 4142:2014+A1:2019, with the proposed mitigation measures in place.

The worst-case impact is predicted to be of Neutral/Slight Adverse significance in terms of the TAN assessment framework at the isolated dwelling immediately to the south of the development.

The proposed mitigation measures include restricting the hours of operation, locating the access doors of the noise-generating buildings on the south-west elevation, fitting a high level of acoustic insulation and automatic self-closing doors, the erection a substantial amenity bund and the adoption of appropriate working methods to minimise impacts on amenity.

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Acronyms

ATC	Automatic Traffic Counter
BS	British Standard
CRTN	Calculation of Road Traffic Noise (a method specified by the UK Department of Transport)
dB	decibels – the logarithmic scale used to measure noise
dBA	A weighted dB – measured levels adjusted for the effect on human hearing
EHO	Environmental Health Officer
EIA	Environmental Impact Assessment (a series of organised activities – a process)
EPA	Environmental Protection Act 1990
ES	Environmental Statement (a document or documents)
ISO	International Standards Organisation
$LA_{eq T}$	The equivalent (eq) A weighted (A) average noise level (L) over a given period of time (T)
$LA_{90 T}$	The A weighted (A) noise level (L) exceeded over 90% ($_{90}$) of a given period of time (T)
L_{WA}	Sound Power Level – a convenient unit of noise measurement independent of distance
m/s	metres per second
WHO	World Health Organisation

GLOSSARY

Acoustic studies make use of terminology that is specific to this type of assessment. The terminology employed in the report is discussed in this section.

dB

Noise is defined as unwanted sound. The range of audible sound is from 0 dB to 140 dB. The frequency response of the ear is usually taken to be about 18 Hz (number of oscillations per second) to 18000 Hz. The ear does not respond equally to different frequencies at the same level. It is more sensitive in the mid-frequency range than the lower and higher frequencies and because of this, the low and high frequency components of a sound are reduced in importance by applying a weighting (filtering) circuit to the noise measuring instrument. The weighting which is most widely used and which correlates best with subjective response to noise is the dB(A) weighting. This is an internationally accepted standard for noise measurements.

Loudness

For variable noise sources such as traffic, a difference of 3 dB(A) is just perceptible by most people. In addition, a doubling of traffic flow will increase the overall noise by 3 dB(A). The "loudness" of a noise is a purely subjective parameter but it is generally accepted that an increase/decrease of 10 dB(A) corresponds to a doubling/halving in perceived loudness. Road traffic noise changes as flow varies during the day and will also fluctuate within shorter time periods as vehicles pass the reception point.

Free Field

Free field measurements are taken at least 3.5m from any building or other hard reflecting surface. Noise standards within the UK are normally specified as external free field limits for ease of enforcement e.g. to avoid the necessity of gaining access to people's houses late at night. Noise standards at sensitive receptors can be expressed as the noise level measured or predicted inside a habitable room as in the case of the World Health Organisation sleep disturbance criteria; or as an external level where it is considered important to protect the amenity of the garden. Some noise standards are specified as façade levels as in the case of road traffic noise.

Statistical Level, L_N

The most commonly used statistical levels are the LA_{10} and LA_{90} .

The LA_{10} is a statistical sound level, being the dBA level exceeded for 10% of a given time. For example, if the hourly LA_{10} is 70 then during that hour the noise level was greater than 70dBA for 6 minutes (10%) and less than or equal to 70dBA for the remaining 54 minutes.

LA_{90} is the level exceeded for 90% of the time, which corresponds to the "quieter" periods. The LA_{90} is defined in BS4142: 1990 Rating Industrial Noise Affecting Mixed Residential and Industrial Areas, as the background noise level.

LA_{eq}

The LA_{eq} is used to describe ambient sound. The Noise Advisory Council Guide to the measurement and prediction of the Equivalent Continuous sound level, defined the LA_{eq} as follows:

The equivalent continuous noise level, LA_{eq} , is the level of notional steady sound which, at a given position and over a defined period of time would have the same A-weighted acoustic energy as the fluctuating noise.

A-Weighted

The "A" in LA_{eq} (or LA_{90}) refers to the A-weighted sound pressure level of the noise in decibels. Weighting is a filter contained in the sound level meter which is designed to produce the relative response of the human ear to sound at different frequencies.

Background to Report

- 1.1. Pentland Biomass, Loanhead, EH20 9QG is proposing to relocate its timber yard to Westloch Farm, by Peebles. The unit is proposed to be located on rough grazing land to the north of the minor road to the east of Falla Toll. The location of the proposed development site is shown in Figure 1. Further details on the project description are presented in Appendix 1. The applicant has appointed Airshed to conduct the noise impact assessment.

Potential Adverse Impacts

- 1.2. The application site lies in a remote rural area. There are several residential sites nearby which may be adversely affected by the scheme. These include: Westloch Farmhouse to the north and Westloch Farm Cottages to the east. Scottish Borders Council (SBC) has granted planning permission for change of use to convert the stone-built farm steading to the south into three dwellings. [22/01423/FUL].¹
- 1.3. The proposed use will include noise-generating equipment, cutting and chipping gear and a processing shed. The application to SBC was refused on the grounds that no noise impact assessment had been submitted and that Environmental Health had concerns regarding the potential impact of this application on the existing and consented dwellings adjacent to the site.²
- 1.4. Sound from the proposed development has the potential to affect the health and amenity of existing and proposed dwellings near the development. This assessment assumes that all noise generating activities will be conducted during normal working daytime hours (07:00 – 19:00) except in case of emergency.

Scope of Assessment

- 1.5. The assessment includes sound survey measurements at existing sensitive receptor locations adjacent to the proposed development site conducted by Airshed in January 2023 to obtain representative ambient and background sound levels and to help determine the baseline sound in accordance with BS 4142:2014.³ Sound from the proposed development has been assessed in accordance with BS 4142:2014. The assessment also has regard to the assessment method in the Technical Advice Note (TAN)⁴ which forms part of the Scottish Government's Planning and Noise Advice 1/2011⁵.

¹ <https://eplanning.scotborders.gov.uk/online-applications/applicationDetails.do?activeTab=summary&keyVal=R18KMKNTIT100>

² Scottish Borders Council. 22nd September 2022. Memo from Craig Wilson EHO to Planning – Application ref 22/00933/FUL. This stated that: 'Environmental Health has concerns regarding the potential impact of this application on the existing and consented dwellings adjacent to the site. No information in relation to how noise generated by this proposal would impact the existing (or consented) dwellings adjacent has been submitted and it is the opinion of Environmental Health that the physical means of mitigation required to attenuate noise breakout from an industrial process in this area of low background noise would be prohibitive to the developer.'

³ BSI 2014. Methods for rating and assessing industrial and commercial sound BS 4142:2014: +A1:2019.

⁴ Scottish Government 2011. Technical Advice Note. Assessment of Noise

⁵ Scottish Government 2011. Planning Advice Note 1/2011 Planning and Noise

- 1.6. Current non-statutory professional Guidance⁶ suggests that noise from road traffic generated by a project is likely to be insignificant where road traffic is predicted to increase by <33% (as this would result in an increase of <1 dB). A change in predicted noise of <1 dB is considered to be of negligible significance in the Scottish Government Planning and Noise TAN. The road traffic forecast to be generated by this project is well below this threshold, in which case the change in road traffic noise as a consequence of the proposed scheme is likely to be of negligible significance. This aspect has therefore not been considered further. The consequences of noise from vehicle movements within the development site have been considered.
- 1.7. This report describes the potential noise impacts likely to arise from the proposal, based on the proposed design. The assessment sets out the assessment criteria that have been used to consider the impacts and reports the results of a baseline sound survey at the nearest existing dwellings. Sound levels from the proposed development have been predicted at the nearest noise-sensitive receptors and assessed against appropriate environmental noise criteria intended to protect residential amenity. The proposed development will not involve any night-time working so that the effects of sleep disturbance are not relevant and have not been considered further.
- 1.8. The predicted impacts are based on the proposed design and include the mitigation measures to be included within the scheme. The results from interim design iterations have not been included, to help simplify the communication of results.
- 1.9. This noise assessment has been conducted by Steve Fraser BSc MPhil MIOA CEnv who has more than 40 years of professional experience as an environmental consultant, Environmental Health Officer and Environmental Protection Officer. The baseline survey was conducted by survey technicians who have (IoA) Certificates of Competence for Measurement of Environmental Noise.

Report Layout

- 1.10. Relevant noise standards are discussed in Section 2. Baseline noise is described in Section 3. The noise prediction methodology is outlined in Section 4. The results from the prediction exercise are presented in Section 5. Mitigation measures are proposed in Section 6. The overall significance of the noise arising from the proposed development is considered in Section 7.

⁶ IEMA Version 1.2 (November 2014) Guidelines for Environmental Noise Impact Assessment.

Planning Advice Note (PAN)

2.1. PAN 1/2011 Planning and Noise provides advice to planning authorities in Scotland on how they must seek to minimise the adverse impact of noise arising from new development. This Guidance is not prescriptive with respect to specific noise standards and is mainly concerned with the advising on good practice for environmental noise assessment. The noise impact assessment method set out in PAN 1/2011 Technical Guidance states: "The choice of appropriate criteria noise levels and relevant time periods are the responsibility of the local authority. Although this may lead to inconsistencies between different local authorities and, indeed, across areas within a given local authority, it does provide flexibility, allowing particular circumstances to be taken into account and the use of the latest guideline values to be included where appropriate."

2.2. The Technical Advice Note (TAN) issued to accompany the PAN for the assessment of noise proposes a methodology where the noise from the proposed operations is compared to existing ambient noise levels. The TAN refers to the (now superseded) ratings used in BS 4142:1997 to describe environmental noise but proposes a different assessment framework. The change in ambient noise level resulting from the proposed scheme is used to determine the magnitude of the impact, as described in Table 2.1 below.

Magnitude	Change in Noise Level dB LA _{eq T} (After – Before)
Major	>5
Moderate	3 – 4.9
Minor	1 – 2.9
Negligible	0.1 – 0.9
No Change	0

2.3. The significance of these effects is assessed according to the magnitude of the impacts and the difference between the specific rated noise level LA_{r T} and the pre-existing background noise level LA₉₀. The scheme suggested by the TAN is set out in Table 2.2 below. This provides a useful framework for assessment.

Magnitude (Table 2.1)	Sensitivity of Receptor based on likelihood of complaint $x = \text{rating level LA}_{rT} - \text{background LA}_{90}$		
	Low ($x < 5$)	Medium ($5 \leq x < 10$)	High ($x \geq 10$)
Major	Slight/Moderate	Moderate/Large	Large/Very Large
Moderate	Slight	Moderate	Moderate/Large
Minor	Neutral/Slight	Slight	Slight/Moderate
Negligible	Neutral/Slight	Neutral/Slight	Slight
No Change	Neutral	Neutral	Neutral

Statutory Nuisance

2.4. The Environmental Protection Act 1990 (EPA) imposes a duty on local authorities to periodically survey environmental noise levels and to investigate noise complaints. The Act requires local authorities to serve notice when noise nuisance exists. Under this regime the investigation and response to noise complaints would be the responsibility of SBC. The EPA

requires that the process operator adopts the best practicable means to prevent or minimise nuisance.

BS 4142

2.5. British Standard BS 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound describes methods for determining sound from industrial and commercial operations from fixed installations, and from the loading and unloading of goods and materials at industrial and commercial premises. The Standard includes procedures for quantifying noise from tonal, intermittent and impulsive noise. Use of this Standard for predicting noise from the proposed development is appropriate. Noise during the daytime should be based on a 1-hour average exposure and at night-time over a period of 15 minutes⁷. The Standard also includes a procedure to determine the significance of the rated noise from an installation where, typically, the greater the difference between the background sound level and the specific sound, the greater the magnitude of the impact. According to the Standard:

- An increase of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context;
- An increase of around +5 dB is likely to be an indication of an adverse impact, depending on the context; and
- The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.

World Health Organisation Guidelines for Community Noise

2.6. The World Health Organisation (WHO) has published Guidelines for Community Noise, the outcome of a WHO expert task force meeting in 1999.⁸ The WHO Guidelines advise that noise impacts within dwellings include sleep disturbance, annoyance and speech interference. The criteria relevant to this assessment are summarised in Table 2.3 below.

Environment	Critical Health Effect	Sound Level dB LA _{eq,T}	Time (hours)
Inside dwellings	Speech intelligibility	35	16

Noise Assessment Criteria

2.7. The following assessment criteria have been adopted to help determine the significance of the environmental noise impacts. These criteria are based on the method in BS 4142:2014+A1:2019, and WHO criteria. These criteria are set out in Table 2.4 below. Noise rating (NR) curves are not considered to be relevant as there will be no fixed plant within the proposed development.

⁷ According to both BS 4142:2014 and WHO, night-time is defined as between 23:00 and 07:00 hours.

⁸ World Health Organisation Geneva 1999. Guidelines for Community Noise.

⁹ <http://www.who.int/mediacentre/factsheets/fs258/en/>

Table 2.4 - Environmental Noise Assessment Criteria	
Predicted Noise Level	Justification
35 dB LA _{eq} 1 hour	Noise level inside habitable rooms during the daytime based on WHO criteria.
Relative to background	Relevant when considering impact from the proposed development. (BS 4142 and TAN).

Noise and Sound

- 2.8. This report uses the term noise when referring to WHO criteria used to assess noise from transport sources.¹⁰ Noise from industry is assessed using a different standard (BS 4142) and follows the conventions of that Standard which refers to sound from industrial or commercial activities.

Attenuation Provided by Open Windows

- 2.9. Traditionally acousticians have used a value of 10 – 15 dBA based on the WHO 1999 Community Noise Guidelines. The estimate of attenuation proposed in the WHO's latest Guidance (published in 2018) is based on more recent research¹¹, which reflects improvements in standard window attenuation over the last 20 years. WHO rule-of-thumb estimates a reduction of 15 dBA between external and internal noise levels, assuming partially open windows. In considering the attenuation provided by windows, the latest WHO Guidance states: 'The differences between indoor and outdoor levels are usually estimated at around 10 dB for open, 15 dB for tilted or half-open and about 25 dB for closed windows.'¹²
- 2.10. The professional guidance published jointly by the Institute of Acoustics and the Association of Noise Consultants states that '...it is assumed that a partially open window will provide an outside to-inside level difference of 13 dB. This level difference is considered representative of typical domestic rooms with simple façade openings of around 2% of the floor area.'¹³ On the basis of the findings reported by WHO and the joint IoA/ANC design guide, this assessment assumes 15 dB attenuation through a partially open window.

¹⁰ Department of Transport 1988. Calculation of Road Traffic Noise.

¹¹ Barbara Locher et al. 2018. Differences between Outdoor and Indoor Sound Levels for Open, Tilted and Closed Windows. International Journal of Environmental Research and Public Health 2018 15,149. This reported a mean value of 16 dBA for tilted windows.

¹² WHO 2018. Environmental Noise Guidelines for the European Region Section 2.2.2 page 9

¹³ IoA / ANC January 2020. Acoustics Ventilation and Overheating – Residential Design Guide Version 1.1

3.0. BASELINE

Baseline Sound Survey

- 3.1. A baseline sound survey was conducted at two locations between 13th and 16th January 2023. The aim of the baseline survey was to assess existing ambient and background sound levels at the nearest existing dwellings. The measurements at Baseline Site 1 consisted of continuous measurements. The measurements at Baseline Site 2 were obtained for a period of 1-hour on two separate days. The surveys were conducted on open ground close to these receptor locations, without accessing private gardens. The locations of the survey sites used to quantify baseline sound are shown in Figure 2.
- 3.2. Sound levels at Baseline Site 1 were recorded at 15-minute intervals. Sound levels at Baseline Site 2 were recorded at 1-minute intervals. The parameters LA_{eq} , LA_{max} , and LA_{90} are reported. Measurements were taken using Norsonic Type 1 sound level meters. The instrumentation was calibrated at the beginning and end of each survey period. The instrumentation was contained within sealed weather-proof cases with full outdoor microphone protection. Wind speed, wind direction and other meteorological conditions were recorded during the surveys. Details of the character of the sound at the survey locations are summarised in Table 3.1 below.

Site	Site Conditions
Site 1 Westloch Farmhouse	This survey location was at the south-west garden boundary of the Farmhouse, in line with the south-east-facing façade. This is a quiet rural location. Noise from the quarry to the west of the A703 was occasionally audible. Noise from construction at the farmhouse was also occasionally audible. The main source of noise was from infrequent traffic movements on the minor road. Aircraft noise was also audible on some occasions.
Site 2 Westloch Farm Cottages	This survey location was 22m from the south-west-facing gable of the nearest cottage and 4m from the nearside kerb. The dominant sound was from road traffic on the minor road.

- 3.3. The ambient and background sound levels at Baseline Site 1 are predominantly influenced by the prevailing wind speed, rather than exhibiting the typical diurnal pattern where levels reduce at night (which is typical in acoustic environments where the ambient sound is dominated by transport sources). Anthropogenic ambient sound is predominantly from traffic on the minor road with some contribution from a distant quarry. The baseline survey data for Baseline Sites 1 is plotted in Chart 1 at the end of the text. The diurnal variations for background and ambient sound are plotted in Charts 1-1 and 1-2 respectively.
- 3.4. The survey at Baseline Site 1 included periods with high wind speeds. The relationship between wind speed and background sound levels (from the entire survey) are plotted in Chart 2. This shows a pronounced relationship between wind speed and elevated background sound levels. Chart 3 plots the same relationship for periods with no recorded rain. During the survey, there were 13% of 15-minute periods when the wind speed exceeded 5m/s and 18% of 15-minute periods with recorded rain. The temperature fell below 0°C for 23% of the survey, so that latterly, the tipping bucket used to record rainfall was frozen. The results with temperatures below zero have been discounted as it is not possible to determine if those survey

periods included precipitation [See Chart 4]. Chart 5 plots the valid daytime background sound levels. The overall meteorological data and ambient and background sound levels are plotted in Charts 6 and 7. Based on this analysis, the typical daytime background sound level at Baseline Site 1 is 32 dB LA₉₀ during the daytime (between 07:00 and 19:00). This agrees reasonably well with the levels obtained during the second survey at Baseline Site 2 as summarised below. The detailed results from the baseline survey are presented in Appendix 2.1.

Site	Date	Time start	Time end	LA _{eq}	LA _{max}	LA ₉₀
1	All valid filtered daytime data			38	65	32
	13-Jan-23	13:00	14:00	56	91	38
2	16-Jan-23	14:43	15:42	51	78	33

N.B. Units = dB LA T

- 3.5. The typical daytime ambient and background sound levels at Baseline Site 1 are summarised in Table 3.3 below.

Site	Ambient Sound dB LA _{eq daytime}	Background Sound dB LA _{90 daytime}
Manor Farm Road (day)	38	32

Proposed Design Criteria

- 3.6. Pragmatically this assessment adopts a design criterion that minimises the potential adverse impacts from the proposed development in terms of both BS 4142:2014 and the Scottish Government’s TAN.
- 3.7. This assessment assumes the existing ambient and background sound levels at the worst-case noise-sensitive receptor as reported in Table 3.3 above.

Source Estimates from Representative Installation

- 3.8. A sound survey was conducted at the applicant’s existing timber yard at Loanhead, to provide source estimates for the proposed operations. The frequency characteristics of the measurements are plotted in Chart 8. The results from this survey are presented in Appendix 2.2.

Justification for Approach

- 4.1 Sound levels were measured at two locations adjacent to the proposed development in suitable weather conditions. These sound levels provide a reasonable representation of existing ambient and background sound. Sound from the proposed development is based on source estimates obtained by Airshed at the applicant's current operations at Loanhead and procurement specifications for the building fabric. Sound from the proposed development has been predicted using a computer-based model, to help inform the design.

Sound from Proposed Activities

- 4.2 The modelling technique adopted in this study is based on the procedure set out in ISO 9613¹⁴ as implemented by SoundPlan 8.2 ®. ISO 9613 specifies an engineering method for calculating the attenuation of sound to predict noise levels at a distance from a variety of sources. The method predicts the equivalent continuous A-weighted sound pressure level (LA_{eq}) under meteorological conditions favourable to propagation from sources of known sound emission. This prediction technique is considered to be appropriate in practice for modelling a great variety of noise sources and environments. ISO 9613 may be applied to the prediction of noise from industry and many other ground-based sources. This prediction technique is considered to be appropriate for the noise sources under consideration in this assessment.
- 4.3 The model includes for geometrical divergence, atmospheric absorption, ground effects, reflection from surfaces, and screening by obstacles. The model allows for the use of correction factors for ground cover. For hard surfaces such as water or tarmac the correction is applied simply as 3 dB for all frequencies and distances. Where the ground cover is soft, such as grass, woodland, or other less reflective material, an empirical relationship between ground attenuation and frequency and distance may be used. Soft (absorbent) ground has been assumed across the study area. These predictions assume downwind meteorological conditions which are favourable for noise propagation from the source to a receiver, where the predicted noise level is seldom exceeded. The estimated accuracy using this method is ± 3 dBA. The estimate of error in the ISO Standard is based on situations where there are no effects of attenuation due to screening.
- 4.4 The layout was obtained from the drawings provided by the applicant as presented in Appendix 1. The details of surrounding noise-sensitive receptors and ground conditions were obtained from a site centred OS map at 1:10,000, a site walkover, and OS Terrain 5 spot ground levels. The topographical model includes the ground levels shown in Appendix 1. Variations in local ground heights were taken into account. A digital model of the ground and buildings was constructed using the plans shown in Appendix 1.

¹⁴ ISO 9613:1996 (E) Acoustics – Attenuation of sound during propagation outdoors. Part 1: Calculation of the absorption of sound by the atmosphere; and Part 2 : General method of calculation.

Scenarios Considered

- 4.5 This assessment considers a single Scenario which is based on the level of mitigation required to minimise the operational impacts to an acceptable level. A number of design iterations have been considered as part of the assessment process, which included considering the level of acoustic insulation required within the process buildings and the height of the amenity bund required to protect amenity. The results from these design iterations have not been included within the report to simplify the presentation of results.
- Scenario 1 – assumes a high level of acoustic insulation within the chipper building (47 dB Rw on walls and roof panels); internal screening and the use of automatic fast-closing doors to reduce breakout and the erection of a 5m high acoustic bund on the north-eastern site boundary to protect the amenity of Westloch Farmhouse. This Scenario is intended to represent realistic worst-case activity during the daytime (07:00 – 19:00).
- 4.7. Source estimates for the wood-chipper, log unloading and wood-chip loading and dispatch are based on measurements obtained at the applicant's existing operations. The model predictions assume that the wood-chipping operations are located in a highly insulated building where the walls and roof panels have a minimum attenuation of 47 dB Rw and that all access doors are fitted with automatic fast-closing doors with a minimum attenuation of 18 dB Rw and where the main access door is located on the south-west-facing elevations. The model includes for the erection of a 5m high acoustic bund.
- 4.8. Sound from site traffic is based on an assumed 1 vehicle movement per hour where the line source estimates have been calculated using equation F.6 from BS 5228.¹⁵
- 4.9. The model assumes simultaneous activity of wood-chip dispatch and log off-loading within the yard and assumes a 100% on-time in any hour. The sound sources used in the assessment are presented in detail in Appendix 3. The model layout is shown in Figures 3.1 and 3.2.
- 4.10. The mitigation design was developed using numerous intermediate iterations, to identify practicable measures to minimise adverse impacts. The intermediate stages of this design process have not been presented here, to simplify the communication of the results.

¹⁵ BSI 2014. Code of Practice for noise and vibration control on construction and open sites. – Part 1 – Noise BS 5228:2019 + A1:2014.

5.0 ASSESSMENT RESULTS

Sound from Proposed Installation

- 5.1 Sound levels have been predicted assuming noise-generating activities will take place between 07:00 and 19:00 hours, with no activity during the evening (19:00 – 23:00) or at night (23:00 – 07:00), with the exception of emergency access.
- 5.2 The results have been calculated at 5m intervals across the study area. The daytime (07:00 – 19:00) sound levels are plotted in Figure 4. These sound predictions are at 1.5m height above ground level. The predictions include the proposed mitigation measures. Details of the relative contribution from each activity: site traffic (HGVs), mobile plant (wood-chip dispatch and log unloading, and breakout (walls, roofs and doors of the wood-chip building) are presented in Table 5.1 at the end of the text.
- 5.3 Sound levels reported assume there will be no tonal, intermittent or impulsive characteristics associated with any fixed plant. The predicted contribution from the wood-chip building is well below the typical daytime background at the nearest noise-sensitive receptor, once mitigation measures are fully implemented, so that no character correction has been applied to this activity. Noise from the offloading and dispatch has the potential to be distinctive against the residual acoustic environment, so a penalty of +3 dB has been added to the predicted specific sound to allow for character correction. The detailed results for Scenario 1 are presented in Appendix 3.
- 5.4 The worst-case rated specific sound level during the day (07:00 – 19:00) is predicted to be +3 dB above the background sound level. This is based on realistic worst-case assumptions about activities at the proposed installation, with the mitigation measures in place.
- 5.5 The impacts at the closest noise-sensitive receptor is predicted to be of Neutral/Slight Adverse significance in terms of the Scottish Government's TAN assessment framework (see assessment framework in Tables 2.1 and 2.2). These impacts are summarised in Table 5.2 at the end of the text.

Uncertainty

- 5.6 Prediction errors within ISO 9613:1996 are + 3dB. The model predictions are based on a widely validated prediction algorithm, a conceptual design layout, and procurement specifications that will be enforced by commercial contract. Even with the potential prediction errors, the significance of the impacts would be of Slight Adverse significance as a worst-case in terms of the TAN assessment methods.

Operational Noise

6.1 The noise mitigation measures proposed at the development are listed in Table 6.1 below. The overall noise mitigation strategy for the development includes:

- Restricting operations to the normal working day (07:00 – 19:00 hours);
- Normal working methods will include the use of timber stockpiles to act as acoustic screens;
- The erection of a substantial 5m high acoustic bund to minimise adverse impacts on the nearest noise-sensitive receptors; and
- Enclosing the noisy fixed plant within buildings with a high acoustic performance. This assumes that the walls and roof panels will have a sound reduction of 47 dB R_w and that fast-closing doors will have a minimum attenuation of 18 dB R_w .

Table 6.1 - Proposed Noise Mitigation	
Issue	Mitigation
Fixed Plant	
All Fixed Plant	The location of all fixed plant shall be selected to minimise adverse impacts on noise-sensitive receptors. The sound power levels for all fixed plant and breakout from buildings shall ensure that the combined noise from all fixed plant at the nearest noise-sensitive receptor shall be less than the typical daytime background sound level.
All Fixed Plant	All plant and equipment shall be free from tonal, intermittent or impulsive characteristics.
Vehicles and Mobile Plant	
Transport Noise	All roadways within the development site shall be smooth, to reduce noise from any road vehicles moving within the access roads and service yards.
Transport Noise	No vehicular access to the site shall take place between the hours of 19:00 and 07:00 hours.
Vehicle Reversing Alarms	Where practicable, all vehicles, including HGVs and front-loading shovels within the site shall be fitted with background adjusting broadband directional sound reversing alarms which are designed to target the danger area immediately behind the vehicle.
Building Elements	
Walls and Roofs Noise Generating Buildings	All wall and roof panels shall have a minimum noise reduction of 47 dB R_w . All doors shall be automatic self-closing with a minimum noise reduction of 18 dB R_w .
Acoustic Louvres	Any acoustic louvres for building ventilation shall be designed to ensure the total noise breakout from the building shall not exceed the typical daytime background sound level and be located to minimise adverse impacts on noise-sensitive receptors.
Other Measures	
Acoustic Barrier	The erection of an acoustic bund at the north-eastern site boundary to protect the amenity of the nearest noise-sensitive receptor [see Figure 4]. The bund shall be constructed to a height of 5m relative to the ground level within the nearest part of the proposed development site.

Construction Noise

6.2

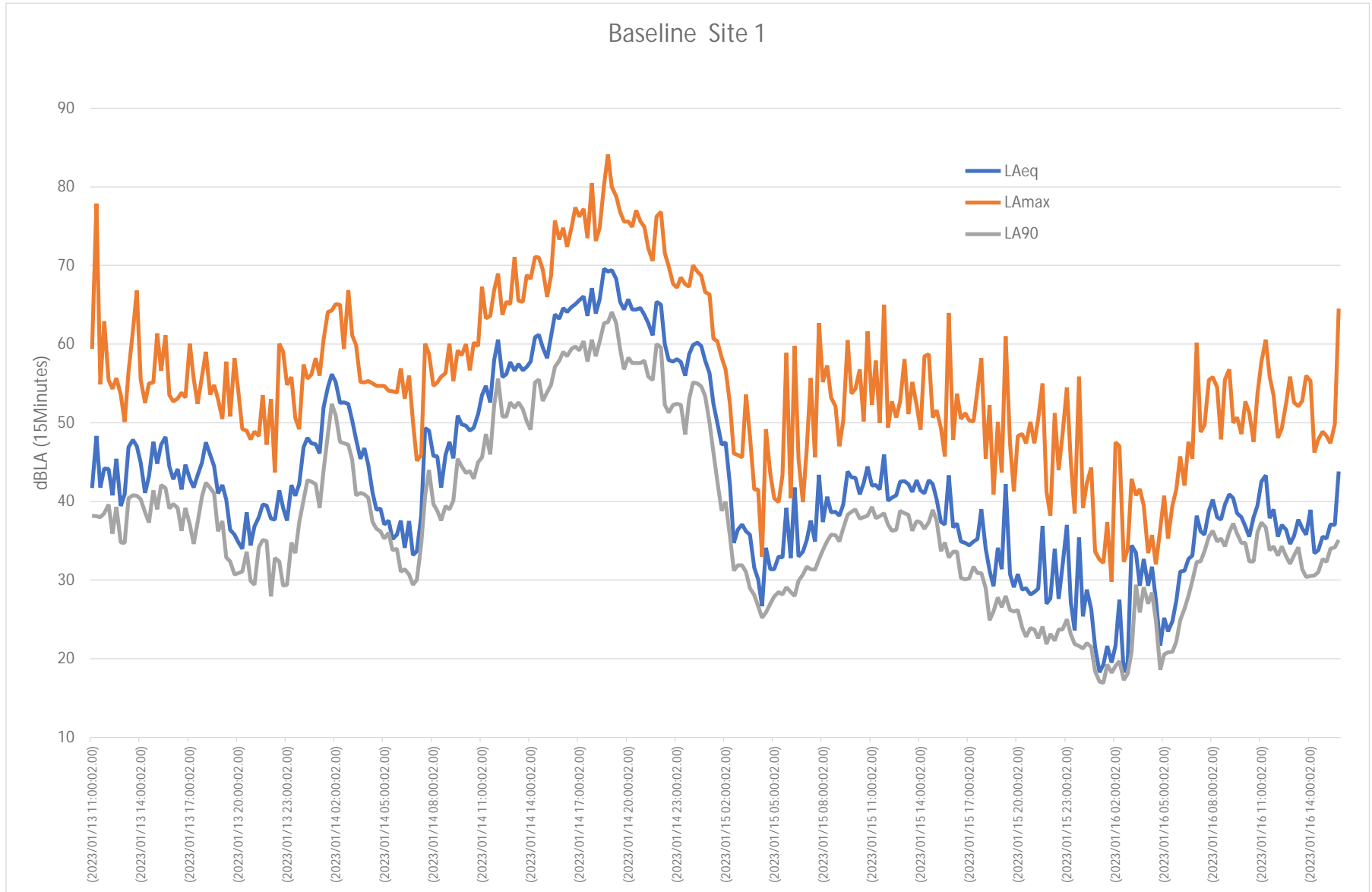
Noise during construction has the potential to cause annoyance. The following procedures shall be adopted to ensure that noise impacts from construction operations are minimised, to protect local amenity:

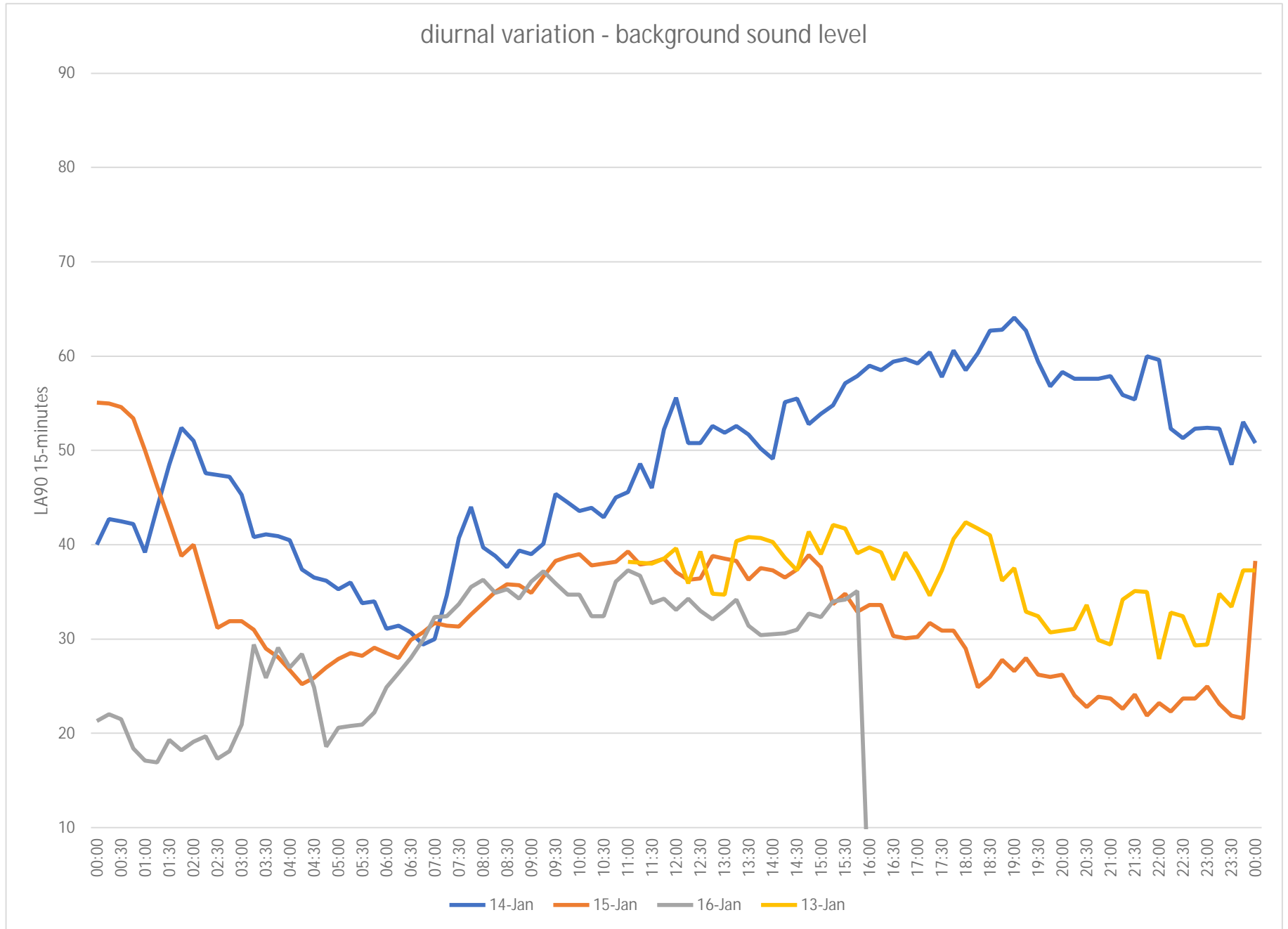
- Prior to the commencement of development, the appointed contractors shall prepare a construction method statement for the project. This shall include an assessment of potential noisy operations and outline the noise mitigation measures proposed. The construction noise impact assessment shall be used to help inform the development of the detailed construction methods.
- The contractors shall be required to select the quietest item of suitable plant available for all site operations. The work programme on site shall also be phased to reduce the combined impacts arising from several noisy construction operations, to reduce adverse impacts. Where practicable, noise from fixed plant and equipment shall be contained within suitable acoustic enclosures or behind acoustic screens.
- Any plant and equipment required for operation at night (23:00 – 07:00) e.g. for security lighting shall be mains-electric powered where practicable.
- The site contractors shall conduct all site operations in accordance with accredited documented procedures. This shall include a complaint investigation procedure.
- All sub-contractors appointed by the main contractor shall be formally required through contract to comply with all environmental noise conditions.

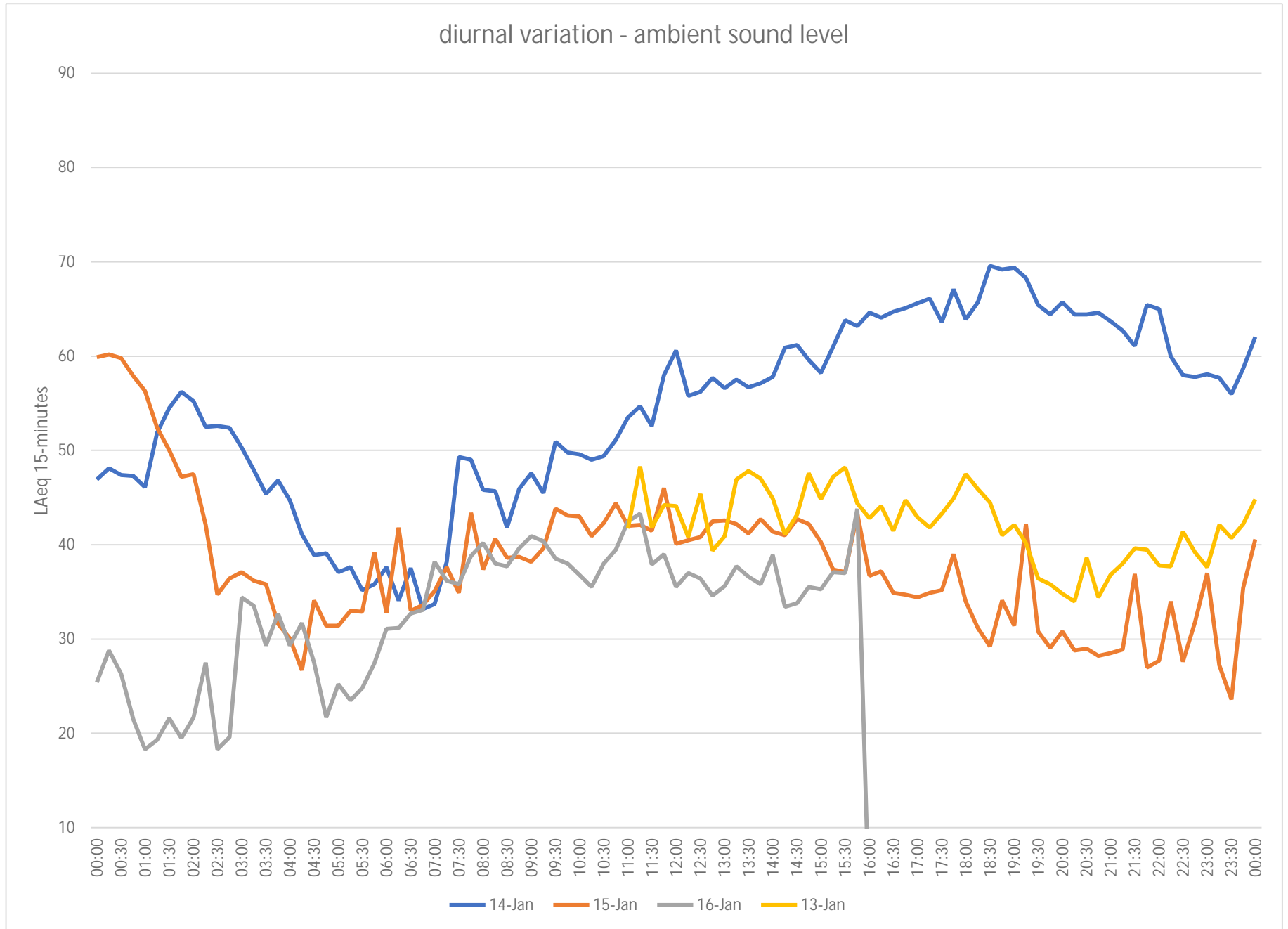
7.0 CONCLUSIONS

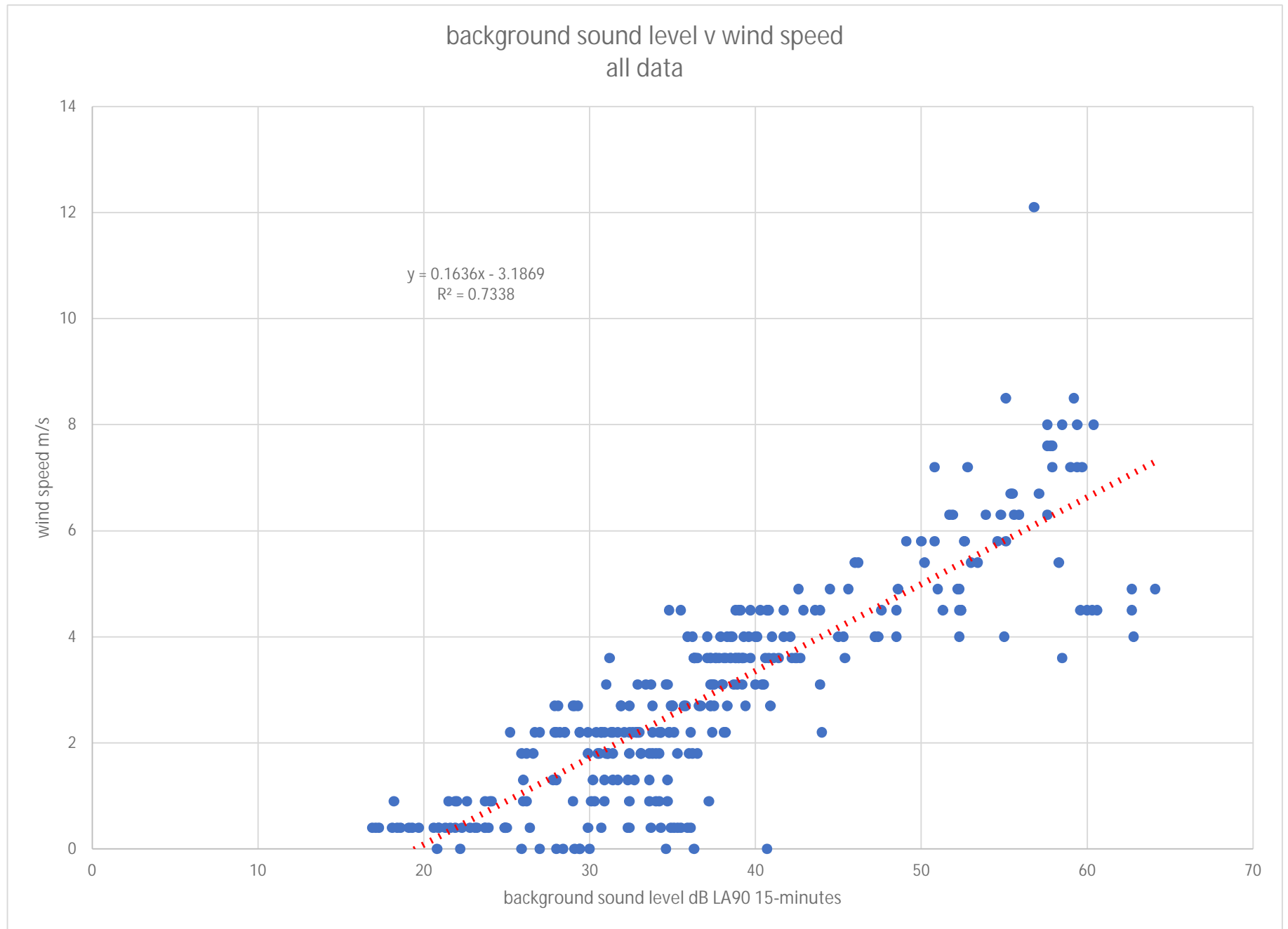
- 7.1 The results from the baseline survey at the nearest existing noise-sensitive receptors indicate that the typical daytime background sound at the nearest noise-sensitive receptor is 32 dB LA₉₀ 1-hour. The ambient daytime sound is typically 38 dB LA_{eq,1-hour}. The acoustic environment in the study area is exceptionally quiet and the proposed operations will need to adopt a high level of mitigation to protect residential amenity. The dominant sound in the study area is from intermittent traffic on the minor road, with occasional sounds from the distant quarry to the west of the A703.
- 7.2 The results from the noise prediction exercise indicate that sound from the proposed development has the potential to affect the residential amenity of the existing dwelling at Westloch Farmhouse to the east of the proposed installation.
- 7.3 The sound from the proposed installation including the breakout from the wood-chip building, yard noise and site traffic has also been assessed in accordance with BS 4142:2014 + A1:2019 and the assessment framework from the Scottish Government's TAN as set out in Tables 2.1 and 2.2.
- 7.4 Sound from the proposed installation is predicted to be of Low Adverse impact in terms of BS 4142:2014+A1:2019, subject to the successful implementation of the mitigation measures set out in Section 6.
- 7.5 The worst-case impact is predicted to be of Neutral/Slight Adverse Significance in terms of the TAN assessment framework, subject to the successful implementation of the mitigation measures set out in Section 6.
- 7.6 The proposed mitigation measures include restricting the hours of operation, locating the access doors of the noise-generating buildings on the south-west elevation, fitting a high level of acoustic insulation and automatic self-closing doors, the erection a substantial amenity bund and the adoption of appropriate working methods to minimise impacts on amenity.

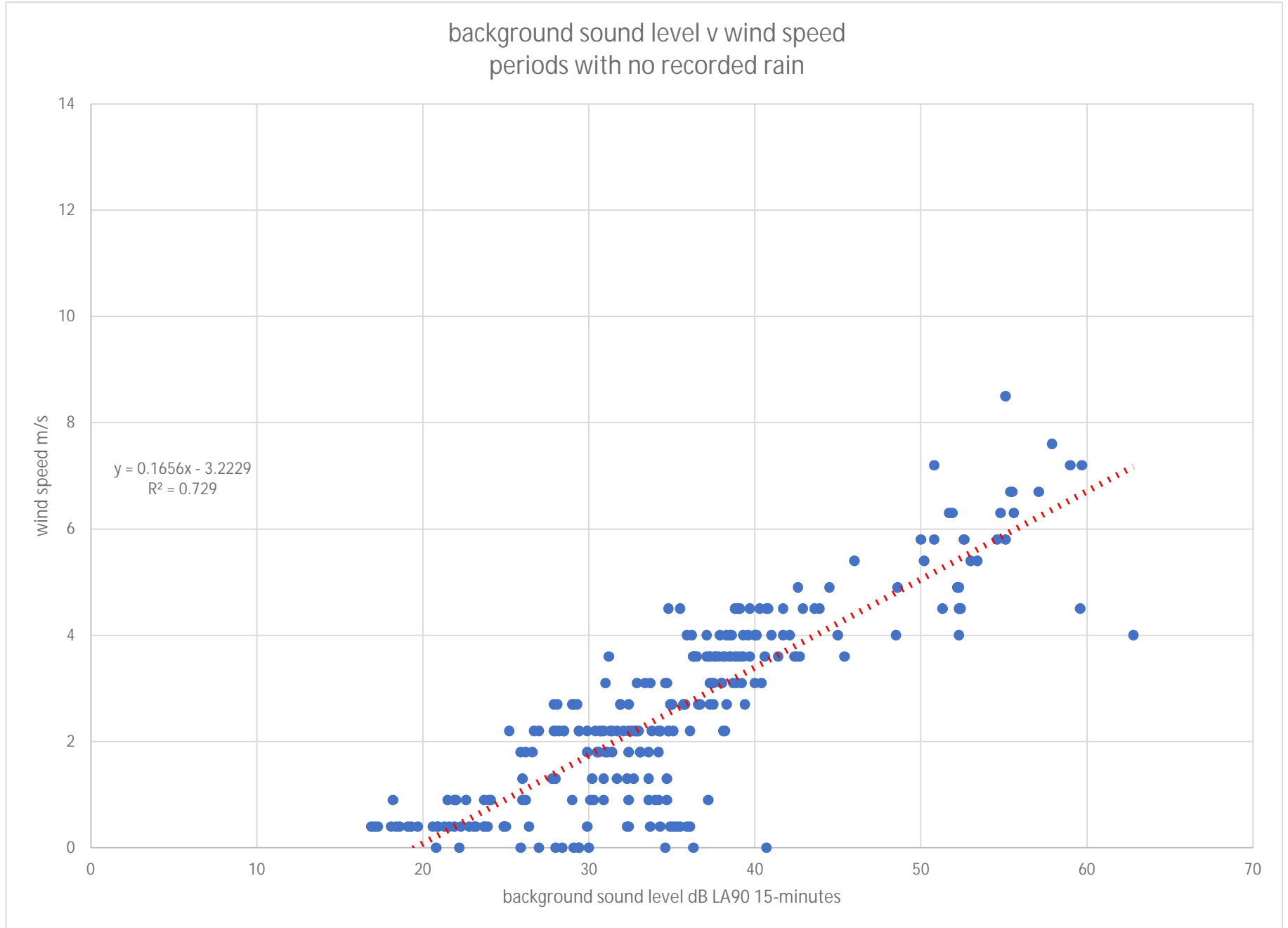
Charts

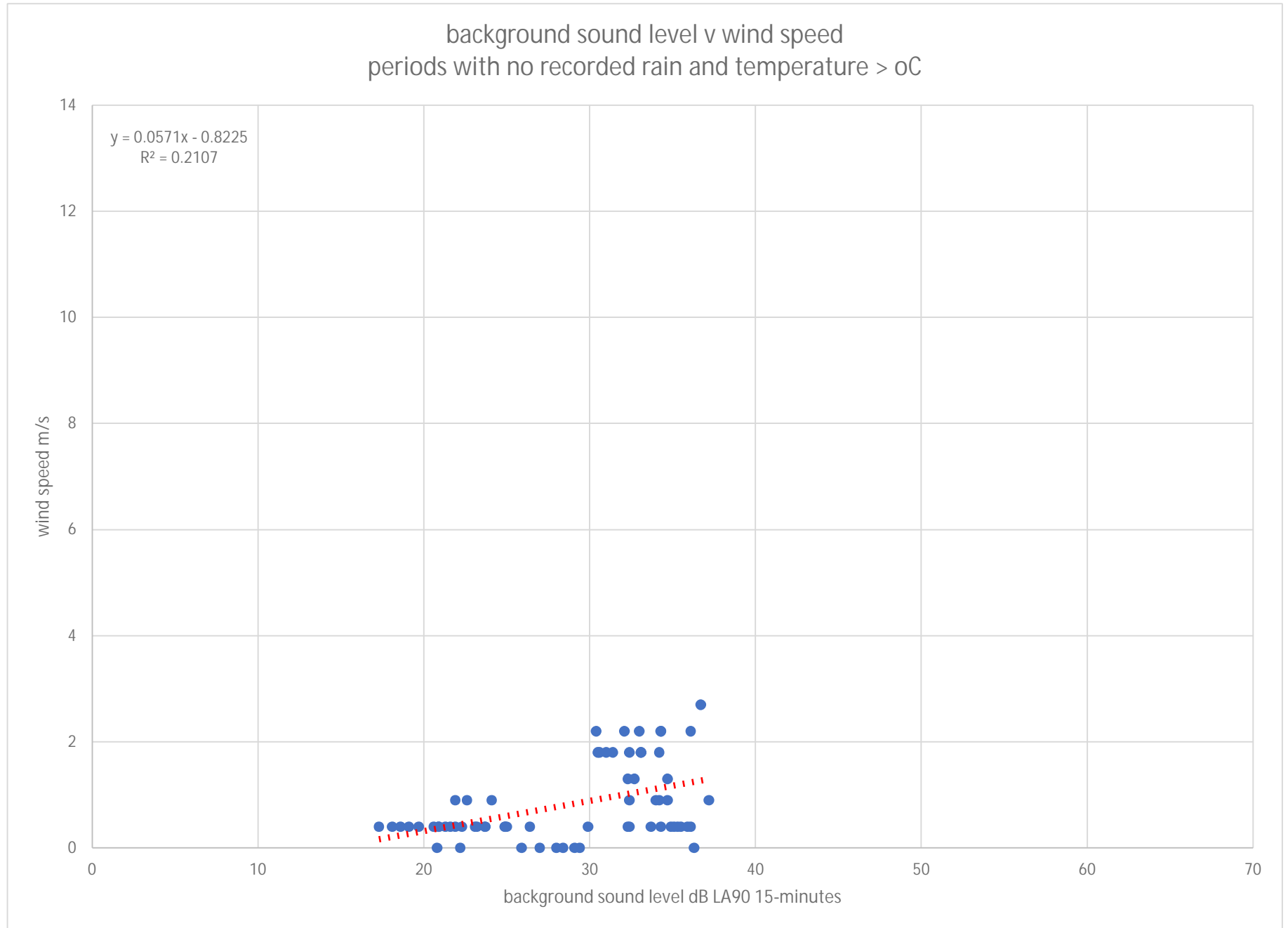


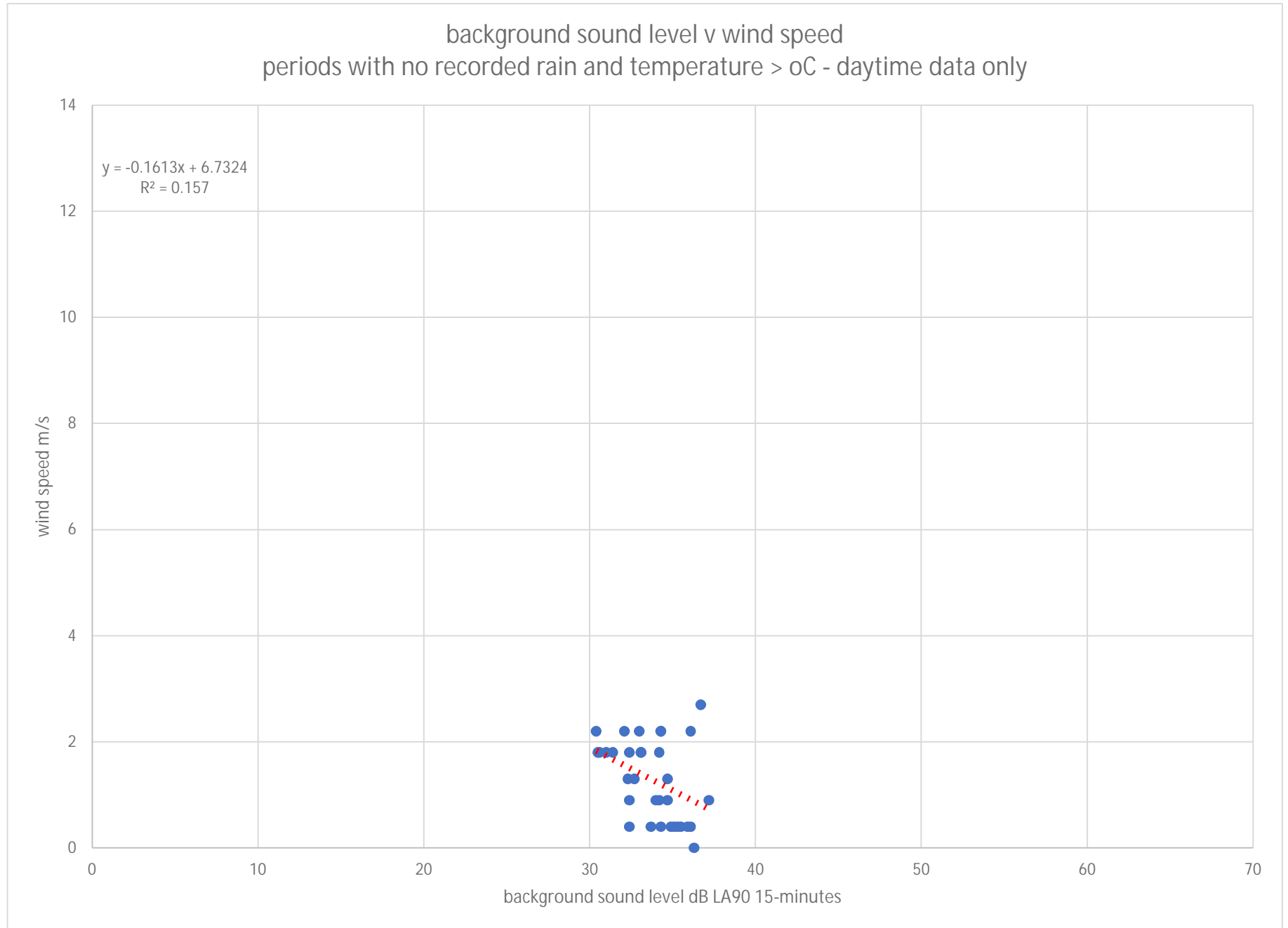


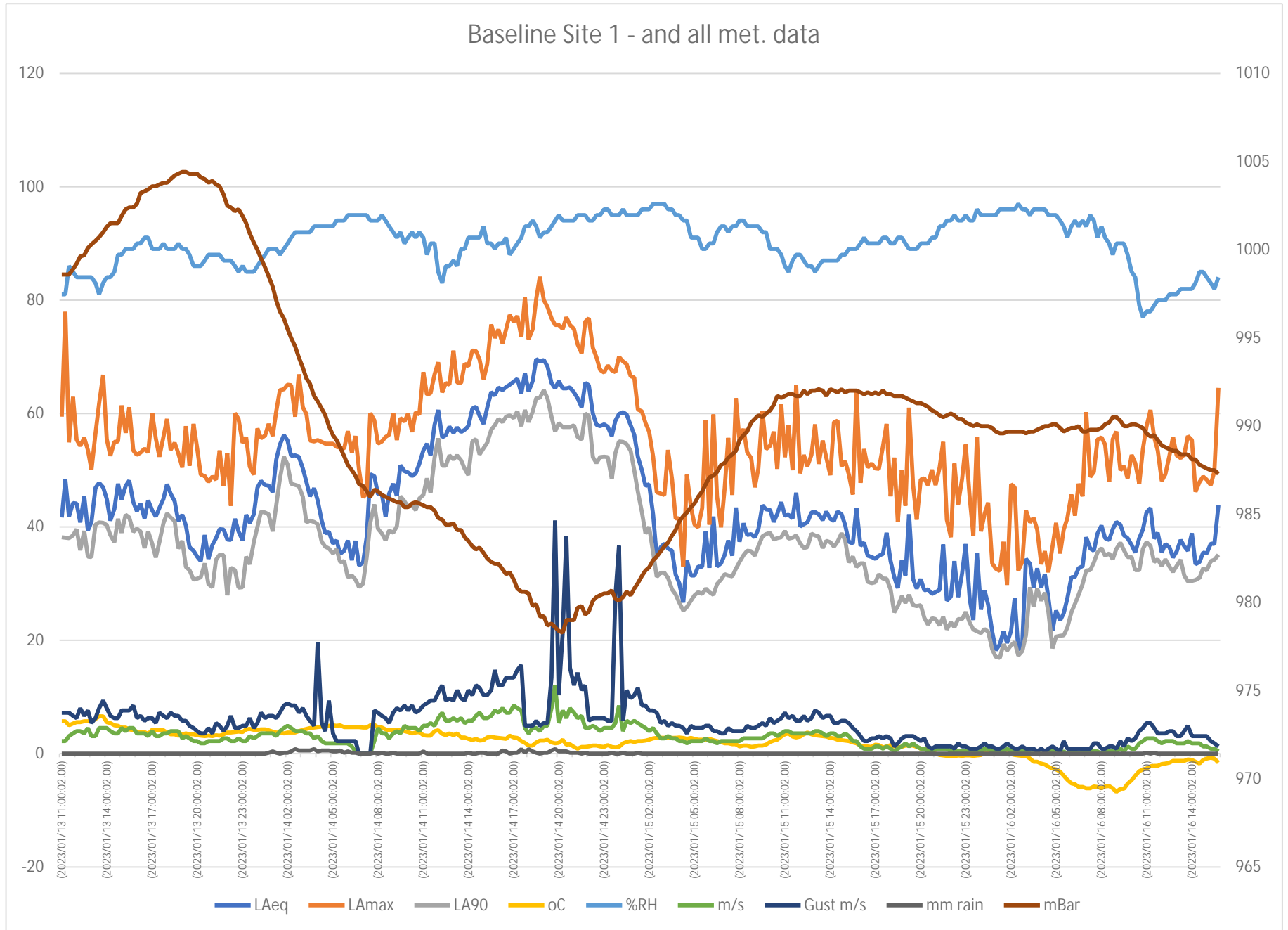


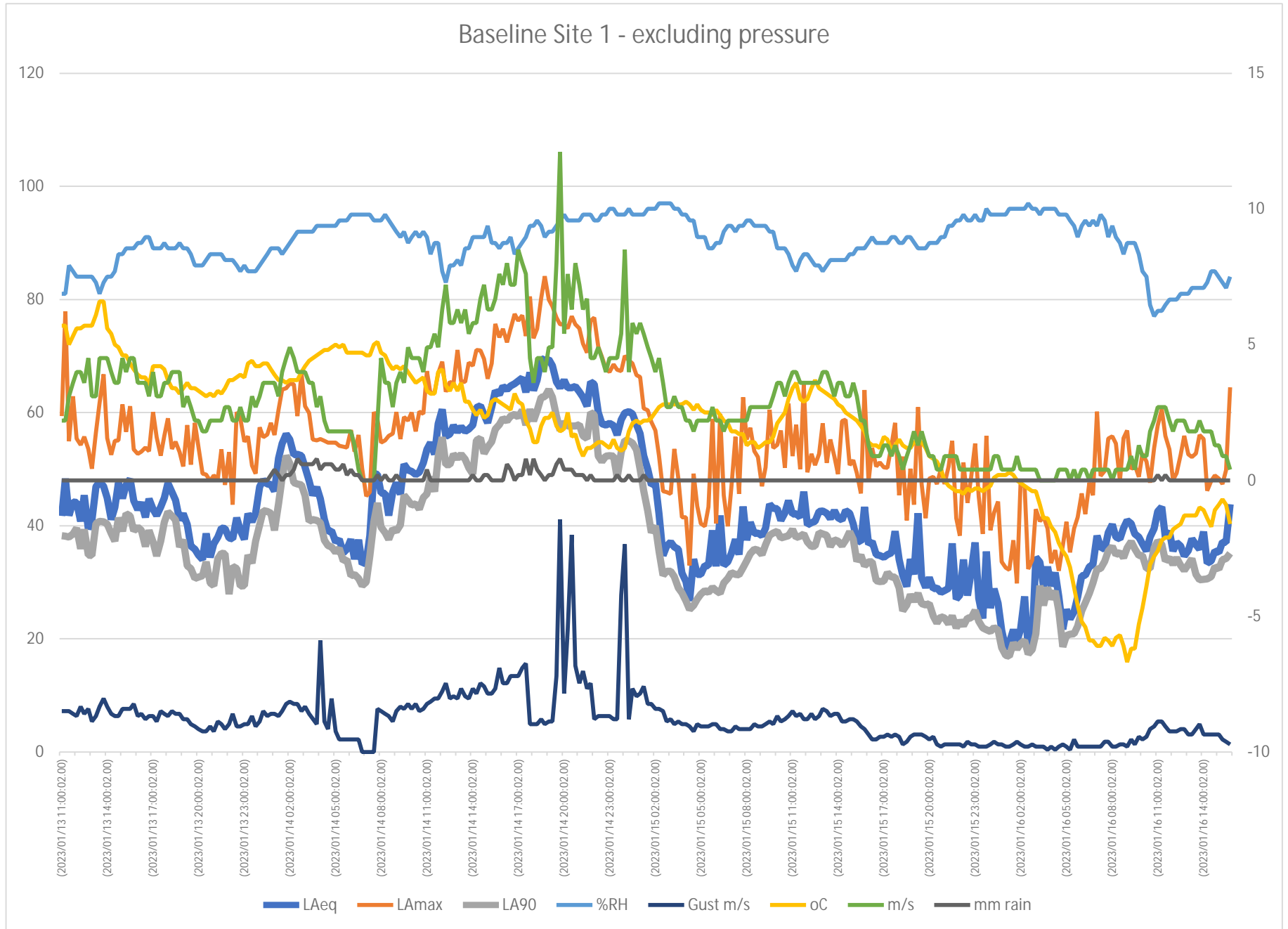


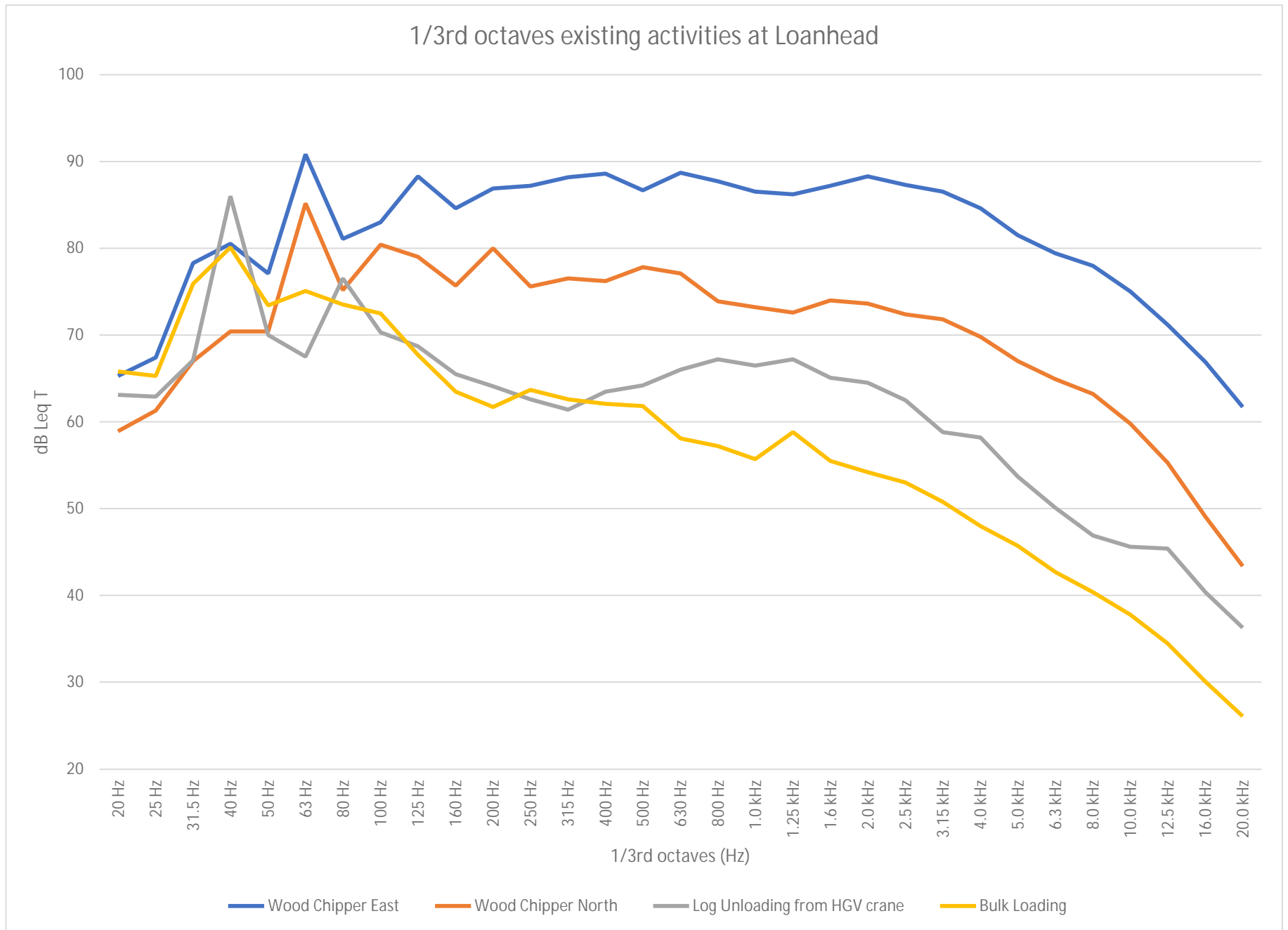












Tables

Table 5.2

Environmental Noise Exposure					Assessment in Accordance with TAN					
Receptor	Specific sound	rated sound	Baseline Ambient	Baseline Background	X	Likelihood of complaint	combined noise	after - before	Magnitude	Significance
	dB LA _{eq}	dB LA _r	dB LA _{eq}	dB LA ₉₀						
Daytime	34	35	38	32	3	Low	39	1.5	Minor	Neutral/Slight

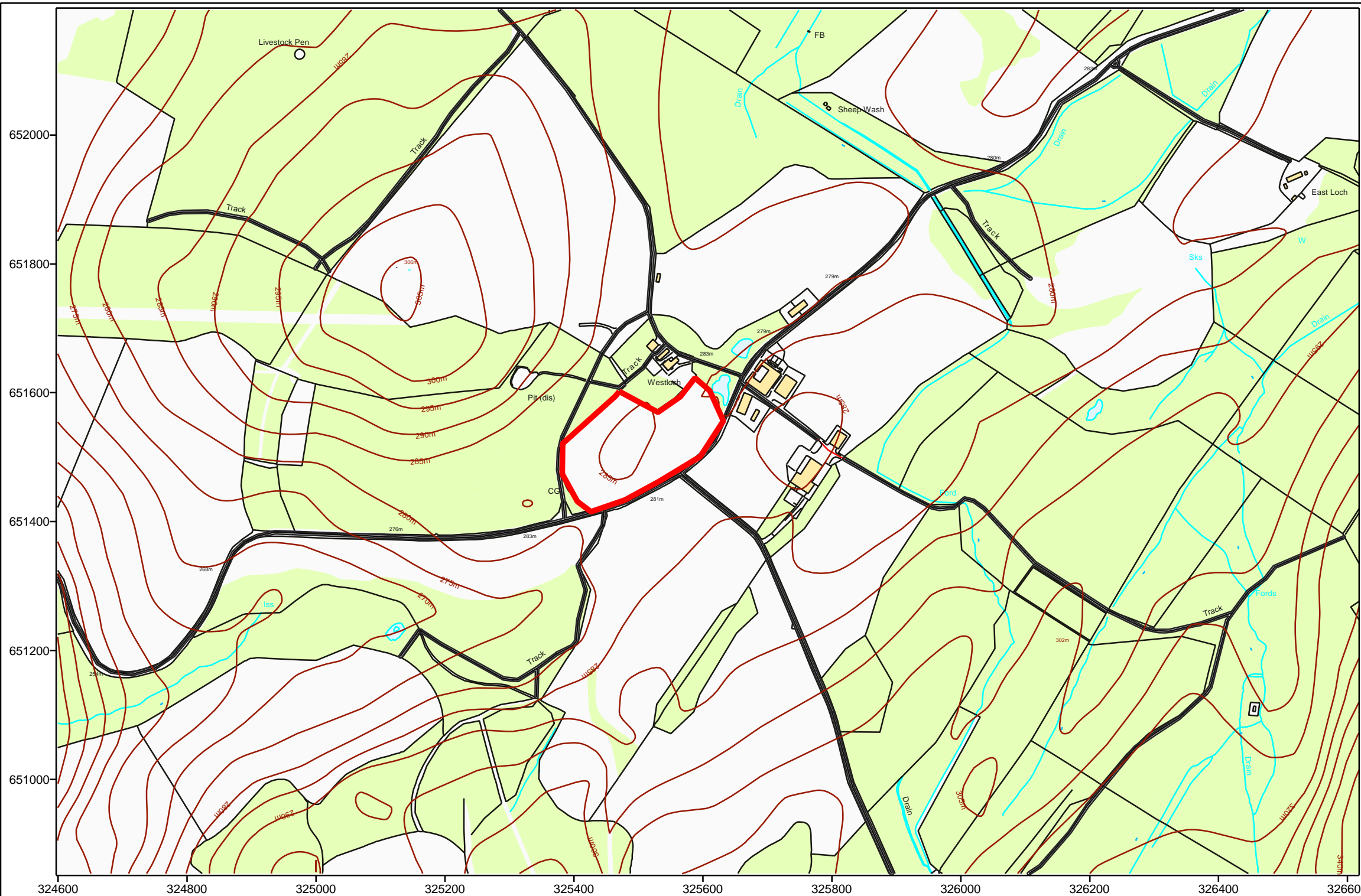
Notes

Predicted exposure at worst-case opening window

Figures

Pentland Biomass
Westloch Farm

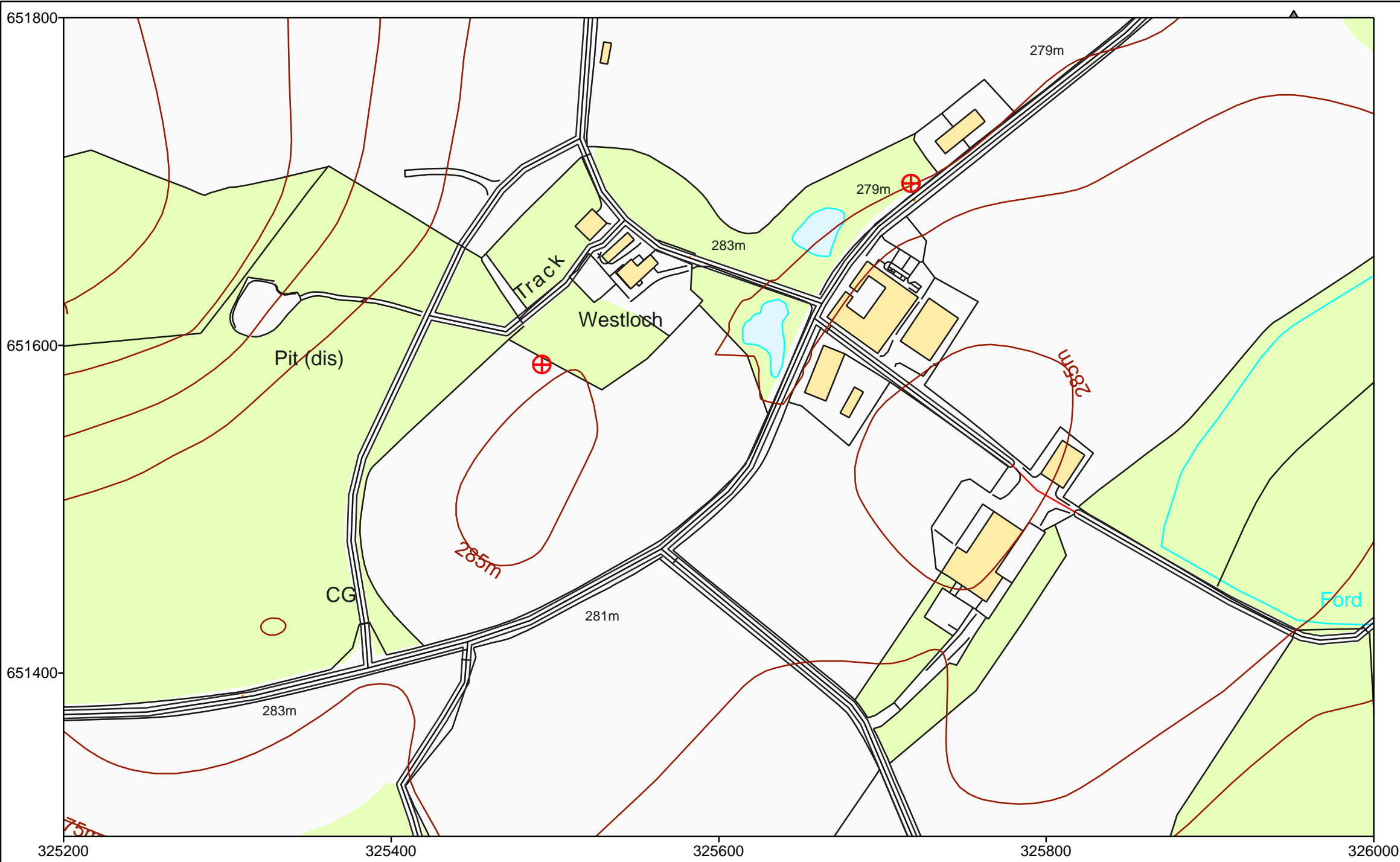
Figure 1
Site Location

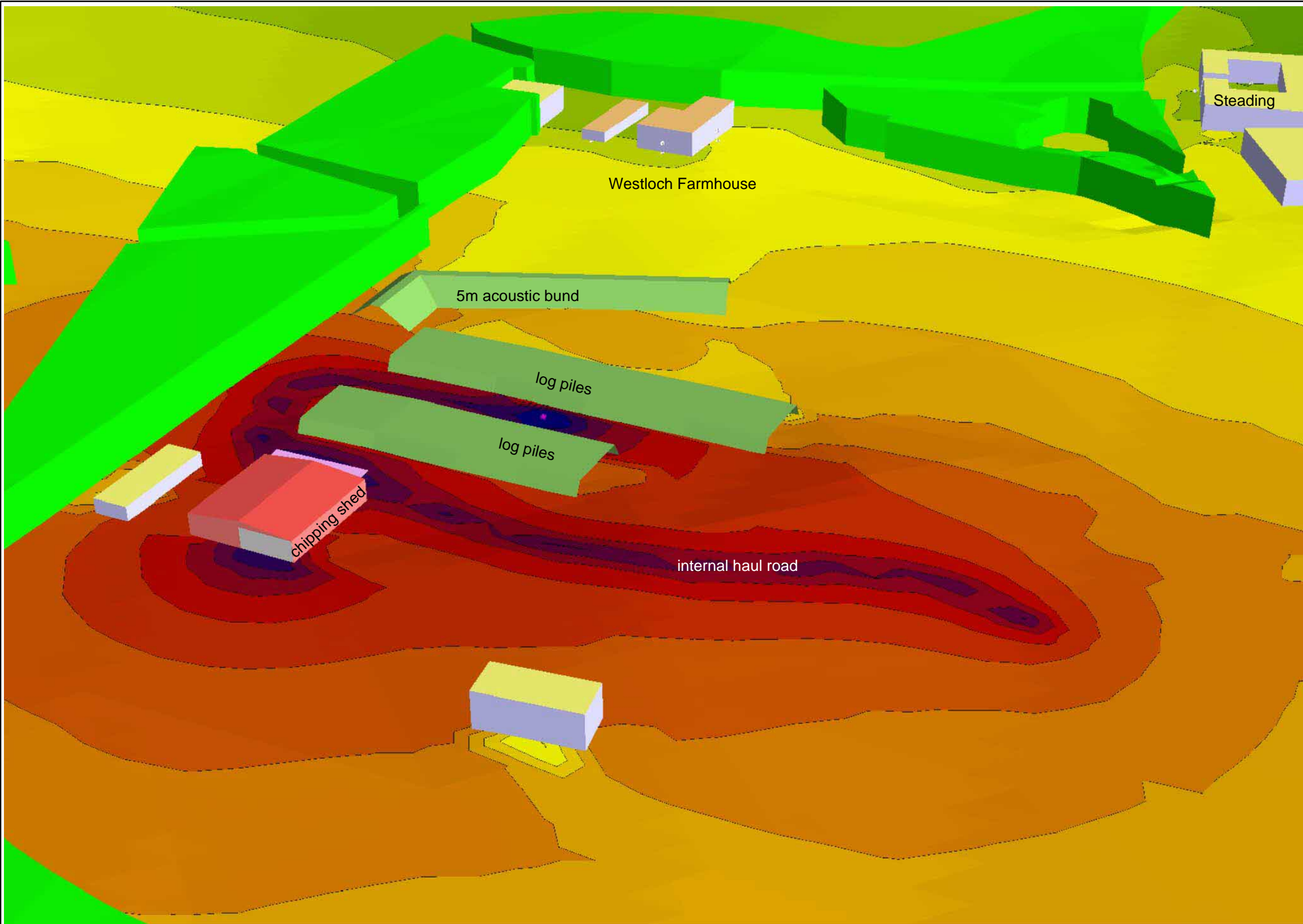


Pentland Biomass
Westloch Farm

Figure 2
Baseline Survey

⊕ approximate location
of baseline surveys



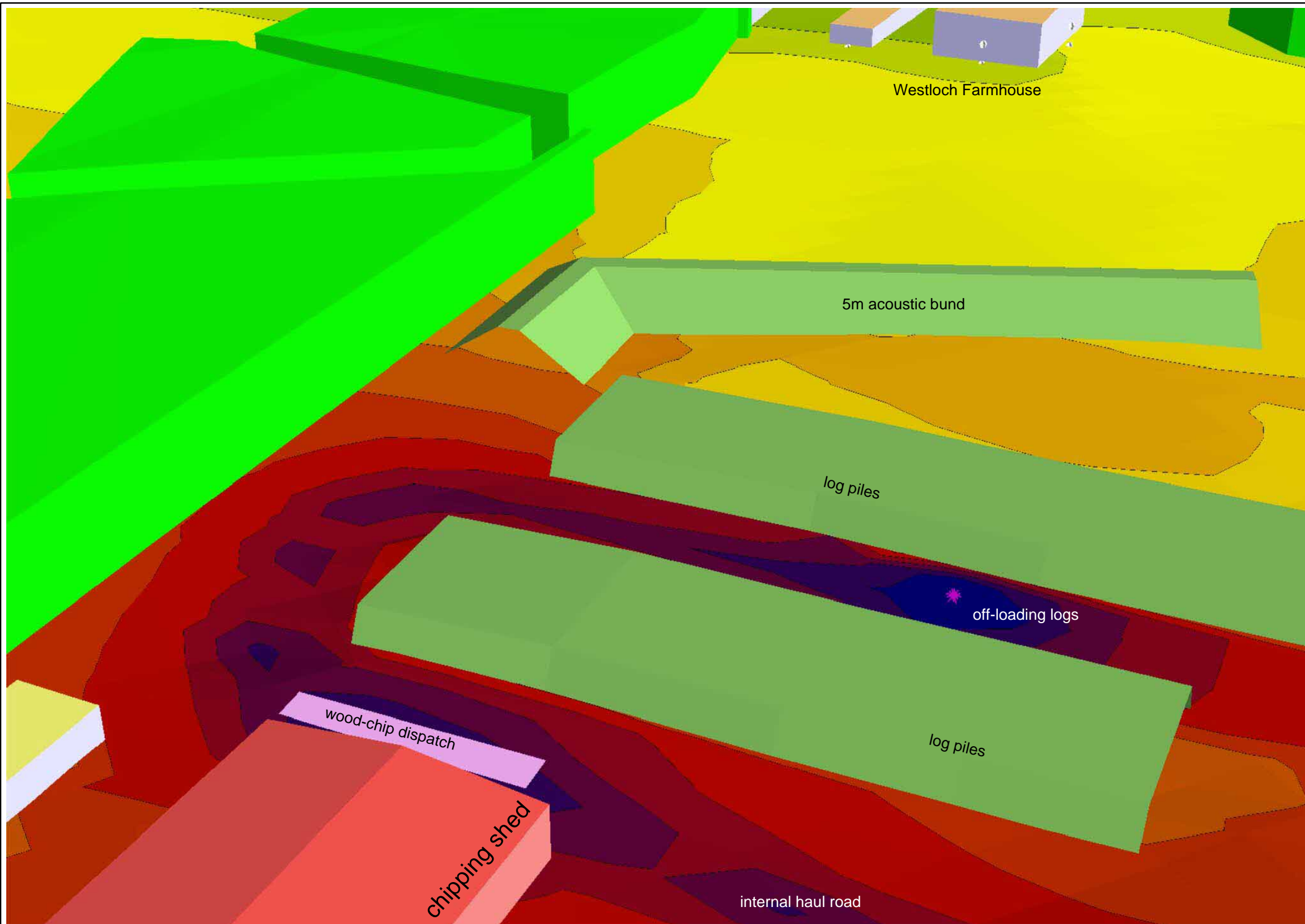


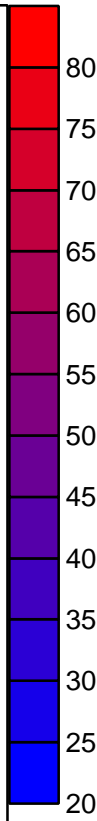
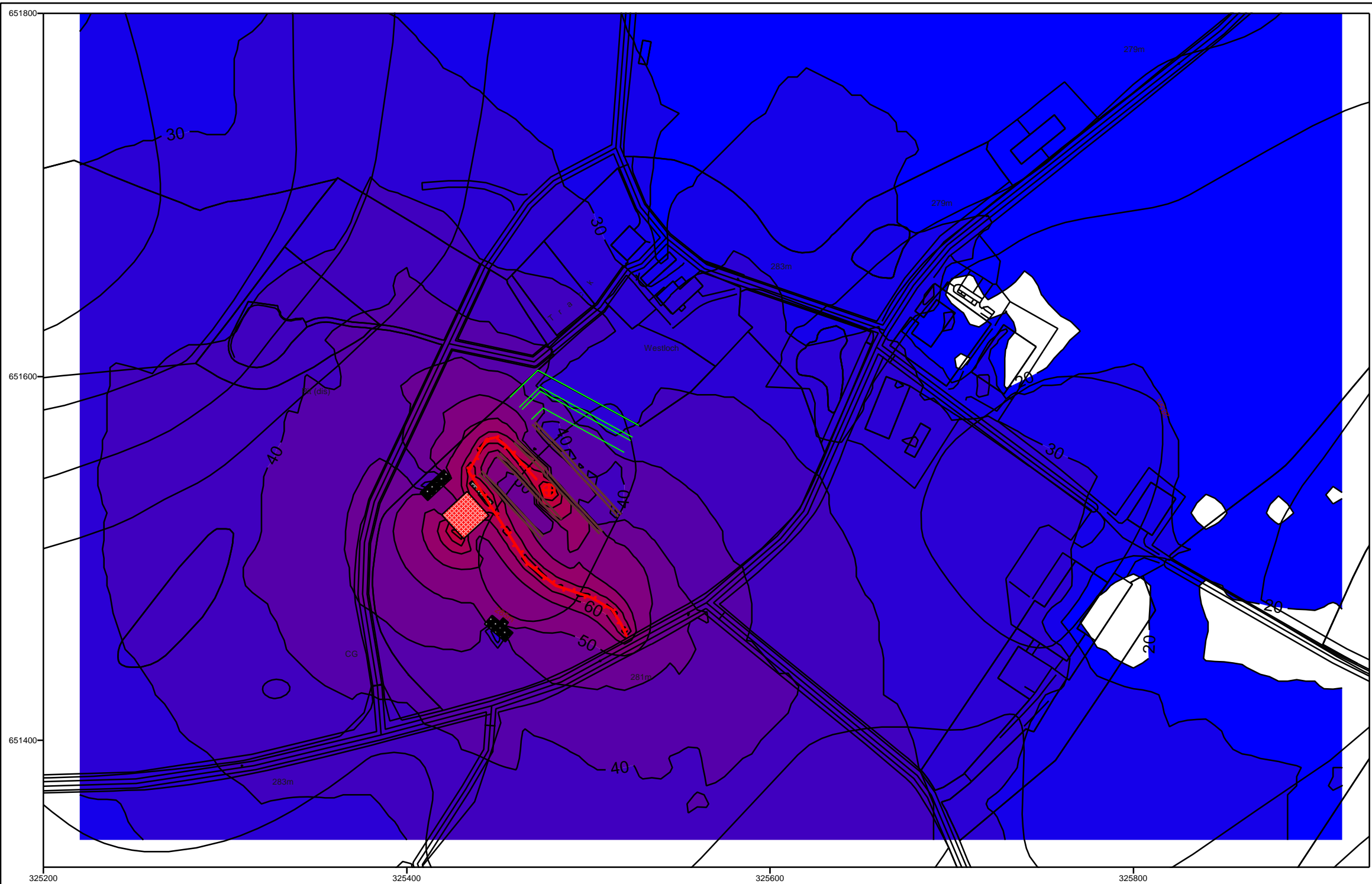
Pentland Biomass
Westloch Farm

Figure 3.1
Model Layout

Pentland Biomass
Westloch Farm

Figure 3.2
Model Layout





**Pentland Biomass
Westloch Farm**

**Figure 4
Predicted Sound Levels**

Prediction Model
 Soundplan 8.2
 Scenario 1
 Model includes proposed buildings
 breakout from wood-chip shed (47 dB Rw)
 100% on-time yard activities
 internal HGV movements
 acoustic bund = 5m
 Prediction ISO 9613-2
 Topography based on OS data
 and site layout
 Prediction grid 5m
 contours dB LA_{eq} 1-hour
 1.5m above ground level
 units = dB LA_{eq} 1-hour
 sound levels not rated

AS 0960 Westloch Farm Timber Yard - 24 January 2023 : Crown copyright Ordnance Survey 0100031673

Appendix 1 – Project Description

22/00933/FUL
05/10/2022

Scottish Borders Council
Town And Country
Planning (Scotland) Act
1997

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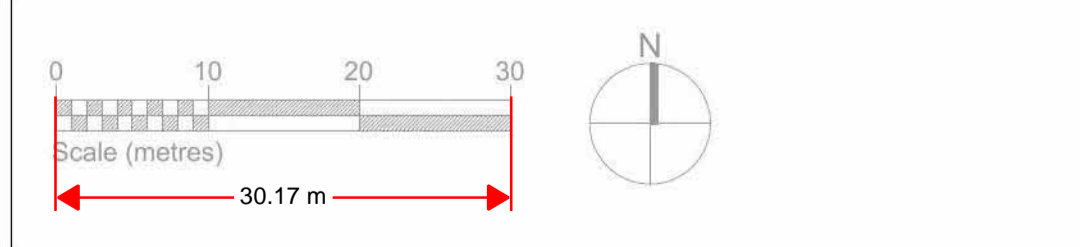
- Key
- +283.80** Proposed Levels
- ① Chipping & Storage Shed
 - ② Processing Shed
 - ③ Temporary Office & Staff Facilities
 - ④ Open Timber Storage Areas
 - ⑤ Weigh Bridge
 - ⑥ Staff parking
 - ⑦ HGV parking
 - ⑧ Waste & Recycling
 - ⑨ Rainwater Harvesting
 - ⑩ Surface Water Interceptor & Soakaway
 - ⑪ Heavy Duty Aco Drain
 - ⑫ Tarmac Access Road

Building Areas

Chipping & Storage Shed = 342m²
 Processing Shed 108m²
 Temporary Office & Staff Facilities 29.1m²
Total = 479.1m²

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Site Area

Timber Yard = 1.81 hectares (4.49 acres)
 Future Plot/ Office = 0.17 hectares (0.42 acres)
Total = 1.98 hectares (4.91 acres)

Job Title

**Proposed Timber Processing
Yard, Westloch**

Dwg Title

Proposed Site Plan & Levels

Planning

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Revisions	Date	By	Description
31.05.22	D		boundary fencing added
25.05.22	C		Site Boundary updated
24.05.22	B		Site Boundary updated
20.05.22	A	nb	Site Boundary revised and additional information added

Client

Pentland Biomass

Scale

1:500 @ A1

Date

May 2022

Drawn by

dmc

Checked by

NB

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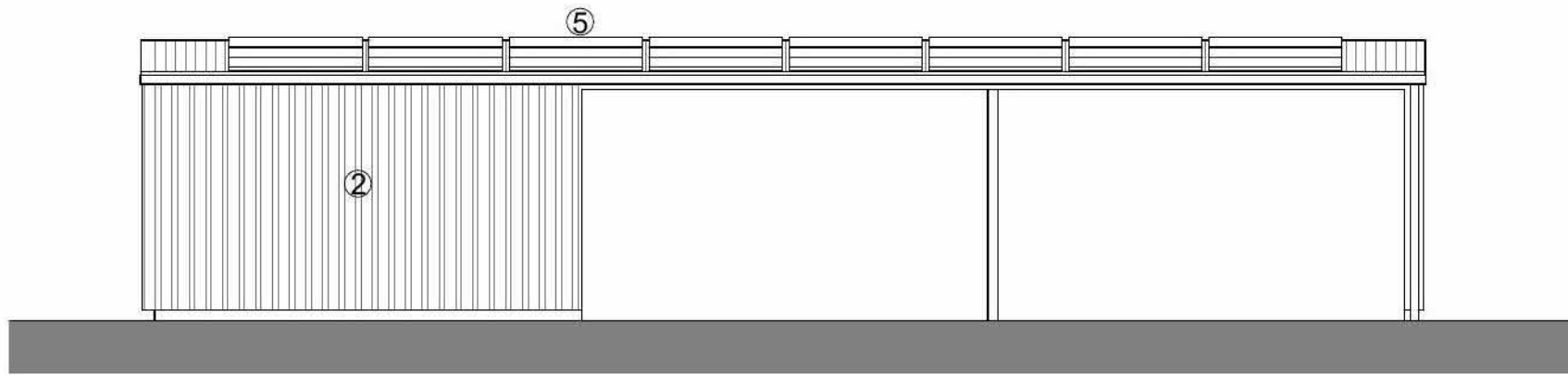
PEN22S01 - 01-102 D

cb³ design
architects

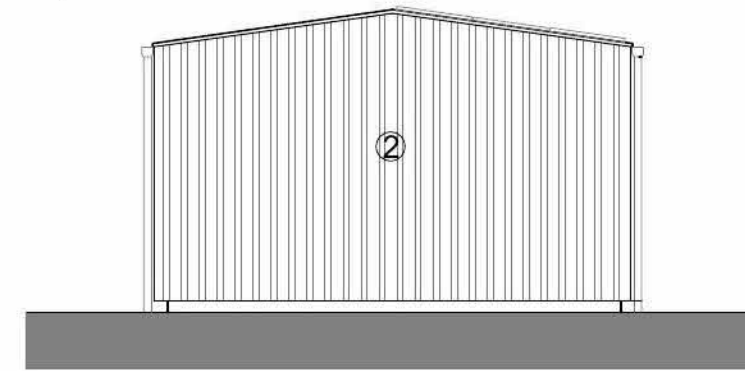
RIBA Chartered Practice

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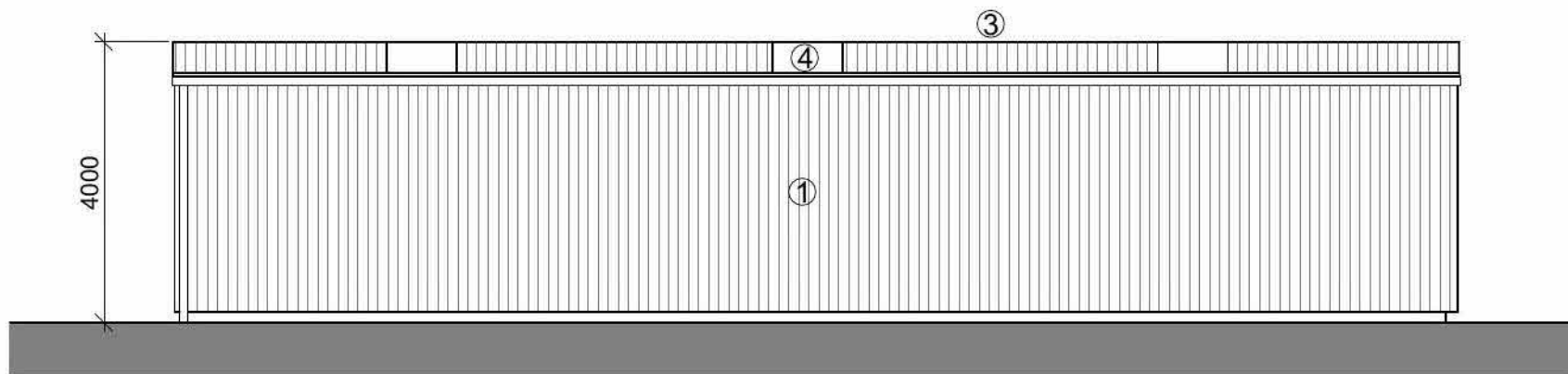
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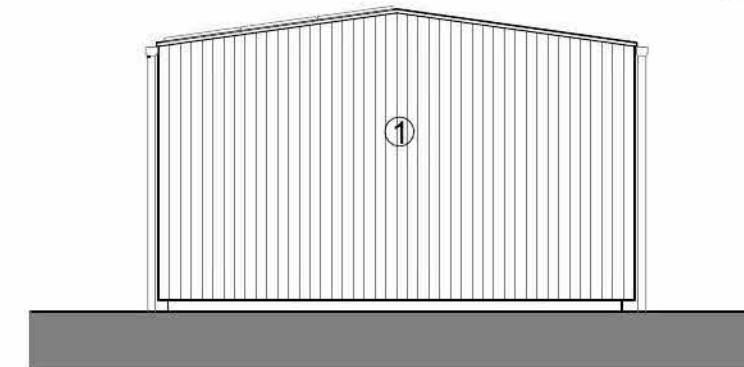
South East Elevation



South West Elevation

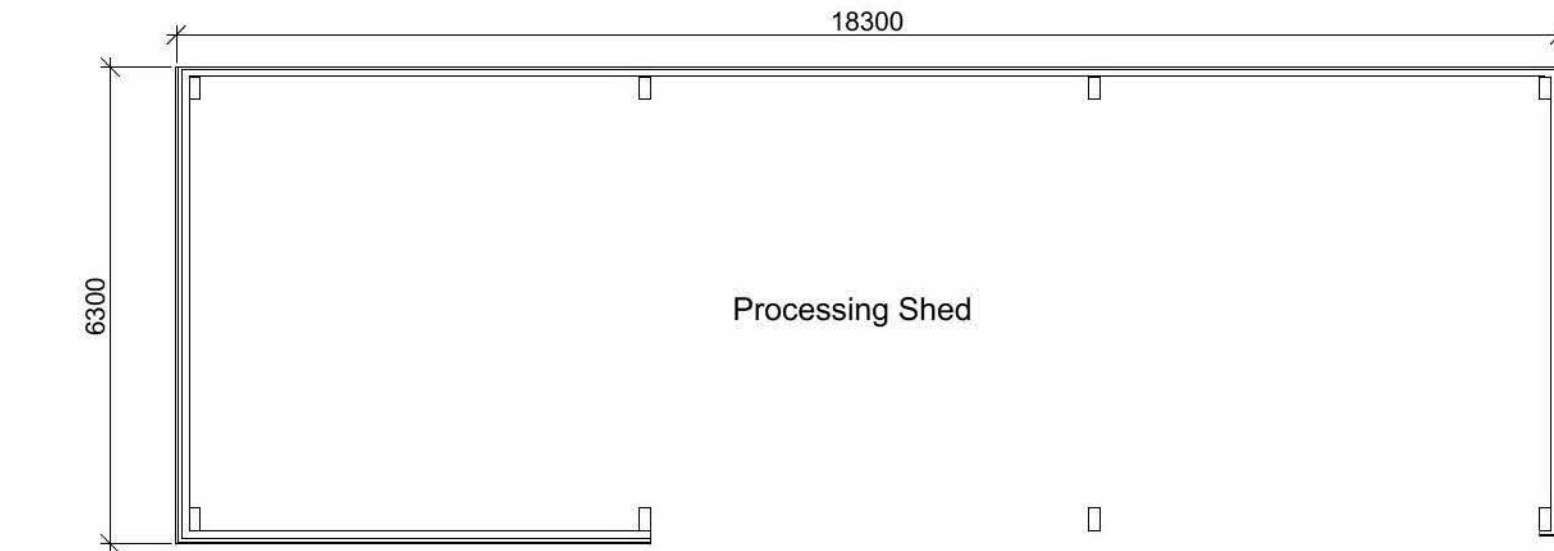


North West Elevation



North East Elevation

22/00933/FUL
05/10/2022



Floor Plan

- ① Brown metal profiled sheet cladding
- ② Vertical larch cladding
- ③ Brown metal profiled roof cladding
- ④ translucent roof sheets
- ⑤ Solar panels

Scottish Borders Council
Town And Country
Planning (Scotland) Act
1997

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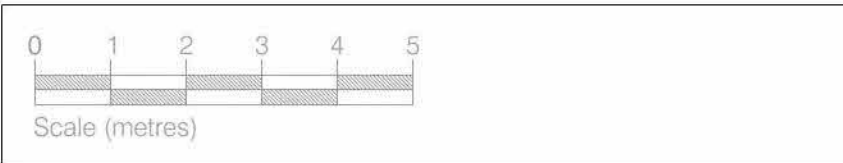
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26.05.22	A	Dimensions added
Revisions		

Job Title

**Proposed Timber Processing Yard,
Westloch**

Client

Pentland Biomass

Dwg Title

**Processing Shed
Proposed Floor Plan & Elevations**

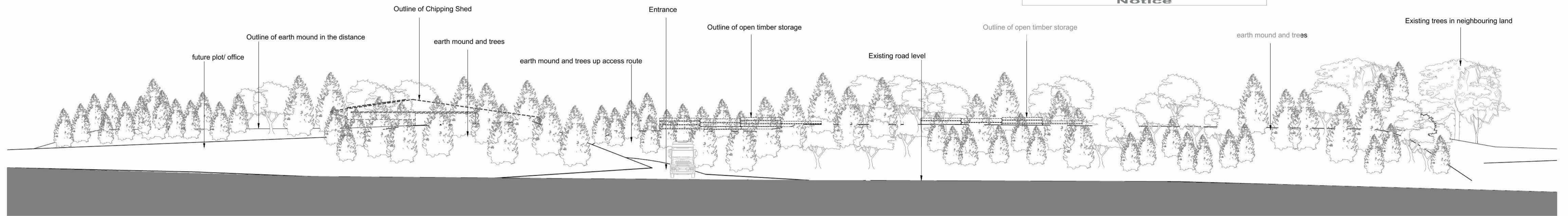
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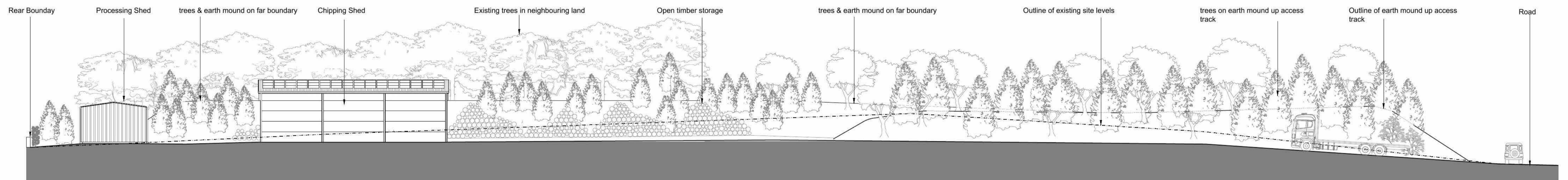
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Street Scene



Site Section AA

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Revisions		
30.05.22	A	Street Scene added
		nb

Job Title
**Proposed Timber Processing
 Yard, Westloch**

Dwg Title
**Proposed Street Scene & Site
 Section AA**

Client
Pentland Biomass

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1:200 @ A1

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May 2022

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Noise Survey



Project Number: AS 0960
 Log Book Number: 116
 Site No: 1
 Location: Westloch Farmhouse
 At the SW garden boundary

Project Name: Westloch Timberyard
 Date/Time: Friday 13th January: 11:30 till Monday 16th January: 15:30 2023
 Sound Level Meter: 5
 Calibration at End: 113.8

Site No: 2
 Location: Westloch Farm Cottages
 22m from the gable end and 4m from the kerb

Date/Time: Friday 13th January 2023: 13:00
 Sound Level Meter: 7
 Calibration at End: 113.8
 Date/Time: Monday 16th January 2023: 14:40
 Sound Level Meter: 7
 Calibration at End: 113.8

Norsonic Nor-140 Sound Level Meter 5
 Norsonic Nor-1251 Acoustic Calibrator A
 Norsonic Nor-1225 Microphone
 Norsonic Nor-1217 Outdoor Protection Kit
 Calibration Factor 113.8

Serial No. 1406913
 Serial No. 31060
 Serial No. 208201
 Serial No. 12175402

Norsonic Nor-140 Sound Level Meter 7
 Norsonic Nor-1251 Acoustic Calibrator A
 Gras 40AF Microphone
 Norsonic Nor-1217 Outdoor Protection Kit
 Calibration Factor 113.8

Serial No. 1405074
 Serial No. 31060
 Serial No. 114655
 Serial No. 12175404

Weather Station
 Davis Vantage Pro 2 6152UK

Date/Time: Friday 13th January 2023: 13:00
 Monday 16th January 2023: 15:30



Date	LAeq	LAmaz	LA90	20 Hz	25 Hz	31.5 Hz	40 Hz	50 Hz	63 Hz	80 Hz	100 Hz	125 Hz	160 Hz	200 Hz	250 Hz	315 Hz	400 Hz	500 Hz	630 Hz	800 Hz	1.0 kHz	1.25 kHz	1.6 kHz	2.0 kHz	2.5 kHz	3.15 kHz	4.0 kHz	5.0 kHz	6.3 kHz	8.0 kHz	10.0 kHz	12.5 kHz	16.0 kHz	20.0 kHz	
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(2023/01/13 18:00:02.00)	47.5	59.0	42.4	64	62	60	58	54	50	47	44	43	42	42	42	42	41	41	40	39	39	37	35	33	30	27	24	21	18	17	15	12	9	8	
(2023/01/13 18:15:02.00)	45.9	53.6	41.7	64	62	59	56	52	49	45	42	40	40	39	38	39	38	38	38	38	38	36	34	32	29	26	23	20	17	17	15	12	9	8	
(2023/01/13 18:30:02.00)	44.5	54.8	41.0	63	61	59	55	52	47	44	41	39	38	38	37	38	38	37	37	37	35	33	30	27	24	20	18	16	14	14	11	8	7		
(2023/01/13 18:45:02.00)	41.0	53.0	36.2	57	55	53	49	45	42	39	36	35	35	35	35	35	35	34	34	34	33	31	28	25	22	19	16	13	12	12	11	9	6	6	
(2023/01/13 19:00:02.00)	42.1	50.5	37.5	60	58	55	52	48	44	41	38	36	35	35	34	35	35	35	35	35	34	32	30	27	24	21	17	15	13	14	13	10	7	7	
(2023/01/13 19:15:02.00)	40.2	57.8	32.9	55	52	49	45	43	39	37	43	43	40	36	38	36	36	35	33	31	30	27	24	20	16	13	11	10	9	10	9	7	6	6	
(2023/01/13 19:30:02.00)	36.4	50.8	32.4	53	51	47	45	42	38	35	33	31	30	29	29	30	30	30	29	29	29	26	23	20	16	13	11	9	9	10	9	7	5	6	
(2023/01/13 19:45:02.00)	35.8	58.2	30.7	53	50	47	43	41	38	35	33	30	30	29	29	29	29	29	29	29	28	26	23	19	16	13	10	9	9	9	8	7	5	6	
(2023/01/13 20:00:02.00)	34.8	53.9	30.9	49	47	45	41	40	39	37	38	34	29	27	26	27	27	27	27	27	28	25	22	20	15	11	9	8	8	8	7	6	5	6	
(2023/01/13 20:15:02.00)	34.0	49.2	31.1	50	47	44	41	39	37	36	37	35	31	29	28	28	28	28	27	26	26	23	20	15	11	9	8	8	8	8	7	6	5	6	
(2023/01/13 20:30:02.00)	38.6	49.0	33.6	57	54	50	46	43	40	38	36	35	34	33	33	33	32	32	32	31	30	28	25	22	19	16	13	11	10	10	9	7	6	6	
(2023/01/13 20:45:02.00)	34.4	47.9	29.9	50	47	44	41	38	36	33	31	29	28	30	30	30	29	28	28	27	26	24	21	16	13	10	9	8	8	8	7	6	5	6	
(2023/01/13 21:00:02.00)	36.8	48.9	29.4	55	52	50	46	42	40	37	34	32	31	32	31	31	30	30	30	29	29	27	24	20	18	15	12	10	9	9	8	7	5	6	
(2023/01/13 21:15:02.00)	38.0	48.3	34.2	55	52	49	45	43	40	37	35	34	33	32	32	32	32	32	31	31	29	28	25	21	18	15	13	11	10	9	8	7	5	6	
(2023/01/13 21:30:02.00)	39.6	53.5	35.1	56	53	50	46	43	40	37	35	33	33	33	33	34	33	33	33	32	31	31	28	24	21	17	14	12	11	10	9	8	6	6	
(2023/01/13 21:45:02.00)	39.5	47.2	35.0	57	55	51	48	44	41	38	35	34																							

Date	L1eq	L1max	L1D	0.1Hz	0.2Hz	0.3Hz	0.4Hz	0.5Hz	0.6Hz	0.7Hz	0.8Hz	0.9Hz	1.0Hz	1.25Hz	1.5Hz	2.0Hz	2.5Hz	3.15Hz	4.0Hz	5.0Hz	6.3Hz	8.0Hz	10.0Hz	12.5Hz	16.0Hz	20.0Hz	25.0Hz	31.5Hz	40.0Hz	50.0Hz	63.0Hz	80.0Hz	100.0Hz			
2023/01/14 08:00:03	46.9	57.4	40.0	65	63	66	67	54	58	47	44	41	40	40	39	40	39	39	39	38	37	36	34	31	28	25	21	19	17	14	12	9	8			
2023/01/14 00:15:02	48.1	55.6	42.7	66	63	61	58	54	50	47	44	42	41	41	40	41	41	41	41	40	40	39	37	35	32	28	24	21	18	16	14	12	9	8		
2023/01/14 00:30:02	47.4	56.1	42.5	65	63	61	57	53	49	46	43	41	41	40	40	41	40	40	39	39	38	36	34	32	30	27	25	24	23	22	21	19	16	16		
2023/01/14 00:45:02	47.3	58.2	42.2	66	63	61	58	54	50	46	43	41	40	40	39	40	39	40	39	39	38	36	34	32	29	27	25	23	22	21	20	18	16	14		
2023/01/14 01:00:02	46.1	56.0	39.2	65	63	60	56	52	49	45	42	40	39	39	38	39	38	39	38	37	36	35	33	31	28	25	23	21	20	19	18	16	14			
2023/01/14 01:15:02	51.9	60.5	43.9	70	68	66	64	60	56	52	49	46	45	45	44	44	44	44	44	43	42	41	39	37	34	31	28	25	22	18	16	13	10	8		
2023/01/14 01:30:02	54	64	48	71	68	66	64	60	56	52	49	46	45	45	44	44	44	44	43	42	41	39	37	34	31	28	25	22	18	16	13	11	8	6		
2023/01/14 01:45:02	56.2	64.3	45.4	74	72	70	68	64	61	57	53	51	50	49	48	48	48	48	48	48	47	47	46	44	42	39	36	34	32	29	26	24	22	19	16	
2023/01/14 02:00:02	55.2	65.1	51.0	72	71	68	66	63	59	55	52	49	48	48	48	48	48	47	47	47	46	46	45	43	41	38	35	33	31	29	26	25	23	20	18	
2023/01/14 02:15:02	52.5	65.0	47.6	70	68	66	63	60	56	52	49	48	46	46	45	45	45	45	44	44	43	43	42	40	38	35	32	31	30	28	26	24	21	18	15	
2023/01/14 02:30:02	52.6	59.4	47.4	70	69	66	63	59	55	51	48	46	46	45	45	45	45	45	44	44	44	43	42	40	38	35	32	31	30	28	26	24	23	21	19	
2023/01/14 02:45:02	52.4	66.9	47.2	70	68	65	63	59	56	52	49	47	46	45	44	44	44	44	44	43	43	42	40	38	35	32	31	30	28	26	24	23	21	19	16	
2023/01/14 03:00:02	50.3	61.1	45.3	68	66	64	61	57	54	50	47	44	43	43	43	42	42	42	42	41	41	39	38	36	33	30	29	28	27	26	25	23	21	18	15	
2023/01/14 03:15:02	47.9	59.9	40.8	65	63	60	57	53	49	46	43	41	41	40	40	41	40	40	40	39	38	37	36	34	31	29	28	28	26	26	25	23	20	18	16	
2023/01/14 03:30:02	45.4	55.2	41.1	63	61	58	54	50	46	43	41	39	38	38	37	38	38	38	38	37	36	35	34	33	31	29	27	27	27	25	25	23	21	19	16	
2023/01/14 03:45:02	46.8	55.1	40.9	64	62	59	56	52	48	45	42	40	40	40	39	40	39	39	39	38	37	36	34	32	29	27	26	26	24	23	22	20	17	14	12	
2023/01/14 04:00:02	44.7	55.3	40.5	61	59	56	52	48	44	42	39	38	37	37	37	37	37	37	36	36	35	33	32	30	29	27	27	26	25	24	23	21	19	16	14	
2023/01/14 04:15:02	41.1	55.0	37.4	58	56	53	49	45	41	38	36	34	34	33	33	34	33	33	32	31	30	29	28	27	26	25	25	23	23	21	19	16	14	12	9	
2023/01/14 04:30:02	38.9	54.7	36.5	53	50	47	43	40	37	34	32	31	30	30	31	30	31	30	30	29	28	27	27	26	25	24	24	24	23	22	21	18	15	12	9	
2023/01/14 04:45:02	39.1	54.7	36.2	56	54	50	46	42	39	36	34	32	31	31	30	31	31	31	31	30	29	28	27	27	26	25	24	24	24	22	22	20	18	16	14	
2023/01/14 05:00:02	37.1	54.7	35.3	46	43	39	36	34	31	29	27	26	26	25	25	26	26	27	27	27	26	26	26	26	26	25	24	24	23	22	20	18	16	14	12	
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2023/01/14 05:30:02	35.2	54.0	33.8	40	37	35	32	31	28	27	26	24	22	21	20	21	22	23	24	24	24	24	24	24	24	23	23	23	21	21	19	17	15	13	11	
2023/01/14 05:45:02	35.8	53.8	34.0	40	39	39	38	38	37	35	31	31	33	31	26	25	24	24	24	24	24	24	24	24	23	23	22	22	21	20	19	17	14	12	9	
2023/01/14 06:00:02	37	56.9	41.1	47	46	42	39	36	34	31	29	27	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26
2023/01/14 06:15:02	34.1	53.1	31.4	44	42	40	38	37	36	34	31	28	26	28	28	26	24	24	24	24	24	24	23	22	22	21	20	20	18	18	16	14	12	9	8	
2023/01/14 06:30:02	37.5	56.0	30.7	44	42	41	39	38	36	34	35	37	36	34	36	34	35	33	30	28	25	22	20	19	18	17	17	17	15	15	13	11	9	7	6	
2023/01/14 06:45:02	33.2	50.1	29.4	41	39	38	36	34	34	30	29	25	22	21	20	22	23	25	26	26	26	24	21	19	18	17	16	16	14	14	12	10	9	7	6	
2023/01/14 07:00:02	33.7	45.2	30.0	48	44	42	40	39	38	37	35	32	29	28	28	28	28	28	28	27	26	26	25	22	19	17	15	14	12	12	11	9	7	6	5	
2023/01/14 07:15:02	38.2	45.9	34.6	55	52	49	45	42	41	36	34	33	32	32	31	32	32	32	31	30	28	25	22	18	15	12	11	11	10	10	8	6	5	4	3	
2023/01/14 07:30:02	46.0	58.8	44.0	67	65	63	61	57	53	50	46	44	43	43	42	42	41	41	41	40	39	38	36	34	32	30	26	24	22	20	18	17	13	10	8	6
2023/01/14 08:00:02	45.8	54.7	39.7	65	63	61	58	54	50	47	44	42	40	40	39	39	38	38	38	38	37	36	34	32	30	27	24	23	22	21	19	18	15	12	9	8
2023/01/14 08:15:02	45.7	55.1	38.8	64	62	60	57	53	50	46	42	41	39	38	38	38	38	38	38	38	37	36	35	32	30	26	23	20	19	17	15	13	10	9	7	
2023/01/14 08:30:02	41.8	55.9	37.6	58	55	52	49	46	43	40	38	36	35	34	33	34	37	34	34	35	34	32	30	28	24	20	17	15	14	12	10	9	7	6	5	
2023/01/14 08:45:02	45.9	56.3	39.4	63	61	59	56	52	48	44	42	40	39	39	38	38	38	38	38	38	38	38	36	34	30	26	22	22	20	17	11	8	6	5	4	
2023/01/14 09:00:02	47	60	42.9	64	62	59	55	51	48	44	41	40	40	39	38	38	38	38	38	37	36	35	32	30	26	22	22	20	18	12	9	6	5	4	3	
2023/01/14 09:15:02	45.5	55.3	40.1	62	60	58	55	51	48	44	41	40	39	38	38	38	38	38	38	38	36	34	32	29	25	22	21	19	14	10	8	6	5	4	3	
2023/01/14 09:30:02	50.9	59.2	45.4	68	67	65	62	59	55	51	48	45	44	43	43	43	43	43	43	42	42	40	39	36	33	29	26	23	20	15	12	8	7	6	5	
2023/01/14 09:45:02	49.8	58.6	44.5	67	65	63	60	57	53	49	46	44	43	42	42	43	42	42	42	42	42	41	39	37	35	32	28	25	23	19	15	12	9	7	6	
2023/01/14 10:00:02	49.6	60.0	43.6	68	67	65	62	59	55	51	48	45	43	42	42	42	41	41	41	40	39	37	35	32	28	26	24	22	19	18	16	13	10	8	7	
2023/01/14 10:15:02	49.0	56.7	43.9	67	65	63	60	56	52	48	45	43	42	42	41	42	41	41	41	41	41	40	38	36	34	30	26	23	20	17	14	11	7	6	5	
2023/01/14 10:30:02	49.1	60	42.9	64	62	60	57	54	50	46	43	41	40	40	39	40	39	40	39	39	38	38	36	34	30	26	23	20	18	16	13	11	9	7	6	
2023/01/14 10:45:02	51.1	59.8	45.0	68	67	65	63	59	56	51	48	46	44	43	43	43	43	43	43	43	42	42	41	39	37	34	31									

Date	LAeq	LAmaz	LA90	20 Hz	25 Hz	31.5 Hz	40 Hz	50 Hz	63 Hz	80 Hz	100 Hz	125 Hz	160 Hz	200 Hz	250 Hz	315 Hz	400 Hz	500 Hz	630 Hz	800 Hz	1.0 kHz	1.25 kHz	1.6 kHz	2.0 kHz	2.5 kHz	3.15 kHz	4.0 kHz	5.0 kHz	6.3 kHz	8.0 kHz	10.0 kHz	12.5 kHz	16.0 kHz	20.0 kHz			
(2023/01/16 00:00:03.00)	25.4	39.2	21.3	34	34	36	31	28	24	21	22	17	15	13	13	14	16	17	19	21	18	13	8	5	4	5	5	6	6	6	6	6	5	6			
(2023/01/16 00:15:02.00)	28.8	42.3	22.0	35	34	35	33	29	26	27	23	20	17	16	19	17	20	20	22	23	23	18	14	10	6	5	6	6	6	6	7	7	6	5	6		
(2023/01/16 00:30:02.00)	26.3	44.3	21.5	36	33	34	30	27	25	21	20	17	14	12	12	14	16	17	20	21	20	15	10	6	5	6	7	8	9	10	10	10	9	9	6		
(2023/01/16 00:45:02.00)	21.5	33.6	18.4	35	32	34	30	25	23	20	20	19	11	13	10	11	12	13	13	14	14	11	7	5	5	6	6	7	8	8	8	8	7	7	7		
(2023/01/16 01:00:02.00)	18.3	32.6	17.1	32	32	32	29	24	19	16	14	11	8	7	6	8	9	10	9	10	8	5	4	4	4	5	6	6	6	6	7	6	6	5	6		
(2023/01/16 01:15:02.00)	19.3	32.2	16.9	32	32	33	29	23	19	15	15	12	10	9	8	9	10	11	10	10	9	6	4	4	4	5	6	7	7	8	8	8	8	7	6		
(2023/01/16 01:30:02.00)	21.6	37.4	19.3	35	34	33	29	26	22	19	20	16	15	14	13	13	13	13	12	10	8	7	6	7	7	8	9	10	10	11	12	12	11	10	9	8	
(2023/01/16 01:45:02.00)	19.5	29.8	18.2	34	33	33	29	26	22	18	20	15	13	11	9	10	10	10	8	7	7	5	4	5	6	7	7	8	9	9	10	10	9	8	7	6	
(2023/01/16 02:00:02.00)	21.7	47.5	19.1	34	34	34	29	27	22	19	20	15	12	10	8	9	10	10	9	9	8	7	5	6	9	8	9	10	11	11	12	12	16	15	11	10	
(2023/01/16 02:15:02.00)	27.5	47.0	19.7	35	35	34	31	30	28	24	23	27	31	30	26	26	25	19	15	9	6	5	6	10	8	9	10	11	12	12	13	14	14	14	11	10	
(2023/01/16 02:30:02.00)	18.3	32.3	17.3	33	39	44	28	29	32	19	18	14	11	10	8	9	9	9	7	5	4	3	3	4	5	5	6	6	7	7	7	7	7	6	6	5	
(2023/01/16 02:45:02.00)	19.6	33.9	18.1	34	38	39	28	27	27	19	19	16	13	12	11	12	12	11	9	7	5	5	5	6	6	7	7	8	8	8	9	9	9	9	9	8	
(2023/01/16 03:00:02.00)	34.4	42.9	20.9	54	50	46	42	39	36	34	32	30	29	28	29	29	28	28	27	26	25	24	22	21	18	15	13	12	12	13	13	16	15	13	11	10	
(2023/01/16 03:15:02.00)	33.5	40.8	29.4	53	49	45	42	39	36	34	32	29	28	28	28	27	27	27	27	25	24	23	21	19	16	13	11	10	9	10	10	12	12	11	9	8	
(2023/01/16 03:30:02.00)	29.3	41.6	25.9	48	44	41	37	35	32	29	27	25	24	24	24	24	23	23	22	21	20	18	16	14	11	10	9	8	9	9	9	11	10	9	8	7	
(2023/01/16 03:45:02.00)	32.7	39.5	29.1	51	48	44	41	38	35	33	31	28	27	27	26	27	27	26	26	25	23	22	20	18	15	12	10	9	9	10	10	13	12	9	8	7	
(2023/01/16 04:00:02.00)	29.3	33.4	27.0	48	45	42	38	35	33	30	27	26	24	24	23	24	24	23	23	21	20	18	16	13	10	9	8	7	7	8	7	8	7	7	7	7	
(2023/01/16 04:15:02.00)	31.7	35.7	28.4	50	46	43	39	37	34	32	29	27	26	26	26	26	26	25	25	24	22	21	19	16	13	11	9	8	7	7	7	7	7	6	6	5	
(2023/01/16 04:30:02.00)	27.5	32.0	24.9	46	43	40	37	35	32	29	27	24	23	22	21	22	22	22	21	19	18	16	13	11	9	8	7	7	7	7	7	7	7	6	6	5	
(2023/01/16 04:45:02.00)	21.7	36.5	18.6	37	36	35	33	32	28	25	23	18	14	13	14	17	16	15	15	14	10	6	4	4	4	4	5	6	6	6	6	6	6	5	6	5	6
(2023/01/16 05:00:02.00)	25.2	40.7	20.6	37	38	40	33	32	29	25	25	19	15	16	17	20	21	19	19	18	14	11	7	8	8	8	9	9	9	9	9	9	8	7	7	6	
(2023/01/16 05:15:02.00)	23.5	35.3	20.8	40	39	40	35	34	29	26	24	19	15	15	16	18	18	17	16	16	15	10	6	5	5	6	6	6	7	7	6	6	6	5	5	4	
(2023/01/16 05:30:02.00)	24.8	39.5	20.9	36	36	36	32	32	29	25	23	21	16	17	19	20	20	18	17	18	16	11	7	7	7	7	8	8	8	8	9	9	8	8	7	6	
(2023/01/16 05:45:02.00)	27.4	41.5	22.2	39	37	35	33	33	32	33	25	22	17	17	20	22	23	21	20	22	19	15	11	8	5	5	6	6	6	6	6	6	5	5	5	4	
(2023/01/16 06:00:02.00)	31.1	45.7	24.9	39	40	40	41	39	38	36	33	30	31	32	29	25	25	24	23	24	22	17	11	6	4	5	5	6	6	6	6	6	5	5	5	4	
(2023/01/16 06:15:02.00)	31.2	42.0	26.4	40	40	39	39	42	39	33	32	30	28	28	27	28	27	26	24	24	22	16	10	6	5	5	6	6	6	6	6	6	5	5	5	4	
(2023/01/16 06:30:02.00)	32.7	47.6	28.0	42	41	41	41	40	36	34	31	27	27	30	28	28	28	27	25	26	25	19	12	6	4	5	5	6	6	6	6	6	5	5	5	4	
(2023/01/16 06:45:02.00)	33.1	45.4	29.9	41	40	40	39	37	35	30	29	26	21	23	27	28	28	26	26	28	25	20	13	7	5	5	6	6	6	6	6	6	5	5	5	4	
(2023/01/16 07:00:02.00)	38.2	60.2	32.3	43	42	41	44	39	36	33	34	35	26	27	30	32	31	32	29	31	29	24	17	17	27	29	23	20	16	11	8	6	5	4	3		
(2023/01/16 07:15:02.00)	36.2	48.8	32.4	41	42	42	40	40	37	34	45	43	28	28	31	32	31	31	28	29	27	21	14	8	5	5	6	6	6	6	6	6	5	4	4	3	
(2023/01/16 07:30:02.00)	35.8	49.7	33.7	43	44	43	41	41	39	35	33	32	31	31	31	32	32	31	29	29	27	21	15	14	9	6	8	7	7	7	6	5	5	4	3		
(2023/01/16 07:45:02.00)	38.8	55.4	35.5	44	45	44	42	42	41	38	35	35	35	34	36	36	36	35	31	30	28	22	17	15	14	13	19	15	12	8	7	6	5	4	3		
(2023/01/16 08:00:02.00)	40.2	55.8	36.3	44	45	45	44	45	44	44	43	36	37	36	37	38	37	35	31	31	29	27	24	22	22	20	21	20	16	13	8	7	6	5	4		
(2023/01/16 08:15:02.00)	38.0	54.5	34.9	43	45	44	43	42	42	38	34	31	32	31	33	34	35	34	30	29	29	27	23	16	10	8	7	7	7	7	6	5	5	4	3		
(2023/01/16 08:30:02.00)	37.7	47.9	35.3	46	45	44	44	42	40	36	35	30	34	30	33	35	34	33	30	29	24	19	16	12	12	14	13	13	10	6	5	5	4	3	2		
(2023/01/16 08:45:02.00)	39.6	55.5	34.3	44	45	45	46	43	41	38	45	42	37	36	38	37	36	34	31	31	30	25	21	16	10	10	10	9	9	9	9	6	5	5	4		
(2023/01/16 09:00:02.00)	40.9	56.8	36.1	46	46	45	43	43	42	38	36	33	32	32	35	37	36	35	33	33	32	29	31	26	15	15	15	11	9	7	6	5	5	4	3		
(2023/01/16 09:15:02.00)	40.4	50.0	37.2	46	46	44	44	44	43	41	36	33	33	34	36	38	37	35	33	33	32	26	20	15	10	7	6	6	7	6	6	5	5	4	3		
(2023/01/16 09:30:02.00)	38.5	50.7	35.9	46	45	45	44	43	42	38	36	33	31	32	35	37	36	34	31	31	28	23	20	17	14	11	11	9	8	7	7	6	5	4	3		
(2023/01/16 09:45:02.00)	38.0	48.6	34.7	45	45	45	43	43	44	39	37	34	29	30	32	34	33	33	31	31	29	24	21	19	16	14	20	16	12	7	6	6	5	4	3		
(2023/01/16 10:00:02.00)	36.8	52.7	34.7	46	47	45	44	42	40	36	34	31	28	28	31	33	32	33	31	29	28	22	16	11	9	9	8	8	8	8	7	6	5	4	3		
(2023/01/16 10:15:02.00)	35.5	51.3	32.4	51	48	46	44	42	39	36	38	36	32	32	35	33	30	30	28	27	24	20	16	13	12	10	11	14	14	11	7	7	6	6	5		
(2023/01/16 10:30:02.00)	38.0	47.6	32.4	54	53	50	47	44	42	38	36	33	32	32	32	34	33	33	31	30	29	26	23	20	17	14	11	10	10	10	8	8	7	7	6		

Date	LAeq	LAmx	LA90	20Hz	25Hz	31.5Hz	40Hz	50Hz	63Hz	80Hz	100Hz	125Hz	160Hz	200Hz	250Hz	315Hz	400Hz	500Hz	630Hz	800Hz	1.0KHz	1.25KHz	1.6KHz	2.0KHz	2.5KHz	3.15KHz	4.0KHz	5.0KHz	6.3KHz	8.0KHz	10.0KHz	12.5KHz	16.0KHz	20.0KHz
(2023/01/13 13:01:02.00)	38.0	51.3	32.7	47	43	42	40	41	39	36	34	34	34	28	26	26	28	28	28	28	30	29	27	26	24	22	20	20	19	19	22	22	18	
(2023/01/13 13:02:02.00)	43.0	63.1	32.5	55	51	45	42	40	38	38	34	34	34	32	32	31	32	33	34	34	34	31	30	31	29	29	27	27	30	29	29	30	26	
(2023/01/13 13:03:02.00)	51.8	63.1	33.4	48	48	54	61	60	53	43	42	40	39	39	41	37	40	43	42	44	44	42	40	37	38	35	32	32	30	26	25	25	17	
(2023/01/13 13:04:02.00)	37.0	44.8	34.6	49	45	43	41	39	37	37	34	33	33	28	29	29	28	29	31	31	27	23	20	17	15	14	12	15	16	8	8	7	6	
(2023/01/13 13:05:02.00)	41.8	50.9	35.7	54	51	48	45	43	41	39	41	41	38	37	37	37	36	35	34	33	33	31	29	26	25	23	22	20	19	18	16	15	14	10
(2023/01/13 13:06:02.00)	40.7	45.5	36.6	60	55	51	48	45	41	39	40	40	36	37	36	36	35	34	33	32	31	29	27	26	24	22	21	20	18	16	16	15	11	
(2023/01/13 13:07:02.00)	40.2	44.5	36.9	56	53	50	47	43	41	39	40	40	36	36	36	36	35	34	32	32	31	28	26	24	22	20	20	18	17	15	14	13	13	9
(2023/01/13 13:08:02.00)	60.0	74.9	38.7	61	57	55	52	53	56	48	46	45	44	46	45	43	44	44	46	49	53	52	52	50	48	45	43	41	39	39	37	35	34	28
(2023/01/13 13:09:02.00)	37.0	43.9	32.8	60	57	53	49	46	42	39	36	34	31	30	30	30	29	28	28	30	30	27	24	21	18	17	17	16	15	14	13	13	13	9
(2023/01/13 13:10:02.00)	35.2	39.8	32.6	44	43	41	39	39	37	36	33	30	25	23	23	24	25	25	26	29	29	27	22	20	19	18	14	11	9	7	6	5	5	5
(2023/01/13 13:11:02.00)	36.0	40.1	33.3	42	43	41	39	40	38	36	34	31	27	26	25	25	26	26	27	30	31	27	22	20	19	18	14	11	9	8	6	6	5	5
(2023/01/13 13:12:02.00)	39.5	42.2	38.3	54	51	47	44	42	40	38	37	35	31	32	32	33	31	31	33	33	30	25	21	20	19	16	15	17	12	10	10	9	7	
(2023/01/13 13:13:02.00)	57.7	73.5	38.6	56	53	50	47	46	44	51	47	41	44	46	46	44	43	45	47	48	49	50	49	48	45	42	40	37	33	30	28	25	24	18
(2023/01/13 13:14:02.00)	41.2	47.0	36.0	56	53	50	45	43	41	40	41	40	37	37	36	36	36	35	34	33	32	30	27	25	24	23	23	23	20	18	16	15	14	10
(2023/01/13 13:15:03.00)	38.2	44.0	35.0	52	51	47	44	44	42	40	38	38	37	37	37	34	32	30	30	30	30	26	22	19	18	16	16	16	15	14	11	10	9	6
(2023/01/13 13:16:02.00)	37.2	42.1	35.3	55	51	48	44	43	42	40	39	36	33	32	31	30	29	29	30	29	26	23	20	18	17	17	14	13	20	14	11	12	8	8
(2023/01/13 13:17:03.00)	38.4	44.6	36.2	55	51	48	44	42	39	37	36	34	31	30	30	30	30	30	30	33	32	28	24	20	18	17	17	19	21	24	16	13	13	10
(2023/01/13 13:18:04.00)	38.8	44.0	37.0	45	43	42	40	41	39	36	35	34	33	31	31	31	30	30	31	33	33	29	24	19	17	17	19	19	21	18	12	10	8	6
(2023/01/13 13:19:02.00)	59.3	73.6	36.9	47	49	52	45	49	52	46	44	46	45	46	43	42	42	45	48	50	51	51	51	50	47	45	43	40	38	37	35	33	31	25
(2023/01/13 13:20:03.00)	58.2	73.4	38.9	67	62	59	57	53	49	46	46	45	43	44	44	42	42	45	47	50	51	49	50	48	46	42	38	34	30	29	27	25	24	19
(2023/01/13 13:21:02.00)	45.2	53.1	39.8	65	63	59	56	54	51	48	45	44	42	41	41	40	39	39	38	37	36	33	31	30	28	27	26	24	23	22	20	19	19	18
(2023/01/13 13:22:03.00)	40.9	50.9	38.0	49	46	44	44	46	40	39	36	36	36	36	36	36	35	34	33	32	29	27	24	23	22	22	23	26	24	17	15	13	9	
(2023/01/13 13:23:02.00)	71.0	90.6	37.3	45	44	50	70	56	51	71	58	68	68	68	67	64	58	60	61	67	65	57	56	54	51	49	47	46	44	43	41	39	38	34
(2023/01/13 13:24:03.00)	41.3	46.7	37.7	60	59	55	51	46	44	40	39	37	34	34	34	34	33	33	33	34	33	30	28	26	24	25	25	27	28	18	14	14	13	10
(2023/01/13 13:25:04.00)	60.0	74.1	37.7	46	46	46	48	47	49	46	44	44	43	42	43	45	46	49	53	53	52	51	49	46	43	40	37	34	34	32	29	28	22	22
(2023/01/13 13:26:02.00)	40.2	44.7	38.1	56	52	48	46	43	43	39	37	36	34	34	33	33	33	32	32	33	34	30	27	24	22	21	20	18	16	15	14	14	14	10
(2023/01/13 13:27:04.00)	61.5	76.2	36.1	55	52	52	50	55	62	51	47	47	45	47	47	46	46	50	50	52	53	53	53	51	49	48	45	43	40	39	37	34	33	26
(2023/01/13 13:28:02.00)	54.1	68.5	37.9	57	55	52	58	55	45	50	47	44	40	41	43	41	43	45	47	46	46	45	42	40	37	35	34	32	29	27	25	24	21	19
(2023/01/13 13:29:02.00)	40.8	48.4	36.6	57	54	51	48	45	42	39	41	39	36	35	35	35	34	33	33	33	33	30	27	25	23	21	19	18	16	15	14	14	15	11
(2023/01/13 13:30:02.00)	39.7	43.0	38.4	57	54	51	47	44	43	39	38	36	33	33	33	33	32	32	33	33	30	26	22	20	18	16	15	14	13	12	12	12	9	9
(2023/01/13 13:31:03.00)	55.0	70.3	41.0	57	55	52	49	53	46	43	43	41	44	42	44	42	41	46	44	44	46	46	46	45	44	41	38	35	32	30	28	25	24	18
(2023/01/13 13:32:02.00)	43.2	48.4	40.3	59	56	53	51	47	43	41	41	41	37	38	38	38	37	36	36	35	35	32	31	29	27	25	23	21	19	18	16	16	16	11
(2023/01/13 13:33:02.00)	42.2	48.4	38.5	61	59	55	51	47	45	42	42	41	38	38	37	37	36	36	35	34	33	31	29	27	25	23	22	21	19	18	16	16	16	12
(2023/01/13 13:34:05.00)	43.3	48.9	38.8	57	53	51	47	44	43	42	42	42	40	38	38	38	37	36	35	34	32	30	28	27	25	24	23	21	20	18	16	15	11	11
(2023/01/13 13:35:02.00)	42.6	48.0	38.5	56	52	49	46	44	42	41	41	41	39	38	38	38	37	36	35	34	33	31	29	27	26	24	23	22	21	19	17	15	14	10
(2023/01/13 13:36:04.00)	58.9	74.6	40.1	55	52	49	47	46	47	45	44	44	45	46	46	45	45	48	51	52	51	50	49	46	42	39	36	33	30	27	25	23	18	
(2023/01/13 13:37:02.00)	58.0	71.7	36.1	57	51	48	46	44	44	43	40	39	38	40	41	40	40	43	47	50	51	49	49	48	44	42	40	38	37	37	34	32	30	23
(2023/01/13 13:38:02.00)	36.6	40.9	35.0	45	43	42	43	43	41	43	35	32	30	28	28	28	28	29	30	30	27	24	20	17	14	13	12	10	9	8	7	6	5	5
(2023/01/13 13:39:02.00)	53.9	65.4	36.2	48	56	54	52	50	55	49	44	44	44	42	43	42	41	41	41	44	46	45	44	44	43	40	36	32	29	26	23	21	19	14
(2023/01/13 13:40:02.00)	57.8	72.5	37.9	58	57	55	52	50	45	50	45	44	43	42	45	43	41	44	45	49	52	49	49	48	44	41	37	34	31	30	27	25	24	20
(2023/01/13 13:41:05.00)	40.2	48.6	37.3	55	52	49	45	42	40	39	40	37	35	34	35	36	35	34	33	32	32	29	27	24	22	20	19	17	16	13	12	11	11	8
(2023/01/13 13:42:02.00)	55.1	70.5	38.5	47	47	49	52	47	46	45	44	40	39	37	39	40	40	45	44	45	47	47	46	45	45	42	38	34	31	30	27	25	23	17
(2023/01/13 13:43:04.00)	52.0	66.9	37.6	48	47	50	52	51	58	45	51	50	42	43	42	40	40	41	41	45	42	41	40	39	36	33	30	28	25	23	21	16	16	15
(2023/01/13 13:44:03.00)	39.4	43.6	37.1	54	51																													

Date	LAeq	LAmaz	LA90	20Hz	25Hz	31.5Hz	40Hz	50Hz	63Hz	80Hz	100Hz	125Hz	160Hz	200Hz	250Hz	315Hz	400Hz	500Hz	630Hz	800Hz	1.0kHz	1.25kHz	1.6kHz	2.0kHz	2.5kHz	3.15kHz	4.0kHz	5.0kHz	6.3kHz	8.0kHz	10.0kHz	12.5kHz	16.0kHz	20.0kHz	
(2023/01/16 14:43:02.00)	38.5	53.7	29.4	43	46	42	40	43	39	34	31	25	20	20	21	23	22	24	25	28	28	27	29	31	31	18	19	15	11	7	6	5	5		
(2023/01/16 14:44:04.00)	58.4	74.1	29.3	44	48	46	56	55	42	41	39	41	36	35	36	38	39	41	43	46	49	48	48	48	48	48	48	46	44	42	38	32	23	17	
(2023/01/16 14:45:02.00)	34.8	52.3	30.8	48	47	44	43	41	41	37	35	34	29	27	26	26	28	30	26	28	26	23	22	19	18	16	18	14	14	13	10	8	6	5	
(2023/01/16 14:46:02.00)	34.7	47.9	31.7	48	49	48	46	45	44	42	41	39	33	28	28	25	27	28	26	27	27	24	20	18	14	13	11	10	8	8	7	6	5	5	
(2023/01/16 14:47:02.00)	33.4	44.5	30.7	45	46	43	41	43	43	40	39	33	23	24	26	25	25	25	24	25	26	25	22	13	10	10	9	8	8	7	6	6	5	5	
(2023/01/16 14:48:02.00)	39.9	57.2	30.9	46	46	43	44	42	42	41	41	37	30	28	26	25	25	27	26	27	29	34	34	28	17	18	15	14	15	9	7	6	6	5	
(2023/01/16 14:49:02.00)	34.4	39.3	32.6	45	48	42	41	43	41	39	40	37	25	23	27	25	25	27	27	28	28	23	19	15	12	12	10	10	8	7	6	6	5	5	
(2023/01/16 14:50:02.00)	36.0	49.7	32.2	48	50	44	44	44	40	39	40	38	29	27	29	28	28	28	27	28	27	26	26	22	18	16	13	12	10	8	7	6	6	5	5
(2023/01/16 14:51:02.00)	34.8	49.7	30.8	44	44	43	41	41	39	32	28	24	21	22	25	24	24	25	25	26	27	28	28	16	11	10	8	8	8	8	6	6	5	5	
(2023/01/16 14:52:02.00)	46.2	66.4	29.1	43	45	42	41	41	40	35	32	29	24	22	23	26	25	25	27	26	27	26	21	15	10	9	10	10	9	8	7	6	6	5	7
(2023/01/16 14:53:02.00)	29.6	34.3	28.7	43	45	42	40	40	38	33	29	26	21	22	24	23	23	24	22	22	22	18	15	11	10	9	9	8	9	8	7	6	6	5	5
(2023/01/16 14:54:02.00)	30.6	34.9	29.3	43	45	41	39	40	38	33	28	23	20	21	24	24	24	25	23	24	23	20	16	13	10	9	8	7	7	7	6	6	5	5	
(2023/01/16 14:55:02.00)	32.5	34.9	30.7	45	44	42	40	40	38	32	29	24	22	23	26	25	25	27	26	27	26	21	15	10	9	10	10	9	8	7	6	6	6	5	5
(2023/01/16 14:56:02.00)	56.3	71.9	31.2	44	46	44	44	46	52	57	39	41	44	36	36	36	36	38	40	45	48	45	47	47	45	45	45	44	42	41	36	31	22	17	
(2023/01/16 14:57:02.00)	35.0	45.7	29.3	43	43	42	41	46	45	43	31	27	34	23	24	24	24	25	25	27	28	25	24	22	20	19	18	15	13	11	6	6	5	5	
(2023/01/16 14:58:02.00)	30.5	34.9	29.4	43	43	41	40	40	38	33	29	24	21	22	25	25	24	25	24	23	23	19	14	9	7	7	9	7	7	6	6	6	5	5	
(2023/01/16 14:59:02.00)	31.5	35.1	29.4	43	43	41	40	40	38	34	29	25	21	22	24	23	23	24	24	26	26	21	16	10	8	7	7	6	6	6	6	5	5	5	
(2023/01/16 15:00:02.00)	32.6	42.5	28.7	43	45	42	41	40	39	34	29	25	21	22	24	23	24	25	25	27	27	21	16	10	9	11	18	10	8	7	6	6	5	5	
(2023/01/16 15:01:02.00)	29.3	32.9	27.8	43	43	41	40	40	38	33	30	26	22	23	26	24	23	24	22	22	21	16	11	7	6	9	8	6	7	6	6	6	5	5	
(2023/01/16 15:02:02.00)	30.6	40.7	28.8	43	44	41	40	40	39	34	29	27	26	28	30	28	26	25	22	22	21	16	12	9	8	7	6	6	6	6	6	6	5	5	
(2023/01/16 15:03:02.00)	28.5	30.4	27.8	43	44	41	40	40	38	33	28	23	20	21	22	22	23	23	22	21	20	16	11	9	8	8	10	7	7	7	6	6	5	5	
(2023/01/16 15:04:02.00)	29.6	33.6	28.9	43	43	41	39	40	38	32	28	23	20	21	24	24	24	23	23	22	17	11	8	7	9	10	6	7	7	6	6	5	5		
(2023/01/16 15:05:02.00)	30.7	35.3	29.9	43	43	42	40	41	39	34	29	25	20	23	26	25	25	26	24	24	23	18	12	8	7	7	7	9	8	6	6	5	5		
(2023/01/16 15:06:02.00)	33.6	45.3	29.1	43	44	42	40	43	43	34	30	26	22	23	25	25	25	26	27	25	25	22	18	15	13	12	8	7	7	6	6	5	5		
(2023/01/16 15:07:02.00)	61.8	78.3	33.5	44	45	46	45	55	52	41	42	41	41	42	44	46	42	46	51	52	53	53	52	50	49	50	49	48	45	42	38	32	22	17	
(2023/01/16 15:08:02.00)	33.3	36.6	32.0	43	44	41	40	40	39	33	29	26	22	24	26	27	27	26	27	27	27	22	16	10	7	6	6	6	6	6	6	5	5	5	
(2023/01/16 15:09:02.00)	33.1	38.6	31.5	46	44	42	41	40	39	33	29	26	21	22	25	25	25	27	25	27	28	23	16	9	7	7	7	6	6	6	5	5	5		
(2023/01/16 15:10:02.00)	31.0	37.6	29.6	43	43	41	39	40	39	32	29	23	21	22	26	25	26	24	24	24	19	14	9	7	8	8	7	6	6	6	5	5	5		
(2023/01/16 15:11:02.00)	31.3	33.9	29.9	43	44	42	40	41	38	32	28	23	19	22	26	25	26	24	24	25	20	14	9	7	7	7	6	7	6	6	6	5	5		
(2023/01/16 15:12:02.00)	33.7	43.2	30.6	44	45	42	40	40	38	33	30	27	26	28	28	27	27	26	26	25	22	19	18	18	17	17	16	15	15	12	9	7	6	5	
(2023/01/16 15:13:02.00)	34.0	37.0	32.8	43	43	42	40	41	41	35	32	28	27	29	29	30	29	29	27	26	25	21	16	13	12	15	16	13	11	11	9	7	6	5	
(2023/01/16 15:14:02.00)	34.5	43.9	32.8	45	44	42	40	41	41	35	31	25	22	25	26	26	26	27	27	28	28	23	19	16	18	19	21	15	13	8	6	6	5	5	
(2023/01/16 15:15:02.00)	36.7	57.7	31.6	47	46	43	42	43	40	39	35	31	26	26	26	26	26	27	26	27	27	24	25	27	30	17	16	20	15	12	7	6	5	5	
(2023/01/16 15:16:02.00)	59.0	74.1	31.5	47	45	44	49	47	44	44	40	43	37	37	40	39	40	41	44	49	52	49	49	48	47	47	47	46	43	41	36	29	20	15	
(2023/01/16 15:17:02.00)	61.7	79.1	30.5	45	44	45	45	46	45	56	49	38	48	43	42	40	40	43	46	49	52	51	52	52	51	50	50	50	48	47	42	37	27	22	
(2023/01/16 15:18:02.00)	58.6	75.9	32.8	44	44	43	42	43	42	50	37	36	37	37	41	38	40	40	41	47	46	46	48	49	49	49	48	47	45	43	38	32	23	17	
(2023/01/16 15:19:02.00)	47.4	63.0	32.1	46	45	44	43	43	41	38	35	33	32	31	31	30	32	34	39	43	41	37	32	27	23	22	19	16	11	8	6	6	5	5	
(2023/01/16 15:20:02.00)	33.8	37.3	32.6	44	45	44	42	42	41	36	31	26	23	24	26	26	26	28	27	28	27	23	16	10	7	9	8	9	8	6	6	5	5		
(2023/01/16 15:21:02.00)	34.8	41.6	33.2	45	44	42	41	41	40	34	31	28	25	25	26	26	27	29	28	30	28	23	17	9	8	7	7	7	6	6	5	5			
(2023/01/16 15:22:02.00)	39.7	57.0	35.4	45	44	42	40	41	38	37	39	39	34	35	35	33	32	31	28	29	29	29	30	30	18	16	17	17	15	7	6	5	5		
(2023/01/16 15:23:02.00)	34.0	38.4	32.5	46	44	43	41	41	39	34	35	35	35	29	29	28	28	28	27	27	26	21	15	11	7	9	7	8	9	6	6	5	5		
(2023/01/16 15:24:02.00)	34.8	40.0	32.5	45	43	43	41	41	40	34	30	27	23	24	27	28	28	29	28	29	28	23	17	10	9	7	7	7	7	6	6	5	5		
(2023/01/16 15:25:02.00)	35.5	42.2	32.6	44	43	42	40	40	39	33	30	26	23	27	28	29	32	31	29	29	28	23	19	15	12	9	9	8	8	8	6	6	5	5	
(2023/01/16 15:26:02.00)	36.4	41.5	34.8	44	43	43	41	41	40	34	30	26	26	29	29	31	31	30	30	30	25	19	12	10	9	8	8	7	6	6	5	5			
(2023/01/16 15:27:02.00)	62.2	78.9	34.9	47	47	47	5																												

Date	Time	Temp oC	Out RH%	Wind m/s	Wind Dir	Pressure mBar	Precip mm
13/01/2023	11:15	5.7	81	2.2	NW	999	0
13/01/2023	11:30	5	86	3.1	NW	999	0
13/01/2023	11:45	5.3	85	3.6	NW	999	0
13/01/2023	12:00	5.6	84	4	NW	999	0
13/01/2023	12:15	5.6	84	4	NW	1000	0
13/01/2023	12:30	5.7	84	3.6	NW	1000	0
13/01/2023	12:45	5.7	84	4.5	NW	1000	0
13/01/2023	13:00	5.7	84	3.1	NW	1000	0
13/01/2023	13:15	6.1	83	3.1	NW	1001	0
13/01/2023	13:30	6.6	81	4.5	WNW	1001	0
13/01/2023	13:45	6.6	83	4.5	NW	1001	0
13/01/2023	14:00	5.6	84	4.5	NW	1001	0
13/01/2023	14:15	5.4	84	4	NW	1002	0
13/01/2023	14:30	5	85	3.6	NW	1002	0
13/01/2023	14:45	4.9	88	3.6	WNW	1002	0
13/01/2023	15:00	4.6	88	4.5	NW	1002	0
13/01/2023	15:15	4.6	89	4	NW	1002	0
13/01/2023	15:30	4.3	89	4.5	NW	1002	0
13/01/2023	15:45	4.1	89	4.5	WNW	1002	0
13/01/2023	16:00	3.9	90	3.6	WNW	1003	0
13/01/2023	16:15	3.8	90	3.6	WNW	1003	0
13/01/2023	16:30	3.8	91	3.6	W	1003	0
13/01/2023	16:45	3.5	91	3.1	WNW	1003	0
13/01/2023	17:00	4.2	89	4	W	1004	0
13/01/2023	17:15	4.2	89	3.1	W	1004	0
13/01/2023	17:30	4.2	89	3.1	WNW	1004	0
13/01/2023	17:45	4.1	90	3.6	WNW	1004	0
13/01/2023	18:00	3.7	89	3.6	WNW	1004	0
13/01/2023	18:15	3.4	89	4	WNW	1004	0
13/01/2023	18:30	3.4	89	4	WNW	1004	0
13/01/2023	18:45	3.2	90	4	WNW	1004	0
13/01/2023	19:00	3.4	89	2.7	W	1004	0
13/01/2023	19:15	3.6	89	3.1	W	1004	0
13/01/2023	19:30	3.4	88	2.7	W	1004	0
13/01/2023	19:45	3.4	86	2.2	W	1004	0
13/01/2023	20:00	3.3	86	2.2	WSW	1004	0
13/01/2023	20:15	3.2	86	1.8	WSW	1004	0
13/01/2023	20:30	3.1	87	1.8	SW	1004	0
13/01/2023	20:45	3.2	88	2.2	SW	1004	0
13/01/2023	21:00	3.1	88	2.2	SW	1004	0
13/01/2023	21:15	3.3	88	2.2	SW	1004	0
13/01/2023	21:30	3.2	88	2.2	SW	1004	0
13/01/2023	21:45	3.4	87	2.7	WSW	1003	0
13/01/2023	22:00	3.7	87	2.7	WSW	1003	0
13/01/2023	22:15	3.7	87	2.2	SW	1002	0
13/01/2023	22:30	3.8	86	2.2	SW	1002	0
13/01/2023	22:45	3.9	85	2.7	WSW	1002	0
13/01/2023	23:00	3.8	86	2.2	W	1002	0
13/01/2023	23:15	4.3	85	2.2	WSW	1002	0
13/01/2023	23:30	4.4	85	3.1	SW	1001	0
13/01/2023	23:45	4.2	85	2.7	SW	1000	0
14/01/2023	00:00	4.2	86	3.1	SW	1000	0
14/01/2023	00:15	4.3	87	3.6	SW	1000	0
14/01/2023	00:30	4.3	88	3.6	SW	999	0
14/01/2023	00:45	4.1	89	3.6	SW	999	0.2
14/01/2023	01:00	3.9	89	3.6	SW	998	0.4
14/01/2023	01:15	3.7	89	3.1	SW	997	0.2
14/01/2023	01:30	3.7	88	4	SW	997	0
14/01/2023	01:45	3.6	89	4.5	SW	996	0.2
14/01/2023	02:00	3.7	90	4.9	SW	996	0.2
14/01/2023	02:15	3.7	91	4.5	SSW	995	0.4
14/01/2023	02:30	3.7	92	4	SSW	995	0.8
14/01/2023	02:45	4	92	4	SW	994	0.6
14/01/2023	03:00	4.2	92	4	SW	993	0.6
14/01/2023	03:15	4.4	92	3.6	SW	993	0.6
14/01/2023	03:30	4.5	92	3.6	SW	992	0.6
14/01/2023	03:45	4.6	93	2.7	SW	992	0.8
14/01/2023	04:00	4.7	93	3.1	SW	991	0.4
14/01/2023	04:15	4.8	93	2.2	SW	991	0.6
14/01/2023	04:30	4.8	93	1.8	W	991	0.6
14/01/2023	04:45	4.9	93	1.8	W	990	0.6
14/01/2023	05:00	5	93	1.8	WSW	990	0.4
14/01/2023	05:15	4.9	94	1.8	WSW	989	0.4
14/01/2023	05:30	5	94	1.8	WSW	989	0.6
14/01/2023	05:45	4.7	94	1.8	WSW	988	0.2
14/01/2023	06:00	4.7	95	1.8	WSW	988	0.4
14/01/2023	06:15	4.7	95	1.3	W	988	0.2
14/01/2023	06:30	4.7	95	0.4	W	987	0.2
14/01/2023	06:45	4.7	95	0	---	987	0

Date	Time	Temp oC	Out RH%	Wind m/s	Wind Dir	Pressure mBar	Precip mm
14/01/2023	07:00	4.6	95	0	---	987	0
14/01/2023	07:15	4.6	95	0	---	986	0
14/01/2023	07:30	5	94	0	---	986	0
14/01/2023	07:45	5.1	94	2.2	W	986	0.2
14/01/2023	08:00	4.7	94	4.5	WNW	986	0
14/01/2023	08:15	4.6	95	3.6	WNW	986	0.2
14/01/2023	08:30	4.3	94	3.6	WNW	986	0
14/01/2023	08:45	4.1	93	2.7	W	986	0
14/01/2023	09:00	4.2	92	3.6	WSW	986	0.2
14/01/2023	09:15	4.1	91	4	W	986	0
14/01/2023	09:30	4.2	92	3.6	W	986	0
14/01/2023	09:45	4	90	4.9	W	985	0
14/01/2023	10:00	3.8	91	4.5	W	985	0
14/01/2023	10:15	3.6	92	4.5	WNW	986	0
14/01/2023	10:30	3.7	91	4.5	W	986	0
14/01/2023	10:45	3.8	92	4	W	986	0
14/01/2023	11:00	3.3	91	4.9	W	986	0.4
14/01/2023	11:15	3.2	88	4.9	W	985	0
14/01/2023	11:30	3.2	90	5.4	W	985	0
14/01/2023	11:45	4	90	4.9	WNW	985	0
14/01/2023	12:00	4.1	85	6.3	WNW	985	0
14/01/2023	12:15	3.5	83	7.2	W	985	0
14/01/2023	12:30	3.3	86	5.8	W	984	0
14/01/2023	12:45	3.6	86	5.8	W	984	0
14/01/2023	13:00	3.3	87	6.3	W	985	0
14/01/2023	13:15	3.6	86	5.8	W	984	0
14/01/2023	13:30	2.9	89	6.3	W	984	0
14/01/2023	13:45	2.9	89	5.4	W	984	0
14/01/2023	14:00	2.6	91	5.8	W	984	0.2
14/01/2023	14:15	2.4	91	5.8	W	983	0
14/01/2023	14:30	2.6	91	6.7	W	983	0
14/01/2023	14:45	2.3	91	7.2	W	983	0.2
14/01/2023	15:00	2.4	93	6.3	W	983	0.2
14/01/2023	15:15	2.9	90	6.3	W	983	0
14/01/2023	15:30	3	90	6.7	W	982	0
14/01/2023	15:45	2.9	89	7.6	W	982	0
14/01/2023	16:00	2.8	90	7.2	W	982	0
14/01/2023	16:15	2.7	90	8	W	982	0.6
14/01/2023	16:30	2.6	91	7.2	W	982	0.4
14/01/2023	16:45	3.2	88	7.2	W	982	0
14/01/2023	17:00	2.9	89	8.5	W	981	0.2
14/01/2023	17:15	2.8	90	8	W	981	0.2
14/01/2023	17:30	2.2	91	7.6	W	981	0.8
14/01/2023	17:45	1.9	93	4.5	WNW	981	0.2
14/01/2023	18:00	1.4	93	3.6	WNW	981	0.8
14/01/2023	18:15	1.4	94	4.5	W	980	0.4
14/01/2023	18:30	2	93	4.5	WNW	980	0.2
14/01/2023	18:45	2.3	91	4	WNW	979	0
14/01/2023	19:00	2.3	92	4.9	NW	979	0.2
14/01/2023	19:15	2.5	92	4.9	WNW	979	0.2
14/01/2023	19:30	2	93	8	W	979	0.6
14/01/2023	19:45	1.8	94	12.1	NW	979	0.8
14/01/2023	20:00	1.9	95	5.4	W	978	0.4
14/01/2023	20:15	2.5	94	7.6	WNW	978	0.4
14/01/2023	20:30	1.6	94	6.3	W	979	0.4
14/01/2023	20:45	1.7	94	8	W	979	0.2
14/01/2023	21:00	1.2	94	7.2	WNW	979	0.2
14/01/2023	21:15	0.9	95	6.3	W	980	0.2
14/01/2023	21:30	1.2	95	6.7	W	980	0
14/01/2023	21:45	1.2	95	4.5	WNW	979	0.2
14/01/2023	22:00	1.3	94	4.5	WNW	980	0
14/01/2023	22:15	1.4	94	4.9	NW	980	0
14/01/2023	22:30	1.4	95	4.5	WNW	980	0
14/01/2023	22:45	1.3	95	4	WNW	980	0
14/01/2023	23:00	1.2	96	4.5	WNW	981	0
14/01/2023	23:15	1.5	96	4.5	WNW	981	0
14/01/2023	23:30	1.2	95	4.5	WNW	981	0.2
14/01/2023	23:45	1.1	95	5.4	W	980	0
15/01/2023	00:00	1.2	95	8.5	WNW	980	0
15/01/2023	00:15	1.8	96	4	NW	980	0.2
15/01/2023	00:30	2.1	95	5.8	WNW	981	0
15/01/2023	00:45	2.2	95	5.4	NW	980	0
15/01/2023	01:00	2.1	95	5.8	WNW	981	0
15/01/2023	01:15	2.2	95	5.4	WNW	981	0.2
15/01/2023	01:30	2.2	96	4.9	WNW	982	0
15/01/2023	01:45	2.3	96	4.5	WNW	982	0
15/01/2023	02:00	2.5	96	4	WNW	982	0
15/01/2023	02:15	2.7	97	4.5	WNW	982	0
15/01/2023	02:30	2.8	97	3.6	WNW	983	0

Date	Time	Temp oC	Out RH%	Wind m/s	Wind Dir	Pressure mBar	Precip mm
15/01/2023	02:45	2.8	97	2.7	WNW	983	0
15/01/2023	03:00	2.8	97	2.7	W	983	0
15/01/2023	03:15	2.8	96	3.1	WNW	983	0
15/01/2023	03:30	2.8	96	2.7	WNW	984	0
15/01/2023	03:45	2.8	95	2.7	W	984	0
15/01/2023	04:00	2.9	95	2.2	WNW	985	0
15/01/2023	04:15	2.8	94	2.2	WNW	985	0
15/01/2023	04:30	2.6	94	1.8	WNW	985	0
15/01/2023	04:45	2.8	91	2.2	W	985	0
15/01/2023	05:00	2.6	91	2.2	W	986	0
15/01/2023	05:15	2.5	91	2.2	W	986	0
15/01/2023	05:30	2.5	89	2.2	W	986	0
15/01/2023	05:45	2.4	89	2.7	W	987	0
15/01/2023	06:00	2.6	90	2.2	W	987	0
15/01/2023	06:15	2.4	90	2.2	WSW	987	0
15/01/2023	06:30	2.2	92	1.8	WSW	987	0
15/01/2023	06:45	2.1	93	2.2	W	988	0
15/01/2023	07:00	1.8	93	2.2	WNW	988	0
15/01/2023	07:15	1.8	92	2.2	WNW	988	0
15/01/2023	07:30	1.7	93	2.2	WNW	988	0
15/01/2023	07:45	1.7	93	2.2	WNW	989	0
15/01/2023	08:00	1.3	94	2.2	WNW	989	0
15/01/2023	08:15	1.4	94	2.7	WNW	990	0
15/01/2023	08:30	1.4	93	2.7	WNW	990	0
15/01/2023	08:45	1.2	93	2.7	WNW	990	0
15/01/2023	09:00	1.3	93	2.7	WNW	990	0
15/01/2023	09:15	1.4	93	2.7	WNW	991	0
15/01/2023	09:30	1.4	92	2.7	WNW	991	0
15/01/2023	09:45	1.6	92	3.1	WNW	991	0
15/01/2023	10:00	2.1	89	3.6	NW	991	0
15/01/2023	10:15	2.3	89	3.6	NW	991	0
15/01/2023	10:30	2.5	89	3.1	WNW	992	0
15/01/2023	10:45	3	88	3.6	WNW	992	0
15/01/2023	11:00	3.4	86	4	NW	992	0
15/01/2023	11:15	3.6	85	4	NW	992	0
15/01/2023	11:30	3	87	3.6	NW	992	0
15/01/2023	11:45	2.9	88	3.6	WNW	992	0
15/01/2023	12:00	3	88	3.6	NW	992	0
15/01/2023	12:15	3.4	87	3.6	NW	992	0
15/01/2023	12:30	3.7	86	3.6	NW	992	0
15/01/2023	12:45	3.4	86	3.6	NW	992	0
15/01/2023	13:00	3.3	85	4	NW	992	0
15/01/2023	13:15	3.2	86	4	NW	992	0
15/01/2023	13:30	3.1	87	3.6	WNW	992	0
15/01/2023	13:45	3	87	3.1	NW	992	0
15/01/2023	14:00	2.8	87	3.6	WNW	992	0
15/01/2023	14:15	2.7	87	3.6	WNW	992	0
15/01/2023	14:30	2.5	87	3.1	WNW	992	0
15/01/2023	14:45	2.4	88	3.1	W	992	0
15/01/2023	15:00	2.3	88	3.6	WNW	992	0
15/01/2023	15:15	2.2	89	3.1	WNW	992	0
15/01/2023	15:30	2	89	2.2	WNW	992	0
15/01/2023	15:45	1.8	89	2.2	WNW	992	0
15/01/2023	16:00	1.4	90	1.3	WNW	992	0
15/01/2023	16:15	1.3	91	0.9	W	992	0
15/01/2023	16:30	1.3	90	0.9	WSW	992	0
15/01/2023	16:45	1.2	90	0.9	WSW	992	0
15/01/2023	17:00	1.6	90	1.3	W	992	0
15/01/2023	17:15	1.5	90	1.3	WNW	992	0
15/01/2023	17:30	1.1	91	0.9	WSW	992	0
15/01/2023	17:45	1.3	91	1.3	SW	992	0
15/01/2023	18:00	1.5	90	0.9	W	992	0
15/01/2023	18:15	1.3	90	0.4	NE	992	0
15/01/2023	18:30	1.2	91	0.9	SW	992	0
15/01/2023	18:45	1.2	91	1.3	W	992	0
15/01/2023	19:00	1.4	90	1.8	WSW	992	0
15/01/2023	19:15	1.4	89	1.3	SW	992	0
15/01/2023	19:30	1.4	89	1.8	WSW	991	0
15/01/2023	19:45	1.2	89	1.3	WNW	991	0
15/01/2023	20:00	0.9	90	0.9	WSW	991	0
15/01/2023	20:15	0.8	90	0.9	W	991	0
15/01/2023	20:30	0.7	90	0.4	N	991	0
15/01/2023	20:45	0.4	91	0.4	NW	991	0
15/01/2023	21:00	0	91	0.9	WNW	991	0
15/01/2023	21:15	-0.2	93	0.9	NW	991	0
15/01/2023	21:30	-0.3	93	0.9	NW	991	0
15/01/2023	21:45	-0.4	94	0.9	NW	991	0
15/01/2023	22:00	-0.4	94	0.4	NW	991	0
15/01/2023	22:15	-0.5	95	0.4	NW	991	0

Date	Time	Temp oC	Out RH%	Wind m/s	Wind Dir	Pressure mBar	Precip mm
15/01/2023	22:30	-0.3	94	0.4	NW	990	0
15/01/2023	22:45	-0.4	94	0.4	W	990	0
15/01/2023	23:00	-0.3	95	0.4	NW	990	0
15/01/2023	23:15	-0.3	94	0.4	SE	990	0
15/01/2023	23:30	-0.4	94	0.4	SE	990	0
15/01/2023	23:45	-0.3	96	0.4	SE	990	0
16/01/2023	00:00	-0.2	95	0.4	NW	990	0
16/01/2023	00:15	0.1	95	0.9	WNW	990	0
16/01/2023	00:30	0.2	95	0.9	NW	990	0
16/01/2023	00:45	0.2	95	0.4	NW	990	0
16/01/2023	01:00	0.2	95	0.4	NW	990	0
16/01/2023	01:15	0.3	96	0.4	NNW	990	0
16/01/2023	01:30	0.2	96	0.4	ENE	990	0
16/01/2023	01:45	0	96	0.9	ENE	990	0
16/01/2023	02:00	-0.1	96	0.4	ENE	990	0
16/01/2023	02:15	-0.2	96	0.4	ENE	990	0
16/01/2023	02:30	-0.3	97	0.4	E	990	0
16/01/2023	02:45	-0.4	96	0.4	ENE	990	0
16/01/2023	03:00	-0.4	96	0.4	NE	990	0
16/01/2023	03:15	-0.9	95	0	NE	990	0
16/01/2023	03:30	-1.4	96	0	NE	990	0
16/01/2023	03:45	-1.4	96	0	NE	990	0
16/01/2023	04:00	-1.7	96	0	NE	990	0
16/01/2023	04:15	-1.9	96	0	NE	990	0
16/01/2023	04:30	-2.3	95	0.4	ENE	990	0
16/01/2023	04:45	-2.6	95	0.4	E	990	0
16/01/2023	05:00	-2.8	95	0.4	ESE	990	0
16/01/2023	05:15	-3.2	94	0	ESE	990	0
16/01/2023	05:30	-3.9	93	0.4	ESE	990	0
16/01/2023	05:45	-4.6	91	0	NW	990	0
16/01/2023	06:00	-5.2	93	0.4	ESE	990	0
16/01/2023	06:15	-5.4	94	0.4	SE	990	0
16/01/2023	06:30	-5.9	93	0	NW	990	0
16/01/2023	06:45	-5.9	94	0.4	SE	990	0
16/01/2023	07:00	-6.1	93	0.4	SSW	990	0
16/01/2023	07:15	-6.1	95	0.4	SSE	990	0
16/01/2023	07:30	-5.8	94	0.4	SE	990	0
16/01/2023	07:45	-5.9	91	0.4	NW	990	0
16/01/2023	08:00	-6.1	93	0	SW	990	0
16/01/2023	08:15	-5.8	91	0.4	NW	990	0
16/01/2023	08:30	-5.7	90	0.4	SW	990	0
16/01/2023	08:45	-6.1	88	0.4	WNW	991	0
16/01/2023	09:00	-6.7	90	0.4	NW	991	0
16/01/2023	09:15	-6.2	90	0.9	WSW	990	0
16/01/2023	09:30	-6.2	90	0.4	SW	990	0
16/01/2023	09:45	-5.3	88	1.3	WNW	990	0
16/01/2023	10:00	-4.7	85	0.9	WNW	990	0
16/01/2023	10:15	-3.9	84	0.9	WSW	990	0
16/01/2023	10:30	-3.1	79	1.8	SW	990	0
16/01/2023	10:45	-2.8	77	2.2	WSW	990	0
16/01/2023	11:00	-2.6	78	2.7	WSW	990	0.2
16/01/2023	11:15	-2.2	78	2.7	WSW	989	0
16/01/2023	11:30	-2.1	79	2.7	WSW	990	0.2
16/01/2023	11:45	-2.1	80	2.2	W	989	0
16/01/2023	12:00	-1.8	80	1.8	SW	989	0
16/01/2023	12:15	-1.7	80	2.2	WSW	989	0
16/01/2023	12:30	-1.6	81	2.2	WSW	989	0
16/01/2023	12:45	-1.3	81	2.2	W	989	0
16/01/2023	13:00	-1.3	81	1.8	WSW	989	0
16/01/2023	13:15	-1.3	82	1.8	WSW	988	0
16/01/2023	13:30	-1.3	82	1.8	W	988	0
16/01/2023	13:45	-1	82	2.2	W	988	0
16/01/2023	14:00	-1.1	82	1.8	WSW	988	0
16/01/2023	14:15	-1.4	83	1.8	WSW	988	0
16/01/2023	14:30	-1.7	85	1.8	WSW	988	0
16/01/2023	14:45	-1.1	85	1.3	W	988	0
16/01/2023	15:00	-0.9	84	1.3	WSW	988	0
16/01/2023	15:15	-0.7	83	0.9	W	988	0
16/01/2023	15:30	-0.9	82	0.9	W	988	0
16/01/2023	15:45	-1.6	84	0.4	WSW	987	0
16/01/2023	16:00	-2.4	88	1.3	W	987	0
16/01/2023	16:15	-2.9	89	0.4	S	988	0
16/01/2023	16:30	-3.3	91	0.4	ESE	988	0

Date	LAeq	LAmx	LA90	Time slice	oC	%RH	m/s	direction	Gust m/s	mBar	mm rain
(2023/01/16 07:15:02.00)	36.2	48.8	32.4	day	-6.1	95	0.4	SSE	0.9	990	0
(2023/01/16 07:30:02.00)	35.8	49.7	33.7	day	-5.8	94	0.4	SE	1.8	990	0
(2023/01/16 07:45:02.00)	38.8	55.4	35.5	day	-5.9	91	0.4	NW	1.8	990	0
(2023/01/16 08:00:02.00)	40.2	55.8	36.3	day	-6.1	93	0	SW	0.9	990	0
(2023/01/16 08:15:02.00)	38.0	54.5	34.9	day	-5.8	91	0.4	NW	0.9	990	0
(2023/01/16 08:30:02.00)	37.7	47.9	35.3	day	-5.7	90	0.4	SW	1.3	990	0
(2023/01/16 08:45:02.00)	39.6	55.5	34.3	day	-6.1	88	0.4	WNW	1.3	991	0
(2023/01/16 09:00:02.00)	40.9	56.8	36.1	day	-6.7	90	0.4	NW	0.9	991	0
(2023/01/16 09:15:02.00)	40.4	50.0	37.2	day	-6.2	90	0.9	WSW	2.2	990	0
(2023/01/16 09:30:02.00)	38.5	50.7	35.9	day	-6.2	90	0.4	SW	1.3	990	0
(2023/01/16 09:45:02.00)	38.0	48.6	34.7	day	-5.3	88	1.3	WNW	2.7	990	0
(2023/01/16 10:00:02.00)	36.8	52.7	34.7	day	-4.7	85	0.9	WNW	2.2	990	0
(2023/01/16 10:15:02.00)	35.5	51.3	32.4	day	-3.9	84	0.9	WSW	2.7	990	0
(2023/01/16 10:30:02.00)	38.0	47.6	32.4	day	-3.1	79	1.8	SW	4	990	0
(2023/01/16 10:45:02.00)	39.5	53.7	36.1	day	-2.8	77	2.2	WSW	4.5	990	0
(2023/01/16 11:15:02.00)	43.3	60.6	36.7	day	-2.2	78	2.7	WSW	5.4	989	0
(2023/01/16 11:45:02.00)	39.0	53.5	34.3	day	-2.1	80	2.2	W	3.6	989	0
(2023/01/16 12:00:02.00)	35.5	48.1	33.1	day	-1.8	80	1.8	SW	3.6	989	0
(2023/01/16 12:15:02.00)	37.0	49.3	34.3	day	-1.7	80	2.2	WSW	3.6	989	0
(2023/01/16 12:30:02.00)	36.4	52.5	33.0	day	-1.6	81	2.2	WSW	4	989	0
(2023/01/16 12:45:02.00)	34.6	55.9	32.1	day	-1.3	81	2.2	W	4	989	0
(2023/01/16 13:00:02.00)	35.6	52.6	33.1	day	-1.3	81	1.8	WSW	3.1	989	0
(2023/01/16 13:15:02.00)	37.7	52.1	34.2	day	-1.3	82	1.8	WSW	3.1	988	0
(2023/01/16 13:30:02.00)	36.6	52.8	31.4	day	-1.3	82	1.8	W	4	988	0
(2023/01/16 13:45:02.00)	35.8	56.0	30.4	day	-1	82	2.2	W	4.9	988	0
(2023/01/16 14:00:02.00)	38.9	55.3	30.5	day	-1.1	82	1.8	WSW	3.1	988	0
(2023/01/16 14:15:02.00)	33.4	46.2	30.6	day	-1.4	83	1.8	WSW	3.1	988	0
(2023/01/16 14:30:02.00)	33.8	47.9	31.0	day	-1.7	85	1.8	WSW	3.1	988	0
(2023/01/16 14:45:02.00)	35.5	48.9	32.7	day	-1.1	85	1.3	W	3.1	988	0
(2023/01/16 15:00:02.00)	35.3	48.3	32.3	day	-0.9	84	1.3	WSW	3.1	988	0
(2023/01/16 15:15:02.00)	37.1	47.4	34.0	day	-0.7	83	0.9	W	2.2	988	0
(2023/01/16 15:30:02.00)	37.0	49.8	34.2	day	-0.9	82	0.9	W	1.8	988	0
(2023/01/16 15:45:02.00)	43.8	64.5	35.1	day	-1.6	84	0.4	WSW	1.3	987	0



0789

Certificate of Calibration and Conformance

Certificate number: U37646

Test object: Sound Level Meter, BS EN IEC 61672-1:2013 Class 1 (Precision)
Producer : Norsonic
Type : 140
Serial No.: 1406913
Customer: The Airshed Ltd
Address: 5 Lauder Place
 East Linton
 EH40 3DB
Contact Person: Hilary Fraser

Method :

Calibration has been performed as set out in CA Technical Procedures TP01 & 02 as appropriate. These are based on the procedures for periodic verification of sound level meters as set out in BS EN IEC 61672-3:2013. Results and conformance statement are overleaf and detailed results are in the attached Test Report.

Tested

	Producer:	Type:	Serial No:	Certificate number
Microphone	Norsonic	1225	208201	37645
Calibrator*	Norsonic	1251	34961	U37644
Preamplifier	Norsonic	1209A	21061	Included

Additional items that also have been submitted for verification

- Wind shield -
- Attenuator -
- Extension cable -

These items have been taken into account wherever appropriate.

Instruction manual: Im140_1Ed8R0En Firmware version: v4.0.1430 The test object is a single channel instrument.

Conditions	Pressure	Temperature	Humidity
Reference conditions:	101.325 kPa	23.0 °C	50 %RH
Measurement conditions:	102.68 ±0.05 kPa	23.3 ±0.3 °C	37.6 ±0.7 %RH

Date received for calibration: 24/03/2021
 Date of calibration: 14/04/2021
 Date of issue: 14/04/2021
 Engineer

[Redacted Signature]

Supervisor

Markus Cross
 [Redacted Signature]
 Darren Batter Tech IOA

This certificate is issued in accordance with the laboratory accreditation requirements of the United Kingdom Accreditation Service. It 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 sound calibrator was complete with the coupler specified in the instruction manual for the sound calibrator and the sound level meter as appropriate for the coupling of the microphone provided to the specified sound calibrator.

Certificate of Calibration and Conformance

UKAS Laboratory Number 0789

Certificate number: U37646

Conformance

From markings on the sound level meter or by reference to the manufacturer's published literature it has been determined that the instrument submitted for verification was originally manufactured to BS EN IEC 61672-1:2013 and similarly that the associated sound calibrator conforms to BS EN IEC 60942.

Statement of conformance

The sound level meter submitted for testing has successfully completed the periodic tests of BS EN IEC 61672-3:2013, for the environmental conditions under which the tests were performed. As evidence was publicly available¹, from an independent testing organisation responsible for approving the results of pattern-evaluation tests performed in accordance with BS EN IEC 61672-2:2013, to demonstrate that the model of sound level meter fully conformed to the requirements in BS EN IEC 61672-1:2013, and that the sound level meter submitted for testing conforms to the class 1 specifications of BS EN IEC 61672-1:2013.

¹ This evidence is held on file at the calibration laboratory

Summary of Measurement Results

Indication at the calibration check frequency - IEC61672-3 Ed.2 Clause 10	Passed
Self-generated noise - IEC 61672-3 Ed.2.0 Clause 11.2	Passed
Acoustical signal tests of a frequency weighting - IEC 61672-3 Ed.2.0 Clause 12	Passed
Electrical signal tests of frequency weightings - IEC 61672-3 Ed.2.0 Clause 13	Passed
Frequency weightings: A Network - IEC 61672-3 Ed.2.0 Clause 13.3	Passed
Frequency weightings: C Network - IEC 61672-3 Ed.2.0 Clause 13.3	Passed
Frequency weightings: Z Network - IEC 61672-3 Ed.2.0 Clause 13.3	Passed
Frequency and time weightings at 1 kHz IEC 61672-3 Ed.2.0 Clause 14	Passed
Level linearity on the reference level range - IEC 61672-3 Ed.2.0 Clause 16	Passed
Toneburst response - IEC 61672-3 Ed.2.0 Clause 18	Passed
Peak C sound level - IEC 61672-3 Ed.2.0 Clause 19	Passed
Overload indication - IEC 61672-3 Ed.2.0 Clause 20	Passed
High level stability test - IEC 61672-3 Ed.2.0 Clause 21	Passed
Long term stability test - IEC 61672-3 Ed.2.0 Clause 15	Passed

Comment

Correct level with associated calibrator is 113.9dB(A).

Observations

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor $k = 2$, providing a coverage probability of approximately 95 %. The uncertainty evaluation has been carried out in accordance with UKAS requirements. Details of the uncertainty for each measurement are available from the Calibration Laboratory upon request. Details of the sources of corrections and their associated uncertainties that relate to this verification are contained within the test report accompanying this certificate.

Calibration Report

Certificate No.:37645

Manufacturer: Norsonic
Type: 1225
Serial no: 208201

Customer: The Airshed Ltd
Address: 5 Lauder Place
East Linton
EH40 3DB
Contact Person: Hilary Fraser

Measurement Results:

	Sensitivity: (dB re 1V/Pa)	Capacitance: (pF)
1:	-25.72	22.4
2:	-25.67	22.4
3:	-25.66	22.4
Result (Average):	-25.69	22.4
Expanded Uncertainty:	0.13	1.00
Degree of Freedom:	28	>100
Coverage Factor:	2.13	2.00

The following correction factors have been applied during the measurement:
Pressure:-0.001 dB/kPa Temperature:-0.005 dB/°C Relative humidity:0.000 dB/%RH

Reference Calibrator: WSC2 - GRAS42AA-18277 Volume correction: 0.000 dB
Records:K:\C A\Calibration\Nor-1504\Nor-1017 MicCal\2021\NOR1225_208201_M1.nmf
Measurement procedure: TP05

All results quoted are directly traceable to National Physical Laboratory, London

The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor $k = 2$, which for a normal distribution corresponds to coverage probability of approximately 95%. The standard uncertainty of measurement has been determined in accordance with EA publication EA-4/02.

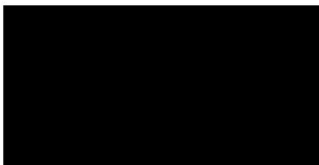
Comment:

Environmental conditions:

Pressure: 102.499 ± 0.043 kPa Temperature: 22.7 ± 0.1 °C Relative humidity: 35.7 ± 0.8 %RH

Date of calibration: 13/04/2021
Date of issue: 13/04/2021

Supervisor : Darren Batten TechIOA
Engineer :

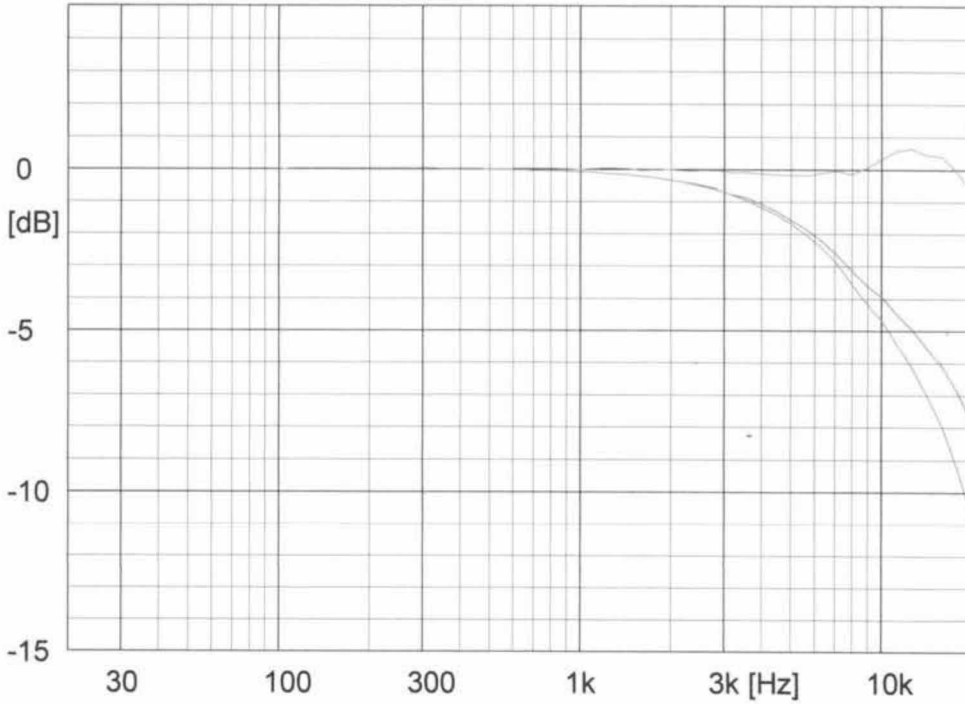


Markus Cross
Software version: 6.0h


Campbell Associates

www.campbell-associates.co.uk

Microphone Calibration Certificate



Norsonic
Type: 1225

Serial no: 208201

Sensitivity: 51.97 mV/Pa
-25.69 ±0.13 dB re. 1 V/Pa
Capacitance: 22.4 ±1.0 pF
Date: 13/04/2021

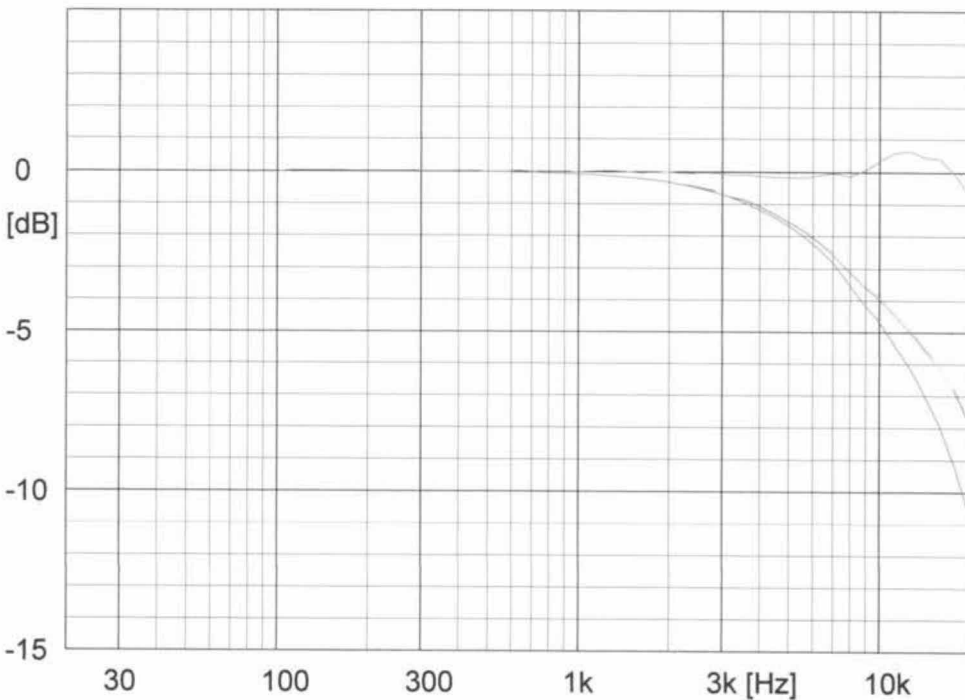
Signature

Measurement conditions:
Polarisation voltage: 200.0 V
Pressure: 102.50 ±0.04 kPa
Temperature: 22.7 ±0.1 °C
Relative humidity: 35.7 ±0.8 %RH
Results are normalized to the reference conditions.

Free field response
Diffuse field response
Pressure (Actuator) response

Campbell Associates
www.campbell-associates.co.uk

Microphone Calibration Certificate



Norsonic
Type: 1225

Serial no: 208201

Sensitivity: 51.97 mV/Pa
-25.69 ±0.13 dB re. 1 V/Pa
Capacitance: 22.4 ±1.0 pF
Date: 13/04/2021

Signature

Measurement conditions:
Polarisation voltage: 200.0 V
Pressure: 102.50 ±0.04 kPa
Temperature: 22.7 ±0.1 °C
Relative humidity: 35.7 ±0.8 %RH
Results are normalized to the reference conditions.

Free field response
Diffuse field response
Pressure (Actuator) response

Campbell Associates
www.campbell-associates.co.uk

Comment:

Laboratory Location

Campbell Associates Ltd

5b Chelmsford Road Industrial Estate
GREAT DUNMOW, Essex, GB-CM6 1HD
Phone 01371 871030



Certificate of Calibration and Conformance

Certificate number: **U38655**

Test Object: **Sound Level Meter, BS EN IEC 61672-1:2003 Class 1**

Producer: **Norsonic**
Type: **140**
Serial number: **1405074**
Customer: **The Airshed Ltd**
Address: **5 Lauder Place, East Linton,
East Lothian. EH40 3DB.**
Contact Person: **Hilary Fraser**
Order No: **AS 21-08**

Introduction:

Calibration has been performed as set out in CA Technical Procedures which are based on the procedures for periodic verification of sound level meters as per the **Test Object** listed above. Results and conformance statement are overleaf and detailed results, where appropriate, are provided in the attached Measurement Report.

Tested:	Producer	Type	Serial No	Certificate No
Microphone	GRAS	40AF	114655	38654
Calibrator*	Norsonic	1251	31060	U37894
Preamplifier	Norsonic	1209	21254	included

* The calibrator was complete with any required coupler for the microphone specified.

Additional items that have also been submitted for verification:

Wind shield -
Attenuator -
Extension cable -

These items have been taken into account wherever appropriate.

Instruction Manual: Im140_1Ed8R0En. Firmware Version: v2.1.670. The test object is a single channel instrument.

Conditions	Pressure kPa	Temperature °C	Humidity %RH
Reference conditions	101.325	23	50
Measurement conditions	99.28 +/-0.03	22.73 +/-0.1	39.00 +/-1.2

Calibration Dates:

Received date: 27/07/2021 Reviewed date: 06/08/2021
Calibration date: 06/08/2021 Issued date: 06/08/2021

Technicians: (Electronic certificate)

Calibrated by: *Palanivel Marappan B.Eng (Hons), M.Sc*

Reviewed by: *Darren Batten*

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Certificate of Calibration and Conformance

Continuation of Certificate number: U38655

The statements of conformance and observation notes detailed in this certificate are made with reference to the following standards in respect of the calibration of the test object.

Manufactured: BS EN IEC 61672-1:2003
Periodics Tests: BS EN IEC 61672-3:2006
Pattern Evaluation: BS EN IEC 61672-2:2003

Conformance:

From markings on the sound level meter or by reference to the manufacturer's published literature it has been determined that the instrument submitted for verification was originally manufactured to the listed standard and similarly that the associated sound calibrator conforms to the BS EN IEC 60942 standard.

Measurement Summary:

Indication at the calibration check frequency - IEC61672-3 Ed.1 #9	Passed
Self-generated noise - IEC 61672-3 Ed.1 #10.2	Passed
Acoustical signal tests of a frequency weighting - IEC 61672-3 Ed.1 #11	Passed
Electrical signal tests of frequency weightings - IEC 61672-3 Ed.1 #12	Passed
Frequency weightings: A Network - IEC 61672-3 Ed.1 #12.3	Passed
Frequency weightings: C Network - IEC 61672-3 Ed.1 #12.3	Passed
Frequency weightings: Z Network - IEC 61672-3 Ed.1 #12.3	Passed
Frequency and time weightings at 1 kHz IEC 61672-3 Ed.1 #13	Passed
Level linearity on the reference level range - IEC 61672-3 Ed.1 #14	Passed
Toneburst response - IEC 61672-3 Ed.1 #16	Passed
Peak C sound level - IEC 61672-3 Ed.1 #17	Passed
Overload indication - IEC 61672-3 Ed.1 #18	Passed

Comments

Correct level with associated calibrator is 114.0dB(A).

Statement of Conformance

The sound level meter submitted has successfully completed the periodic tests of the standard listed for the environmental conditions under which the tests were performed. As public evidence(1) was available, from an independent testing organisation responsible for approving the results of pattern evaluation tests performed in accordance with the manufactured standard to demonstrate that the model of sound level meter fully conformed to the requirements of the said standard, the sound level meter submitted for testing conforms to the relevant class of the said standard.

(1 - evidence is held on file at the calibration laboratory)

Observations

Decision Rule

The decision rules will be applied in accordance with the procedure as described in BS EN 61672-3:2006.

This certificate relates only to the items tested above.

** End of Certificate **

Laboratory Location

Campbell Associates Ltd

5b Chelmsford Road Industrial Estate
GREAT DUNMOW, Essex, GB-CM6 1HD
Phone 01371 871030



Certificate of Calibration

Certificate number: **38654**

Test Object: **Measurement Microphone**

Producer: **GRAS**
Type: **40AF**
Serial number: **114655**
Customer: **The Airshed Ltd**
Address: **5 Lauder Place, East Linton,
East Lothian. EH40 3DB.**
Contact Person: **Hilary Fraser**
Order No: **AS 21-08**

Measurement Results	Sensitivity (dB re 1V/Pa)	Sensitivity (mV/Pa)	Capacitance (pF)
Measurement 1	-26.57	46.94	22.56
Measurement 2	-26.56	46.99	22.63
Measurement 3	-26.56	47.01	22.67
Result (Average):	-26.56	46.98	22.62
Expanded Uncertainty:	0.10		1.01
Degree of Freedom:	>100		>100
Coverage Factor:	2		2

The stated sensitivity is the pressure sensitivity at 250Hz, S₂₅₀, and is valid at reference conditions. The following correction factors have been applied during the measurement:

Pressure:-0.011 dB/kPa Temperature:-0.01 dB/°C Humidity:-0.001 dB/%RH

Conditions	Pressure kPa	Temperature °C	Humidity %RH
Reference conditions	101.325	23	50
Measurement conditions	99.257 ± 0.043	22.8 ± 0.1	39.1 ± 0.8

The calibration test report shown on the next page gives details of the response at other frequencies relative to this 250 Hz reference sensitivity. Results ≥100 Hz are obtained using an electrostatic actuator as described in BS EN 61094-6 and those below 100 Hz are obtained in a reference pressure chamber. Detailed results are available from the calibration laboratory upon request.

The reported expanded uncertainty of measurements is based on a standard uncertainty multiplied by the coverage factor of k=2, providing a coverage probability of approximately 95%. Where the degrees of freedom are insufficient to maintain this confidence level, the coverage factor is increased to maintain this confidence level.

Calibration Dates:

Received date: 27/07/2021 Reviewed date: 06/08/2021
Calibration date: 06/08/2021 Issued date: 06/08/2021

Technicians: (Electronic certificate)

Calibrated by: *Palanivel Marappan BEng (Hons), MSc*
Reviewed by: *Darren Batten*

This certificate is issued in accordance with the CA Quality Management system. It provides traceability of measurement to recognized national standards, and to the units of measurement realized at the National Physical Laboratory or other recognized national standards laboratories. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory.

Certificate of Calibration

Continuation of Certificate number: 38654

Reference Calibrator: WSC1 - Nor1253-24269

Measurement Record: K:\C A\Calibration\Nor-1504\Nor-1017 MicCal\GRAS40AF_114655_M1.nmf

Preconditioning

The equipment was preconditioned for more than 12 hours at the specified calibration temperature and humidity.

Instruments and Program

A complete list of instruments, hardware and software that have been used for this calibration is available from the calibration laboratory

Traceability

The measured values for sound pressure, frequency, voltage, capacitance, temperature, humidity and ambient pressure are traceable to an accredited national physical laboratory.

Observations

The differences between the two results at 100 Hz are within normal limits bearing in mind the different test methods and are taken into account in arriving at the uncertainties of measurement.

Method of Calibration

The open circuit sensitivity of the microphone has been determined at 250 Hz against a reference laboratory standard measurement microphone by insert voltage techniques using a laboratory standard sound calibrator as a transfer standard. The electrostatic actuator frequency response was then obtained for frequencies above 100 Hz as described in BS EN IEC 61094-6. In addition, where requested the optional free field frequency response over the range 2 – 100 Hz has been obtained using a pressure chamber; in this case the reference frequency is 100 Hz. All of these results and their associated uncertainties are detailed in the table on page 3 of this certificate. See the observations field below for details of any discrepancies between the 100 Hz results obtained via the electrostatic actuator and pressure chamber.

The overall uncertainty at any frequency $\sigma_{\text{Combined},F_n}$ may be obtained by combining the uncertainty of the open circuit sensitivity σ_{S250} with the uncertainty of the actuator / or LF pressure response at any other frequency σ_{Act,F_n} where F_n is the uncertainty at the frequency of interest using the relationship:

$$\sigma_{\text{Combined},F_n} = 2\sqrt{(\sigma_{S250}^2 + \sigma_{\text{Act},F_n}^2)}$$

Appendix to this certificate

Where data is available from the microphone manufacturer to correct the actuator / pressure frequency response to obtain the random incidence and / or free field response it is shown in the appendix to this certificate. The uncertainty information relating to these corrections is the responsibility of the microphone manufacturer and when it is available the total uncertainty for the corrected frequency response at each point may then be obtained by including the correction uncertainty in the root-sum-square formula given above. These responses are outside the UKAS accredited scope, but are provided for information.

Observations

Laboratory Location

Campbell Associates Ltd

5b Chelmsford Road Industrial Estate
GREAT DUNMOW, Essex, GB-CM6 1HD
Phone 01371 871030



Certificate of Calibration and Conformance

Certificate number: U41065

Test Object: Sound Calibrator

Producer: Norsonic AS.
Type: 1251
Serial number: 31060
Customer: The Airshed Ltd
Address: 5 Lauder Place,
East Linton, EH40 3DB.

Contact Person: Hilary Fraser.
Order No: AS 22-01

Measurement Results	Level dB	Level Stability dB	Frequency Hz	Distortion %
Measurement 1	114.07	0.06	1000.02	<0.3
Measurement 2	114.09	0.06	1000.02	<0.3
Measurement 3	114.08	0.06	1000.02	<0.3
Result (Average):	114.08	0.06	1000.02	<0.3
Expanded Uncertainty:	0.1	0.02	1	0.25
Degree of Freedom:	>100	>100	>100	>100
Coverage Factor:	2	2	2	2

The stated level is relative to 20 μ Pa. The level is traceable to National Standards. The stated level is valid at reference conditions. The following correction factors have been applied during the measurement

Pressure: 0.0005 dB/kPa Temperature: 0.003 dB/ $^{\circ}$ C Humidity: 0 dB/%RH Load volume: 0.0003 dB/mm³

Conditions	Pressure kPa	Temperature $^{\circ}$ C	Humidity %RH
Reference conditions	101.325	23	50
Measurement conditions	101.128 \pm 0.044	21 \pm 0.1	49.3 \pm 1.1

The reported expanded uncertainty of measurements is based on a standard uncertainty multiplied by the coverage factor of $k=2$, providing a level of confidence of approximately 95%. Where the degrees of freedom are insufficient to maintain this confidence level, the coverage factor is increased to maintain this confidence level. The uncertainty has been determined in accordance with UKAS requirements.

Records: K:\C A\Calibration\Nor-1504\Nor-1018 CalCal\2022\NOR1251_31060_M1.nmf

Preconditioning

The equipment was preconditioned for more than 4 hours in the specified calibration environment.

Method

Calibration has been performed as set out in the current version of CA Technical procedure TP01

Calibration Dates:

Received date: 09/05/2022 Reviewed date: 19/05/2022
Calibration date: 19/05/2022 Issued date: 19/05/2022

Technicians: (Electronic certificate)

Calibrated by: Michael Tickner
Reviewed by: Jenny Crawford

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Noise Survey

Project Number: AS 0960 Project Name: Pentland Biomass, Plant Sound Survey
 Log Book Number: 116

Site No: Plant Sound Survey Date/Time: Monday 23rd January 2023
 Location: Timber Yard Temperature (C): 6
 Wind Speed/Dir: 0
 Cloud Cover (Oktas): 6
 Sound Level Meter: 5
 Calibration at End: 113.7

Norsonic Nor-140 Sound Level Meter 5 Serial No. 1406913
 Norsonic Nor-1251 Acoustic Calibrator A Serial No. 31060
 Norsonic Nor-1225 Microphone Serial No. 208201
 Norsonic Nor-1217 Outdoor Protection Kit Serial No. 12175402
 Calibration Factor 113.8



Wood Chipping



Log Unloading



Bulk Loading



Chipping Unit

Date	Description	Distance	PWL	LAeq	LAmaz	LA90	20 Hz	25 Hz	31.5 Hz	40 Hz	50 Hz	63 Hz	80 Hz	100 Hz	125 Hz	160 Hz	200 Hz	250 Hz	315 Hz	400 Hz	500 Hz	630 Hz	800 Hz	1.0 kHz	1.25 kHz	1.6 kHz	2.0 kHz	2.5 kHz	3.15 kHz	4.0 kHz	5.0 kHz	6.3 kHz	8.0 kHz	10.0 kHz	12.5 kHz	16.0 kHz	20.0 kHz
(2023/01/23 14:07:46.00)	Wood Chipper East	2	117.9	97.9	104.7	83.7	65	67	78	81	77	91	81	83	88	85	87	87	88	89	87	89	88	87	86	87	88	87	87	85	82	79	78	75	71	67	62
(2023/01/23 14:13:13.00)	Wood Chipper North	10	109.8	84.7	94.1	78.6	59	61	67	70	70	85	75	80	79	76	80	76	77	76	78	77	74	73	73	74	74	72	72	70	67	65	63	60	55	49	43
(2023/01/23 14:30:50.00)	Log Unloading from HGV crane	3	96.0	75.2	84.5	73.8	63	63	67	86	70	68	77	70	69	66	64	63	61	64	64	66	67	67	67	65	65	63	59	58	54	50	47	46	45	40	36
(2023/01/23 14:43:28.00)	Bulk Loading	3	88.8	68.0	84.1	54.3	66	65	76	80	73	75	74	73	68	64	62	64	63	62	62	58	57	56	59	56	54	53	51	48	46	43	40	38	35	30	26



0789

Certificate of Calibration and Conformance

Certificate number: U37646

Test object: Sound Level Meter, BS EN IEC 61672-1:2013 Class 1 (Precision)
Producer : Norsonic
Type : 140
Serial No.: 1406913
Customer: The Airshed Ltd
Address: 5 Lauder Place
 East Linton
 EH40 3DB
Contact Person: Hilary Fraser

Method :

Calibration has been performed as set out in CA Technical Procedures TP01 & 02 as appropriate. These are based on the procedures for periodic verification of sound level meters as set out in BS EN IEC 61672-3:2013. Results and conformance statement are overleaf and detailed results are in the attached Test Report.

Tested

	Producer:	Type:	Serial No:	Certificate number
Microphone	Norsonic	1225	208201	37645
Calibrator*	Norsonic	1251	34961	U37644
Preamplifier	Norsonic	1209A	21061	Included

Additional items that also have been submitted for verification

Wind shield -
 Attenuator -
 Extension cable -

These items have been taken into account wherever appropriate.

Instruction manual: Im140_1Ed8R0En Firmware version: v4.0.1430 The test object is a single channel instrument.

Conditions	Pressure	Temperature	Humidity
Reference conditions:	101.325 kPa	23.0 °C	50 %RH
Measurement conditions:	102.68 ±0.05 kPa	23.3 ±0.3 °C	37.6 ±0.7 %RH

Date received for calibration: 24/03/2021
 Date of calibration: 14/04/2021
 Date of issue: 14/04/2021
 Engineer



 Markus Cros


 Darren Batter Tech IOA

Supervisor

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 *The sound calibrator was complete with the coupler specified in the instruction manual for the sound calibrator and the sound level meter as appropriate for the coupling of the microphone provided to the specified sound calibrator.

Certificate of Calibration and Conformance

UKAS Laboratory Number 0789

Certificate number: U37646

Conformance

From markings on the sound level meter or by reference to the manufacturer's published literature it has been determined that the instrument submitted for verification was originally manufactured to BS EN IEC 61672-1:2013 and similarly that the associated sound calibrator conforms to BS EN IEC 60942.

Statement of conformance

The sound level meter submitted for testing has successfully completed the periodic tests of BS EN IEC 61672-3:2013, for the environmental conditions under which the tests were performed. As evidence was publicly available¹, from an independent testing organisation responsible for approving the results of pattern-evaluation tests performed in accordance with BS EN IEC 61672-2:2013, to demonstrate that the model of sound level meter fully conformed to the requirements in BS EN IEC 61672-1:2013, and that the sound level meter submitted for testing conforms to the class 1 specifications of BS EN IEC 61672-1:2013.

¹ This evidence is held on file at the calibration laboratory

Summary of Measurement Results

Indication at the calibration check frequency - IEC61672-3 Ed.2 Clause 10	Passed
Self-generated noise - IEC 61672-3 Ed.2.0 Clause 11.2	Passed
Acoustical signal tests of a frequency weighting - IEC 61672-3 Ed.2.0 Clause 12	Passed
Electrical signal tests of frequency weightings - IEC 61672-3 Ed.2.0 Clause 13	Passed
Frequency weightings: A Network - IEC 61672-3 Ed.2.0 Clause 13.3	Passed
Frequency weightings: C Network - IEC 61672-3 Ed.2.0 Clause 13.3	Passed
Frequency weightings: Z Network - IEC 61672-3 Ed.2.0 Clause 13.3	Passed
Frequency and time weightings at 1 kHz IEC 61672-3 Ed.2.0 Clause 14	Passed
Level linearity on the reference level range - IEC 61672-3 Ed.2.0 Clause 16	Passed
Toneburst response - IEC 61672-3 Ed.2.0 Clause 18	Passed
Peak C sound level - IEC 61672-3 Ed.2.0 Clause 19	Passed
Overload indication - IEC 61672-3 Ed.2.0 Clause 20	Passed
High level stability test - IEC 61672-3 Ed.2.0 Clause 21	Passed
Long term stability test - IEC 61672-3 Ed.2.0 Clause 15	Passed

Comment

Correct level with associated calibrator is 113.9dB(A).

Observations

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor $k = 2$, providing a coverage probability of approximately 95 %. The uncertainty evaluation has been carried out in accordance with UKAS requirements. Details of the uncertainty for each measurement are available from the Calibration Laboratory upon request. Details of the sources of corrections and their associated uncertainties that relate to this verification are contained within the test report accompanying this certificate.

Calibration Report

Certificate No.:37645

Manufacturer: Norsonic
Type: 1225
Serial no: 208201

Customer: The Airshed Ltd
Address: 5 Lauder Place
East Linton
EH40 3DB
Contact Person: Hilary Fraser

Measurement Results:

	Sensitivity: (dB re 1V/Pa)	Capacitance: (pF)
1:	-25.72	22.4
2:	-25.67	22.4
3:	-25.66	22.4
Result (Average):	-25.69	22.4
Expanded Uncertainty:	0.13	1.00
Degree of Freedom:	28	>100
Coverage Factor:	2.13	2.00

The following correction factors have been applied during the measurement:
Pressure:-0.001 dB/kPa Temperature:-0.005 dB/°C Relative humidity:0.000 dB/%RH

Reference Calibrator: WSC2 - GRAS42AA-18277 Volume correction: 0.000 dB
Records:K:\C A\Calibration\Nor-1504\Nor-1017 MicCal\2021\NOR1225_208201_M1.nmf
Measurement procedure: TP05

All results quoted are directly traceable to National Physical Laboratory, London

The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor $k = 2$, which for a normal distribution corresponds to coverage probability of approximately 95%. The standard uncertainty of measurement has been determined in accordance with EA publication EA-4/02.

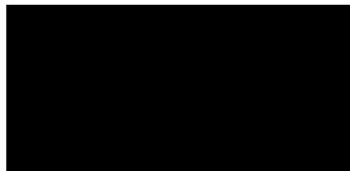
Comment:

Environmental conditions:

Pressure: 102.499 ± 0.043 kPa Temperature: 22.7 ± 0.1 °C Relative humidity: 35.7 ± 0.8 %RH

Date of calibration: 13/04/2021
Date of issue: 13/04/2021

Supervisor : Darren Batten TechIOA
Engineer :



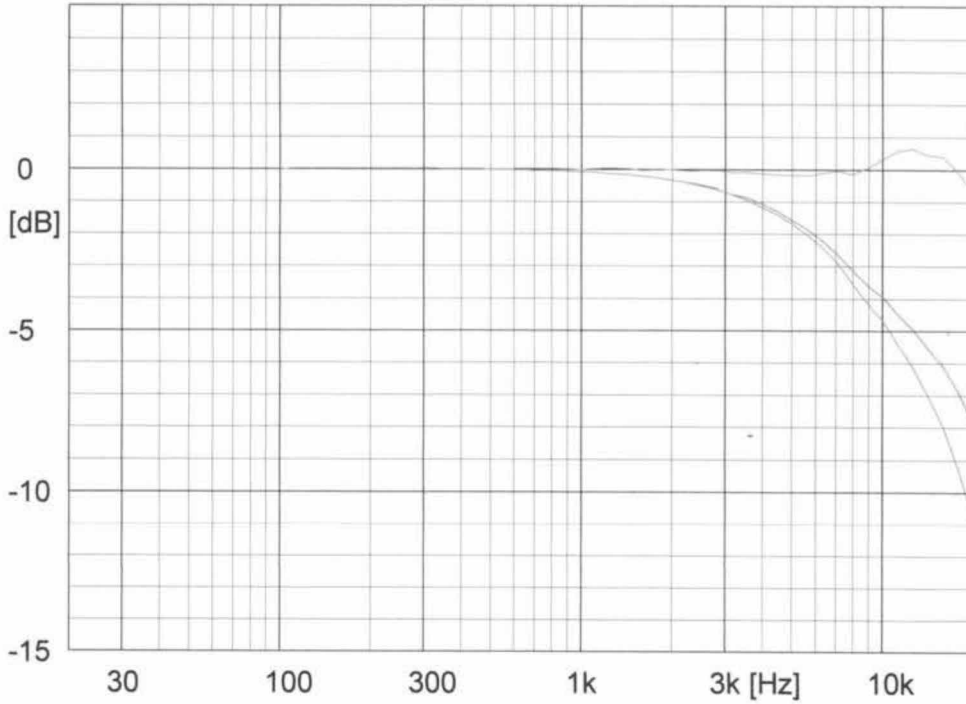
Markus Cross
Software version: 6.0h



Campbell Associates

www.campbell-associates.co.uk

Microphone Calibration Certificate



Norsonic
Type: 1225

Serial no: 208201

Sensitivity: 51.97 mV/Pa
-25.69 ±0.13 dB re. 1 V/Pa
Capacitance: 22.4 ±1.0 pF
Date: 13/04/2021

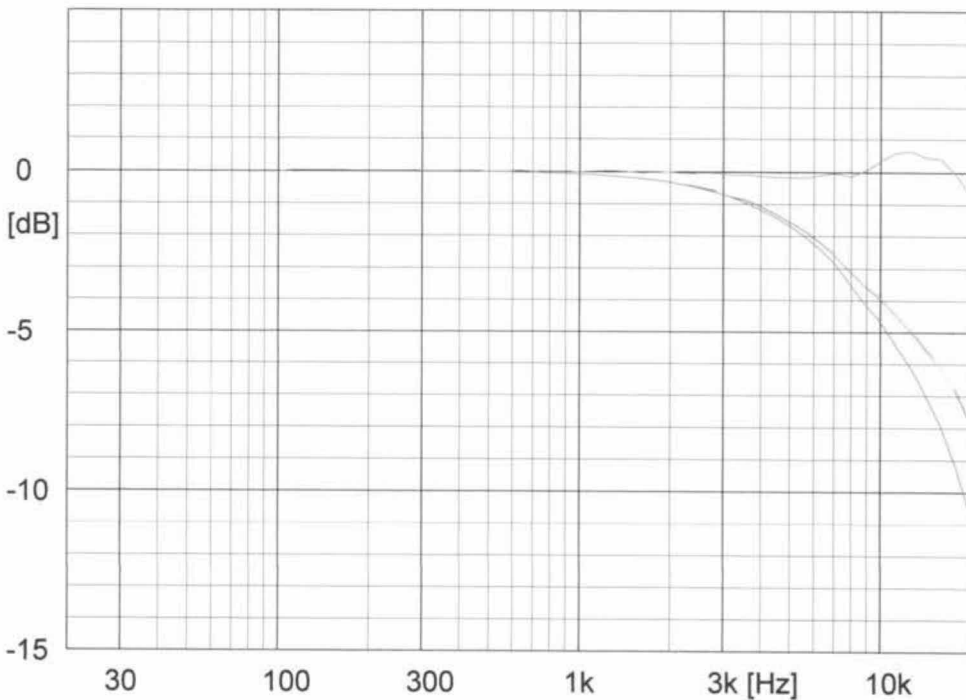
Signature

Measurement conditions:
Polarisation voltage: 200.0 V
Pressure: 102.50 ±0.04 kPa
Temperature: 22.7 ±0.1 °C
Relative humidity: 35.7 ±0.8 %RH
Results are normalized to the reference conditions.

Free field response
Diffuse field response
Pressure (Actuator) response

Campbell Associates
www.campbell-associates.co.uk

Microphone Calibration Certificate



Norsonic
Type: 1225

Serial no: 208201

Sensitivity: 51.97 mV/Pa
-25.69 ±0.13 dB re. 1 V/Pa
Capacitance: 22.4 ±1.0 pF
Date: 13/04/2021

Signature

Measurement conditions:
Polarisation voltage: 200.0 V
Pressure: 102.50 ±0.04 kPa
Temperature: 22.7 ±0.1 °C
Relative humidity: 35.7 ±0.8 %RH
Results are normalized to the reference conditions.

Free field response
Diffuse field response
Pressure (Actuator) response

Campbell Associates
www.campbell-associates.co.uk

Comment:

Laboratory Location

Campbell Associates Ltd

5b Chelmsford Road Industrial Estate
GREAT DUNMOW, Essex, GB-CM6 1HD
Phone 01371 871030



Certificate of Calibration and Conformance

Certificate number: U41065

Test Object: Sound Calibrator

Producer: Norsonic AS.
Type: 1251
Serial number: 31060
Customer: The Airshed Ltd
Address: 5 Lauder Place,
East Linton, EH40 3DB.

Contact Person: Hilary Fraser.
Order No: AS 22-01

Measurement Results	Level dB	Level Stability dB	Frequency Hz	Distortion %
Measurement 1	114.07	0.06	1000.02	<0.3
Measurement 2	114.09	0.06	1000.02	<0.3
Measurement 3	114.08	0.06	1000.02	<0.3
Result (Average):	114.08	0.06	1000.02	<0.3
Expanded Uncertainty:	0.1	0.02	1	0.25
Degree of Freedom:	>100	>100	>100	>100
Coverage Factor:	2	2	2	2

The stated level is relative to 20 μ Pa. The level is traceable to National Standards. The stated level is valid at reference conditions. The following correction factors have been applied during the measurement

Pressure: 0.0005 dB/kPa Temperature: 0.003 dB/ $^{\circ}$ C Humidity: 0 dB/%RH Load volume: 0.0003 dB/mm³

Conditions	Pressure kPa	Temperature $^{\circ}$ C	Humidity %RH
Reference conditions	101.325	23	50
Measurement conditions	101.128 \pm 0.044	21 \pm 0.1	49.3 \pm 1.1

The reported expanded uncertainty of measurements is based on a standard uncertainty multiplied by the coverage factor of $k=2$, providing a level of confidence of approximately 95%. Where the degrees of freedom are insufficient to maintain this confidence level, the coverage factor is increased to maintain this confidence level. The uncertainty has been determined in accordance with UKAS requirements.

Records: K:\C A\Calibration\Nor-1504\Nor-1018 CalCal\2022\NOR1251_31060_M1.nmf

Preconditioning

The equipment was preconditioned for more than 4 hours in the specified calibration environment.

Method

Calibration has been performed as set out in the current version of CA Technical procedure TP01

Calibration Dates:

Received date: 09/05/2022 Reviewed date: 19/05/2022
Calibration date: 19/05/2022 Issued date: 19/05/2022

Technicians: (Electronic certificate)

Calibrated by: Michael Tickner
Reviewed by: Jenny Crawford

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Appendix 3 – Noise Model Outputs

AS 0960 Westloch Farm Timber Yard

Run info

Scenario 1

Project description

Project title: AS 0960 Westloch Farm Timber Yard
Project No.: AS 0960
Project engineer: Steve Fraser
Customer: Pentland Biomass

Description:
noise impact assessment for proposed timber yard

Run description

Calculation type: Single Point Sound
Title: Scenario 1
Calculation group
Run file: RunFile.runx
Result number: 3
Local calculation (ThreadCount=4)
Calculation start: 24/01/2023 14:08:58
Calculation end: 24/01/2023 14:09:01
Calculation time: 00:01:576 [m:s.ms]
No. of points: 14
No. of calculated points: 14
Kernel version: SoundPLAN 8.2 (23/11/2022) - 32 bit

Run parameters

Reflection order: 3
Maximum reflection distance to receiver: 200 m
Maximum reflection distance to source: 50 m
Search radius: 5000 m
Weighting: dB(A)
Allowed tolerance (per individual source): 0.100 dB
Create ground effect areas from road surfaces: No

Standards:

Industry: ISO 9613-2: 1996
Air absorption: ISO 9613-1
regular ground effect (chapter 7.3.1), for sources without a spectrum automatically alternative ground effect
Limitation of screening loss:
single/multiple 20.0 dB /25.0 dB
Side diffraction: Side paths also around terrain (outdated)
Use Eqn (Abar=Dz-Max(Agr,0)) instead of Eqn (12) (Abar=Dz-Agr) for insertion loss
Environment:
Air pressure 1013.3 mbar
rel. humidity 70.0 %
Temperature 10.0 °C
Meteo. corr. C0(7-23h)[dB]=0.0; C0(23-7h)[dB]=0.0;
Ignore Cmet for Lmax industry calculation: No
Parameter for screening: C2=20.0

The Airshed

1

AS 0960 Westloch Farm Timber Yard

Run info

Scenario 1

Dissection parameters:

Distance to diameter factor	8
Minimal distance	1 m
Max. difference ground effect + diffraction	1.0 dB
Max. number of iterations	4

Attenuation

Foliage:	ISO 9613-2
Built-up area:	ISO 9613-2
Industrial site:	ISO 9613-2

Assessment: PPG24 (day/night)
Reflection of "own" facade is suppressed

Geometry data

Scenario 1.sit	24/01/2023 14:08:50
- contains:	
Broad-leaved Woodland.geo	09/01/2023 12:02:00
Building No. 1.geo	24/01/2023 13:12:12
calc area.geo	24/01/2023 13:14:46
conifer woodland.geo	09/01/2023 12:10:40
existing building polygons.geo	24/01/2023 12:50:46
external sources.geo	24/01/2023 12:58:18
future building.geo	24/01/2023 12:31:42
HGV traffic.geo	24/01/2023 12:58:18
log piles.geo	24/01/2023 11:53:32
OS vector map.geo	09/01/2023 12:10:40
perimter bund.geo	24/01/2023 14:00:06
ground conditions.geo	24/01/2023 14:08:50
RDGM0001.dgm	24/01/2023 11:51:00

The Airshed

2

AS 0960 Westloch Farm Timber Yard
Assessed receiver levels
Scenario 1

2

Receiver	Fl	Dir	X	Y	Z	LrD	
			m	m	m	dB(A)	
Westloch Farmhouse	F 1	SW	325541	651639	288.3	34	
Westloch Farmhouse	F 1	SE	325555	651641	288.3	33	
Westloch Farmhouse - studio	GF	SW	325530	651652	285.7	32	
Westloch Farmhouse	GF	SW	325541	651639	285.8	32	
Westloch Farmhouse	GF	SE	325555	651641	285.8	32	
Westloch Steading	GF	NW	325680	651639	281.9	29	
Westloch Steading	GF	SW	325681	651605	281.9	26	
Westloch Steading (in courtyard)	GF	NW	325694	651626	281.9	23	
Westloch Steading (courtyard)	GF	SW	325696	651638	281.9	22	
Westloch Farm Cottages	GF	SE	325751	651726	282.2	22	
Westloch Steading (courtyard)	GF	SE	325681	651626	281.9	22	
Westloch Steadin	GF	SE	325710	651611	284.4	21	
Westloch Steading (courtyard)	GF	NE	325684	651621	281.9	21	
Westloch Steading (courtyard)	GF	SE	325689	651637	281.9	21	
Westloch Farm Cottages	GF	NW	325744	651735	282.2	19	
Westloch Steading	GF	NE	325707	651641	281.9	16	

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	The Airshed	1
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AS 0960 Westloch Farm Timber Yard Octave spectra of the sources in dB(A) - Scenario 1

3

Name	Source type	X m	Y m	Z m	I or A m,m ²	Li dB(A)	R'w dB	L'w dB(A)	Lw dB(A)	KI dB	KT dB	DO-Wall dB	Time histogram	Emission spectrum	125Hz dB(A)	250Hz dB(A)	500Hz dB(A)	1kHz dB(A)	2kHz dB(A)	4kHz dB(A)
1 vehicle per hour	Line	325468	651517	284.9	188.60			72.0	94.8	0.0	0.0	0	daytime only	Truck > 105 kW, 2000 1/min	79.9	81.2	85.7	90.0	89.9	84.9
Chipper building-doorway with quick film	Area	325428	651514	286.2	43.73	90.7	18.0	72.5	88.9	0.0	0.0	3	100%/24h	1149_Transmissive area 02_	80.2	76.6	79.3	84.4	84.3	
Chipper building-Facade 01	Area	325426	651530	286.1	95.00	83.4	47.0	43.2	63.0	0.0	0.0	3	100%/24h	1144_Facade 01_	62.1	54.3	46.7	44.2	43.8	32.0
Chipper building-Facade 02	Area	325423	651520	286.6	55.27	86.7	47.0	45.3	62.7	0.0	0.0	3	100%/24h	1147_Facade 02_	61.7	54.5	47.5	45.2	44.8	33.5
Chipper building-Facade 03	Area	325438	651517	286.1	95.00	96.1	47.0	53.2	73.0	0.0	0.0	3	100%/24h	1146_Facade 03_	71.6	65.5	59.3	56.6	56.5	45.9
Chipper building-Facade 04	Area	325439	651530	286.4	99.00	94.1	47.0	51.0	71.0	0.0	0.0	3	100%/24h	1145_Facade 04_	69.6	63.7	57.7	54.8	54.6	44.0
Chipper building-Roof 01	Area	325435	651520	289.1	172.05	94.1	47.0	51.4	73.8	0.0	0.0	0	100%/24h	1141_Roof 01_	72.4	66.2	59.9	57.1	57.1	46.4
Chipper building-Roof 02	Area	325429	651527	289.1	172.05	83.4	47.0	43.1	65.5	0.0	0.0	0	100%/24h	1142_Roof 02_	64.6	56.8	49.3	46.7	46.5	34.7
dispatch	Area	325441	651536	285.7	40.82			72.9	89.0	0.0	0.0	0	daytime only	dispatch	79.3	80.1	83.4	83.1	81.3	75.4
log unloading	Point	325478	651538	285.4				96.0	96.0	0.0	0.0	0	daytime only	log unloading	77.9	79.6	87.0	92.4	91.0	83.9

The Airshed

1

AS 0960 Westloch Farm Timber Yard

Assessed level of source groups

Scenario 1

1
2

Source group	LrD dB(A)	LrN dB(A)	
Receiver Westloch Farmhouse FI F 1	LrD,lim dB(A)	LrN,lim dB(A)	LrD 34 dB(A) Sigma(LrD) 0.0 dB(A) LrN
vehicle movements	30.9		
mobile plant	30.2		
open doorway	15.1		
Chipper building walls	14.3		
chipper building roofs	14.1		
Receiver Westloch Farmhouse FI F 1	LrD,lim dB(A)	LrN,lim dB(A)	LrD 33 dB(A) Sigma(LrD) 0.0 dB(A) LrN
vehicle movements	30.3		
mobile plant	29.4		
open doorway	14.0		
chipper building roofs	13.3		
Chipper building walls	13.3		
Receiver Westloch Farmhouse - studio FI GF	LrD,lim dB(A)	LrN,lim dB(A)	LrD 32 dB(A) Sigma(LrD) 0.0 dB(A) LrN
vehicle movements	29.4		
mobile plant	28.9		
open doorway	14.3		
Chipper building walls	13.7		
chipper building roofs	13.6		
Receiver Westloch Farmhouse FI GF	LrD,lim dB(A)	LrN,lim dB(A)	LrD 32 dB(A) Sigma(LrD) 0.0 dB(A) LrN
vehicle movements	29.3		
mobile plant	28.9		
open doorway	14.4		
chipper building roofs	13.7		
Chipper building walls	13.5		
Receiver Westloch Farmhouse FI GF	LrD,lim dB(A)	LrN,lim dB(A)	LrD 32 dB(A) Sigma(LrD) 0.0 dB(A) LrN
vehicle movements	29.2		
mobile plant	28.2		
open doorway	13.8		
chipper building roofs	13.1		
Chipper building walls	12.6		
Receiver Westloch Steading FI GF	LrD,lim dB(A)	LrN,lim dB(A)	LrD 29 dB(A) Sigma(LrD) 0.0 dB(A) LrN dI
vehicle movements	26.6		
mobile plant	24.4		
Chipper building walls	11.6		
open doorway	11.3		
chipper building roofs	9.1		
Receiver Westloch Steading FI GF	LrD,lim dB(A)	LrN,lim dB(A)	LrD 26 dB(A) Sigma(LrD) 0.0 dB(A) LrN dI
mobile plant	23.3		
vehicle movements	20.9		
open doorway	9.7		
Chipper building walls	7.5		
chipper building roofs	6.1		

	The Airshed	1
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AS 0960 Westloch Farm Timber Yard
Assessed level of source groups
Scenario 1

1
2

Source group	LrD dB(A)	LrN dB(A)	
Receiver Westloch Steading (in courtyard) FI GF	LrD,lim dB(A)	LrN,lim dB(A)	LrD 23 dB(A) Sigma(LrD) 0.0 dB
mobile plant	20.5		
vehicle movements	17.8		
open doorway	9.1		
chipper building roofs	4.8		
Chipper building walls	4.6		
Receiver Westloch Steading (courtyard) FI GF	LrD,lim dB(A)	LrN,lim dB(A)	LrD 22 dB(A) Sigma(LrD) 0.0 dB
mobile plant	19.5		
vehicle movements	17.8		
open doorway	9.6		
chipper building roofs	4.7		
Chipper building walls	4.3		
Receiver Westloch Farm Cottages FI GF	LrD,lim dB(A)	LrN,lim dB(A)	LrD 22 dB(A) Sigma(LrD) 0.0 dB(A) LrN dB
vehicle movements	21.4		
mobile plant	11.7		
open doorway	-0.1		
Chipper building walls	-1.5		
chipper building roofs	-3.6		
Receiver Westloch Steading (courtyard) FI GF	LrD,lim dB(A)	LrN,lim dB(A)	LrD 22 dB(A) Sigma(LrD) 0.0 dB
mobile plant	19.5		
vehicle movements	17.3		
open doorway	8.0		
chipper building roofs	0.3		
Chipper building walls	0.1		
Receiver Westloch Steading (courtyard) FI GF	LrD,lim dB(A)	LrN,lim dB(A)	LrD 21 dB(A) Sigma(LrD) 0.0 dB(A) LrN dB
mobile plant	19.5		
vehicle movements	15.4		
open doorway	8.4		
Chipper building walls	6.9		
chipper building roofs	6.3		
Receiver Westloch Steading (courtyard) FI GF	LrD,lim dB(A)	LrN,lim dB(A)	LrD 21 dB(A) Sigma(LrD) 0.0 dB
mobile plant	18.3		
vehicle movements	16.6		
open doorway	7.7		
Chipper building walls	-0.4		
chipper building roofs	-0.7		
Receiver Westloch Steading (courtyard) FI GF	LrD,lim dB(A)	LrN,lim dB(A)	LrD 21 dB(A) Sigma(LrD) 0.0 dB
mobile plant	17.9		
vehicle movements	16.4		
open doorway	7.4		
chipper building roofs	-0.4		
Chipper building walls	-0.7		

	The Airshed	2
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AS 0960 Westloch Farm Timber Yard
Assessed level of source groups
Scenario 1

1
2

Source group	LrD dB(A)	LrN dB(A)	
Receiver Westloch Farm Cottages	FI GF LrD,lim dB(A)	LrN,lim dB(A)	LrD 19 dB(A) Sigma(LrD) 0.0 dB(A) LrN
mobile plant	17.1		
vehicle movements	13.5		
Chipper building walls	5.3		
chipper building roofs	2.9		
open doorway	2.7		
Receiver Westloch Steading	FI GF LrD,lim dB(A)	LrN,lim dB(A)	LrD 16 dB(A) Sigma(LrD) 0.0 dB(A) LrN
mobile plant	14.6		
vehicle movements	9.6		
open doorway	5.1		
Chipper building walls	-1.8		
chipper building roofs	-2.3		

	The Airshed	3
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AS 0960 Westloch Farm Timber Yard Mean propagation Leq - Scenario 1

10

Source	Source type	Time slice	Li dB(A)	R'w dB	L'w dB(A)	Lw dB(A)	I or A m,m²	KI dB	KT dB	Ko dB	S m	Adiv dB	Agr dB	Abar dB	Aatm dB	Amisc dB	ADI dB	dLrefl dB(A)	Ls dB(A)	dLw dB	Cmet dB	ZR dB	Lr dB(A)
Receiver Westloch Farmhouse FI F 1			LrD,lim dB(A)	LrN,lim dB(A)	LrD 34 dB(A)	Sigma(LrD) 0.0 dB(A)	LrN dB(A)	Sigma(LrN) dB(A)															
1 vehicle per hour	Line	LrD			72.0	94.8	188.6	0.0	0.0	0	142.85	-54.1	-1.5	-7.5	-1.2		0.0	0.3	30.9	0.0	0.0	0.0	30.9
1 vehicle per hour	Line	LrN			72.0	94.8	188.6	0.0	0.0	0	142.85	-54.1	-1.5	-7.5	-1.2		0.0	0.3	30.9	0.0	0.0	0.0	30.9
Chipper building-doorway with quick film	Area	LrD	90.7	18.0	72.5	88.9	43.7	0.0	0.0	3	168.22	-55.5	-1.0	-19.9	-0.4		0.0	0.0	15.1	0.0	0.0	0.0	15.1
Chipper building-doorway with quick film	Area	LrN	90.7	18.0	72.5	88.9	43.7	0.0	0.0	3	168.22	-55.5	-1.0	-19.9	-0.4		0.0	0.0	15.1	0.0	0.0	0.0	15.1
Chipper building-Facade 01	Area	LrD	83.4	47.0	43.2	63.0	95.0	0.0	0.0	3	157.44	-54.9	-4.2	-1.7	-0.1		0.0	0.0	5.1	0.0	0.0	0.0	5.1
Chipper building-Facade 01	Area	LrN	83.4	47.0	43.2	63.0	95.0	0.0	0.0	3	157.44	-54.9	-4.2	-1.7	-0.1		0.0	0.0	5.1	0.0	0.0	0.0	5.1
Chipper building-Facade 02	Area	LrD	86.7	47.0	45.3	62.7	55.3	0.0	0.0	3	167.68	-55.5	-4.2	-9.4	-0.1		0.0	0.0	-3.5	0.0	0.0	0.0	-3.5
Chipper building-Facade 02	Area	LrN	86.7	47.0	45.3	62.7	55.3	0.0	0.0	3	167.68	-55.5	-4.2	-9.4	-0.1		0.0	0.0	-3.5	0.0	0.0	0.0	-3.5
Chipper building-Facade 03	Area	LrD	96.1	47.0	53.2	73.0	95.0	0.0	0.0	3	158.69	-55.0	-4.0	-10.6	-0.1		0.0	0.0	6.2	0.0	0.0	0.0	6.2
Chipper building-Facade 03	Area	LrN	96.1	47.0	53.2	73.0	95.0	0.0	0.0	3	158.69	-55.0	-4.0	-10.6	-0.1		0.0	0.0	6.2	0.0	0.0	0.0	6.2
Chipper building-Facade 04	Area	LrD	94.1	47.0	51.0	71.0	99.0	0.0	0.0	3	148.92	-54.5	-4.0	-2.6	-0.1		0.0	0.0	12.9	0.0	0.0	0.0	12.9
Chipper building-Facade 04	Area	LrN	94.1	47.0	51.0	71.0	99.0	0.0	0.0	3	148.92	-54.5	-4.0	-2.6	-0.1		0.0	0.0	12.9	0.0	0.0	0.0	12.9
Chipper building-Roof 01	Area	LrD	94.1	47.0	51.4	73.8	172.1	0.0	0.0	0	158.58	-55.0	-4.0	-1.2	-0.1		0.0	0.0	13.5	0.0	0.0	0.0	13.5
Chipper building-Roof 01	Area	LrN	94.1	47.0	51.4	73.8	172.1	0.0	0.0	0	158.58	-55.0	-4.0	-1.2	-0.1		0.0	0.0	13.5	0.0	0.0	0.0	13.5
Chipper building-Roof 02	Area	LrD	83.4	47.0	43.1	65.5	172.1	0.0	0.0	0	157.72	-54.9	-4.4	-0.8	-0.1		0.0	0.0	5.2	0.0	0.0	0.0	5.2
Chipper building-Roof 02	Area	LrN	83.4	47.0	43.1	65.5	172.1	0.0	0.0	0	157.72	-54.9	-4.4	-0.8	-0.1		0.0	0.0	5.2	0.0	0.0	0.0	5.2
dispatch	Area	LrD			72.9	89.0	40.8	0.0	0.0	0	143.60	-54.1	-1.1	-10.7	-0.2		0.0	2.4	25.3	0.0	0.0	0.0	25.3
dispatch	Area	LrN			72.9	89.0	40.8	0.0	0.0	0	143.60	-54.1	-1.1	-10.7	-0.2		0.0	2.4	25.3	0.0	0.0	0.0	25.3
log unloading	Point	LrD			96.0	96.0		0.0	0.0	0	119.23	-52.5	-0.3	-14.2	-0.4		0.0	0.0	28.6	0.0	0.0	0.0	28.6
log unloading	Point	LrN			96.0	96.0		0.0	0.0	0	119.23	-52.5	-0.3	-14.2	-0.4		0.0	0.0	28.6	0.0	0.0	0.0	28.6
Receiver Westloch Farmhouse FI F 1			LrD,lim dB(A)	LrN,lim dB(A)	LrD 33 dB(A)	Sigma(LrD) 0.0 dB(A)	LrN dB(A)	Sigma(LrN) dB(A)															
1 vehicle per hour	Line	LrD			72.0	94.8	188.6	0.0	0.0	0	154.05	-54.7	-1.5	-7.1	-1.5		0.0	0.3	30.2	0.0	0.0	0.0	30.3
1 vehicle per hour	Line	LrN			72.0	94.8	188.6	0.0	0.0	0	154.05	-54.7	-1.5	-7.1	-1.5		0.0	0.3	30.2	0.0	0.0	0.0	30.3
Chipper building-doorway with quick film	Area	LrD	90.7	18.0	72.5	88.9	43.7	0.0	0.0	3	180.04	-56.1	-1.0	-20.4	-0.5		0.0	0.0	14.0	0.0	0.0	0.0	14.0
Chipper building-doorway with quick film	Area	LrN	90.7	18.0	72.5	88.9	43.7	0.0	0.0	3	180.04	-56.1	-1.0	-20.4	-0.5		0.0	0.0	14.0	0.0	0.0	0.0	14.0
Chipper building-Facade 01	Area	LrD	83.4	47.0	43.2	63.0	95.0	0.0	0.0	3	169.93	-55.6	-4.3	-8.5	-0.1		0.0	0.0	-2.5	0.0	0.0	0.0	-2.5
Chipper building-Facade 01	Area	LrN	83.4	47.0	43.2	63.0	95.0	0.0	0.0	3	169.93	-55.6	-4.3	-8.5	-0.1		0.0	0.0	-2.5	0.0	0.0	0.0	-2.5
Chipper building-Facade 02	Area	LrD	86.7	47.0	45.3	62.7	55.3	0.0	0.0	3	179.89	-56.1	-4.3	-9.3	-0.1		0.0	0.0	-4.1	0.0	0.0	0.0	-4.1

	The Airshed	1
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AS 0960 Westloch Farm Timber Yard Mean propagation Leq - Scenario 1

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Source	Source type	Time slice	Li dB(A)	R'w dB	L'w dB(A)	Lw dB(A)	l or A m,m²	KI dB	KT dB	Ko dB	S m	Adiv dB	Agr dB	Abar dB	Aatm dB	Amisc dB	ADI dB	dLrefl dB(A)	Ls dB(A)	dLw dB	Cmet dB	ZR dB	Lr dB(A)	
Chipper building-Facade 02	Area	LrN	86.7	47.0	45.3	62.7	55.3	0.0	0.0	3	179.89	-56.1	-4.3	-9.3	-0.1		0.0	0.0	-4.1		0.0			
Chipper building-Facade 03	Area	LrD	96.1	47.0	53.2	73.0	95.0	0.0	0.0	3	170.28	-55.6	-4.1	-10.1	-0.1		0.0	0.0	6.0	0.0	0.0	0.0	0.0	6.0
Chipper building-Facade 03	Area	LrN	96.1	47.0	53.2	73.0	95.0	0.0	0.0	3	170.28	-55.6	-4.1	-10.1	-0.1		0.0	0.0	6.0		0.0			
Chipper building-Facade 04	Area	LrD	94.1	47.0	51.0	71.0	99.0	0.0	0.0	3	160.93	-55.1	-4.1	-2.6	-0.1		0.0	0.0	12.1	0.0	0.0	0.0	0.0	12.1
Chipper building-Facade 04	Area	LrN	94.1	47.0	51.0	71.0	99.0	0.0	0.0	3	160.93	-55.1	-4.1	-2.6	-0.1		0.0	0.0	12.1		0.0			
Chipper building-Roof 01	Area	LrD	94.1	47.0	51.4	73.8	172.1	0.0	0.0	0	170.18	-55.6	-4.0	-1.3	-0.2		0.0	0.0	12.7	0.0	0.0	0.0	0.0	12.7
Chipper building-Roof 01	Area	LrN	94.1	47.0	51.4	73.8	172.1	0.0	0.0	0	170.18	-55.6	-4.0	-1.3	-0.2		0.0	0.0	12.7		0.0			
Chipper building-Roof 02	Area	LrD	83.4	47.0	43.1	65.5	172.1	0.0	0.0	0	170.05	-55.6	-4.4	-0.9	-0.1		0.0	0.0	4.4	0.0	0.0	0.0	0.0	4.4
Chipper building-Roof 02	Area	LrN	83.4	47.0	43.1	65.5	172.1	0.0	0.0	0	170.05	-55.6	-4.4	-0.9	-0.1		0.0	0.0	4.4		0.0			
dispatch	Area	LrD			72.9	89.0	40.8	0.0	0.0	0	155.74	-54.8	-1.1	-10.7	-0.2		0.0	2.5	24.6	0.0	0.0	0.0	0.0	24.6
dispatch	Area	LrN			72.9	89.0	40.8	0.0	0.0	0	155.74	-54.8	-1.1	-10.7	-0.2		0.0	2.5	24.6		0.0			
log unloading	Point	LrD			96.0	96.0		0.0	0.0	0	129.53	-53.2	-0.3	-14.3	-0.4		0.0	0.0	27.7	0.0	0.0	0.0	0.0	27.7
log unloading	Point	LrN			96.0	96.0		0.0	0.0	0	129.53	-53.2	-0.3	-14.3	-0.4		0.0	0.0	27.7		0.0			
Receiver Westloch Farmhouse - studio																								
FI	GF	LrD,lim	LrN,lim	LrD 32	Sigma(LrD)	LrN	Sigma(LrN)																	
		dB(A)	dB(A)	dB(A)	0.0 dB(A)	dB(A)	dB(A)																	
1 vehicle per hour	Line	LrD			72.0	94.8	188.6	0.0	0.0	0	147.15	-54.3	-1.8	-9.4	-1.0		0.0	1.2	29.4	0.0	0.0	0.0	0.0	29.4
1 vehicle per hour	Line	LrN			72.0	94.8	188.6	0.0	0.0	0	147.15	-54.3	-1.8	-9.4	-1.0		0.0	1.2	29.4		0.0			
Chipper building-doorway with quick film	Area	LrD	90.7	18.0	72.5	88.9	43.7	0.0	0.0	3	170.91	-55.6	-1.6	-19.9	-0.5		0.0	0.0	14.3	0.0	0.0	0.0	0.0	14.3
Chipper building-doorway with quick film	Area	LrN	90.7	18.0	72.5	88.9	43.7	0.0	0.0	3	170.91	-55.6	-1.6	-19.9	-0.5		0.0	0.0	14.3		0.0			
Chipper building-Facade 01	Area	LrD	83.4	47.0	43.2	63.0	95.0	0.0	0.0	3	159.08	-55.0	-3.1	-2.3	-0.1		0.0	0.0	5.5	0.0	0.0	0.0	0.0	5.5
Chipper building-Facade 01	Area	LrN	83.4	47.0	43.2	63.0	95.0	0.0	0.0	3	159.08	-55.0	-3.1	-2.3	-0.1		0.0	0.0	5.5		0.0			
Chipper building-Facade 02	Area	LrD	86.7	47.0	45.3	62.7	55.3	0.0	0.0	3	169.61	-55.6	-3.4	-10.4	-0.1		0.0	0.0	-3.7	0.0	0.0	0.0	0.0	-3.7
Chipper building-Facade 02	Area	LrN	86.7	47.0	45.3	62.7	55.3	0.0	0.0	3	169.61	-55.6	-3.4	-10.4	-0.1		0.0	0.0	-3.7		0.0			
Chipper building-Facade 03	Area	LrD	96.1	47.0	53.2	73.0	95.0	0.0	0.0	3	162.20	-55.2	-3.3	-11.9	-0.1		0.0	0.0	5.5	0.0	0.0	0.0	0.0	5.5
Chipper building-Facade 03	Area	LrN	96.1	47.0	53.2	73.0	95.0	0.0	0.0	3	162.20	-55.2	-3.3	-11.9	-0.1		0.0	0.0	5.5		0.0			
Chipper building-Facade 04	Area	LrD	94.1	47.0	51.0	71.0	99.0	0.0	0.0	3	151.46	-54.6	-3.4	-3.9	-0.1		0.0	0.0	12.1	0.0	0.0	0.0	0.0	12.1
Chipper building-Facade 04	Area	LrN	94.1	47.0	51.0	71.0	99.0	0.0	0.0	3	151.46	-54.6	-3.4	-3.9	-0.1		0.0	0.0	12.1		0.0			
Chipper building-Roof 01	Area	LrD	94.1	47.0	51.4	73.8	172.1	0.0	0.0	0	161.36	-55.1	-4.0	-1.6	-0.1		0.0	0.0	12.9	0.0	0.0	0.0	0.0	12.9
Chipper building-Roof 01	Area	LrN	94.1	47.0	51.4	73.8	172.1	0.0	0.0	0	161.36	-55.1	-4.0	-1.6	-0.1		0.0	0.0	12.9		0.0			
Chipper building-Roof 02	Area	LrD	83.4	47.0	43.1	65.5	172.1	0.0	0.0	0	159.83	-55.1	-3.9	-1.0	-0.1		0.0	0.0	5.4	0.0	0.0	0.0	0.0	5.4
Chipper building-Roof 02	Area	LrN	83.4	47.0	43.1	65.5	172.1	0.0	0.0	0	159.83	-55.1	-3.9	-1.0	-0.1		0.0	0.0	5.4		0.0			
dispatch	Area	LrD			72.9	89.0	40.8	0.0	0.0	0	145.87	-54.3	-2.0	-9.8	-0.2		0.0	1.5	24.2	0.0	0.0	0.0	0.0	24.2

The Airshed

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AS 0960 Westloch Farm Timber Yard Mean propagation Leq - Scenario 1

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Source	Source type	Time slice	Li dB(A)	R'w dB	L'w dB(A)	Lw dB(A)	lor A m,m²	KI dB	KT dB	Ko dB	S m	Adiv dB	Agr dB	Abar dB	Aatm dB	Amisc dB	ADI dB	dLrefl dB(A)	Ls dB(A)	dLw dB	Cmet dB	ZR dB	Lr dB(A)	
dispatch	Area	LrN			72.9	89.0	40.8	0.0	0.0	0	145.87	-54.3	-2.0	-9.8	-0.2		0.0	1.5	24.2		0.0			
log unloading	Point	LrD			96.0	96.0		0.0	0.0	0	125.17	-52.9	-1.0	-14.6	-0.4		0.0	0.0	27.1	0.0	0.0	0.0	0.0	27.1
log unloading	Point	LrN			96.0	96.0		0.0	0.0	0	125.17	-52.9	-1.0	-14.6	-0.4		0.0	0.0	27.1		0.0			
Receiver Westloch Farmhouse		FI GF	LrD,lim dB(A)	LrN,lim dB(A)	LrD 32 dB(A)	Sigma(LrD) 0.0 dB(A)		LrN dB(A)	Sigma(LrN) dB(A)															
1 vehicle per hour	Line	LrD			72.0	94.8	188.6	0.0	0.0	0	142.80	-54.1	-1.8	-8.5	-1.4		0.0	0.2	29.3	0.0	0.0	0.0	0.0	29.3
1 vehicle per hour	Line	LrN			72.0	94.8	188.6	0.0	0.0	0	142.80	-54.1	-1.8	-8.5	-1.4		0.0	0.2	29.3		0.0			
Chipper building-doorway with quick film	Area	LrD	90.7	18.0	72.5	88.9	43.7	0.0	0.0	3	168.21	-55.5	-1.6	-20.0	-0.5		0.0	0.0	14.4	0.0	0.0	0.0	0.0	14.4
Chipper building-doorway with quick film	Area	LrN	90.7	18.0	72.5	88.9	43.7	0.0	0.0	3	168.21	-55.5	-1.6	-20.0	-0.5		0.0	0.0	14.4		0.0			
Chipper building-Facade 01	Area	LrD	83.4	47.0	43.2	63.0	95.0	0.0	0.0	3	157.42	-54.9	-3.1	-3.5	-0.1		0.0	0.0	4.4	0.0	0.0	0.0	0.0	4.4
Chipper building-Facade 01	Area	LrN	83.4	47.0	43.2	63.0	95.0	0.0	0.0	3	157.42	-54.9	-3.1	-3.5	-0.1		0.0	0.0	4.4		0.0			
Chipper building-Facade 02	Area	LrD	86.7	47.0	45.3	62.7	55.3	0.0	0.0	3	167.68	-55.5	-3.4	-10.7	-0.1		0.0	0.0	-3.9	0.0	0.0	0.0	0.0	-3.9
Chipper building-Facade 02	Area	LrN	86.7	47.0	45.3	62.7	55.3	0.0	0.0	3	167.68	-55.5	-3.4	-10.7	-0.1		0.0	0.0	-3.9		0.0			
Chipper building-Facade 03	Area	LrD	96.1	47.0	53.2	73.0	95.0	0.0	0.0	3	158.68	-55.0	-3.3	-11.7	-0.1		0.0	0.0	5.8	0.0	0.0	0.0	0.0	5.8
Chipper building-Facade 03	Area	LrN	96.1	47.0	53.2	73.0	95.0	0.0	0.0	3	158.68	-55.0	-3.3	-11.7	-0.1		0.0	0.0	5.8		0.0			
Chipper building-Facade 04	Area	LrD	94.1	47.0	51.0	71.0	99.0	0.0	0.0	3	148.91	-54.5	-3.4	-4.2	-0.1		0.0	0.0	11.9	0.0	0.0	0.0	0.0	11.9
Chipper building-Facade 04	Area	LrN	94.1	47.0	51.0	71.0	99.0	0.0	0.0	3	148.91	-54.5	-3.4	-4.2	-0.1		0.0	0.0	11.9		0.0			
Chipper building-Roof 01	Area	LrD	94.1	47.0	51.4	73.8	172.1	0.0	0.0	0	158.61	-55.0	-4.0	-1.7	-0.1		0.0	0.0	13.0	0.0	0.0	0.0	0.0	13.0
Chipper building-Roof 01	Area	LrN	94.1	47.0	51.4	73.8	172.1	0.0	0.0	0	158.61	-55.0	-4.0	-1.7	-0.1		0.0	0.0	13.0		0.0			
Chipper building-Roof 02	Area	LrD	83.4	47.0	43.1	65.5	172.1	0.0	0.0	0	157.75	-55.0	-3.9	-1.1	-0.1		0.0	0.0	5.4	0.0	0.0	0.0	0.0	5.4
Chipper building-Roof 02	Area	LrN	83.4	47.0	43.1	65.5	172.1	0.0	0.0	0	157.75	-55.0	-3.9	-1.1	-0.1		0.0	0.0	5.4		0.0			
dispatch	Area	LrD			72.9	89.0	40.8	0.0	0.0	0	143.57	-54.1	-2.0	-10.5	-0.2		0.0	1.7	23.9	0.0	0.0	0.0	0.0	23.9
dispatch	Area	LrN			72.9	89.0	40.8	0.0	0.0	0	143.57	-54.1	-2.0	-10.5	-0.2		0.0	1.7	23.9		0.0			
log unloading	Point	LrD			96.0	96.0		0.0	0.0	0	119.19	-52.5	-1.0	-14.9	-0.4		0.0	0.0	27.2	0.0	0.0	0.0	0.0	27.2
log unloading	Point	LrN			96.0	96.0		0.0	0.0	0	119.19	-52.5	-1.0	-14.9	-0.4		0.0	0.0	27.2		0.0			
Receiver Westloch Farmhouse		FI GF	LrD,lim dB(A)	LrN,lim dB(A)	LrD 32 dB(A)	Sigma(LrD) 0.0 dB(A)		LrN dB(A)	Sigma(LrN) dB(A)															
1 vehicle per hour	Line	LrD			72.0	94.8	188.6	0.0	0.0	0	154.00	-54.7	-1.7	-7.7	-1.6		0.0	0.2	29.2	0.0	0.0	0.0	0.0	29.2
1 vehicle per hour	Line	LrN			72.0	94.8	188.6	0.0	0.0	0	154.00	-54.7	-1.7	-7.7	-1.6		0.0	0.2	29.2		0.0			
Chipper building-doorway with quick film	Area	LrD	90.7	18.0	72.5	88.9	43.7	0.0	0.0	3	180.03	-56.1	-1.4	-20.1	-0.5		0.0	0.0	13.8	0.0	0.0	0.0	0.0	13.8
Chipper building-doorway with quick film	Area	LrN	90.7	18.0	72.5	88.9	43.7	0.0	0.0	3	180.03	-56.1	-1.4	-20.1	-0.5		0.0	0.0	13.8		0.0			

The Airshed

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AS 0960 Westloch Farm Timber Yard Mean propagation Leq - Scenario 1

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Source	Source type	Time slice	Li	R'w	L'w	Lw	l or A	KI	KT	Ko	S	Adiv	Agr	Abar	Aatm	Amisc	ADI	dLrefl	Ls	dLw	Cmet	ZR	Lr	
			dB(A)	dB	dB(A)	dB(A)	m, m ²	dB	dB	dB	m	dB	dB	dB	dB	dB	dB	dB(A)	dB(A)	dB	dB	dB	dB(A)	
Chipper building-Facade 01	Area	LrD	83.4	47.0	43.2	63.0	95.0	0.0	0.0	3	169.91	-55.6	-3.2	-9.7	-0.1		0.0	0.0	-2.6	0.0	0.0	0.0	-2.6	
Chipper building-Facade 01	Area	LrN	83.4	47.0	43.2	63.0	95.0	0.0	0.0	3	169.91	-55.6	-3.2	-9.7	-0.1		0.0	0.0	-2.6		0.0			
Chipper building-Facade 02	Area	LrD	86.7	47.0	45.3	62.7	55.3	0.0	0.0	3	179.88	-56.1	-3.5	-10.4	-0.1		0.0	0.0	-4.4	0.0	0.0	0.0	-4.4	
Chipper building-Facade 02	Area	LrN	86.7	47.0	45.3	62.7	55.3	0.0	0.0	3	179.88	-56.1	-3.5	-10.4	-0.1		0.0	0.0	-4.4		0.0			
Chipper building-Facade 03	Area	LrD	96.1	47.0	53.2	73.0	95.0	0.0	0.0	3	170.26	-55.6	-3.4	-11.3	-0.1		0.0	0.0	5.6	0.0	0.0	0.0	5.6	
Chipper building-Facade 03	Area	LrN	96.1	47.0	53.2	73.0	95.0	0.0	0.0	3	170.26	-55.6	-3.4	-11.3	-0.1		0.0	0.0	5.6		0.0			
Chipper building-Facade 04	Area	LrD	94.1	47.0	51.0	71.0	99.0	0.0	0.0	3	160.92	-55.1	-3.5	-4.0	-0.1		0.0	0.0	11.3	0.0	0.0	0.0	11.3	
Chipper building-Facade 04	Area	LrN	94.1	47.0	51.0	71.0	99.0	0.0	0.0	3	160.92	-55.1	-3.5	-4.0	-0.1		0.0	0.0	11.3		0.0			
Chipper building-Roof 01	Area	LrD	94.1	47.0	51.4	73.8	172.1	0.0	0.0	0	170.21	-55.6	-4.0	-1.6	-0.1		0.0	0.0	12.5	0.0	0.0	0.0	12.5	
Chipper building-Roof 01	Area	LrN	94.1	47.0	51.4	73.8	172.1	0.0	0.0	0	170.21	-55.6	-4.0	-1.6	-0.1		0.0	0.0	12.5		0.0			
Chipper building-Roof 02	Area	LrD	83.4	47.0	43.1	65.5	172.1	0.0	0.0	0	170.08	-55.6	-4.0	-1.3	-0.1		0.0	0.0	4.5	0.0	0.0	0.0	4.5	
Chipper building-Roof 02	Area	LrN	83.4	47.0	43.1	65.5	172.1	0.0	0.0	0	170.08	-55.6	-4.0	-1.3	-0.1		0.0	0.0	4.5		0.0			
dispatch	Area	LrD			72.9	89.0	40.8	0.0	0.0	0	155.71	-54.8	-1.8	-10.6	-0.2		0.0	1.8	23.3	0.0	0.0	0.0	23.3	
dispatch	Area	LrN			72.9	89.0	40.8	0.0	0.0	0	155.71	-54.8	-1.8	-10.6	-0.2		0.0	1.8	23.3		0.0			
log unloading	Point	LrD			96.0	96.0		0.0	0.0	0	129.50	-53.2	-0.8	-15.0	-0.4		0.0	0.0	26.5	0.0	0.0	0.0	26.5	
log unloading	Point	LrN			96.0	96.0		0.0	0.0	0	129.50	-53.2	-0.8	-15.0	-0.4		0.0	0.0	26.5		0.0			
Receiver Westloch Steading FI GF LrD,lim dB(A) LrN,lim dB(A) LrD 29 dB(A) Sigma(LrD) 0.0 dB(A) LrN dB(A) Sigma(LrN) dB(A)																								
1 vehicle per hour	Line	LrD			72.0	94.8	188.6	0.0	0.0	0	247.80	-58.9	-1.6	-4.2	-2.2	-1.64	0.0	0.3	26.6	0.0	0.0	0.0	26.6	
1 vehicle per hour	Line	LrN			72.0	94.8	188.6	0.0	0.0	0	247.80	-58.9	-1.6	-4.2	-2.2	-1.64	0.0	0.3	26.6		0.0			
Chipper building-doorway with quick film	Area	LrD	90.7	18.0	72.5	88.9	43.7	0.0	0.0	3	281.26	-60.0	-1.1	-18.3	-0.8	-0.49	0.0	0.0	11.3	0.0	0.0	0.0	11.3	
Chipper building-doorway with quick film	Area	LrN	90.7	18.0	72.5	88.9	43.7	0.0	0.0	3	281.26	-60.0	-1.1	-18.3	-0.8	-0.49	0.0	0.0	11.3		0.0			
Chipper building-Facade 01	Area	LrD	83.4	47.0	43.2	63.0	95.0	0.0	0.0	3	276.17	-59.8	-4.3	-11.1	-0.1	-0.64	0.0	0.0	-9.9	0.0	0.0	0.0	-9.9	
Chipper building-Facade 01	Area	LrN	83.4	47.0	43.2	63.0	95.0	0.0	0.0	3	276.17	-59.8	-4.3	-11.1	-0.1	-0.64	0.0	0.0	-9.9		0.0			
Chipper building-Facade 02	Area	LrD	86.7	47.0	45.3	62.7	55.3	0.0	0.0	3	283.59	-60.0	-4.4	-9.1	-0.1	-0.18	0.0	0.0	-8.2	0.0	0.0	0.0	-8.2	
Chipper building-Facade 02	Area	LrN	86.7	47.0	45.3	62.7	55.3	0.0	0.0	3	283.59	-60.0	-4.4	-9.1	-0.1	-0.18	0.0	0.0	-8.2		0.0			
Chipper building-Facade 03	Area	LrD	96.1	47.0	53.2	73.0	95.0	0.0	0.0	3	270.67	-59.6	-4.2	-2.0	-0.2	-0.12	0.0	0.0	9.8	0.0	0.0	0.0	9.8	
Chipper building-Facade 03	Area	LrN	96.1	47.0	53.2	73.0	95.0	0.0	0.0	3	270.67	-59.6	-4.2	-2.0	-0.2	-0.12	0.0	0.0	9.8		0.0			
Chipper building-Facade 04	Area	LrD	94.1	47.0	51.0	71.0	99.0	0.0	0.0	3	264.45	-59.4	-4.2	-3.1	-0.2	-0.38	0.0	0.0	6.7	0.0	0.0	0.0	6.7	
Chipper building-Facade 04	Area	LrN	94.1	47.0	51.0	71.0	99.0	0.0	0.0	3	264.45	-59.4	-4.2	-3.1	-0.2	-0.38	0.0	0.0	6.7		0.0			
Chipper building-Roof 01	Area	LrD	94.1	47.0	51.4	73.8	172.1	0.0	0.0	0	272.24	-59.7	-4.4	-0.6	-0.2	-0.19	0.0	0.0	8.7	0.0	0.0	0.0	8.7	
Chipper building-Roof 01	Area	LrN	94.1	47.0	51.4	73.8	172.1	0.0	0.0	0	272.24	-59.7	-4.4	-0.6	-0.2	-0.19	0.0	0.0	8.7		0.0			

The Airshed

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