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Capital Delivery Programme

Operational Noise Assessment

Bishop and Wolf Pumping Station and Screening Plant

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Operational Noise Assessment:

St Mary's, Bishop and Wolf
Pumping Station and Screening
Plant

January 2025



Experts in noise and vibration
assessment and management

Document Control

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1 Introduction

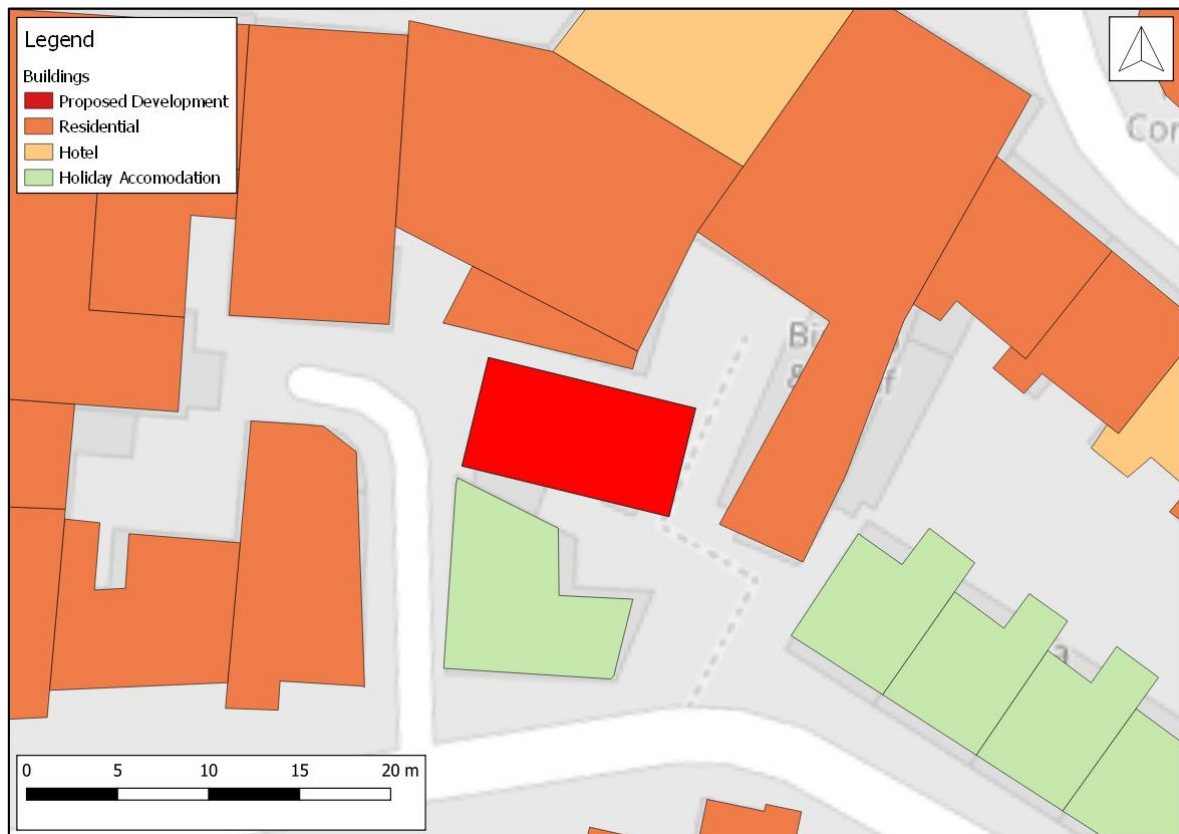
- 1.1 Noise Consultants Ltd (NCL) has been instructed by Pell Frischmann to undertake a noise impact assessment for the installation of a proposed new South West Water Limited (SWWL) interim screening plant in St Mary's, Isles of Scilly. It is understood that the assessment will be used to assess the proposed installation of a screening plant at Bishop and Wolf Pumping Station (the 'Site'). The islands fall within the administrative boundary of the Council of the Isles of Scilly (CIS). This report is intended to support a planning application to CIS for the proposed scheme.
- 1.2 At this stage, full details of the operational plant and equipment (i.e. location, make, model, quantity, hours of operation) and any buildings have not been confirmed. Therefore, the purpose of the assessment is to assist in determining suitable Environmental Sound Criteria (ESC) for the operation of the proposed scheme.

Existing Site and Environs

- 1.3 St Mary's is sparsely populated, with residential areas concentrated around Hugh Town and Old Town. There are several hotels and other holiday accommodation, including a range of private rental properties and a camp site, located across the island.
- 1.4 Existing land uses have been determined by analysis of the OS Address+ database and by inspection during NCLs visit to the island.
- 1.5 The number of vehicles on the island is very low and, consequently, anthropogenic noise is generally limited to infrequent vehicle movement, pedestrians/island visitors occasionally, distant aircraft (arriving/departing from St Mary's airport) in the daytime. At all other times, and under relatively calm weather conditions, the sound of lapping waves and psithurism are the main contributors to the existing noise climate across the majority of the island.

Proposed Scheme Details

- 1.6 The proposed scheme consists of the construction of an enlarged wastewater infrastructure building, which will replace the existing Bishop and Wolf Sewage Pumping Station (SPS) building. The new building will house new variable-speed pumps and a new screening plant. The screening plant will remove objects such as rags, paper, plastics, and metals to prevent damage and clogging of downstream equipment, piping, and appurtenances as well as ensuring they do not enter the marine environment.
- 1.7 The plant will operate intermittently as required on a 24/7 basis, operation could occur at any time.
- 1.8 The proposed screening Site Location Plan is shown in **Figure 1.1**.

Figure 1.1: Proposed Screening Site Location Plan

Assessment Scope

- 1.9 This noise assessment report has been prepared in accordance with National legislation, policies, and guidance and by reference to appropriate British and International standards which are summarised in **Appendix A1** and **A2**.
- 1.10 This report presents:
- The findings of a baseline sound survey undertaken to understand the existing noise climate at human noise-sensitive receptors (NSRs), and;
 - Outline Environmental Sound Criteria (ESC) at the identified NSRs for the operational phase of the proposed scheme set with reference to BS 4142:2014¹.

Notes

- 1.11 Noise levels in the body of this report have been rounded to the nearest whole number since fractions of decibels (dB) are imperceptible. Noise data is reported in terms of an A-weighting (denoted by a subscript 'A') and approximates the frequency response of the human ear. A glossary of acoustic terminology is provided in **Section 6**.

¹ BS 4142:2014+A1:2019 'Methods for Rating and Assessing Industrial and Commercial Sound' (BS 4142:2019)

2 Assessment Approach

National Policy and Guidance

- 2.1 Assessment criteria have been selected in accordance with the National legislation, policies, and guidance and by reference to appropriate British and International standards outlined in:
- **Appendix A1:** Relevant Policy and Guidance; and
 - **Appendix A2:** Operational Sound (Building Services and Other Sound of an Industrial and/or Commercial Nature) Assessment Guidance.

Assessment Methodology

- 2.2 Operational noise associated with the proposed scheme will be limited to fixed plant and equipment which is considered to be of an industrial character. Therefore, ESC will be set, primarily, in accordance with the methodology set out in BS 4142:2014.
- 2.3 The basic procedure of a BS 4142:2014 assessment is to compare the operational sound level from the source(s) at the assessment location(s) (the specific sound level, L_s) with character corrections applied for acoustic features of the specific sound level that would likely increase the significance of impact. This is referred to as the rating level ($L_{Ar,Tr}$). The assessment is then performed by comparing the rating level against the background sound level, $L_{A90,T}$, and importantly, is subject to consideration of contextual factors.
- 2.4 BS 4142 provides guidance on how to monitor and determine the background sound level, which should be measured in the absence of the influence of sound from the new industrial sources.

Selection of LOELs and SOAELs

- 2.5 The setting of LOELs and SOAELs for industrial noise to determine impact is not well-rehearsed. Because the recognised assessment of these types of sources is based on the prominence of the sound source relative to baseline levels, it does not readily lend itself to a single threshold value.
- 2.6 Initial thresholds, including where there is an indication of '*significant adverse impact*', has been aligned with the effect levels in NPSE, namely the SOAEL, which is the effect level above which significant adverse effects on health and quality of life occur.
- 2.7 For residential receptors during the daytime and night-time periods, the SOAEL threshold is set at 10 dB greater than the background sound level, when determined in accordance with the BS 4142 assessment procedure. The adopted LOAEL is equal to the typical background sound level ($L_{A90,T}$), and represents a 'low impact' when determined in accordance with the BS 4142 assessment procedure. However, contextual considerations should be taken into account when setting the ESC, especially when background sound levels and rating levels are low.

2.8 **Table 2.1** summarises the proposed LOAEL and SOAEL threshold effect levels relating to operational sound from the proposed scheme with reference to the impact thresholds contained in BS 4142:2014.

Table 2.1: Proposed LOAEL and SOAEL Criteria by reference to BS 4142:2014+A1:2019

Period	LOAEL	SOAEL
Daytime (0700-2300hrs)	Rating level ($L_{Ar, Tr}$) equal to background sound level, $L_{A90, T}$ (with consideration of context)	Rating level ($L_{Ar, Tr}$) +10 dB above background sound level, $L_{A90, T}$ (with consideration of context)
Night-time (2300-0700hrs)		

Contextual Considerations

- 2.9 Adopting the above threshold criteria in isolation excludes other quantitative and qualitative considerations needed to provide a reasoned and balanced assessment, which are particularly important where existing noise levels are very high or low (see **Appendix A2**).
- 2.10 BS 4142:2019 states that "*Where background sound levels and rating levels are low, absolute levels might be as, or more, relevant than the margin by which the rating level exceeds the background. This is especially true at night*". The first note to the Scope of the previous version of BS 4142 (BS 4142:1997) stated that "[external] background noise levels below about 30 dB, and Rating Levels below about 35 dB are considered to be very low".
- 2.11 For further context, absolute internal noise levels are considered with respect to BS 8233:2014, reproduced in **Table 2.2**, which are considered to represent the LOAEL, but in the absence of any corrections that ought be applied to account for the character of noise from the proposed scheme. Internal threshold noise levels that represent the SOAEL are also not well-rehearsed but, for the purposes of this assessment, have been taken as being 10 dB above the guideline values in **Table 2.2**.

Table 2.2: Internal LOAEL Criteria by Reference to BS 8233:2014

Building Use	Internal Space	Daytime Guideline (07:00-23:00hrs)	Night-time Guideline (07:00-23:00hrs)
Residential	Living Room	35 dB $L_{Aeq, 16hr}$	-
	Bedroom	35 dB $L_{Aeq, 16hr}$	30 dB $L_{Aeq, 8hr}$
Hotel	Bedrooms	30 - 40 dB $L_{Aeq, 1hr}$	25 - 35 dB $L_{Aeq, 1hr}$

3 Baseline Sound Survey

Survey Details

- 3.1 To quantify existing sound levels at existing NSRs closest and most exposed to operational noise from the proposed scheme, a baseline noise survey was conducted between 15:30hrs on Monday 18th March 2024 and 09:55hrs on Friday 22nd March 2024. Full details of the baseline survey are provided in **Appendix A3**. Photographs of monitoring locations are provided in **Appendix A4**.
- 3.2 An unattended, long-term location (NML1 – LT) was deployed in the extent of the proposed scheme.
- 3.3 **Figure 3.1** presents the noise monitoring locations, also described in **Table 3.1**, which were chosen to be representative of one or more NSRs in the vicinity of noise generating elements of the proposed scheme.

Sound Survey Results

Survey Observations

- 3.4 Observations of the acoustic climate at the survey locations are summarised in **Table 3.1**. Generally, noise climate was observed to be characterised by birdsong, waves, plant noise from Southwest Water Bishop and Wolf Sewage Pumping Station, psithurism through the survey, occasional voices, and infrequent vehicles and aircraft in the daytime.

Survey Results

- 3.5 Due to the large amount of data, the full baseline sound survey data for the 'LT' survey is presented as a time history in **Appendix A3**. **Table 3.2** summarises all results of the baseline sound survey for the daytime and night-time periods. BS 4142 does not define how a 'typical' background sound level (BSL) is to be established and, therefore, analysis of the measured background (L_{A90}) sound levels has been undertaken to determine the Mean (average), Mode and Median for both the day and night-time periods and are shown in **Table 3.2**.

Figure 3.1: Baseline Survey Measurement Locations, Land Uses and NSR Groups

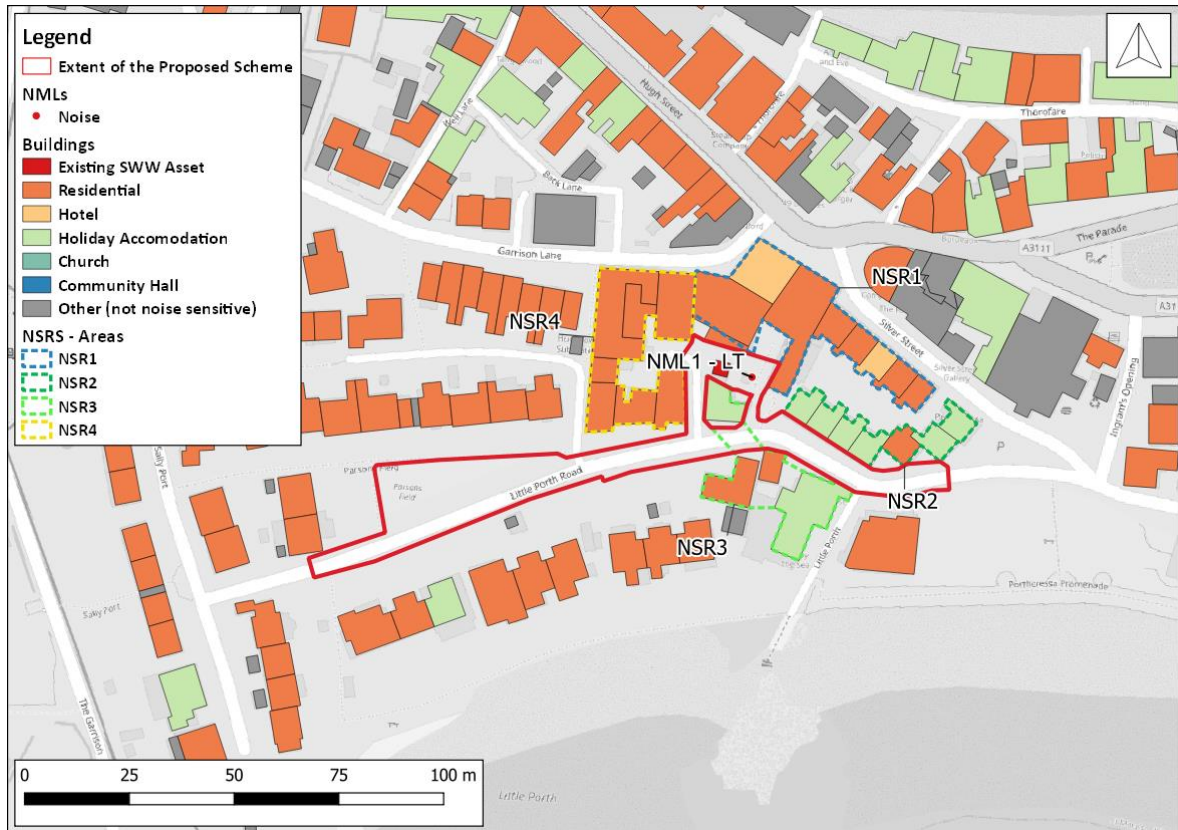


Table 3.1: Summary of Noise Survey Locations

Location		Associated NSR(s)	Survey Period	Observations
Ref	Description			
Baseline Noise Monitoring				
NML1-LT	Bishop and Wolf beer garden	NSR1: Flats 1-2 Morley's, Flats 1-2 The Corners, Bishop Wolf Inn, 2-10 Silver Street NSR2: 12-16 Silver Street and 1-4 Porthcressa View NSR3: Ambleside The Wrasse, Flat 3 The Wrasse, Periwinkle, Wheelhouse, Storm Cottage NSR4: Flats 1-3 Four Seasons, Sea Nymph, Seawinds, The Round house, The Townhouse, Flats 1-4 Haydor, Bollards	18/03/2024 15:30 to 19/03/2024 15:30	Noise climate comprised of intermittent plant within the SWWL Bishop and Wolf SPS compound, seagull birdsong, wind gusts, waves crashing onto rocks.
			20/03/2024 19:45 to 21/03/2024 09:55	Complementary unattended measurement to investigate the effect of wind gusts on the 24-hour measurement.

Determination of Typical Background Sound Levels

- 3.6 Typical background sound levels are summarised in **Table 3.2**. 'Typical' are based on the results of the baseline environmental results and, as a conservative approach, were chosen as the lowest of the derived mean, mode and median values.

Table 3.2: Summary of Measured Sound Levels

Survey Location		NSR Ref	Period	L _{AFmax}	L _{Aeq,T}	Background Sound Level, L _{A90,T}			
Ref	Associated NSR(s)					Mean	Mode	Median	Typical
Baseline Noise Monitoring									
NML1-LT (18-19/03/2024)	NSR1-4	NSR1-4	Day	51-78	51	41	38	41	38
			Night	41-76	47	41	38	40	38
NML1-LT (20-21/03/2024)			Day	37-79	51	37	33	36	n/a ²
			Night	38-78	47	37	38	38	37

² Not applicable as it is not representative of the full daytime period (07:00-23:00)

4 Environmental Sound Criteria

- 4.1 Environmental Sound Criteria (ESC) for the proposed scheme have been set based on the typical background sound levels shown in **Table 3.2**.
- 4.2 Notably, noise from the existing SWWL asset, that is to be retained, was not excluded from the measured baseline sound levels as noise from this asset forms part of the existing baseline sound levels.
- 4.3 The recommended free-field ESC are summarised in **Table 4.1**.

Table 4.1: Recommended Free-field Cumulative Environmental Sound Criteria

NSR / NSR groups	Environmental Sound Criteria (dB L _{A,r,Tr}) ³	
	Daytime	Night-time
NSR1-NSR4	38	37

³ Daytime = 1hr period between 07:00-23:00hrs, Night-time = 15-minute period between 23:00-07:00hrs. ESC includes any BS 4142:2014 character corrections.

5 Conclusion

- 5.1 Noise Consultants Ltd (NCL) has undertaken a noise impact assessment for the operational phase of a proposed interim screening plant by South West Water Limited (SWWL) on St Mary's, Isles of Scilly. The islands fall within the administrative boundary of the Council of the Isles of Scilly (CIS).
- 5.2 The closest and most exposed receptors are dwellings and holiday accommodation, which have a range of sensitivities to operational noise from the proposed scheme.
- 5.3 The main sources of exiting noise at receptors closest to the proposed scheme is intermittent plant within the Bishop and Wolf SWWL asset, birdsong, wind and waves.
- 5.4 As full details of the operational plant and equipment are unknown at this stage, the results of a baseline sound survey have been used to recommend cumulative Environmental Sound Criteria (ESC) for new plant and equipment at the closest and most affected receptors, and by reference to noise policy, and relevant standards and guidance, including the assessment procedure set out BS 4142:2014.
- 5.5 Given proximities to noise generating elements of the proposed scheme plant and equipment, its location, building construction, and any atmosphere terminations (including louvers) or openings in the building envelope will need to be carefully considered to avoid giving rise to a significant adverse impact on health and quality of life in relation to noise.
- 5.6 Provided that operational noise levels can be adequately controlled, the proposed scheme would comply with paragraph 187 and 198 of the NPPF, and comply with Policy OE3 of The Isles of Scilly Local Plan (2015-2030). The need to ensure that noise from the proposed scheme is controlled to an acceptable level can be secured by a suitably worded planning condition, if necessary and example of which is presented below.
- 5.7 *The rating level of operational noise generated from the proposed installation under normal operating conditions, determined in accordance with BS 4142:2014, shall not exceed 38dB $L_{Ar,1hr}$ and 37dB $L_{Ar,15m}$ during the daytime (07:00 – 23:00) and night-time (23:00 – 07:00) periods respectively, measured as a free-field equivalent level at the nearest existing noise sensitive residential receptors.*

6 Glossary

dB	Decibel. The logarithmically scaled measurement unit of sound.
A-weighting	Frequency weighting applied to measured sound in order to account for the relative loudness perceived by the human ear.
$L_{Aeq,T}$	A-weighted equivalent continuous sound level over a given time period. It is the sound level of a steady sound that has the same energy as a fluctuating sound over the same time period.
$L_{A90,T}$	The A-weighted sound level exceeded for 90% of the measurement period. Often referred to as the background sound level.
L_{Amax}	The A-weighted maximum recorded noise level during a measurement period.
Ambient sound level, $L_a = L_{Aeq,T}$	The A-weighted equivalent continuous sound level of the totally encompassing sound for a given situation and time interval, T.
Residual sound level	The A-weighted equivalent continuous ambient sound level remaining when the specific sound level has decreased to a degree in which it does not contribute to the ambient sound level.
Specific sound level, $L_s = L_{Aeq,Tr}$	The A-weighted equivalent continuous sound pressure level produced by the specific sound source at the reference location over a reference time interval, T
Rating level, $L_{Ar,Tr}$	The specific sound level plus any adjustment for the characteristic features of the sound.

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A1 Relevant Planning Policy and Guidance

National Noise Policy

Noise Policy Statement for England (NPSE, 2010)

A1.1 The Noise Policy Statement for England (NPSE, 2010) sets out the Government's Noise Policy Vision to:

"Promote good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development".

A1.2 This long-term vision is supported by three Noise Policy Aims that can be delivered through effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development. These aims are to:

1. *avoid significant adverse impacts on health and quality of life;*
2. *mitigate and minimise adverse impacts on health and quality of life; and*
3. *where possible, contribute to the improvement of health and quality of life.*

A1.3 The explanatory note to the NPSE sets out 'effect levels' which are aligned to the Policy Aims. Drawing upon established concepts from toxicology, the NPSE defines the following noise effect levels:

- NOEL - 'No Observed Effect Level';
- LOAEL - 'Lowest Observed Adverse Effect Level'; and
- SOAEL - 'Significant Observed Adverse Effect Level'.

A1.4 The explanatory note describes SOAEL as the effect level above which significant adverse effects on health and quality of life occur, aligning this level with the first policy aim.

A1.5 LOAEL is described as the level at which adverse effects begin and the second aim of the NPSE refers to a situation where the effect lies somewhere between LOAEL and SOAEL. It requires that all reasonable steps should be taken to mitigate and minimise adverse effects on health and quality of life while also taking into account the guiding principles of sustainable development; however, this does not mean that such adverse effects cannot occur.

A1.6 NOEL is described as a level of noise exposure below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life.

A1.7 The third aim seeks, where possible, to positively improve health and quality of life through the proactive management of noise while also taking into account the guiding principles of sustainable development, recognising that there will be opportunities for such measures to be taken and that they will deliver potential benefits to society.

- A1.8 The protection of quiet places and quiet times as well as the enhancement of the acoustic environment will assist with delivering this aim.
- A1.9 NPSE states that it is not possible have a single, numerical definition of the SOAEL that is applicable to all sources of noise in all situations, since the SOAEL is likely to be different for different noise sources, for different receptors and at different times.
- A1.10 The setting of LOAELs and SOAELs for transportation sources has, however, reached a form of consensus following a number of high-profile infrastructure projects in England, namely HS2 and a series of Highways England Road schemes which have been successful through the Government’s Hybrid Bill and Development Consent Order (DCO) consenting processes.
- A1.11 In these projects, the setting of SOAEL has been aligned to Government policy and legislation in relation to the provision of noise insulation where it has been argued that significant adverse effects can be avoided through these means. **Table A.1.1** provides a summary of the LOAEL and SOAEL values applied on these projects.

Table A.1.1: LOAELs and SOAELs for Road and Projects

Source / Project	Period	LOAEL	SOAEL
Road Traffic (Highway Agency A14 DCO)	Daytime	50 dB LAeq, 16hr	63 dB LAeq, 16hr
	Night-time	40 dB LAeq, 8hr	55 dB LAeq, 8hr

National Planning Policy Framework (NPPF, 2024)

A1.12 The National Planning Policy Framework (NPPF, 2024) sets out the Government’s planning policies for England and how these should be applied. The NPPF provides a framework within which locally prepared plans for housing and other development can be produced.

A1.13 In relation to noise, it states:

“187. Planning policies and decisions should contribute to and enhance the natural local environment by: ...

- *preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans; and...*”

A1.14 The NPPF includes policy which makes reference to ‘significant adverse impacts on health and quality of life’, as per the NPSE. NPPF policy states:

“198. Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on

health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:

- *mitigate and reduce to a minimum potential adverse impact resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life;*
- *identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason; and...*

A1.15 NPPF has also recently introduced the agent of change principle as follows:

“200. Planning policies and decisions should ensure that new development can be integrated effectively with existing businesses and community facilities (such as places of worship, pubs, music venues and sports clubs). Existing businesses and facilities should not have unreasonable restrictions placed on them as a result of development permitted after they were established. Where the operation of an existing business or community facility could have a significant adverse effect on new development (including changes of use) in its vicinity, the applicant (or ‘agent of change’) should be required to provide suitable mitigation before the development has been completed.”

Planning Practice Guidance – Noise (PPG-Noise, 2019)

A1.16 The Planning Practice Guidance (PPG-Noise, 2019) provides further detail about how the effects of noise can be described in terms of perception and outcomes. It aligns this to increasing effect levels as defined in the NPSE. In addition, the PPG-Noise adds a fourth term and corresponding effect level:

- UAEL – ‘Unacceptable Adverse Effect Level’.

A1.17 This effect level is higher than the significant adverse effect on health and quality of life (SOAEL) and requires that unacceptable adverse effects are to be prevented. In PPG-Noise, prevention is not in the context of Government policy on sustainable development. **Table A.1.2** presents the noise exposure hierarchy described in PPG-Noise.

Table A.1.2: Planning Practice Guidance – Noise Exposure Hierarchy

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

A1.18 This noise exposure hierarchy is based on the principle that once noise or vibration becomes perceptible, the effect on people and other receptors increases as the level increases. PPG-Noise presents example outcomes to help characterise these effects using non-technical language. In general terms, an observed adverse effect is characterised as a perceived change in quality of life for occupants of a building or a perceived change in the acoustic character of an area, whereas a significant observed adverse effect disrupts activities.

A1.19 PPG-Noise also provides guidance in terms of what factors may influence whether noise could become a concern, and how adverse effects of noise can be mitigated. Examples of mitigation provided include:

- *“engineering: reducing the noise generated at source and/or containing the noise generated;*
- *layout: where possible, optimising the distance between the source and noise-sensitive receptors and/or incorporating good design to minimise noise transmission through the use of screening by natural or purpose-built barriers, or other buildings;*
- *using planning conditions/obligations to restrict activities allowed on the site at certain times and/or specifying permissible noise levels differentiating as appropriate between different times of day, such as evenings and late at night, and;*
- *mitigating the impact on areas likely to be affected by noise including through noise insulation when the impact is on a building”.*

A1.20 In the case of residential development, PPG-Noise also states that the impact of noise can be “partially off-set” if occupants have access to:

- *“a relatively quiet façade (containing windows to habitable rooms) as part of their dwelling, and/or;*
- *a relatively quiet external amenity space for their sole use, (e.g. a garden or balcony). Although the existence of a garden or balcony is generally desirable, the intended benefits will be reduced with increasing noise exposure and could be such that significant adverse effects occur, and/or;*
- *a relatively quiet, protected, nearby external amenity space for sole use by a limited group of residents as part of the amenity of their dwellings, and/or;*
- *a relatively quiet, protected, external publicly accessible amenity space (e.g. a public park or a local green space designated because of its tranquility) that is nearby (e.g. within 5 minutes walking distance)”.*

Local Noise Policy

Council of the Isles of Scilly Local Plan (2015-2030)

- A1.21 The Isles of Scilly Local Plan (2015-2030) includes policies that address various environmental and community concerns, including those related to noise.
- A1.22 Key noise-related policies can be found primarily under the sections dealing with environmental protection and sustainable development. Policy OE3 (Managing Pollution) of the Isles of Scilly Local Plan (2015-2030) focuses on managing and mitigating noise pollution to protect the tranquil environment of the islands. The policy outlines measures to ensure that development proposals consider their potential noise impacts. Key aspects include:
- **Assessment Requirements:** Developers must conduct thorough noise assessments to identify potential noise sources and predict their impacts on the environment and local community.
 - **Mitigation Measures:** Proposals must incorporate appropriate mitigation strategies to minimize noise pollution. This may involve designing buildings to reduce noise, implementing sound barriers, or using landscaping to buffer noise.
 - **Operational Controls:** Conditions may be imposed on operational hours and activities to limit noise, especially during sensitive times such as night hours.
 - **Protecting Tranquillity:** The policy emphasizes preserving the islands' unique tranquil character by limiting developments that could significantly increase noise levels.
- A1.23 Overall, Policy OE3 aims to balance development needs with the preservation of the Isles of Scilly's quiet and peaceful environment, ensuring sustainable growth that respects the islands' natural and community values.

A2 Operational Sound Assessment Guidance

British Standard 4142:2014+A1:2019 'Methods for Rating and Assessing Industrial and Commercial Sound'

- A2.1 BS 4142:2014 is used to rate and assess sound of an industrial nature including but not limited to assessing sound from proposed, new, modified or additional sources of industrial sound. It contains guidance on the monitoring and assessment of industrial and commercial sound sources (including fixed installations comprising mechanical and electrical plant and equipment) affecting sensitive receptors.
- A2.2 The methodology relies on comparing the operational rating level, $L_{Ar,Tr}$, with the background sound level, $L_{A90,T}$ (i.e. the level that would be present without the development) over a representative time period. BS 4142:2014 provides guidance on the measurement of background sound, the determination of specific sound and calculation of the rating level.
- A2.3 Certain acoustic features can increase the significance of impact over that expected from a basic comparison between the specific sound level and the background sound level. A character correction should be added to the specific sound level to obtain the rating level, where such features are present at the assessment location. This can be approached in three ways; however, the subjective method is considered appropriate for this assessment. This states that the specific sound level should be corrected if a tone, impulse or other characteristic occurs, or is expected to be present for new sound sources.

Tonality

- A2.4 A tonal correction between 0 and +6 dB can be applied for sounds that range from not tonal to prominently tonal. Several methodologies are presented in BS 4142:2014 in order to determine the appropriate correction to be applied. **Table A.2.1** presents the subjective assessment method corrections for tonal sounds.

Table A.2.1: Subjective Method – Rating Level Corrections for Tonal Sounds

Subjective assessment of sound source at the receptor	Correction
The tone is just perceptible at the receptor	+2 dB
The tone is clearly perceptible at the receptor	+4 dB
The tone is highly perceptible at the receptor	+6 dB

Impulsivity

- A2.5 An impulsivity correction of up to +9 dB can be applied for sound that is highly impulsive, considering both the rapidity of the change in sound level and the overall change in sound level. **Table A.2.2** presents the subjective method corrections for impulsive sounds.

Table A.2.2: Subjective Method – Rating Level Corrections for Impulsive Sounds

Subjective assessment of sound source at the receptor	Correction
Impulsivity is just perceptible at the receptor	+3 dB
Impulsivity is clearly perceptible at the receptor	+6 dB
Impulsivity is highly perceptible at the receptor	+9 dB

Intermittency

A2.6 A 3 dB penalty can be applied where the specific sound has identifiable on/off conditions (intermittent operation) which are readily distinctive against the residual acoustic environment.

Other Sound Characteristics

A2.7 Where the specific sound has characteristics that do not fall into the tonal, impulsive or intermittent categories but are otherwise readily distinguishable against the residual acoustic environment, a penalty of +3 dB can be applied.

Assessment Methodology and Contextual Analysis

A2.8 BS 4142:2014 assessment methodology also states that:

- *“Typically, the higher the rating level is above the background sound level the greater the magnitude of impact;*
- *A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context;*
- *A difference 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.”*

A2.9 As required by BS 4142:2014, it is necessary to consider the context of noise immission from the Development to provide a balanced and reasoned assessment. Therefore, additional quantitative and qualitative considerations are needed in order to provide a reasoned assessment and to set Environmental Sound Criteria (ESC), including:

- The magnitude of the noise;
- The existing ambient environment;
- The type of effect, including its intermittency;

- How effective the measures employed to mitigate the effect are, including best practicable means (BPM); and
- The duration of effect.

British Standard 8233:2014 'Guidance on Sound Insulation and Noise Reduction for Buildings' and World Health Organization 'Guidelines for Community Noise'

- A2.10 BS 8233 carries the full weight of an adopted British Standard and is supported by other guidance. It provides acoustic design criteria guidance for the control of noise in and around buildings, and applies to new buildings, or refurbished buildings undergoing a change of use.
- A2.11 The guideline noise design criteria of BS 8233 apply to external noise '*without a specific character*' (previously and sometimes termed or referred to as 'anonymous noise') such as that associated with road and states that it under these conditions, it is desirable that the internal ambient noise level does not exceed the guideline values shown in **Table 2.2** of this report. Where external noise levels do exhibit specific characteristics, then lower criteria may be appropriate.
- A2.12 The internal noise requirements are not intended to be met with open windows, although BS 8233:2014 states that the internal noise levels should take the ventilation strategy into account. If partially open windows were relied upon for background ventilation, the standard states that the noise ingress would be reduced by approximately 15 dB, but can '*vary significantly depending on the window type and the frequency content of the external noise. If the specific details of the window and external noise are known the value for insulation may be adjusted accordingly*⁴.
- A2.13 BS 8233:2014 does not provide specific guidance on noise levels for regular individual noise events, such as passing trains, which can cause sleep disturbance. Guidance on suitable noise levels for individual events is provided in ProPG, which states:

'In most circumstances in noise-sensitive rooms at night (e.g. bedrooms) good acoustic design can be used so that individual noise events do not normally exceed 45 dB $L_{Amax, F}$ more than 10 times a night. However, where it is not reasonably practicable to achieve this guideline then the judgement of acceptability will depend not only on the maximum noise levels but also on factors such as source, number, distribution, predictability and regularity of noise events'.

⁴ BS 8233:2014 Annex G.1 Note 3

A3 Baseline Survey – Instrumentation and Results

Survey Details and Instrumentation

- A3.1 Noise monitoring was undertaken using time-synchronised and fully calibrated Class 1 instrumentation as defined in BS EN 61672-1:2013⁵, calibrated to traceable standards within 2 years of the surveys. Details of the instrumentation used is summarised in **Table A.3.1**. Calibration certificates for acoustic instrumentation can be provided on request.
- A3.2 All noise measurements were conducted, where possible, in accordance with BS 7445:2003⁶ and supplemented by detailed observations of the sound climate at each monitoring location.
- A3.3 The survey was carried using fully calibrated instrumentation fitted with suitable windshields for the duration of the survey, located in free-field conditions at a height of 2.4 m above local ground.
- A3.4 Prior to and following the noise measurements, acoustic field-calibration of the sound level meters and microphones used in the survey was performed using an acoustic calibrator. No significant drift (i.e. ≥ 0.5 dB) in the field-calibrated noise level was observed.
- A3.5 The sound level meters were set to record several noise parameters, including the ambient (L_{Aeq}), maximum (L_{AFmax}), and background (L_{A90}) sound levels.
- A3.6 Noise monitoring was supplemented by continuous weather monitoring at a location chosen as being relatively well exposed to the prevailing weather conditions (**WML, Figure A.4.2**).
- A3.7 There were no construction works or traffic control measures in place during the survey. The local conditions were, therefore, judged to be acceptable for the survey and subsequent assessment.
- A3.8 The prevailing weather mostly dry, mild (12 to 13°C) and calm with maximum wind speeds of no more than 3.5 ms⁻¹. There was a minor period of rain that did not interfere with the measurement. Therefore, no noise data has been excluded from the assessment.

Table A.3.1: Baseline Survey Instrumentation

Type	Make	Model / Type	Serial	Date of Last Calibration
Sound Level Meter	Rion	NL-52	00687044	14/03/2024
			01276546	14/03/2024
Acoustic Calibrator	Svan	NC-74	35281145	14/03/2024
Weather Station	Davis	Vantage Vue	MQ171107088	n/a

⁵ BS EN 61672-1:2013 'Electroacoustics. Sound level meters Specifications' (2013)

⁶ BS EN 7445:2003 'Description and measurement of environmental noise. Guide to quantities and procedures' (2003)

Survey Results

Figure A.3.1: 18/03/2024 Time History, Location NML1-LT (Unattended Noise Measurements)

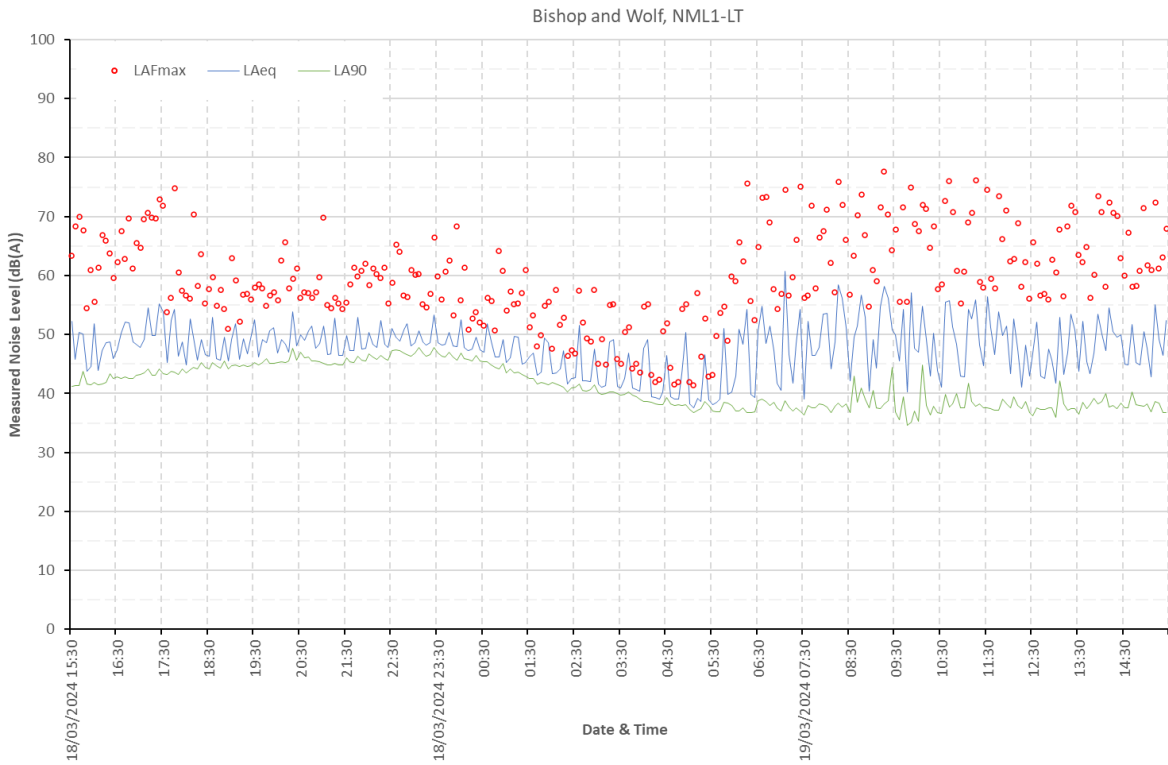


Figure A.3.2: 20/03/2024 Time History, Location NML1-LT (Unattended Noise Measurements)

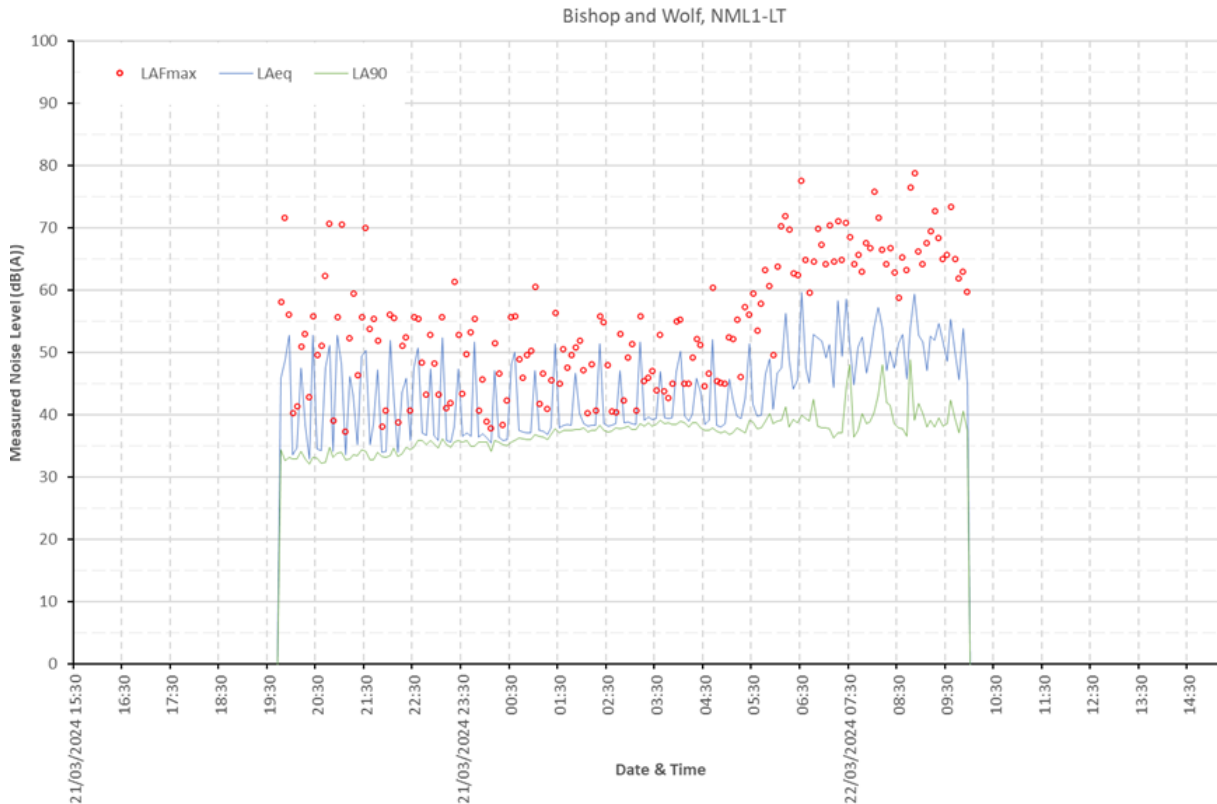
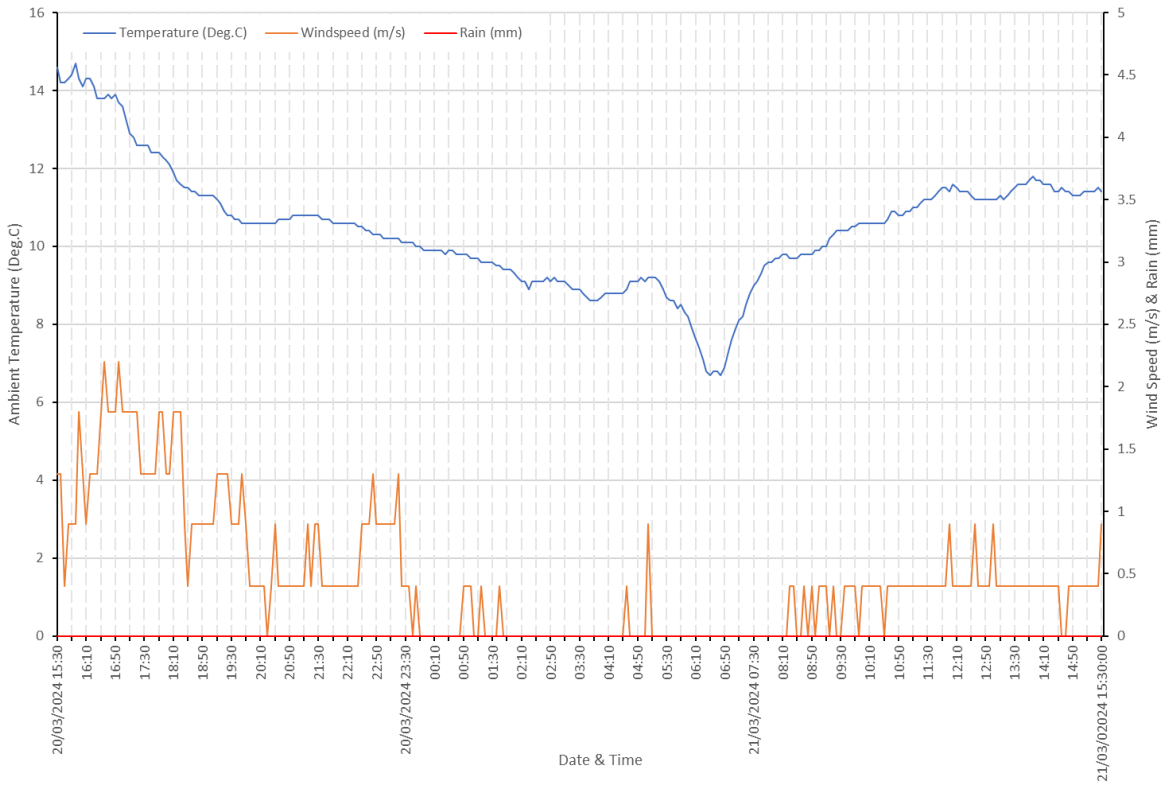
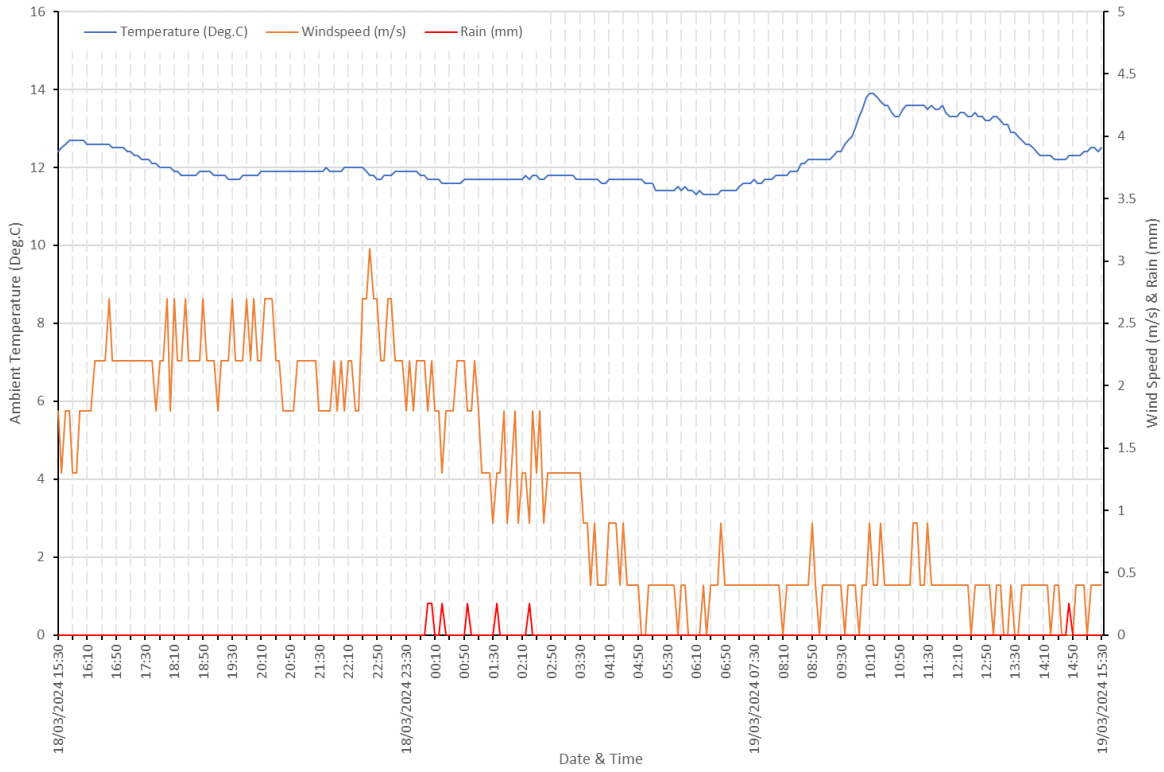


Figure A.3.3: Location WML – Logged Weather Data



A4 Baseline Survey – Site Photographs

Figure A.4.1: Noise Monitoring Location NML1-LT



Figure A.4.2: Weather Monitoring Location WML

