PELHAM SPRINGS SOLAR FARM

NOISE ASSESSMENT FOR PLANNING

Acoustics Report A1784 R01b

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Report for:	Low Carbon Solar Park 6 Ltd
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1 Introduction

Ion Acoustics is appointed by Pegasus Planning Group Ltd on behalf of Low Carbon Solar Park 6 Ltd to provide advice on operational noise associated with the proposed Pelham Springs Solar Farm on land between Manuden and Stocking Pelham, on the Essex / Hertfordshire border.

This assessment has been informed by a baseline noise survey carried out at the site from the 3rd to the 5th August 2021. This report documents the relevant guidance, methodology and survey results, as well as the computer noise modelling exercise undertaken to establish the potential noise impact on nearby dwellings. Appropriate noise limits have been derived from the measured baseline noise levels and the impact derived in line with standard BS4142:2014 criteria. This report sets out the assessment and demonstrates that the impact of noise from the solar farm will not result in any loss of amenity for nearby residents.

2 Scheme Details

2.1 Site Location

The proposed site is located on farm land between Manuden and Stocking Pelham, near the Essex / Hertfordshire border, approximately 6.5km north-west of Bishops Stortford.

The site is in a rural area, with fields in all directions though there are some residential receptors to the south-east and the west of the site boundary. To the west of the site, at a distance of 350m from the site boundary lies a large electricity substation which is part of the existing distribution network in the area. The site location, nearest noise sensitive receptors (blue pins) and noise monitoring locations (red pins) are presented in Figure 1 below.

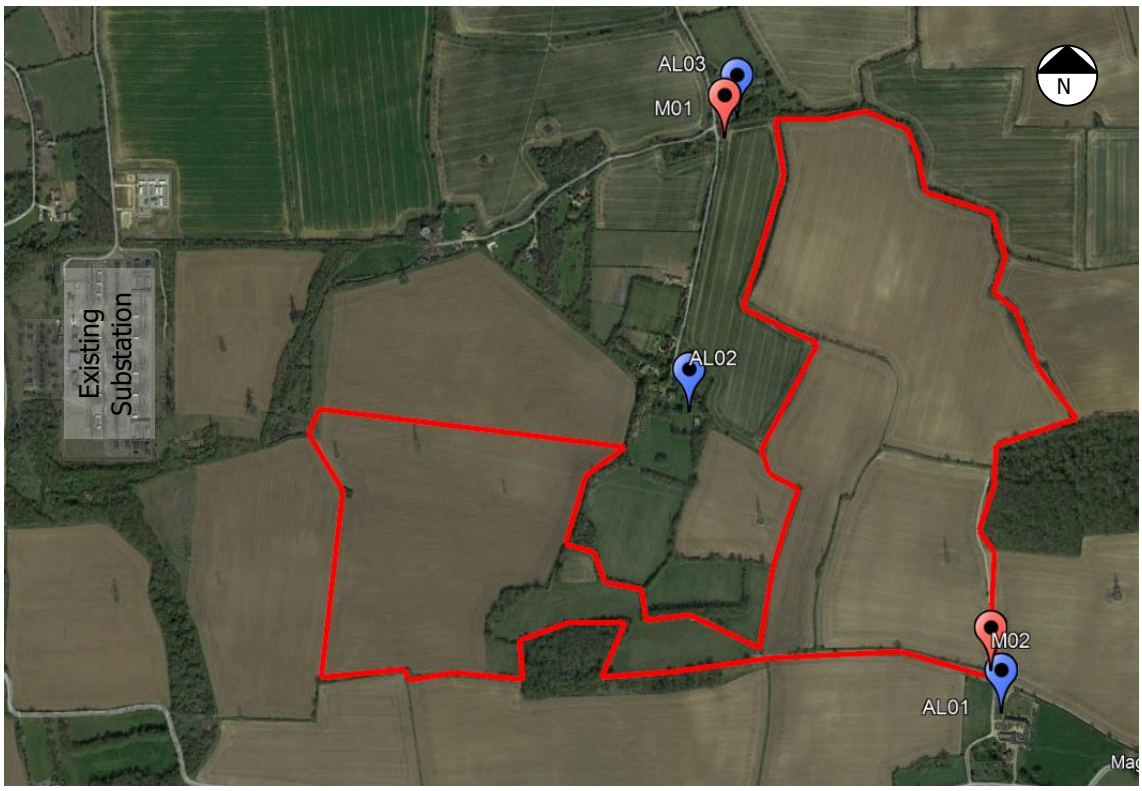


Figure 1 – Site location showing site and nearest receptor locations © Google

The receptors are presented in further detail in Table 1 below. This includes an approximate OS grid co-ordinate and a distance to the site boundary.

Table 1: Noise Assessment Locations

Assessment Location	Approximate OS Grid Co-ordinates, (E, N)	Distance to site boundary (m)
AL01 – Battles Hall	547540, 227750	200
AL02 – Brick House	546917, 228330	50
AL03 – The Crump	546976, 228917	75

2.2 Proposed Solar Farm

The proposed development is for a solar farm with battery storage including the following associated equipment:

- 26 No. Power inverter units;
- 40 No Battery storage units
- A single Distribution Network Operator (DNO) transformer station.

The nature of solar farms is such that electricity is only generated during daylight hours. This may extend into times considered to be part of the night (that is early mornings before 07:00 hours) and during evenings (after 19:00 hours) during the summer. An outline plan of the proposed facility is presented in Figure 2 below.

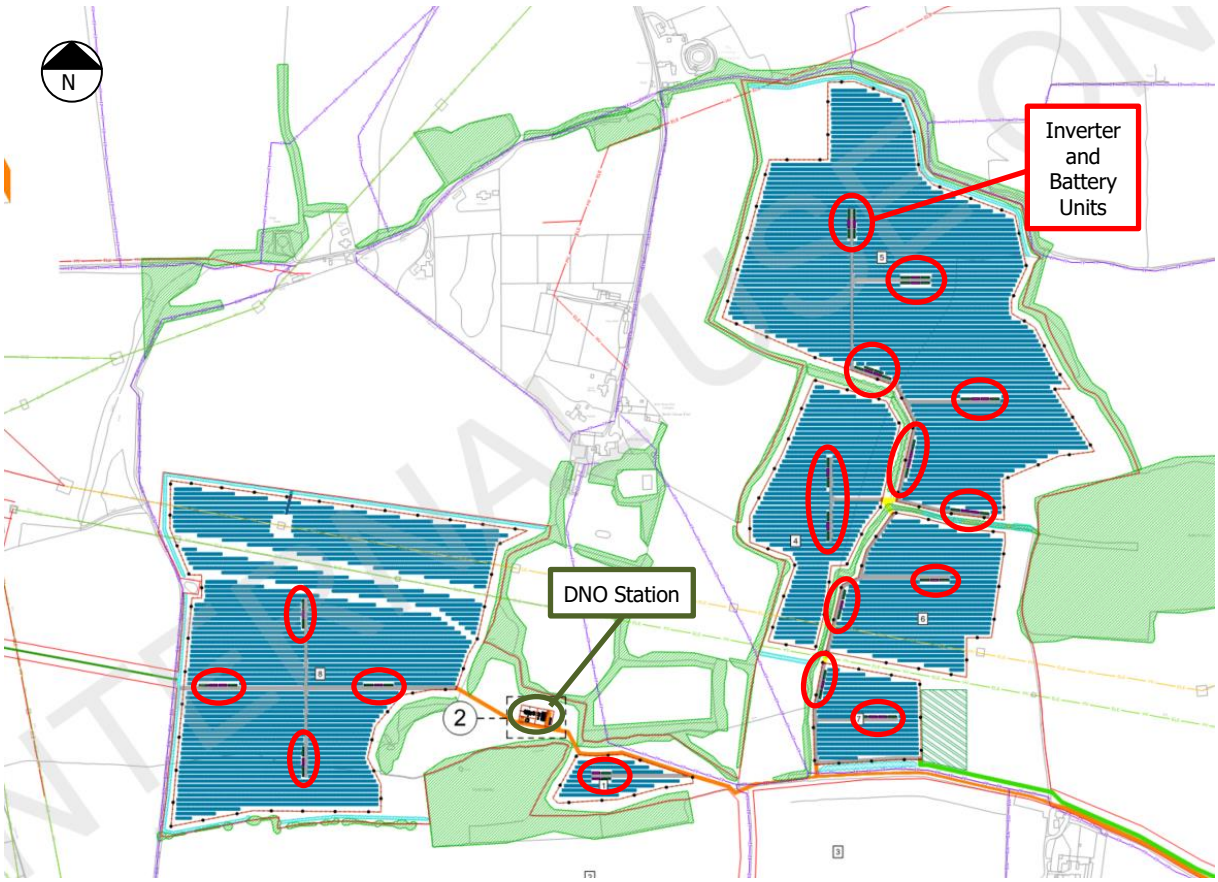


Figure 2 – Proposed Site Layout (Inverter and Battery locations circled in red)

The proposed development will include a number of battery energy storage containers, which store electrical energy during periods of low demand and feed it back in to the distribution network during periods of higher demand. The battery units are assumed to use excess electricity from the solar farm to charge in addition to charging from the distribution network. The battery units are generally arranged around the site and grouped with the inverter infrastructure for the solar farm.

3 Planning Policy and Other Guidance on Noise

3.1 National Planning Policy Framework (NPPF)

In 2012 the National Planning Policy Framework (NPPF) replaced a number of Planning Policy Statements with a single document which is intended to promote sustainable development. The NPPF was revised in July 2021[1] and certain aspects of the guidance changed.

The NPPF sets out the Government's policies for the planning system in England. The document is generally not prescriptive and does not provide noise criteria. Instead, it places the onus on local authorities to develop their own local plans and policies.

Sections of the NPPF relating to noise are stated below:

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

e) 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.

185. 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:

a) mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life;

b) identify and protect areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason;

3.2 Noise Policy Statement for England (NPSE)

The Noise Policy Statement for England (NPSE)[2] sets out the Government's policy on environmental, neighbourhood and neighbour noise for England. The policy has three aims:

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

[1] https://www.gov.uk/government/publications/national-planning-policy-framework--2
2 Noise Policy Statement for England (DEFRA) available at:
[redacted]

The NPSE introduces the following terms which are also used in the NPPF:

"NOEL – No Observed Effect Level

This is the level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to the noise.

LOAEL – Lowest Observed Adverse Effect Level

This is the level above which adverse effects on health and quality of life can be detected.

SOAEL – Significant Observed Adverse Effect Level

This is the level above which significant adverse effects on health and quality of life occur."

However, neither the NPSE nor the NPPF Planning Practice Guidance defines numeric bounds for NOEL, LOAEL or SOAEL. The boundary of each effect level should be defined for each situation and location.

Further Government planning advice is available online[3]. The online guidance refers to the NPPF and NPSE and presents a noise assessment hierarchy table to provide further information on the boundaries between NOEL, LOAEL and SOAEL. This is shown below in Table 2.

[3] See [redacted]

Table 2: Noise Assessment Hierarchy Table

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

3.3 BS4142: 2014 +A1: 2019 – Assessment Principles

The standard method for assessing noise of an industrial nature affecting housing, is British Standard BS 4142 "Method for rating and assessing industrial and commercial sound". A BS 4142 assessment is typically made by determining the difference between the industrial noise under consideration and the background sound level as represented by the L_{A90} parameter, determined in the absence of the industrial noise. The L_{A90} parameter is defined as the level exceeded for 90% of the measurement time, representing the underlying noise in the absence of short duration noise events such as dog barks or individual cars passing.

The industrial noise under consideration is assessed in terms of the ambient noise level, L_{Aeq}, but a character correction penalty can be applied where the noise exhibits certain characteristics such as distinguishable tones, impulsiveness or, if the noise is distinctively intermittent. The ambient noise level, L_{Aeq} is defined as the steady-state noise level with the same energy as the actual fluctuating sound over the same time period. It is effectively the average noise level during the period. The industrial noise level (L_{Aeq}) with the character correction (if necessary) is known as rating level, L_{Ar}, and the difference between the background noise and the rating level is determined to make the BS 4142 assessment. The standard then states:

a) *"Typically, the greater the difference, the greater the magnitude of the impact.*

b) *A difference of around +10dB or more is likely to be an indication of a significant adverse impact, depending on the context.*

c) *A difference of around +5dB is likely to be an indication of an adverse impact, depending on the context.*

d) *The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context."*

The standard outlines a number of methods for defining appropriate 'character corrections' to determine the rating levels to account for tonal qualities, impulsive qualities, other sound characteristics and/or intermittency.

The standard also highlights the importance of considering the context in which a sound occurs. The standard indicates that factors including the absolute sound level, the character of the sound, the sensitivity of the receptor and the existing acoustic character of the area should be considered when assessing the noise impact. The absolute sound level is of particular importance where the measured background sound levels are low, which is typically taken as L_{A90} 30dB and below. In regard to low sound levels, the standard states:

"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."

3.4 BS 8233: 2014 and WHO criteria

British Standard BS 8233: 2014[4] and the World Health Organisation (WHO) also provide external noise criteria to protect residential amenity. These are detailed in Table 3 below.

Table 3: WHO / BS 8233: 2014 Guideline Noise Levels

Location	Critical Health Effect	07:00 to 23:00	23:00 to 07:00
Outside Bedroom Windows	Sleep Disturbance (Windows Open)	--	45dB $L_{Aeq,\ 8hours}$ (1)
Amenity Spaces (Gardens / Patios)	Moderate Annoyance Serious Annoyance	50dB $L_{Aeq,\ 16\ hours}$ (2) 55dB $L_{Aeq,\ 16\ hours}$ (2)	--
Notes: From WHO Community Noise Guidelines (1999) BS 8233: 2014 and WHO Community Noise Guidelines			

The WHO guideline of 45 dB $L_{Aeq,\ 8hr}$ represents an 8-hour L_{Aeq} outside noise-sensitive rooms to prevent sleep disturbance. The WHO limit is a level at 1m from the façade. Therefore, equivalent free field level would be approximately 3dB lower, that is 42 dB L_{Aeq}. The limits apply to relatively anonymous noises without character and are commonly applied to traffic noise.

3.5 Absolute Noise Level Assessment

In instances of low rating noise levels, BS4142 indicates that assessment in line with absolute noise limits might be as, or more, appropriate than a relative assessment. The standard states this is *'especially true at night'*.

To ensure the proposed development is not a significant or prohibiting factor in achieving the relevant WHO guideline values at sensitive residential receptors, noise generated by the development would need to be approximately 10dB below the guidance levels in Table 3.

Therefore, a target of 32 dB L_{Aeq} (free field) is proposed for noise from the solar farm at residential receptors. This is set on the basis of the night-time noise limit to ensure that sleep is protected. This is an external noise limit which, when assessed as an internal noise level, even with windows open, is likely to be consistent with a rating of a low impact in accordance with BS 4142.

4 Noise Survey

A baseline noise survey was carried out between the 3rd and 5th August 2021 at two locations in the vicinity of the site, at locations approximating the nearest noise sensitive receptors.

The survey was undertaken using two Rion NL52 sound level meters, each with a WS-15 windshield. The equipment was set to measure various noise indices in 15-minute periods and record sample audio recordings throughout the survey. At both locations, the microphone and windshield were mounted on a tripod at approximately 1.5m above local ground level. The meters were calibrated at the start and end of the survey using a Brüel & Kjær Type 4231 sound level calibrator with no drift observed. Calibration certificates are available on request.

The noise survey was entirely unattended apart from at set up and collection. All equipment was set up and collected by Mark Harrison of Ion Acoustics.

[4] British Standards Institution (2014) BS 8233:2014: Guidance on sound insulation and noise reduction for buildings

4.1 Noise Monitoring Location M01

The first monitoring location was sited to the north of the site area, in the vicinity of The Crump, approximately 25m from the nearest dwelling. The monitoring station was located on soft ground in a free field location. The location is shown in Figure 3 below.

Figure 3 –Monitoring Station M01 Detail

The noise climate during the set up and collection period was subjectively considered relatively tranquil, with very few readily identifiable noise sources.

Some noise from aircraft movements was audible, particularly in the audio recordings made during the unattended periods. Based on the audio recordings, it is likely that the aircraft were larger passenger aircraft rather than smaller, light / recreational aircraft. Further analysis of the audio recordings demonstrates that aircraft movements were relatively frequent, occurring during both the daytime and portions of the night-time period.

Other noise sources of note include bird song and grasshoppers in the area and very low-level wind noise in trees etc.

4.2 Noise Monitoring Location M02

Monitoring location M02 was sited to the south-eastern corner of the site, in a location approximating the noise climate in the vicinity of Battle Hall (AL01). The monitoring equipment was positioned on soft ground, in a free-field location, approximately 100m from the dwelling. Figure 4 below shows the monitoring location in further detail.

Looking south towards dwellings

Looking west

Figure 4 –Monitoring Station M02 Detail

The noise climate during the set up and collection period was again, relatively tranquil, dominated by bird song and other natural sounds. The time history charts for the survey demonstrate frequent, high L_{A90} noise levels throughout the survey, typically between the hours of 07:30 and 16:30hrs. The frequency and punctuality of these noise events would indicate that the source is man-made (rather than a natural source i.e. stream or river). Analysis of the audio recordings does not indicate an obvious source of the noise. To that end, it is considered to be typical of the character of the area and has been retained in the assessments below.

4.3 Weather

The prevailing meteorological conditions were monitored at this location using a Davis Vantage Vue weather station. This logged rainfall, ambient temperature, wind speed and direction for the duration of the survey. The recorded weather data indicates that conditions during the survey were relatively settled, with warm daytime temperatures (17°C to 19°C) and light wind speeds (<2m/s). During the night-time periods the ambient air temperatures dropped to 10°C to 14°C and wind speeds dropped to very low / still conditions. No rain was recorded throughout the survey period. The weather conditions would not have had a significant impact on the noise levels measured.

5 Survey Results

The baseline survey data measured at the logging stations is summarised in the tables presented below. In both instances, the ambient sound level, the logarithmic average of the $L_{Aeq,\ 15min}$ values is shown. For the background sound level, L_{A90}, the minimum, mean (average) and mode (most

common) values are presented to facilitate the derivation of the "typical" value in line with BS 4142:2014 guidance.

5.1 Location M01 – Survey Results

Table 4: Summary of Noise Monitoring Data – M01

Period		Duration Hh:mm	L_{Aeq}, dB	Background Sound Level, L_{A90}, dB		
				Minimum	Arithmetic mean	Mode (Most common)
Tuesday 3rd August 2021	Daytime 12:30 – 23:00	10:30	42.1	24	32	34
	Night 23:00 – 07:00	08:00	38.1	18	24	25
Wednesday 4th August 2021	Daytime 07:00 – 23:00	16:00	42.1	26	31	31
	Night 23:00 – 07:00	08:00	40.6	22	26	25
Thursday 5th August 2021	Daytime 07:00 – 10:45	04:15	43.3	29	34	32

The ambient noise levels at location M01 are consistent during the daytime hours, being between 42dB and 43dB. The background sound level demonstrates slightly more variation, ranging between L_{A90} 31dB and 34dB (mode).

During the night-time period the background sound level falls to very low levels, never exceeding L_{A90} 30dB in either the min, mean, or mode parameters.

5.2 Location M02 – Survey Results

Table 5: Summary of Noise Monitoring Data – M02

Period		Duration Hh:mm	L_{Aeq}, dB	Background Sound Level, L_{A90}, dB		
				Minimum	Arithmetic mean	Mode (Most common)
Tuesday 3rd August 2021	Daytime 12:00 – 23:00	11:00	47.3	23	35	31
	Night 23:00 – 07:00	08:00	37.0	21	24	21
Wednesday 4th August 2021	Daytime 07:00 – 23:00	16:00	46.7	26	37	31
	Night 23:00 – 07:00	08:00	38.7	24	27	26
Thursday 5th August 2021	Daytime 07:00 – 11:30	04:30	47.7	30	43	43

As with location M01, night-time noise levels at location M02 are low, with background sound levels not exceeding L_{A90} 30dB.

5.3 Analysis of Background Sound Levels

The solar aspect of the facility would only operate during daylight hours. However, during the summer months, this could begin as early as 05:00hrs and extend to 22:00hrs. The battery storage aspect of the facility may operate at any point during a typical 24-hour period. The analysis of the measured background sound levels during the relevant operational periods is summarised in Table 6 below:

Table 6: Background Sound Level Analysis

Monitoring Location	Period	Measured Background Sound Level, L_{A90}, dB		
		Minimum	Arithmetic Mean	Mode (most common)
M01	Daytime (07:00 to 23:00)	24	32	31
	Night-time (23:00 to 07:00)	18	25	25
M02	Daytime (07:00 to 23:00)	23	37	31
	Night-time (23:00 to 07:00)	21	25	25

In addition to the above, the distribution of L_{A90} (integer) values for both the daytime and night-time periods, for both monitoring periods have been considered. These are presented in Appendix A of this report for reference.

For location M01, the daytime period demonstrates a simple bell-shaped distribution of integer values with a peak in the distribution of L_{A90} 31dB (the mode value). Further analysis shows that the background sound level falls within the range L_{A90} 29dB to L_{A90} 33dB for 64% of the survey period. As such, L_{A90} 31dB is considered typical.

During the night-time period, the distribution is more complex, with a peak in values at L_{A90} 25dB and a secondary peak of L_{A90} 22dB. In both instances, the background sound level would be considered very low. L_{A90} 25dB is considered typical.

At location M02, the daytime noise climate shows two discrete distributions of L_{A90} values, with the mode value at L_{A90} 31dB and a second distribution around L_{A90} 46dB. The higher values relate to the unknown activities in the vicinity of the monitoring location which, cannot be identified in the recordings. The activities generally occur between 07:30 and 16:30 during daytime hours only. In this instance, L_{A90} 31dB is taken as being typical as it represents the background sound level in the absence of the unidentified activity.

The night-time noise climate is relatively simple, with a mode value of L_{A90} 25dB or 26dB and an upper value of L_{A90} 31dB. For this location L_{A90} 25dB is considered typical during the night-time. Given this range the background sound level during the night is considered very low.

5.4 Noise Targets

Table 7 below presents the typical background sound level and appropriate noise targets used in this assessment. The table presents noise targets for the daytime and night-time periods and the relevant assessment locations.

For the night-time, an absolute noise target of 32 dB(A) has been set as discussed in Section 3.5. BS 4142 states that such a limit may be more appropriate.

Table 7: Proposed Noise Targets

Monitoring Location	Assessment Location	Assessment Period	Typical Background Sound Level, L_{A90}, dB (Ref section 5.3)	Noise Limit, dB
M01	AL02, AL03	Daytime (07:00 to 23:00)	31	31
		Night-time (23:00 to 07:00)	25	32*
M02	AL01	Daytime (07:00 to 23:00)	31	31
		Night-time (23:00 to 07:00)	25	32*
* When very low noise levels are reported an absolute noise limit has been applied in accordance with the rationale in section 3.5 above				

The rating level is defined as the specific noise level generated by the facility plus any specific character corrections which need to be applied in line with BS4142:2014.

6 Noise Predictions

A noise model has been constructed using IMMI[5] noise modelling software to predict noise levels to the nearest noise-sensitive receptor locations. Within the modelling software, propagation of noise has been calculated in accordance with ISO 9613-2[6] with the following input parameters:

- Downwind propagation (noise levels under crosswind and upwind conditions will be less);
- Mixed ground between the noise source and the receiver locations (G = 0.5),
- Ambient air temperature of 10°C and 70% Relative Humidity; and,
- Barriers and screening influence calculated in accordance with ISO 9613-2.

The input source data for the model is described below. In the event that different equipment is specified, it will be designed to the same noise limits.

6.1 Noise Data

The solar panels feed in to 26no. power inverter units which are distributed across the site as shown in Figure 2 above. The inverters are generally grouped with the battery storage containers. The outputs of the localised inverters are then fed to a DNO substation for export to the distribution network. These items will be the only significant noise sources at the site. Typical sound power levels for these sources are given in the tables below.

Inverter Units

The Inverters are understood to be SMA Solar Inverter systems. These are assumed to be SC 4400 inverters which, according to the manufacturers data, generate a sound pressure level of 75dB @1m. The sound power level has been derived using standard calculation methodologies, assuming hemispherical propagation of the noise source[7]. Table 8 summarises the operational noise levels of the inverter. This represents unit operating at 100% capacity during a sunny daytime period.

[5] IMMI noise mapping https://www.immi.eu/en/noise-mapping-with-immi.html
[6] ISO 9613-2: Acoustics – Attenuation of sound during propagation outdoors: Part 2: General method of calculation
[7] Sound power level calculated using $L_W = L_p+20\log(r)+8$

Table 8: Noise Data – Inverter Unit

Noise Source	Sound Power Level (dB) in Octave Bands, Hz							Overall, dB L_{WA}
	63	125	250	500	1000	2000	4000	
Inverter Units	80.4	79.0	81.5	79.5	75.3	72.7	77.9	83.0

Information available for the SMA inverters indicates the potential of tonal content in the 3150Hz 1/3rd octave band. This would typically require a tonal correction in accordance with BS4142. That being said, the distance between the noise sources and receptors is such that any tonal content will be masked by other environmental noise. Any high frequency content including tones will tend to be dissipated readily with distance which, at this site, is a minimum of 300m (between receptor and noise source).

Battery Energy Storage Units

The site is to accommodate up to 40 energy storage container units which are to store electrical energy and return it to the distribution network as / when required.

The battery storage units generate very little noise and are effectively silent during operation. That said, associated plant items, specifically heating / cooling equipment do generate noise which is relevant to the assessment.

No specific information relating to these noise sources has been provided however, Ion Acoustics library data indicates that battery units of this nature may require up to four HVAC (Heating, Ventilation and Air Conditioning) units. Noise information for four HVAC units operating at 100% is provided in table 9 below.

Table 9: Noise Data – Battery HVAC Units

Noise Source	Sound Power Level (dB) in Octave Bands, Hz							Overall, dB L_{WA}
	63	125	250	500	1000	2000	4000	
4no HVAC Units	80.5	72.5	69.5	72.5	68.5	59.5	59.5	73.0

Noise from HVAC units is generally broadband in nature, exhibiting no tonal content which might warrant a character correction in BS4142.

DNO Station - Transformer

The DNO station includes a number of items of plant which facilitate the connection to the distribution network. The most significant noise source is the large power transformer.

No specific information has been provided for the DNO transformer, therefore typical noise data from a similar solar farm site has been used in this assessment. The sound power level used within this assessment is summarised in Table 10 below.

Table 10: Noise Data – DNO Transformer

Noise Source	Sound Power Level (dB) in Octave Bands, Hz							Overall, dB L_{WA}
	63	125	250	500	1000	2000	4000	
DNO Power Transformer	78.0	78.8	80.4	83.7	77.7	67.6	62.0	83.0

7 Operational Assessment

7.1 Noise Contours

The noise predictions are presented in the first instance as a noise contour plot in Figure 5 below, showing the predicted noise levels (dB L_{Aeq}) and the nearest houses. The contours assume that all equipment is running at full capacity, which is only likely to occur in the middle of a sunny day when all plant is operating at 100%, including the battery storage units.

Figure 5 – Indicative Noise Contour Plot, dB L_{Aeq}

The noise contour plot above indicates that the propagation of noise is largely restricted to the immediate area surrounding the site and is contained within the site boundary. The lowest contour shown (light green) is the 30dB(A) contour which does not propagate as far as the nearest residential receptor locations.

7.2 Predicted Noise Levels at Receptors

In addition to the noise contours, the model has been used to calculate specific noise levels at the third-party receptor locations shown with red house symbols above. These predicted levels have been used to evaluate the noise impact in accordance with the methodology detailed in BS 4142.

The noise information provided for the inverter units indicates some tonal content in the 3150Hz 1/3rd octave band. While some tonal noise may be present, given the distance between the site and the receptor locations, and the low predicted specific noise levels, it is not likely to be readily

identifiable. To that end, a +2dB correction for a 'just perceptible' tonal content has been applied in the calculations below.

Noise generated by the DNO station transformer and the HVAC units is generally taken as being broadband in nature, displaying no tonal elements.

In addition to the above, the solar farm does not generate any other identifiable characteristics i.e. intermittency, impulses and/or 'other' characteristics.

The solar scheme will only operate during daylight hours, with full capacity reached around the middle of the day on a sunny day. However, the battery storage aspect of the development could, feasibly, operate at any time within a typical 24 hours period; charging / discharging as the demands of the distribution network require. To that end, the assessments below have assessed the potential noise impact against the targets established in section 5.4 above, for both the daytime and night-time hours. The predicted noise levels are given in Table 11.

Table 11: Noise Impact Assessment

Receptor Location	Period	Predicted (Specific) level, dB L_{Aeq}	Rating level, dB L_{Ar}	Rating Noise Target (ref Section 5.4) dB L_{Ar}	Difference, dB
AL01 – Battle Hall	Daytime	24.8	27	31	-4
	Night-time	24.8	27	32	-5
AL02 – Brick House	Daytime	29.8	32	31	+1
	Night-time	29.8	32	32	+/-0
AL03 – The Crump	Daytime	27.7	30	31	-1
	Night-time	27.7	30	32	-2

Table 11 above indicates that noise generated by the solar farm may exceed the noise target at AL02 by 1dB. While this exceeds the noise target, the impact rating, in accordance with BS4142 would indicate that it falls comfortably below the level at which an adverse noise impact would occur. Further to this, it is a very low noise level, in absolute terms, and is likely to be masked by the prevailing ambient noise climate in the area.

In terms of the noise exposure hierarchy table (Table 2 above), noise generated by the facility would, at worst, be at the no observed adverse effect level: where noise may be audible but not result in a change in the quality of life. Therefore, there is no mitigation required in terms of noise.

7.3 Uncertainty and Context

BS 4142 requires an assessment of context and uncertainty.

While the site is in a rural setting, it is located approximately 350m to the east of an existing, large, electricity substation indicating that noise from electricity infrastructure is not entirely out of keeping with the existing context of the area.

There is uncertainty in all measurements and assessments. The uncertainty in the survey has been minimised by measuring over two nights. Weather data measured at the site was used to

ensure that the data used in the assessment was collected during periods of appropriate meteorological conditions. The background sound level varied to a degree during the survey therefore detailed consideration has been given to the derivation of the 'typical' background sound level. The calculation methodology used, ISO 9613-2, states that noise levels are predicted to ±3dB.

Additional uncertainty may factor in the manufacturer's noise data obtained; however conservative calculation measures were used to ensure any errors were minimised. Conservative practices adopted to minimise uncertainty over all include:

- Rating correction applied for the potential tonal content associated with the inverter units; and,
- Assumptions relating to operating plant i.e. plant operates for 100% of the assessment period. This is unlikely to occur in practice and certainly not at the more sensitive periods (evenings and early mornings).

Given the above, uncertainty is not considered to have a significant impact on the overall assessment outcome.

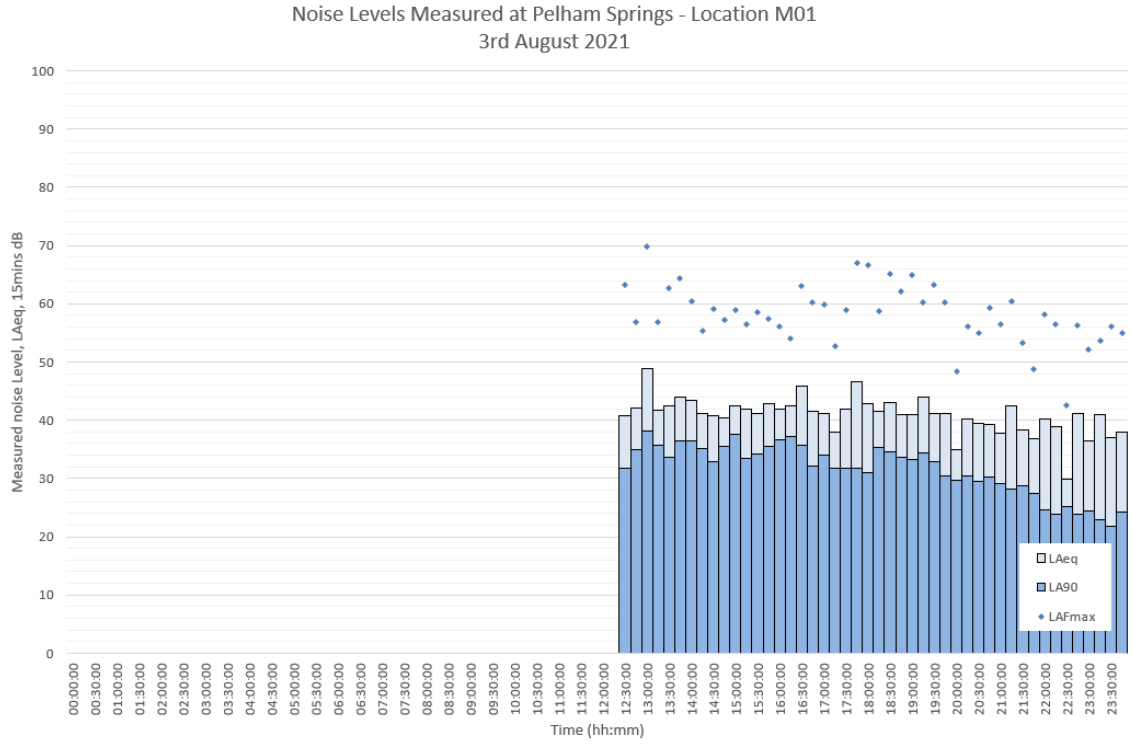
8 Summary

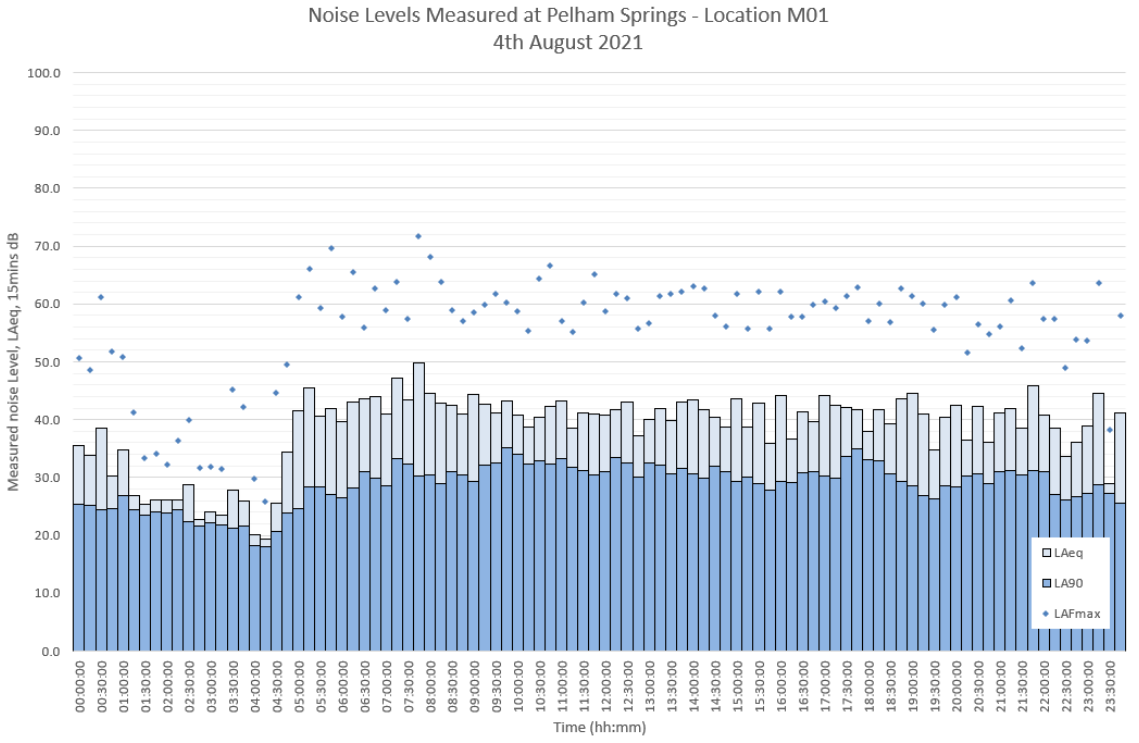
A noise assessment has been carried out for a proposed solar farm on land at Pelham Springs, near Manuden, on the Essex / Hertfordshire border. A baseline noise monitoring survey was undertaken at the site and a combination of the measured background sound levels and absolute noise targets have been used to derive the noise impact of the facility.

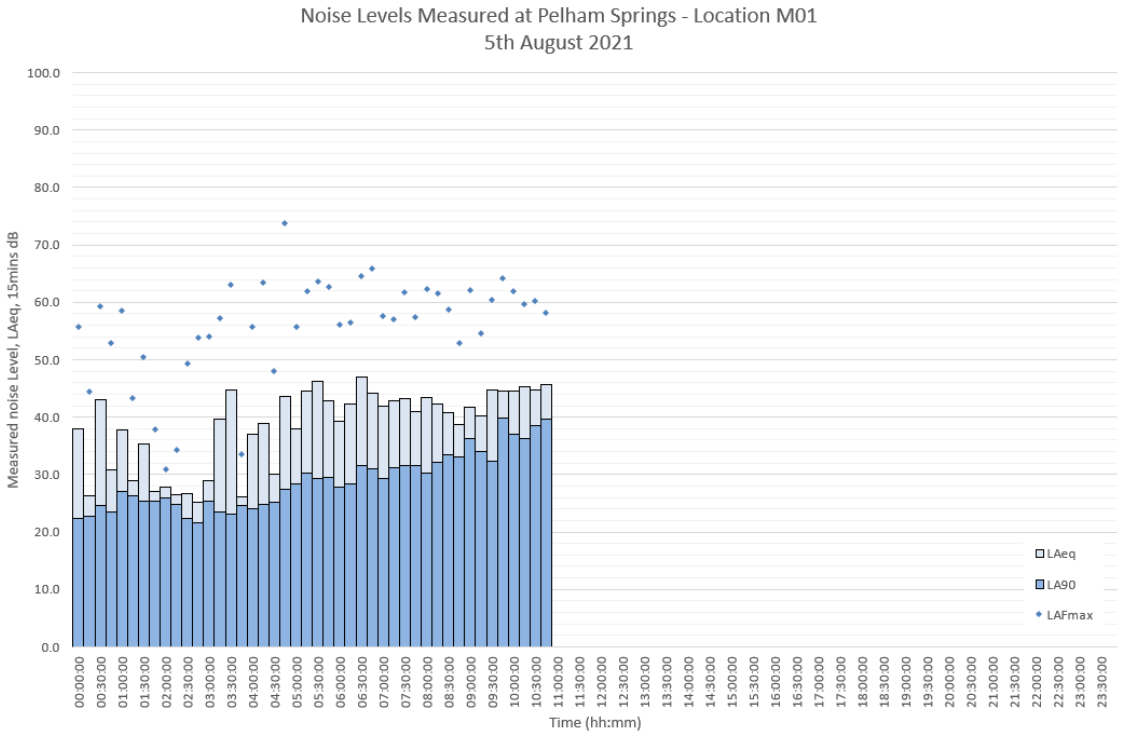
Overall, the calculations indicate that operational noise from the facility during the daytime and night-time periods would be relatively low in absolute terms and would largely comply with the operational noise target though may slightly exceed the target at location AL02. This exceedance is considered to be slight and would not result in any adverse noise impacts in accordance with BS4142.

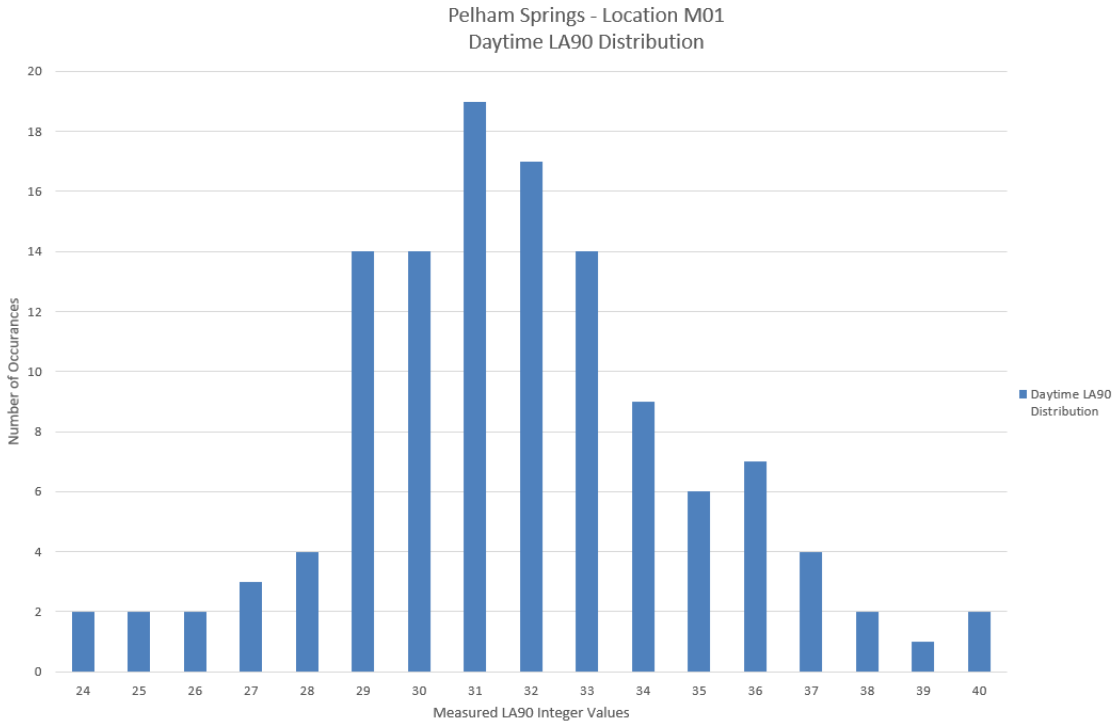
Given the above, it is considered that there are no noise-related issues associated with the proposed solar farm which would prevent the granting of full planning permission.

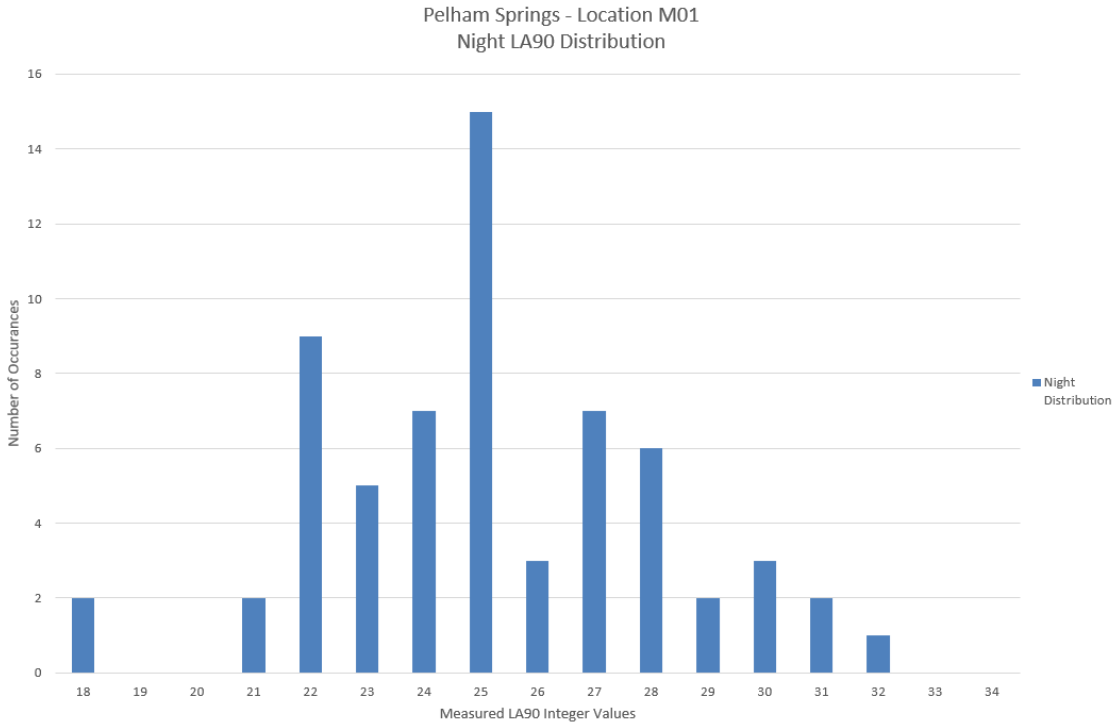
Noise Monitoring Location M01






Noise Levels Measured at Pelham Springs - Location M01
5th August 2021
Measured noise Level, LAeq, 15mins dB
100.0
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
LAeq
LA90
LAFmax
Time (hh:mm)

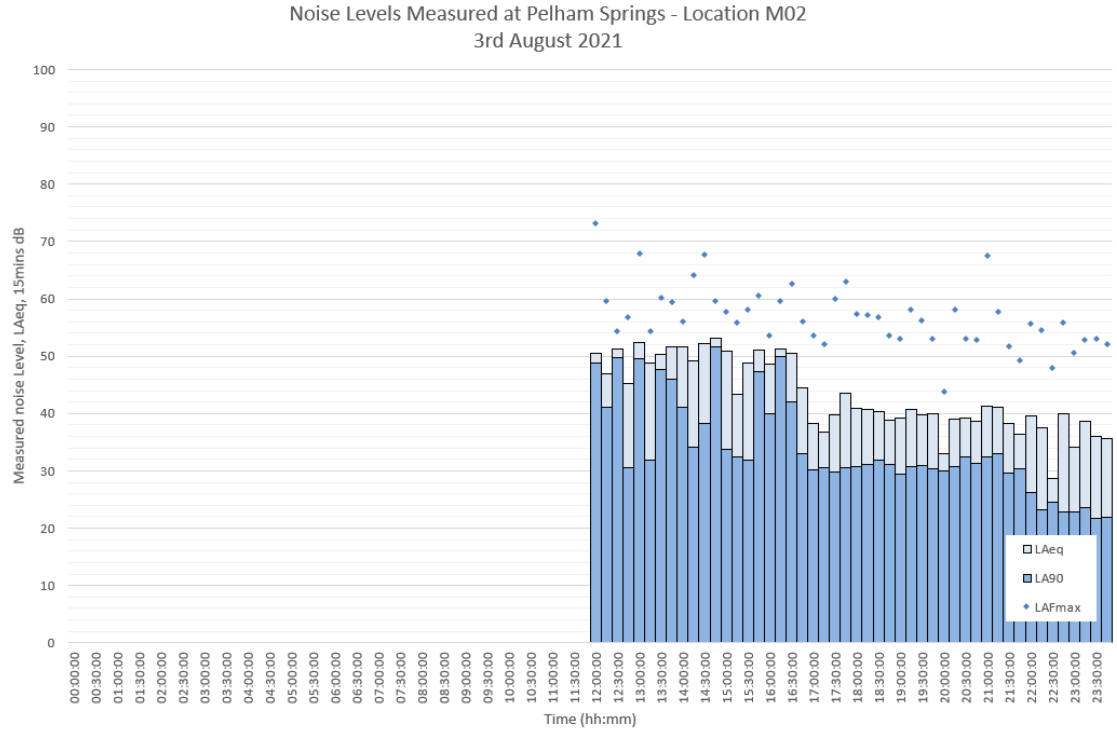

Pelham Springs - Location M01
Daytime LA90 Distribution
Number of Occurances
20
18
16
14
12
10
8
6
4
2
0
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
Measured LA90 Integer Values
Daytime LA90 Distribution

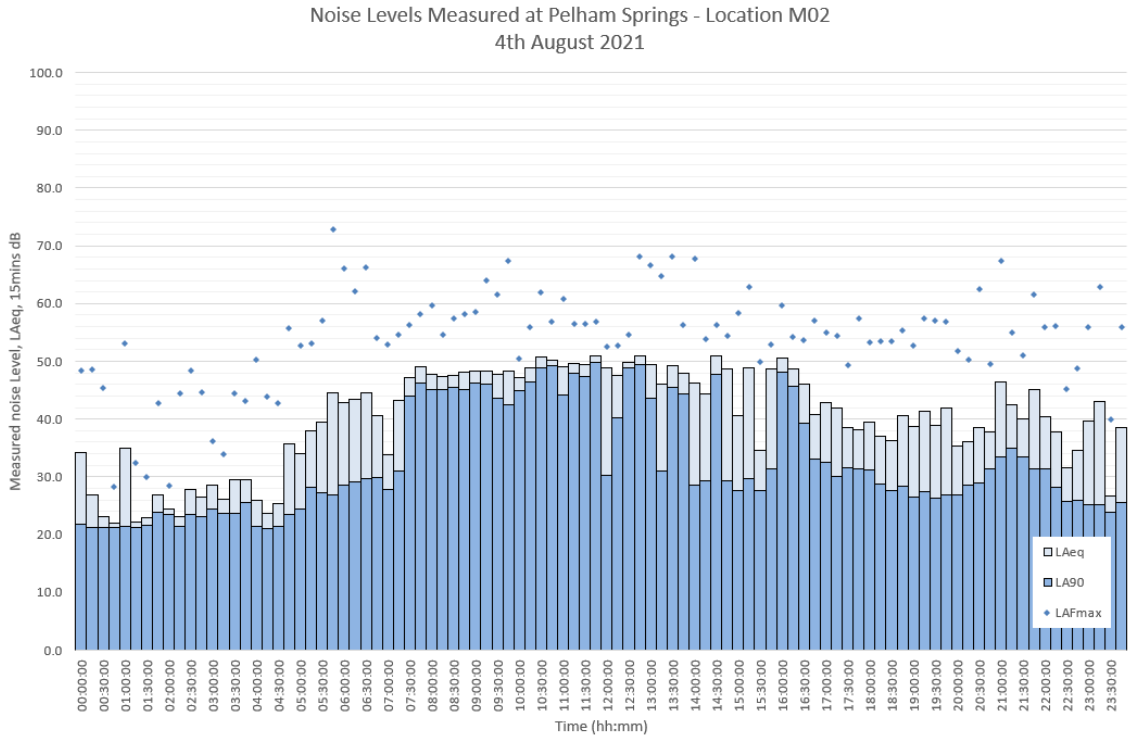

Pelham Springs - Location M01
Night LA90 Distribution
Number of Occurances
0
2
4
6
8
10
12
14
16
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
Measured LA90 Integer Values
Night Distribution

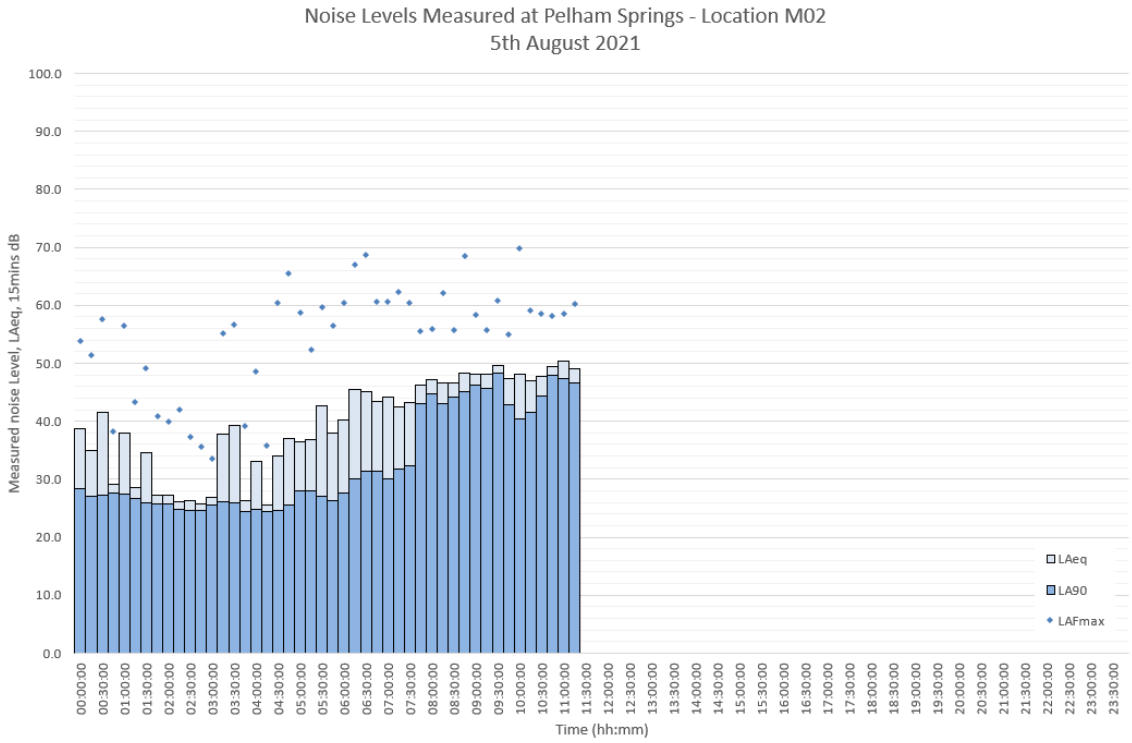
Time	L_{Aeq} dB	$L_{Amax,F}$ dB	L_{AF90} dB	Time	L_{Aeq} dB	$L_{Amax,F}$ dB	L_{AF90} dB	Time	L_{Aeq} dB	$L_{Amax,F}$ dB	L_{AF90} dB
03/08/2021 12:30	40.8	63.3	31.7	04/08/2021 00:30	38.6	61.1	24.5	04/08/2021 12:30	43.0	61.0	32.6
03/08/2021 12:45	42.1	56.8	35.0	04/08/2021 00:45	30.3	51.8	24.7	04/08/2021 12:45	37.2	55.8	30.1
03/08/2021 13:00	48.8	69.9	38.1	04/08/2021 01:00	34.8	50.9	26.8	04/08/2021 13:00	40.0	56.6	32.5
03/08/2021 13:15	41.8	56.9	35.8	04/08/2021 01:15	26.8	41.3	24.5	04/08/2021 13:15	42.0	61.3	32.2
03/08/2021 13:30	42.5	62.7	33.6	04/08/2021 01:30	25.3	33.3	23.4	04/08/2021 13:30	39.9	61.8	30.7
03/08/2021 13:45	44.0	64.4	36.5	04/08/2021 01:45	26.1	34.2	24.1	04/08/2021 13:45	43.1	62.2	31.6
03/08/2021 14:00	43.5	60.5	36.4	04/08/2021 02:00	26.1	32.3	23.9	04/08/2021 14:00	43.4	63.1	30.7
03/08/2021 14:15	41.2	55.4	35.2	04/08/2021 02:15	26.2	36.3	24.4	04/08/2021 14:15	41.7	62.6	29.8
03/08/2021 14:30	40.8	59.2	32.9	04/08/2021 02:30	28.7	39.9	22.3	04/08/2021 14:30	40.4	58.0	32.0
03/08/2021 14:45	40.5	57.2	35.6	04/08/2021 02:45	22.8	31.7	21.6	04/08/2021 14:45	38.8	56.2	31.1
03/08/2021 15:00	42.4	58.9	37.5	04/08/2021 03:00	24.0	31.8	22.2	04/08/2021 15:00	43.6	61.7	29.4
03/08/2021 15:15	42.0	56.4	33.5	04/08/2021 03:15	23.5	31.5	21.8	04/08/2021 15:15	38.7	55.8	30.0
03/08/2021 15:30	41.1	58.5	34.3	04/08/2021 03:30	27.9	45.2	21.3	04/08/2021 15:30	42.8	62.1	28.9
03/08/2021 15:45	42.8	57.5	35.6	04/08/2021 03:45	25.9	42.2	21.7	04/08/2021 15:45	35.9	55.7	27.9
03/08/2021 16:00	42.0	56.1	36.7	04/08/2021 04:00	20.2	29.7	18.2	04/08/2021 16:00	44.2	62.2	29.4
03/08/2021 16:15	42.4	54.0	37.3	04/08/2021 04:15	19.3	25.8	18.0	04/08/2021 16:15	36.6	57.8	29.2
03/08/2021 16:30	45.9	63.1	35.8	04/08/2021 04:30	25.6	44.7	20.7	04/08/2021 16:30	41.3	57.8	30.8
03/08/2021 16:45	41.5	60.2	32.2	04/08/2021 04:45	34.4	49.6	23.8	04/08/2021 16:45	39.6	59.9	31.1
03/08/2021 17:00	41.2	59.9	34.0	04/08/2021 05:00	41.5	61.1	24.7	04/08/2021 17:00	44.2	60.4	30.3
03/08/2021 17:15	37.9	52.8	31.8	04/08/2021 05:15	45.4	66.1	28.3	04/08/2021 17:15	42.5	59.4	29.8
03/08/2021 17:30	42.0	58.9	31.8	04/08/2021 05:30	40.6	59.3	28.4	04/08/2021 17:30	42.1	61.3	33.6
03/08/2021 17:45	46.6	67.0	31.8	04/08/2021 05:45	42.0	69.6	27.0	04/08/2021 17:45	41.7	62.8	34.9
03/08/2021 18:00	42.8	66.6	31.0	04/08/2021 06:00	39.6	57.8	26.5	04/08/2021 18:00	38.0	57.1	33.0
03/08/2021 18:15	41.6	58.7	35.3	04/08/2021 06:15	43.0	65.6	28.2	04/08/2021 18:15	41.7	60.1	32.8
03/08/2021 18:30	43.1	65.2	34.5	04/08/2021 06:30	43.7	55.9	31.0	04/08/2021 18:30	39.2	56.9	30.6
03/08/2021 18:45	40.9	62.1	33.6	04/08/2021 06:45	44.0	62.7	29.9	04/08/2021 18:45	43.6	62.7	29.4
03/08/2021 19:00	40.9	65.0	33.3	04/08/2021 07:00	41.0	59.0	28.6	04/08/2021 19:00	44.5	61.3	28.5
03/08/2021 19:15	43.9	60.2	34.4	04/08/2021 07:15	47.2	63.9	33.3	04/08/2021 19:15	41.0	60.0	26.9
03/08/2021 19:30	41.1	63.3	32.8	04/08/2021 07:30	43.5	57.5	32.3	04/08/2021 19:30	34.7	55.6	26.4
03/08/2021 19:45	41.2	60.3	30.5	04/08/2021 07:45	49.8	71.8	30.2	04/08/2021 19:45	40.4	59.9	28.5
03/08/2021 20:00	34.9	48.4	29.7	04/08/2021 08:00	44.5	68.2	30.4	04/08/2021 20:00	42.4	61.1	28.3
03/08/2021 20:15	40.2	56.2	30.5	04/08/2021 08:15	42.9	63.8	28.9	04/08/2021 20:15	36.4	51.6	30.2
03/08/2021 20:30	39.4	54.9	29.6	04/08/2021 08:30	42.5	59.0	31.0	04/08/2021 20:30	42.3	56.5	30.7
03/08/2021 20:45	39.3	59.3	30.3	04/08/2021 08:45	40.9	57.1	30.4	04/08/2021 20:45	36.1	54.8	29.0
03/08/2021 21:00	37.8	56.5	29.2	04/08/2021 09:00	44.3	58.6	29.4	04/08/2021 21:00	41.1	56.2	31.0
03/08/2021 21:15	42.4	60.4	28.2	04/08/2021 09:15	42.7	59.9	32.1	04/08/2021 21:15	42.0	60.6	31.2
03/08/2021 21:30	38.4	53.3	28.8	04/08/2021 09:30	41.2	61.8	32.5	04/08/2021 21:30	38.5	52.3	30.4
03/08/2021 21:45	36.8	48.8	27.5	04/08/2021 09:45	43.2	60.3	35.1	04/08/2021 21:45	45.9	63.6	31.2
03/08/2021 22:00	40.2	58.1	24.7	04/08/2021 10:00	40.8	58.8	34.1	04/08/2021 22:00	40.8	57.4	31.0
03/08/2021 22:15	38.9	56.4	23.9	04/08/2021 10:15	38.7	55.3	32.3	04/08/2021 22:15	38.6	57.4	27.1
03/08/2021 22:30	29.8	42.6	25.1	04/08/2021 10:30	40.4	64.4	32.8	04/08/2021 22:30	33.6	48.9	26.1
03/08/2021 22:45	41.2	56.3	23.8	04/08/2021 10:45	42.3	66.6	32.4	04/08/2021 22:45	36.0	53.9	26.6
03/08/2021 23:00	36.5	52.2	24.5	04/08/2021 11:00	43.2	57.0	33.2	04/08/2021 23:00	38.9	53.6	27.3
03/08/2021 23:15	40.9	53.7	22.9	04/08/2021 11:15	38.6	55.1	31.8	04/08/2021 23:15	44.5	63.7	28.8
03/08/2021 23:30	37.1	56.2	21.8	04/08/2021 11:30	41.2	60.2	31.2	04/08/2021 23:30	29.0	38.2	27.2
03/08/2021 23:45	37.9	55.0	24.2	04/08/2021 11:45	40.9	65.1	30.5	04/08/2021 23:45	41.1	57.9	25.6
04/08/2021 00:00	35.5	50.7	25.4	04/08/2021 12:00	40.8	58.8	31.0	05/08/2021 00:00	37.9	55.8	22.3
04/08/2021 00:15	33.9	48.5	25.2	04/08/2021 12:15	41.8	61.8	33.4	05/08/2021 00:15	26.3	44.5	22.7

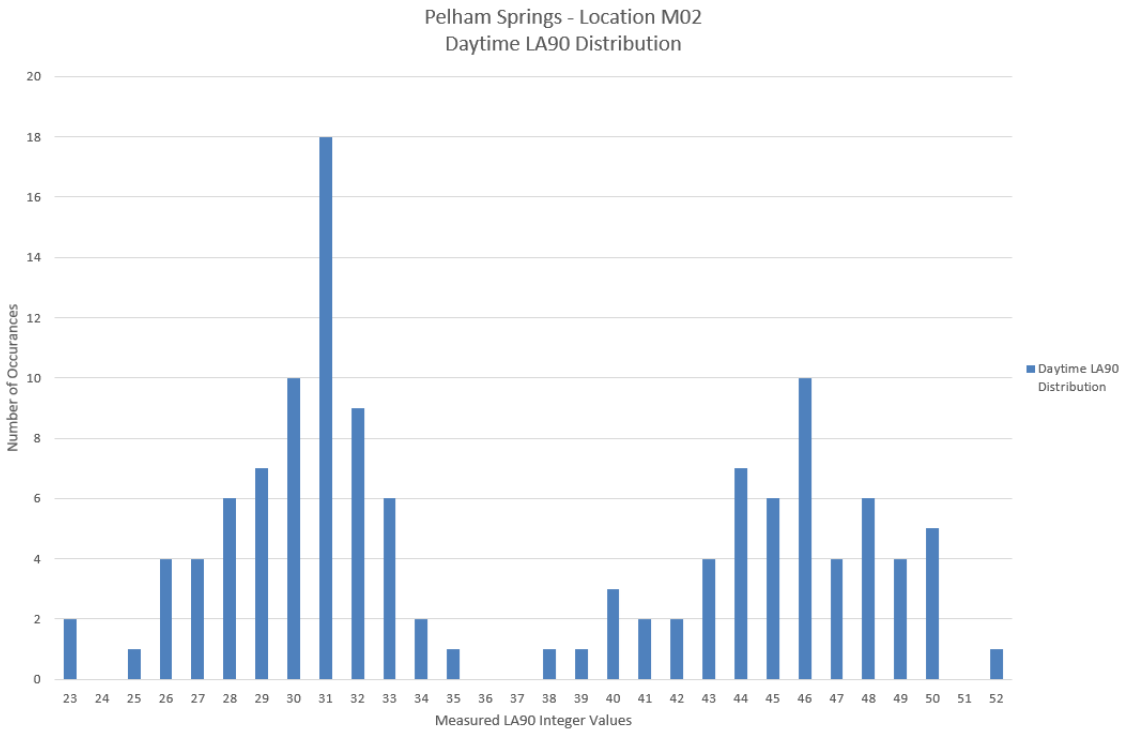
Time	L_{Aeq} dB	$L_{Amax,F}$ dB	L_{AF90} dB
05/08/2021 00:30	43.1	59.3	24.6
05/08/2021 00:45	30.8	53.0	23.4
05/08/2021 01:00	37.7	58.5	27.0
05/08/2021 01:15	28.9	43.3	26.4
05/08/2021 01:30	35.4	50.4	25.3
05/08/2021 01:45	27.1	37.8	25.4
05/08/2021 02:00	27.8	31.0	25.9
05/08/2021 02:15	26.5	34.3	24.9
05/08/2021 02:30	26.7	49.3	22.4
05/08/2021 02:45	25.2	53.8	21.6
05/08/2021 03:00	28.9	54.1	25.4
05/08/2021 03:15	39.6	57.2	23.5
05/08/2021 03:30	44.8	63.1	23.2
05/08/2021 03:45	26.2	33.5	24.7
05/08/2021 04:00	37.0	55.8	24.0
05/08/2021 04:15	39.0	63.4	24.8
05/08/2021 04:30	30.1	48.1	25.2
05/08/2021 04:45	43.6	73.8	27.4
05/08/2021 05:00	38.0	55.7	28.4
05/08/2021 05:15	44.6	61.9	30.2
05/08/2021 05:30	46.2	63.7	29.3
05/08/2021 05:45	42.9	62.7	29.5
05/08/2021 06:00	39.2	56.2	27.9
05/08/2021 06:15	42.2	56.4	28.3
05/08/2021 06:30	46.9	64.5	31.5
05/08/2021 06:45	44.1	65.8	31.0
05/08/2021 07:00	41.9	57.7	29.3
05/08/2021 07:15	42.9	57.0	31.2
05/08/2021 07:30	43.3	61.8	31.5
05/08/2021 07:45	41.0	57.5	31.5
05/08/2021 08:00	43.4	62.4	30.3
05/08/2021 08:15	42.3	61.6	32.2
05/08/2021 08:30	40.7	58.7	33.4
05/08/2021 08:45	38.7	53.0	33.0
05/08/2021 09:00	41.7	62.2	36.3
05/08/2021 09:15	40.3	54.6	34.0
05/08/2021 09:30	44.7	60.4	32.3
05/08/2021 09:45	44.6	64.2	39.9
05/08/2021 10:00	44.5	61.9	37.0
05/08/2021 10:15	45.3	59.7	36.2
05/08/2021 10:30	44.8	60.3	38.6
05/08/2021 10:45	45.7	58.1	39.7
05/08/2021 11:00	0.0	0.0	0.0
05/08/2021 11:15	0.0	0.0	0.0
05/08/2021 11:30	0.0	0.0	0.0
05/08/2021 11:45	0.0	0.0	0.0
05/08/2021 12:00	0.0	0.0	0.0
05/08/2021 12:15	0.0	0.0	0.0

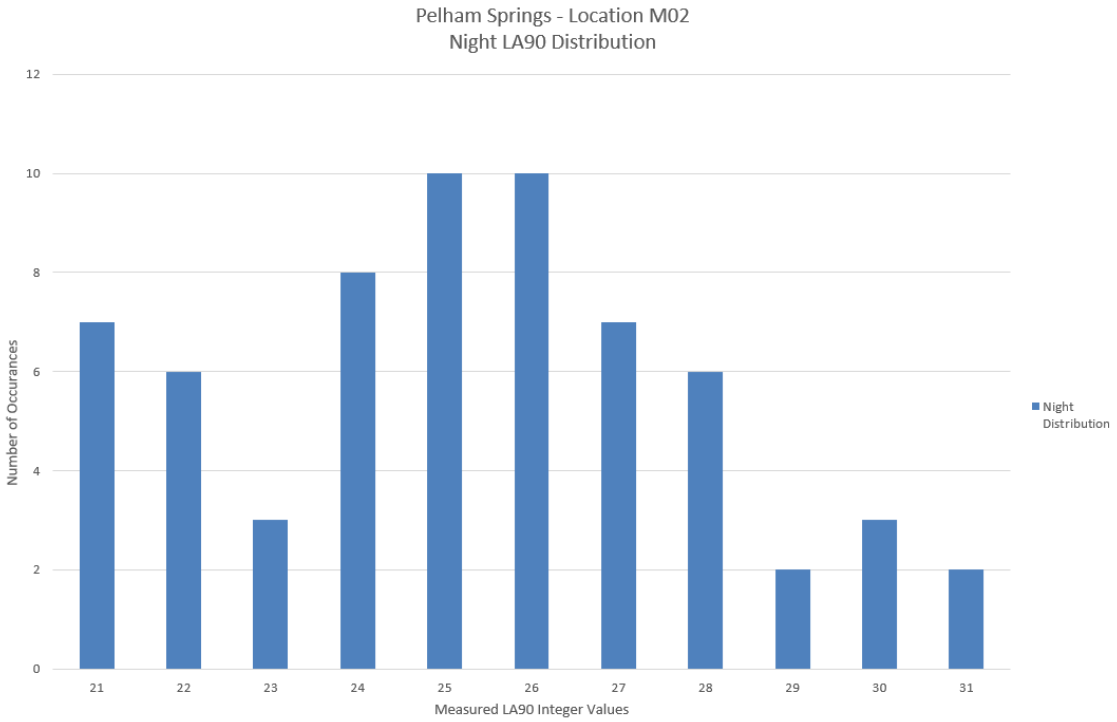
Noise Monitoring Location M02






Noise Levels Measured at Pelham Springs - Location M02
5th August 2021
Measured noise Level, LAeq, 15mins dB
100.0
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
LAeq
LA90
LAFmax
00:00:00
00:30:00
01:00:00
01:30:00
02:00:00
02:30:00
03:00:00
03:30:00
04:00:00
04:30:00
05:00:00
05:30:00
06:00:00
06:30:00
07:00:00
07:30:00
08:00:00
08:30:00
09:00:00
09:30:00
10:00:00
10:30:00
11:00:00
11:30:00
12:00:00
12:30:00
13:00:00
13:30:00
14:00:00
14:30:00
15:00:00
15:30:00
16:00:00
16:30:00
17:00:00
17:30:00
18:00:00
18:30:00
19:00:00
19:30:00
20:00:00
20:30:00
21:00:00
21:30:00
22:00:00
22:30:00
23:00:00
23:30:00
Time (hh:mm)


Pelham Springs - Location M02
Daytime LA90 Distribution
Number of Occurances
20
18
16
14
12
10
8
6
4
2
0
Daytime LA90 Distribution
23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52
Measured LA90 Integer Values


Pelham Springs - Location M02
Night LA90 Distribution
Number of Occurances
0
2
4
6
8
10
12
21
22
23
24
25
26
27
28
29
30
31
Measured LA90 Integer Values
Night Distribution

Time	L_{Aeq} dB	$L_{Amax,F}$ dB	L_{AF90} dB	Time	L_{Aeq} dB	$L_{Amax,F}$ dB	L_{AF90} dB	Time	L_{Aeq} dB	$L_{Amax,F}$ dB	L_{AF90} dB
03/08/2021 12:00	50.5	73.1	48.8	04/08/2021 00:00	34.3	48.4	21.8	04/08/2021 12:00	48.9	52.6	30.3
03/08/2021 12:15	46.9	59.6	41.0	04/08/2021 00:15	26.9	48.5	21.2	04/08/2021 12:15	47.6	52.8	40.3
03/08/2021 12:30	51.3	54.3	49.7	04/08/2021 00:30	23.1	45.4	21.2	04/08/2021 12:30	49.9	54.6	48.8
03/08/2021 12:45	45.3	56.8	30.5	04/08/2021 00:45	22.0	28.2	21.2	04/08/2021 12:45	50.9	68.1	49.5
03/08/2021 13:00	52.4	68.0	49.5	04/08/2021 01:00	35.0	53.1	21.4	04/08/2021 13:00	49.5	66.7	43.7
03/08/2021 13:15	48.8	54.3	31.9	04/08/2021 01:15	22.1	32.5	21.3	04/08/2021 13:15	46.1	64.7	31.1
03/08/2021 13:30	50.4	60.2	47.7	04/08/2021 01:30	23.0	30.0	21.7	04/08/2021 13:30	49.3	68.2	45.5
03/08/2021 13:45	51.6	59.5	45.9	04/08/2021 01:45	26.9	42.8	23.8	04/08/2021 13:45	48.0	56.3	44.4
03/08/2021 14:00	51.7	56.0	41.1	04/08/2021 02:00	24.5	28.5	23.5	04/08/2021 14:00	46.3	67.7	28.6
03/08/2021 14:15	49.2	64.2	34.2	04/08/2021 02:15	23.1	44.4	21.5	04/08/2021 14:15	44.4	53.9	29.3
03/08/2021 14:30	52.2	67.8	38.2	04/08/2021 02:30	27.9	48.4	23.5	04/08/2021 14:30	50.9	56.3	47.8
03/08/2021 14:45	53.2	59.7	51.7	04/08/2021 02:45	26.5	44.7	23.2	04/08/2021 14:45	48.7	54.5	29.4
03/08/2021 15:00	50.8	57.7	33.8	04/08/2021 03:00	28.5	36.2	24.5	04/08/2021 15:00	40.6	58.3	27.6
03/08/2021 15:15	43.3	55.8	32.4	04/08/2021 03:15	26.2	34.0	23.6	04/08/2021 15:15	48.9	62.8	29.7
03/08/2021 15:30	48.8	58.2	31.9	04/08/2021 03:30	29.6	44.4	23.7	04/08/2021 15:30	34.6	49.9	27.6
03/08/2021 15:45	51.0	60.6	47.3	04/08/2021 03:45	29.6	43.1	25.5	04/08/2021 15:45	48.7	53.0	31.4
03/08/2021 16:00	48.7	53.6	40.0	04/08/2021 04:00	26.0	50.3	21.5	04/08/2021 16:00	50.6	59.7	48.1
03/08/2021 16:15	51.3	59.6	50.0	04/08/2021 04:15	23.7	43.8	21.1	04/08/2021 16:15	48.7	54.3	45.6
03/08/2021 16:30	50.5	62.6	42.1	04/08/2021 04:30	25.3	42.7	21.4	04/08/2021 16:30	46.0	53.7	39.2
03/08/2021 16:45	44.4	56.0	33.0	04/08/2021 04:45	35.8	55.8	23.4	04/08/2021 16:45	40.8	57.1	33.1
03/08/2021 17:00	38.2	53.6	30.1	04/08/2021 05:00	34.0	52.7	24.5	04/08/2021 17:00	42.9	54.9	32.5
03/08/2021 17:15	36.8	52.1	30.5	04/08/2021 05:15	38.0	53.1	28.1	04/08/2021 17:15	42.0	54.4	30.0
03/08/2021 17:30	39.8	60.0	29.8	04/08/2021 05:30	39.5	57.1	27.3	04/08/2021 17:30	38.5	49.4	31.5
03/08/2021 17:45	43.6	63.1	30.5	04/08/2021 05:45	44.5	72.8	26.8	04/08/2021 17:45	38.1	57.4	31.4
03/08/2021 18:00	40.9	57.3	30.8	04/08/2021 06:00	42.8	66.0	28.6	04/08/2021 18:00	39.5	53.3	31.2
03/08/2021 18:15	40.8	57.2	31.1	04/08/2021 06:15	43.4	62.2	29.1	04/08/2021 18:15	37.0	53.4	28.8
03/08/2021 18:30	40.3	56.8	31.9	04/08/2021 06:30	44.5	66.2	29.7	04/08/2021 18:30	36.3	53.5	27.6
03/08/2021 18:45	38.9	53.6	31.2	04/08/2021 06:45	40.6	54.1	29.8	04/08/2021 18:45	40.6	55.3	28.3
03/08/2021 19:00	39.3	53.1	29.4	04/08/2021 07:00	33.9	52.9	27.8	04/08/2021 19:00	38.8	52.8	26.5
03/08/2021 19:15	40.7	58.1	30.7	04/08/2021 07:15	43.3	54.7	31.0	04/08/2021 19:15	41.3	57.5	27.4
03/08/2021 19:30	39.7	56.3	31.0	04/08/2021 07:30	47.1	56.3	43.9	04/08/2021 19:30	39.0	57.0	26.3
03/08/2021 19:45	39.9	53.1	30.4	04/08/2021 07:45	49.0	58.2	46.3	04/08/2021 19:45	41.9	56.9	26.9
03/08/2021 20:00	33.0	43.9	30.0	04/08/2021 08:00	47.7	59.6	45.2	04/08/2021 20:00	35.3	51.7	26.9
03/08/2021 20:15	39.0	58.1	30.7	04/08/2021 08:15	47.3	54.6	45.2	04/08/2021 20:15	36.1	50.3	28.6
03/08/2021 20:30	39.2	53.0	32.4	04/08/2021 08:30	47.5	57.5	45.5	04/08/2021 20:30	38.6	62.5	28.9
03/08/2021 20:45	38.7	52.9	31.4	04/08/2021 08:45	48.1	58.2	45.2	04/08/2021 20:45	37.7	49.5	31.3
03/08/2021 21:00	41.2	67.6	32.4	04/08/2021 09:00	48.4	58.5	46.2	04/08/2021 21:00	46.5	67.4	33.4
03/08/2021 21:15	41.0	57.8	33.0	04/08/2021 09:15	48.4	64.1	46.0	04/08/2021 21:15	42.5	54.9	35.0
03/08/2021 21:30	38.2	51.7	29.7	04/08/2021 09:30	47.7	61.5	43.7	04/08/2021 21:30	40.0	51.0	33.4
03/08/2021 21:45	36.4	49.3	30.3	04/08/2021 09:45	48.3	67.3	42.5	04/08/2021 21:45	45.2	61.6	31.4
03/08/2021 22:00	39.5	55.6	26.2	04/08/2021 10:00	47.1	50.4	44.9	04/08/2021 22:00	40.5	56.0	31.4
03/08/2021 22:15	37.5	54.6	23.2	04/08/2021 10:15	48.9	56.0	46.4	04/08/2021 22:15	37.7	56.1	28.2
03/08/2021 22:30	28.7	48.0	24.5	04/08/2021 10:30	50.7	61.9	48.8	04/08/2021 22:30	31.5	45.2	25.7
03/08/2021 22:45	39.9	55.9	22.9	04/08/2021 10:45	50.2	56.9	49.2	04/08/2021 22:45	34.5	48.7	25.9
03/08/2021 23:00	34.2	50.6	22.8	04/08/2021 11:00	49.0	60.8	44.1	04/08/2021 23:00	39.7	55.9	25.2
03/08/2021 23:15	38.7	52.8	23.5	04/08/2021 11:15	49.6	56.5	47.9	04/08/2021 23:15	43.1	62.9	25.2
03/08/2021 23:30	36.1	53.0	21.7	04/08/2021 11:30	49.5	56.5	47.4	04/08/2021 23:30	26.7	39.9	23.9
03/08/2021 23:45	35.7	52.1	21.9	04/08/2021 11:45	51.0	56.8	49.8	04/08/2021 23:45	38.5	55.9	25.5

Time	L_{Aeq} dB	$L_{Amax,F}$ dB	L_{AF90} dB
05/08/2021 00:00	38.7	53.8	28.4
05/08/2021 00:15	34.9	51.4	27.0
05/08/2021 00:30	41.5	57.6	27.3
05/08/2021 00:45	29.1	38.3	27.6
05/08/2021 01:00	38.0	56.5	27.4
05/08/2021 01:15	28.5	43.3	26.6
05/08/2021 01:30	34.5	49.1	25.9
05/08/2021 01:45	27.3	40.8	25.8
05/08/2021 02:00	27.2	40.0	25.8
05/08/2021 02:15	26.2	42.1	24.9
05/08/2021 02:30	26.4	37.4	24.7
05/08/2021 02:45	25.7	35.6	24.6
05/08/2021 03:00	26.9	33.5	25.6
05/08/2021 03:15	37.8	55.1	26.1
05/08/2021 03:30	39.3	56.7	25.9
05/08/2021 03:45	26.3	39.1	24.4
05/08/2021 04:00	33.0	48.6	24.8
05/08/2021 04:15	25.6	35.8	24.5
05/08/2021 04:30	34.1	60.4	24.6
05/08/2021 04:45	37.1	65.6	25.5
05/08/2021 05:00	36.5	58.8	28.0
05/08/2021 05:15	36.8	52.4	28.0
05/08/2021 05:30	42.7	59.6	27.1
05/08/2021 05:45	38.0	56.4	26.4
05/08/2021 06:00	40.2	60.4	27.6
05/08/2021 06:15	45.5	67.0	30.1
05/08/2021 06:30	45.1	68.7	31.4
05/08/2021 06:45	43.4	60.7	31.4
05/08/2021 07:00	44.2	60.6	30.1
05/08/2021 07:15	42.5	62.4	31.7
05/08/2021 07:30	43.3	60.5	32.3
05/08/2021 07:45	46.3	55.6	43.0
05/08/2021 08:00	47.1	55.9	44.8
05/08/2021 08:15	46.6	62.1	43.1
05/08/2021 08:30	46.6	55.8	44.1
05/08/2021 08:45	48.3	68.6	45.2
05/08/2021 09:00	48.1	58.4	46.3
05/08/2021 09:15	48.2	55.7	45.7
05/08/2021 09:30	49.7	60.9	48.4
05/08/2021 09:45	47.3	54.9	42.9
05/08/2021 10:00	48.2	69.8	40.4
05/08/2021 10:15	46.9	59.1	41.5
05/08/2021 10:30	47.7	58.6	44.4
05/08/2021 10:45	49.5	58.1	47.9
05/08/2021 11:00	50.4	58.5	47.3
05/08/2021 11:15	49.0	60.3	46.7
05/08/2021 11:30	0.0	0.0	0.0
05/08/2021 11:45	0.0	0.0	0.0