



# Environmental Permit Application – Supporting Documentation Appendix F1 - Noise Impact Assessment

## Sawston Pilot Plant

### Immaterial Limited

Unit 3, Cambridge South Business Park, Sawston, Cambridge, CB22 3FG

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## 1.0 Introduction

This Noise Impact Assessment (NIA) has been prepared in support of an application for a new bespoke Environmental Permit (EP) for an Installation to operate a Schedule 1 Part 2 Section 4.1 Part A(1) (a) activity ‘Producing organic chemicals such as – (vii) organometallic compounds’.

The Operator will be Immaterial Limited, and the site is located at Unit 3, South Cambridge Business Park, Sawston, Cambridge, CB22 3FG (the site).

### 1.1 Report Structure

This noise impact assessment includes:

- A description of the Site;
- A description of applicable guidance;
- The results of a baseline background sound survey at locations representative of the nearest noise-sensitive receptors to the proposed new plant; and
- An assessment of potential noise impacts undertaken in accordance with British Standard 4142:2014+A1:2019 *Methods for rating and assessing industrial and commercial sound* as required by the Environment Agency (EA) Guidance *Noise and vibration management: environmental permits*.

Whilst reasonable effort has been made to ensure that this report is easy to understand, it is technical in nature; to assist the reader, a glossary of terminology is included in Appendix A.



## 2.0 Site Description

### 2.1 Existing Site

The site is located at Unit 3, South Cambridge Business Park, Sawston, Cambridge, CB22 3FG. The position of The Site in the context of the surrounding area can be seen in Figure 2-1.

**Figure 2-1 Site Location**



### 2.2 Proposed Site Activities

The proposed development comprises a pilot scale testing and production facility which is expected to be located at South Cambridgeshire Business Park in Sawston.

The activities proposed to be undertaken at the production facility will utilise pilot scale production equipment (reactors, blender, tray dryers) in order produce densified metal-organic framework (MOF) materials.

The plant will also be used to undertake and optimise scale up from laboratory scale testing and will also be used to gather Intellectual Property to enable the commercialisation of the proprietary process technologies and products.

The plant is intended to initially produce 6 and 12 tonnes of product per annum, with the potential for increased hours of operation increasing the production capacity up to around 20 tonnes per annum. The materials produced will be sold on for use by third parties for them to use in the development and testing of industrial scale end uses for the materials.

### 2.3 Planning History

Planning permission was granted under permission ref: S1962/10 for the development of 27 industrial / commercial units which includes the Site (Unit 3)

It is noted that the planning permission for the Site includes noise limits as summarised below in Condition 16 and 21.



### 2.3.1 Condition 16

Condition 16 is copied below:

*“Overall noise emitted from operations conducted on the development site hereby approved shall not exceed the following levels during any 23-hour period:*

*50dB<sub>L<sub>Aeq</sub>1h</sub> between 0500 and 2100 hours*

*42dB<sub>L<sub>Aeq</sub>1h</sub> between 2100 and 0500 hours*

*The noise levels shall be determined/measured at any point along the boundary green line detailed on the approved plan, approximately 20 metres from the site boundary. The measurements and assessment shall be made in accordance with the provision of the current version of the BS4142:1997 and a +5dB penalty correction shall be applied to the detailed noise levels for any distinguishable acoustic features. The 42dB<sub>L<sub>Aeq</sub>1h</sub> between 2100 hours and 0500 hours boundary limit shall also be measured at a height of 5 metres”.*

### 2.3.2 Condition 21

Condition 21 is copied below.

*“All external plant/equipment including building services plant shall be attenuated and/or maintained such that any noise therefrom shall not exceed:*

*2100 to 0500 hours: 30 dB<sub>L<sub>ar,T</sub></sub>, free-field from all plant, applicable at any point 20 metres from the south-west boundary of the site, at 5 metres above ground level.*

*0500 to 2100 hours: 35 dB<sub>L<sub>ar,T</sub></sub>, free-field from all plant, applicable at any point 20 metres from the south-west boundary of the site, at 2 metres above ground level.*

*(‘T’ = 5 mins between 2100 and 0500 hours and ‘T’ = 1hr between 0500 and 2100 hours).*

*The noise levels shall be determined/measured at any point along the boundary green line detailed on the approved plan, approximately 20 metres from the site boundary. The measurements and assessment shall be made in accordance with the provision of the current version of the BS4142:1997 and a +5dB penalty correction shall be applied to the detailed noise levels for any distinguishable acoustic features”.*



## 3.0 Environment Agency Requirements

The EA requires assessment of the potential noise impacts associated with the proposed site activities in accordance with BS4142:2014+A1:2019 and in accordance with the EA guidance document '*Noise and vibration management: environmental permits*' for the purposes of the Permit application.

A summary of the requirements outlined in the EA Guidance document, and the assessment methodology outlined in BS4142:2014+A1:2019 are provided below.

### 3.1 Guidance

The Environment Agency (EA) released the guidance document '*Noise and vibration management: environmental permits*' (NVM) in July 2021, replacing the previous guidance presented in '*Horizontal Guidance for Noise (H3) parts 1 and 2*'. The NVM details when a noise assessment is required, the competency required to undertake an assessment and how to carry out a noise impact assessment.

The NVM references BS4142:2014+A1:2019 as the appropriate assessment methodology.

The NVM outlines how context should be taken into account in the assessment and notes that "*Whilst context allows you to interpret impact thresholds (to a degree), there are practical limits to the extent of the interpretation. It is unlikely you could adjust the assessment outcome beyond the next band (for example, modifying a BS 4142 outcome of more than 10dB to be less than an 'adverse impact').*"

Determining the outcome of the assessment the following should be considered:

- Weekdays rather than weekends;
- What the sound 'means' – meaningful sound is one that conveys an unpleasant meaning beyond its mere acoustic content, for example noise from an abattoir;
- Time of day;
- The absolute sound level;
- Where the sound occurs;
- New industry or new residences;
- Intrinsic links between the source and receptor, for example the source is the resident's place of work;
- Local attitudes;
- The residual acoustic environment;
- The land use at the receptor (for example, gardens rather than yards);
- The exceedance (traditional BS 4142); and
- Whatever else might be particular to that individual situation.

Based on the results of the BS4142:2014+A1:2019 assessment the NVM has three distinct requirements as detailed in Table 3-1.





**Table 3-1 NVM Assessment**

NVM Result	BS4142 Descriptor	Next Stage
Unacceptable level of audible or detectable noise	The closest corresponding BS 4142 descriptor is 'significant adverse impact'	You must take further action or you may have to reduce or stop operations. The environment agencies will not issue a permit if you are likely to be operating at this level.
Audible or detectable noise	The closest corresponding BS 4142 descriptor is 'adverse impact'	Your duty is to use appropriate measures to prevent or, where that is not practicable, minimise noise. You are not in breach if you are using appropriate measures. But you will need to rigorously demonstrate that you are using appropriate measures.
No noise, or barely audible or detectable noise	The closest corresponding BS 4142 descriptor is 'low impact or no impact'	Low impact does not mean there is no pollution. However, if you have correctly assessed it as low impact under BS 4142, the environment agencies may decide that taking action to minimise noise is a low priority.

### 3.2 British Standard 4142:2014+A1:2019

British Standard 4142:2014+A1:2019 '*Methods for rating and assessing industrial and commercial sound*' is intended to be used to assess the potential adverse impact of sound, of an industrial and/or commercial nature, at nearby noise-sensitive receptor locations within the context of the existing sound environment.

Where the specific sound contains tonality, impulsivity and/or other sound characteristics, penalties should be applied depending on the perceptibility. For tonality, a correction of either 0, 2, 4 or 6dB should be added and for impulsivity, a correction of either 0, 3, 6 or 9dB should be added. If the sound contains specific sound features which are neither tonal nor impulsive, a penalty of 3dB should be added.

In addition, if the sound contains identifiable operational and non-operational periods, that are readily distinguishable against the existing sound environment, a further penalty of 3dB may be applied.

The assessment of impact contained in BS4142:2014+A1:2019 is undertaken by comparing the sound rating level, i.e. the specific sound level of the source plus any penalties, to the measured representative background sound level immediately outside the noise-sensitive receptor location. Consideration is then given to the context of the existing sound environment at the noise-sensitive receptor location to assess the potential impact.

Once an initial estimate of the impact is determined, by subtracting the measured background sound level from the rating sound level, BS4142:2014+A1:2019 states that the following should be considered:

- Typically, the greater the difference, the greater the magnitude of the impact;
- A difference of around +10dB or more is likely to be an indication of a significant adverse impact, depending on the context;
- A difference of around +5dB is likely to be an indication of an adverse impact, depending on the context; 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. It is an indication that the specific sound source has a low impact, depending on the context.



BS4142:2014+A1:2019 notes that:

*“Adverse impacts include, but are not limited to, annoyance and sleep disturbance. Not all adverse impacts will lead to complaints and not every complaint is proof of an adverse impact.”*

BS4142:2014+A1:2019 outlines guidance for the consideration of the context of the potential impact including consideration of the existing residual sound levels, location and/or absolute sound levels.

To account for the acoustic character of proposed sound sources, BS4142:2014+A1:2019 provides the following with respect to the application of penalties to account for *“the subjective prominence of the character of the specific sound at the noise-sensitive locations and the extent to which such acoustically distinguishing characteristics will attract attention”*.

- **Tonality** – “For sound ranging from not tonal to predominantly tonal the Joint Nordic Method gives a correction of between 0dB and +6dB for tonality. Subjectively, this can be converted to a penalty of 2dB for a tone which is just perceptible at the noise receptor, 4dB where it is clearly perceptible and 6dB where it is highly perceptible;
- **Impulsivity** – A correction of up to +9dB 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. Subjectively, this can be converted to a penalty of 3dB for impulsivity which is just perceptible at the noise receptor, 6dB where it is clearly perceptible, and 9dB where it is highly perceptible;
- **Intermittency** – When the specific sound has identifiable on/off conditions, the specific sound level ought to be representative of the time period of length equal to the reference time interval which contains the greatest total amount of on time. If the intermittency is readily distinctive against the residual acoustic environment, a penalty of 3dB can be applied; and
- **Other Sound Characteristics** – Where the specific sound features characteristics that are neither tonal nor impulsive, though otherwise are readily distinctive against the residual acoustic environment, a penalty of 3dB can be applied.”

Finally, BS4142:2014+A1:2019 outlines guidance for the consideration of the context of the potential impact, including consideration of the existing residual sound levels, location and/or absolute sound levels.



## 4.0 Baseline Sound Survey

### 4.1 Survey Date

To determine baseline sound levels in the vicinity of the Site a noise survey was undertaken between Thursday 25<sup>th</sup> and Monday 29<sup>th</sup> July 2024.

### 4.2 Weather Conditions

A weather station was set up at Location 2 (No. 8 Fairfields) so that any extraneous weather influence on the acoustic baseline data could be removed.

During the survey, weather conditions were generally suitable for noise monitoring. There were no periods of high wind or rainfall or recorded during the survey. A full summary of the weather conditions for the duration of the noise survey during daytime and night-time periods can be seen in Appendix B.

### 4.3 Equipment

Sound pressure level and vibration measurements were carried out using the noise survey equipment listed in Table 4-1, confirming to Class 1 acoustic accuracy for sound level meters and matched calibrators.

The sound level meters were calibrated before the measurements using the handheld acoustic calibrator and the calibration was checked upon completion of the survey. No significant drift was observed with calibration offsets of  $\leq 0.25$  dB. The calibration chain of equipment has been maintained traceably to national standards, no greater than one year for sound calibrators and two years for sound level meters.

**Table 4-1 Survey Equipment**

Location	Equipment	Serial Number	Drift
1	Cirrus CR:171B Class 1 Sound Level Meter	G061094	0.16dB
	Cirrus CR:515 Acoustic Calibrator	72210	-
2	Cirrus CR:171B Class 1 Sound Level Meter	G068726	0.25dB
	Cirrus CR:515 Acoustic Calibrator	102979	-
3	Cirrus CR:171B Class 1 Sound Level Meter	G303356	0.13dB
	Cirrus CR:515 Acoustic Calibrator	97641	-

### 4.4 Survey Locations

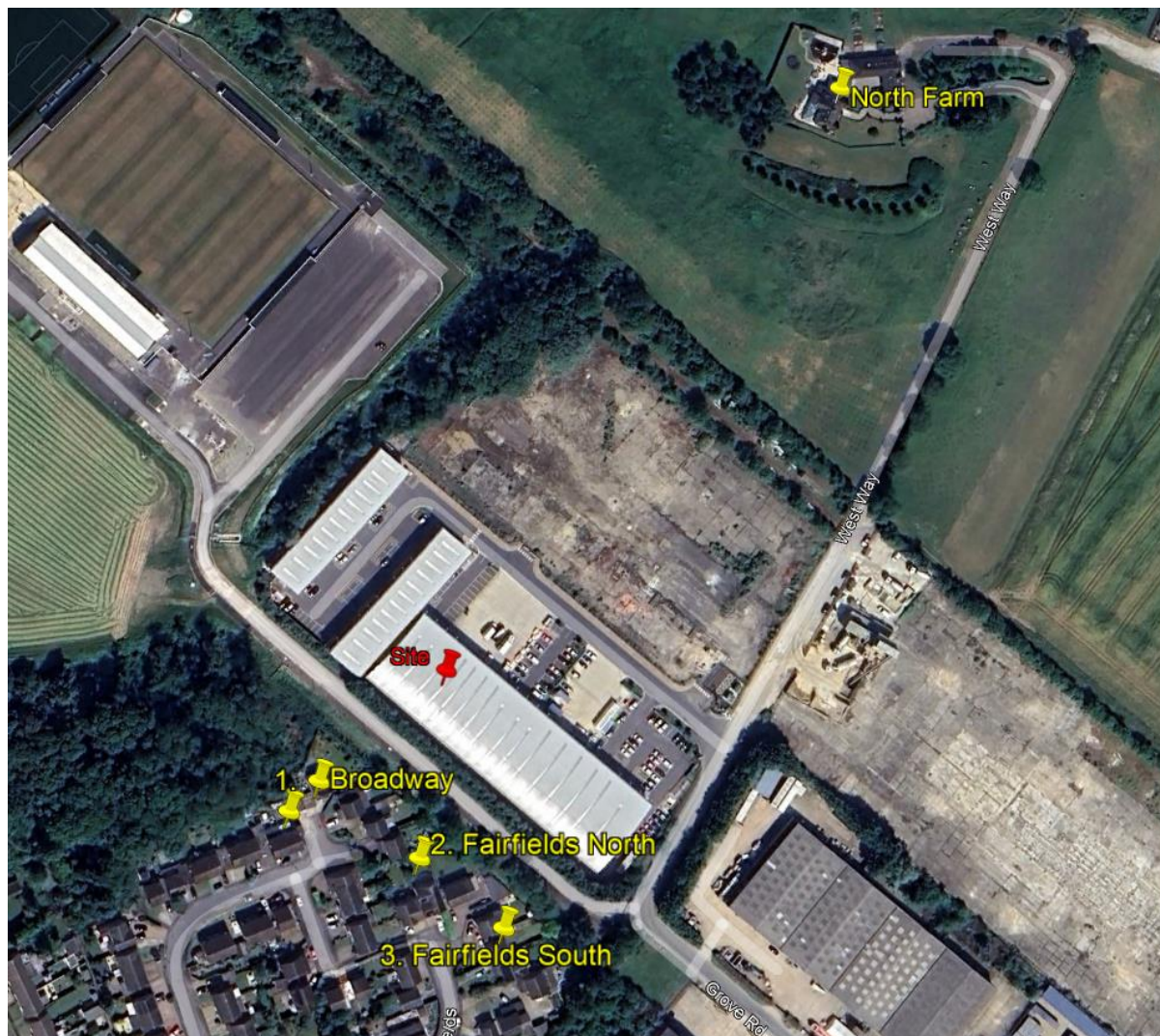
Sound levels were measured at three locations considered representative of the nearest Noise Sensitive Receptor's (NSR's) to the site, as follows:

- Location 1: Receptors to the north on Broadway and North Farm.
- Location 2; Receptors on Fairfields at a more northerly position.
- Location 3: Receptors on Fairfields at a more southerly position.

The survey locations are shown in Figure 4-1.



**Figure 4-1: Monitoring and Sensitive Receptor Locations**



The coordinates of each monitoring position are included at Table 4-2.

**Table 4-2: Noise Monitoring Coordinates**

Meter Location	X	Y
1	548940.62	250333.95
2	548995.79	250317.78
3	549042.96	250295.28





Photographs of each monitoring location can be seen in Figures 4-2 to 4-4 below.

**Figure 4-2: Location 1 – No. 55 Broadway**



**Figure 4-3: Location 2 – No. 8 Fairfields**





**Figure 4-4: Location 3 No. 11 Fairfields**



At the survey locations, the microphone was placed 1.5m above the local ground level in free-field conditions, i.e. at least 3.5m from the nearest vertical, reflecting surface. The following noise level indices were recorded:

- $L_{Aeq,T}$ : The A-weighted equivalent continuous noise level over the measurement period;
- $L_{A90}$ : The A-weighted noise level exceeded for 90% of the measurement period. This parameter is often used to describe background noise;
- $L_{A10}$ : The A-weighted noise level exceeded for 10% of the measurement period. This parameter is often used to describe road traffic noise; and
- $L_{AFmax}$ : The maximum A-weighted noise level during the measurement period.

## 4.5 Soundscape

### 4.5.1 Location 1: Broadway

On setup, there were children playing immediately next door. There were also occasional bird tweets from inside the house (55 Broadway) nearby, but not regularly or loud enough to dramatically disrupt the soundscape. The tweets of the small birds inside will have added some transient, high frequency noise to the soundscape. The breeze in the nearby trees could also be heard. The industrial site to the north was not audible.

On collection, there were no children playing in the neighbouring residence. Ambient birdsong could be heard as well as occasional tweets from pet birds inside the house. Occasional high-altitude planes were audible. Distant tracked plant movement could be heard in the direction of the industrial area.



### 4.5.2 Location 2: Fairfields (Middle)

On setup, the breeze in the nearby trees was most dominant. Quiet chatter from inside the resident’s house, the same children playing adjacent to location 1, and birdsong was also audible. Distant beeps, bangs and plant movement could be heard in the direction of the industrial area. Distant road noise to the west could also be heard.

Collection was much the same, with low-level hum and whine from the industrial site also audible, which is considered to have potentially been HVAC equipment.

### 4.5.3 Location 3: Fairfields (South)

Industrial noise from Restore and Mtec warehousing was much more prevalent here than at the other two locations, dominating the existing soundscape on setup and collection, with breeze in the nearby trees and birdsong also audible.

## 4.6 Baseline Sound Level Results

A summary of the survey results at Location 1 is shown in Table 4-3. The full survey results are available in Appendix C.

**Table 4-3 Location 1 – Broadway Summary of Measured Sound Levels, free-field, dB**

Date	Period	L <sub>Aeq,T</sub>	L <sub>Amax</sub>	Median L <sub>A10</sub>	Median L <sub>A90</sub>
Thursday 25/07/2024	13:00 - 23:00	52.8	86.8	44.6	36.4
	23:00 - 07:00	43.0	70.7	37.2	32.2
Friday 26/07/2024	07:00 - 23:00	46.5	77.2	44.2	35.7
	23:00 - 07:00	41.2	67.6	36.2	30.1
Saturday 27/07/2024	07:00 - 23:00	46.7	86.4	46.2	33.2
	23:00 - 07:00	41.4	67.1	34.4	28.9
Sunday 28/07/2024	07:00 - 23:00	47.9	81.3	45.1	32.3
	23:00 - 07:00	38.7	65.1	32.5	28.6
Monday 29/07/2024	07:00 - 11:30	45.3	76.8	45.7	37.2
	No data	No data	No data	No data	No data

A summary of the survey results at Location 2 is shown in Table 4-4. The full survey results are available in Appendix C.



**Table 4-4 Location 2 – Fairfields (Middle) Summary of Measured Sound Levels, free-field, dB**

Date	Period	L <sub>Aeq,T</sub>	L <sub>Amax</sub>	Median L <sub>A10</sub>	Median L <sub>A90</sub>
Thursday 25/07/2024	13:30 - 23:00	41.7	75.2	43.6	36.2
	23:00 - 07:00	38.6	63.2	35.3	31.5
Friday 26/07/2024	07:00 - 23:00	48.6	81.2	44.7	37.4
	23:00 - 07:00	38.5	67.6	35.6	28.6
Saturday 27/07/2024	07:00 - 23:00	44.0	79.4	42.8	35.2
	23:00 - 07:00	37.8	64.7	33.8	27.5
Sunday 28/07/2024	07:00 - 23:00	46.4	81.7	43.6	34.8
	23:00 - 07:00	38.4	67.6	32.9	28.9
Monday 29/07/2024	07:00 - 11:45	54.3	87.3	45.3	38.9
	No data	No data	No data	No data	No data

A summary of the survey results at Location 3 is shown in Table 4-5. The full survey results are available in Appendix C.

**Table 4-5 Location 3 – Fairfields (South) Summary of Measured Sound Levels, free-field, dB**

Date	Period	L <sub>Aeq,T</sub>	L <sub>Amax</sub>	Median L <sub>A10</sub>	Median L <sub>A90</sub>
Thursday 25/07/2024	13:45 - 23:00	46.8	75.1	45.9	36.2
	23:00 - 07:00	40.4	74.5	37.7	31.1
Friday 26/07/2024	07:00 - 23:00	48.7	78.6	47.6	41.6
	23:00 - 07:00	38.7	64.7	34.2	27.0
Saturday 27/07/2024	07:00 - 23:00	43.4	75.7	44.5	36.9
	23:00 - 07:00	38.7	66.7	32.2	25.9
Sunday 28/07/2024	07:00 - 23:00	44.8	77.9	45.0	35.3
	23:00 - 07:00	39.4	74.5	33.2	29.5
Monday 29/07/2024	07:00 - 11:45	47.7	70.4	49.5	43.6
	No data	No data	No data	No data	No data

## 4.7 Baseline Background Sound Levels

Histograms of the daytime and night-time baseline background sound levels at all locations can be seen in Appendix D.

From a review of the data, the following baseline background sound levels presented in Table 4-6 may be considered representative for any future BS 4142:2014+A1:2019 assessment required for the Site.





**Table 4-6 Baseline Background Sound Levels for Future Assessment**

Monitoring Location	Receptor	Period	L <sub>A90</sub> Range, dB	L <sub>A90</sub> Selected, dB
1	Broadway and North Farm	Daytime	29 - 40	34
		Night-time	27 - 41	30
2	Fairfields (North)	Daytime	30 - 42	35
		Night-time	26 - 41	28
3	Fairfields (South)	Daytime	28 - 46	40
		Night-time	23 - 44	26

## 4.8 Uncertainty

In accordance with BS4142:2014+A1:2019 assessment the uncertainty associated with measured baseline sound levels requires discussion. Baseline sound level measurement uncertainty was minimised using the following steps:

- Measurement locations were representative of the nearest noise-sensitive receptors to the site;
- Measurements were undertaken using a suitable logging period considered to provide representative background sound levels;
- The sound measurements included an extended period;
- Measurements were rounded to the nearest one decimal place before the final calculations; and
- Instrumentation was appropriate and in accordance with Section 5 of BS4142:2014+A1:2019.



## 5.0 BS4142 Assessment

### 5.1 Internal Noise Sources

The plant listed in Table 5-1 will be located internal to the main building but within an Internal Process Room. The ID in the first column (where provided) is shown on the drawing in Appendix E.

As it has been stated in the “User Requirements Specification”<sup>1</sup> document that “*The noise level emitted by any equipment shall not exceed 85 dB (A) at 1.0m from the equipment surface*”, where data has not been provided a sound pressure level of 85dB(A) at 1m has been assumed (for point source attenuation this equates to a sound power level of 93dB(A) per plant item).

**Table 5-1: Internal Process Room Noise Sources**

Equipment	Location	Sound Power Data dB(A)
Reactor x2	Internal process room	93
Pump - P101 Ethanol	Internal process room	93
Pump - P102 Water	Internal process room	93
Pump - P103 KOH	Internal process room	93
Pump - P104 Reactor discharge high shear mixer	Internal process room	70
Pump - P105 Membrane filtrate	Internal process room	93
Pump - P106 Decanter feed	Internal process room	93
Pump - P107 Decanter output - gear pump	Internal process room	93
Pump - P108 T108 Distillate	Internal process room	93
Pump - P109 T109/T110 Distillate	Internal process room	93
Pump - P110 Water distribution - centrifugal	Internal process room	93
Pump - P111 CIP pump - centrifugal	Internal process room	93
Pump - P112 Hot wash - centrifugal	Internal process room	93
Pump - P113 Ethanol Solvent Exchange - centrifugal	Internal process room	93
Pump - P114 Hot water - centrifugal	Internal process room	93
Vacuum pump - VP101 - mixer	Internal process room	93
Vacuum pump - VP102 - TD101	Internal process room	93
Vacuum pump - VP103 - TD102	Internal process room	93
Z101 Membrane package	Internal process room	75
Mixer/blender	Internal process room	93
Decanter	Internal process room	85

<sup>1</sup> Document No. 9609-0007-URS dated 7<sup>th</sup> December 2023



Equipment	Location	Sound Power Data dB(A)
Extruder	Internal process room	93
Tray Dryer x2	Internal process room	93
Packaging machine	Internal process room	93
Z102 reactor heating package ICS	Internal process room	75
Solvent exchange fan/blower	Internal process room	93
Mixer heating system	Internal process room	93

The plant listed in Table 5-2 will also be within the Main Building but will not be within the Internal Process Room. The ID in the first column (where provided) is shown on the drawing in Appendix E.

As it has been stated in the “User Requirements Specification” document that “*The noise level emitted by any equipment shall not exceed 85 dB (A) at 1.0m from the equipment surface*”, where data has not been provided a sound pressure level of 85dB(A) at 1m has been assumed (for point source attenuation this equates to a sound power level of 93dB(A) per plant item).

**Table 5-2: Main Building Noise Sources**

Equipment	Location	Sound Power Data dB(A)
HVAC	Indoors	93
LEV	Indoors	93
Powder handling booth	Indoors	75

## 5.2 External Noise Sources

The plant listed in Table 5-3 will be located external to the main building. The ID in the first column is shown on the drawing in Appendix E.

As it has been stated in the “User Requirements Specification” document that “*The noise level emitted by any equipment shall not exceed 85 dB (A) at 1.0m from the equipment surface*”, where data has not been provided a sound pressure level of 85dB(A) at 1m has been assumed (for point source attenuation this equates to a sound power level of 93dB(A) per plant item).



**Table 5-3: External Noise Sources**


Equipment	Location	Sound Power Data dB(A)
Z104 Overall plant cooling package ICS	External	84.3
Z103 gas fired heating package	External	88
Softened water package	External	93
Z107 - DI water package	External	93

### 5.3 Noise Input Data to Noise Model

Based on the data provided in Tables 5-1 to 5-3 the following noise sources have been included in the noise model.



**Table 5-4: Noise Source Data**

Location	Source	X/Y (Or Image)	Height [m]	Sound Power Level [dB]	CadnaA Attribute
Internal Plant Room in Main Building	Plant in Table 5-1	In Main Building	n/a	<p>Combined noise source of 107dB(A) internal to the main building<sup>2</sup>. As not all plant would operate at the same time a 3dB(A) reduction will be accounted for in the noise model.</p> <p>As the plant will be housed within an internal plant room a sound reduction of 24dB(A) has then been applied to the noise level to account for the internal housing.</p> <p>The internal plant room has therefore been included as an internal noise source to the main building with a total input level of 80dB(A).</p>	See Main Building.
Main Building	HVAC	In Main Building	9m to eaves	93 with a 3dB(A) correction as plant would not operate all the time.	With a surface area of 1386m <sup>2</sup> and an absorption coefficient of 0.2 the internal reverberant level is 74.8dB(A). This has been applied to the walls (vertical area sources) and roof (area) source, with a sound reduction of 26dB to 45dB R <sub>w</sub> to account doors/cladding.
	LEV			93 with a 3dB(A) correction as plant would not operate all the time.	
	Powder handling booth			75 with a 3dB(A) correction as plant would not operate all the time.	
	Internal Plant Room			80 (see row above)	
Louvres	Main Building Break Out		1m in height	Internal main building reverberation of 74.8 with a minus 3dB for louvre attenuation.	Vertical Area Source
External	Z104 Overall plant cooling package	548995 / 250408	2m	84.3	Point Source

<sup>2</sup> Log add all plant as listed in Table 5-1.



## 5.4 Noise Model Assumptions

The sound predictions in this assessment have been undertaken using a proprietary software-based noise model, CadnaA 2024 (Including the ISO 9613 update), which implements the full range of the latest UK noise-based calculation methods.

The calculation algorithms set out in ISO 9613-2:2024 “*Acoustics – Attenuation of sound during propagation outdoors – Part 2 General method of calculation*” have been used and the model assumes:

- A ground absorption factor of 0.5;
- Contour Data to include OS terrain data; and
- A reflection factor of 3.

For the avoidance of doubt, following its publication in early 2024, SLR Consulting Ltd now uses the updated ISO 9613:2024 “*Acoustics — Attenuation of sound during propagation outdoors*” in all noise modelling exercises, following the cancellation of the 1996 edition of the standard.

## 5.5 Sound Character Corrections

The character of each noise source, and the correction that will be applied in the BS 4142 assessment are as follows:

- **Tonality:** It is not known if tonality is likely to be attributable to the proposed preliminary plant selection. Where the overall level at the receptor has been predicted to be very low, it has been considered unlikely for tonality to be perceptible in the residual sound climate. Therefore, no penalty has been applied.
- **Impulsivity:** The noise sources are not known to exhibit significant impulsive characteristics based on well-maintained equipment.
- **Intermittency:** Although noise sources at the site may operate intermittently, it has been considered unlikely on/off events to be perceptible in the residual sound climate. Therefore, no penalty has been applied.
- Where the specific sound features characteristics that are neither tonal nor impulsive, nor intermittent, though otherwise are readily distinctive against the residual acoustic environment, a penalty of 3 dB can be applied. A precautionary penalty of +3 dB has been applied for robust assessment tending towards a worst-case.

In total a +3 dB character correction has been added to the calculated specific sound level at each receptor.

## 5.6 Results

The BS4142 assessment is presented in Table 5-5. The daytime and night-time CADNA output images can be seen in Figures 5-1 to 5-2.



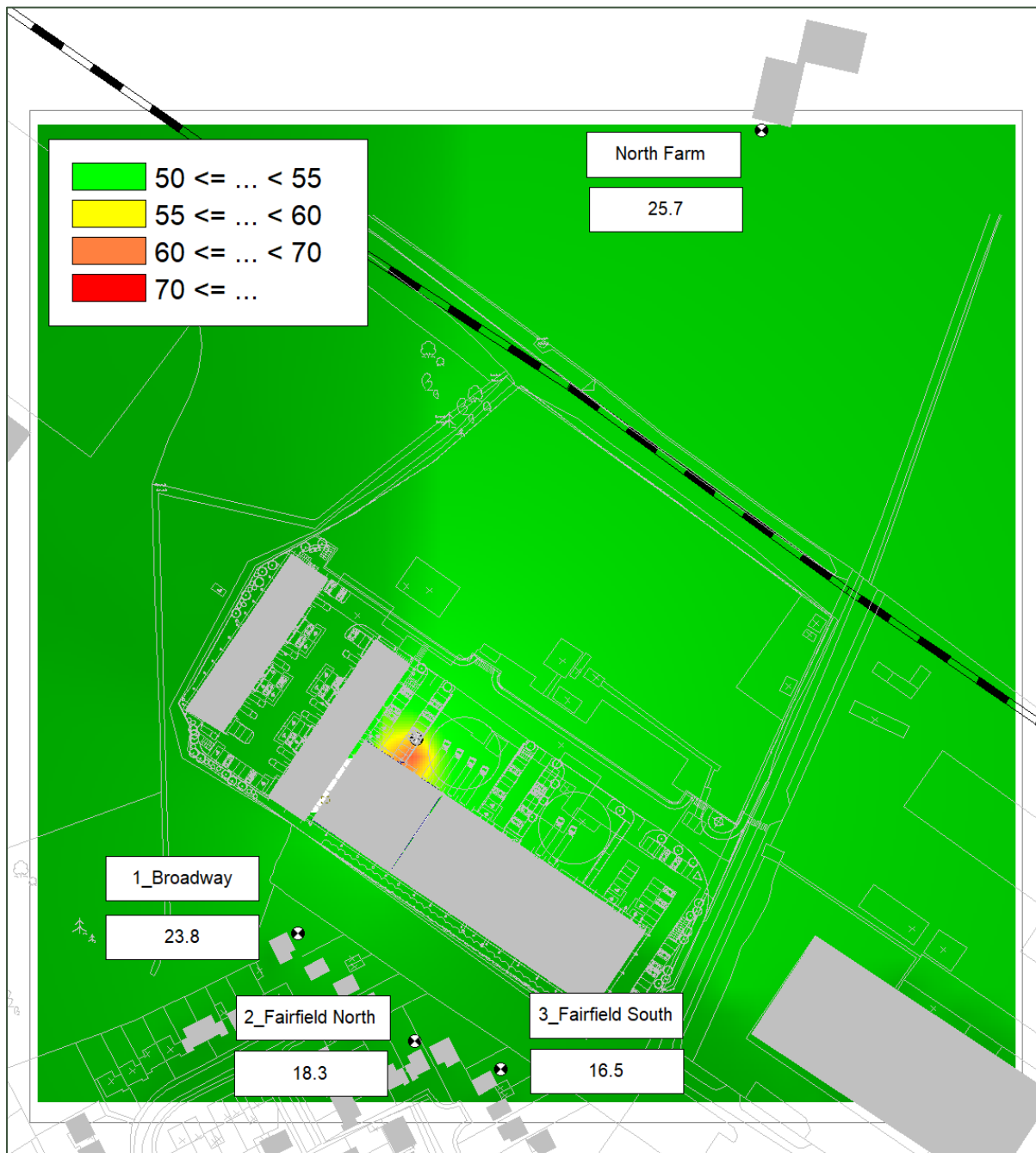
**Table 5-5: BS4142 Assessment**

Receptor	Assessment Period	Predicted Specific Sound Level, dB $L_{Aeq,T}^3$	Predicted Rating Level, dB $L_{Ar,Tr}$	Background Sound Level dB $L_{A90,T}$	Difference dB
Broadway	Daytime	24	27	34	-7
	Night-Time	25	28	30	-2
Fairfield North	Daytime	18	21	35	-14
	Night-Time	19	22	28	-6
Fairfield South	Daytime	17	20	40	-20
	Night-Time	17	20	26	-6
North Farm	Daytime	26	29	34	-5
	Night-Time	26	29	30	-1

<sup>3</sup> See Table 7.1 of Report 410.HF03.00001 V3 Dated October 2022.

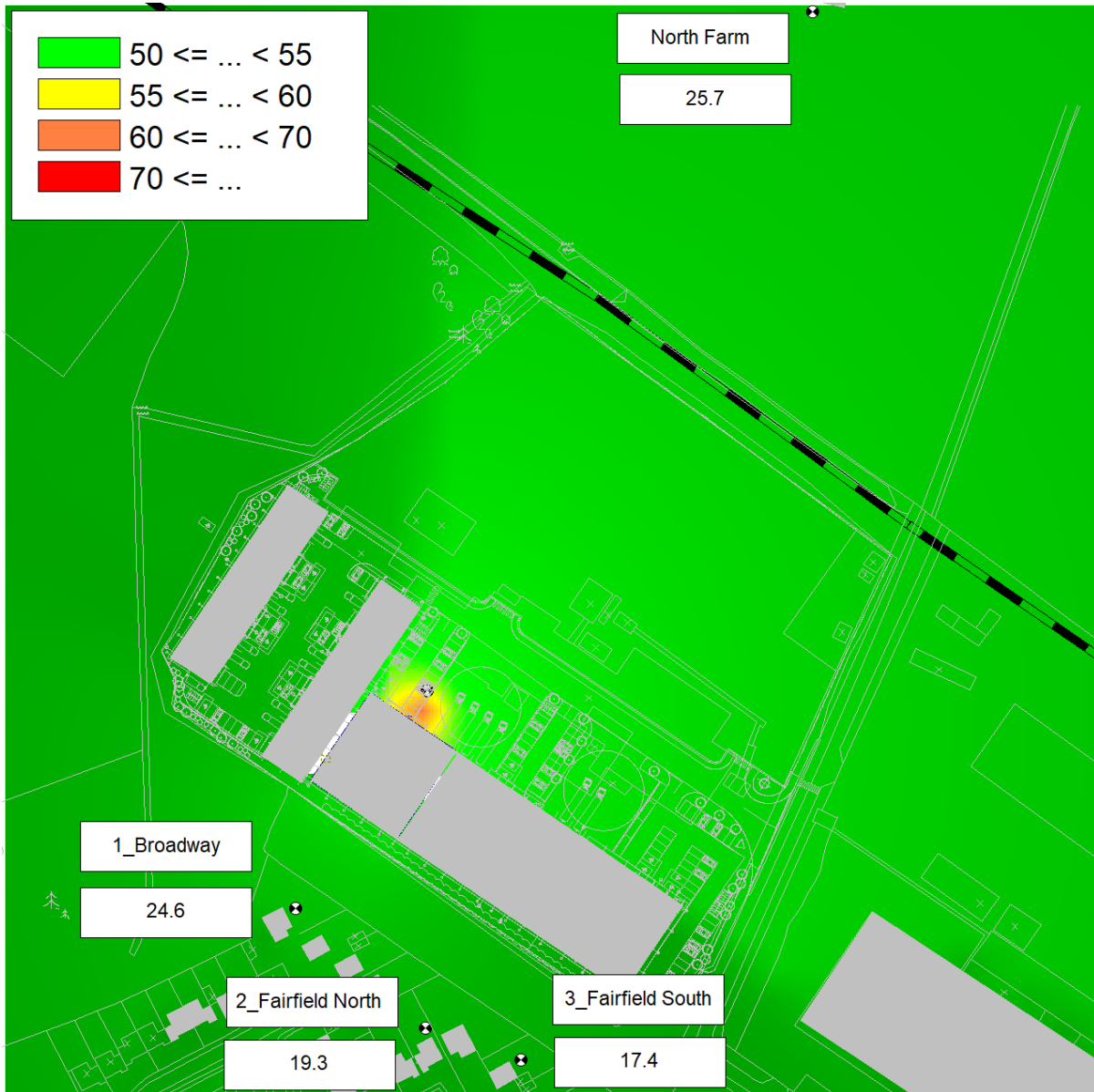


Figure 5-1: Daytime BS4142 Assessment





**Figure 5-2: Night-Time BS4142 Assessment**



## 5.7 Discussion

Following the numerical assessment presented in Table 5-5, it is considered that the proposed development will have no significant noise impact at the identified NSRs.

When comparing predicted rating levels to the background sound levels, all predicted noise rating levels are less than the existing background sound level, suggesting the sources would not be audible from the receptors and overall the impact in accordance with Table 3-1 would be Low.



## 6.0 Conclusion

This Noise Impact Assessment (NIA) has been prepared in support of an application for a new bespoke Environmental Permit (EP) for the Sawston Pilot Plant located at Unit 3, South Cambridge Business Park, Sawston, Cambridge, CB22 3FG

As part of this NIA, a baseline noise survey has been undertaken to establish existing background noise levels, and a noise impact assessment has been undertaken in accordance with BS4142.

The assessment has demonstrated that when comparing predicted noise rating levels to the existing background sound levels at the identified NSR locations, all rating levels are predicted to be less than the existing background sound level, suggesting the sources would not be audible from the receptors and the overall impact resulting from the operation of the Sawston Pilot Plant would be Low.





# **Appendix A    Glossary of Terminology**

**Environmental Permit Application – Supporting  
Documentation Appendix F1 - Noise Impact Assessment**

**Sawston Pilot Plant**

**Immaterial Limited**

SLR Project No: 405.065240.00001

8 November 2024

## A.1 Glossary of Terminology

The human ear can detect a very wide range of pressure fluctuations, which are perceived as sound. In order to express these fluctuations in a manageable way, a logarithmic scale called the decibel, or dB scale is used. The decibel scale typically ranges from 0dB (the threshold of hearing) to over 120dB. An indication of the range of sound levels commonly found in the environment is given in the following table.

**Table A-1: Sound Levels Commonly Found in the Environment**

Sound Level	Location
0 dB(A)	Threshold of hearing
20 to 30 dB(A)	Quiet bedroom at night
30 to 40 dB(A)	Living room during the day
40 to 50 dB(A)	Typical office
50 to 60 dB(A)	Inside a car
60 to 70 dB(A)	Typical high street
70 to 90 dB(A)	Inside factory
100 to 110 dB(A)	Burglar alarm at 1m away
110 to 130 dB(A)	Jet aircraft on take off
140 dB(A)	Threshold of Pain

## A.2 Acoustic Terminology

**dB (decibel)** The scale on which sound pressure level is expressed. It is defined as 20 times the logarithm of the ratio between the root-mean-square pressure of the sound field and a reference pressure (of 20  $\mu$ Pa).

**dB(A)** A-weighted decibel. This is a measure of the overall level of sound across the audible spectrum with a frequency weighting (i.e. 'A' weighting) to compensate for the varying sensitivity of the human ear to sound at different frequencies.

**$L_{Aeq, T}$**   $L_{Aeq, T}$  is defined as the notional steady sound level which, over a stated period T, would contain the same amount of acoustical energy as the A-weighted fluctuating sound measured over that period.

**$L_{A10, T}$  &  $L_{A90}$**  If a non-steady noise is to be described it is necessary to know both its level and the degree of fluctuation. The  $L_n$  indices are used for this purpose, and the term refers to the level exceeded for n% of the time. Hence  $L_{A10}$  is the level exceeded for 10% of the time and as such can be regarded as the 'average maximum level'. Similarly,  $L_{A90}$  is the 'average minimum level' and is often used to describe the background noise. It is common practice to use the  $L_{A10}$  index to describe traffic noise.

**$L_{Amax(F)}$**   $L_{Amax(F)}$  is the maximum A-weighted sound pressure level recorded over the period stated.  $L_{Amax}$  is sometimes used in assessing environmental noise where occasional loud noises occur, which may have little effect on the overall  $L_{Aeq}$  noise level but will still affect the noise environment. Unless described otherwise, it is measured using the 'fast' sound level meter response.





# Appendix B Weather Data

## Environmental Permit Application – Supporting Documentation Appendix F1 - Noise Impact Assessment

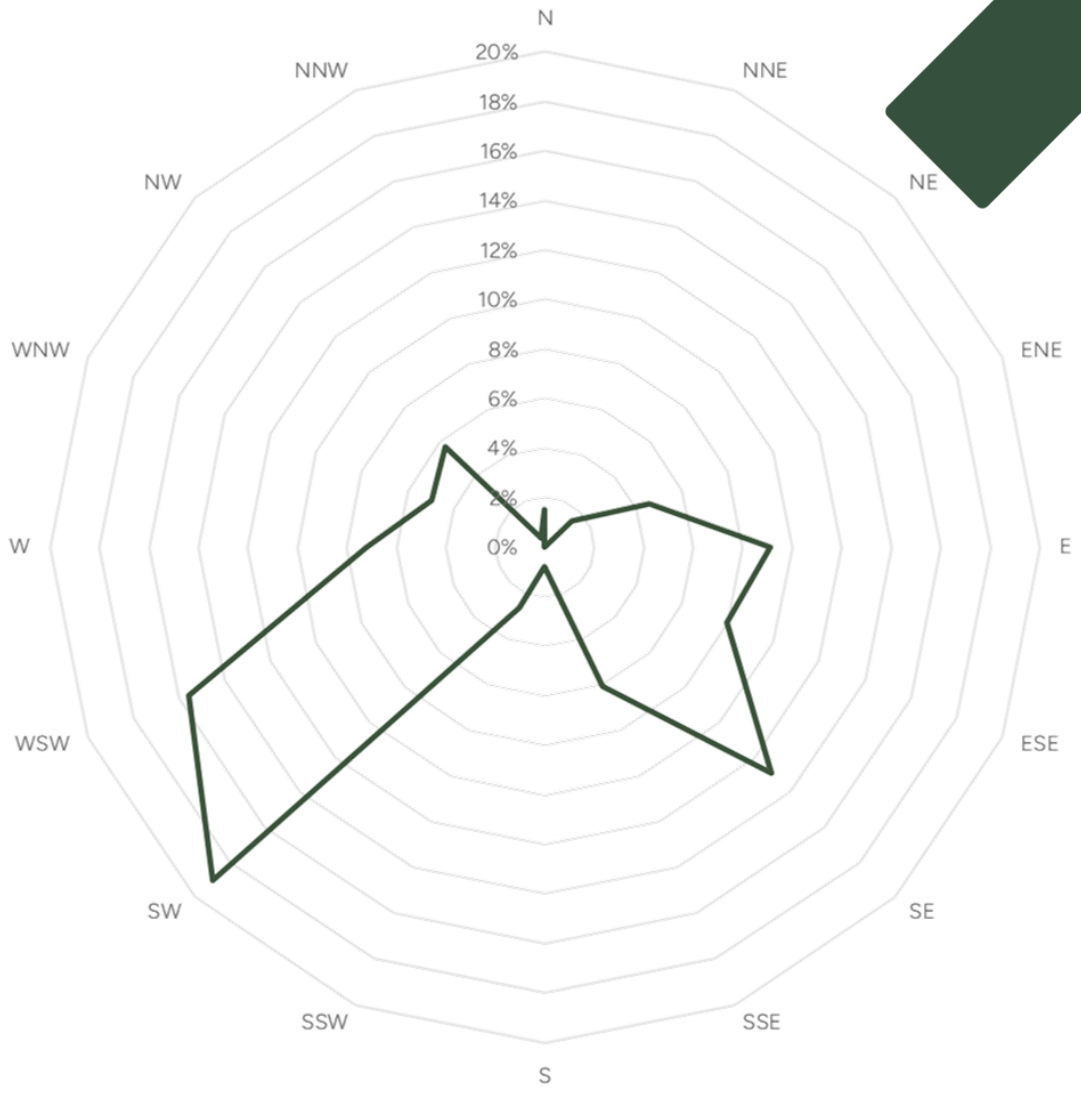
Sawston Pilot Plant

Immaterial Limited

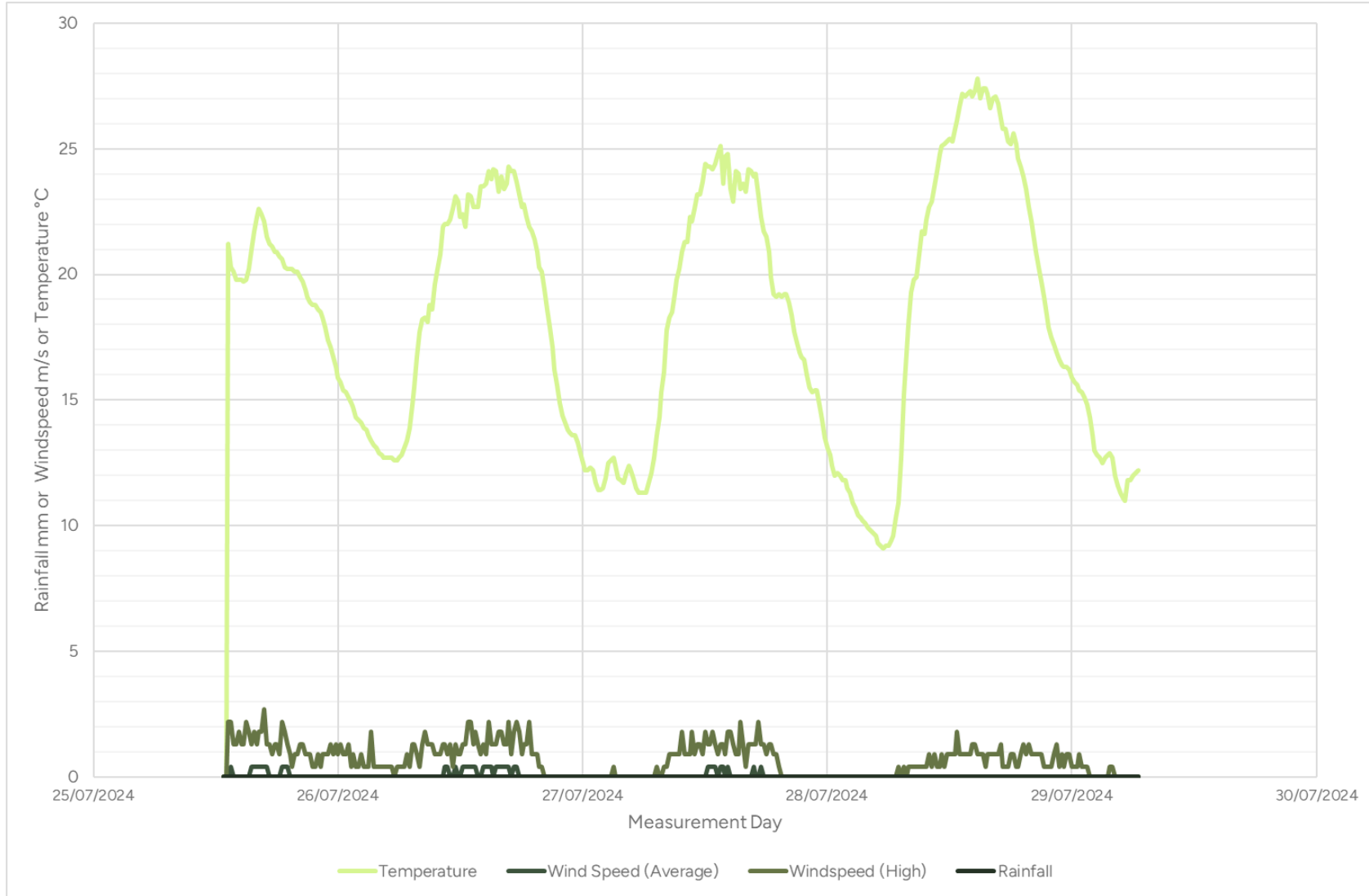
SLR Project No: 405.065240.00001

8 November 2024

# Wind Direction Plot



### Weather Overview





# Appendix C Noise Survey Results

**Environmental Permit Application – Supporting  
Documentation Appendix F1 - Noise Impact Assessment**

**Sawston Pilot Plant**

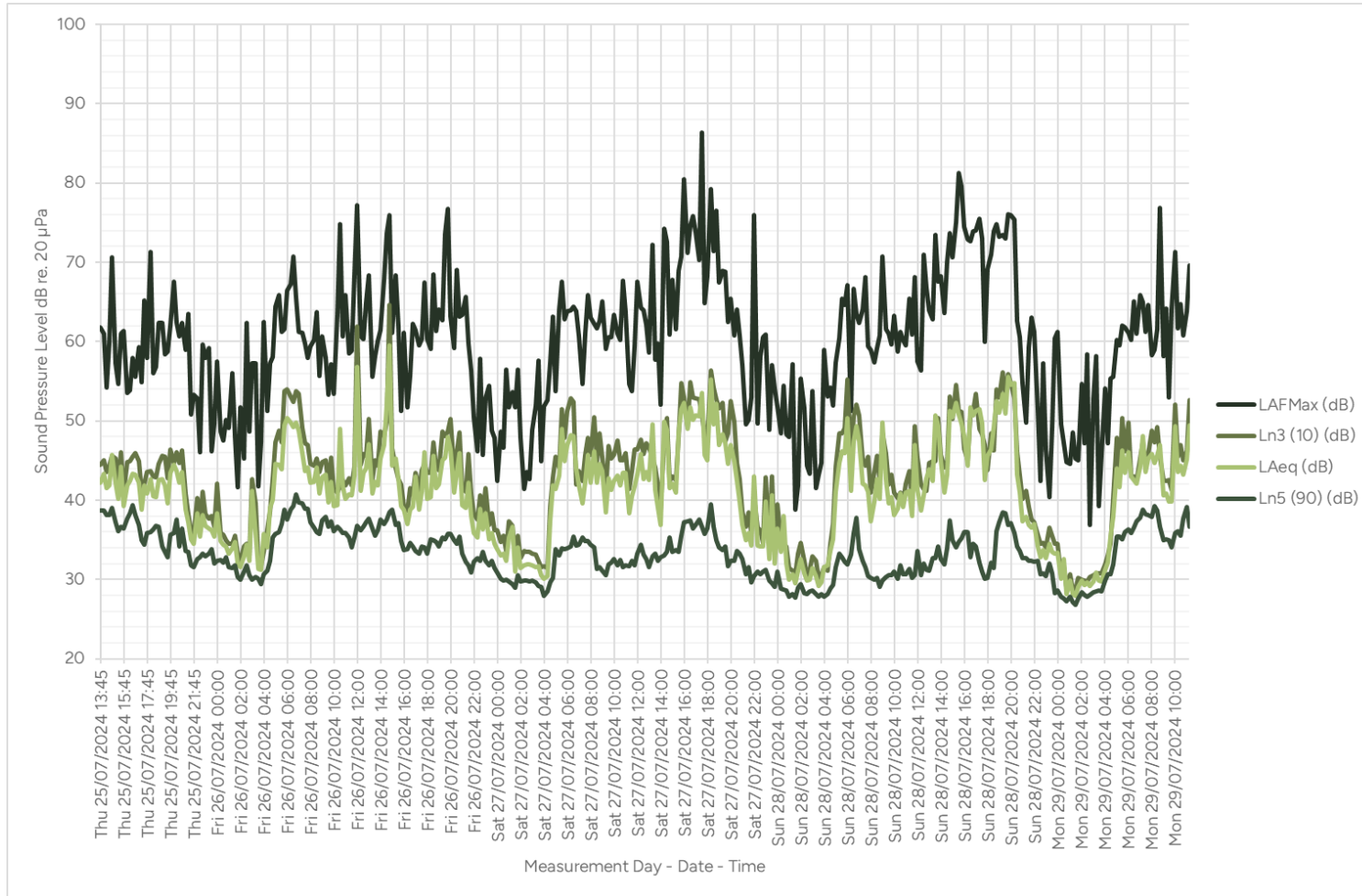
**Immaterial Limited**

SLR Project No: 405.065240.00001

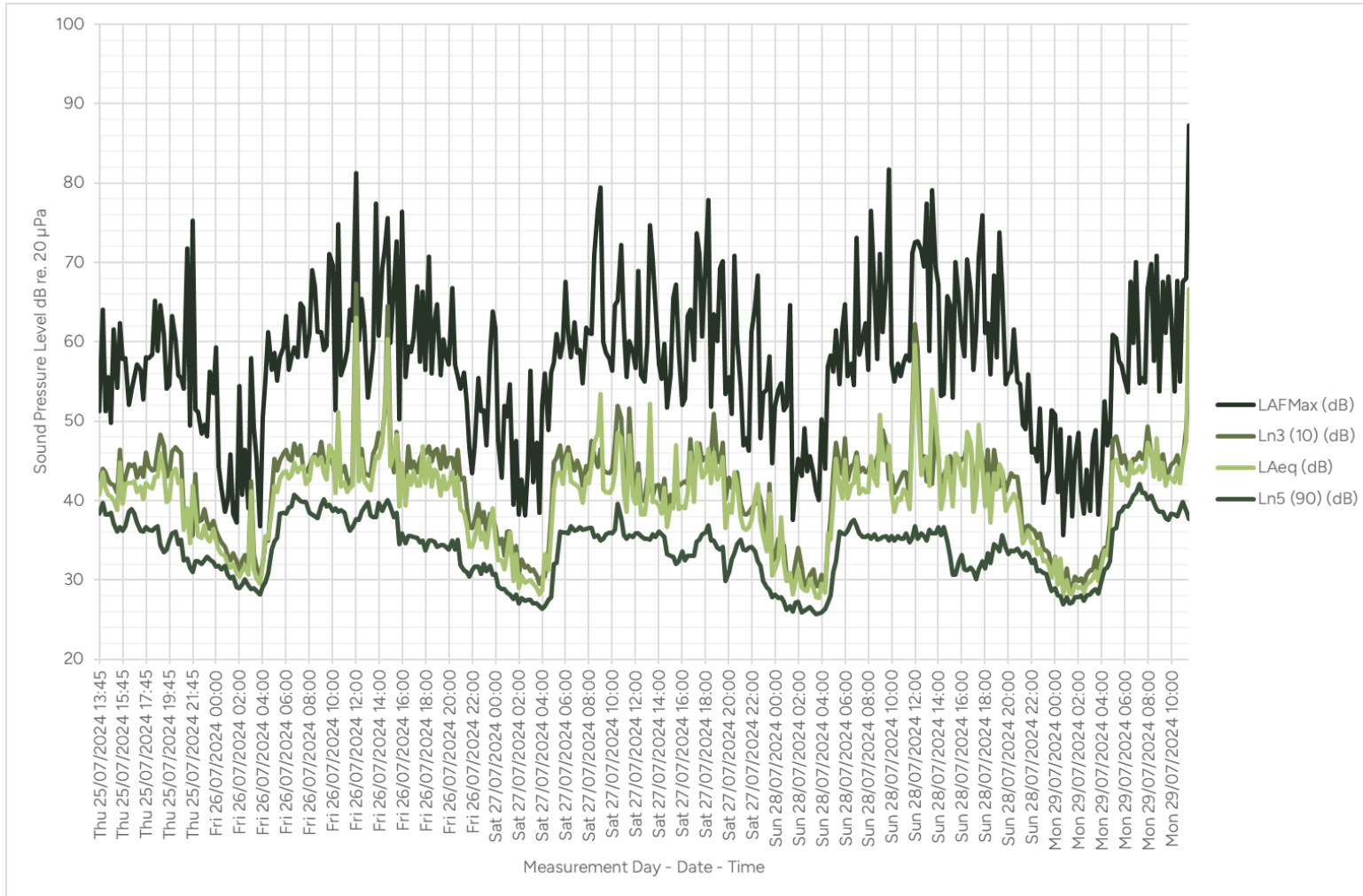
8 November 2024



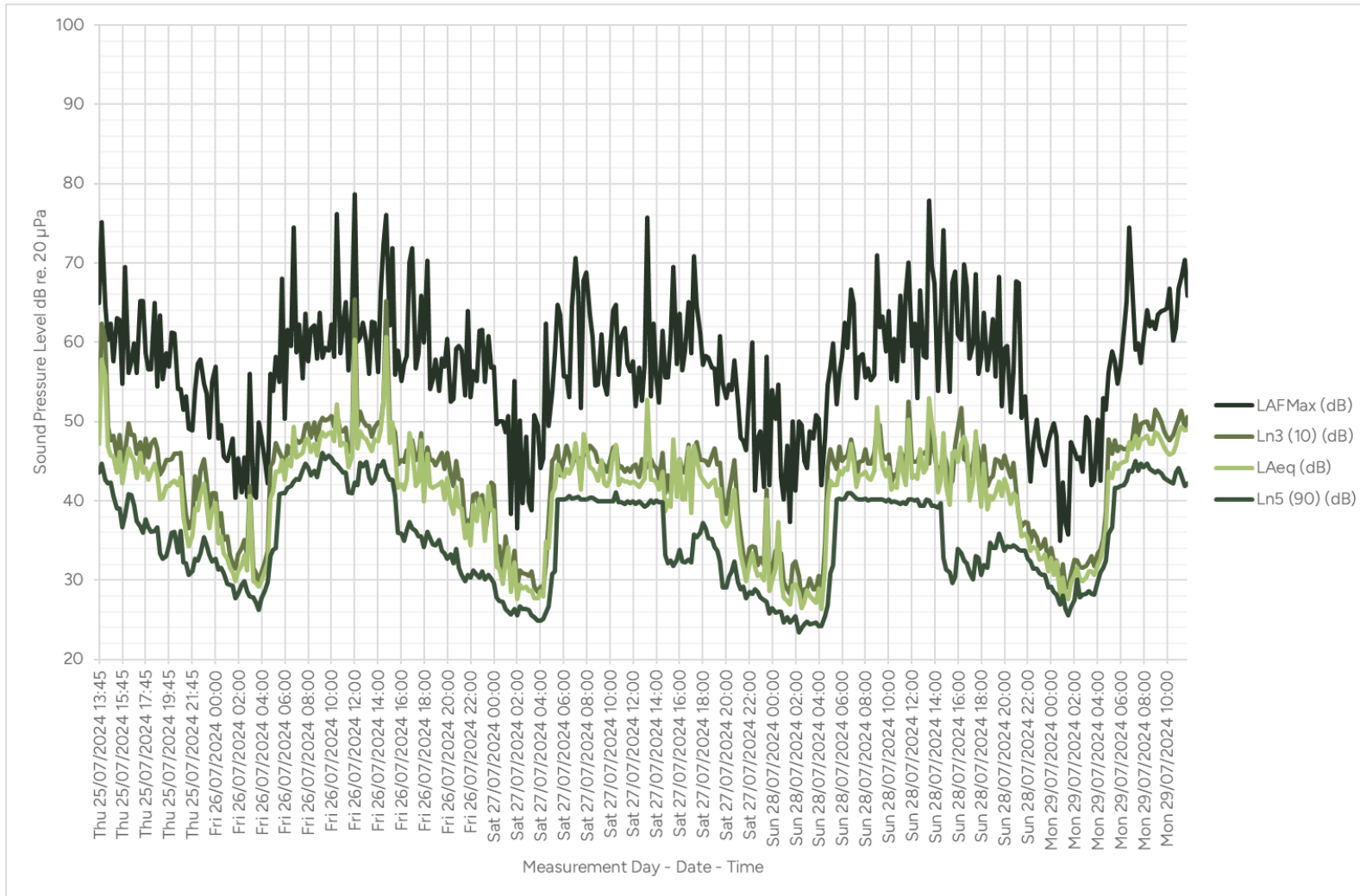
### Location 1 Noise Survey Timeline, daytime and night-time



### Location 2 Noise Survey Timeline, daytime and night-time



### Location 3 Histogram, daytime and night-time



## **Measured Sound Levels at Location 1, free-field, Db**

Time	$L_{Aeq}$ (dB)	$L_{A10}$ (dB)	$L_{A90}$ (dB)	$L_{AFMax}$ (dB)
25/07/2024 13:30	42.4	44.7	38.9	57.4
25/07/2024 13:45	42.2	44.5	38.7	61.8
25/07/2024 14:00	43.3	45	38.7	61
25/07/2024 14:15	41.5	43.6	38.1	54.2
25/07/2024 14:30	41.9	44.3	38.1	59.8
25/07/2024 14:45	45.7	45.6	39	70.6
25/07/2024 15:00	42.2	45.2	37.2	57.2
25/07/2024 15:15	40.1	42.3	36.1	54.6
25/07/2024 15:30	44.2	46.1	36.7	61
25/07/2024 15:45	39.3	40.8	36.4	61.3
25/07/2024 16:00	41.8	44.8	37.7	53.5
25/07/2024 16:15	42.4	44.9	38.3	53.9
25/07/2024 16:30	43.3	45.5	39.4	57.9
25/07/2024 16:45	43.2	45.9	38.1	55.5
25/07/2024 17:00	42.2	44.9	36.9	59.3
25/07/2024 17:15	38.8	41.2	34.9	54.9
25/07/2024 17:30	41.8	42.1	34.4	65.2
25/07/2024 17:45	40.8	43.5	35.8	57.9
25/07/2024 18:00	42.7	43.7	36	71.3
25/07/2024 18:15	40.5	43	36.3	56
25/07/2024 18:30	40.4	42.9	36.8	56.8
25/07/2024 18:45	42.5	44.6	36.6	62.4
25/07/2024 19:00	42.7	45.6	34.2	62.4
25/07/2024 19:15	41.8	45.5	33.5	58.4
25/07/2024 19:30	39.6	42.8	32.8	58.7
25/07/2024 19:45	43.4	46.4	35.6	62
25/07/2024 20:00	44.5	44.7	35.9	67.6
25/07/2024 20:15	43.7	46.1	37.5	62.3
25/07/2024 20:30	42.2	44.7	34.1	60.6
25/07/2024 20:45	43.5	46.3	36.4	62.3
25/07/2024 21:00	38.8	40.8	33.6	58.9
25/07/2024 21:15	37.2	38.2	33.5	63.5
25/07/2024 21:30	35.1	36.1	31.8	50.8
25/07/2024 21:45	34.5	35.7	31.5	53.3
25/07/2024 22:00	38.3	40.3	32.6	52.8
25/07/2024 22:15	35.4	37.3	32.8	46.1
25/07/2024 22:45	38.1	41.1	33.2	59.6
25/07/2024 23:00	36.8	38.2	32.9	57.9
25/07/2024 23:15	36.4	37.7	33.3	59.2
25/07/2024 23:30	36.2	38	33.8	46.2
25/07/2024 23:45	35.4	36.7	32	49.7

Time	$L_{Aeq}$ (dB)	$L_{A10}$ (dB)	$L_{A90}$ (dB)	$L_{AFMax}$ (dB)
26/07/2024 00:00	38.4	42.1	32.3	57.5
26/07/2024 00:15	34.8	35.9	32.5	48.7
26/07/2024 00:30	34.4	35.6	32.1	47.5
26/07/2024 00:45	34.1	35	32.8	50.1
26/07/2024 01:00	33.2	34.5	31.6	49.1
26/07/2024 01:15	33.9	34.5	31.4	56
26/07/2024 01:30	34.7	35.5	31.8	48
26/07/2024 01:45	32	33.2	30.3	41.6
26/07/2024 02:00	31.5	32.4	30	51.7
26/07/2024 02:15	32.9	34.2	31	45.3
26/07/2024 02:30	34.4	34.5	31.8	62.3
26/07/2024 02:45	32.4	33	30.5	48.6
26/07/2024 03:00	41.2	42.6	30	57.2
26/07/2024 03:15	35.7	39.6	30.3	57.3
26/07/2024 03:30	31.3	32.4	30.1	41.7
26/07/2024 03:45	31.2	31.8	29.4	47.3
26/07/2024 04:00	35.7	33.5	30.7	62.5
26/07/2024 04:15	34	36.3	31.1	51.2
26/07/2024 04:30	39	38.6	32.4	57.3
26/07/2024 04:45	40	42.6	35.3	58.1
26/07/2024 05:00	44.6	47.3	35.7	64.4
26/07/2024 05:15	44.5	48.8	36	65.9
26/07/2024 05:30	43.9	47.3	37	61.2
26/07/2024 05:45	49.4	53.7	38.8	61.6
26/07/2024 06:00	50.3	54	37.5	66.4
26/07/2024 06:15	49.8	53.1	38.8	67.2
26/07/2024 06:30	49.2	52.4	39.2	70.7
26/07/2024 06:45	49.8	53.7	40.7	65.5
26/07/2024 07:00	48.8	53.4	39.7	61.2
26/07/2024 07:15	45.9	49.1	39.6	61.1
26/07/2024 07:30	43.7	47.2	38.9	59.7
26/07/2024 07:45	44.1	47	38.9	57.9
26/07/2024 08:00	42.2	44.6	37.2	59.4
26/07/2024 08:15	42.3	44.3	36.5	60.2
26/07/2024 08:30	44.1	45.2	36	63.7
26/07/2024 08:45	40.8	43.5	35.7	55.7
26/07/2024 09:00	42.9	44.8	37.4	60.6
26/07/2024 09:15	43.2	45	37.9	57.9
26/07/2024 09:30	39.7	42	36.7	53.3
26/07/2024 09:45	42.3	45.4	37.3	57.1
26/07/2024 10:00	39.3	41.4	36.1	53.4

Time	$L_{Aeq}$ (dB)	$L_{A10}$ (dB)	$L_{A90}$ (dB)	$L_{AFMax}$ (dB)
26/07/2024 10:15	39.4	40.9	36.6	63.5
26/07/2024 10:30	49	41.7	36.3	74.8
26/07/2024 10:45	41.7	42.5	35.8	60.6
26/07/2024 11:00	40.2	41.9	35.8	65.9
26/07/2024 11:15	40.7	42.8	35.3	58.5
26/07/2024 11:30	40.6	41.8	34	58.8
26/07/2024 11:45	43.1	44.2	35.3	68.4
26/07/2024 12:00	56.8	61.9	36.8	77.2
26/07/2024 12:15	41.2	44.5	36.2	60.6
26/07/2024 12:30	43.4	45.8	36.6	60.3
26/07/2024 12:45	44	45.6	37.2	64.9
26/07/2024 13:00	47.1	50.2	37.7	68.4
26/07/2024 13:15	40.8	42.7	36.4	55.6
26/07/2024 13:30	42.3	45	35.5	58.2
26/07/2024 13:45	41.9	44.3	36.2	60.1
26/07/2024 14:00	45.2	48.7	37.6	61.4
26/07/2024 14:15	46.9	48.1	37	67.8
26/07/2024 14:30	52.1	49.9	37.5	73.7
26/07/2024 14:45	59.5	64.6	38.5	75.9
26/07/2024 15:00	44.3	46.5	38.8	61.1
26/07/2024 15:15	45.3	44	36.9	68.4
26/07/2024 15:30	42.7	42.6	37.1	61.9
26/07/2024 15:45	39.3	42	34.8	51.3
26/07/2024 16:00	38.8	39.2	33.7	61.1
26/07/2024 16:15	37	38.7	33.8	51.7
26/07/2024 16:30	38.8	41.5	34.6	55.7
26/07/2024 16:45	39.1	40.7	34.2	62.2
26/07/2024 17:00	43	43.4	33.6	61.4
26/07/2024 17:15	38.8	41.3	33.2	59.5
26/07/2024 17:30	41.1	43.8	34.2	60.3
26/07/2024 17:45	46.1	44.6	34	67.4
26/07/2024 18:00	40.1	43.4	33.2	60.3
26/07/2024 18:15	40.4	43.4	35.1	59.1
26/07/2024 18:30	45.6	47.3	34.9	68.5
26/07/2024 18:45	41.5	44.1	34.7	61.3
26/07/2024 19:00	42	43.8	34.2	64
26/07/2024 19:15	45	48.6	35.3	62.7
26/07/2024 19:30	45.4	48.1	35.1	73.6
26/07/2024 19:45	48	48.6	35.7	76.7
26/07/2024 20:00	46.4	50.2	35.7	63.1
26/07/2024 20:15	40.9	43.7	34.9	59.2



Time	$L_{Aeq}$ (dB)	$L_{A10}$ (dB)	$L_{A90}$ (dB)	$L_{AFMax}$ (dB)
26/07/2024 20:30	43.5	46.1	34.5	69
26/07/2024 20:45	45.9	48.5	35.4	63.1
26/07/2024 21:00	39.4	41.6	33.2	63.4
26/07/2024 21:15	39	41.1	32.2	65.6
26/07/2024 21:30	42.2	45.8	31.8	59.7
26/07/2024 21:45	38	40.8	30.9	56.3
26/07/2024 22:00	35.9	38.2	32.2	50.3
26/07/2024 22:15	35.3	37.6	32.7	46.2
26/07/2024 22:30	38.9	40.6	32.3	57.8
26/07/2024 22:45	36.3	38.3	33.5	45.7
26/07/2024 23:00	38.3	41.5	32.4	52.8
26/07/2024 23:15	35.1	36.9	31.8	54.4
26/07/2024 23:30	35.9	38.3	32.3	48.8
26/07/2024 23:45	34.5	36.2	31.4	47.9
27/07/2024 00:00	33.8	36.2	30.9	42.4
27/07/2024 00:15	33	34.7	30.1	48.6
27/07/2024 00:30	33.3	35.5	29.8	46.6
27/07/2024 00:45	32.4	33.6	30	56.5
27/07/2024 01:00	35.3	37.3	29.7	51.7
27/07/2024 01:15	36.6	36.8	29.4	53.6
27/07/2024 01:30	31	32.7	28.9	51.7
27/07/2024 01:45	34	35.5	30.5	56.5
27/07/2024 02:00	31.4	32.7	29.7	47.8
27/07/2024 02:15	31.8	33.6	29.8	41.4
27/07/2024 02:30	31.9	33.5	29.9	43.6
27/07/2024 02:45	31.9	33.5	29.7	42.7
27/07/2024 03:00	31.8	33.3	29.9	48.9
27/07/2024 03:15	31.5	33.1	29.6	51.9
27/07/2024 03:30	31.7	32.4	29.2	57.6
27/07/2024 03:45	30.5	31.6	29.1	44.9
27/07/2024 04:00	30.1	31.7	27.9	51.8
27/07/2024 04:15	30.4	31.4	28.5	52.6
27/07/2024 04:30	37.4	39.2	29.6	57.4
27/07/2024 04:45	41.9	42.9	30.2	63.1
27/07/2024 05:00	41.4	45.5	33.8	53.7
27/07/2024 05:15	43.1	44.1	33	64.1
27/07/2024 05:30	49	51.5	33.9	67.6
27/07/2024 05:45	44.9	47.8	33.8	62.8
27/07/2024 06:00	46.9	51.3	33.9	63.8
27/07/2024 06:15	48.2	52.8	34.2	63.9
27/07/2024 06:30	48.1	52.4	35.4	64.4

Time	L <sub>Aeq</sub> (dB)	L <sub>A10</sub> (dB)	L <sub>A90</sub> (dB)	L <sub>AFMax</sub> (dB)
27/07/2024 06:45	43.9	42	34.3	63.8
27/07/2024 07:00	41.8	43.7	34.4	60.7
27/07/2024 07:15	39.6	42.4	35.3	54.7
27/07/2024 07:30	42.3	45.7	34.8	61
27/07/2024 07:45	45.7	47.9	34.8	65.9
27/07/2024 08:00	42.2	45.7	34.4	63
27/07/2024 08:15	46.2	50.5	34	62.2
27/07/2024 08:30	42.2	44.9	31.3	61.7
27/07/2024 08:45	44.6	48.4	31.5	62.6
27/07/2024 09:00	43.7	45.4	31.1	65.1
27/07/2024 09:15	38.5	41	30.5	59.1
27/07/2024 09:30	42.8	46.8	31.9	60.5
27/07/2024 09:45	41.3	45.3	32.1	60.5
27/07/2024 10:00	42.4	45.7	32.6	63.4
27/07/2024 10:15	43.1	47.5	31.8	61
27/07/2024 10:30	41.8	45	32.5	60.2
27/07/2024 10:45	43.4	45	31.6	67.7
27/07/2024 11:00	43.4	45.9	31.8	63.7
27/07/2024 11:15	38.4	41.4	31.7	54.7
27/07/2024 11:30	40.5	43.7	32.3	53.7
27/07/2024 11:45	41.7	46.4	31.8	59.4
27/07/2024 12:00	43.2	46.4	33.2	67.6
27/07/2024 12:15	45.8	47.6	34.4	64.3
27/07/2024 12:30	42.7	45.8	33.1	63.9
27/07/2024 12:45	43.6	47.2	32.6	62.1
27/07/2024 13:00	42.5	46.6	31.6	58.6
27/07/2024 13:15	49.6	45.3	32.9	72.2
27/07/2024 13:30	41.3	44.1	33.2	57.7
27/07/2024 13:45	39	41.8	32.4	59.7
27/07/2024 14:00	36.9	38.8	32.8	52.1
27/07/2024 14:15	49.9	47.6	33	74.2
27/07/2024 14:30	48.9	50.3	33.5	72.5
27/07/2024 14:45	41.5	42.4	35.3	60.9
27/07/2024 15:00	42.1	43	33.5	67.8
27/07/2024 15:15	40.9	42.5	33.7	61.5
27/07/2024 15:30	48.5	48	33.5	68.9
27/07/2024 15:45	51.5	54.8	35.5	70.7
27/07/2024 16:00	52.3	53	37.2	80.5
27/07/2024 16:15	49	49.1	37.3	71.2
27/07/2024 16:30	51.7	54.9	37.4	74.6
27/07/2024 16:45	50.1	53	36.4	75.8

Time	L <sub>Aeq</sub> (dB)	L <sub>A10</sub> (dB)	L <sub>A90</sub> (dB)	L <sub>AFMax</sub> (dB)
27/07/2024 17:00	50.7	52.8	36.9	73.8
27/07/2024 17:15	50.6	52.7	37.6	70.3
27/07/2024 17:30	53.5	50.7	36.7	86.4
27/07/2024 17:45	45.7	48.4	35.7	64.8
27/07/2024 18:00	45	47.6	36.4	68.2
27/07/2024 18:15	55.2	56.4	39.5	79.2
27/07/2024 18:30	49.5	54.2	36.7	71.4
27/07/2024 18:45	52.2	52.7	35	76.5
27/07/2024 19:00	47	51.6	34	67.4
27/07/2024 19:15	48.3	52.3	33.7	68.9
27/07/2024 19:30	47.2	47.4	34.1	68.8
27/07/2024 19:45	44.6	48.4	31.7	62.5
27/07/2024 20:00	47	52.5	32.3	65.4
27/07/2024 20:15	44.9	49.9	32.4	60.8
27/07/2024 20:30	42.4	44.7	33.6	64
27/07/2024 20:45	39.8	42.6	33.3	60.8
27/07/2024 21:00	36.9	38.6	32.6	57
27/07/2024 21:15	34.9	36.6	30.7	49.5
27/07/2024 21:30	35.8	38.5	31.5	50.1
27/07/2024 21:45	34.3	35.8	29.6	53
27/07/2024 22:00	43	40.4	30.4	75.9
27/07/2024 22:15	34.3	36.5	31	49.7
27/07/2024 22:30	34.2	36.2	30.6	58.1
27/07/2024 22:45	34.1	34.6	31	60.5
27/07/2024 23:00	39.8	42.9	31.2	60.9
27/07/2024 23:15	32.6	34.5	29.9	48.9
27/07/2024 23:30	40.6	43	29.5	57
27/07/2024 23:45	32	33.6	29.1	54.1
28/07/2024 00:00	36.4	39.5	31	51.8
28/07/2024 00:15	33.5	35.1	28.8	48.4
28/07/2024 00:30	38	34.3	28.7	54.4
28/07/2024 00:45	32	34.1	28.6	48.3
28/07/2024 01:00	30	31.4	27.8	48
28/07/2024 01:15	30.7	31.1	28.1	57.1
28/07/2024 01:30	29.5	30.7	27.7	38.8
28/07/2024 01:45	31.1	33.3	28.9	41.9
28/07/2024 02:00	32.6	34.6	29.4	55.3
28/07/2024 02:15	30.8	32.4	28.3	51.6
28/07/2024 02:30	29.8	30.4	28.2	44.4
28/07/2024 02:45	30	31.2	28.5	43.3
28/07/2024 03:00	31.4	32.9	28.6	53.7

Time	$L_{Aeq}$ (dB)	$L_{A10}$ (dB)	$L_{A90}$ (dB)	$L_{AFMax}$ (dB)
28/07/2024 03:15	30.4	32.3	28.1	41.5
28/07/2024 03:30	29.2	30.2	27.8	43.2
28/07/2024 03:45	29.6	30.5	28.1	44.7
28/07/2024 04:00	31.5	31.5	27.8	59
28/07/2024 04:15	31.8	31.1	28.1	53.1
28/07/2024 04:30	33.6	34.5	28.8	54.2
28/07/2024 04:45	35.1	37	29.3	51.9
28/07/2024 05:00	41.1	44.2	31.6	57.4
28/07/2024 05:15	44.7	48.4	33.3	60.4
28/07/2024 05:30	46.2	48.4	32.8	65.4
28/07/2024 05:45	45.9	49.1	32.2	64.6
28/07/2024 06:00	50.4	55.2	31.9	67.1
28/07/2024 06:15	41.2	45.3	33.1	51.2
28/07/2024 06:30	47.4	50.6	35.8	66.6
28/07/2024 06:45	49.3	52	37.8	63.5
28/07/2024 07:00	47.5	50.7	33.8	62.4
28/07/2024 07:15	42.1	45.1	32.3	64.1
28/07/2024 07:30	41.9	44.4	31.5	68.1
28/07/2024 07:45	41.1	45.5	30.4	59.4
28/07/2024 08:00	37.3	40.9	30.2	59
28/07/2024 08:15	39.8	43.6	30	57.4
28/07/2024 08:30	42.7	45.6	30.2	59.2
28/07/2024 08:45	40.2	42.5	29.1	60.8
28/07/2024 09:00	49.8	48.5	29.9	70.7
28/07/2024 09:15	42.5	45.8	30.3	61.5
28/07/2024 09:30	39.6	42	30.5	61
28/07/2024 09:45	40.4	43.2	30.5	59.6
28/07/2024 10:00	38.1	41	31	63.3
28/07/2024 10:15	38.9	40.3	30.1	58.7
28/07/2024 10:30	40.8	40.9	31.8	61.2
28/07/2024 10:45	39.1	39.8	30.7	60.2
28/07/2024 11:00	41	42.1	30.7	59.5
28/07/2024 11:15	41.2	43.7	31.3	65.4
28/07/2024 11:30	38	39.6	30.2	60.9
28/07/2024 11:45	47	49.3	30.5	68.1
28/07/2024 12:00	41.3	45.4	33.6	57.5
28/07/2024 12:15	38.7	42	30.5	56.3
28/07/2024 12:30	40.6	41.4	32	71
28/07/2024 12:45	42.8	41.2	31.2	66.8
28/07/2024 13:00	43.9	44.7	31.1	63.9
28/07/2024 13:15	42.4	44.9	32.7	62.8

Time	$L_{Aeq}$ (dB)	$L_{A10}$ (dB)	$L_{A90}$ (dB)	$L_{AFMax}$ (dB)
28/07/2024 13:30	50.7	44.9	32.7	73.4
28/07/2024 13:45	49.3	50.3	34.1	67.6
28/07/2024 14:00	45	45.7	32.6	68.2
28/07/2024 14:15	41	44.1	31.9	63.6
28/07/2024 14:30	43.2	44.3	33.9	70.1
28/07/2024 14:45	51.3	53.1	37.4	73.7
28/07/2024 15:00	50.5	50.2	34.9	70.6
28/07/2024 15:15	52.3	54.5	34	75
28/07/2024 15:30	50.8	51.2	34.7	81.3
28/07/2024 15:45	49.7	51.1	35.2	79.6
28/07/2024 16:00	48.1	46.5	36	74.5
28/07/2024 16:15	44.3	45	36	72.9
28/07/2024 16:30	51.7	50.8	32.8	72.7
28/07/2024 16:45	50.7	51.1	34.5	73.9
28/07/2024 17:00	51.2	53.4	34.2	74
28/07/2024 17:15	51.5	49	32.1	75.5
28/07/2024 17:30	49.7	48.3	31	73
28/07/2024 17:45	42.5	46.9	30.1	60
28/07/2024 18:00	45.6	43.8	30.2	69.1
28/07/2024 18:15	46.4	48.4	32.1	70.9
28/07/2024 18:30	49.2	46.3	31.4	73.9
28/07/2024 18:45	52.5	54	36.1	74.8
28/07/2024 19:00	51	52.9	37.2	73.2
28/07/2024 19:15	53.4	56.1	38.5	73.4
28/07/2024 19:30	50.9	53.2	38.3	73
28/07/2024 19:45	55.6	55.9	36.9	76.1
28/07/2024 20:00	54.5	54.8	37.1	75.9
28/07/2024 20:15	54.8	52.8	35.8	75.4
28/07/2024 20:30	43.2	46.1	34.2	62.6
28/07/2024 20:45	41	43.1	33.6	60.5
28/07/2024 21:00	37.3	40.2	32.7	54.7
28/07/2024 21:15	37.9	41.2	32.7	49.8
28/07/2024 21:30	36.9	39.1	32.3	59.3
28/07/2024 21:45	36.5	37.5	32.3	63
28/07/2024 22:00	37	37.2	32.2	61.2
28/07/2024 22:15	34.2	35.6	32.3	51.2
28/07/2024 22:30	32.8	34.5	30.7	42.4
28/07/2024 22:45	33.7	34.6	30.8	57.3
28/07/2024 23:00	32.7	34	30.4	46.4
28/07/2024 23:15	34.5	36.5	32	40.4
28/07/2024 23:30	33.5	35.5	30.8	49.1

Time	L <sub>Aeq</sub> (dB)	L <sub>A10</sub> (dB)	L <sub>A90</sub> (dB)	L <sub>AFMax</sub> (dB)
28/07/2024 23:45	33.3	34.5	28.3	60.4
29/07/2024 00:00	33.4	34.5	28.6	61.2
29/07/2024 00:15	30.1	30.3	27.8	49.5
29/07/2024 00:30	32.6	31.7	27.6	47.2
29/07/2024 00:45	28.2	29	27.2	44.8
29/07/2024 01:00	29.8	30.7	27.8	44.6
29/07/2024 01:15	28.2	28.6	27.1	48.5
29/07/2024 01:30	27.9	28.7	26.8	45.2
29/07/2024 01:45	29.1	30.2	27.6	45
29/07/2024 02:00	29.9	30	28.4	54.7
29/07/2024 02:15	29.3	29.9	28	47.2
29/07/2024 02:30	29.6	29.7	27.8	58.4
29/07/2024 02:45	29.2	30.3	28	36.9
29/07/2024 03:00	29.7	30.5	28.4	52.8
29/07/2024 03:15	30.9	30.8	28.5	58.2
29/07/2024 03:30	29.8	30.8	28.6	39.3
29/07/2024 03:45	29.7	30.8	28.5	45.7
29/07/2024 04:00	31.2	31.9	29.9	54.1
29/07/2024 04:15	32.1	33	30.6	47.2
29/07/2024 04:30	35.4	34.5	30.7	55.3
29/07/2024 04:45	37.9	40.3	31.9	55.6
29/07/2024 05:00	44	47.8	35.4	60.2
29/07/2024 05:15	41.6	43.2	35.4	59.5
29/07/2024 05:30	46.3	50.3	35.1	62
29/07/2024 05:45	43.4	46.2	36	61.8
29/07/2024 06:00	46	49.8	36.3	61.1
29/07/2024 06:15	43	43	35.8	60.2
29/07/2024 06:30	42.5	43	36.5	65.1
29/07/2024 06:45	42.1	42.4	37.3	61
29/07/2024 07:00	44.2	45.2	37.8	65.8
29/07/2024 07:15	48.1	47.3	38.8	65
29/07/2024 07:30	43.5	44.6	38.2	61.2
29/07/2024 07:45	45.2	45.8	38.1	64.6
29/07/2024 08:00	45.8	48.8	37.9	58.3
29/07/2024 08:15	44.7	47.3	39.2	59
29/07/2024 08:30	45.6	49.2	38.7	61.5
29/07/2024 08:45	46.9	45.5	36.6	76.8
29/07/2024 09:00	40.6	42.5	34.9	58.2
29/07/2024 09:15	40.8	42.4	35.1	64.2
29/07/2024 09:30	39.8	42.5	34.9	52.9
29/07/2024 09:45	39.8	41.3	34	64.1

<b>Time</b>	<b><i>L</i><sub>Aeq</sub> (dB)</b>	<b><i>L</i><sub>A10</sub> (dB)</b>	<b><i>L</i><sub>A90</sub> (dB)</b>	<b><i>L</i><sub>AFMax</sub> (dB)</b>
29/07/2024 10:00	49.3	52.1	35.8	71.3
29/07/2024 10:15	43.5	45.5	36.1	61.7
29/07/2024 10:30	44.3	47	35.5	64.7
29/07/2024 10:45	43.2	45	37.7	60.8
29/07/2024 11:00	45.1	46.2	39.1	63.8
29/07/2024 11:15	49.4	52.6	36.6	69.6



**Measured Sound Levels at Location 2, free-field, dB**

Time	<i>L</i> <sub>Aeq</sub> (dB)	<i>L</i> <sub>A10</sub> (dB)	<i>L</i> <sub>A90</sub> (dB)	<i>L</i> <sub>AFMax</sub> (dB)
25/07/2024 13:17	55	53	39.2	81.8
25/07/2024 13:30	41.8	44	38.3	59
25/07/2024 13:45	40.7	42.4	38.4	51.3
25/07/2024 14:00	43.6	44	39.7	64.1
25/07/2024 14:15	41.5	43.6	38.2	51.2
25/07/2024 14:30	40.7	42.5	38.2	55.5
25/07/2024 14:45	40.5	42.1	38.5	49.8
25/07/2024 15:00	40	42	37.1	61.6
25/07/2024 15:15	38.8	40.9	36.1	54.2
25/07/2024 15:30	44.8	46.4	36.6	62.3
25/07/2024 15:45	39.6	41	36.2	57.8
25/07/2024 16:00	42.1	42.9	36.8	57.9
25/07/2024 16:15	42.2	44.6	38.6	52
25/07/2024 16:30	42.2	44.3	38.9	54
25/07/2024 16:45	42.4	44.6	38.3	55.5
25/07/2024 17:00	41.1	42.9	37.2	57.1
25/07/2024 17:15	41.7	44.1	36.2	56.5
25/07/2024 17:30	40.2	43	36.1	52.7
25/07/2024 17:45	42.2	46	36.7	58.1
25/07/2024 18:00	41.7	44.4	36.3	57.9
25/07/2024 18:15	41.5	43.8	36.2	58.4
25/07/2024 18:30	43	43.9	36.5	65.2
25/07/2024 18:45	43	46.4	36.8	58.8
25/07/2024 19:00	45.9	48.3	34.4	64.6
25/07/2024 19:15	43.5	46.8	33.5	60.9
25/07/2024 19:30	39.8	43	33.8	54.1
25/07/2024 19:45	40.1	43.5	34.9	54.5
25/07/2024 20:00	43.4	46.2	35.9	63.3
25/07/2024 20:15	44	46.7	36.1	60.2
25/07/2024 20:30	42.2	46.3	34.5	55.8
25/07/2024 20:45	42.5	45.9	35.1	55.4
25/07/2024 21:00	36.3	38.2	32.5	54.1
25/07/2024 21:15	39	37.8	32.7	71.7
25/07/2024 21:30	34.6	35.5	31.6	49.4
25/07/2024 21:45	41.8	35.6	31	75.2
25/07/2024 22:00	38.8	43.3	32.3	51.5

Time	$L_{Aeq}$ (dB)	$L_{A10}$ (dB)	$L_{A90}$ (dB)	$L_{AFMax}$ (dB)
25/07/2024 22:15	35.5	37.3	32.3	51.1
25/07/2024 22:45	35.3	37.6	32	48.4
25/07/2024 23:00	36.9	38.9	32.5	49.5
25/07/2024 23:15	35.3	37.3	32.9	48.1
25/07/2024 23:30	34.8	36.4	32.6	56.2
25/07/2024 23:45	36.4	37.4	32.2	53.5
26/07/2024 00:00	35	36.2	31.7	59.3
26/07/2024 00:15	33.8	35.4	31.8	44.2
26/07/2024 00:30	33.2	34.7	31.3	41.5
26/07/2024 00:45	33	34.1	31.8	38.6
26/07/2024 01:00	32	33.1	30.7	40
26/07/2024 01:15	31.5	32.5	30.2	45.8
26/07/2024 01:30	32	33.4	30.4	38.3
26/07/2024 01:45	30.9	32.3	29.1	37.2
26/07/2024 02:00	30.4	31.2	29	54.4
26/07/2024 02:15	31.1	32.5	29.4	40.7
26/07/2024 02:30	31.8	33.1	30.1	46.4
26/07/2024 02:45	30.7	31.6	29.3	39
26/07/2024 03:00	41.2	42.4	28.8	57.9
26/07/2024 03:15	31.3	33.2	29	49.2
26/07/2024 03:30	30.2	31.5	28.6	45.4
26/07/2024 03:45	29.5	30.6	28.1	36.8
26/07/2024 04:00	32	32.1	29.2	50.5
26/07/2024 04:15	35.5	35.1	29.7	55.3
26/07/2024 04:30	35.2	34.9	30.9	61.2
26/07/2024 04:45	38.8	41	33.8	56.5
26/07/2024 05:00	41.8	45.3	34.8	58.6
26/07/2024 05:15	41.1	43.8	35.3	55.1
26/07/2024 05:30	42.8	45	38.4	58
26/07/2024 05:45	43.6	45.9	38.5	59.3
26/07/2024 06:00	43.7	46.4	38.4	63.2
26/07/2024 06:15	42.8	45.3	39.1	56.5
26/07/2024 06:30	43.2	45	39.3	58.1
26/07/2024 06:45	44.8	47.2	40.7	59.3
26/07/2024 07:00	43.5	45.7	40.3	58.1
26/07/2024 07:15	44.2	46.9	39.9	64.8
26/07/2024 07:30	44.4	44	39.8	64.3

Time	$L_{Aeq}$ (dB)	$L_{A10}$ (dB)	$L_{A90}$ (dB)	$L_{AFMax}$ (dB)
26/07/2024 07:45	42.1	43.6	39.8	58.2
26/07/2024 08:00	42.6	44.3	38.5	61
26/07/2024 08:15	45.4	45.2	38.2	69
26/07/2024 08:30	45.5	45.8	38	66.9
26/07/2024 08:45	44.5	44.7	37.8	61.2
26/07/2024 09:00	45.5	47.4	39.4	61.2
26/07/2024 09:15	43.4	45.2	40.1	58.9
26/07/2024 09:30	42.6	44.7	39.2	59.5
26/07/2024 09:45	46.9	45.2	39.5	71.1
26/07/2024 10:00	46	44.7	38.7	69.6
26/07/2024 10:15	41	42.8	39	51.4
26/07/2024 10:30	51.1	45.6	38.6	74.8
26/07/2024 10:45	41.7	43.4	38.8	55.8
26/07/2024 11:00	42.3	44.3	38.5	57.2
26/07/2024 11:15	41.1	42.7	37.1	59
26/07/2024 11:30	41.6	41.6	36.2	64.1
26/07/2024 11:45	41.9	43.2	36.6	62.7
26/07/2024 12:00	63	67.3	37.7	81.2
26/07/2024 12:15	42.4	44.7	37.6	60.2
26/07/2024 12:30	45.2	46.5	38.6	65.4
26/07/2024 12:45	42.5	43.5	39.1	61.9
26/07/2024 13:00	41.7	43.2	39.8	53
26/07/2024 13:15	41.3	43.1	38.1	55.8
26/07/2024 13:30	43.8	45.9	37.9	59.3
26/07/2024 13:45	45.6	46.7	37.9	77.4
26/07/2024 14:00	45.4	48.5	39.7	60.8
26/07/2024 14:15	47.2	48.3	38.7	69.2
26/07/2024 14:30	52.7	51.3	39.5	71.9
26/07/2024 14:45	60.3	64.5	40	75.6
26/07/2024 15:00	44.4	47	39.2	59.9
26/07/2024 15:15	45.9	43.5	37.9	67.1
26/07/2024 15:30	48.3	48.6	38.5	72.7
26/07/2024 15:45	39.2	42.8	34.5	50.2
26/07/2024 16:00	44.7	43.8	35.8	76.4
26/07/2024 16:15	39.4	42	34.6	55.6
26/07/2024 16:30	43.2	46.8	35.5	59.4
26/07/2024 16:45	42	44.1	35.5	58.7

Time	$L_{Aeq}$ (dB)	$L_{A10}$ (dB)	$L_{A90}$ (dB)	$L_{AFMax}$ (dB)
26/07/2024 17:00	43.7	44.9	35.4	60.6
26/07/2024 17:15	41.9	43.5	35.3	67
26/07/2024 17:30	41.9	45.2	34.7	57.5
26/07/2024 17:45	46.8	46.2	35	66.3
26/07/2024 18:00	42.2	45.9	33.7	56.5
26/07/2024 18:15	45.4	46.8	34.9	70.7
26/07/2024 18:30	41.7	44.9	34.9	56
26/07/2024 18:45	43.9	46.2	34.8	62.4
26/07/2024 19:00	43.6	46.5	34.2	64.7
26/07/2024 19:15	40.6	44	34.4	55.8
26/07/2024 19:30	43.1	46.8	34.4	60.3
26/07/2024 19:45	41.4	44.2	34.1	58.3
26/07/2024 20:00	41.9	45.4	33.8	57.1
26/07/2024 20:15	43.7	45.4	34.9	66.8
26/07/2024 20:30	40.6	43.3	33.8	57.1
26/07/2024 20:45	42.9	46.4	35.1	55.7
26/07/2024 21:00	38.9	42.6	31.9	54.1
26/07/2024 21:15	38.5	42.9	31.2	56.1
26/07/2024 21:30	37	39.5	31	52.4
26/07/2024 21:45	34.2	36.6	30.4	46.6
26/07/2024 22:00	34.2	36.5	31.2	43.4
26/07/2024 22:15	35.3	37.4	31.7	47.1
26/07/2024 22:30	37.5	39.6	31.7	55.4
26/07/2024 22:45	35.1	37.2	30.8	51.2
26/07/2024 23:00	36	38.6	32	51.4
26/07/2024 23:15	34	35.9	31.1	46.9
26/07/2024 23:30	37.2	38.4	31.8	58.4
26/07/2024 23:45	39	37.8	30.7	63.8
27/07/2024 00:00	35.1	36.7	30.8	61.7
27/07/2024 00:15	32.5	34.5	29.2	47.5
27/07/2024 00:30	32.5	35.2	28.8	42.9
27/07/2024 00:45	31.3	33	28.8	51.9
27/07/2024 01:00	33.5	36.1	28.4	50.6
27/07/2024 01:15	36	36.1	28.2	54.7
27/07/2024 01:30	29.8	31.8	27.6	39.5
27/07/2024 01:45	33.2	34.3	28.2	47.5
27/07/2024 02:00	29	30.8	27	38.2

Time	$L_{Aeq}$ (dB)	$L_{A10}$ (dB)	$L_{A90}$ (dB)	$L_{AFMax}$ (dB)
27/07/2024 02:15	30.5	32.6	27.7	42.7
27/07/2024 02:30	29.6	31.5	27.4	38.1
27/07/2024 02:45	29.9	31.8	27.5	44
27/07/2024 03:00	30	31.1	27.5	56.3
27/07/2024 03:15	29.5	31.3	27	42.3
27/07/2024 03:30	29	30.5	27	47.3
27/07/2024 03:45	28.1	29.5	26.7	38.5
27/07/2024 04:00	28.7	30.4	26.3	52.1
27/07/2024 04:15	33.2	30.4	26.7	56
27/07/2024 04:30	31.2	33.4	27.5	48.9
27/07/2024 04:45	36	38.2	27.8	56.1
27/07/2024 05:00	41.3	44.8	32	57.4
27/07/2024 05:15	43.3	45.4	32.1	61
27/07/2024 05:30	43.6	46.9	36.1	58.1
27/07/2024 05:45	42.1	43.9	36	59.9
27/07/2024 06:00	44.7	45.6	36	67.6
27/07/2024 06:15	45.8	46.7	35.9	61
27/07/2024 06:30	42.4	45.3	36.8	58
27/07/2024 06:45	42.1	43.8	36.2	62.5
27/07/2024 07:00	41.8	45	36.3	58.6
27/07/2024 07:15	41.4	44	36.7	59
27/07/2024 07:30	39.7	41.8	36.3	54.8
27/07/2024 07:45	43	44.4	36.4	61.8
27/07/2024 08:00	42.2	43.9	36.5	61.1
27/07/2024 08:15	44.6	47.5	36.5	61
27/07/2024 08:30	47.3	45.7	35.4	70.9
27/07/2024 08:45	48.4	44.2	35.6	76.7
27/07/2024 09:00	53.4	46.5	35	79.4
27/07/2024 09:15	41.4	43.8	35.2	60
27/07/2024 09:30	41.1	43.5	35.7	58.6
27/07/2024 09:45	41	43.4	36	57.8
27/07/2024 10:00	41.5	43.9	35.9	56.4
27/07/2024 10:15	43.4	47.2	36.3	64.6
27/07/2024 10:30	48.5	51.9	39.6	65.2
27/07/2024 10:45	47.8	50.3	37.8	72.2
27/07/2024 11:00	41	43.1	35.6	61.8
27/07/2024 11:15	38.6	40.1	35.2	55.6

Time	$L_{Aeq}$ (dB)	$L_{A10}$ (dB)	$L_{A90}$ (dB)	$L_{AFMax}$ (dB)
27/07/2024 11:30	48.2	51.6	35.6	60.1
27/07/2024 11:45	40.5	42.4	35.4	58.7
27/07/2024 12:00	39.6	41.4	35.8	56.7
27/07/2024 12:15	43.3	44.7	35.8	68.9
27/07/2024 12:30	38.2	40.3	35.5	55.8
27/07/2024 12:45	38.2	39.9	35.2	55
27/07/2024 13:00	40.8	42.8	35.2	59.8
27/07/2024 13:15	52.2	42.8	35.1	74.7
27/07/2024 13:30	39.8	40.5	35.7	70.4
27/07/2024 13:45	39.9	41.9	35.4	64.7
27/07/2024 14:00	39.4	42	36.1	57.1
27/07/2024 14:15	38.4	40	35.7	55.3
27/07/2024 14:30	41.6	42.8	35.4	59.7
27/07/2024 14:45	36.7	39.3	33.2	51.7
27/07/2024 15:00	39.4	40.7	33	55.9
27/07/2024 15:15	39	39.5	32.9	65.5
27/07/2024 15:30	47	41.8	32	67.2
27/07/2024 15:45	38.9	41.8	32.4	59.1
27/07/2024 16:00	39.3	42.2	33.6	52.1
27/07/2024 16:15	39	42.4	32.5	52.8
27/07/2024 16:30	40.9	42.1	33	63.2
27/07/2024 16:45	46	47.7	33	64
27/07/2024 17:00	39.8	41.8	33	57.7
27/07/2024 17:15	47.3	46.1	34.8	73.7
27/07/2024 17:30	45.7	47.2	35.1	71.1
27/07/2024 17:45	42.9	45	35.7	60.6
27/07/2024 18:00	43.6	45.5	36	70.6
27/07/2024 18:15	46.5	44.7	36.9	77.9
27/07/2024 18:30	42.2	45.9	34.9	51.8
27/07/2024 18:45	46	50.9	35	63.5
27/07/2024 19:00	42.7	44.9	34	60.1
27/07/2024 19:15	43.5	44.8	33.8	69.2
27/07/2024 19:30	45.5	47.3	34.1	70.2
27/07/2024 19:45	36.5	40.1	29.9	53.4
27/07/2024 20:00	39.5	42.9	31	55.6
27/07/2024 20:15	38.5	41.6	32.6	50.9
27/07/2024 20:30	43.6	42.8	33.4	70.8

Time	$L_{Aeq}$ (dB)	$L_{A10}$ (dB)	$L_{A90}$ (dB)	$L_{AFMax}$ (dB)
27/07/2024 20:45	42.1	43.6	34.5	60.3
27/07/2024 21:00	37.9	39.6	35.1	54.4
27/07/2024 21:15	36.5	38.3	33.8	47
27/07/2024 21:30	36.3	38.2	33.7	47.8
27/07/2024 21:45	36.7	38.5	34	46.3
27/07/2024 22:00	37.6	39	34.2	61.2
27/07/2024 22:15	40.5	39.6	33.6	64.5
27/07/2024 22:30	42.1	41.3	32.4	68.3
27/07/2024 22:45	37.3	40.2	31.8	47.8
27/07/2024 23:00	35.6	38.2	29.9	53.5
27/07/2024 23:15	33.6	34.4	29.1	54
27/07/2024 23:30	40.8	42.1	28.7	58.2
27/07/2024 23:45	30.5	32.4	27.8	44.7
28/07/2024 00:00	31.3	32.9	28.1	51.8
28/07/2024 00:15	32.7	35.2	27.7	54
28/07/2024 00:30	37.9	33.5	27.8	54.8
28/07/2024 00:45	32.1	34.4	27.3	51.4
28/07/2024 01:00	29.8	30.5	26.2	51.9
28/07/2024 01:15	30.9	29.9	26.7	64.6
28/07/2024 01:30	28.2	30.1	26	37.6
28/07/2024 01:45	29.8	32.2	27.1	42.1
28/07/2024 02:00	31.4	34	27.3	45.3
28/07/2024 02:15	29.1	31.5	25.9	43.1
28/07/2024 02:30	28.7	28.9	26.1	49.1
28/07/2024 02:45	28.6	29.6	26.4	43.7
28/07/2024 03:00	30.1	30.7	26.6	45.6
28/07/2024 03:15	29	31.3	26	43.3
28/07/2024 03:30	27.8	29.2	25.7	41.2
28/07/2024 03:45	27.7	29.3	25.8	40
28/07/2024 04:00	29.5	30.7	25.9	50.2
28/07/2024 04:15	28.4	29	26.3	44
28/07/2024 04:30	35.8	34.5	27.1	56.9
28/07/2024 04:45	35.1	37.8	28	58.3
28/07/2024 05:00	39.8	43.4	31	56.2
28/07/2024 05:15	45.3	47.3	32.4	61.4
28/07/2024 05:30	41.7	44.6	36.1	54.7
28/07/2024 05:45	40.3	43.3	35.9	61.7



Time	$L_{Aeq}$ (dB)	$L_{A10}$ (dB)	$L_{A90}$ (dB)	$L_{AFMax}$ (dB)
28/07/2024 06:00	45.1	47.9	35.7	64.7
28/07/2024 06:15	40.3	42.5	36.2	55.7
28/07/2024 06:30	42	44.3	37.2	57.3
28/07/2024 06:45	42.2	44.6	37.6	54.5
28/07/2024 07:00	45.5	46.1	36.8	73.1
28/07/2024 07:15	40.8	43.5	35.8	58.4
28/07/2024 07:30	41.5	44.1	35.4	60.6
28/07/2024 07:45	41.1	43.6	35.4	62.4
28/07/2024 08:00	41.1	43.8	35.6	56.5
28/07/2024 08:15	45.6	44.8	35.2	76.5
28/07/2024 08:30	42.6	43.9	35.7	66.2
28/07/2024 08:45	41.8	45.4	35.1	57.8
28/07/2024 09:00	50.8	46.5	35.2	71.1
28/07/2024 09:15	45.1	48.9	35.4	61.2
28/07/2024 09:30	45	47.1	35.5	68.4
28/07/2024 09:45	46.9	42.7	34.9	81.7
28/07/2024 10:00	40.7	43.2	35.5	57.2
28/07/2024 10:15	38.6	41	34.9	55
28/07/2024 10:30	40.3	42.1	35.5	57.3
28/07/2024 10:45	40	42.8	35.2	55.7
28/07/2024 11:00	41.4	43.6	35.2	57.3
28/07/2024 11:15	41.1	43.6	35.9	58.3
28/07/2024 11:30	38.9	40.3	34.7	57.6
28/07/2024 11:45	49.6	50.9	35.3	71.2
28/07/2024 12:00	59.6	62.2	36.8	72.5
28/07/2024 12:15	52.8	58.8	35.2	72.7
28/07/2024 12:30	43.2	44.5	35.9	71.5
28/07/2024 12:45	45	45.6	35.5	69.5
28/07/2024 13:00	45.5	42.4	35	77.4
28/07/2024 13:15	41.8	43.3	36.3	58.8
28/07/2024 13:30	54	42.1	35.9	79.1
28/07/2024 13:45	49.7	49.5	35.8	69.4
28/07/2024 14:00	46.2	45.7	36.7	67.2
28/07/2024 14:15	38.9	41	35.6	53.2
28/07/2024 14:30	40.6	43.1	36.7	53.4
28/07/2024 14:45	45.5	44.3	34.8	65.7
28/07/2024 15:00	42.5	45.6	33	64.6

Time	$L_{Aeq}$ (dB)	$L_{A10}$ (dB)	$L_{A90}$ (dB)	$L_{AFMax}$ (dB)
28/07/2024 15:15	39.3	43.4	30.6	53
28/07/2024 15:30	45.9	45.8	30.7	70
28/07/2024 15:45	45.1	44.7	32.4	64.9
28/07/2024 16:00	42.7	45.3	33.1	60.4
28/07/2024 16:15	41.9	45.4	31.3	58.2
28/07/2024 16:30	48.6	47.1	31.2	70.4
28/07/2024 16:45	47.2	46.8	31.6	66.3
28/07/2024 17:00	38.6	42	31.1	56.5
28/07/2024 17:15	40.8	41.3	30.1	61.3
28/07/2024 17:30	49.5	47.4	31.3	70.7
28/07/2024 17:45	44	45	32.4	75.9
28/07/2024 18:00	39.3	42.2	31.4	61.1
28/07/2024 18:15	43.3	46.4	33.4	62.4
28/07/2024 18:30	37.2	39.6	32.1	55.9
28/07/2024 18:45	43.4	46.4	34.5	68.4
28/07/2024 19:00	41.4	44.1	34.2	58.1
28/07/2024 19:15	44.6	41.7	33.6	73.8
28/07/2024 19:30	43.8	43.7	35.6	66.9
28/07/2024 19:45	38.7	41.2	34	54.7
28/07/2024 20:00	39.5	42.3	33.3	55.9
28/07/2024 20:15	40.2	43.4	33.7	56.2
28/07/2024 20:30	40.8	43	33.6	61.5
28/07/2024 20:45	39.8	43	33.9	55
28/07/2024 21:00	37.7	40.2	33.4	54.7
28/07/2024 21:15	34.6	35.6	32.9	49.5
28/07/2024 21:30	35.3	36.6	33.5	49
28/07/2024 21:45	36.2	36.9	33.2	55.9
28/07/2024 22:00	34.6	36.4	32.1	46
28/07/2024 22:15	34.8	36.2	32.6	46.5
28/07/2024 22:30	33.3	35.3	31.1	44.9
28/07/2024 22:45	33.9	35.9	31.2	51.6
28/07/2024 23:00	32.4	33.8	30.9	39.7
28/07/2024 23:15	32.5	33.7	30.8	42.8
28/07/2024 23:30	31.8	33.4	29.6	43.8
28/07/2024 23:45	30.3	31.4	28.6	51.4
29/07/2024 00:00	32.8	32.9	28.9	50.8
29/07/2024 00:15	29.4	30.4	28	41.1

Time	$L_{Aeq}$ (dB)	$L_{A10}$ (dB)	$L_{A90}$ (dB)	$L_{AFMax}$ (dB)
29/07/2024 00:30	32.7	31.1	27.9	49
29/07/2024 00:45	28.2	29.2	26.9	35.6
29/07/2024 01:00	30	31.4	27.8	43.5
29/07/2024 01:15	28.3	29.1	27	48
29/07/2024 01:30	28.1	29	27.1	38
29/07/2024 01:45	29.4	30.4	27.8	45.3
29/07/2024 02:00	29	29.8	27.8	48.5
29/07/2024 02:15	29.2	30.2	28	41
29/07/2024 02:30	28.5	29.4	27.4	38.3
29/07/2024 02:45	29.4	30.7	28	43.9
29/07/2024 03:00	29.7	31.2	28.1	38.7
29/07/2024 03:15	30.2	31.2	28.6	47.1
29/07/2024 03:30	31.1	32.9	28.8	48.9
29/07/2024 03:45	29.9	31.1	28.3	38.2
29/07/2024 04:00	32.1	33.2	30.1	44.3
29/07/2024 04:15	33.7	34	31.3	52.5
29/07/2024 04:30	33.1	34.2	31.5	47
29/07/2024 04:45	35.7	37.6	32.3	47.8
29/07/2024 05:00	44.8	47.6	36.3	60.9
29/07/2024 05:15	45.1	48.1	36.5	60.4
29/07/2024 05:30	43.8	46.6	38.5	57.6
29/07/2024 05:45	42.5	44.7	38.7	57
29/07/2024 06:00	42.9	45.7	39.2	55.3
29/07/2024 06:15	41.8	43.9	39.3	53.6
29/07/2024 06:30	44.9	43.7	39.8	67.6
29/07/2024 06:45	43.4	45.3	40.6	59.8
29/07/2024 07:00	43.6	45.1	40.9	70.1
29/07/2024 07:15	44.3	46	42.1	54.8
29/07/2024 07:30	43.5	45.3	41	55.4
29/07/2024 07:45	44.2	46.1	41	54.9
29/07/2024 08:00	47.3	49.3	40.2	66.8
29/07/2024 08:15	46.1	45.7	40.6	69.8
29/07/2024 08:30	43	44.6	39.7	57.6
29/07/2024 08:45	47.9	44.3	38.9	70.8
29/07/2024 09:00	42.7	45.3	38.6	53.7
29/07/2024 09:15	44.7	45.8	38.6	67.5
29/07/2024 09:30	41.8	43.5	37.8	61.1

<b>Time</b>	<b><i>L</i><sub>Aeq</sub> (dB)</b>	<b><i>L</i><sub>A10</sub> (dB)</b>	<b><i>L</i><sub>A90</sub> (dB)</b>	<b><i>L</i><sub>AFMax</sub> (dB)</b>
29/07/2024 09:45	43	43.4	37.5	68.2
29/07/2024 10:00	42.9	44.5	38.3	63.7
29/07/2024 10:15	42.3	44.9	38.2	53.7
29/07/2024 10:30	44.2	45.7	38	67.7
29/07/2024 10:45	42.2	44.2	38.9	55
29/07/2024 11:00	45.3	45.1	39.8	67.5
29/07/2024 11:15	47.5	49.2	38.7	68
29/07/2024 11:30	66.6	55.4	37.7	87.3

**Measured Sound Levels at Location 3, free-field, dB**

Time	<i>L</i> <sub>Aeq</sub> (dB)	<i>L</i> <sub>A10</sub> (dB)	<i>L</i> <sub>A90</sub> (dB)	<i>L</i> <sub>AFMax</sub> (dB)
25/07/2024 13:45	47.2	49.4	43.6	64.9
25/07/2024 14:00	57.8	62.3	44.7	75.1
25/07/2024 14:15	55.8	60.3	42.6	64.6
25/07/2024 14:30	46.8	49.3	42.2	60.3
25/07/2024 14:45	45.7	47.6	42.3	62.3
25/07/2024 15:00	45.6	48.2	40.6	57.6
25/07/2024 15:15	43.6	45.6	39	63
25/07/2024 15:30	46.2	48.3	39	62.8
25/07/2024 15:45	42.2	44.9	36.7	54.8
25/07/2024 16:00	44.3	46	38.1	69.5
25/07/2024 16:15	46.6	49.8	40.8	56.1
25/07/2024 16:30	45.7	48.3	40.7	57.6
25/07/2024 16:45	45.1	48.3	39.5	59.9
25/07/2024 17:00	42.9	45.9	37.4	56.1
25/07/2024 17:15	46	47.4	36.8	65.2
25/07/2024 17:30	43.5	44.7	36	65.2
25/07/2024 17:45	44.1	47.9	37.7	58.6
25/07/2024 18:00	42.7	45.5	36.6	56.6
25/07/2024 18:15	43.7	47.2	36.1	56.6
25/07/2024 18:30	44.7	47.7	36.2	65
25/07/2024 18:45	43.3	46.5	36.6	54.4
25/07/2024 19:00	40.2	43.3	33.4	63.4
25/07/2024 19:15	40.4	43.9	32.7	55.3
25/07/2024 19:30	41.9	45.1	33	58.6
25/07/2024 19:45	41.8	45.1	34.4	56.9
25/07/2024 20:00	42.3	45.2	36	61.2
25/07/2024 20:15	42.5	45.9	36.1	61.1
25/07/2024 20:30	42	45.9	33.5	54.1
25/07/2024 20:45	43	46.1	36.2	54.1
25/07/2024 21:00	38	41.5	32.2	51.5
25/07/2024 21:15	36	38.2	32.1	53.2
25/07/2024 21:30	34.3	36.5	30.6	49.1
25/07/2024 21:45	35.6	37.7	31.1	48.9
25/07/2024 22:00	39	43.1	32.7	54
25/07/2024 22:15	38.8	40.1	32.5	57.2
25/07/2024 22:45	40.8	43.8	33.4	57.8

Time	$L_{Aeq}$ (dB)	$L_{A10}$ (dB)	$L_{A90}$ (dB)	$L_{AFMax}$ (dB)
25/07/2024 23:00	42.2	45.3	35.4	54.8
25/07/2024 23:15	39.5	42.4	34.4	53.5
25/07/2024 23:30	36.5	38.7	33.1	48
25/07/2024 23:45	38.8	41	32.4	55
26/07/2024 00:00	39.7	41	32.7	56.9
26/07/2024 00:15	34.6	36.8	31.3	47.9
26/07/2024 00:30	35.5	38.5	31.5	49.5
26/07/2024 00:45	33.4	35.1	30.9	45.6
26/07/2024 01:00	32.7	35.5	29.5	45
26/07/2024 01:15	31.5	33.1	29.4	46.4
26/07/2024 01:30	31	32	29.3	47.9
26/07/2024 01:45	29.8	31.4	27.7	40.4
26/07/2024 02:00	31.1	33.2	28.3	45.4
26/07/2024 02:15	31.9	34	29.4	41.1
26/07/2024 02:30	33.1	35.1	29.9	45.5
26/07/2024 02:45	31.2	33.1	28.6	40.5
26/07/2024 03:00	40.6	41.8	27.9	56
26/07/2024 03:15	29.9	31.5	27.8	41
26/07/2024 03:30	29.6	30.9	27.1	40.4
26/07/2024 03:45	29.2	29.6	26.2	49.9
26/07/2024 04:00	29.9	31	27.7	48
26/07/2024 04:15	31.2	32.4	28.7	44.9
26/07/2024 04:30	32.2	33.7	29.7	42.2
26/07/2024 04:45	40.3	44.3	33	56
26/07/2024 05:00	41.2	44.9	33.8	53.8
26/07/2024 05:15	43.7	47.3	34	58.2
26/07/2024 05:30	43.7	46.2	40.8	55
26/07/2024 05:45	45.1	45.4	41	68
26/07/2024 06:00	42.7	44.4	41	50.3
26/07/2024 06:15	45.3	47	41.6	61.5
26/07/2024 06:30	44.3	45.8	41.8	59.5
26/07/2024 06:45	49.3	47.9	42.4	74.5
26/07/2024 07:00	45.5	47.6	42.8	58.7
26/07/2024 07:15	45.7	47.3	42.6	62.2
26/07/2024 07:30	46.1	47.7	43.9	55.4
26/07/2024 07:45	47.6	49.5	44.7	63.6
26/07/2024 08:00	47.8	49.8	44.2	57.6

Time	$L_{Aeq}$ (dB)	$L_{A10}$ (dB)	$L_{A90}$ (dB)	$L_{AFMax}$ (dB)
26/07/2024 08:15	46.2	48	43.2	61.7
26/07/2024 08:30	47.2	49.9	43.8	62.1
26/07/2024 08:45	45.7	47.6	43	57.9
26/07/2024 09:00	47.8	49.8	44.6	63.7
26/07/2024 09:15	48.7	50.5	46	58.1
26/07/2024 09:30	48.1	50.1	45.3	59.3
26/07/2024 09:45	48.5	50.4	45.7	58.9
26/07/2024 10:00	48.6	50.7	45.4	62.2
26/07/2024 10:15	47.5	49.3	44.8	58.2
26/07/2024 10:30	52.2	50.9	44.6	76.2
26/07/2024 10:45	47	48.8	44	58.6
26/07/2024 11:00	47.3	48.8	43.5	62.3
26/07/2024 11:15	47.2	49.2	43.5	65.1
26/07/2024 11:30	44.2	46.2	41.1	56.5
26/07/2024 11:45	45.6	46.9	41	64.8
26/07/2024 12:00	60.3	65.4	42.3	78.6
26/07/2024 12:15	46.6	49.4	42	60.1
26/07/2024 12:30	48.8	51.3	44.8	60.7
26/07/2024 12:45	48.1	50.1	44.3	62.5
26/07/2024 13:00	47.7	49.4	44.9	60
26/07/2024 13:15	47	49.4	43	56
26/07/2024 13:30	46.3	48.1	42.2	62.6
26/07/2024 13:45	47.7	49.2	42.7	62.5
26/07/2024 14:00	47.5	49.9	44.5	56.2
26/07/2024 14:15	49	49.8	44.3	66.4
26/07/2024 14:30	52.7	52.5	45	72.3
26/07/2024 14:45	60.6	65.2	43.5	76.1
26/07/2024 15:00	47.3	49.8	42.7	62.1
26/07/2024 15:15	49.9	49.4	42.6	71.8
26/07/2024 15:30	46	48.5	40.6	55.9
26/07/2024 15:45	41.6	44.6	36	59
26/07/2024 16:00	42.1	45.1	35.9	55.1
26/07/2024 16:15	41.4	44.9	34.9	57.3
26/07/2024 16:30	42.8	46.4	36.3	58.3
26/07/2024 16:45	48.5	46.3	37.3	70.1
26/07/2024 17:00	46.7	47.6	36.5	71.8
26/07/2024 17:15	41.9	45.1	36.2	56.7

Time	$L_{Aeq}$ (dB)	$L_{A10}$ (dB)	$L_{A90}$ (dB)	$L_{AFMax}$ (dB)
26/07/2024 17:30	42.4	45.4	35.5	58.6
26/07/2024 17:45	47.6	48.5	35.5	65.9
26/07/2024 18:00	39.9	42.9	34.1	60
26/07/2024 18:15	45.9	46.7	36.1	70.3
26/07/2024 18:30	41.8	45.1	35.3	54.1
26/07/2024 18:45	41.6	45.1	34.5	55.3
26/07/2024 19:00	41.8	44.5	34.4	57.8
26/07/2024 19:15	42.1	45.4	35.1	53.9
26/07/2024 19:30	42.4	46.1	33.7	57.9
26/07/2024 19:45	40.2	44	33.4	56.9
26/07/2024 20:00	42.9	46.1	32.7	60.4
26/07/2024 20:15	39.6	43.2	33.3	52.5
26/07/2024 20:30	38.4	41.9	32.1	52.8
26/07/2024 20:45	41.7	45	33.9	59.2
26/07/2024 21:00	39.3	42.8	31.5	59.5
26/07/2024 21:15	39	42.6	30.7	59
26/07/2024 21:30	35.3	36.9	29.8	53.3
26/07/2024 21:45	37	37.6	30.7	63.9
26/07/2024 22:00	34.4	36.5	30.3	53.1
26/07/2024 22:15	39.5	40.7	31.2	56.4
26/07/2024 22:30	37.4	40.9	30.7	55.1
26/07/2024 22:45	40.3	38.8	30.3	61.4
26/07/2024 23:00	39.1	40.7	31.1	61.5
26/07/2024 23:15	34.9	35.9	30.1	55
26/07/2024 23:30	41.9	38.9	30.7	60.8
26/07/2024 23:45	38.8	42.3	30.2	56.8
27/07/2024 00:00	38.8	42	29.6	56.9
27/07/2024 00:15	31.7	34	27.8	49.7
27/07/2024 00:30	31.4	34.3	27.4	50
27/07/2024 00:45	29.5	30.8	27.2	50
27/07/2024 01:00	32.5	35.5	26.4	48.6
27/07/2024 01:15	34.2	32.7	26	50.7
27/07/2024 01:30	28.5	30.4	25.7	38.4
27/07/2024 01:45	32.2	33.7	26.3	55.1
27/07/2024 02:00	27.6	29.2	25.5	36.5
27/07/2024 02:15	29.4	31.2	26.7	50.1
27/07/2024 02:30	29	30.9	26.4	39.7



Time	$L_{Aeq}$ (dB)	$L_{A10}$ (dB)	$L_{A90}$ (dB)	$L_{AFMax}$ (dB)
27/07/2024 02:45	29.2	30.8	26.4	48.1
27/07/2024 03:00	28.6	30.5	26.2	39.8
27/07/2024 03:15	28.7	31.1	25.5	38.8
27/07/2024 03:30	27.7	29.2	25.3	50.8
27/07/2024 03:45	27.7	28.5	24.9	49.4
27/07/2024 04:00	28.6	29.2	24.9	44.1
27/07/2024 04:15	27.9	29	25.1	45.4
27/07/2024 04:30	34.8	32	25.9	62.3
27/07/2024 04:45	34	37.5	26.7	49.4
27/07/2024 05:00	40.8	45	30.8	53.7
27/07/2024 05:15	41.6	45.5	31.1	58.5
27/07/2024 05:30	44.6	46.9	40.1	64.7
27/07/2024 05:45	43.5	43.2	40.1	63.4
27/07/2024 06:00	43	45.3	40.2	55.7
27/07/2024 06:15	44	47	40.3	55.7
27/07/2024 06:30	43.4	45.8	40.6	53.1
27/07/2024 06:45	44.3	44.3	40.3	64.5
27/07/2024 07:00	47.3	45.8	40.4	70.6
27/07/2024 07:15	44.8	45.5	40.5	66.3
27/07/2024 07:30	41.4	42.4	40.2	51.7
27/07/2024 07:45	48.4	46.6	40.2	67.8
27/07/2024 08:00	46.8	45.8	40.2	68.8
27/07/2024 08:15	44.2	46.9	40.4	63.5
27/07/2024 08:30	44	46.6	40.4	60.6
27/07/2024 08:45	43.4	46.2	40.2	54.5
27/07/2024 09:00	42.5	44.9	39.9	54.6
27/07/2024 09:15	45.1	44.9	39.9	61
27/07/2024 09:30	42.2	44.5	39.9	54.8
27/07/2024 09:45	41.8	43.7	39.9	53.4
27/07/2024 10:00	42.6	44.9	39.9	58.1
27/07/2024 10:15	45.9	46.7	39.9	64
27/07/2024 10:30	47.1	46.9	41.1	64.7
27/07/2024 10:45	42	44.1	39.8	55.9
27/07/2024 11:00	42.8	44.3	39.8	60.6
27/07/2024 11:15	42.4	43.7	39.6	61.8
27/07/2024 11:30	42.4	44.1	39.9	57.2
27/07/2024 11:45	42.2	43.7	39.7	56.3

Time	$L_{Aeq}$ (dB)	$L_{A10}$ (dB)	$L_{A90}$ (dB)	$L_{AFMax}$ (dB)
27/07/2024 12:00	42.4	44.3	39.9	57.6
27/07/2024 12:15	42.2	44.6	39.6	51.9
27/07/2024 12:30	41.7	43	39.9	56.8
27/07/2024 12:45	42.3	45.3	39.6	52.6
27/07/2024 13:00	42.8	44	39.3	57.2
27/07/2024 13:15	52.7	44.4	39.5	75.7
27/07/2024 13:30	42.7	45.3	40	53.2
27/07/2024 13:45	42.6	44.5	39.7	62.4
27/07/2024 14:00	42.3	44.1	40	55.6
27/07/2024 14:15	41.4	42.8	39.8	52.4
27/07/2024 14:30	43.7	46	39.8	61.4
27/07/2024 14:45	38.7	41	33.1	55.5
27/07/2024 15:00	40	43.2	32.1	55.5
27/07/2024 15:15	39.2	40.9	32.5	60.4
27/07/2024 15:30	47.7	44.5	31.8	69.5
27/07/2024 15:45	40.5	43.3	32.6	57.2
27/07/2024 16:00	45.3	45.2	33.8	63.6
27/07/2024 16:15	40.1	43.7	32.3	56.5
27/07/2024 16:30	40.2	43.6	32.2	59
27/07/2024 16:45	46.7	47.1	32.6	65.1
27/07/2024 17:00	38.5	41.8	32.2	58.6
27/07/2024 17:15	46.9	45.4	35.7	70.8
27/07/2024 17:30	45.5	47.4	35.4	64.6
27/07/2024 17:45	43.2	45.1	36	61.1
27/07/2024 18:00	42.7	45.1	37.2	57.1
27/07/2024 18:15	42.2	45	36.5	58.3
27/07/2024 18:30	41.7	44.5	35.3	58.1
27/07/2024 18:45	42.3	45.7	35.2	56.8
27/07/2024 19:00	42.7	46.6	34.1	56.7
27/07/2024 19:15	40.6	44.6	33.7	52.2
27/07/2024 19:30	41.5	44.8	32.3	60.8
27/07/2024 19:45	37.6	40.5	29.1	54.8
27/07/2024 20:00	36.8	38.3	29.1	53
27/07/2024 20:15	37.3	41.2	30.4	54.7
27/07/2024 20:30	39.4	43	31.1	54
27/07/2024 20:45	41.4	45.1	32.3	57.7
27/07/2024 21:00	35.9	38.6	29.7	52.5

Time	$L_{Aeq}$ (dB)	$L_{A10}$ (dB)	$L_{A90}$ (dB)	$L_{AFMax}$ (dB)
27/07/2024 21:15	33.2	35.7	28.8	48
27/07/2024 21:30	31.7	33.2	29.2	47.5
27/07/2024 21:45	29.8	31.3	27.7	46.4
27/07/2024 22:00	32.1	34	28.5	54.6
27/07/2024 22:15	33.4	34.3	28.3	60
27/07/2024 22:30	31.7	34.1	28.8	41.3
27/07/2024 22:45	30.5	31.9	28.5	47.8
27/07/2024 23:00	30.8	32.8	27.8	48.8
27/07/2024 23:15	30	31.9	27.5	41.7
27/07/2024 23:30	40.2	41.4	27.3	58.2
27/07/2024 23:45	28.6	30.6	25.8	42
28/07/2024 00:00	29.8	31.2	26.5	54
28/07/2024 00:15	31.5	33.7	25.9	50.3
28/07/2024 00:30	37.3	32.6	26	54.6
28/07/2024 00:45	30.2	33.4	26	43
28/07/2024 01:00	27.8	29.7	24.6	40.2
28/07/2024 01:15	27.4	28.8	25.3	46.9
28/07/2024 01:30	26.9	28.3	24.6	37.3
28/07/2024 01:45	29.3	31.9	25	50
28/07/2024 02:00	29.5	32.4	25.4	41.3
28/07/2024 02:15	28.4	30.5	23.4	50
28/07/2024 02:30	26.5	27.5	24	49.6
28/07/2024 02:45	27.2	28.8	24.4	45
28/07/2024 03:00	28.7	29	24.8	44.1
28/07/2024 03:15	28	30.2	24.4	48.8
28/07/2024 03:30	27.5	28.8	24.5	47.8
28/07/2024 03:45	27.1	28.8	24.6	50.8
28/07/2024 04:00	29	30.5	24.2	50.4
28/07/2024 04:15	26.4	27.7	24.2	42
28/07/2024 04:30	31.3	34.4	25.4	47.9
28/07/2024 04:45	40	44.2	26.8	54.7
28/07/2024 05:00	42.5	46.5	30.9	56.8
28/07/2024 05:15	42	45.1	31.9	59.8
28/07/2024 05:30	42	44	40.1	52.2
28/07/2024 05:45	43.8	46.8	40.3	56
28/07/2024 06:00	43.3	45	40.2	58.2
28/07/2024 06:15	44.1	45.5	40.3	62.5

Time	$L_{Aeq}$ (dB)	$L_{A10}$ (dB)	$L_{A90}$ (dB)	$L_{AFMax}$ (dB)
28/07/2024 06:30	43.9	45.7	40.9	59.3
28/07/2024 06:45	47.2	47.7	40.9	66.7
28/07/2024 07:00	44.9	46	40.6	64.8
28/07/2024 07:15	41.7	42.5	40.3	53
28/07/2024 07:30	43.2	44.9	40.2	58.1
28/07/2024 07:45	43.3	45	40.1	58.5
28/07/2024 08:00	43.7	46.5	40.3	55.5
28/07/2024 08:15	42.9	44.7	40	56.7
28/07/2024 08:30	42.7	44.7	40.2	55.2
28/07/2024 08:45	43.8	46.1	40.1	55.9
28/07/2024 09:00	51.8	49.6	40.1	70.9
28/07/2024 09:15	46.8	49.6	40.1	61.9
28/07/2024 09:30	44.3	45.8	40.1	63.2
28/07/2024 09:45	43.1	45.3	39.9	58.8
28/07/2024 10:00	44.2	45.8	40.2	63.9
28/07/2024 10:15	41.4	42.3	39.8	55.3
28/07/2024 10:30	42	43.3	39.9	60.4
28/07/2024 10:45	41.6	43.1	39.8	55.1
28/07/2024 11:00	46.7	46.3	39.6	65.9
28/07/2024 11:15	43.4	45.6	39.8	57.6
28/07/2024 11:30	42	42.5	39.6	66.1
28/07/2024 11:45	50.2	52.5	40.1	70
28/07/2024 12:00	42.9	45	40.1	59.5
28/07/2024 12:15	43.2	44.9	40	62.3
28/07/2024 12:30	42.8	45	40.2	53
28/07/2024 12:45	46.5	45.9	39.4	66.5
28/07/2024 13:00	43.5	45.9	39.4	58.3
28/07/2024 13:15	44.1	46.3	40.2	58.1
28/07/2024 13:30	53	44.7	40	77.9
28/07/2024 13:45	49.8	49.5	39.4	69.6
28/07/2024 14:00	47.7	46.1	39.4	67.4
28/07/2024 14:15	41.1	43	39.1	53.9
28/07/2024 14:30	42.5	44.2	39.7	62.9
28/07/2024 14:45	48.5	45.9	32.8	74.1
28/07/2024 15:00	41.9	45	31.3	62.3
28/07/2024 15:15	39.5	42	31	53.7
28/07/2024 15:30	46	42.5	29.6	67.6

Time	$L_{Aeq}$ (dB)	$L_{A10}$ (dB)	$L_{A90}$ (dB)	$L_{AFMax}$ (dB)
28/07/2024 15:45	46.3	46.9	30.4	68.9
28/07/2024 16:00	44.9	49.1	33.9	61
28/07/2024 16:15	47.2	51.7	33.4	60.3
28/07/2024 16:30	48.1	45.3	32.5	69.8
28/07/2024 16:45	46.9	45	32.1	67
28/07/2024 17:00	40	43.1	31	57.9
28/07/2024 17:15	42.4	44.9	30.1	59.7
28/07/2024 17:30	48.8	47.7	33	68.6
28/07/2024 17:45	42.7	46.2	32.8	56
28/07/2024 18:00	39.3	42.5	30.6	58.1
28/07/2024 18:15	44.7	46.9	31.9	63.7
28/07/2024 18:30	38.9	41.8	31.5	56.5
28/07/2024 18:45	40.6	42.8	34.7	59.3
28/07/2024 19:00	40.2	43.1	34	62.9
28/07/2024 19:15	40.9	45.2	34	55.7
28/07/2024 19:30	42.4	45	35.8	68.2
28/07/2024 19:45	40.6	44.1	34.8	51.9
28/07/2024 20:00	42.8	45.7	33.7	59.2
28/07/2024 20:15	41.7	44.5	34.3	59.5
28/07/2024 20:30	39.6	43	34.2	51.1
28/07/2024 20:45	41	44.8	34.4	56.3
28/07/2024 21:00	40.6	41.3	34.1	67.7
28/07/2024 21:15	38.2	38	33.8	67.4
28/07/2024 21:30	35.5	36.8	33.7	50.5
28/07/2024 21:45	35.8	37.3	33.7	53.2
28/07/2024 22:00	35.3	37.2	32.7	47.2
28/07/2024 22:15	33.7	34.7	32.3	42.4
28/07/2024 22:30	34.1	36.2	31.4	47.3
28/07/2024 22:45	33.9	35.4	31.4	50.2
28/07/2024 23:00	32.6	33.9	30.9	46.8
28/07/2024 23:15	32.7	34.3	30.6	45.8
28/07/2024 23:30	33.3	35.2	30.6	44.5
28/07/2024 23:45	31.1	32.1	29.1	47.5
29/07/2024 00:00	32.8	34	29.2	48.8
29/07/2024 00:15	30.7	32.3	28.5	49.8
29/07/2024 00:30	32.4	32.5	28.2	48.1
29/07/2024 00:45	28.2	29.2	26.9	35

Time	$L_{Aeq}$ (dB)	$L_{A10}$ (dB)	$L_{A90}$ (dB)	$L_{AFMax}$ (dB)
29/07/2024 01:00	30.3	32	28	42.3
29/07/2024 01:15	28	29.1	26.4	37.2
29/07/2024 01:30	27.6	29.1	25.6	35.7
29/07/2024 01:45	29.6	30.6	26.6	47.4
29/07/2024 02:00	30.7	32.6	27.5	46.3
29/07/2024 02:15	31.6	32.5	30.1	45.2
29/07/2024 02:30	30.1	31.7	27.8	45.5
29/07/2024 02:45	29.9	31.6	28.1	43.7
29/07/2024 03:00	30.3	31.8	28.3	50.6
29/07/2024 03:15	31.1	32.4	28.6	50
29/07/2024 03:30	31.1	33	28.3	42
29/07/2024 03:45	30.6	31.8	28.2	42.7
29/07/2024 04:00	31.9	33.4	29.8	50.2
29/07/2024 04:15	32.7	33.8	31	42.5
29/07/2024 04:30	34.3	35.2	31.5	52.9
29/07/2024 04:45	36.5	38.6	32.5	51.5
29/07/2024 05:00	43.7	47.7	35.9	56.2
29/07/2024 05:15	42.9	45.9	36.6	58.8
29/07/2024 05:30	44.8	47.6	41.6	57.6
29/07/2024 05:45	44	46.3	41.6	54.8
29/07/2024 06:00	44.7	46.8	41.8	56.7
29/07/2024 06:15	44.9	46.5	42	61.3
29/07/2024 06:30	45	46.5	42.5	65.1
29/07/2024 06:45	47.4	47.1	43.8	74.5
29/07/2024 07:00	46.5	47.3	43.7	67.8
29/07/2024 07:15	48.2	50.8	45	59.1
29/07/2024 07:30	46.6	48.2	43.8	59.9
29/07/2024 07:45	47.7	49.7	44.7	57.4
29/07/2024 08:00	47.8	49.9	44.2	60.5
29/07/2024 08:15	48.2	50	44.7	64.1
29/07/2024 08:30	47.2	49	44	62
29/07/2024 08:45	47.2	49	43.8	62.6
29/07/2024 09:00	48.6	51.5	43.5	61.7
29/07/2024 09:15	48.4	50.9	43.8	63.5
29/07/2024 09:30	47.5	49.9	43.4	63.9
29/07/2024 09:45	46.7	48.8	42.9	64.1
29/07/2024 10:00	46.2	48.1	42.6	64.3

<b>Time</b>	<b><i>L</i><sub>Aeq</sub> (dB)</b>	<b><i>L</i><sub>A10</sub> (dB)</b>	<b><i>L</i><sub>A90</sub> (dB)</b>	<b><i>L</i><sub>AFMax</sub> (dB)</b>
29/07/2024 10:15	45.8	47.6	42.4	66.8
29/07/2024 10:30	46.1	48.3	42.2	60.2
29/07/2024 10:45	47	49.3	43.5	61.8
29/07/2024 11:00	48.5	50.2	44.1	66.8
29/07/2024 11:15	49.3	51.4	43.2	68.1
29/07/2024 11:30	48.9	49.2	41.8	70.4
29/07/2024 11:45	49	50.6	42.2	65.9

# Appendix D Survey Data Analysis

## Environmental Permit Application – Supporting Documentation Appendix F1 - Noise Impact Assessment

### Sawston Pilot Plant

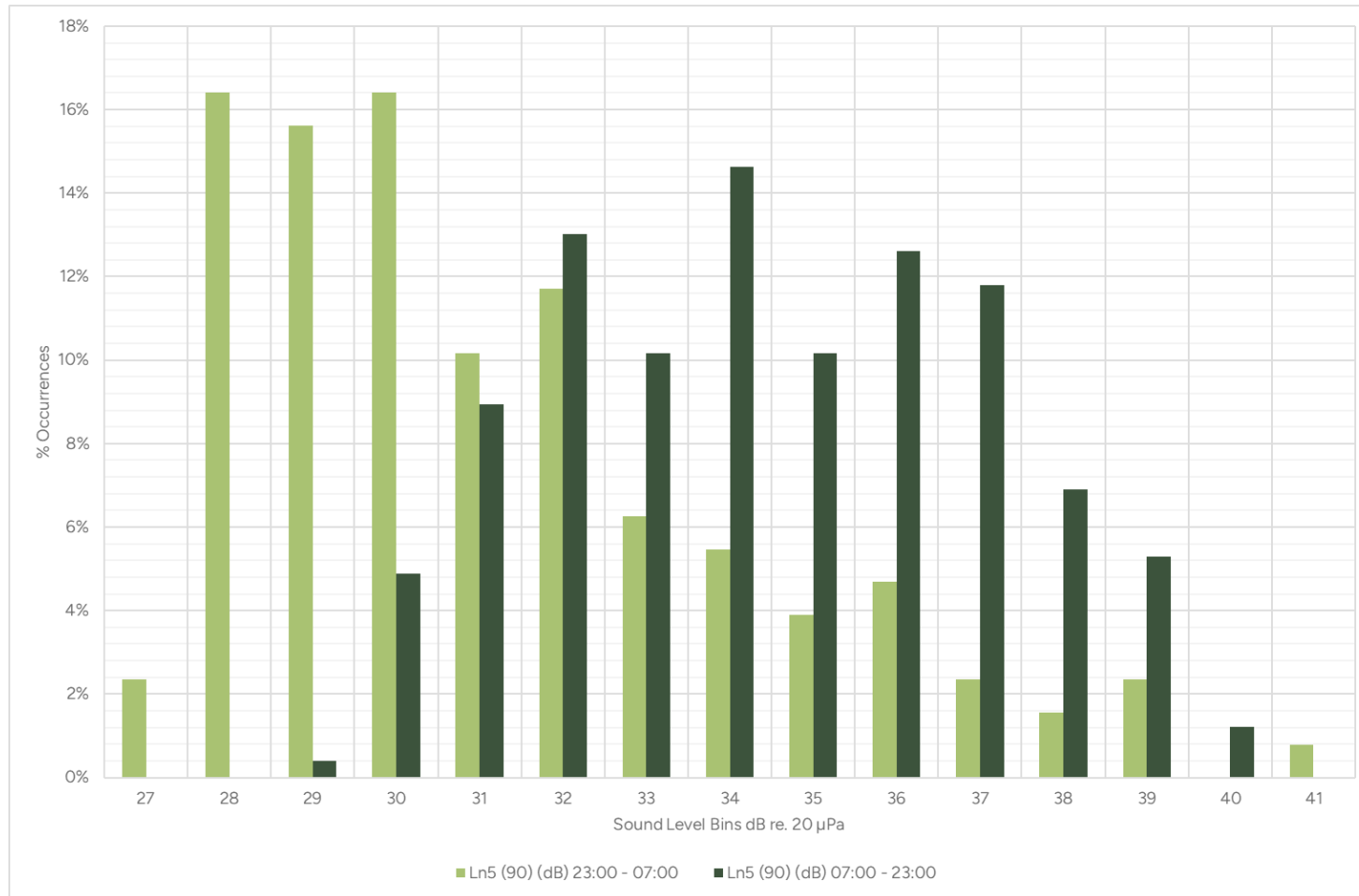
Immaterial Limited

SLR Project No: 405.065240.00001

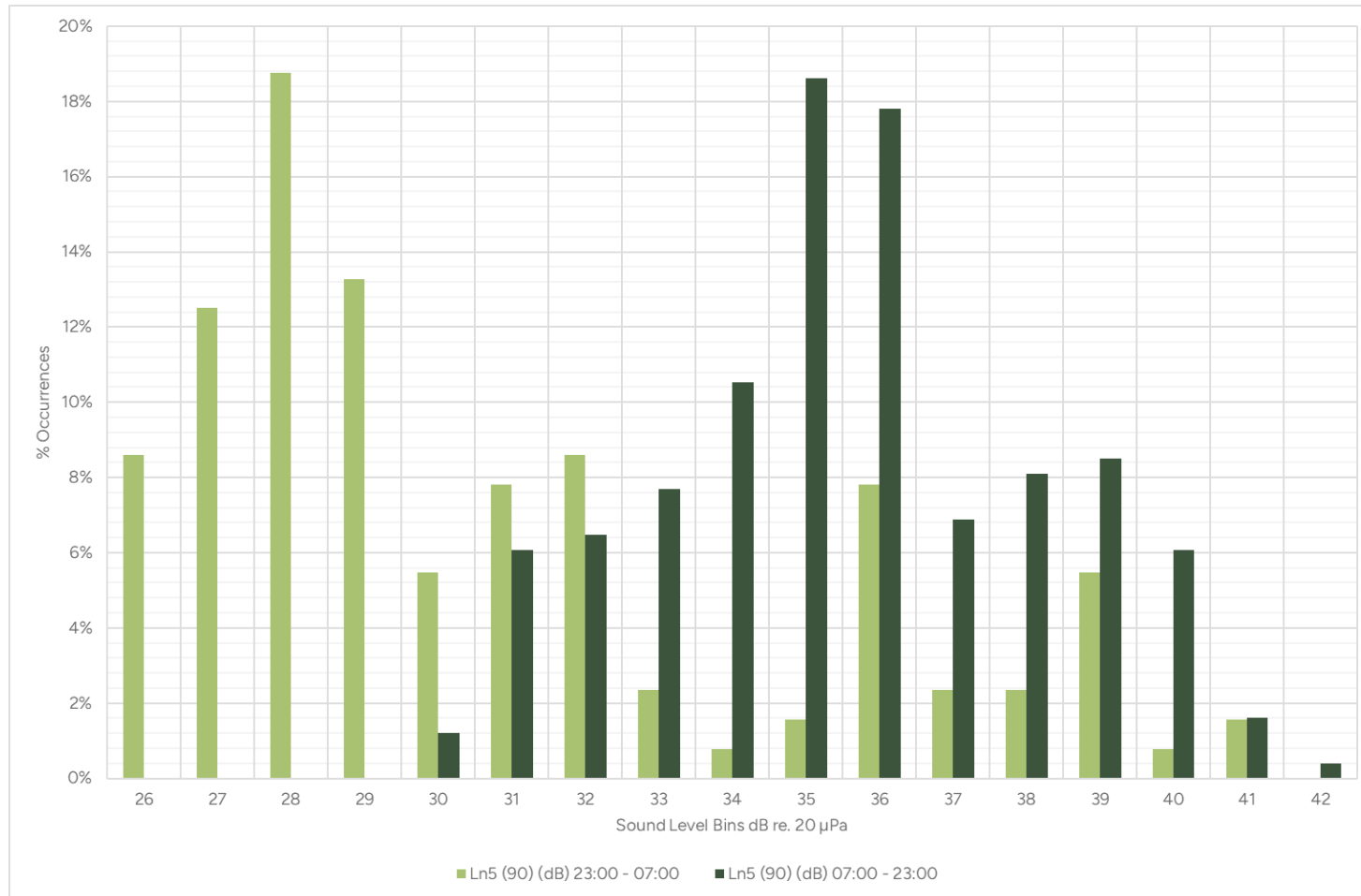
8 November 2024



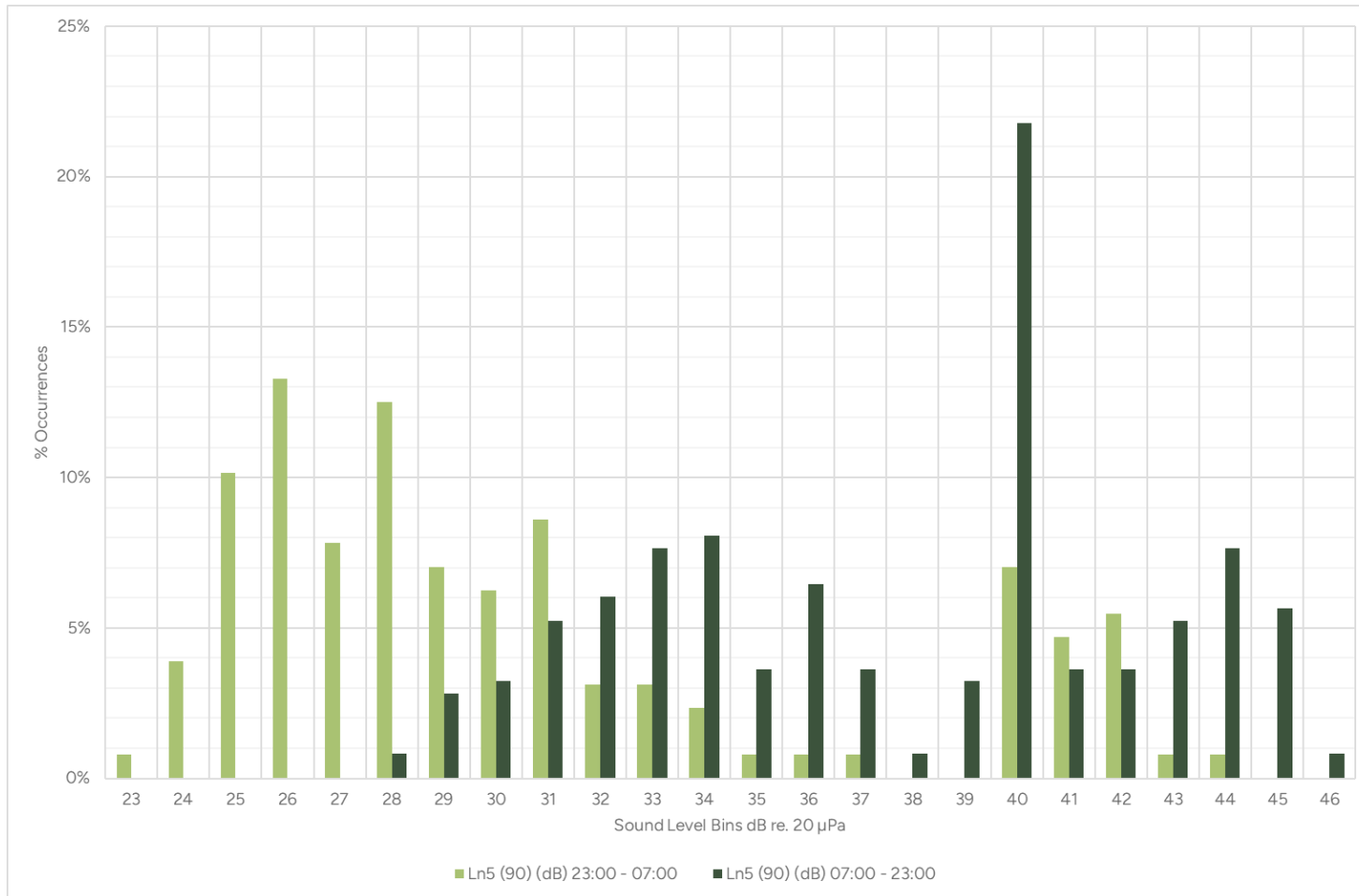
### Location 1 Histogram, daytime and night-time, dB $L_{A90}$



**Location 2 Histogram, daytime and night-time, dB  $L_{A90}$**



**Location 3 Histogram, daytime and night-time, L<sub>A90</sub>**





# Appendix E Plant Location Plan

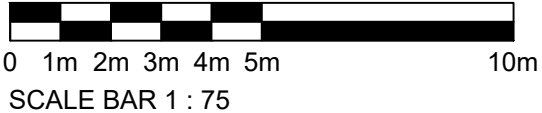
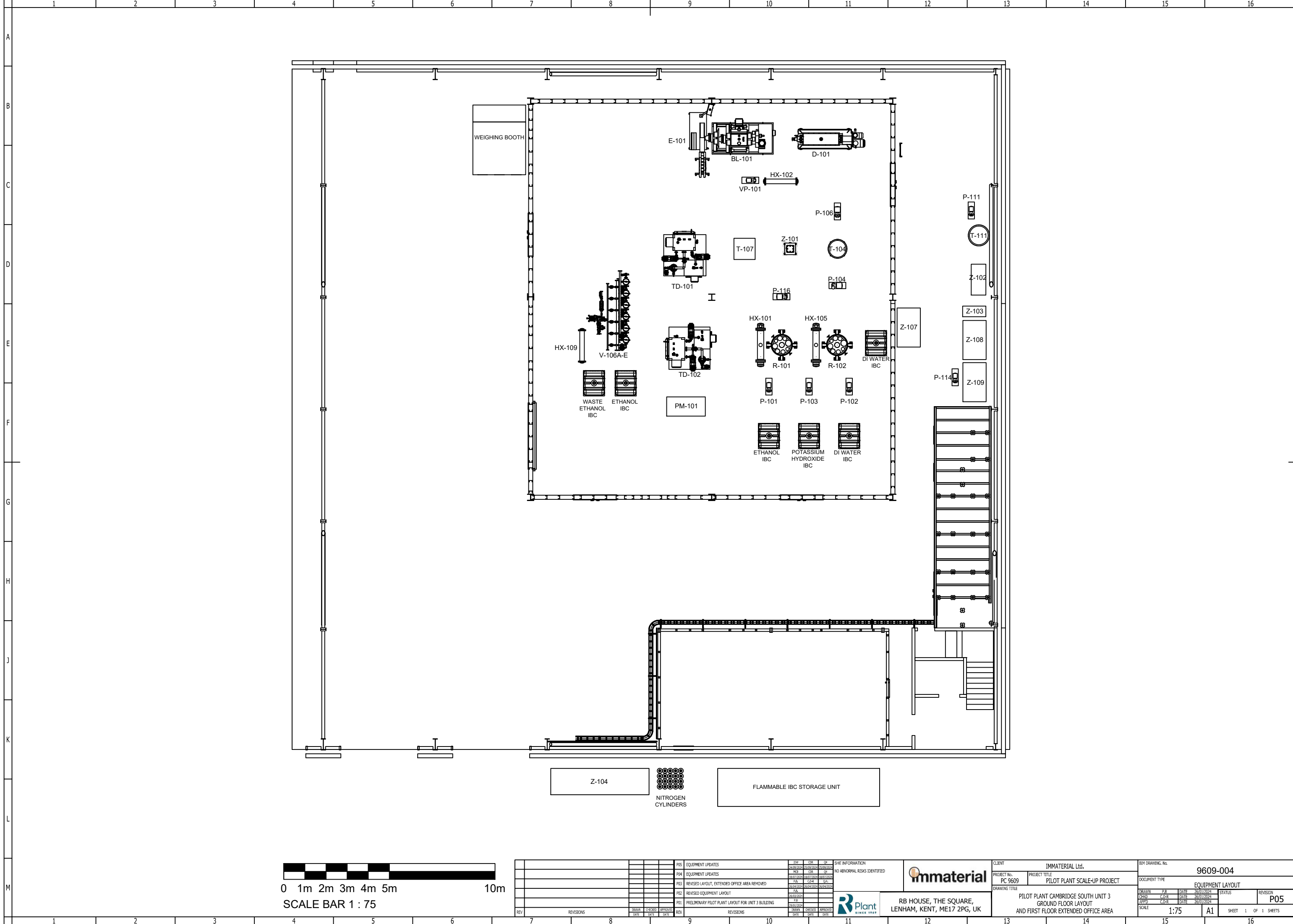
**Environmental Permit Application – Supporting  
Documentation Appendix F1 - Noise Impact Assessment**

**Sawston Pilot Plant**

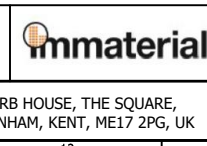
**Immaterial Limited**

SLR Project No: 405.065240.00001

8 November 2024



REV	REVISIONS	DATE	BY	CHECKED	DATE	APPROVED	DATE	REV	REVISIONS	DATE	BY	CHECKED	DATE	APPROVED	DATE
P05	EQUIPMENT UPDATES														
P04	EQUIPMENT UPDATES														
P03	REVISED LAYOUT, EXTENDED OFFICE AREA REMOVED														
P02	REVISED EQUIPMENT LAYOUT														
P01	PRELIMINARY PILOT PLANT LAYOUT FOR UNIT 3 BUILDING														



CLIENT: IMMATERIAL Ltd.  
 PROJECT No: PC 9609  
 PROJECT TITLE: PILOT PLANT SCALE-UP PROJECT  
 DRAWING TITLE: PILOT PLANT CAMBRIDGE SOUTH UNIT 3 GROUND FLOOR LAYOUT AND FIRST FLOOR EXTENDED OFFICE AREA

BIM DRAWING No:	9609-004						
DOCUMENT TYPE:	EQUIPMENT LAYOUT						
DRAWN:	PJR	DATE:	26/01/2024	STATUS:		REVISION:	P05
CHECKED:	CJR	DATE:	26/01/2024				
APPROVED:	CJR	DATE:	26/01/2024				
SCALE:	1:75	A1	SHEET 1 OF 1 SHEETS				

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