



## Noise Impact Assessment

Site Address: Mill House, Redbrook Road, Barnsley, S75 2RS

Client Name: Mark Bilous

Project Reference: NP-013630



### Authorisation and Version Control

Revision	Reported By	Checked By
02	R. Whitfield, MSc, MIOA	M. Caley, MSc, MIOA

### Amendment History

Revision	Date	Summary of Amendments
01	04/01/2026	--
02	08/01/2026	Updates to calculations.

### Disclaimer

This document has been prepared for the Client only and solely for the purposes expressly defined herein. NOVA Acoustics Ltd owe no duty of care to any third parties in respect of its content. Therefore, unless expressly agreed by NOVA Acoustics Ltd in signed writing, NOVA Acoustics Ltd hereby exclude all liability to third parties, including liability for negligence, save only for liabilities that cannot be so excluded by operation of applicable law. This report has been solely based on the specific design assumptions and criteria stated herein.

All works undertaken by NOVA Acoustics Ltd are carried out in accordance with NOVA Acoustics Ltd.'s terms and conditions found at [www.novaacoustics.co.uk](http://www.novaacoustics.co.uk).

### Contact Details

NOVA Acoustics Ltd,  
Suite 13, Crown House,  
94 Armley Road,  
Leeds,  
LS12 2EJ

0113 322 7977

[www.novaacoustics.co.uk](http://www.novaacoustics.co.uk)  
[technical@novaacoustics.co.uk](mailto:technical@novaacoustics.co.uk)

*Delivering sustainable development by promoting good health and well-being through effective management of noise.*

## Contents

<b>1.</b>	<b>INTRODUCTION .....</b>	<b>4</b>
1.1	Standards, Legislation, Policy & Guidance .....	4
1.2	Proposal Brief and History .....	4
1.3	Local Planning Authority & Background .....	5
<b>2.</b>	<b>ENVIRONMENTAL NOISE SURVEY .....</b>	<b>7</b>
2.1	Measurement Methodology .....	7
2.2	Context & Subjective Impression.....	7
2.3	Environmental Noise Survey Results.....	8
<b>3.</b>	<b>VEHICLE COMING AND GOINGS / CAR PARK NOISE ASSESSMENT .....</b>	<b>9</b>
3.1	Proposals .....	9
3.2	Assessment Criteria.....	9
3.3	Carparking Area Noise Levels.....	10
3.4	IEMA 'Increase in Ambient Noise Level' Assessment.....	11
<b>4.</b>	<b>PLANT NOISE IMPACT ASSESSMENT .....</b>	<b>12</b>
4.1	BS4142 Noise Impact Assessment .....	12
<b>5.</b>	<b>CONCLUSION.....</b>	<b>14</b>
	<b>APPENDIX A – ACOUSTIC TERMINOLOGY .....</b>	<b>15</b>
	<b>APPENDIX B – STANDARDS, LEGISLATION, POLICY, AND GUIDANCE .....</b>	<b>16</b>
	B.1 – National Planning Policy Framework (2024).....	16
	B.2 – Noise Policy Statement for England (2010).....	16
	<b>APPENDIX C – ENVIRONMENTAL SURVEY .....</b>	<b>18</b>
	C.1 – Time History Noise Data .....	18
	C.2 – Surveying Equipment .....	20
	C.3 – Meteorological Conditions .....	21
	<b>APPENDIX D – MANUFACTURER DATASHEET .....</b>	<b>22</b>

## List of Figures

<i>Figure 1 – ASHP Location .....</i>	<i>5</i>
<i>Figure 2 – Measurement Locations and Site Surroundings.....</i>	<i>7</i>
<i>Figure 3 – Carparking Location.....</i>	<i>9</i>
<i>Figure 4 – MP1 Noise Survey Time History.....</i>	<i>18</i>
<i>Figure 5 – Background Sound Level Histogram Graph – 09:00 – 10:00.....</i>	<i>18</i>
<i>Figure 6 – Background Sound Level Histogram Graph – 12:00 – 13:00.....</i>	<i>19</i>
<i>Figure 7 – Background Sound Level Histogram Graph – 15:00 – 16:00.....</i>	<i>19</i>
<i>Figure 8 – Background Sound Level Histogram Graph – 19:00 – 20:00.....</i>	<i>19</i>
<i>Figure 9 – Background Sound Level Histogram Graph – Full Daytime .....</i>	<i>20</i>
<i>Figure 10 – Background Sound Level Histogram Graph – Full Night-time .....</i>	<i>20</i>

**List of Tables**

<i>Table 1 – Measurement Methodology</i> .....	7
<i>Table 2 – Summary of Measured Sound Level Results</i> .....	8
<i>Table 3 – IEMA Guidelines Effect Descriptors</i> .....	9
<i>Table 4 – Vehicle Noise SEL Data</i> .....	10
<i>Table 5 – Increase in Ambient Noise Level Calculations</i> .....	10
<i>Table 6 – Sound Power Levels of ASHP</i> .....	12
<i>Table 7 – Calculations &amp; BS4142 Noise Impact Assessment – NSR1 – Night-time</i> .....	12
<i>Table 8 – Surveying Equipment</i> .....	20
<i>Table 9 – Weather Conditions</i> .....	21

## 1. Introduction

NOVA Acoustics Ltd has been commissioned to prepare a noise impact assessment for the proposed commercial use of an existing privately owned swimming pool ('the Proposed Development') at Mill House, Redbrook Road, Barnsley, S75 2RS ('the Site').

The applicant has submitted a planning application (ref. 2025/0949, 'the application') to the Local Planning Authority ('LPA'), Barnsley Metropolitan Borough Council. This report is intended to accompany the application.

A noise survey has been undertaken to establish the prevailing sound levels at the proposed development site. This report details the existing ambient and background sound climate and the predicted noise emissions associated with the proposed development. Measures required to mitigate noise impact have been recommended where necessary and are assessed in accordance with the relevant performance standards, legislation, policy and guidance.

This noise assessment is necessarily technical in nature; therefore, a glossary of terms is included in Appendix A to assist the reader.

### 1.1 Standards, Legislation, Policy & Guidance

The following performance standards, legislation, policy and guidance have been considered to ensure good acoustic design in the assessment:

- National Planning Policy Framework (2024)
- Noise Policy Statement for England (2010)
- WHO Guidelines for Community Noise (1999)
- IEMA – Guidelines for environmental noise impact assessment

Further information on the legislation can be found in Appendix B.

### 1.2 Proposal Brief and History

The proposal relates to the partial commercial use of an existing domestic swimming pool. It is intended that a swim school will operate for approximately three hours per day, providing public access during limited daytime and early evening periods. The proposed operating hours are 10:00–12:00 and 16:00–19:00, seven days per week, with a maximum occupancy of up to eight patrons at any one time and a maximum total usage of 18 hours per week. Each session is a minimum 30-minutes in length, so during a worst-case 1-hour period, there could be up to 32 vehicle movements (16 in and 16 out).

In addition, an air source heat pump (ASHP) unit is installed to serve the pool heating requirements. The operation of this plant has therefore been included within the scope of the assessment.

The planning application is titled as follows:

*"Change of use of domestic swimming pool for business use for swimming lessons and/or private hire, and erection of boundary fence (Retrospective) (Amended Description)".*

The location of the ASHP unit in relation to the wider property is highlighted in the figure below.



*Although the application states a maximum of 18 hours a week, the proposed windows (hours) of use are likely to be intrusive to nearby residents. This impact can be lessened by planning hours of use around times when nearby residents are least likely to be affected. It is recommended that Sunday and Bank Holiday hours of use are reduced, with a later start. For example, 11:00 – 13:00 only on Sundays and Bank Holidays. It is also recommended that the number of sessions between 16:00 and 19:00 Monday to Friday is limited as this is the time when residents are likely to be home and using their outdoor amenity space.”*

These comments are considered within the report and mitigation measures are recommended where deemed appropriate.

## 2. Environmental Noise Survey

### 2.1 Measurement Methodology

An environmental noise survey was undertaken at the site to define the acoustic environment. The measurement dates and particulars are outlined in the following table. Full details regarding the equipment used and the weather conditions recorded during the survey can be found in Appendix D.

Location	Survey Dates	Measurement Particulars
MP1	12 – 15/12/2025	Equipment attached to a lamppost on the boundary of NSR2, overlooking Redbrook Road, 4m above the ground. Microphone located in free-field conditions.

Table 1 – Measurement Methodology

The site surroundings and measurement location are shown in the figure below:



Imagery ©2025 Vexcel Imaging US, Inc., Imagery ©2025 Airbus, Infoterra Ltd & Bluesky, Maxar Technologies, Vexcel Imaging US, Inc., Map data ©2025

Figure 2 – Measurement Locations and Site Surroundings

### 2.2 Context & Subjective Impression

The area surrounding the site is residential in nature in all directions. The noise profile is typical for this type of area and is largely dominated by intermittent traffic noise and birdsong.

The two closest and most affected noise-sensitive receptors to the swimming pool (NSR1, NSR2) are approximately 24m from the ASHP unit. The most sensitive receptor to the east (NSR3) is approximately 10m from the associated parking area. Intermediate acoustic shielding includes a 1.8m stone wall, which appears to form the perimeter of the site.

## 2.3 Environmental Noise Survey Results

The ranges of background ( $L_{A90}$ ), ambient ( $L_{Aeq}$ ), and maximum ( $L_{AFmax}$ ) sound levels measured during the most sensitive operational periods are detailed in the table below. As the development site is already operational, noise levels representative of the proposed operational hours (10:00–12:00 and 16:00–19:00) have been derived from measurements undertaken during non-operational periods immediately before and after these hours. Detailed time history results are provided in Appendix C.

Measurement Period ('T')	$L_{A90,15min}$ Range (dB)	$L_{Aeq,15min}$ Range (dB)
<b>Morning</b>		
09:00 – 10:00	46 – 51	50 – 56
12:00 – 13:00	46 – 54	53 – 60
<b>Afternoon/Evening</b>		
15:00 – 16:00	46 – 54	52 – 57
19:00 – 20:00	42 – 54	50 – 58

*Table 2 – Summary of Measured Sound Level Results*

Full histogram graphs showing the distributions of measured background sound levels can be found in Appendix C.

### 3. Vehicle Coming and Goings / Car Park Noise Assessment

In the following section, the noise impact due to increased traffic flow in the carpark area is predicted and assessed.

#### 3.1 Proposals

As detailed in Section 1.2, during a worst-case 1-hour period, there could be up to 16-vehicles using the carpark area. This equates to 32 movements (16 in and 16 out), per hour. The carpark area will be located adjacent to the northern façade of the property, fully shielded from NSR3, as shown in the figure below.

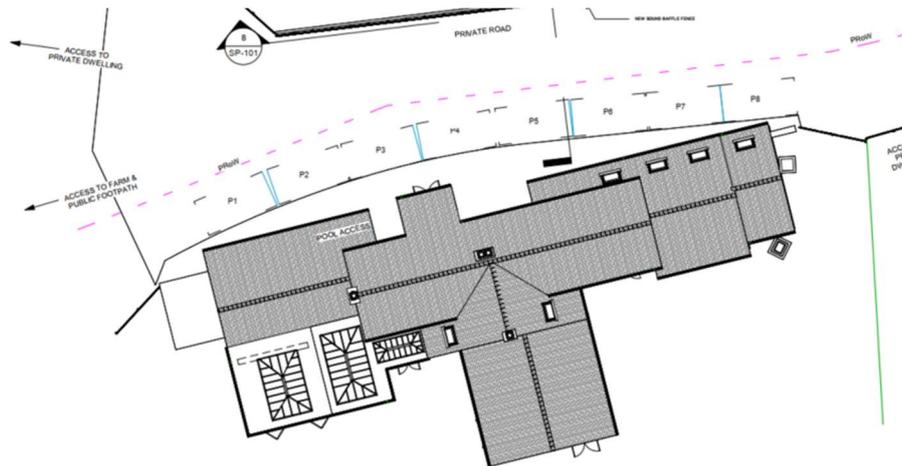


Figure 3 – Carparking Location

#### 3.2 Assessment Criteria

The following assessment is based on guidance presented in the IEMA 'Guidelines for Environmental Noise Impact Assessment' document. The level of impact from the carpark is calculated considering the increase in ambient noise level at the receptors. This approach is similar to that adopted for assessing an increase in vehicular movements along public roads, as provided in LA111 (DMRB).

The criteria for the assessment and the associated NPPF/NPSE impact levels are outlined in the table below.

IEMA Effect Descriptors	
Very Substantial	Greater than 10dB $L_{Aeq}$ change in sound level at a noise sensitive receptor.
<b>Significant Observed Adverse Effect Level (SOAEL)</b>	
Moderate	Greater than 5dB $L_{Aeq}$ change in sound level at a noise sensitive receptor.
<b>Lowest Observed Adverse Effect Level (LOAEL)</b>	
Slight / Moderate	A 3dB to 4.9dB $L_{Aeq}$ change in sound level at a noise sensitive receptor.
<b>No Observed Adverse Effect Level (NOAEL)</b>	
None/Not Significant	Less than 3dB $L_{Aeq}$ change in in sound level at a noise sensitive receptor.

Table 3 – IEMA Guidelines Effect Descriptors

### 3.3 Carparking Area Noise Levels

To predict the noise emissions of vehicles entering/exiting and manoeuvring within the carparking area, measurements were taken by NOVA Acoustics of a mid-sized hatchback car. The measurements included the car door opening and closing, the car starting up, and the car pulling away.

Further to this, a measurement was also taken of the same car passing by the measurement point at approximately 10mph.

The measured  $L_{Aeq}$  noise levels and the SEL data at 2m is presented in the table below.

Noise Source	$L_{Aeq}$ at 2m (dB)	SEL at 2m (dBA)
Car Pass-by	68 [1]	75 [2]
Car Starting Up & Pulling Away	65	78 [3]

**Notes:**  
 [1] Highest 1-second measurement.  
 [2] 5-second event.  
 [3] 20-second event.

Table 4 – Vehicle Noise SEL Data

The SEL data has been used to calculate a single source noise level based on the number of events over the assessment period using the following equation:  $L_{Aeq,T} = SEL - 10\log(T) + 10\log(n)$ , where:

- 'SEL' is the  $L_{Aeq}$  over a one second period and represents the noise energy from an event compressed into one second.
- 'T' is the reference time period in seconds (in this case 3600 seconds (60-minutes)).
- 'n' is the number of movements in the time period (in this case 32).

The following parameters have been used in the calculations:

- The centre of the carparking area is approximately 10m from the closest NSR garden (NSR1).
- Vehicle manoeuvring noise calculations are undertaken considering point source propagation from this location with a sound power level for the cumulative carparking area.
- There will be a maximum of 32 vehicle movements during a 'worst-case' 1-hour period.

It should be noted that the car park area is fully shielded by the building envelope at NSR3 and as such, this will not be assessed

The predicted noise levels are presented in the table below.

Location	Time Period	Existing Noise Level (Lowest $L_{Aeq,15min}$ , dB)	Predicted Carpark Noise Level at NSR ( $L_{Aeq,1hr}$ , dB)	Cumulative Noise Level ( $L_{Aeq,1hr}$ , dB)	Increase (dB)
NSR1	10:00 – 11:00	50	45.3	51.3	+1.3
	18:00 – 19:00	50	45.3	51.3	+1.3

Table 5 – Increase in Ambient Noise Level Calculations

### 3.4 IEMA 'Increase in Ambient Noise Level' Assessment

As can be seen in the assessment above, the ambient noise levels are expected to increase by a maximum of 1.3dB. This level of impact would be classed as 'not significant' when assessed with the IEMA guidelines, which equates to 'No Observed Adverse Effect Level' ('NOAEL') when assessed in accordance with the NPSE and NPPF. Given this, it is thought that noise from vehicles is likely to be acceptable without the need for further mitigation.

## 4. Plant Noise Impact Assessment

In the following section, the noise emissions from the ASHP unit located at the front of the property are assessed.

The 1/1 octave band sound power levels for the ASHP unit are shown in the table below. The manufacturer's datasheet can be found in Appendix D.

Description	1/1 Octave Frequency Band (L <sub>w</sub> , Hz, dB)								Overall (L <sub>w</sub> , dBA)
	63	125	250	500	1k	2k	4k	8k	
1 No. Fairland InverX20-32 [1]	70	67	58	55	53	47	45	42	58

**Notes:**

[1] Octave-band data is not provided by the manufacturer. For this reason, the frequency spectrum has been taken from comparable unit and adjusted to match stated overall sound power level.

Table 6 – Sound Power Levels of ASHP

### 4.1 BS4142 Noise Impact Assessment

The BS4142 assessments at the most affected NSR is presented in the following table. Due to the nature of the unit, it is assumed that it may operate at any time during the day or night, depending on demand. As the background noise level is significantly lower during the night-time period, the assessment is shown for this time-period exclusively. Providing low impact is achieved during the night, it will inherently be achieved during the day. The assessment is carried out considering the following factors:

- The unit is approximately **24m** from the façade of the most affected receptor (NSR1).
- There is no acoustic shielding between the unit and the receptor.
- As it cannot be certain whether the unit currently operates during the night, the lowest measured night-time L<sub>A90,15min</sub> is used as this is unlikely to have been affected by plant noise.

Description	1/1 Octave Frequency Band (Hz, dB)								Overall (dBA)
	63	125	250	500	1k	2k	4k	8k	
1 No. Fairland InverX20-32 (L <sub>w</sub> )	70	67	58	55	53	47	45	42	58
Propagation Loss (24m – Q8)	-30								--
Specific Sound Level at NSR1	40	37	28	25	23	17	15	12	28
Acoustic Feature Correction	A 3dB penalty is applied to account for the intermittent operation of this type of unit.								+3
Rating Sound Level (L <sub>Ar,Tr</sub> )	Specific sound level plus rating penalty.								31
Background Sound Level	Lowest measured night-time background sound level.								38
Exceedance	L <sub>Ar,Tr</sub> – L <sub>A90,15min</sub> .								-7
BS4142 Assessment Outcome	Low impact, dependent on context.								
NPPF & NPSE Outcome	No Observed Adverse Effect Level (NOAEL).								
<b>Mitigation measures are not required.</b>									

Table 7 – Calculations & BS4142 Noise Impact Assessment – NSR1 – Night-time

As can be seen the rating noise level is not predicted to exceed the background noise level at the most affected NSR. This is classed as 'low impact' when assessed with BS4142, which equates to 'No Observed Adverse Effect Level' ('NOAEL') when assessed with the NPSE and NPPF.

## 5. Conclusion

The proposed development has been assessed against the appropriate acoustic design criteria to predict the levels of noise risk associated with the plans. The outcomes of the assessment are detailed below.

### **Noise from Vehicles**

Providing the vehicle movement numbers do not exceed those specified in the report, the level of impact is not expected to exceed 'No Observed Adverse Effect Level' ('NOAEL') when assessed with the NPPF and NPSE.

Further to this, it should also be noted that the assessment considers a 'worst-case' scenario. For the majority of the time, noise from the carparking area is expected to be negligible.

### **Noise from Fixed Plant**

Assessment of the existing ASHP unit shows that the rating noise level should not exceed the background noise level at the most affected NSRs. This is classed as 'low impact' when assessed with BS4142, which again equates to 'No Observed Adverse Effect Level' ('NOAEL') when assessed with the NPSE and NPPF.

The make and model of the plant unit should not be altered. If alterations to the specification and location of the unit are required, then further assessment should be undertaken.

The findings of this report will require written approval from the Local Authority prior to the approval of the application.

## Appendix A – Acoustic Terminology

A-weighted sound pressure level, $L_{pA}$	Quantity of A-weighted sound pressure given by the following formula in decibels (dBA). $L_{pA} = 10 \log_{10} (pA/p_0)^2$ . Where: $pA$ is the A-weighted sound pressure in pascals (Pa) and $p_0$ is the reference sound pressure (20 $\mu$ Pa)
Background Sound	Underlying level of sound over a period, $T$ , which might in part be an indication of relative quietness at a given location
Equivalent continuous A-weighted sound pressure level, $L_{Aeq,T}$	Value of the A-weighted sound pressure level in decibels (dB) of a continuous, steady sound that, within a specified time interval, $T$ , has the same mean-squared sound pressure as the sound under consideration that varies with time
Facade level	Sound pressure level 1 m in front of the facade
Free-field level	Sound pressure level away from reflecting surfaces
Indoor ambient noise	Noise in a given situation at a given time, usually composed of noise from many sources, inside and outside the building, but excluding noise from activities of the occupants
Noise Criteria	Numerical indices used to define design goals in a given space
Noise Rating (NR)	Graphical method for rating a noise by comparing the noise spectrum with a family of noise rating curves
Octave Band	Band of frequencies in which the upper limit of the band is twice the frequency of the lower limit
Percentile Level, $L_{AN,T}$	A-weighted sound pressure level obtained using time-weighting “F”, which is exceeded for $N\%$ of a specified time interval
Rating Level, $L_{Ar,Tr}$	Equivalent continuous A-weighted sound pressure level of the noise, plus any adjustment for the characteristic features of the noise
Reverberation time, $T$	Time that would be required for the sound pressure level to decrease by 60 dB after the sound source has stopped
Sound Pressure, $p$	root-mean-square value of the variation in air pressure, measured in pascals (Pa) above and below atmospheric pressure, caused by the sound
Sound Pressure Level, $L_p$	Quantity of sound pressure, in decibels (dB), given by the formula: $L_p = 10 \log_{10} (p/p_0)^2$ . Where: $p$ is the root-mean-square sound pressure in pascals (Pa) and $p_0$ is the reference sound pressure (20 $\mu$ Pa)
Weighted sound reduction index, $R_w$	Single-number quantity which characterizes the airborne sound insulating properties of a material or building element over a range of frequencies

## Appendix B – Standards, Legislation, Policy, and Guidance

This report is to be primarily based on the following standards, legislation, policy and guidance.

### B.1 – National Planning Policy Framework (2024)

Government policy on noise is set out in the National Planning Policy Framework (NPPF), published in 2024. This replaced all earlier guidance on noise and places an emphasis on sustainability. In section 15, Conserving and enhancing the natural and local environment, paragraph 187e, it states:

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

Paragraph 198 states:

*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 impact 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 tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason; and*
- c) Limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation.*

### B.2 – Noise Policy Statement for England (2010)

Paragraph 198 of the NPPF also refers to advice on adverse effects of noise given in the Noise Policy Statement for England (NPSE). This document sets out a policy vision to:

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

To achieve this vision the Statement identifies the following three aims:

Through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development:

- Avoid significant adverse impacts on health and quality of life:
- Mitigate and minimise adverse impacts on health and quality of life:
- Where possible, contribute to the improvement of health and quality of life.

In achieving these aims the document introduces significance criteria as follows:

**SOAEL – Significant Observed Adverse Effect Level**

This is the level above which significant adverse effects on health and quality of life occur. It is stated that “significant adverse effects on health and quality of life should be avoided while also considering the guiding principles of sustainable development”.

**LOAEL – Lowest Observed Adverse Effect Level**

This is the level above which adverse effects on health and quality of life can be detected. It is stated that the second aim above lies somewhere between LOAEL and SOAEL and requires that: “all reasonable steps should be taken to mitigate and minimise adverse effects on health and quality of life while also considering the guiding principles of sustainable development. This does not mean that such adverse effects cannot occur.”

**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. This can be related to the third aim above, which seeks: “where possible, positively to improve health and quality of life through the pro-active management of noise while also considering the guiding principles of sustainable development, recognising that there will be opportunities for such measures to be taken and that they will deliver potential benefits to society. The protection of quiet places and quiet times as well as the enhancement of the acoustic environment will assist with delivering this aim.”

This is further expanded using the updated “Noise Exposure Hierarchy Table” which includes an additional level of impact referred to as the ‘No Observed Adverse Effect Level’ (‘NOAEL’). It is stated that at this level: “noise can be heard, but does not cause any change in behaviour, attitude or other physiological response”. In addition, noise at this level “can slightly affect the acoustic character of the area but not such that there is a change in the quality of life”.

The NPSE recognises that it is not possible to have a single objective noise-based measure that is mandatory and applicable to all sources of noise in all situations and provides no guidance as to how these criteria should be interpreted. It is clear, however, that there is no requirement to achieve noise levels where there are no observable adverse impacts but that reasonable and practicable steps to reduce adverse noise impacts should be taken in the context of sustainable development and ensure a balance between noise sensitive and the need for noise generating developments.

Any scheme of noise mitigation outlined in this report will, therefore, aim to abide by the above principles of the NPPF and NPSE whilst recognizing the constraints of the site.

## Appendix C – Environmental Survey

### C.1 – Time History Noise Data

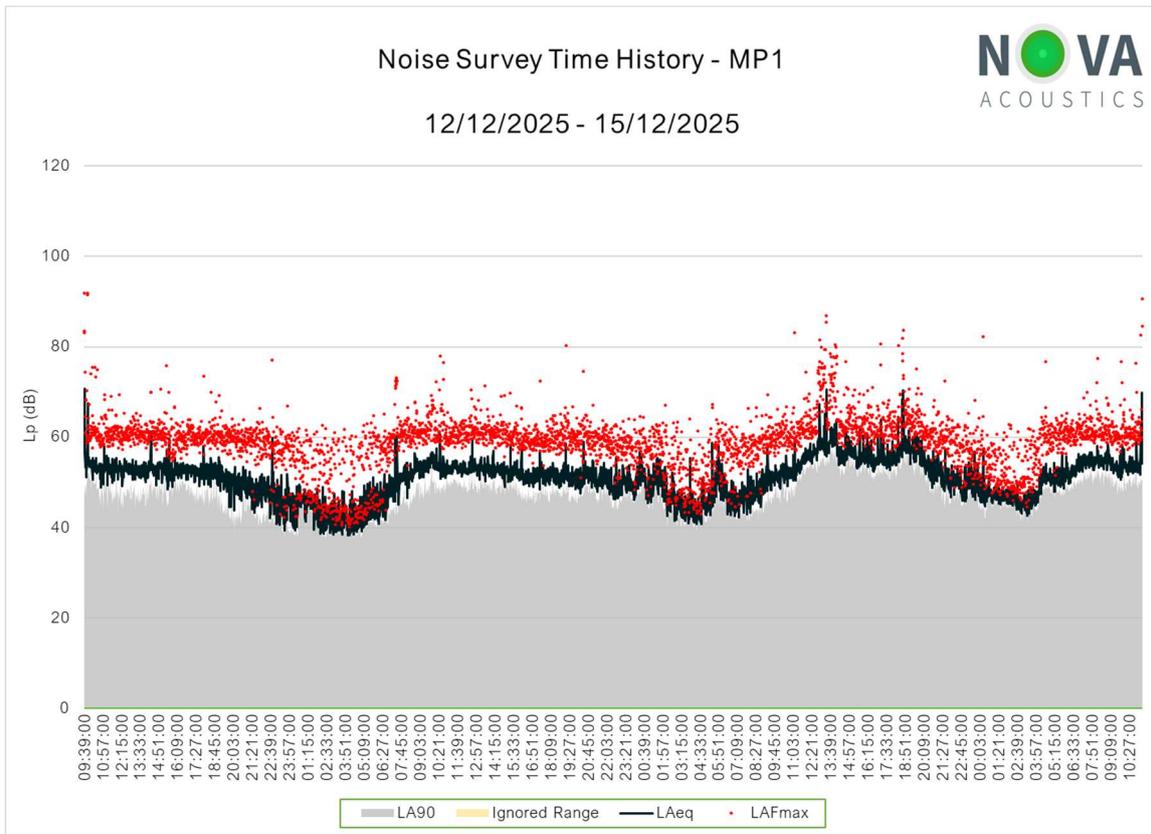


Figure 4 – MP1 Noise Survey Time History

The distributions of measured background sound levels are shown in the histogram graphs below.

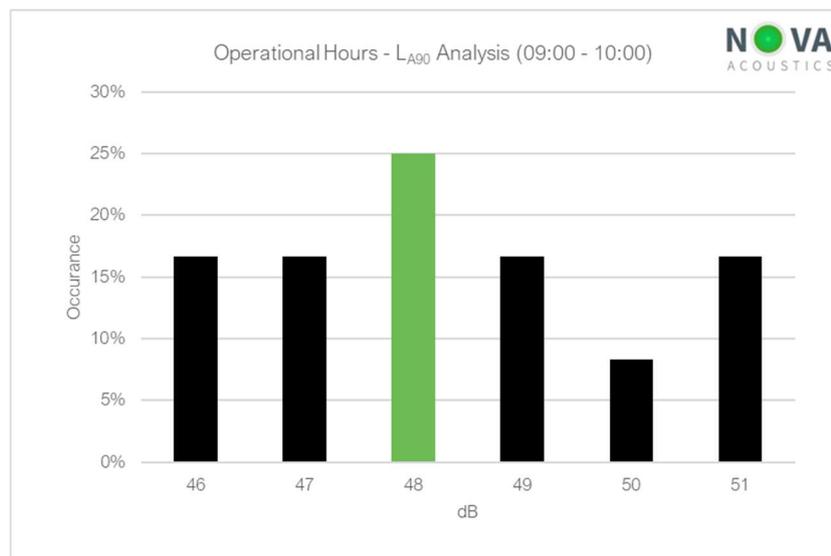


Figure 5 – Background Sound Level Histogram Graph – 09:00 – 10:00

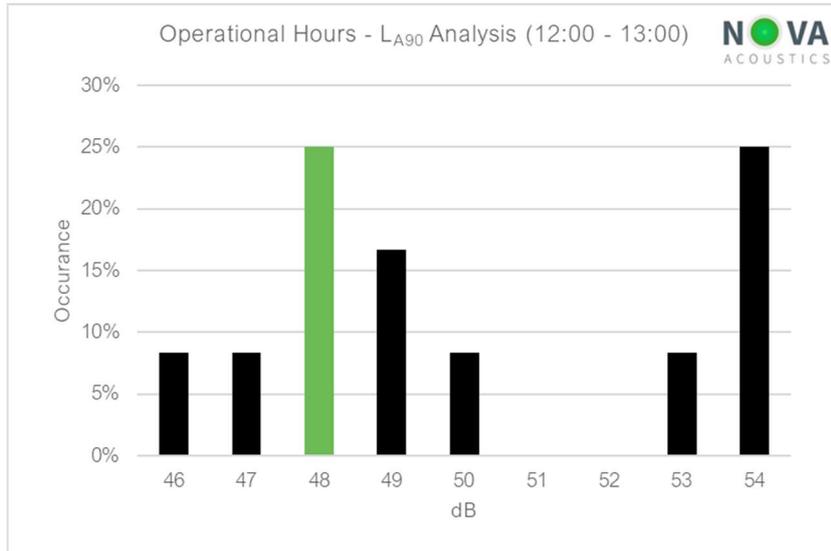


Figure 6 – Background Sound Level Histogram Graph – 12:00 – 13:00

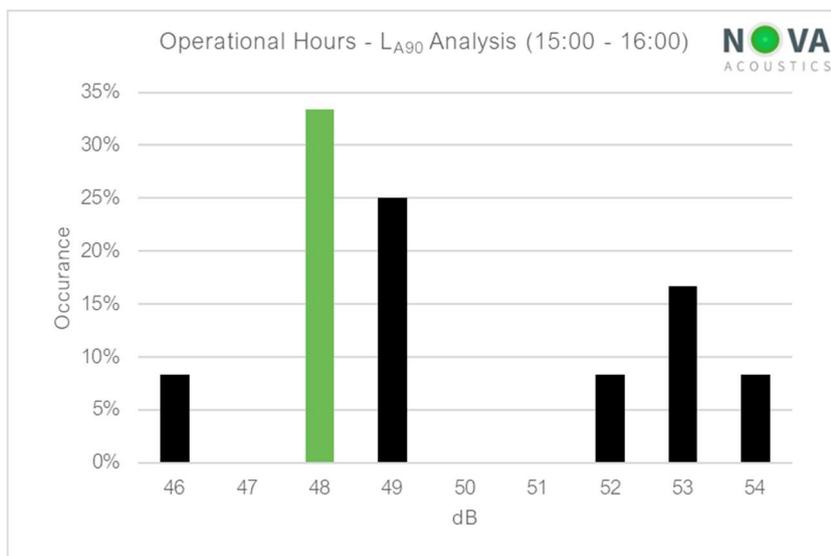


Figure 7 – Background Sound Level Histogram Graph – 15:00 – 16:00

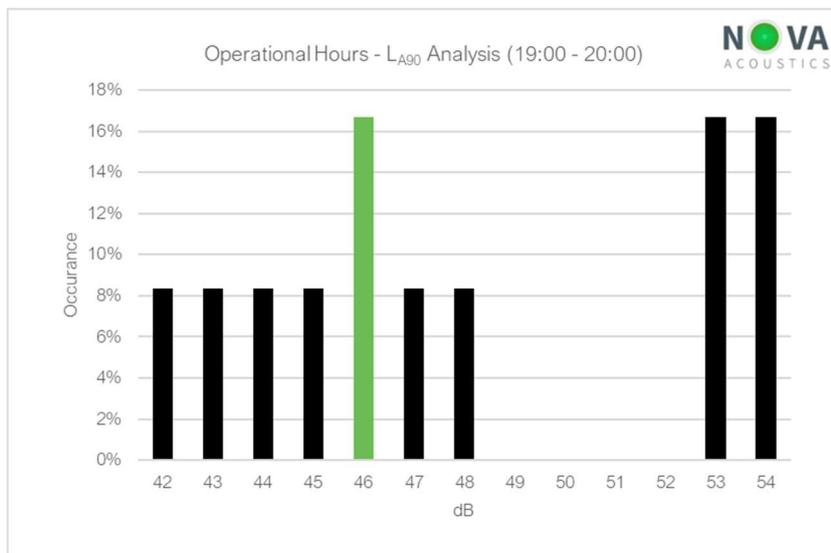


Figure 8 – Background Sound Level Histogram Graph – 19:00 – 20:00

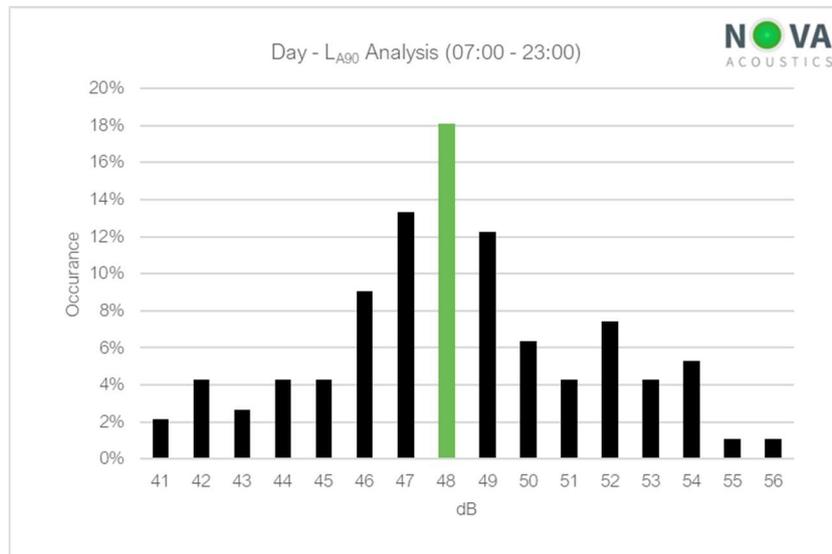


Figure 9 – Background Sound Level Histogram Graph – Full Daytime

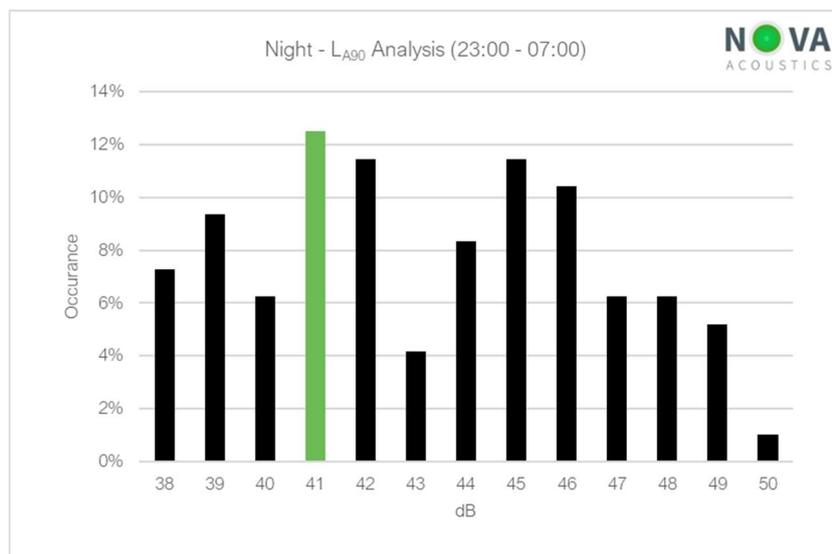


Figure 10 – Background Sound Level Histogram Graph – Full Night-time

## C.2 – Surveying Equipment

Piece of Equipment	Serial No.	Calibration Deviation
Svantek SV971A Class 1 Sound Level Meter	143564	≤0.1
Svantek SV31 Class 1 Calibrator	32569	

Table 8 – Surveying Equipment

All equipment used during the survey was field calibrated at the start and end of the measurement period with a negligible deviation of  $\leq 0.1$  dB. All sound level meters are calibrated every 24 months, and all calibrators are calibrated every 12 months, by a third-party calibration laboratory. All microphones were fitted with a protective windshield for the entire measurements period. Calibration certificates can be provided upon request.

### C.3 – Meteorological Conditions

As the environmental noise survey was carried out over a long un-manned period no localised records of weather conditions were taken. However, all measurements have been compared with met office weather data of the area, specifically the closest weather station, and the data from the weather station is outlined in the table below. When reviewing the time history of the noise measurements, any scenarios that were considered potentially to be affected by the local weather conditions have been omitted. The analysis of the noise data includes statistical and percentile analysis and review of minimum and maximum values, which aids in the preclusion of any periods of undesirable weather conditions. The weather conditions were deemed suitable for the measurement of environmental noise in accordance with BS7445 Description and Measurement of Environmental Noise. The table below presents the average temperature, wind speed and rainfall range for each 24-hour period during the entire measurement.

Weather Conditions – Rectory Road (Approx. 5km Northeast of Site)				
Time Period	Air Temp (°C)	Rainfall (mm/h)	Prevailing Wind Direction	Wind Speed (m/s)
12/12/25 – 00:00 – 23:59	5.1 – 10.2	0.0 – 6.0	ESE	0.0 – 1.8
13/12/25 – 00:00 – 23:59	5.1 – 9.4	0.0 – 1.8	ESE	0.0 – 3.6
14/12/25 – 00:00 – 23:59	8.6 – 11.1	0.0	SE	0.0 – 4.8
15/12/25 – 00:00 – 23:59	7.0 – 10.7	0.0 – 3.0	ESE	0.0 – 2.7

**Notes:**  
 [1] Significant rainfall recorded outside of measurement period.

Table 9 – Weather Conditions

## Appendix D – Manufacturer Datasheet

### Specifications of The InverX20 Inverter Swimming Pool Heat Pump

Model	X20-14	X20-18	X20-22	X20-26	X20-32
Advised pool volume (m3)	30-50	40-65	45-75	55-90	65-105
Working air temp (°C / °F F)	20-43 / 4-109				
Performance Condition: Air 26°C / 80°F F, Water 26°C / 80°F F, Humidity 80%					
Heating capacity (kW) in Turbo mode	14.0	18.5	22.0	26.5	32.0
Heating capacity (kW) in Smart mode	12.0	15.4	18.0	22.5	27.5
COP	20.0-7.8	19.6-7.2	21-7.4	20.7-7.5	20.0-7.3
COP at 50% capacity	15.2	14.8	15.3	15.2	15.1
COP at 20% capacity	20.0	19.6	21.0	20.7	20.0
Performance Condition: Air 15°C / 59°F F, Water 26°C / 80°F F, Humidity 70%					
Heating capacity (kW) in Turbo mode	9.2	12.5	14.8	18.2	22.3
Heating capacity (kW) in Smart mode	7.5	10.4	12.5	15.0	18.5
COP	8.1-5.4	8.2-5.1	9.0-5.4	9.5-5.5	8.3-5.4
COP at 50% capacity	7.3	7.3	7.6	8.0	7.6
COP at 20% capacity	8.1	8.2	9.0	9.5	8.3
Performance Condition: Air 7°C / 45°F F, Water 26°C / 80°F F, Humidity 90%					
Heating capacity (kW) in Turbo mode	7.4	10.5	11.8	15.5	17.8
COP	7.1-4.6	7.0-4.4	7.4-4.5	7.3-4.7	7.3-4.7
Sound pressure at 1m dB(A)	37.8-45.9	41.5-47.3	41.9-49.5	39.7-49.8	42.1-50.3
Sound pressure of 50% capacity at 1m dB(A)	40.3	42.5	43.3	43.1	45.2
Sound pressure at 10m dB(A)	17.8-25.9	21.5-27.3	21.9-29.5	19.7-29.8	22.1-30.3



**NOVA**  
ACOUSTICS