

Cathy Carleton

From: Mike Amiel Mekell <mamekell@mkoireland.ie>
Sent: Tuesday 28 October 2025 16:29
To: Appeals2
Cc: Alan Clancy; Eoin McCarthy; Micheal Cahill
Subject: RE: 230502-h Briskalagh Renewable Energy Development - Response to Further Information - ACP Ref. 322154-25 (Email 4 of 5)
Attachments: RFI Appendix 5 - Baseline Noise Survey at Ballyragget.pdf; RFI Appendix 6 - Predicted Omni-Directional Noise Levels.pdf; RFI Appendix 7 - Predicted Cumulative Omni-Directional Noise Levels.pdf; RFI Appendix 8 - Response by Hydro Environmental Services.pdf; RFI Appendix 4 - Updated Bat Survey Report.pdf

Caution: This is an **External Email** and may have malicious content. Please take care when clicking links or opening attachments. When in doubt, contact the ICT Helpdesk.

An Coimisiún Pleanála,

Due to the large file size of the documents, multiple emails will be issued. **This is email 4 of 5.**

Is mise le meas,
Mike.

Mike Amiel Mekell BA, MSc, RTPi Licentiate
Planner

MKO

Tuam Road, Galway, H91 VW84

Offices in Galway and Dublin
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McCarthy Kevila O Sullivan Ltd. T/A MKO. Registered in Ireland No. 462657. VAT No. IE9693052R

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From: Mike Amiel Mekell
Sent: Tuesday 28 October 2025 16:27
To: 'Appeals2' <appeals@pleanala.ie>
Cc: Alan Clancy <aclancy@mkoireland.ie>; Eoin McCarthy <emccarthy@mkoireland.ie>; Micheal Cahill <mcahill@mkoireland.ie>
Subject: RE: 230502-h Briskalagh Renewable Energy Development - Response to Further Information - ACP Ref. 322154-25 (Email 3 of 5)

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From: Mike Amiel Mekell

Sent: Tuesday 28 October 2025 16:26

To: Appeals2 <appeals@pleanala.ie>

Cc: Alan Clancy <aclancy@mkoireland.ie>; Eoin McCarthy <emccarthy@mkoireland.ie>; Micheal Cahill <mcahill@mkoirdand.ie>

Subject: RE: 230502-h Briskalagh Renewable Energy Development - Response to Further Information - ACP Ref. 322154-25 (Email 2 of 5)

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From: Mike Amiel Mekell

Sent: Tuesday 28 October 2025 16:22

To: Appeals2 <appeals@pleanala.ie>

Cc: Alan Clancy <aclancy@mkoireland.ie>; Eoin McCarthy <emccarthy@mkoireland.ie>; Micheal Cahill <mcahill@mkoireland.ie>

Subject: 230502-h Briskalagh Renewable Energy Development - Response to Further Information - ACP Ref. 322154-25 (Email 1 of 5)

An Coimisiún Pleanála,



APPENDIX 5

BASELINE ENVIRONMENTAL NOISE SURVEY AT BALLYRAGGET



Trinity
Consultants



awnconsulting

Baseline Environmental Noise Survey at Ballyragget

Briskalagh Wind Farm Grid Connection – Noise Monitoring

CLIENT
MKO

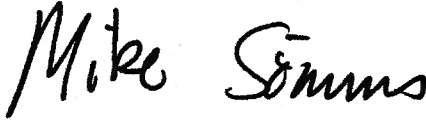
DOCUMENT REFERENCE
257501.0268NR01a

DATE
16 October 2025

DOCUMENT CONTROL SHEET

Document Control Sheet	
Our Reference	257501.0268NR01a
Original Issue Date	26 September 2025
Client:	MKO
Client Address:	Tuan Road, Galway

Revision	Revision Date	Description
a	16 October 2025	Minor edits

Details	Written by	Approved by
Signature		
Name	Mike Simms	Dermot Blunnie
Title	Principal Acoustic Consultant	Associate
Date	16 October 2025	

Disclaimer

This report considers the specific instructions and requirements of our client. It is not intended for third-party use or reliance, and no responsibility is accepted for any third party. The provisions in this report apply solely to this project and should not be assumed applicable to other developments without review and modification.



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1. INTRODUCTION

This report relates to the baseline environmental noise and vibration survey undertaken at the proposed HDD drilling area as part of the Proposed Grid Connection underground cabling route. The proposed HDD activity is in the vicinity of the River Nore Special Area of Conservation.

Noise measurements were taken through attended noise surveys; daytime noise measurements were undertaken within the Site and at locations external to the Site in public areas. Vibration monitoring was carried out at one location within the Site. The noise and vibration survey locations are shown in Figure 2-1.

2. SURVEY DETAILS

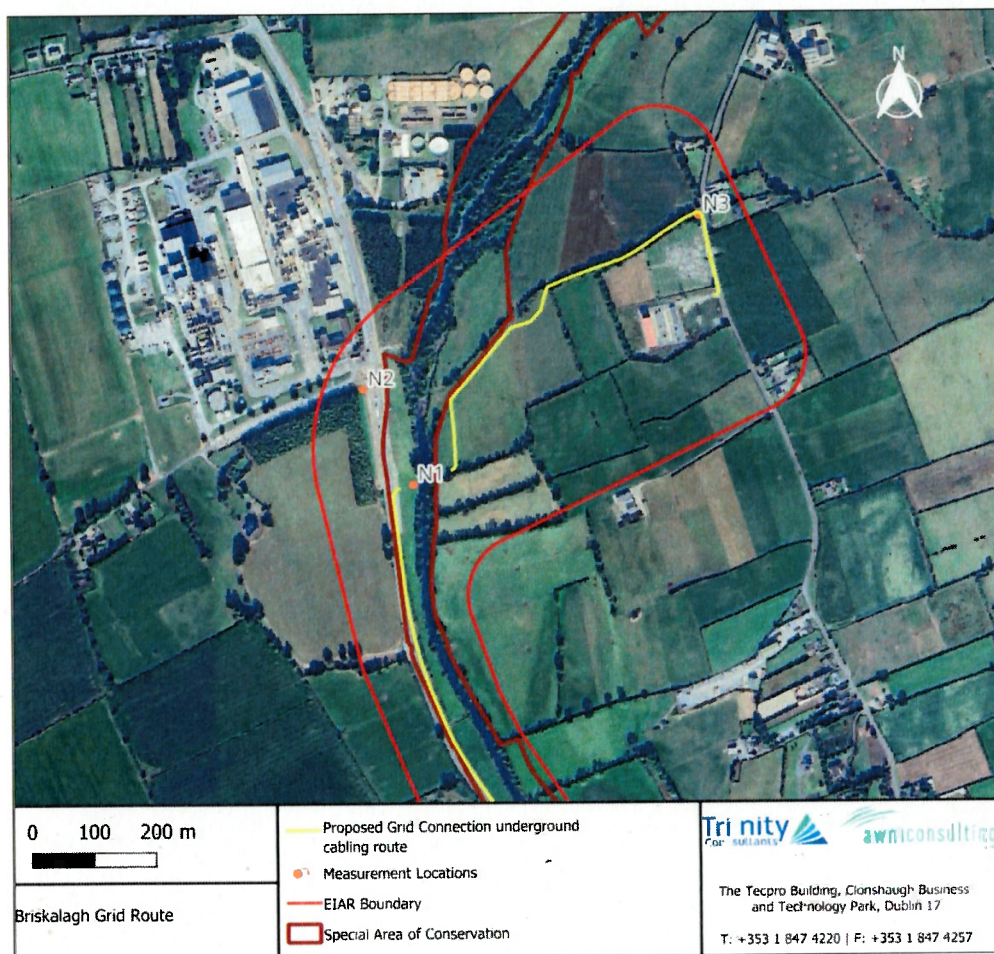
2.1 Measurement Locations

The monitoring locations for this survey are described below and illustrated in Table 2-1.

Table 2-1 Attended Noise and Vibration Monitoring Details

Ref	Description	Survey Period
N1	The monitoring location is surrounded by agricultural lands to the east and south, bordered to the west by the N77 road and to the north by the Ballyragget Tirlan industrial facility.	3 x 15-minute daytime attended measurements / 2hr 45 min continuous vibration measurement, 02 September 2025
N2	The monitoring location is situated on grassland located near the Ballyragget Tirlan industrial facility and Ballyconra road junction. The N77 Road is directly to the east.	3 x 15-minute daytime attended measurements, 02 September 2025
N3	The monitoring location is bordered by the R432 Road to the east, the St. Finnian's Cemetery to the south and agricultural lands to the west and north.	3 x 15-minute daytime attended measurements, 02 September 2025

Fig 2-1. Attended Noise and Vibration Monitoring Locations



2.2 Survey Procedure

Noise measurements were conducted in accordance with the guidance contained in ISO 1996: Acoustics – Description measurement and assessment and environmental noise. Part 1: Basic quantities and assessment procedures (2016) and Part 2: Determination of sound pressure levels (2017).

Vibration measurements were conducted in accordance with the guidance contained in British Standard BS 7385. Part 1: Guide for measurement of vibrations and evaluation of their effects on buildings (1990).

2.3 Survey Equipment and Personnel

The attended noise survey was undertaken by AWN Consulting using Rion NL-52 sound level meters and were calibrated using Bruel & Kjaer 4231 type calibrator.

Vibration surveys were undertaken using a Rion VM-56 with PV-83D tri-axial accelerometer. The specific equipment details are summarised in Table 2-2. Calibration certificates of the monitoring equipment are included within Appendix A.

Table 2-2. Noise and Vibration Monitoring Equipment

Equipment	Serial Number	Calibration Date
Rion NL-52	00164427	06/06/2024
Rion VM-56	00680043	12/09/2024
Bruel & Kjaer 4231	2394086	24/06/2025

2.4 Survey Weather Conditions

The weather conditions for the noise and vibration monitoring were dry, sunny and no cloud with a wind speed of between 1-2 m/s at the microphone height of 1.2 m.

2.5 Survey Parameters

The following measurement parameters were measured and are discussed within this report.

$L_{Aeq,T}$ is the A-weighted equivalent continuous steady sound level during the sample period and effectively represents an average value over the defined measurement period, T.

$L_{A90,T}$ is the A-weighted sound level that is exceeded for 90% of the sample period; generally used to quantify background noise. The T is the sample period the parameter is measured over.

PPV Peak Particle Velocity (PPV) is a measure of the velocity of vibration displacement in terms of millimetres per second (mm/s). It is defined as follows within BS 7385: (1990) as: "the maximum instantaneous velocity of a particle at a point during a given time interval".

2.6 Attended Noise Survey results

The survey results for the attended monitoring locations are presented below.

2.6.1 Location N1

Table 2-3. N1 Noise Monitoring Results

Date	Location	Start Time	Measured Noise Levels (dB re .2x10 ⁻⁵ Pa)	
			LAeq	LA90
02 September 2025	N1	10:40	57	41
		11:55	59	41
		13:07	60	42

The dominant noise source at location N1 was N77 road traffic noise, other noise sources audible in the environment included birdsong and foliage rustling. Ambient noise levels were measured in the range of 57 to 60 dB LAeq. Background noise levels were in the range 41 to 42 dB LA90.

2.6.2 Location N2

Table 2-4. N2 Noise Monitoring Results

Date	Location	Start Time	Measured Noise Levels (dB re .2x10 ⁻⁵ Pa)	
			LAeq	LA90
02 September 2025	N2	11:00	67	48
		12:16	69	51
		13:31	68	51

The dominant noise source at location N2 was N77 road traffic noise, other noise sources audible in the environment included birdsong and HGV entering and leaving from the nearby TirLan facility. Ambient noise levels were measured in the range of 67 to 69 dB LAeq. Background noise levels were in the range 48 to 51 dB LA90.

2.6.3 Location N3

Table 2-5. N3 Noise Monitoring Results

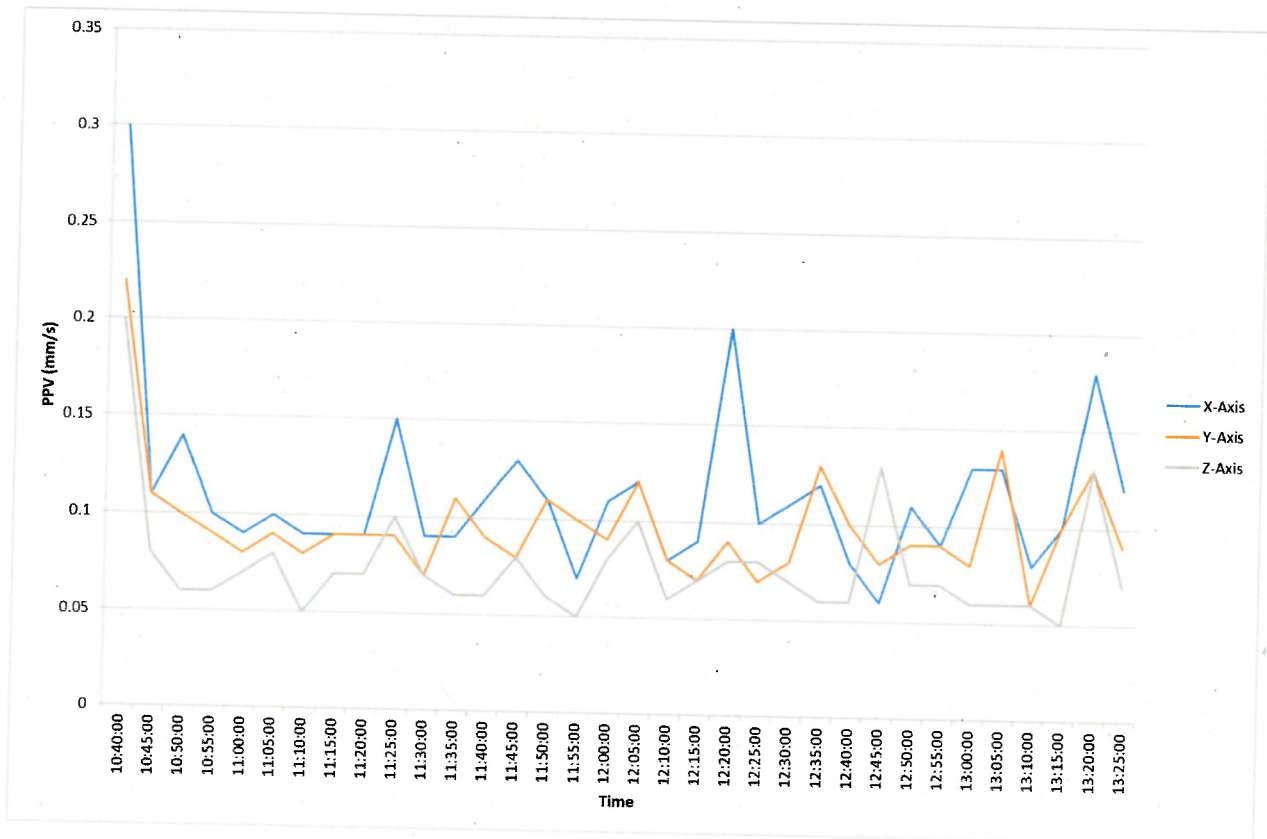
Date	Location	Start Time	Measured Noise Levels (dB re .2x10 ⁻⁵ Pa)	
			LAeq	LA90
02 September 2025	N3	11:30	61	37
		12:42	59	37
		13:59	60	38

The dominant noise source at location N3 was R432 local road traffic noise and distant N77 road traffic noise, during lulls. Other noise sources audible in the environment included birdsong and distant construction noise. Ambient noise levels were measured in the range of 59 to 61 dB LAeq. Background noise levels were in the range 37 to 38 dB LA90.

2.7 Vibration Survey Results

The survey results for the vibration monitoring location are presented in graphical form below and tabular form in Appendix B.

Fig 2-2. Measured Vibration Levels at N1



No noticeable vibration was noted for the duration of the survey. The spike at the beginning of the survey is due to survey personal stepping away from vibration monitor after installation.

BS 5228-2 provides a useful guide relating to the assessment of human response to vibration in terms of the peak particle velocity (PPV). Table 2-6 below summarises the range of vibration values and the associated potential effects on humans.

Table 2-6. Human Response to PPV Magnitudes

Vibration Level, mm/s PPV	Description of Effect	Possible Significance Rating
≥10	Vibration is likely to be intolerable for any more than a brief exposure to a level of 10 mm/s	Very Significant
≥1 to <10	Increasing likelihood of complaints in residential environments but can be tolerated at the lower end of the scale if prior warning and explanation has been given to residents	Significant to Very Significant
≥0.3 to <1	Increasing likelihood of perceptible vibration in residential environments	Slight to Moderate

Vibration Level, mm /s PPV	Description of Effect	Possible Significance Rating
<0.3	Vibration is unlikely to be perceptible in even the most sensitive situations for most vibration frequencies associated with construction	Not significant

With reference to the above table the measured vibration results indicate vibration is imperceptible at this location.

APPENDIX A. CALIBRATION CERTIFICATES



CERTIFICATE OF CALIBRATION



0653

Date of Issue: 06 June 2024

Certificate Number: UCRT24/1830

Calibrated at & Certificate issued by:

ANV Measurement Systems

Beaufort Court

17 Roebuck Way

Milton Keynes MK5 8HL

Telephone 01908 642846 Fax 01908 642814

E-Mail: info@noise-and-vibration.co.uk

Web: www.noise-and-vibration.co.uk

Acoustics Noise and Vibration Ltd trading as ANV Measurement Systems

Page 1 of 2 Pages
Approved Signatory

K. Mistry

Customer AWN Consulting Ltd
The Tecpro Building
IDA Business and Technology Park
Clonsaugh
Dublin
D17 XD90

Order No. 2408

Description Sound Level Meter / Pre-amp / Microphone / Associated Calibrator

Identification	Manufacturer	Instrument	Type	Serial No. / Version
	Rion	Sound Level Meter	NL-52	00164427
	Rion	Firmware		2.0
	Rion	Pre Amplifier	NH-25	54560
	Rion	Microphone	UC-59	09208
	Rion	Calibrator	NC-75	34334830
		Calibrator adaptor type if applicable		NC-75-022

Performance Class 1

Test Procedure TP 10. SLM 61672-3:2013

Procedures from IEC 61672-3:2013 were used to perform the periodic tests.

Type Approved to IEC 61672-1:2013 Yes

If YES above there is public evidence that the SLM has successfully completed the applicable pattern evaluation tests of IEC 61672-2:2013

Date Received 29 May 2024

ANV Job No. UKAS24/05402

Date Calibrated 06 June 2024

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

Previous Certificate	Dated	Certificate No.	Laboratory
	12 May 2022	UCRT22/1644	0653

This certificate is issued in accordance with the laboratory accreditation requirements of the United Kingdom Accreditation Service. It provides traceability of measurement to the SI system of units and/or to units of measurement realised at the National Physical Laboratory or other recognised national metrology institutes. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory.

CERTIFICATE OF CALIBRATION	Certificate Number
	UCRT24/1830
	Page 2 of 2 Pages

UKAS Accredited Calibration Laboratory No. 0653

Sound Level Meter Instruction manual and data used to adjust the sound levels indicated.

SLM instruction manual title	NL-52/NL-42 Description for IEC 61672-1		
SLM instruction manual ref / issue	No. 56034 21-03	Source	Rion
Date provided or internet download date	19 March 2021		
	Case Corrections	Wind Shield Corrections	Mic Pressure to Free Field Corrections
Uncertainties provided	Yes	Yes	Yes
Total expanded uncertainties within the requirements of IEC 61672-1:2013			YES
Specified or equivalent Calibrator	Specified		
Customer or Lab Calibrator	Lab Calibrator		
Calibrator adaptor type if applicable	NC-75-022		
Calibrator cal. date	04 June 2024		
Calibrator cert. number	UCRT24/1808		
Calibrator cal cert issued by Lab	0653		
Calibrator SPL @ STP	94.01	dB	Calibration reference sound pressure level
Calibrator frequency	1000.00	Hz	Calibration check frequency
Reference level range	Single	dB	
Accessories used or corrected for during calibration - Extension Cable & Wind Shield WS-15			
Note - The Extension Cable was used between the SLM and the pre-amp for this calibration.			

Environmental conditions during tests		Start	End	
Temperature		22.43	22.49	± 0.30 °C
Humidity		49.2	49.3	± 3.00 %RH
Ambient Pressure		100.69	100.70	± 0.03 kPa

Indication at the Calibration Check Frequency			
Initial indicated level	94.2	dB	Adjusted indicated level
Uncertainty of calibrator used for Indication at the Calibration Check Frequency ±			0.10
Self Generated Noise			dB
Microphone installed -	Less Than	18.3	dB A Weighting
Microphone replaced with electrical input device -	UR = Under Range indicated		
Weighting	A	C	Z
	13.1	16.6	23.1
	dB	dB	dB
	UR	UR	UR

Self Generated Noise reported for information only and not used to assess conformance to a requirement

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor $k=2$, providing a coverage probability of approximately 95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

Additional Comments The results on this certificate only relate to the items calibrated as identified above.

None

Calibrated by: B. Bogdan

END

R 2



CERTIFICATE OF CALIBRATION

Date of Issue: 12 September 2024

Certificate Number: TCRT24/1706

Issued by:
ANV Measurement Systems
Beaufort Court
17 Roebuck Way
Milton Keynes MK5 8HL
Telephone 01908 642846 Fax 01908 642814
E-Mail: info@noise-and-vibration.co.uk
Web: www.noise-and-vibration.co.uk

Page 1 of 3 Pages
Approved Signatory

K. Mistry

Acoustics Noise and Vibration Ltd trading as ANV Measurement Systems

Client	AWN Consulting Ltd The Tecpro Building, 17 Clonshaugh Business & Technology Park Dublin IRELAND
Purchase Order No.	2423
Instrument	Rion VM-56 Tri-Axial Vibration Meter
Serial No.	00680043
Accelerometer Type	PV-83D
Accelerometer Serial No.	30354
Program	2.0
Client Asset No.	N/A
Procedure ID.	VM-56 Issue 2
Job Number	TRAC24/09401
Date of Calibration	12 Sep 2024
Previous Cert. number	TCRT24/1376
Date of Previous Cert.	20 May 2024
Rig Number	5
Kit Number	24
Calibration Status	Passed Calibration

This calibration is traceable to National Standards. ANV Measurement Systems sources used to perform calibrations are calibrated at the National Physical Laboratory or by UKAS laboratories accredited for the purpose.

The performance of the system (the meter, accelerometer) was found to be within the manufacturer's specification.

Comment

This certificate reports recorded values after the instrument's accelerometer was replaced.

CERTIFICATE OF CALIBRATION



Certificate Number

TCRT24/1706

Page 2 of 3 Pages

Environment

The ambient environmental conditions at the time of the calibration were;

Temperature: $24.7 \pm 1^\circ\text{C}$, Humidity: $38 \pm 5\%\text{RH}$, Atmospheric pressure $100.6 \pm 1\text{ kPa}$

Test results

Each accelerometer axis was mounted co-axially with a Rion LS-10C servo accelerometer, and tests conducted for the dynamic range, PPV linearity and frequency response of the complete system. Additional electrical tests were carried out on the amplitude linearity of the instrument.

PPV linearity response for the complete system at 16 Hz

With PV-83CW serial No. 30354

Weightings for all channels turned OFF

Target Vel. mm/s	Actual Vel. mm/s	Indicated (X) mm/s	Error (X) %	Indicated (Y) mm/s	Error (Y) %	Indicated (Z) mm/s	Error (Z) %
0.50	0.51	0.56	10.51	0.54	6.56	0.54	6.56
1.00	1.01	1.09	7.55	1.09	7.55	1.05	3.60
2.50	2.53	2.67	5.38	2.66	4.98	2.58	1.83
5.00	5.07	5.33	5.18	5.30	4.59	5.14	1.43
10.00	10.11	10.64	5.21	10.60	4.81	10.19	0.76
20.00	20.23	21.24	5.01	21.10	4.32	20.50	1.35

Permitted tolerance $\pm 10\% \pm 1\text{ LSD}$ (Least Significant Digit).

Linearity errors in dB measured electrically at 40 Hz

Weightings for all channels turned OFF

Level changes in dB; reading error in dB given for each axis. " m/s^2 " is actual reading in m/s^2 .

1 m/s^2 Range

Level dB	Error (X) dB	m/s^2 (X)	Error (Y) dB	m/s^2 (Y)	Error (Z) dB	m/s^2 (Z)
0	REF	0.97921	REF	0.97932	REF	0.97871
-20	0.02	0.09818	0.02	0.09819	0.02	0.09813
-40	0.03	0.00983	0.03	0.00983	0.03	0.00982
-60	0.01	0.00098	0.01	0.00098	0.01	0.00098
-66	-0.01	0.00049	-0.01	0.00049	-0.01	0.00049
-72	-0.21	0.00024	-0.21	0.00024	-0.21	0.00024

Permitted tolerance $\pm 1.0\text{ dB}$.

10 m/s^2 Range

Level dB	Error (X) dB	m/s^2 (X)	Error (Y) dB	m/s^2 (Y)	Error (Z) dB	m/s^2 (Z)
20	-0.04	9.74998	-0.04	9.71889	-0.04	9.69743
0	REF	0.97998	REF	0.97663	REF	0.97462
-20	0.02	0.09822	0.02	0.09793	0.02	0.09768
-30	-0.02	0.03092	0.03	0.03098	0.02	0.03089
-40	-0.05	0.00974	0.05	0.00982	0.02	0.00977
-52	-0.11	0.00243	-0.01	0.00245	0.01	0.00245

Permitted tolerance $\pm 1.0\text{ dB}$.

CERTIFICATE OF CALIBRATION



Certificate Number

TCRT24/1706

Page 3 of 3 Pages

Frequency Responses For Complete System

Measured on the 1 m/s² range with weightings as indicated in the table and PV-83CW serial No. 30354

Frequency Hz	Applied Acc. m/s ²	X (Wd) rms m/s ²	Error X %	VDV (X) m/s ^{1.75}	Error X %
3.981	0.285	0.15731	5.6	0.30947	5.6
5.012	0.355	0.15492	4.9	0.30482	4.9
6.310	0.355	0.12213	5.0	0.24016	4.9
7.943	0.355	0.09639	4.8	0.18964	4.7
10.00	0.355	0.07648	5.1	0.15048	5.1
12.59	0.355	0.06073	5.4	0.11951	5.4
15.85	0.355	0.04858	6.4	0.09562	6.4
19.95	0.550	0.06082	8.3	0.11969	8.3

Frequency Hz	Applied Acc. m/s ²	Y (Wd) rms m/s ²	Error Y %	VDV (Y) m/s ^{1.75}	Error Y %
3.981	0.285	0.15765	5.8	0.31005	5.8
5.012	0.355	0.15492	4.9	0.30470	4.8
6.310	0.355	0.12204	4.9	0.24006	4.9
7.943	0.355	0.09625	4.6	0.18933	4.6
10.00	0.355	0.07666	5.3	0.15083	5.3
12.59	0.355	0.06057	5.1	0.11918	5.1
15.85	0.355	0.04845	6.1	0.09535	6.1
19.95	0.550	0.06054	7.8	0.11913	7.8

Frequency Hz	Applied Acc. m/s ²	Z (Wb) rms m/s ²	Error Z %	VDV (Z) m/s ^{1.75}	Error Z %
3.981	0.285	0.26124	1.9	0.51598	2.3
5.012	0.355	0.37471	0.9	0.73974	1.2
6.310	0.355	0.38439	1.0	0.75835	1.3
7.943	0.355	0.37266	0.7	0.73447	0.8
10.00	0.355	0.35229	0.2	0.69368	0.2
12.59	0.355	0.32723	0.3	0.64412	0.3
15.85	0.355	0.29441	0.2	0.57944	0.2
19.95	0.550	0.39658	0.1	0.78049	0.1
25.12	0.550	0.33327	2.8	0.65593	2.8
31.62	0.550	0.27467	3.1	0.54054	3.1
39.81	0.550	0.22333	3.4	0.43952	3.4
50.12	0.550	0.17461	2.2	0.34361	2.2
63.10	0.550	0.13508	2.6	0.26584	2.6
79.43	0.550	0.09933	2.9	0.19549	2.9

Tolerance required @ 4 Hz to 63 Hz +12%/-11% ; @ 80 Hz +26%/-21%

All results meet the manufacturer's specification.

END OF CALIBRATION

CALIBRATED BY :- A. Lloyd



CERTIFICATE OF CALIBRATION



0653

Date of Issue: 25 June 2025

Certificate Number: UCRT25/1927

Calibrated at & Certificate issued by:

ANV Measurement Systems

Beaufort Court

17 Roebuck Way

Milton Keynes MK5 8HL

Telephone 01908 642846 Fax 01908 642814

E-Mail: info@noise-and-vibration.co.uk

Web: www.noise-and-vibration.co.uk

Acoustics Noise and Vibration Ltd trading as ANV Measurement Systems

Page 1 of 2 Pages
Approved Signatory

B. Bogdan

Customer AWN Consulting Limited
 The Tecpro Building
 17
 Clonshaugh Business & Technology Park
 Dublin

Order No. 2526

Test Procedure Procedure TP 1 Calibration of Sound Calibrators

Description Acoustic Calibrator

Identification	Manufacturer	Instrument	Model	Serial No.
	Brüel & Kjær	Calibrator	4231	2394086

The calibrator has been tested as specified in Annex B of IEC 60942:2003. As public evidence was available from a testing organisation (PTB) responsible for approving the results of pattern evaluation tests, to demonstrate that the model of sound calibrator fully conformed to the requirements for pattern evaluation described in Annex A of IEC 60942:2003, the sound calibrator tested is considered to conform to all the class 1 requirements of IEC 60942:2003.

ANV Job No. UKAS25/06485

Date Received 24 June 2025

Date Calibrated 25 June 2025

Previous Certificate	Dated	06 June 2024
	Certificate No.	UCRT24/1823
	Laboratory	0653

This certificate is issued in accordance with the laboratory accreditation requirements of the United Kingdom Accreditation Service. It provides traceability of measurement to the SI system of units and/or to units of measurement realised at the National Physical Laboratory or other recognised national metrology institutes. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory.

CERTIFICATE OF CALIBRATION

UKAS Accredited Calibration Laboratory No 0653

Certificate Number

UCRT25/1927

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Measurements

The sound pressure level generated by the calibrator in its WS2 configuration was measured five times by the Insert Voltage Method using a microphone as detailed below. The mean of the results obtained is shown below. It is corrected to the standard atmospheric pressure of 101.3 kPa (1013 mBar) using original manufacturers information.

Test Microphone	Manufacturer	Type
	Brüel & Kjær	4134

Results

The level of the calibrator output under the conditions outlined above was

93.86 ± 0.10 dB rel 20 µPa

Functional Tests and Observations

The frequency of the sound produced was	999.97 ± 0.12 Hz
The total distortion was	0.49 ± 0.06 % Distortion

During the measurements environmental conditions were

Temperature	23 to 24 °C
Relative Humidity	49 to 56 %
Barometric Pressure	100.2 to 100.3 kPa

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a coverage probability of approximately 95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

The uncertainties refer to the measured values only with no account being taken of the ability of the instrument to maintain its calibration.

A small correction factor may need to be applied to the sound pressure level quoted above if the device is used to calibrate a sound level meter which is fitted with a free-field response microphone. See manufacturers handbook for details.

..... END

Note:

Calibrator adjusted prior to calibration?	NO
Initial Level	N/A dB
Initial Frequency	N/A Hz

Additional Comments The results on this certificate only relate to the items calibrated as identified above.
None

Calibrated by: TK/BB

R 2

APPENDIX B. MEASURED VIBRATION LEVELS

Start Time	Vibration as Peak Particle Velocity (PPV)		
	X-Axis	Y-Axis	Z-Axis
10:40	0.30	0.22	0.20
10:45	0.11	0.11	0.08
10:50	0.14	0.10	0.06
10:55	0.10	0.09	0.06
11:00	0.09	0.08	0.07
11:05	0.10	0.09	0.08
11:10	0.09	0.08	0.05
11:15	0.09	0.09	0.07
11:20	0.09	0.09	0.07
11:25	0.15	0.09	0.10
11:30	0.09	0.07	0.07
11:35	0.09	0.11	0.06
11:40	0.11	0.09	0.06
11:45	0.13	0.08	0.08
11:50	0.11	0.11	0.06
11:55	0.07	0.10	0.05
12:00	0.11	0.09	0.08
12:05	0.12	0.12	0.10
12:10	0.08	0.08	0.06
12:15	0.09	0.07	0.07
12:20	0.20	0.09	0.08
12:25	0.10	0.07	0.08
12:30	0.11	0.08	0.07
12:35	0.12	0.13	0.06
12:40	0.08	0.10	0.06
12:45	0.06	0.08	0.13
12:50	0.11	0.09	0.07
12:55	0.09	0.09	0.07
13:00	0.13	0.08	0.06
13:05	0.13	0.14	0.06
13:10	0.08	0.06	0.06
13:15	0.10	0.10	0.05
13:20	0.18	0.13	0.13
13:25	0.12	0.09	0.07



APPENDIX 6

PREDICTED OMNI-DIRECTIONAL NOISE LEVELS

APPENDIX 6– PROPOSED WIND FARM NOISE LEVELS

Table A-1 below presents the noise levels due to the Proposed Wind Farm alone, at each NSL, compared to day and night-time noise criteria.

Table A-1. Predicted Noise Level at Noise-sensitive locations

House	Parameter	Predicted Noise Level, dB LA90 at wind speed m/s at standardised 10m height						
		3	4	5	6	7	8	9
H001	Predicted	32.4	33.9	38.4	42.8	43.9	44.0	44.0
	Daytime Criterion	45	45	45	45	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	45	45	45	45	45	45	45
	Night-time Excess	--	--	--	--	--	--	--
H002	Predicted	31.4	32.9	37.4	41.8	42.9	43.0	43.0
	Daytime Criterion	45	45	45	45	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	45	45	45	45	45	45	45
	Night-time Excess	--	--	--	--	--	--	--
H003	Predicted	25.6	27.1	31.6	36.0	37.1	37.2	37.2
	Daytime Criterion	45	45	45	45	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	45	45	45	45	45	45	45
	Night-time Excess	--	--	--	--	--	--	--
H004	Predicted	31.0	32.5	37.0	41.4	42.5	42.6	42.6
	Daytime Criterion	45	45	45	45	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	45	45	45	45	45	45	45
	Night-time Excess	--	--	--	--	--	--	--
H005	Predicted	29.5	31.0	35.5	39.9	41.0	41.1	41.1
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H006	Predicted	24.0	25.5	30.0	34.4	35.5	35.6	35.6
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H007	Predicted	28.3	29.8	34.3	38.7	39.8	39.9	39.9
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H008	Predicted	30.0	31.5	36.0	40.4	41.5	41.6	41.6
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	0.4	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H009	Predicted	32.8	34.3	38.8	43.2	44.3	44.4	44.4
	Daytime Criterion	45	45	45	45	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	45	45	45	45	45	45	45
	Night-time Excess	--	--	--	--	--	--	--

House	Parameter	Predicted Noise Level, dB L _{A90} at wind speed m/s at standardised 10m height						
		3	4	5	6	7	8	9
H010	Predicted	23.9	25.4	29.9	34.3	35.4	35.5	35.5
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H011	Predicted	23.9	25.4	29.9	34.3	35.4	35.5	35.5
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H012	Predicted	30.2	31.7	36.2	40.6	41.7	41.8	41.8
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	0.6	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H013	Predicted	29.4	30.9	35.4	39.8	40.9	41.0	41.0
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H014	Predicted	27.6	29.1	33.6	38.0	39.1	39.2	39.2
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H015	Predicted	24.4	25.9	30.4	34.8	35.9	36.0	36.0
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H016	Predicted	23.8	25.3	29.8	34.2	35.3	35.4	35.4
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H017	Predicted	23.8	25.3	29.8	34.2	35.3	35.4	35.4
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H018	Predicted	23.8	25.3	29.8	34.2	35.3	35.4	35.4
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H019	Predicted	23.8	25.3	29.8	34.2	35.3	35.4	35.4
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H020	Predicted	23.8	25.3	29.8	34.2	35.3	35.4	35.4
	Daytime Criterion	40	40	40	40	45	45	45

House	Parameter	Predicted Noise Level, dB LA90 at wind speed m/s at standardised 1.0m height						
		3	4	5	6	7	8	9
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	23.8	25.3	29.8	34.2	35.3	35.4	35.4
	Daytime Criterion	40	40	40	40	45	45	45
H021	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	23.7	25.2	29.7	34.1	35.2	35.3	35.3
	Daytime Criterion	40	40	40	40	45	45	45
H022	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	23.7	25.2	29.7	34.1	35.2	35.3	35.3
	Daytime Criterion	40	40	40	40	45	45	45
H023	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	24.1	25.6	30.1	34.5	35.6	35.7	35.7
	Daytime Criterion	40	40	40	40	45	45	45
H024	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	23.7	25.2	29.7	34.1	35.2	35.3	35.3
	Daytime Criterion	40	40	40	40	45	45	45
H025	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	23.7	25.2	29.7	34.1	35.2	35.3	35.3
	Daytime Criterion	40	40	40	40	45	45	45
H026	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	23.7	25.2	29.7	34.1	35.2	35.3	35.3
	Daytime Criterion	40	40	40	40	45	45	45
H027	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	23.7	25.2	29.7	34.1	35.2	35.3	35.3
	Daytime Criterion	40	40	40	40	45	45	45
H028	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	23.7	25.2	29.7	34.1	35.2	35.3	35.3
	Daytime Criterion	40	40	40	40	45	45	45
H029	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	45	45	45	45	45	45	45
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	28.9	30.4	34.9	39.3	40.4	40.5	40.5
	Daytime Criterion	40	40	40	40	45	45	45
H030	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--

House	Parameter	Predicted Noise Level, dB L _{A90} at wind speed m/s at standardised 10m height						
		3	4	5	6	7	8	9
	Night-time Excess	--	--	--	--	--	--	--
H031	Predicted	24.4	25.9	30.4	34.8	35.9	36.0	36.0
	Daytime Criterion	45	45	45	45	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	45	45	45	45	45	45	45
	Night-time Excess	--	--	--	--	--	--	--
H032	Predicted	23.7	25.2	29.7	34.1	35.2	35.3	35.3
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H033	Predicted	24.6	26.1	30.6	35.0	36.1	36.2	36.2
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H034	Predicted	27.7	29.2	33.7	38.1	39.2	39.3	39.3
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H035	Predicted	29.2	30.7	35.2	39.6	40.7	40.8	40.8
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H036	Predicted	24.8	26.3	30.8	35.2	36.3	36.4	36.4
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H037	Predicted	28.2	29.7	34.2	38.6	39.7	39.8	39.8
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H038	Predicted	29.0	30.5	35.0	39.4	40.5	40.6	40.6
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H039	Predicted	23.8	25.3	29.8	34.2	35.3	35.4	35.4
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H040	Predicted	24.2	25.7	30.2	34.6	35.7	35.8	35.8
	Daytime Criterion	45	45	45	45	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	45	45	45	45	45	45	45
	Night-time Excess	--	--	--	--	--	--	--
H041	Predicted	24.3	25.8	30.3	34.7	35.8	35.9	35.9

House	Parameter	Predicted Noise Level, dB LA90 at wind speed m/s at standardised 10m height						
		3	4	5	6	7	8	9
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Nighttime Excess	--	--	--	--	--	--	--
	Predicted	24.5	26.0	30.5	34.9	36.0	36.1	36.1
H042	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Nighttime Criterion	43	43	43	43	43	43	43
	Night time Excess	--	--	--	--	--	--	--
	Predicted	28.8	30.3	34.8	39.2	40.3	40.4	40.4
H043	Daytime Criterion	40	40	40	40	45	45	45
	DaytimeExcess	--	--	--	--	--	--	--
	Nighttime Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	28.8	30.3	34.8	39.2	40.3	40.4	40.4
H044	Daytime Criterion	40	40	40	40	45	45	45
	DaytimeExcess	--	--	--	--	--	--	--
	Ni ght-time Criterion	43	43	43	43	43	43	43
	Ni ght timeExcess	--	--	--	--	--	--	--
	Predicted	28.5	30.0	34.5	38.9	40.0	40.1	40.1
H045	Da ytimeCriterion	40	40	40	40	45	45	45
	Da ytimeExcess	--	--	--	--	--	--	--
	Ni ght-tim e Criterion	43	43	43	43	43	43	43
	Ni ght-time Excess	--	--	--	--	--	--	--
	Predicted	28.9	30.4	34.9	39.3	40.4	40.5	40.5
H046	Daytime Criterion	40	40	40	40	45	45	45
	Da ytime Excess	--	--	--	--	--	--	--
	Ni ght-time Criterion	43	43	43	43	43	43	43
	Ni ght-time Excess	--	--	--	--	--	--	--
	Predicted	23.4	24.9	29.4	33.8	34.9	35.0	35.0
H047	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	N'ight-time Criterion	43	43	43	43	43	43	43
	N'ight-time Excess	--	--	--	--	--	--	--
	Predicted	24.7	31.2	35.7	40.1	41.2	41.3	41.3
H048	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	0.1	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Nighttime Excess	--	--	--	--	--	--	--
	Predicted	27.6	29.1	33.6	38.0	39.1	39.2	39.2
H049	Daytime Criterion	40	40	45	45	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Nighttime Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	23.8	25.3	29.8	34.2	35.3	35.4	35.4
H050	Daytime Criterion	40	40	40	40	45	45	45
	DaytimeExcess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	N'ight-time Excess	--	--	--	--	--	--	--
	Predicted	26.1	27.6	32.1	36.5	37.6	37.7	37.7
H051	Da ytimeCriterion	40	40	40	40	45	45	45
	Da ytimeExcess	--	--	--	--	--	--	--

House	Parameter	Predicted Noise Level, dB LA90 at wind speed m/s at standardised 10m height						
		3	4	5	6	7	8	9
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H052	Predicted	24.2	25.7	30.2	34.6	35.7	35.8	35.8
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H053	Predicted	27.9	29.4	33.9	38.3	39.4	39.5	39.5
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H054	Predicted	28.8	30.3	34.8	39.2	40.3	40.4	40.4
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H055	Predicted	25.2	26.7	31.2	35.6	36.7	36.8	36.8
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H056	Predicted	29.0	30.5	35.0	39.4	40.5	40.6	40.6
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H057	Predicted	23.8	25.3	29.8	34.2	35.3	35.4	35.4
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H058	Predicted	26.5	28.0	32.5	36.9	38.0	38.1	38.1
	Daytime Criterion	45	45	45	45	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	45	45	45	45	45	45	45
	Night-time Excess	--	--	--	--	--	--	--
H059	Predicted	24.0	25.5	30.0	34.4	35.5	35.6	35.6
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H060	Predicted	29.3	30.8	35.3	39.7	40.8	40.9	40.9
	Daytime Criterion	40	40	45	45	45	45	45.7
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	44.7
	Night-time Excess	--	--	--	--	--	--	--
H061	Predicted	29.1	30.6	35.1	39.5	40.6	40.7	40.7
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--

House	Parameter	Predicted Noise Level, dB LA90 at wind speed m/s at standardised 10m height						
		3	4	5	6	7	8	9
H062	Predicted	28.8	30.3	34.8	39.2	40.3	40.4	40.4
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Nighttime Criterion	43	43	43	43	43	43	43
	Nighttime Excess	--	--	--	--	--	--	--
H063	Predicted	24.0	25.5	30.0	34.4	35.5	35.6	35.6
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Nighttime Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H064	Predicted	28.0	29.5	34.0	38.4	39.5	39.6	39.6
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Nighttime Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H065	Predicted	25.2	26.7	31.2	35.6	36.7	36.8	36.8
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H066	Predicted	23.7	25.2	29.7	34.1	35.2	35.3	35.3
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H067	Predicted	26.5	28.0	32.5	36.9	38.0	38.1	38.1
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H068	Predicted	27.1	28.6	33.1	37.5	38.6	38.7	38.7
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H069	Predicted	26.8	28.3	32.8	37.2	38.3	38.4	38.4
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Nighttime Excess	--	--	--	--	--	--	--
H070	Predicted	24.3	25.8	30.3	34.7	35.8	35.9	35.9
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H071	Predicted	23.2	24.7	29.2	33.6	34.7	34.8	34.8
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Nighttime Criterion	43	43	43	43	43	43	43
	Nighttime Excess	--	--	--	--	--	--	--
H072	Predicted	23.2	24.7	29.2	33.6	34.7	34.8	34.8
	Daytime Criterion	40	40	40	40	45	45	45

House	Parameter	Predicted Noise Level, dB LA90 at wind speed m/s at standardised 10m height						
		3	4	5	6	7	8	9
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	27.6	29.1	33.6	38.0	39.1	39.2	39.2
H073	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	23.4	24.9	29.4	33.8	34.9	35.0	35.0
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
H074	Night-time Excess	--	--	--	--	--	--	--
	Predicted	29.3	30.8	35.3	39.7	40.8	40.9	40.9
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
H075	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	23.5	25.0	29.5	33.9	35.0	35.1	35.1
	Daytime Criterion	40	40	40	40	45	45	45
H076	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	22.8	24.3	28.8	33.2	34.3	34.4	34.4
H077	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	22.8	24.3	28.8	33.2	34.3	34.4	34.4
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
H078	Night-time Excess	--	--	--	--	--	--	--
	Predicted	27.1	28.6	33.1	37.5	38.6	38.7	38.7
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
H079	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	28.5	30.0	34.5	38.9	40.0	40.1	40.1
	Daytime Criterion	40	40	40	40	45	45	45
H080	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	22.7	24.2	28.7	33.1	34.2	34.3	34.3
H081	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	23.0	24.5	29.0	33.4	34.5	34.6	34.6
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
H082	Night-time Excess	--	--	--	--	--	--	--

House	Parameter	Predicted Noise Level, dB LA90 at wind speed m/s at standardised 10m height						
		3	4	5	6	7	8	9
	Night-time Excess	--	--	--	--	--	--	--
H083	Predicted	28.7	30.2	34.7	39.1	40.2	40.3	40.3
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H084	Predicted	23.2	24.7	29.2	33.6	34.7	34.8	34.8
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H085	Predicted	25.8	27.3	31.8	36.2	37.3	37.4	37.4
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H086	Predicted	27.7	29.2	33.7	38.1	39.2	39.3	39.3
	Daytime Criterion	45	45	45	45	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	45	45	45	45	45	45	45
	Night-time Excess	--	--	--	--	--	--	--
H087	Predicted	23.6	25.1	29.6	34.0	35.1	35.2	35.2
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H088	Predicted	23.5	25.0	29.5	33.9	35.0	35.1	35.1
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H089	Predicted	29.1	30.6	35.1	39.5	40.6	40.7	40.7
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H090	Predicted	22.5	24.0	28.5	32.9	34.0	34.1	34.1
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H091	Predicted	22.5	24.0	28.5	32.9	34.0	34.1	34.1
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H092	Predicted	22.5	24.0	28.5	32.9	34.0	34.1	34.1
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H093	Predicted	26.8	28.3	32.8	37.2	38.3	38.4	38.4

House	Parameter	Predicted Noise Level, dB LA90 at wind speed m/s at standardised 10m height						
		3	4	5	6	7	8	9
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	23.4	24.9	29.4	33.8	34.9	35.0	35.0
H094	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	22.4	23.9	28.4	32.8	33.9	34.0	34.0
H095	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	22.4	23.9	28.4	32.8	33.9	34.0	34.0
H096	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	22.4	23.9	28.4	32.8	33.9	34.0	34.0
H097	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	22.4	23.9	28.4	32.8	33.9	34.0	34.0
H098	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	23.0	24.5	29.0	33.4	34.5	34.6	34.6
H099	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	22.4	23.9	28.4	32.8	33.9	34.0	34.0
H100	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	22.3	23.8	28.3	32.7	33.8	33.9	33.9
H101	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	23.2	24.7	29.2	33.6	34.7	34.8	34.8
H102	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	22.3	23.8	28.3	32.7	33.8	33.9	33.9
H103	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--

House	Parameter	Predicted Noise Level, dB LA90 at wind speed m/s at standardised 1.0m height						
		3	4	5	6	7	8	9
	Nighttime Criterion	43	43	43	43	43	43	43
	Nighttime Excess	--	--	--	--	--	--	--
	Predicted	26.4	27.9	32.4	36.8	37.9	38.0	38.0
H104	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	22.8	24.3	28.8	33.2	34.3	34.4	34.4
H105	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	29.0	30.5	35.0	39.4	40.5	40.6	40.6
H106	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	26.5	28.0	32.5	36.9	38.0	38.1	38.1
H107	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	27.1	28.6	33.1	37.5	38.6	38.7	38.7
H108	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	27.0	28.5	33.0	37.4	38.5	38.6	38.6
H109	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	25.8	27.3	31.8	36.2	37.3	37.4	37.4
H110	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	22.8	24.3	28.8	33.2	34.3	34.4	34.4
H111	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	23.8	25.3	29.8	34.2	35.3	35.4	35.4
H112	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	22.5	24.0	28.5	32.9	34.0	34.1	34.1
H113	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	22.5	24.0	28.5	32.9	34.0	34.1	34.1

House	Parameter	Predicted Noise Level, dB LA90 at wind speed m/s at standardised 10m height						
		3	4	5	6	7	8	9
H114	Predicted	21.7	23.2	27.7	32.1	33.2	33.3	33.3
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H115	Predicted	22.3	23.8	28.3	32.7	33.8	33.9	33.9
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H116	Predicted	25.8	27.3	31.8	36.2	37.3	37.4	37.4
	Daytime Criterion	45	45	45	45	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	45	45	45	45	45	45	45
	Night-time Excess	--	--	--	--	--	--	--
H117	Predicted	26.3	27.8	32.3	36.7	37.8	37.9	37.9
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H118	Predicted	21.6	23.1	27.6	32.0	33.1	33.2	33.2
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H119	Predicted	25.6	27.1	31.6	36.0	37.1	37.2	37.2
	Daytime Criterion	45	45	45	45	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	45	45	45	45	45	45	45
	Night-time Excess	--	--	--	--	--	--	--
H120	Predicted	23.5	25.0	29.5	33.9	35.0	35.1	35.1
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H121	Predicted	25.3	26.8	31.3	35.7	36.8	36.9	36.9
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H122	Predicted	22.1	23.6	28.1	32.5	33.6	33.7	33.7
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H123	Predicted	21.4	22.9	27.4	31.8	32.9	33.0	33.0
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H124	Predicted	27.6	29.1	33.6	38.0	39.1	39.2	39.2
	Daytime Criterion	40	40	40	40	45	45	45

House	Parameter	Predicted Noise Level d _{BLA90} at wind speed m/s at standardised 10m height						
		3	4	5	6	7	8	9
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	22.0	23.5	28.0	32.4	33.5	33.6	33.6
H125	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	28.1	29.6	34.1	38.5	39.6	39.7	39.7
H126	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	27.4	28.9	33.4	37.8	38.9	39.0	39.0
H127	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	21.2	22.7	27.2	31.6	32.7	32.8	32.8
H128	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	21.9	23.4	27.9	32.3	33.4	33.5	33.5
H129	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	25.1	26.6	31.1	35.5	36.6	36.7	36.7
H130	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	25.6	27.1	31.6	36.0	37.1	37.2	37.2
H131	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	24.3	25.8	30.3	34.7	35.8	35.9	35.9
H132	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	21.7	23.2	27.7	32.1	33.2	33.3	33.3
H133	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	21.8	23.3	27.8	32.2	33.3	33.4	33.4
H134	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--

House	Parameter	Predicted Noise Level, dB L _{A90} at wind speed m/s at standardised 10m height						
		3	4	5	6	7	8	9
H135	Night-time Excess	--	--	--	--	--	--	--
	Predicted	27.4	28.9	33.4	37.8	38.9	39.0	39.0
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H136	Predicted	26.0	27.5	32.0	36.4	37.5	37.6	37.6
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	25.4	26.9	31.4	35.8	36.9	37.0	37.0
H137	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	25.8	27.3	31.8	36.2	37.3	37.4	37.4
	Daytime Criterion	40	40	40	40	45	45	45
H138	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	20.8	22.3	26.8	31.2	32.3	32.4	32.4
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
H139	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	26.5	28.0	32.5	36.9	38.0	38.1	38.1
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
H140	Night-time Excess	--	--	--	--	--	--	--
	Predicted	21.4	22.9	27.4	31.8	32.9	33.0	33.0
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H141	Predicted	22.7	24.2	28.7	33.1	34.2	34.3	34.3
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	24.1	25.6	30.1	34.5	35.6	35.7	35.7
H142	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	24.0	25.5	30.0	34.4	35.5	35.6	35.6
	Daytime Criterion	40	40	40	40	45	45	45
H143	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	24.0	25.5	30.0	34.4	35.5	35.6	35.6
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
H144	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	22.6	24.1	28.6	33.0	34.1	34.2	34.2
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
H145	Night-time Excess	--	--	--	--	--	--	--
	Predicted	22.6	24.1	28.6	33.0	34.1	34.2	34.2

House	Parameter	Predicted Noise Level ,dB LA90 at wind speed m/s at standardised 10m height						
		3	4	5	6	7	8	9
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Nighttime Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	22.8	24.3	28.8	33.2	34.3	34.4	34.4
H146	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Nighttime Criterion	43	43	43	43	43	43	43
	Nighttime Excess	--	--	--	--	--	--	--
	Predicted	23.5	25.0	29.5	33.9	35.0	35.1	35.1
H147	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Nighttime Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	20.5	22.0	26.5	30.9	32.0	32.1	32.1
H148	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night time Excess	--	--	--	--	--	--	--
	Predicted	22.5	24.0	28.5	32.9	34.1	34.1	34.1
H149	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Nighttime Criterion	43	43	43	43	43	43	43
	Nighttime Excess	--	--	--	--	--	--	--
	Predicted	22.5	24.0	28.5	32.9	34.0	34.1	34.1
H150	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	22.6	24.1	28.6	33.0	34.1	34.2	34.2
H151	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night time Excess	--	--	--	--	--	--	--
	Predicted	24.6	26.1	30.6	35.0	36.1	36.2	36.2
H152	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	24.7	26.2	30.7	35.1	36.2	36.3	36.3
H153	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	25.1	26.6	31.1	35.5	36.6	36.7	36.7
H154	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	22.4	23.9	28.4	32.8	33.9	34.0	34.0
H155	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--

House	Parameter	Predicted Noise Level, dB LA90 at wind speed m/s at standardised 10m height						
		3	4	5	6	7	8	9
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H156	Predicted	25.6	27.1	31.6	36.0	37.1	37.2	37.2
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H157	Predicted	23.2	24.7	29.2	33.6	34.7	34.8	34.8
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H158	Predicted	20.1	21.6	26.1	30.5	31.6	31.7	31.7
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H159	Predicted	23.1	24.6	29.1	33.5	34.6	34.7	34.7
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H160	Predicted	23.6	25.1	29.6	34.0	35.1	35.2	35.2
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H161	Predicted	25.7	27.2	31.7	36.1	37.2	37.3	37.3
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H162	Predicted	20.4	21.9	26.4	30.8	31.9	32.0	32.0
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H163	Predicted	23.1	24.6	29.1	33.5	34.6	34.7	34.7
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H164	Predicted	20.3	21.8	26.3	30.7	31.8	31.9	31.9
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H165	Predicted	24.6	26.1	30.6	35.0	36.1	36.2	36.2
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--

House	Parameter	Predicted Noise Level, dB LA90 at wind speed m/s at standardised 10m height						
		3	4	5	6	7	8	9
H166	Predicted	23.6	25.1	29.6	34.0	35.1	35.2	35.2
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H167	Predicted	22.3	23.8	28.3	32.7	33.8	33.9	33.9
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H168	Predicted	20.3	21.8	26.3	30.7	31.8	31.9	31.9
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H169	Predicted	20.2	21.7	26.2	30.6	31.7	31.8	31.8
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H170	Predicted	22.6	24.1	28.6	33.0	34.1	34.2	34.2
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H171	Predicted	22.1	23.6	28.1	32.5	33.6	33.7	33.7
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H172	Predicted	22.7	24.2	28.7	33.1	34.2	34.3	34.3
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H173	Predicted	22.4	23.9	28.4	32.8	33.9	34.0	34.0
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H174	Predicted	22.4	23.9	28.4	32.8	33.9	34.0	34.0
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H175	Predicted	19.4	20.9	25.4	29.8	30.9	31.0	31.0
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H176	Predicted	22.3	23.8	28.3	32.7	33.8	33.9	33.9
	Daytime Criterion	40	40	40	40	45	45	45

House	Parameter	Predicted Noise Level, dB L _{A90} at wind speed m/s at standardised 10m height						
		3	4	5	6	7	8	9
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	22.3	23.8	28.3	32.7	33.8	33.9	33.9
H177	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	24.4	25.9	30.4	34.8	35.9	36.0	36.0
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
H178	Night-time Excess	--	--	--	--	--	--	--
	Predicted	19.8	21.3	25.8	30.2	31.3	31.4	31.4
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
H179	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	22.5	24.0	28.5	32.9	34.0	34.1	34.1
	Daytime Criterion	40	40	40	40	45	45	45
H180	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	19.3	20.8	25.3	29.7	30.8	30.9	30.9
H181	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	19.8	21.3	25.8	30.2	31.3	31.4	31.4
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
H182	Night-time Excess	--	--	--	--	--	--	--
	Predicted	21.9	23.4	27.9	32.3	33.4	33.5	33.5
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
H183	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	22.5	24.0	28.5	32.9	34.0	34.1	34.1
	Daytime Criterion	40	40	40	40	45	45	45
H184	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	22.6	24.1	28.6	33.0	34.1	34.2	34.2
H185	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H186	Predicted	22.3	23.8	28.3	32.7	33.8	33.9	33.9
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43

House	Parameter	Predicted Noise Level dB LA90 at wind speed m / s at standardised 10m height						
		3	4	5	6	7	8	9
	Night-time Excess	--	--	--	--	--	--	--
H187	Predicted	19.7	21.2	25.7	30.1	31.2	31.3	31.3
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H188	Predicted	21.9	23.4	27.9	32.3	33.4	33.5	33.5
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H189	Predicted	21.0	22.5	27.0	31.4	32.5	32.6	32.6
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H190	Predicted	19.0	20.5	25.0	29.4	30.5	30.6	30.6
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H191	Predicted	21.7	23.2	27.7	32.1	33.2	33.3	33.3
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H192	Predicted	21.3	22.8	27.3	31.7	32.8	32.9	32.9
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H193	Predicted	18.9	20.4	24.9	29.3	30.4	30.5	30.5
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H194	Predicted	21.4	22.9	27.4	31.8	32.9	33.0	33.0
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H195	Predicted	22.2	23.7	28.2	32.6	33.7	33.8	33.8
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H196	Predicted	23.7	25.2	29.7	34.1	35.2	35.3	35.3
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H197	Predicted	22.2	23.7	28.2	32.6	33.7	33.8	33.8

House	Parameter	Predicted Noise Level, dB LA90 at wind speed m/s at standardised 10m height						
		3	4	5	6	7	8	9
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	21.9	23.4	27.9	32.3	33.4	33.5	33.5
H198	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	18.8	20.3	24.8	29.2	30.3	30.4	30.4
H199	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	19.4	20.9	25.4	29.8	30.9	31.0	31.0
H200	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	21.8	23.3	27.8	32.2	33.3	33.4	33.4
H201	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	21.4	22.9	27.4	31.8	32.9	33.0	33.0
H202	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	21.9	23.4	27.9	32.3	33.4	33.5	33.5
H203	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	18.7	20.2	24.7	29.1	30.2	30.3	30.3
H204	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	19.3	20.8	25.3	29.7	30.8	30.9	30.9
H205	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	23.4	24.9	29.4	33.8	34.9	35.0	35.0
H206	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	21.2	22.7	27.2	31.6	32.7	32.8	32.8
H207	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--

House	Parameter	Predicted Noise Level, dB LA90 at wind speed m/s at standardised 10m height						
		3	4	5	6	7	8	9
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H208	Predicted	23.3	24.8	29.3	33.7	34.8	34.9	34.9
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H209	Predicted	22.9	24.4	28.9	33.3	34.4	34.5	34.5
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H210	Predicted	21.8	23.3	27.8	32.2	33.3	33.4	33.4
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H211	Predicted	21.8	23.3	27.8	32.2	33.3	33.4	33.4
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H212	Predicted	21.0	22.5	27.0	31.4	32.5	32.6	32.6
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H213	Predicted	23.3	24.8	29.3	33.7	34.8	34.9	34.9
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H214	Predicted	18.5	20.0	24.5	28.9	30.0	30.1	30.1
	Daytime Criterion	45	45	45	45	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	45	45	45	45	45	45	45
	Night-time Excess	--	--	--	--	--	--	--
H215	Predicted	21.0	22.5	27.0	31.4	32.5	32.6	32.6
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H216	Predicted	21.1	22.6	27.1	31.5	32.6	32.7	32.7
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H217	Predicted	18.7	20.2	24.7	29.1	30.2	30.3	30.3
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--

House	Parameter	Predicted Noise Level, dB LA90 at wind speed m/s at standardised 10m height						
		3	4	5	6	7	8	9
H218	Predicted	20.7	22.2	26.7	31.1	32.2	32.3	32.3
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H219	Predicted	18.3	19.8	24.3	28.7	29.8	29.9	29.9
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H220	Predicted	22.2	23.7	28.2	32.6	33.7	33.8	33.8
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H221	Predicted	21.3	22.8	27.3	31.7	32.8	32.9	32.9
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H222	Predicted	21.4	22.9	27.4	31.8	32.9	33.0	33.0
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H223	Predicted	21.1	22.6	27.1	31.5	32.6	32.7	32.7
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H224	Predicted	21.2	22.7	27.2	31.6	32.7	32.8	32.8
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H225	Predicted	19.0	20.5	25.0	29.4	30.5	30.6	30.6
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H226	Predicted	20.3	21.8	26.3	30.7	31.8	31.9	31.9
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H227	Predicted	20.5	22.0	26.5	30.9	32.0	32.1	32.1
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H228	Predicted	20.5	22.0	26.5	30.9	32.0	32.1	32.1
	Daytime Criterion	40	40	40	40	45	45	45

Ho use	Parameter	P redictedNoise Level, dB LA90 at wind speed m/s at standardised 10m h eight						
		3	4	5	6	7	8	9
	D aytme Excess	--	--	--	--	--	--	--
	Nighttime Criterion	43	43	43	43	43	43	43
	Night-timeExcess	--	--	--	--	--	--	--
H229	Predicted	20.4	21.9	26.4	30.8	31.9	32.0	32.0
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Ni ght-time Criterion	43	43	43	43	43	43	43
	Ni ght-time Excess	--	--	--	--	--	--	--
H230	Predicted	22.7	24.2	28.7	33.1	34.2	34.3	34.3
	Da ytime Criterion	40	40	40	40	45	45	45
	DaytimeExce ss	--	--	--	--	--	--	--
	Ni ght-time Criterion	43	43	43	43	43	43	43
	N'ight-time Excess	--	--	--	--	--	--	--
H231	Pr edicted	20.9	22.4	26.9	31.3	32.4	32.5	32.5
	D aytme Criterion	40	40	40	40	45	45	45
	D aytme Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H232	Predicted	18.4	19.9	24.4	28.8	29.9	30.0	30.0
	DaytimeCriterion	40	40	40	40	45	45	45
	Da ytime Excess	--	--	--	--	--	--	--
	Ni ght-time Criterion	43	43	43	43	43	43	43
	Ni ght-time Excess	--	--	--	--	--	--	--
H233	Predicted	20.7	22.2	26.7	31.1	32.2	32.3	32.3
	DaytimeCr iterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-timeExcess	--	--	--	--	--	--	--
H234	Predicted	20.1	21.6	26.1	30.5	31.6	31.7	31.7
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Ni ght-timeCriterion	43	43	43	43	43	43	43
	Ni ght-time E xcess	--	--	--	--	--	--	--
H235	Predicted	20.8	22.3	26.8	31.2	32.3	32.4	32.4
	DaytimeCriterion	45	45	45	45	45	45	45
	DaytimeExcess	--	--	--	--	--	--	--
	Ni ght-time Crit erion	45	45	45	45	45	45	45
	N'ight-time Excess	--	--	--	--	--	--	--
H236	Predicted	19.9	21.4	25.9	30.3	31.4	31.5	31.5
	D aytme Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H237	Predicted	20.2	21.7	26.2	30.6	31.7	31.8	31.8
	Da ytimeCriterion	40	40	40	40	45	45	45
	Da ytimeExcess	--	--	--	--	--	--	--
	Ni ghttime Criterion	43	43	43	43	43	43	43
	N ight-time Excess	--	--	--	--	--	--	--
H238	Predicted	20.1	21.6	26.1	30.5	31.6	31.7	31.7
	D aytme Criterion	40	40	40	40	45	45	45
	D aytme Excess	--	--	--	--	--	--	--
	Nighttime C riterion	43	43	43	43	43	43	43

House	Parameter	Predicted Noise Level, dB LA90 at wind speed m/s at standardised 10m height						
		3	4	5	6	7	8	9
	Night-time Excess	--	--	--	--	--	--	--
H239	Predicted	20.8	22.3	26.8	31.2	32.3	32.4	32.4
	Daytime Criterion	45	45	45	45	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	45	45	45	45	45	45	45
	Night-time Excess	--	--	--	--	--	--	--
H240	Predicted	20.0	21.5	26.0	30.4	31.5	31.6	31.6
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H241	Predicted	20.7	22.2	26.7	31.1	32.2	32.3	32.3
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H242	Predicted	20.3	21.8	26.3	30.7	31.8	31.9	31.9
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H243	Predicted	19.7	21.2	25.7	30.1	31.2	31.3	31.3
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H244	Predicted	19.8	21.3	25.8	30.2	31.3	31.4	31.4
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H245	Predicted	21.7	23.2	27.7	32.1	33.2	33.3	33.3
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H246	Predicted	19.9	21.4	25.9	30.3	31.4	31.5	31.5
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H247	Predicted	19.6	21.1	25.6	30.0	31.1	31.2	31.2
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H248	Predicted	21.6	23.1	27.6	32.0	33.1	33.2	33.2
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H249	Predicted	19.5	21.0	25.5	29.9	31.0	31.1	31.1

House	Parameter	Predicted Noise Level, dB LA90 at wind speed m/s at standardised 10m height						
		3	4	5	6	7	8	9
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	19.4	20.9	25.4	29.8	30.9	31.0	31.0
H250	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	19.4	20.9	25.4	29.8	30.9	31.0	31.0
H251	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	19.4	20.9	25.4	29.8	30.9	31.0	31.0
H252	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	21.2	22.7	27.2	31.6	32.7	32.8	32.8
H253	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	21.1	22.6	27.1	31.5	32.6	32.7	32.7
H254	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	20.2	21.7	26.2	30.6	31.7	31.8	31.8
H255	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	20.3	21.8	26.3	30.7	31.8	31.9	31.9
H256	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	17.6	19.1	23.6	28.0	29.1	29.2	29.2
H257	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	21.4	22.9	27.4	31.8	32.9	33.0	33.0
H258	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	21.6	23.1	27.6	32.0	33.1	33.2	33.2
H259	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Predicted	18.3	19.8	24.3	28.7	29.8	29.9	29.9

House	Parameter	Predicted Noise Level, dB LA90 at wind speed m/s at standardised 10m height						
		3	4	5	6	7	8	9
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H260	Predicted	21.1	22.6	27.1	31.5	32.6	32.7	32.7
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	21.5	23.0	27.5	31.9	33.0	33.1	33.1
H261	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	18.1	19.6	24.1	28.5	29.6	29.7	29.7
	Daytime Criterion	40	40	40	40	45	45	45
H262	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	21.4	22.9	27.4	31.8	32.9	33.0	33.0
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
H263	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	23.9	25.4	29.9	34.3	35.4	35.5	35.5
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
H264	Night-time Excess	--	--	--	--	--	--	--
	Predicted	22.2	23.7	28.2	32.6	33.7	33.8	33.8
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H265	Predicted	21.6	23.1	27.6	32.0	33.1	33.2	33.2
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	21.8	23.3	27.8	32.2	33.3	33.4	33.4
H266	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	19.5	21.0	25.5	29.9	31.0	31.1	31.1
	Daytime Criterion	40	40	40	40	45	45	45
H267	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	22.0	23.5	28.0	32.4	33.5	33.6	33.6
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
H268	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	22.0	23.5	28.0	32.4	33.5	33.6	33.6
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
H269	Night-time Excess	--	--	--	--	--	--	--

House	Parameter	Predicted NoiseLevel, dB LA90 at wind speed m/s at standardised 10m height						
		3	4	5	6	7	8	9
H270	Predicted	23.9	25.4	29.9	34.3	35.4	35.5	35.5
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Nighttime Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H271	Predicted	19.6	21.1	25.6	30.0	31.1	31.2	31.2
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Nighttime Excess	--	--	--	--	--	--	--
H272	Predicted	25.7	27.2	31.7	36.1	37.2	37.3	37.3
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H273	Predicted	22.9	24.4	28.9	33.3	34.4	34.5	34.5
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H274	Predicted	21.4	22.9	27.4	31.8	32.9	33.0	33.0
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H275	Predicted	21.7	23.2	27.7	32.1	33.2	33.3	33.3
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H276	Predicted	20.3	21.8	26.3	30.7	31.8	31.9	31.9
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Nighttime Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--



APPENDIX 8

**RESPONSE BY HYDRO-
ENVIRONMENTAL SERVICES**

Date: 09th October 2025
Our Ref: P1657-1-0020

An Coimisiún Pleanála
64 Marlborough Street,
Dublin 1,
D01 V902.

To whom it may concern,

Re: An Coimisiún Pleanála Appeal Submission

Geological, Hydrological and Hydrogeological Responses to ACP FIR Items relating to the proposed Briskalagh Renewable Energy Development, Co. Kilkenny

**KCC Planning Ref: P25/60003
ACP Ref: ABP-322154-25**

Hydro-Environmental Services (HES) were requested by MKO Ireland (MKO) to respond to the geological, hydrological and hydrogeological Further Information Request (FIR) Items raised in An Coimisiún Pleanála's (ACP) letter of 15th July 2025.

This FIR response letter responds to Items 1 to 5 of the "Hydrology and Hydrogeology" (HH) Section of the ACP letter.

1 STATEMENT OF EXPERIENCE – WIND FARM DRAINAGE

Hydro-Environmental Services (HES) has extensive wind farm drainage and hydrogeological experience relevant to this project. Wind farm environmental impact assessment reports in respect of geology, hydrology, and hydrogeology has and is a core business area for HES presently and also over the past 22 years. Wind farm drainage design/management requires experience both as a civil/drainage engineer, a hydrologist, and as a hydrogeological specialist. HES has these combined experiences and expertise. HES has worked on over 100 wind farm projects in Ireland and Northern Ireland. Many of these required assessments of existing drainage features and streams and water quality data. HES work at all stages of wind farm developments including feasibility stage, layout design & preliminary drainage design/planning stage, FRAs, and also at construction management stage.

HES's experience also covers the key area of water quality and drainage controls and mitigation during the construction phase of wind farm developments. HES work at EIAR/planning stage to assist with the development of the optimal site layout which involves the development of hydrological constraints maps and interaction with geotechnical and ecological specialists and with site designers. HES also provide a follow-on consultancy service (if planning is granted and the development proceeds to construction) of detailed drainage design and construction management for drainage during wind farm development/construction stage. This practical on-site experience is invaluable as it has led to the development of improved preliminary and detailed drainage layouts and also many improvements/optimisations to standard peatland drainage mitigation measures.

HES specialises in wetland and peatland eco-hydrology. We also complete flood risk assessments for all types of developments across the country.

All these experiences are particularly relevant to this project, and they have been applied through the project development phase, the constraints mapping phase, and EIAR preparation work, including the cumulative impact assessment. This response submission has

been prepared by Michael Gill and Conor McGettigan. Michael and Conor prepared the Land Soil and Geology and Water Chapters of the EIAR, and their qualifications, competencies, and experience are already presented in the EIAR (Section 9.1.2).

2 FURTHER INFORMATION RESPONSES

2.1 ITEM HH1

Item HH1 reads as follows:

"You shall provide a robust rationale for the adequacy of the trial pits provided across the site, noting their depth relative to the depth of the foundations for the proposed turbine bases."

HES Response:

Details regarding the site investigation works undertaken as part of the assessment are presented in Section 8.3.3.1 of the EIAR, with additional information provided in Figure 8-2 and Appendix 8-1. The available site investigation data presented in the EIAR comprises:

- 22 no. Trial Pits, 8 no. at proposed borrow pits areas, and 16 no. across the Proposed Wind Farm site;
- Ground conditions at 6 of 7 no. proposed turbine locations were investigated by direct site investigations comprising of trial pit excavations;
- 8 no. Particle Size Distribution (PSD) analyses were completed on the recovered subsoil samples arising from the trial pit excavations; and,
- 2 no. monitoring wells were drilled in the valley of the Kilmanagh/Tullaroan River.

A summary of strata encountered at proposed turbine locations is provided in **Table A**.

Table A: Trial Pit data at Turbine Locations

Turbine ID	Trial Pit ID	Total depth of TP (m)	Type of foundation proposed/assessed in EIAR	Depth to rock (mbgl)
T1	TP1	2.4	Gravity/piled	1.6
T2	TP2	2.7	Gravity/piled	Unknown
T3	TP3	2.7	Gravity/piled	Unknown
T4	TP4	3.2	Gravity/piled	Unknown
T5	TP5	3.1	Gravity/piled	Unknown
T6	TP6	2.9	Gravity/piled	Unknown
T7*	None	n/a	Gravity/piled	Unknown

**note that no trial pit excavations were completed in the immediate vicinity of T7 due to dense forestry prohibiting access. As part of this FIR response a borehole has been completed within 90m of T07 (refer to Section 2.3 below).*

The depth of gravity based turbine foundations is typically 4 to 4.5mbgl (metres below ground level) and is dependent on the local geological conditions. As noted in **Table A** above, the depth of the trial pits completed at the proposed turbine locations ranged from 2.4 to 3.2m. However, the extent of the site investigations is considered to be appropriate due to the geological setting of the Proposed Wind Farm and the predictability of the geological profile encountered across the site (shallow overburden deposits on the sides of the valley). Furthermore, the assessment presented in the EIAR considers a precautionary approach by assessing both gravity and piled foundations at all proposed turbine locations.

For clarity, it is considered that the site investigations completed at the Proposed Wind Farm site, including the trial pits, and the depth of those trial pit excavations, are appropriate for EIAR phase of the project for the following reasons:

- The use of point location geotechnical investigations (i.e. boreholes and trial pits) are a reliable and trusted method of site investigations in order to characterise the baseline geological environment;
- These geotechnical investigations provide precise geological information at a given location and the wider geology can be understood if there is a suitable quantity of point investigations completed at a given site;
- The quantum of site data gathered to characterise the baseline soils and geological environment, comprising of 24 no. point investigations (22 no. trial pits and 2 no. monitoring wells/boreholes) combined with site walkover surveys, logging of exposed soils/subsoils at the site and laboratory analysis of recovered soil samples, is considered to be suitable for the scale of the proposed development (7 no. turbine wind farm) and the geological/hydrogeological setting of the site;
- 7 of the 22 no. trial pits completed across the Proposed Wind Farm site encountered weather siltstone bedrock at depths ranging from 0.4 to 3.3mbgl on the sides of the valley. The boreholes drilled on the valley floor encountered thicker glaciofluvial deposits (up to 18.7m thick) in the vicinity of the Tullaroan Stream (Tullaroan/Kilmanagh River);
- The geology of the Proposed Wind Farm site is therefore predictable with shallow overburden on the sides of the valley and deeper deposits on the floor of the valley;
- The soils, subsoils and bedrock encountered during the site investigations largely corresponded with the GSI mapped geology (www.gsi.ie);
- No karst bedrock is mapped at the site and no karst features were recorded during walkover surveys or during the site investigations at the Proposed Wind Farm site which would warrant more extensive geophysical surveys and site investigations;
- Regardless of the depth of the trial pits, the impact assessment presented in Chapter 8: Land, Soils and Geology and Chapter 9: Water of the EIAR takes a precautionary approach whereby both gravity and piled foundations are assessed at all proposed turbine locations;
- As detailed in Section 8.6.2.8 of the EIAR, the residual effect from piled foundations on the land, soils and geological environment will be a negative, imperceptible, direct, permanent, unlikely effect due to the very small footprint of the piles and the small volumes of material which will be displaced; and,
- In terms of potential effects on the receiving water environment, the assessment presented in Section 9.5.2.14 of the EIAR concluded that due to the prevailing hydrogeological regime and with the implementation of the prescribed tried and tested, best practice mitigation measures that the residual effects of piled foundations will be a negative, imperceptible, short-term, unlikely effect on the receiving water environment.

For these reasons, it is considered that the site investigations completed at the Proposed Wind Farm site are appropriate, and are more than sufficient to characterise the baseline geological environment.

2.2 ITEM HH2

Item HH2 reads as follows:

"Concerns are raised regarding the extent of site investigations undertaken for the proposed borrow pit given its proximity to the aquifer and nearby watercourse on site. Noting its location relative to this regionally important gravel aquifer, you are

required to establish the impacts of such an excavation on the potential to impact surface water and groundwater flows in the area. Further detailed site investigations shall be provided to fully establish a conceptual site model for flow regimes in this area of the site."

HES Response:

All proposed borrow pits (and all proposed developments) occur within mapped aquifers. This is not a unique characteristic for the Briskalagh WF proposal. Indeed, the entire island of Ireland is mapped by the GSI to be underlain by aquifers with the aquifer classification ranging from Poor Aquifers to Regionally Important Aquifers. In the case of the borrow pit proposed for the Proposed Wind Farm, the proposed borrow pit is mapped to be underlain by a Poor Aquifer – Bedrock which is generally unproductive except for Local Zones. This indicates that the bedrock underlying the proposed borrow pit location is of low permeability and low transmissivity, with limited potential to store and transmit groundwater. This means that surface water will be the main sensitive receptor in the area of the proposed borrow pit. A Regionally Important Sand and Gravel Aquifer, associated with the Kilmanagh Gravels, is mapped 993m to the southwest of the proposed borrow pit.

The proposed borrow pit is located at the top of a hill, with a shallow depth of subsoil cover. 4 no. trial pits have been completed at the proposed borrow pit location, and all encountered this overburden, i.e. shallow depths to bedrock. The depth to weathered rock ranged from 0.4m at BP1-TP2 to 1m at BP1-TP1.

The proposed borrow pit is 196m northeast of the nearest mapped stream, significantly outside the 50m buffer zone of that stream. The next closest stream to the proposed borrow pit is 437m to the north-northwest.

A monitoring well has been drilled at the proposed borrow pit location on 7th August 2025. The geological log of that well (25MW2) is provided in **Appendix A**. No significant water strikes were encountered during the drilling of this monitoring well. The water level in 25MW2 was recorded at 5.5mbRef on 18th August 2025, and 4.10mbRef on 02nd October 2025. A permeability test¹ was completed in this well on 02nd October 2025, and the resulting permeability was determined to be 3.97×10^{-7} m/s.

The assessments requested in relation to the potential of the proposed borrow pit to effect surface water and groundwater, and therefore impact the Regionally Important Sand and Gravel Aquifer, are already provided in the EIAR in Section 9.5.2.2 (suspended solids), Section 9.5.2.4 (excavation dewatering), Section 9.5.2.5 (groundwater levels during excavation) and Section 9.5.2.6 (hydrocarbons).

In the interest of clarity, we summarise the above as follows:

- The proposed borrow pit location is distant from the sand and gravel aquifer (993m) and distant from nearby streams (196m);
- The hydrogeological regime at the proposed borrow pit location is currently characterized by high rates of surface water runoff and low rates of groundwater recharge. This is a function of the sloping nature of the land and the low permeability of the soils/subsoils and the underlying bedrock aquifer;
- The proposed borrow pit will not significantly alter the existing hydrogeological regime. Groundwater ingress into the pit will be minor and rainfall will be the primary source of water requiring treatment;
- Due to the relatively low permeability of the bedrock (measured at 3.97×10^{-7} m/s), the location of the borrow pit on the side of a hill and the lack of any significant groundwater strikes during the drilling investigations, there will be no change to groundwater flows or flow volumes in the local area. The main water inflows to the

¹ Falling head test in accordance with BS 5930 and Horslev, 1951.

borrow pit will be from rainfall and shallow groundwater flows across the top of the bedrock profile;

- Using the recorded permeability (3.97×10^{-7} m/s), and applying Sichardt's empirical formula², we estimate the radius of influence of the borrow pit dewatering at ~19m (<196m). Applying an order of magnitude increase in permeability (i.e. completing a sensitivity analysis) to simulate a worst-case scenario increases the estimated zone of influence to ~60m. Even this very conservative zone of influence is well short of the distance to the nearest stream (196m). Therefore, drawdown impacts on the stream will not occur;
- There will be no direct discharge from the proposed borrow pit to surface waters. Given the nature of borrow pits, being enclosed depressions in the landscape, it is easy to manage runoff from these areas. The topographic setting (on the side of a hill) and hydrogeological setting (shallow overburden overlying a poor bedrock aquifer) of the proposed borrow pit means that groundwater inflows will be minimal and rainfall will be the main source of water requiring attenuation and treatment. All rainfall falling within the borrow pit will be directed to settlement ponds (designed to allow for 24-hour retention – the highest level of protection as recommended by the EPA (EPA, 2006)³. Discharge from the borrow pit will be intermittent and will depend on the preceding rainfall. There will be no potential for the borrow pit to significantly alter downstream flow volumes;
- With regards to water quality within the regionally important sand and gravel aquifer, the successful implementation of the mitigation measures prescribed in the EIAR will ensure the protection of local groundwater quality and downstream surface water quality/quantity; and,
- By protecting water flow volumes and water quality in the immediate vicinity of the proposed borrow pit, all downstream/downgradient water quality and flow volumes will also be protected and therefore, the excavation of the proposed borrow pit will have no potential for quantitative or qualitative effects on the downgradient regionally important sand and gravel aquifer.

In summary, it is considered that due to the topographic setting of the proposed borrow pit, the local hydrogeological regime, the separation distance between the proposed borrow pit and both nearby streams and the regionally important sand and gravel aquifer, combined with the implementation of the tried and tested best practice mitigation measures for the protection of local water quality and quantity, there will be no potential for significant effects on local watercourses or the sand and gravel aquifer.

2.3 ITEM HH3

Item HH3 reads as follows:

"Concerns are raised regarding the complete absence of site investigations at the location of T7. Notwithstanding the rationale provided by the Applicant within the Chapter 9 of the EIAR, the absence of data prohibits an adequate assessment of the potential impacts of the development on both groundwater quality and flow dynamics and surface water flows and quality at this location. Therefore, you are required to undertake further site investigations proximate to the location of T7 to address this issue."

HES Response:

Additional site investigations have been completed within 90m of T07. A monitoring well has been drilled at location 25MW01 in August 2025. The geological log of that well (25MW1) is

² The estimated extent of hydraulic influence of dewatering can be estimated using different analytical techniques. A commonly applied method is the 'Sichardt equation' (Preene and Powrie, 2016: PUB C750 Groundwater control - design and practice).

³ Environmental Protection Agency (2006): Environmental Management in the Extractive Industry (Non-Scheduled Minerals).

provided in **Appendix A**. During the drilling a slow water strike was encountered in the clay deposits at a depth of 5.5mbgl with a more significant strike at 11.5mbgl in the underlying sand and gravel deposits. A water level of 2.42mbRef was recorded in 25MW1 on 18th August 2025,

and 2.24mbRef on 02nd October 2025. A permeability test⁴ was completed in this well on 02nd October 2025, and the resulting permeability was determined to be 1.79×10^{-4} m/s. This is a relatively high permeability value, and is to be expected in the observed weathered bedrock layer that is in continuity with the overlying sand and gravel deposits.

The results of the additional site investigation do not alter the conclusions of the robust assessment presented in the EIAR. The EIAR assessed both gravity and piled foundations, and this additional data indicates that a piled foundation solution will most likely be implemented at T07, subject to confirmatory site investigation and detailed design.

Section 9.5.2.14 of the EIAR also presents a robust impact assessment with respect to the use of piled foundations at T7 and concluded that with the implementation of the prescribed tried and tested best practice mitigation measures for the protection of water quality that there will be no significant effects on local groundwater quality. Furthermore, due to the small footprint of the proposed pile clusters, there is limited potential for groundwater flowpaths to be blocked, with groundwater in the sand and gravel aquifer simply flowing around the piles, and the recorded relatively high permeability value in 25MW01 (of 1.79×10^{-4} m/s) supports this assessment.

In summary, the construction of T7 with piled foundations will not have any significant effects on the receiving land, soil, geology or water environments and will have no potential to change the WFD status of impact the WFD objectives of the receiving waterbodies.

2.4 ITEM HH4

Item HH4 reads as follows:

"You are required to provide an assessment pertaining to all potential impacts on surface waters flows and/or groundwater flows as a result of dewatering associated within the excavations for the turbine foundations."

HES Response:

An assessment of the potential effects of the proposed dewatering at the turbine bases on surface and groundwater flows is presented in Sections 9.5.2.4 and 9.5.2.5 of the EIAR.

For clarity and completeness, there will be no effects on surface and groundwater flows for the following reasons:

- The proposed development does not include any permanent dewatering of excavations;
- Any proposed dewatering will be temporary, and will be shallow;
- Across much of the Proposed Wind Farm site there may be temporary reductions in groundwater levels during turbine foundation construction, but these will be of a short duration, localised, small in magnitude and transient in nature due to the topographic and hydrogeological setting of the site:
 - The majority of the proposed wind farm infrastructure is located on the sides of the valley and does not overlap with the aquifer associated with the Kilmanagh Gravels which is present along the course of the Kilmanagh/Tullaroan River;
 - With the exception of T07 (assessed below), this area of the Proposed Wind Farm site is underlain by low permeability subsoils and a Poor Bedrock Aquifer which is unproductive;

⁴ Falling head test in accordance with BS 5930 and Horslev, 1951.

- The drilling of a borehole (25MW02) at the proposed borrow pit location to a depth of 20.5mbgl did not encounter any significant groundwater strikes;
- Therefore, no significant inflows of groundwater will occur within the proposed shallow excavations;
- Groundwater flows in this area will be short and will discharge to nearby surface water features;
- The existing baseline hydrogeological regime on the sides of the valley is characterised by high rates of surface water runoff and low rates of groundwater recharge;
- The proposed development will not alter this hydrogeological regime;
- Rainwater falling in the vicinity of excavations will be the main source of water requiring treatment;
- All water within the excavations will be pumped to the Proposed Wind Farm drainage system for treatment and attenuation prior to discharge;
- There will be no discharge of untreated or unattenuated waters;
- The volume of water being discharged will be dependent on the precedent rainfall; and,
- Therefore, there will be no potential for significant effects on local groundwater flows and downstream surface water flow volumes.
- On the lower ground in the vicinity of the Kilmanagh/Tullaroan River (T07), there may be the requirement for excavation dewatering within the Kilmanagh Gravels;
 - However, any effects will be temporary;
 - No significant or permanent excavations are proposed;
 - There will be no change to groundwater or surface water flow volumes as all water will be returned to the aquifer following treatment within the Proposed Wind Farm drainage system.

In summary, it is considered that due to the topographic setting and the local hydrogeological regime, that there will be no significant inflows of groundwater that will require dewatering in most excavations. Where dewatering is required, tried and tested best practice mitigation measures will ensure that there will be no significant effects on surface or groundwater flows.

2.5 ITEM HH5

Item HH5 reads as follows:

"It is noted that the crossing of the Tullaroan Stream and some access roads are proposed to be located within a flood zone (National Indicative Fluvial Mapping). In addition, there is a history of flood events immediately downstream of the site within the village of Kilmanagh. In this regard, you are required to submit an updated Flood Risk Assessment (FRA) which includes detailed site-specific hydraulic modelling of the Tullaroan Stream which would examine the potential impact on the existing floodplain or on flood risk elsewhere downstream. The updated FRA shall also have regard to the alterations that have been undertaken to the Tullaroan Stream within the boundaries of the site."

HES Response:

As part of this appeal submission response Fluvio R&D have completed detailed site-specific Hydraulic flood modelling along the Kilmanagh/Tullaroan River (refer to **Appendix 9**). The detailed site-specific flood modelling concludes that there is no significant change to flood water levels between the existing baseline flood scenario and the future flood scenario which includes the Proposed Wind Farm. There is no significant change in the flood extents or the flow rates between the existing baseline flood scenario and the future flood scenario which includes the Proposed Wind Farm infrastructure.

In summary:

- The existing FRA (EIAR Appendix 9.1) and EIAR undertook a semi quantitative (Table 9.20 of the EIAR)) and a qualitative assessment of potential for increase in flood risk. Both concluded that no significant increase in flood risk will occur, and that proposed mitigation in the form of drainage attenuation would ameliorate any residual risk;
- The total catchment area upstream of Kilmanagh is ~40km², and the proposed development footprint is ~0.087km², ~0.22% of the catchment area. In reality, the ability of the proposed development to effect downstream flood flows is negligible based on this area proportion alone;
- Notwithstanding this, further detailed flood modelling assessment has been completed by Fluvio R&D in response to ACPs RFI request;
- The channel alterations within the site are included in the modelled scenarios in the Fluvio R&D report;
- The watercourse crossings are also assessed in the Fluvio R&D report;
- As noted above, the detailed site-specific flood modelling concludes there will be no significant increase in flood water levels and flood flows downstream of the wind farm site arising from the proposed development, and the downstream areas include the village of Kilmanagh and the associated amenity pitches (hurling pitch);
- The proposed development includes mitigation for drainage discharge controls for protection of water quality and attenuation of runoff to greenfield flows; and,
- The Fluvio R&D report confirms the semi quantitative and qualitative assessments presented in the EIAR.

In summary, the Proposed Development will not result in any increase in the downstream flood risk at the village of Kilmanagh Bridge, or downstream of Kilmanagh Bridge.

3 3RD PARTY SUBMISSIONS

This section presents our responses to recurring themes included in the various 3rd party submissions relating to water and flooding. The following recurring themes were raised in these submissions:

- Potential effects on a vulnerable aquifer;
- Potential effects on local drinking water sources;
- Potential increased flood risk; and,
- Inadequate site investigations.

The majority of the 3rd party submissions refer to the issues raised in the CAAS EIAR review and Kilkenny County Council's planning report which related to the adequacy of mitigation measures and the cumulative assessment. These issues have been comprehensively addressed already from a hydrological/hydrogeological perspective in HES's Grounds of Appeal (GOA) document.

The mitigation measures prescribed in the EIAR for the protection of the hydrological/hydrogeological environment are proven, tried and tested, best in class mitigation measures which will ensure that the Proposed Project has no potential for significant effects on the receiving water environment. The Proposed Project drainage system will ensure that there is no discharge of untreated or unattenuated waters. The EIAR also prescribes best practice mitigation measures in relation to hydrocarbons, cement-based products and wastewater. With the implementation of the prescribed mitigation measures, there will be no potential for significant effects on the hydrological/hydrogeological environment. Therefore, as presented in Section 9.5.7 of the submitted EIAR, the exhaustive cumulative assessment concludes that the Proposed Project has no potential to result in cumulative or in-combination effects with other developments on the hydrological/hydrogeological environment.

Other issues raised in the 3rd party submissions including the potential increase in downstream flood risk, potential effects on the local vulnerable aquifer and water supplies, and the adequacy of the site investigations completed as part of the baseline assessment. These issues have also been thoroughly previously addressed by HES in the GOA. Please refer to the GOA for a complete and robust response to the aforementioned issues.

Notable submissions were received from Kilmanagh Ballycallan Tullaroan Responsible Energy Group and the Kilkenny West GWS Cooperative Society and these submissions are addressed directly below.

3.1 KILMANAGH BALLYCALLAN TULLAROAN (KBT) RESPONSIBLE ENERGY – HYDRO-G SUBMISSION

A substantial submission was received from the community group Kilmanagh Ballycallan Tullaroan (KBT) Responsible Energy. The KBT community group submission included a Technical Response Note from Hydro-G which provided a commentary on the GOA document. This section provides a response to the key issues raised in the KBT response and in Hydro-G's Technical Response Note.

Potential Effects on drinking water supplies/wells:

A robust impact assessment of the potential for effects on local drinking water supplies was presented in Sections 9.5.2.17 and 9.5.3.6 of the submitted EIAR. The comprehensive impact assessments conclude that there will be no potential for significant effects on local public groundwater supplies (Callan PWS, Tullaroan GWS, Ballycallan Shale Region GWS and the Ballycallan Limestone Region GWS) or on local private groundwater well supplies. Furthermore, Section 4.1.3 of the GOA demonstrates that there is no potential for significant effects on the Kilkenny City (Troyswood) Supply.

The reasoning for these conclusions was reiterated in the GOA and is based on the local topographic and hydrogeological setting of the site combined with the implementation of the prescribed tried and tested, best practice mitigation measures for the protection of the local water environment.

Additional site investigations, in the form of borehole drilling and water level monitoring, have been completed at both the proposed borrow pit (refer to Section 2.2 above) and at T07 (refer to Section 2.4 above) as part of this submission response. The results of these site investigations build upon and support the conclusions of the impact assessments presented in the EIAR. The additional site investigation data does not alter the conclusions that there will be no significant effects on local public and private water supplies.

With the implementation of the robust, tried and tested, best practice mitigation measures for the protection of surface and groundwater quality and quantity, there will be no potential for effects on any downgradient public or private water supply.

Uncertainty regarding the location of the Proposed Wind Farm Drainage System infrastructure and potential interference with the Kilmanagh/Tullaroan River:

Detailed drainage drawings were appended to the EIAR (Appendix 4-3) and indicate the layout of the proposed drainage infrastructure. The drawings highlight the indicative locations for interceptor drains, collector drains, settlement ponds, silt fences and outfall locations are all provided on the submitted drainage drawings.

KBT note that vegetation filters are not indicated/labelled on the drainage drawings. Vegetation filters comprise of the vegetated land between the point at which the treated water from the Proposed Project drainage system is released and the nearest hydrological feature. There will be no direct discharge from the Proposed Wind Farm drainage system into any watercourse, and all proposed outfall locations are indicated on the submitted drainage drawings. All water will be released onto vegetated land which will provide further opportunities for infiltration and filtration before the treated water can reach a local watercourse as surface water runoff.

There is no potential for the Proposed Project drainage system to interfere with runoff rates to the Kilmanagh/Tullaroan River. The drainage system has been designed for the protection of downstream surface water quality and flow volumes. In the absence of the proposed drainage system the replacement of natural surfaces with impermeable surfaces could potentially increase the proportion of surface water runoff entering downstream watercourses. However, all rainwater falling within the Proposed Project construction areas will be treated and attenuated prior to release. The Proposed Project drainage system comprises of a water treatment train with source controls (interceptor drains, diversion drains, velocity control measures, small working areas etc.), in-line controls (drains, check dams, silt bags, silt fences, sumps etc.) and treatment systems (sediment traps and settlement ponds etc.). No element of the Proposed Wind Farm drainage system works in isolation. The elements work together as part of a series of treatment and attenuation systems. Furthermore, all settlement ponds will be designed to ensure that flows/discharge are restricted to greenfield runoff rates (this preventing any increase in downstream flood risk, this is done in accordance with standards SuDS principles).

Therefore, the Proposed Project drainage system has no potential to alter runoff rates to the Kilmanagh/Tullaroan River.

Water Quality Monitoring:

Section 9.5.2.2 of the submitted EIAR states that during the construction phase field testing and laboratory analysis of a range of parameters will be undertaken for each primary watercourse, and specifically following heavy rainfall events.

The monitoring locations (SW1, SW2 and SW3) and parameters to be monitored will be the same as those used to characterise the baseline hydrological environment (refer to Section 9.3.7.2 of the submitted EIAR) including suspended solids, BOD, nitrite, nitrate, ammonia, orthophosphate and chloride. The monitoring will be completed by the site EM. The field testing will comprise of on-site measurements for turbidity, temperature, pH and electrical conductivity.

Inadequate Site Investigations to Characterise Geological/Hydrogeological Environment:

Comprehensive site investigations have been completed at the Proposed Wind Farm site and comprise of the following:

- 22 no. Trial Pits, 8 no. at proposed borrow pits areas, and 16 no. across the Proposed Wind Farm site;
- Ground conditions at 6 of 7 no. proposed turbine locations were investigated by direct site investigations comprising of trial pit excavations;
- 2 no. monitoring wells were drilled in the valley of the Kilmanagh/Tullaroan River as part of the EIAR baseline assessment; and,
- An additional 2 no. monitoring wells were drilled as part of this appeal response (1 no. monitoring well at the proposed borrow pit location and 1 no. monitoring well ~90m from T07).

As detailed in Section 2.1 above, the site investigations largely revealed a predictable geological profile which corresponds with the GSI mapped geology in the local area. The bedrock at the Proposed Wind Farm site comprises of shaley black SILTSTONE of the Killeslin Siltstone Formation and is overlain by thick overburden deposits (13.1 to 18.7m) in the valley of the Kilmanagh/Tullaroan River. Depth to rock is shallow on the sides of the valley (0.4 to 3.3m). The conclusions of the impact assessment are unaltered.

Flooding:

Refer to Section 2.5 above which presents our response to Item HH5.

Comparison of Mitigation Measures with Other Sites:

KBT claim that the comparison of the Proposed Project site with other sites such as the permitted Glenard Wind Farm and the permitted Seven Hills Wind Farm is inappropriate. This comparison was solely made with respect to the similarity of the prescribed mitigation measures. The mitigation measures prescribed for the protection of the water environment were deemed to be appropriate in several recent decisions to grant permission for similar developments in very sensitive hydrogeological areas (i.e. Glenard Wind Farm and Seven Hills Wind Farm). Whilst each site is different topographically, hydrologically and hydrogeologically, the key principles of protecting the water environment remain the same: ensuring that there is no release of untreated or unattenuated water and ensuring the proposed development does not result in any significant effects on the receiving water environment.

3.2 KILKENNY WEST GWS COOPERATIVE SOCIETY LTD

Many of the issues raised in this submission overlap with the original submission made by Kilkenny West GWS Cooperative Society Ltd to Kilkenny County Council and were addressed in the GOA (Grounds of Appeal).

HES would like to reiterate the following:

- The ZoC from the limestone aquifer to the Ballycallan GWS does not overlap with any area of the Proposed Wind Farm site;
- The Ballycallan Limestone Region ZoC is distant (~2km) from the closest proposed turbine (T07);
- No limestone or karstic bedrock is mapped at the Proposed Wind Farm site;
- The siltstone bedrock encountered across much of the Proposed Wind Farm site during the site investigations corresponds with the GSI mapped Killeslin Formation which is classified as a 'Poor Aquifer – Bedrock which is Generally Unproductive except for Local Zones';
- Additional site investigations completed ~90m from T07 encountered moderately strong siltstone which is classified as a poor bedrock aquifer;
- Whilst some areas of the Proposed Wind Farm site are mapped by the GSI as having 'High' to 'Extreme' groundwater vulnerability, the areas in the south of the site which overlap with the BallyCallan Shale and BallyCallan Sand and Gravel ZoCs are mapped as having 'Low' to 'Moderate' vulnerability;
- No excavations or works are proposed with the ZoC associated with the BallyCallan Limestone Region;
- The only works proposed in the BallyCallan Shale and BallyCallan Sand and Gravel ZoCs relate to the construction of new roads and the upgrade of an existing road;
- These works will be of a short-duration and will have limited potential to impact local groundwater or surface water quality; and,
- Nevertheless, the EIAR details best practice mitigation measures for the protection of surface and groundwater quality.

4 RESPONSE SUMMARY

In summary and in response to ACP's Further Information Request:

- A comprehensive site investigation dataset, comprising of trial pits, boreholes, logging of subsoil exposures and laboratory analysis of recovered soil/subsoil samples, was accrued as part of the baseline characterisation of the Proposed Wind Farm site in the EIAR. This site-specific dataset informed the robust impact assessment which was presented in the EIAR;
- The site investigations completed at the proposed turbine locations are considered to be appropriate due to the consistent and predictable nature of the geological profile across the site which corresponds to GSI mapping.

Furthermore, the EIAR assesses both gravity and piled foundations at all turbine locations, and concludes that with the implementation of the tried and tested best practice mitigation measures there will be no significant effects on the receiving hydrological/hydrogeological environment as a result of the construction of the Proposed Project;

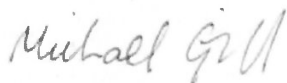
- At the request of ACP, additional site investigation has been completed as part of this FIR response and comprised of the drilling of 2 no. monitoring wells (1 no. well was completed at the proposed borrow pit location and 1 no. monitoring well was completed approximately 90m from T7);
- The geological and hydrogeological information obtained from these additional site investigations correlates with our previous understanding of the geology and hydrogeology of the site and supports the conclusions of the impact assessments presented in the EIAR;
- The proposed borrow pit will have no potential to alter groundwater or surface water flow volumes due to its topographic (on the side of a hill) and hydrogeological setting (relatively low permeability soils and a Poor Bedrock Aquifer). There will be no significant inflows of deeper groundwater and all shallow groundwater inflows and rainwater falling within the borrow pit will be treated and attenuated prior to discharge. Drawdown impacts from this will be local to the pit and will be temporary, and as such will not impact on local watercourses or the sand and gravel aquifer;
- With the implementation of the tried and tested, best practice mitigation measures there will be no potential for effects on surface or groundwater quality/quantity as a result of the construction of T7. All excavations in this area will be temporary, limiting the potential for significant effects. Any water pumped from local excavations will be infiltrated back into the sand and gravel aquifer following treatment and attenuation within the Proposed Wind Farm drainage system; and,
- Elsewhere, the volumes of water requiring treatment in excavations will be small due to the low permeability soils/subsoils and will largely depend on the precedent rainfall. There will be no discharge of untreated or unattenuated waters.

HES has responded to all matters raised in ACP's Further Information Request and also in relation to concerns raised in 3rd party submissions.

We respectfully submit to An Coimisiún Pleanála that this letter response reiterates the conclusions of the robust and comprehensive impact assessments presented in EIAR Chapter 8 (Land, Soils and Geology), EIAR Chapter 9 (Hydrology and Hydrogeology), the associated Flood Risk Assessment (Appendix 9-1) and WFD Compliance Assessment Report (Appendix 9-3). The impact assessments presented in the EIAR are informed by a comprehensive site investigation dataset and rely upon the tried and tested, best practice mitigation measures which ensure the protection of the receiving environment. Similar mitigation measures have been successfully applied during the construction of countless wind farm developments across the country and were also presented in the EIARs for several recently permitted wind farm developments.

As a result of the above, we urge the Commission to issue a positive decision with respect to this appeal submission.

Yours sincerely,



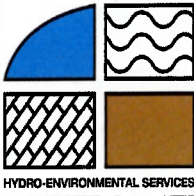
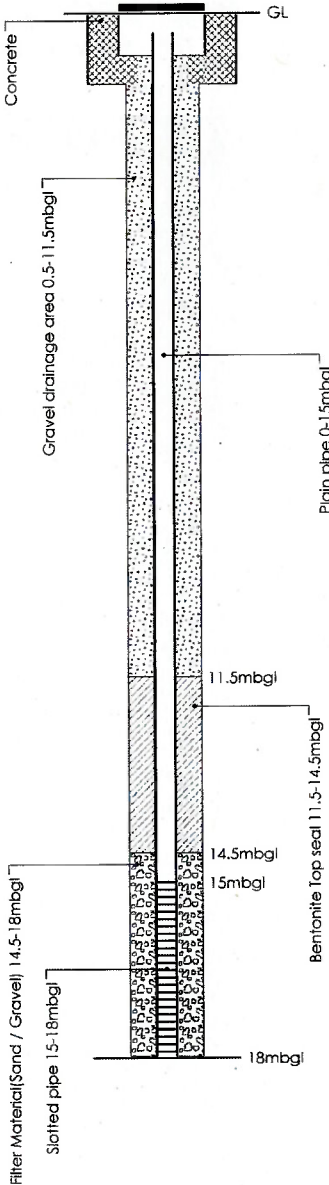
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Appendix A

		Monitoring Well Log		Well No.: 25MW1		
Project No: P1657-1		Date started: 07/08/2025		Easting: 639019.98		
Site: Briskalagh WF, Co. Kilkenny		Date finished: 07/08/2025		Northing: 653561.9		
Client: Briskalagh Ltd				Elevation: 110.3mOD		
SUBSURFACE PROFILE						
Depth	Symbol	Description	Depth/Elev.	Water Level	Comments	Well Completion Details
0		Ground Surface	110.3			
		Firm brown TOPSOIL	0.0		WL on 18/08/25	
		Firm to stiff brown sandy clayey SILT with occasional sub rounded and sub angular limestone, siltstone and shale pebbles	107.8			
		Firm to stiff greyish brown sandy clayey SILT with occasional subrounded and sub angular limestone, siltstone and shale pebbles	2.5		Slow water inflow at 5.5mbgl	
		Medium dense coarse brownish grey sub-rounded SAND AND GRAVEL with frequent silty clayey layers	103.5		Dirty Sand and Gravel	
		Medium dense coarse brownish grey sub-rounded SAND AND GRAVEL	6.8			
		Medium dense coarse brownish grey sub-rounded SAND AND GRAVEL	102.0		Cleaner Sand and Gravel	
		Medium dense coarse orangish brown sub-rounded and sub-angular SAND AND GRAVEL, (possibly weathered bedrock or rock-fill interface)	8.3			
		Medium strong dark grey Siltstone/Shale	98.8		Fast water inflow at 11.5mbgl	
			11.5			
10			97.2			
			13.1			
			92.3			
		EOH at 18mbgl	18.0			
20						
Remarks: WL recorded on 18/08/2025 at 2.42mbgl or 108.286mOD				Drilling Contractor: Petersen Drilling Ltd.		
				Drilling type: DTH		
				Logged by: MGill		
				Scale as shown		
				Sheet: 1 of 1		
HYDRO-ENVIRONMENTAL SERVICES 22 Lower Main Street Dungarvan Co. Waterford X35 WK85 - Tel: 058-44122 - email: info@hydroenvironmental.ie						



Monitoring Well Log

Well No.: 25MW2

Project No: P1657-0

Date started: 07/08/2025

Easting: 640143.80

Site: Briskalagh WF, Co. Kilkenny

Date finished: 07/08/2025

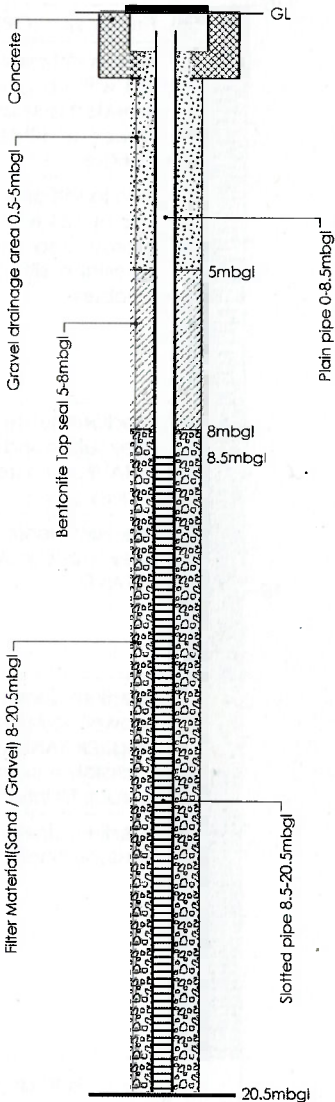
Northing: 656349.27

Client: Briskalagh Ltd

Elevation: 183.49mOD

SUBSURFACE PROFILE

Depth	Symbol	Description	Depth/Elev.	Water Level	Comments	Well Completion Details
0		Ground Surface	183.5			
		Firm to stiff light brown sandy clayey SILT (glacial till)	0.0			
		Weak grey shaley SILTSTONE	181.3			
10		Very small water strike at 14mbgl, only enough to make initial 0.5m of subsequent drilling rods damp, and after 0.5m of subsequent rods additional water was added to keep the dust down.	2.2		WL on 18/08/25	
20		After flushing and airlifting at the end of the hole there was only drops of water being purged from the well.	163.0		Small seepage at 14mbgl	
			20.5		yield estimated at <5 gals/hr	



Concrete

Gravel drainage area 0.5-5mbgl

Bentonite Top seal 5-8mbgl

Filter Material (Sand / Gravel) 8-20.5mbgl

5mbgl

8mbgl

8.5mbgl

20.5mbgl

Plain pipe 0-8.5mbgl

Slotted pipe 8.5-20.5mbgl

Remarks:

WL recorded on 18/08/2025 at 5.5mbgl or 178.43mOD

Drilling Contractor: Petersen Drilling Ltd.

Drilling type: DTH

Scale as shown

Logged by: MGill

Sheet: 1 of 1



APPENDIX 7

PREDICTED CUMULATIVE OMNI-DIRECTIONAL NOISE LEVELS

APPENDIX 7 – CUMULATIVE NOISE LEVELS

Table B-1 below presents the cumulative noise levels, i.e. including the Proposed Wind Farm and Foyle Wind Farm at each NSL, compared to day and night-time noise criteria.

Table B-1. Predicted Noise Level at Noise-sensitive locations

House	Parameter	Predicted Noise Level, dB LA90 at wind speed/m/s at standardised 10m height						
		3	4	5	6	7	8	9
H001	Predicted	32.5	34.0	38.4	42.8	43.9	44.0	44.0
	Daytime Criterion	45	45	45	45	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	45	45	45	45	45	45	45
	Night-time Excess	--	--	--	--	--	--	--
H002	Predicted	31.6	33.0	37.5	41.9	43.0	43.1	43.1
	Daytime Criterion	45	45	45	45	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	45	45	45	45	45	45	45
	Night-time Excess	--	--	--	--	--	--	--
H003	Predicted	26.4	27.7	31.8	36.2	37.4	37.5	37.5
	Daytime Criterion	45	45	45	45	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	45	45	45	45	45	45	45
	Night-time Excess	--	--	--	--	--	--	--
H004	Predicted	31.1	32.6	37.0	41.4	42.5	42.6	42.6
	Daytime Criterion	45	45	45	45	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	45	45	45	45	45	45	45
	Night-time Excess	--	--	--	--	--	--	--
H005	Predicted	29.8	31.2	35.6	40.0	41.1	41.3	41.3
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H006	Predicted	24.9	26.1	30.3	34.7	35.8	36.0	36.0
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H007	Predicted	29.4	30.6	34.6	39.0	40.3	40.4	40.4
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H008	Predicted	30.0	31.5	36.0	40.4	41.5	41.6	41.6
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	0.4	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H009	Predicted	33.0	34.5	38.8	43.2	44.4	44.5	44.5
	Daytime Criterion	45	45	45	45	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	45	45	45	45	45	45	45
	Night-time Excess	--	--	--	--	--	--	--

House	Parameter	Predicted Noise Level, dB LA90 at wind speed m/s at standardised 10m height						
		3	4	5	6	7	8	9
H010	Predicted	24.8	26.0	30.2	34.6	35.7	35.9	35.9
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H011	Predicted	24.7	26.0	30.1	34.5	35.7	35.9	35.9
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H012	Predicted	30.3	31.8	36.2	40.6	41.8	41.8	41.8
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	0.6	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H013	Predicted	29.5	31.0	35.4	39.8	41.0	41.1	41.1
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H014	Predicted	28.1	29.5	33.7	38.1	39.3	39.4	39.4
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H015	Predicted	25.3	26.6	30.6	35.0	36.2	36.4	36.4
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H016	Predicted	24.6	25.9	30.0	34.4	35.6	35.7	35.7
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H017	Predicted	24.6	25.9	30.0	34.4	35.6	35.7	35.7
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H018	Predicted	24.6	25.9	30.0	34.4	35.6	35.7	35.7
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H019	Predicted	24.6	25.9	30.0	34.4	35.6	35.7	35.7
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H020	Predicted	24.6	25.9	30.0	34.4	35.6	35.7	35.7
	Daytime Criterion	40	40	40	40	45	45	45

House	Parameter	Predicted Noise Level dB LA90 at wind speed m /sat standardised 10m height						
		3	4	5	6	7	8	9
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	24.6	25.9	30.0	34.4	35.6	35.7	35.7
H021	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	24.6	25.9	30.0	34.4	35.6	35.7	35.7
H022	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	24.6	25.9	30.0	34.4	35.6	35.7	35.7
H023	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	24.6	25.9	30.0	34.4	35.6	35.7	35.7
H024	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	24.8	26.1	30.3	34.7	35.8	36.0	36.0
H025	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	24.6	25.9	30.0	34.4	35.6	35.7	35.7
H026	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	24.6	25.9	30.0	34.4	35.6	35.7	35.7
H027	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	24.6	25.9	29.9	34.3	35.5	35.7	35.7
H028	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	24.6	25.9	29.9	34.3	35.5	35.7	35.7
H029	Daytime Criterion	45	45	45	45	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	45	45	45	45	45	45	45
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	24.6	25.8	30.0	34.4	35.6	35.7	35.7
H030	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Predicted	29.2	30.6	35.0	39.4	40.5	40.6	40.6

House	Parameter	Predicted Noise Level, dB LA90 at wind speed m/s at standardised 10m height						
		3	4	5	6	7	8	9
H031	Night-time Excess	--	--	--	--	--	--	--
	Predicted	25.4	26.6	30.7	35.1	36.3	36.4	36.4
	Daytime Criterion	45	45	45	45	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	45	45	45	45	45	45	45
	Night-time Excess	--	--	--	--	--	--	--
H032	Predicted	24.6	25.8	29.9	34.3	35.5	35.7	35.7
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H033	Predicted	25.6	26.8	30.8	35.2	36.4	36.6	36.6
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H034	Predicted	29.1	30.2	34.1	38.5	39.8	39.9	39.9
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H035	Predicted	29.3	30.8	35.2	39.6	40.8	40.8	40.8
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H036	Predicted	25.8	27.0	31.0	35.4	36.7	36.8	36.8
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H037	Predicted	28.6	30.0	34.3	38.7	39.8	40.0	40.0
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H038	Predicted	29.7	31.0	35.2	39.6	40.8	40.9	40.9
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H039	Predicted	24.8	26.0	30.1	34.5	35.7	35.8	35.8
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H040	Predicted	25.2	26.4	30.5	34.9	36.1	36.2	36.2
	Daytime Criterion	45	45	45	45	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	45	45	45	45	45	45	45
	Night-time Excess	--	--	--	--	--	--	--
H041	Predicted	25.4	26.6	30.6	35.0	36.2	36.4	36.4

House	Parameter	Predicted Noise Level, dB LA90 at wind speed m/s at standardised 10m height						
		3	4	5	6	7	8	9
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H042	Predicted	25.6	26.8	30.8	35.2	36.4	36.6	36.6
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H043	Predicted	29.6	30.9	35.0	39.4	40.6	40.7	40.7
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H044	Predicted	28.8	30.3	34.8	39.2	40.3	40.4	40.4
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H045	Predicted	28.7	30.1	34.5	38.9	40.0	40.1	40.1
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H046	Predicted	29.6	30.9	35.1	39.5	40.7	40.8	40.8
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H047	Predicted	24.3	25.6	29.6	34.0	35.2	35.4	35.4
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H048	Predicted	30.2	31.6	35.8	40.2	41.4	41.5	41.5
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	0.2	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H049	Predicted	29.0	30.1	34.0	38.4	39.6	39.8	39.8
	Daytime Criterion	40	40	45	45	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H050	Predicted	24.8	26.1	30.1	34.5	35.7	35.9	35.9
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H051	Predicted	27.2	28.4	32.4	36.8	38.0	38.2	38.2
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--

House	Parameter	Predicted Noise Level, dB LA90 at wind speed m/s at standardised 10m height						
		3	4	5	6	7	8	9
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	25.3	26.5	30.5	34.9	36.1	36.3	36.3
H052	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	28.9	30.1	34.2	38.6	39.8	40.0	40.0
H053	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	29.6	30.9	35.0	39.4	40.6	40.8	40.8
H054	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	26.5	27.6	31.6	36.0	37.2	37.4	37.4
H055	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	29.7	31.0	35.2	39.6	40.8	40.9	40.9
H056	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	25.0	26.2	30.1	34.5	35.8	35.9	35.9
H057	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	27.7	28.9	32.8	37.2	38.5	38.6	38.6
H058	Daytime Criterion	45	45	45	45	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	45	45	45	45	45	45	45
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	25.2	26.4	30.4	34.8	36.0	36.2	36.2
H059	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	29.9	31.2	35.4	39.8	41.0	41.1	41.1
H060	Daytime Criterion	40	40	45	45	45	45	45.7
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	44.7
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	29.8	31.1	35.3	39.7	40.9	41.0	41.0
H061	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	29.8	31.1	35.3	39.7	40.9	41.0	41.0

House	Parameter	Predicted Noise Level, dB LA90 at windspeed m/s at standardised 10m height						
		3	4	5	6	7	8	9
H062	Predicted	29.2	30.6	34.9	39.3	40.4	40.5	40.5
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H063	Predicted	25.2	26.4	30.3	34.7	36.0	36.1	36.1
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H064	Predicted	28.2	29.6	34.0	38.4	39.5	39.6	39.6
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H065	Predicted	26.1	27.3	31.4	35.8	37.0	37.2	37.2
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H066	Predicted	24.8	26.0	30.0	34.4	35.6	35.8	35.8
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H067	Predicted	27.7	28.9	32.8	37.2	38.5	38.6	38.6
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H068	Predicted	28.2	29.4	33.4	37.8	39.0	39.2	39.2
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H069	Predicted	28.0	29.2	33.2	37.6	38.8	38.9	38.9
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H070	Predicted	25.3	26.5	30.6	35.0	36.2	36.3	36.3
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H071	Predicted	24.0	25.3	29.4	33.8	35.0	35.1	35.1
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H072	Predicted	24.2	25.4	29.4	33.8	35.1	35.2	35.2
	Daytime Criterion	40	40	40	40	45	45	45

House	Parameter	Predicted Noise Level, dB LA90 at wind speed m/s at standardised 10m height						
		3	4	5	6	7	8	9
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	27.7	29.2	33.6	38.0	39.1	39.2	39.2
H073	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	24.5	25.7	29.7	34.1	35.3	35.5	35.5
H074	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	29.9	31.2	35.5	39.9	41.0	41.2	41.2
H075	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	24.7	25.9	29.9	34.3	35.5	35.7	35.7
H076	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	23.8	25.1	29.1	33.5	34.7	34.8	34.8
H077	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	23.8	25.0	29.0	33.4	34.7	34.8	34.8
H078	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	28.3	29.5	33.4	37.8	39.0	39.2	39.2
H079	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	29.0	30.3	34.6	39.0	40.2	40.3	40.3
H080	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	23.8	25.0	29.0	33.4	34.6	34.8	34.8
H081	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	24.1	25.3	29.3	33.7	34.9	35.1	35.1
H082	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--

House	Parameter	Predicted Noise Level, dB LA90 at wind speed m/s at standardised 10m height						
		3	4	5	6	7	8	9
	Night-time Excess	--	--	--	--	--	--	--
H083	Predicted	292	30.6	348	39.2	404	40.5	40.5
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Nighttime Excess	--	--	--	--	--	--	--
H084	Predicted	24.4	25.6	29.6	34.0	35.2	35.8	35.3
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Nighttime Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H085	Predicted	26.5	27.8	32.0	36.4	37.6	37.7	37.7
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H086	Predicted	28.9	30.1	34.1	38.5	39.7	39.8	39.8
	Daytime Criterion	45	45	45	45	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	45	45	45	45	45	45	45
	Nighttime Excess	--	--	--	--	--	--	--
H087	Predicted	25.0	26.2	30.0	34.4	35.7	35.9	35.9
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H088	Predicted	24.6	25.8	29.8	34.2	35.4	35.6	35.6
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Nighttime Excess	--	--	--	--	--	--	--
H089	Predicted	29.6	31.0	35.2	39.6	40.8	40.9	40.9
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H090	Predicted	23.6	24.8	28.8	33.2	34.4	34.6	34.6
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Nighttime Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H091	Predicted	23.6	24.8	28.8	33.2	34.4	34.6	34.6
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H092	Predicted	23.6	24.8	28.8	33.2	34.4	34.6	34.6
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H093	Predicted	28.7	29.7	33.3	37.7	39.0	39.2	39.2

House	Parameter	Predicted Noise Level, dB LA90 at wind speed m/s at standardised 10m height						
		3	4	5	6	7	8	9
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	24.6	25.8	29.8	34.2	35.4	35.6	35.6
H094	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	23.5	24.7	28.7	33.1	34.4	34.5	34.5
H095	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	23.5	24.7	28.7	33.1	34.4	34.5	34.5
H096	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	23.5	24.7	28.7	33.1	34.3	34.5	34.5
H097	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	23.5	24.7	28.7	33.1	34.3	34.5	34.5
H098	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	24.2	25.4	29.3	33.7	34.9	35.1	35.1
H099	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	23.5	24.7	28.7	33.1	34.3	34.4	34.4
H100	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	23.4	24.6	28.6	33.0	34.2	34.4	34.4
H101	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	24.6	25.8	29.6	34.0	35.3	35.4	35.4
H102	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	23.4	24.6	28.6	33.0	34.2	34.4	34.4
H103	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--

House	Parameter	Predicted Noise Level, dB LA90 at wind speed m/s at standardised 10m height						
		3	4	5	6	7	8	9
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	28.6	29.6	33.1	37.5	38.8	39.0	39.0
H104	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	24.2	25.3	29.2	33.6	34.9	35.0	35.0
H105	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	29.5	30.9	35.1	39.5	40.7	40.8	40.8
H106	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	26.7	28.2	32.6	37.0	38.1	38.2	38.2
H107	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	28.7	29.8	33.5	37.9	39.2	39.4	39.4
H108	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	28.7	29.8	33.5	37.9	39.2	39.4	39.4
H109	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	26.5	27.8	32.0	36.4	37.5	37.7	37.7
H110	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	24.2	25.4	29.2	33.6	34.9	35.0	35.0
H111	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	25.6	26.7	30.3	34.7	36.0	36.2	36.2
H112	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	24.0	25.1	28.9	33.3	34.6	34.8	34.8
H113	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	24.0	25.1	28.9	33.3	34.6	34.8	34.8

House	Parameter	Predicted Noise Level, dB LA90 at wind speed m/s at standardised 10m height						
		3	4	5	6	7	8	9
H114	Predicted	23.0	24.1	28.1	32.5	33.7	33.9	33.9
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H115	Predicted	23.8	25.0	28.8	33.2	34.4	34.6	34.6
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H116	Predicted	26.3	27.7	31.9	36.3	37.5	37.6	37.6
	Daytime Criterion	45	45	45	45	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	45	45	45	45	45	45	45
	Night-time Excess	--	--	--	--	--	--	--
H117	Predicted	26.9	28.2	32.4	36.8	38.0	38.1	38.1
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H118	Predicted	22.8	24.0	27.9	32.3	33.6	33.7	33.7
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H119	Predicted	26.2	27.5	31.8	36.2	37.3	37.4	37.4
	Daytime Criterion	45	45	45	45	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	45	45	45	45	45	45	45
	Night-time Excess	--	--	--	--	--	--	--
H120	Predicted	25.4	26.4	30.0	34.4	35.8	36.0	36.0
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H121	Predicted	25.3	26.8	31.3	35.7	36.8	36.9	36.9
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H122	Predicted	23.7	24.8	28.6	33.0	34.2	34.4	34.4
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H123	Predicted	22.7	23.8	27.8	32.2	33.4	33.6	33.6
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H124	Predicted	28.5	29.8	33.8	38.2	39.4	39.6	39.6
	Daytime Criterion	40	40	40	40	45	45	45

House	Parameter	Predicted Noise Level, dB LA90 at wind speed m/s at standardised 10 m height						
		3	4	5	6	7	8	9
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	23.6	24.7	28.5	32.9	34.2	34.4	34.4
H125	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	28.8	30.1	34.2	38.6	39.8	40.0	40.0
H126	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	28.4	29.6	33.6	38.0	39.2	39.4	39.4
H127	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	22.6	23.8	27.6	32.0	33.3	33.4	33.4
H128	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	23.5	24.6	28.4	32.8	34.0	34.2	34.2
H129	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	25.1	26.6	31.1	35.5	36.6	36.7	36.7
H130	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	26.2	27.5	31.7	36.1	37.3	37.4	37.4
H131	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	26.7	27.6	31.0	35.4	36.8	37.0	37.0
H132	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	23.3	24.4	28.1	32.5	33.8	34.0	34.0
H133	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	23.4	24.5	28.2	32.6	33.9	34.1	34.1
H134	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--

House	Parameter	Predicted Noise Level, dB LA90 at wind speed m/s at standardised 10m height						
		3	4	5	6	7	8	9
H135	Night-time Excess	--	--	--	--	--	--	--
	Predicted	28.3	29.6	33.7	38.1	39.3	39.4	39.4
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
H136	Night-time Excess	--	--	--	--	--	--	--
	Predicted	26.2	27.6	32.0	36.4	37.6	37.7	37.7
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
H137	Night-time Excess	--	--	--	--	--	--	--
	Predicted	26.0	27.3	31.6	36.0	37.1	37.2	37.2
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
H138	Night-time Excess	--	--	--	--	--	--	--
	Predicted	26.3	27.6	31.9	36.3	37.5	37.6	37.6
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
H139	Night-time Excess	--	--	--	--	--	--	--
	Predicted	22.3	23.4	27.2	31.6	32.9	33.1	33.1
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
H140	Night-time Excess	--	--	--	--	--	--	--
	Predicted	26.9	28.3	32.6	37.0	38.2	38.3	38.3
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
H141	Night-time Excess	--	--	--	--	--	--	--
	Predicted	23.0	24.1	27.8	32.2	33.5	33.7	33.7
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
H142	Night-time Excess	--	--	--	--	--	--	--
	Predicted	25.3	26.2	29.5	33.9	35.3	35.5	35.5
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
H143	Night-time Excess	--	--	--	--	--	--	--
	Predicted	24.1	25.6	30.1	34.5	35.6	35.7	35.7
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
H144	Night-time Excess	--	--	--	--	--	--	--
	Predicted	24.0	25.5	30.0	34.4	35.5	35.6	35.6
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
H145	Night-time Excess	--	--	--	--	--	--	--
	Predicted	25.3	26.2	29.4	33.8	35.2	35.5	35.5

House	Parameter	Predicted Noise Level dB LA90 at wind speed m/s at standardised 10m height						
		3	4	5	6	7	8	9
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	25.6	26.4	29.7	34.1	35.5	35.8	35.8
H146	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	23.5	25.0	29.5	33.9	35.0	35.1	35.1
H147	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	21.8	22.9	26.9	31.3	32.5	32.7	32.7
H148	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	25.4	26.2	29.4	33.8	35.2	35.5	35.5
H149	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	25.4	26.2	29.4	33.8	35.2	35.5	35.5
H150	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	25.6	26.4	29.5	33.9	35.4	35.6	35.6
H151	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	24.9	26.3	30.6	35.0	36.2	36.3	36.3
H152	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	25.0	26.4	30.8	35.2	36.3	36.4	36.4
H153	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	25.5	26.9	31.2	35.6	36.7	36.9	36.9
H154	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	25.6	26.4	29.5	33.9	35.3	35.6	35.6
H155	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--

House	Parameter	Predicted Noise Level, dB LA90 at wind speed m/s at standardised 10m height						
		3	4	5	6	7	8	9
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	26.0	27.4	31.7	36.1	37.2	37.4	37.4
H156	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	23.2	24.7	29.2	33.6	34.7	34.8	34.8
H157	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	21.6	22.7	26.6	31.0	32.2	32.4	32.4
H158	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	23.1	24.6	29.1	33.5	34.6	34.7	34.7
H159	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	23.8	25.3	29.6	34.0	35.2	35.3	35.3
H160	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	26.1	27.5	31.8	36.2	37.3	37.5	37.5
H161	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	22.1	23.2	26.9	31.3	32.6	32.8	32.8
H162	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	23.2	24.6	29.1	33.5	34.6	34.7	34.7
H163	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	22.0	23.1	26.8	31.2	32.5	32.7	32.7
H164	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	28.5	29.2	32.0	36.4	37.9	38.2	38.2
H165	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	28.5	29.2	32.0	36.4	37.9	38.2	38.2

House	Parameter	Predicted Noise Level, dB LA90at wind speed m/s at standardised 10m height						
		3	4	5	6	7	8	9
H166	Predicted	23.6	25.1	29.6	34.0	35.1	35.2	35.2
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H167	Predicted	25.7	26.5	29.4	33.8	35.4	35.6	35.6
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H168	Predicted	21.9	23.0	26.7	31.1	32.4	32.6	32.6
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H169	Predicted	22.0	23.0	26.7	31.1	32.4	32.6	32.6
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H170	Predicted	22.6	24.1	28.6	33.0	34.1	34.2	34.2
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H171	Predicted	25.8	26.5	29.3	33.7	35.3	35.6	35.6
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H172	Predicted	22.7	24.2	28.7	33.1	34.2	34.3	34.3
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H173	Predicted	22.4	23.9	28.4	32.8	33.9	34.0	34.0
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H174	Predicted	22.4	23.9	28.4	32.8	33.9	34.0	34.0
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H175	Predicted	21.5	22.5	26.0	30.4	31.8	32.0	32.0
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H176	Predicted	22.3	23.8	28.3	32.7	33.8	33.9	33.9
	Daytime Criterion	40	40	40	40	45	45	45

House	Parameter	Predicted Noise Level, dB LA90 at wind speed m/s at standardised 10m height						
		3	4	5	6	7	8	9
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H177	Predicted	22.3	23.8	28.3	32.7	33.8	33.9	33.9
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H178	Predicted	26.0	27.1	30.9	35.3	36.5	36.7	36.7
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H179	Predicted	21.6	22.6	26.3	30.7	32.0	32.2	32.2
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H180	Predicted	22.8	24.2	28.6	33.0	34.1	34.2	34.2
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H181	Predicted	21.4	22.4	25.9	30.3	31.6	31.9	31.9
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H182	Predicted	21.5	22.6	26.3	30.7	32.0	32.2	32.2
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H183	Predicted	21.9	23.4	27.9	32.3	33.4	33.5	33.5
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H184	Predicted	22.5	24.0	28.5	32.9	34.0	34.1	34.1
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H185	Predicted	22.6	24.1	28.6	33.0	34.1	34.2	34.2
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H186	Predicted	22.3	23.8	28.3	32.7	33.8	33.9	33.9
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43

House	Parameter	Predicted Noise Level, dBL _{A90} at wind speed m/s at standardised 10m height						
		3	4	5	6	7	8	9
	Nighttime Excess	--	--	--	--	--	--	--
H187	Predicted	21.4	22.5	26.2	30.6	31.9	32.1	32.1
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H188	Predicted	21.8	23.4	27.8	32.2	33.4	33.4	33.4
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H189	Predicted	24.7	25.4	28.2	32.6	34.2	34.5	34.5
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H190	Predicted	21.3	22.2	25.7	30.1	31.5	31.7	31.7
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H191	Predicted	21.7	23.2	27.7	32.1	33.2	33.3	33.3
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H192	Predicted	21.3	22.8	27.3	31.7	32.8	32.9	32.9
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H193	Predicted	21.1	22.1	25.6	30.0	31.3	31.5	31.5
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H194	Predicted	26.1	26.7	29.1	33.5	35.2	35.6	35.6
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H195	Predicted	22.7	24.0	28.3	32.7	33.8	34.0	34.0
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H196	Predicted	30.1	30.5	32.4	36.8	38.6	39.1	39.1
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H197	Predicted	22.2	23.7	28.2	32.6	33.7	33.8	33.8

House	Parameter	Predicted Noise Level, dB LA90 at wind speed m/s at standardised 10m height						
		3	4	5	6	7	8	9
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	21.9	23.4	27.9	32.3	33.4	33.5	33.5
H198	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	20.9	21.9	25.4	29.8	31.2	31.4	31.4
H199	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	21.1	22.2	25.9	30.3	31.6	31.8	31.8
H200	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	21.8	23.3	27.8	32.2	33.3	33.4	33.4
H201	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	21.4	22.9	27.4	31.8	32.9	33.0	33.0
H202	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	22.2	23.6	28.0	32.4	33.5	33.6	33.6
H203	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	20.7	21.7	25.3	29.7	31.0	31.2	31.2
H204	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	21.0	22.0	25.8	30.2	31.4	31.6	31.6
H205	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	30.4	30.7	32.4	36.8	38.7	39.2	39.2
H206	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	21.2	22.7	27.2	31.6	32.7	32.8	32.8
H207	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--

House	Parameter	Predicted Noise Level dB LA90 at wind speed m/s at standardised 10m height						
		3	4	5	6	7	8	9
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	30.6	30.9	32.5	36.9	38.9	39.4	39.4
H208	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	26.3	27.0	30.0	34.4	35.9	36.2	36.2
H209	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	21.8	23.3	27.8	32.2	33.3	33.4	33.4
H210	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	22.5	23.8	28.0	32.4	33.6	33.7	33.7
H211	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	26.2	26.7	29.0	33.4	35.1	35.5	35.5
H212	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	25.6	26.6	30.0	34.4	35.8	36.0	36.0
H213	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	20.3	21.4	25.0	29.4	30.7	30.9	30.9
H214	Daytime Criterion	45	45	45	45	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	45	45	45	45	45	45	45
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	21.0	22.5	27.0	31.4	32.5	32.6	32.6
H215	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	21.1	22.6	27.1	31.5	32.6	32.7	32.7
H216	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	22.0	22.8	25.8	30.2	31.7	31.9	31.9
H217	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	22.0	22.8	25.8	30.2	31.7	31.9	31.9

House	Parameter	Predicted Noise Level, dB LA90 at wind speed m/s at standardised 10m height						
		3	4	5	6	7	8	9
H218	Predicted	20.7	22.2	26.7	31.1	32.2	32.3	32.3
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H219	Predicted	21.0	21.8	25.2	29.6	31.0	31.2	31.2
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H220	Predicted	26.2	26.9	29.6	34.0	35.6	35.9	35.9
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H221	Predicted	21.3	22.8	27.3	31.7	32.8	32.9	32.9
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H222	Predicted	21.4	22.9	27.4	31.8	32.9	33.0	33.0
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H223	Predicted	21.1	22.6	27.1	31.5	32.6	32.7	32.7
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H224	Predicted	21.2	22.7	27.2	31.6	32.7	32.8	32.8
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H225	Predicted	20.4	21.5	25.4	29.8	31.0	31.2	31.2
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H226	Predicted	20.2	21.8	26.2	30.6	31.8	31.8	31.8
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H227	Predicted	20.5	22.0	26.5	30.9	32.0	32.1	32.1
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H228	Predicted	26.8	27.2	29.1	33.5	35.4	35.8	35.8
	Daytime Criterion	40	40	40	40	45	45	45

House	Parameter	Predicted Noise Level, dB LA90 at wind speed m/s at standardised 10 m height						
		3	4	5	6	7	8	9
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H229	Predicted	26.4	26.9	28.8	33.2	35.0	35.5	35.5
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H230	Predicted	30.6	30.8	32.3	36.7	38.7	39.2	39.2
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H231	Predicted	20.9	22.4	26.9	31.3	32.4	32.5	32.5
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H232	Predicted	22.6	23.2	25.9	30.3	31.8	32.2	32.2
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H233	Predicted	21.2	22.6	26.9	31.3	32.4	32.5	32.5
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H234	Predicted	20.1	21.6	26.1	30.5	31.6	31.7	31.7
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H235	Predicted	20.8	22.3	26.8	31.2	32.3	32.4	32.4
	Daytime Criterion	45	45	45	45	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	45	45	45	45	45	45	45
	Night-time Excess	--	--	--	--	--	--	--
H236	Predicted	19.9	21.4	25.9	30.3	31.4	31.5	31.5
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H237	Predicted	20.2	21.7	26.2	30.6	31.7	31.8	31.8
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H238	Predicted	20.1	21.6	26.1	30.5	31.6	31.7	31.7
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43

House	Parameter	Predicted Noise Level, dB LA90 at wind speed m/s at standardised 10m height						
		3	4	5	6	7	8	9
H239	Night-time Excess	--	--	--	--	--	--	--
	Predicted	20.8	22.2	26.8	31.2	32.2	32.4	32.4
	Daytime Criterion	45	45	45	45	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	45	45	45	45	45	45	45
H240	Night-time Excess	--	--	--	--	--	--	--
	Predicted	20.0	21.5	26.0	30.4	31.5	31.6	31.6
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
H241	Night-time Excess	--	--	--	--	--	--	--
	Predicted	21.6	22.9	27.0	31.4	32.6	32.7	32.7
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
H242	Night-time Excess	--	--	--	--	--	--	--
	Predicted	20.3	21.8	26.3	30.7	31.8	31.9	31.9
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
H243	Night-time Excess	--	--	--	--	--	--	--
	Predicted	19.7	21.2	25.7	30.1	31.2	31.3	31.3
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
H244	Night-time Excess	--	--	--	--	--	--	--
	Predicted	19.8	21.3	25.8	30.2	31.3	31.4	31.4
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
H245	Night-time Excess	--	--	--	--	--	--	--
	Predicted	25.0	25.8	28.8	33.2	34.7	35.0	35.0
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
H246	Night-time Excess	--	--	--	--	--	--	--
	Predicted	19.9	21.4	25.9	30.3	31.4	31.5	31.5
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
H247	Night-time Excess	--	--	--	--	--	--	--
	Predicted	19.6	21.1	25.6	30.0	31.1	31.2	31.2
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
H248	Night-time Excess	--	--	--	--	--	--	--
	Predicted	24.9	25.7	28.7	33.1	34.6	34.9	34.9
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
H249	Night-time Excess	--	--	--	--	--	--	--
	Predicted	19.5	21.0	25.5	29.9	31.0	31.1	31.1

House	Parameter	Predicted Noise Level, dB LA90 at windspeed m/s at standardised 10m height						
		3	4	5	6	7	8	9
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	19.4	20.9	25.4	29.8	30.9	31.0	31.0
H250	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	19.4	20.9	25.4	29.8	30.9	31.0	31.0
H251	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	19.4	20.9	25.4	29.8	30.9	31.0	31.0
H252	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	24.7	25.4	28.4	32.8	34.3	34.6	34.6
H253	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	24.5	25.3	28.2	32.6	34.1	34.4	34.4
H254	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	29.0	29.2	30.4	34.8	36.9	37.4	37.4
H255	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	27.0	27.4	29.2	33.6	35.5	35.9	35.9
H256	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	31.9	31.9	32.3	36.7	39.2	39.8	39.8
H257	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	30.0	30.3	31.5	35.9	38.0	38.5	38.5
H258	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	34.2	34.3	34.8	39.2	41.6	42.2	42.2
H259	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Predicted	29.4	29.6	30.3	34.7	37.0	37.6	37.6

House	Parameter	Predicted Noise Level, dB LA90 at wind speed m/s at standardised 10m height						
		3	4	5	6	7	8	9
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H260	Predicted	35.8	35.9	36.2	40.6	43.1	43.7	43.7
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	0.6	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	0.1	0.7	0.7
H261	Predicted	32.1	32.2	33.1	37.5	39.7	40.3	40.3
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H262	Predicted	29.1	29.3	30.0	34.4	36.7	37.3	37.3
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H263	Predicted	29.5	29.8	31.2	35.6	37.6	38.1	38.1
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H264	Predicted	30.2	30.6	32.5	36.9	38.7	39.1	39.1
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H265	Predicted	30.5	30.8	32.1	36.5	38.5	39.0	39.0
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H266	Predicted	34.7	34.8	35.3	39.7	42.0	42.7	42.7
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H267	Predicted	30.4	30.6	31.9	36.3	38.4	38.9	38.9
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H268	Predicted	28.1	28.3	29.6	34.0	36.1	36.6	36.6
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H269	Predicted	22.0	23.5	28.0	32.4	33.5	33.6	33.6
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--

House	Parameter	Predicted Noise Level, d _{BLA90} at wind speed m/s at standardised 10m height						
		3	4	5	6	7	8	9
H270	Predicted	24.9	26.1	30.1	34.5	35.8	35.9	35.9
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H271	Predicted	21.8	22.7	26.3	30.7	32.0	32.2	32.2
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H272	Predicted	25.9	27.3	31.8	36.2	37.3	37.4	37.4
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H273	Predicted	23.2	24.6	29.0	33.4	34.5	34.6	34.6
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H274	Predicted	21.4	22.9	27.4	31.8	32.9	33.0	33.0
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H275	Predicted	25.5	26.2	29.0	33.4	35.0	35.3	35.3
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H276	Predicted	21.7	22.9	26.7	31.1	32.4	32.5	32.5
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--



APPENDIX 7

PREDICTED CUMULATIVE OMNI-DIRECTIONAL NOISE LEVELS

APPENDIX 7 – CUMULATIVE NOISE LEVELS

Table B-1 below presents the cumulative noise levels, i.e. including the Proposed Wind Farm and Foyle Wind Farm at each NSL, compared to day and night-time noise criteria.

Table B-1. Predicted Noise Level at Noise-sensitive locations

House	Parameter	Predicted Noise Level, dB LA90 at wind speed m/s at standardised 10m height						
		3	4	5	6	7	8	9
H001	Predicted	32.5	34.0	38.4	42.8	43.9	44.0	44.0
	Daytime Criterion	45	45	45	45	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	45	45	45	45	45	45	45
	Night-time Excess	--	--	--	--	--	--	--
H002	Predicted	31.6	33.0	37.5	41.9	43.0	43.1	43.1
	Daytime Criterion	45	45	45	45	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	45	45	45	45	45	45	45
	Night-time Excess	--	--	--	--	--	--	--
H003	Predicted	26.4	27.7	31.8	36.2	37.4	37.5	37.5
	Daytime Criterion	45	45	45	45	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	45	45	45	45	45	45	45
	Night-time Excess	--	--	--	--	--	--	--
H004	Predicted	31.1	32.6	37.0	41.4	42.5	42.6	42.6
	Daytime Criterion	45	45	45	45	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	45	45	45	45	45	45	45
	Night-time Excess	--	--	--	--	--	--	--
H005	Predicted	29.8	31.2	35.6	40.0	41.1	41.3	41.3
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H006	Predicted	24.9	26.1	30.3	34.7	35.8	36.0	36.0
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H007	Predicted	29.4	30.6	34.6	39.0	40.3	40.4	40.4
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H008	Predicted	30.0	31.5	36.0	40.4	41.5	41.6	41.6
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	0.4	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H009	Predicted	33.0	34.5	38.8	43.2	44.4	44.5	44.5
	Daytime Criterion	45	45	45	45	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	45	45	45	45	45	45	45
	Night-time Excess	--	--	--	--	--	--	--

House	Parameter	Predicted Noise Level, dB L _{A90} at wind speed m/s at standardised 10m height						
		3	4	5	6	7	8	9
H010	Predicted	24.8	26.0	30.2	34.6	35.7	35.9	35.9
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H011	Predicted	24.7	26.0	30.1	34.5	35.7	35.9	35.9
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H012	Predicted	30.3	31.8	36.2	40.6	41.8	41.8	41.8
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	0.6	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H013	Predicted	29.5	31.0	35.4	39.8	41.0	41.1	41.1
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H014	Predicted	28.1	29.5	33.7	38.1	39.3	39.4	39.4
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H015	Predicted	25.3	26.6	30.6	35.0	36.2	36.4	36.4
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H016	Predicted	24.6	25.9	30.0	34.4	35.6	35.7	35.7
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H017	Predicted	24.6	25.9	30.0	34.4	35.6	35.7	35.7
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H018	Predicted	24.6	25.9	30.0	34.4	35.6	35.7	35.7
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H019	Predicted	24.6	25.9	30.0	34.4	35.6	35.7	35.7
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H020	Predicted	24.6	25.9	30.0	34.4	35.6	35.7	35.7
	Daytime Criterion	40	40	40	40	45	45	45

House	Parameter	Predicted Noise Levls, dB LA90 at wind speeds m/s at standardised 10m height						
		3	4	5	6	7	8	9
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	24.6	25.9	30.0	34.4	35.6	35.7	35.7
H021	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	24.6	25.9	30.0	34.4	35.6	35.7	35.7
H022	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	24.6	25.9	30.0	34.4	35.6	35.7	35.7
H023	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	24.6	25.9	30.0	34.4	35.6	35.7	35.7
H024	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	24.8	26.1	30.3	34.7	35.8	36.0	36.0
H025	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	24.6	25.9	30.0	34.4	35.6	35.7	35.7
H026	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	24.6	25.9	30.0	34.4	35.6	35.7	35.7
H027	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	24.6	25.9	29.9	34.3	35.5	35.7	35.7
H028	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	24.6	25.9	29.9	34.3	35.5	35.7	35.7
H029	Daytime Criterion	45	45	45	45	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	45	45	45	45	45	45	45
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	24.6	25.8	30.0	34.4	35.6	35.7	35.7
H030	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--

House	Parameter	Predicted Noise Level, dB LA90 at wind speed m/s at standardised 10m height						
		3	4	5	6	7	8	9
	Night-time Excess	--	--	--	--	--	--	--
H031	Predicted	25.4	26.6	30.7	35.1	36.3	36.4	36.4
	Daytime Criterion	45	45	45	45	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	45	45	45	45	45	45	45
	Night-time Excess	--	--	--	--	--	--	--
H032	Predicted	24.6	25.8	29.9	34.3	35.5	35.7	35.7
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H033	Predicted	25.6	26.8	30.8	35.2	36.4	36.6	36.6
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H034	Predicted	29.1	30.2	34.1	38.5	39.8	39.9	39.9
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H035	Predicted	29.3	30.8	35.2	39.6	40.8	40.8	40.8
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H036	Predicted	25.8	27.0	31.0	35.4	36.7	36.8	36.8
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H037	Predicted	28.6	30.0	34.3	38.7	39.8	40.0	40.0
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H038	Predicted	29.7	31.0	35.2	39.6	40.8	40.9	40.9
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H039	Predicted	24.8	26.0	30.1	34.5	35.7	35.8	35.8
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H040	Predicted	25.2	26.4	30.5	34.9	36.1	36.2	36.2
	Daytime Criterion	45	45	45	45	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	45	45	45	45	45	45	45
	Night-time Excess	--	--	--	--	--	--	--
H041	Predicted	25.4	26.6	30.6	35.0	36.2	36.4	36.4

House	Parameter	Predicted Noise Level, dB LA90 at wind speed m/s at standardised 10m height						
		3	4	5	6	7	8	9
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H042	Predicted	25.6	26.8	30.8	35.2	36.4	36.6	36.6
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H043	Predicted	29.6	30.9	35.0	39.4	40.6	40.7	40.7
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H044	Predicted	28.8	30.3	34.8	39.2	40.3	40.4	40.4
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H045	Predicted	28.7	30.1	34.5	38.9	40.1	40.1	40.1
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H046	Predicted	29.6	30.9	35.1	39.5	40.7	40.8	40.8
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H047	Predicted	24.3	25.6	29.6	34.0	35.2	35.4	35.4
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H048	Predicted	30.2	31.6	35.8	40.2	41.4	41.5	41.5
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	0.2	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H049	Predicted	29.0	30.1	34.0	38.4	39.6	39.8	39.8
	Daytime Criterion	40	40	45	45	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H050	Predicted	24.8	26.1	30.1	34.5	35.7	35.9	35.9
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H051	Predicted	27.2	28.4	32.4	36.8	38.0	38.2	38.2
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--

House	Parameter	Predicted Noise Level, dB LA90 at wind speed m/s at standardised 10m height						
		3	4	5	6	7	8	9
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H052	Predicted	25.3	26.5	30.5	34.9	36.1	36.3	36.3
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	28.9	30.1	34.2	38.6	39.8	40.0	40.0
H053	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	29.6	30.9	35.0	39.4	40.6	40.8	40.8
	Daytime Criterion	40	40	40	40	45	45	45
H054	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	26.5	27.6	31.6	36.0	37.2	37.4	37.4
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
H055	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	29.7	31.0	35.2	39.6	40.8	40.9	40.9
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
H056	Night-time Excess	--	--	--	--	--	--	--
	Predicted	25.0	26.2	30.1	34.5	35.8	35.9	35.9
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H057	Predicted	27.7	28.9	32.8	37.2	38.5	38.6	38.6
	Daytime Criterion	45	45	45	45	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	45	45	45	45	45	45	45
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	25.2	26.4	30.4	34.8	36.0	36.2	36.2
H058	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	29.9	31.2	35.4	39.8	41.0	41.1	41.1
	Daytime Criterion	40	40	45	45	45	45	45.7
H059	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	44.7
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	29.8	31.1	35.3	39.7	40.9	41.0	41.0
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
H060	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	29.8	31.1	35.3	39.7	40.9	41.0	41.0
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
H061	Night-time Excess	--	--	--	--	--	--	--

House	Parameter	Predicted Noise Level, dB LA90 at wind speed m/s at standardised 10m height						
		3	4	5	6	7	8	9
H062	Predicted	29.2	30.6	34.9	39.3	40.4	40.5	40.5
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Nighttime Excess	--	--	--	--	--	--	--
H063	Predicted	25.2	26.4	30.3	34.7	36.0	36.1	36.1
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H064	Predicted	28.2	29.6	34.0	38.4	39.5	39.6	39.6
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H065	Predicted	26.1	27.3	31.4	35.8	37.0	37.2	37.2
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Nighttime Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H066	Predicted	24.8	26.0	30.0	34.4	35.6	35.8	35.8
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H067	Predicted	27.7	28.9	32.8	37.2	38.5	38.6	38.6
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H068	Predicted	28.2	29.4	33.4	37.8	39.0	39.2	39.2
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H069	Predicted	28.0	29.2	33.2	37.6	38.8	38.9	38.9
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H070	Predicted	25.3	26.5	30.6	35.0	36.2	36.3	36.3
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Nighttime Excess	--	--	--	--	--	--	--
H071	Predicted	24.0	25.3	29.4	33.8	35.0	35.1	35.1
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H072	Predicted	24.2	25.4	29.4	33.8	35.1	35.2	35.2
	Daytime Criterion	40	40	40	40	45	45	45

House	Parameter	Predicted Noise Level, dB LA90 at wind speed m/s at standardised 10m height						
		3	4	5	6	7	8	9
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H073	Predicted	27.7	29.2	33.6	38.0	39.1	39.2	39.2
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H074	Predicted	24.5	25.7	29.7	34.1	35.3	35.5	35.5
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H075	Predicted	29.9	31.2	35.5	39.9	41.0	41.2	41.2
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H076	Predicted	24.7	25.9	29.9	34.3	35.5	35.7	35.7
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H077	Predicted	23.8	25.1	29.1	33.5	34.7	34.8	34.8
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H078	Predicted	23.8	25.0	29.0	33.4	34.7	34.8	34.8
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H079	Predicted	28.3	29.5	33.4	37.8	39.0	39.2	39.2
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H080	Predicted	29.0	30.3	34.6	39.0	40.2	40.3	40.3
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H081	Predicted	23.8	25.0	29.0	33.4	34.6	34.8	34.8
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H082	Predicted	24.1	25.3	29.3	33.7	34.9	35.1	35.1
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43

House	Parameter	Predicted Noise Level, dB LA90 at wind speed m/s at standardised 10m height						
		3	4	5	6	7	8	9
	Night-time Excess	--	--	--	--	--	--	--
H083	Predicted	29.2	30.6	34.8	39.2	40.4	40.5	40.5
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H084	Predicted	24.4	25.6	29.6	34.0	35.2	35.3	35.3
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H085	Predicted	26.5	27.8	32.0	36.4	37.6	37.7	37.7
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H086	Predicted	28.9	30.1	34.1	38.5	39.7	39.8	39.8
	Daytime Criterion	45	45	45	45	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	45	45	45	45	45	45	45
	Night-time Excess	--	--	--	--	--	--	--
H087	Predicted	25.0	26.2	30.0	34.4	35.7	35.9	35.9
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H088	Predicted	24.6	25.8	29.8	34.2	35.4	35.6	35.6
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H089	Predicted	29.6	31.0	35.2	39.6	40.8	40.9	40.9
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H090	Predicted	23.6	24.8	28.8	33.2	34.4	34.6	34.6
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H091	Predicted	23.6	24.8	28.8	33.2	34.4	34.6	34.6
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H092	Predicted	23.6	24.8	28.8	33.2	34.4	34.6	34.6
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H093	Predicted	28.7	29.7	33.3	37.7	39.0	39.2	39.2

House	Parameter	Predicted Noise Level, dB L _{A90} at wind speed m/s at standardised 10m height						
		3	4	5	6	7	8	9
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	24.6	25.8	29.8	34.2	35.4	35.6	35.6
H094	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	23.5	24.7	28.7	33.1	34.4	34.5	34.5
H095	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	23.5	24.7	28.7	33.1	34.4	34.5	34.5
H096	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	23.5	24.7	28.7	33.1	34.4	34.5	34.5
H097	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	23.5	24.7	28.7	33.1	34.3	34.5	34.5
H098	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	23.5	24.7	28.7	33.1	34.3	34.5	34.5
H099	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	24.2	25.4	29.3	33.7	34.9	35.1	35.1
H100	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	23.5	24.7	28.7	33.1	34.3	34.4	34.4
H101	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	23.4	24.6	28.6	33.0	34.2	34.4	34.4
H102	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	24.6	25.8	29.6	34.0	35.3	35.4	35.4
H103	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Predicted	23.4	24.6	28.6	33.0	34.2	34.4	34.4

House	Parameter	Predicted Noise Level, dB LA90 at wind speed m/s at standardised 10m height						
		3	4	5	6	7	8	9
H104	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	28.6	29.6	33.1	37.5	38.8	39.0	39.0
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
H105	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	24.2	25.3	29.2	33.6	34.9	35.0	35.0
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
H106	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	29.5	30.9	35.1	39.5	40.7	40.8	40.8
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
H107	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	26.7	28.2	32.6	37.0	38.1	38.2	38.2
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
H108	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	28.7	29.8	33.5	37.9	39.2	39.4	39.4
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
H109	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	28.7	29.8	33.5	37.9	39.2	39.4	39.4
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
H110	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	26.5	27.8	32.0	36.4	37.5	37.7	37.7
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
H111	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	24.2	25.4	29.2	33.6	34.9	35.0	35.0
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
H112	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	25.6	26.7	30.3	34.7	36.0	36.2	36.2
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
H113	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	24.0	25.1	28.9	33.3	34.6	34.8	34.8
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--

House	Parameter	Predicted Noise Level, dB LA90 at wind speed m/s at standardised 10m height						
		3	4	5	6	7	8	9
H114	Predicted	23.0	24.1	28.1	32.5	33.7	33.9	33.9
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H115	Predicted	23.8	25.0	28.8	33.2	34.4	34.6	34.6
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H116	Predicted	26.3	27.7	31.9	36.3	37.5	37.6	37.6
	Daytime Criterion	45	45	45	45	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	45	45	45	45	45	45	45
	Night-time Excess	--	--	--	--	--	--	--
H117	Predicted	26.9	28.2	32.4	36.8	38.0	38.1	38.1
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H118	Predicted	22.8	24.0	27.9	32.3	33.6	33.7	33.7
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H119	Predicted	26.2	27.5	31.8	36.2	37.3	37.4	37.4
	Daytime Criterion	45	45	45	45	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	45	45	45	45	45	45	45
	Night-time Excess	--	--	--	--	--	--	--
H120	Predicted	25.4	26.4	30.0	34.4	35.8	36.0	36.0
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H121	Predicted	25.3	26.8	31.3	35.7	36.8	36.9	36.9
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H122	Predicted	23.7	24.8	28.6	33.0	34.2	34.4	34.4
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H123	Predicted	22.7	23.8	27.8	32.2	33.4	33.6	33.6
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H124	Predicted	28.5	29.8	33.8	38.2	39.4	39.6	39.6
	Daytime Criterion	40	40	40	40	45	45	45

House	Parameter	Predicted Noise Level, dB LA90 at wind speed m/s at standardised 10m height						
		3	4	5	6	7	8	9
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	23.6	24.7	28.5	32.9	34.2	34.4	34.4
H125	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	28.8	30.1	34.2	38.6	39.8	40.0	40.0
H126	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	28.4	29.6	33.6	38.0	39.2	39.4	39.4
H127	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	22.6	23.8	27.6	32.0	33.3	33.4	33.4
H128	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	23.5	24.6	28.4	32.8	34.0	34.2	34.2
H129	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	25.1	26.6	31.1	35.5	36.6	36.7	36.7
H130	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	26.2	27.5	31.7	36.1	37.3	37.4	37.4
H131	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	26.7	27.6	31.0	35.4	36.8	37.0	37.0
H132	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	23.3	24.4	28.1	32.5	33.8	34.0	34.0
H133	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	23.4	24.5	28.2	32.6	33.9	34.1	34.1
H134	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--

House	Parameter	Predicted Noise Level, dB L _{A90} at wind speed m/s at standardised 10m height						
		3	4	5	6	7	8	9
	Night-time Excess	--	--	--	--	--	--	--
H135	Predicted	28.3	29.6	33.7	38.1	39.3	39.4	39.4
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H136	Predicted	26.2	27.6	32.0	36.4	37.6	37.7	37.7
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H137	Predicted	26.0	27.3	31.6	36.0	37.1	37.2	37.2
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H138	Predicted	26.3	27.6	31.9	36.3	37.5	37.6	37.6
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H139	Predicted	22.3	23.4	27.2	31.6	32.9	33.1	33.1
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H140	Predicted	26.9	28.3	32.6	37.0	38.2	38.3	38.3
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H141	Predicted	23.0	24.1	27.8	32.2	33.5	33.7	33.7
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H142	Predicted	25.3	26.2	29.5	33.9	35.3	35.5	35.5
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H143	Predicted	24.1	25.6	30.1	34.5	35.6	35.7	35.7
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H144	Predicted	24.0	25.5	30.0	34.4	35.5	35.6	35.6
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H145	Predicted	25.3	26.2	29.4	33.8	35.2	35.5	35.5

House	Parameter	Predicted Noise Level, dB LA90 at wind speed m/s at standardised 10m height						
		3	4	5	6	7	8	9
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Nighttime Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	25.6	26.4	29.7	34.1	35.5	35.8	35.8
H146	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	23.5	25.0	29.5	33.9	35.0	35.1	35.1
H147	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	21.8	22.9	26.9	31.3	32.5	32.7	32.7
H148	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	25.4	26.2	29.4	33.8	35.2	35.5	35.5
H149	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	25.4	26.2	29.4	33.8	35.2	35.5	35.5
H150	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	25.6	26.4	29.5	33.9	35.4	35.6	35.6
H151	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	24.9	26.3	30.6	35.0	36.2	36.3	36.3
H152	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	25.0	26.4	30.8	35.2	36.3	36.4	36.4
H153	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	25.5	26.9	31.2	35.6	36.7	36.9	36.9
H154	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	25.6	26.4	29.5	33.9	35.3	35.6	35.6
H155	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--

House	Parameter	Predicted Noise Level, dB LA90 at wind speed m/s at standardised 10m height						
		3	4	5	6	7	8	9
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H156	Predicted	26.0	27.4	31.7	36.1	37.2	37.4	37.4
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H157	Predicted	23.2	24.7	29.2	33.6	34.7	34.8	34.8
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H158	Predicted	21.6	22.7	26.6	31.0	32.2	32.4	32.4
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H159	Predicted	23.1	24.6	29.1	33.5	34.6	34.7	34.7
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H160	Predicted	23.8	25.3	29.6	34.0	35.2	35.3	35.3
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H161	Predicted	26.1	27.5	31.8	36.2	37.3	37.5	37.5
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H162	Predicted	22.1	23.2	26.9	31.3	32.6	32.8	32.8
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H163	Predicted	23.2	24.6	29.1	33.5	34.6	34.7	34.7
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H164	Predicted	22.0	23.1	26.8	31.2	32.5	32.7	32.7
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H165	Predicted	28.5	29.2	32.0	36.4	37.9	38.2	38.2
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--

House	Parameter	Predicted Noise Level, dBL _{A90} at wind speed m/s at standardised 10m height						
		3	4	5	6	7	8	9
H166	Predicted	23.6	25.1	29.6	34.0	35.1	35.2	35.2
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H167	Predicted	25.7	26.5	29.4	33.8	35.4	35.6	35.6
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H168	Predicted	21.9	23.0	26.7	31.1	32.4	32.6	32.6
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H169	Predicted	22.0	23.0	26.7	31.1	32.4	32.6	32.6
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H170	Predicted	22.6	24.1	28.6	33.0	34.1	34.2	34.2
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H171	Predicted	25.8	26.5	29.3	33.7	35.3	35.6	35.6
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H172	Predicted	22.7	24.2	28.7	33.1	34.2	34.3	34.3
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H173	Predicted	22.4	23.9	28.4	32.8	33.9	34.0	34.0
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H174	Predicted	22.4	23.9	28.4	32.8	33.9	34.0	34.0
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H175	Predicted	21.5	22.5	26.0	30.4	31.8	32.0	32.0
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H176	Predicted	22.3	23.8	28.3	32.7	33.8	33.9	33.9
	Daytime Criterion	40	40	40	40	45	45	45

House	Parameter	Predicted Noise Level, dB LA90 at wind speed m/s at standardised 10m height						
		3	4	5	6	7	8	9
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H177	Predicted	22.3	23.8	28.3	32.7	33.8	33.9	33.9
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H178	Predicted	26.0	27.1	30.9	35.3	36.5	36.7	36.7
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H179	Predicted	21.6	22.6	26.3	30.7	32.0	32.2	32.2
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H180	Predicted	22.8	24.2	28.6	33.0	34.1	34.2	34.2
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H181	Predicted	21.4	22.4	25.9	30.3	31.6	31.9	31.9
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H182	Predicted	21.5	22.6	26.3	30.7	32.0	32.2	32.2
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H183	Predicted	21.9	23.4	27.9	32.3	33.4	33.5	33.5
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H184	Predicted	22.5	24.0	28.5	32.9	34.0	34.1	34.1
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H185	Predicted	22.6	24.1	28.6	33.0	34.1	34.2	34.2
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H186	Predicted	22.3	23.8	28.3	32.7	33.8	33.9	33.9
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43

House	Parameter	Predicted Noise Level dB LA90 at wind speed m/s at standardised 10m height						
		3	4	5	6	7	8	9
	Night-time Excess	--	--	--	--	--	--	--
H187	Predicted	21.4	22.5	26.2	30.6	31.9	32.1	32.1
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H188	Predicted	21.8	23.4	27.8	32.2	33.4	33.4	33.4
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H189	Predicted	24.7	25.4	28.2	32.6	34.2	34.5	34.5
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H190	Predicted	21.3	22.2	25.7	30.1	31.5	31.7	31.7
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H191	Predicted	21.7	23.2	27.7	32.1	33.2	33.3	33.3
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H192	Predicted	21.3	22.8	27.3	31.7	32.8	32.9	32.9
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H193	Predicted	21.1	22.1	25.6	30.0	31.3	31.5	31.5
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H194	Predicted	26.1	26.7	29.1	33.5	35.2	35.6	35.6
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H195	Predicted	22.7	24.0	28.3	32.7	33.8	34.0	34.0
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H196	Predicted	30.1	30.5	32.4	36.8	38.6	39.1	39.1
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H197	Predicted	22.2	23.7	28.2	32.6	33.7	33.8	33.8

House	Parameter	Predicted Noise Level, dB LA90 at wind speed m/s at standardised 10m height						
		3	4	5	6	7	8	9
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	21.9	23.4	27.9	32.3	33.4	33.5	33.5
H198	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	20.9	21.9	25.4	29.8	31.2	31.4	31.4
H199	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	21.1	22.2	25.9	30.3	31.6	31.8	31.8
H200	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	21.8	23.3	27.8	32.2	33.3	33.4	33.4
H201	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	21.4	22.9	27.4	31.8	32.9	33.0	33.0
H202	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	22.2	23.6	28.0	32.4	33.5	33.6	33.6
H203	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	20.7	21.7	25.3	29.7	31.0	31.2	31.2
H204	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	21.0	22.0	25.8	30.2	31.4	31.6	31.6
H205	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	30.4	30.7	32.4	36.8	38.7	39.2	39.2
H206	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	21.2	22.7	27.2	31.6	32.7	32.8	32.8
H207	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--

House	Parameter	Predicted NoiseLevel, dB LA90 at wind speedm/ s at standardised10m height						
		3	4	5	6	7	8	9
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	30.6	30.9	32.5	36.9	38.9	39.4	39.4
H208	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	26.3	27.0	30.0	34.4	35.9	36.2	36.2
H209	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	21.8	23.3	27.8	32.2	33.3	33.4	33.4
H210	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	22.5	23.8	28.0	32.4	33.6	33.7	33.7
H211	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	26.2	26.7	29.0	33.4	35.1	35.5	35.5
H212	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	25.6	26.6	30.0	34.4	35.8	36.0	36.0
H213	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	20.3	21.4	25.0	29.4	30.7	30.9	30.9
H214	Daytime Criterion	45	45	45	45	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	45	45	45	45	45	45	45
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	21.0	22.5	27.0	31.4	32.5	32.6	32.6
H215	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	21.1	22.6	27.1	31.5	32.6	32.7	32.7
H216	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	22.0	22.8	25.8	30.2	31.7	31.9	31.9
H217	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	22.0	22.8	25.8	30.2	31.7	31.9	31.9

House	Parameter	Predicted Noise Level, dB LA90 at wind speed m/s at standardised 10m height						
		3	4	5	6	7	8	9
H218	Predicted	20.7	22.2	26.7	31.1	32.2	32.3	32.3
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H219	Predicted	21.0	21.8	25.2	29.6	31.0	31.2	31.2
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H220	Predicted	26.2	26.9	29.6	34.0	35.6	35.9	35.9
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H221	Predicted	21.3	22.8	27.3	31.7	32.8	32.9	32.9
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H222	Predicted	21.4	22.9	27.4	31.8	32.9	33.0	33.0
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H223	Predicted	21.1	22.6	27.1	31.5	32.6	32.7	32.7
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H224	Predicted	21.2	22.7	27.2	31.6	32.7	32.8	32.8
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H225	Predicted	20.4	21.5	25.4	29.8	31.0	31.2	31.2
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H226	Predicted	20.2	21.8	26.2	30.6	31.8	31.8	31.8
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H227	Predicted	20.5	22.0	26.5	30.9	32.0	32.1	32.1
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H228	Predicted	26.8	27.2	29.1	33.5	35.4	35.8	35.8
	Daytime Criterion	40	40	40	40	45	45	45

House	Parameter	Predicted Noise Level, dB LA90 at wind speed m/s at standardised 10m height						
		3	4	5	6	7	8	9
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H229	Predicted	26.4	26.9	28.8	33.2	35.0	35.5	35.5
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H230	Predicted	30.6	30.8	32.3	36.7	38.7	39.2	39.2
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H231	Predicted	20.9	22.4	26.9	31.3	32.4	32.5	32.5
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H232	Predicted	22.6	23.2	25.9	30.3	31.8	32.2	32.2
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H233	Predicted	21.2	22.6	26.9	31.3	32.4	32.5	32.5
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H234	Predicted	20.1	21.6	26.1	30.5	31.6	31.7	31.7
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H235	Predicted	20.8	22.3	26.8	31.2	32.3	32.4	32.4
	Daytime Criterion	45	45	45	45	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	45	45	45	45	45	45	45
	Night-time Excess	--	--	--	--	--	--	--
H236	Predicted	19.9	21.4	25.9	30.3	31.4	31.5	31.5
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H237	Predicted	20.2	21.7	26.2	30.6	31.7	31.8	31.8
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H238	Predicted	20.1	21.6	26.1	30.5	31.6	31.7	31.7
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43

House	Parameter	Predicted Noise Level, dB L _{A90} at wind speed m/s at standardised 10m height						
		3	4	5	6	7	8	9
	Night-time Excess	--	--	--	--	--	--	--
H239	Predicted	20.8	22.2	26.8	31.2	32.2	32.4	32.4
	Daytime Criterion	45	45	45	45	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	45	45	45	45	45	45	45
	Night-time Excess	--	--	--	--	--	--	--
H240	Predicted	20.0	21.5	26.0	30.4	31.5	31.6	31.6
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H241	Predicted	21.6	22.9	27.0	31.4	32.6	32.7	32.7
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H242	Predicted	20.3	21.8	26.3	30.7	31.8	31.9	31.9
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H243	Predicted	19.7	21.2	25.7	30.1	31.2	31.3	31.3
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H244	Predicted	19.8	21.3	25.8	30.2	31.3	31.4	31.4
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H245	Predicted	25.0	25.8	28.8	33.2	34.7	35.0	35.0
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H246	Predicted	19.9	21.4	25.9	30.3	31.4	31.5	31.5
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H247	Predicted	19.6	21.1	25.6	30.0	31.1	31.2	31.2
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H248	Predicted	24.9	25.7	28.7	33.1	34.6	34.9	34.9
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H249	Predicted	19.5	21.0	25.5	29.9	31.0	31.1	31.1

House	Parameter	Predicted Noise Level, dB LA90 at wind speed m/s at standardised 10m height						
		3	4	5	6	7	8	9
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H250	Predicted	19.4	20.9	25.4	29.8	30.9	31.0	31.0
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H251	Predicted	19.4	20.9	25.4	29.8	30.9	31.0	31.0
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H252	Predicted	24.7	25.4	28.4	32.8	34.3	34.6	34.6
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H253	Predicted	24.5	25.3	28.2	32.6	34.1	34.4	34.4
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H254	Predicted	29.0	29.2	30.4	34.8	36.9	37.4	37.4
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H255	Predicted	27.0	27.4	29.2	33.6	35.5	35.9	35.9
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H256	Predicted	31.9	31.9	32.3	36.7	39.2	39.8	39.8
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H257	Predicted	30.0	30.3	31.5	35.9	38.0	38.5	38.5
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H258	Predicted	34.2	34.3	34.8	39.2	41.6	42.2	42.2
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H259	Predicted	29.4	29.6	30.3	34.7	37.0	37.6	37.6
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--

House	Parameter	Predicted Noise Level, dB LA90 at wind speed m/s at standardised 10m height						
		3	4	5	6	7	8	9
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H260	Predicted	35.8	35.9	36.2	40.6	43.1	43.7	43.7
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	0.6	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	0.1	0.7	0.7
	Predicted	32.1	32.2	33.1	37.5	39.7	40.3	40.3
H261	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	29.1	29.3	30.0	34.4	36.7	37.3	37.3
	Daytime Criterion	40	40	40	40	45	45	45
H262	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	29.5	29.8	31.2	35.6	37.6	38.1	38.1
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
H263	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	30.2	30.6	32.5	36.9	38.7	39.1	39.1
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
H264	Night-time Excess	--	--	--	--	--	--	--
	Predicted	30.5	30.8	32.1	36.5	38.5	39.0	39.0
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H265	Predicted	34.7	34.8	35.3	39.7	42.0	42.7	42.7
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	30.4	30.6	31.9	36.3	38.4	38.9	38.9
H266	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	28.1	28.3	29.6	34.0	36.1	36.6	36.6
	Daytime Criterion	40	40	40	40	45	45	45
H267	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	22.0	23.5	28.0	32.4	33.5	33.6	33.6
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
H268	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
	Predicted	22.0	23.5	28.0	32.4	33.5	33.6	33.6
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
H269	Night-time Excess	--	--	--	--	--	--	--

House	Parameter	Predicted Noise Level, dB LA90 at wind speed m/s at standardised 10m height						
		3	4	5	6	7	8	9
H270	Predicted	24.9	26.1	30.1	34.5	35.8	35.9	35.9
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H271	Predicted	21.8	22.7	26.3	30.7	32.0	32.2	32.2
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H272	Predicted	25.9	27.3	31.8	36.2	37.3	37.4	37.4
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H273	Predicted	23.2	24.6	29.0	33.4	34.5	34.6	34.6
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H274	Predicted	21.4	22.9	27.4	31.8	32.9	33.0	33.0
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H275	Predicted	25.5	26.2	29.0	33.4	35.0	35.3	35.3
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--
H276	Predicted	21.7	22.9	26.7	31.1	32.4	32.5	32.5
	Daytime Criterion	40	40	40	40	45	45	45
	Daytime Excess	--	--	--	--	--	--	--
	Night-time Criterion	43	43	43	43	43	43	43
	Night-time Excess	--	--	--	--	--	--	--

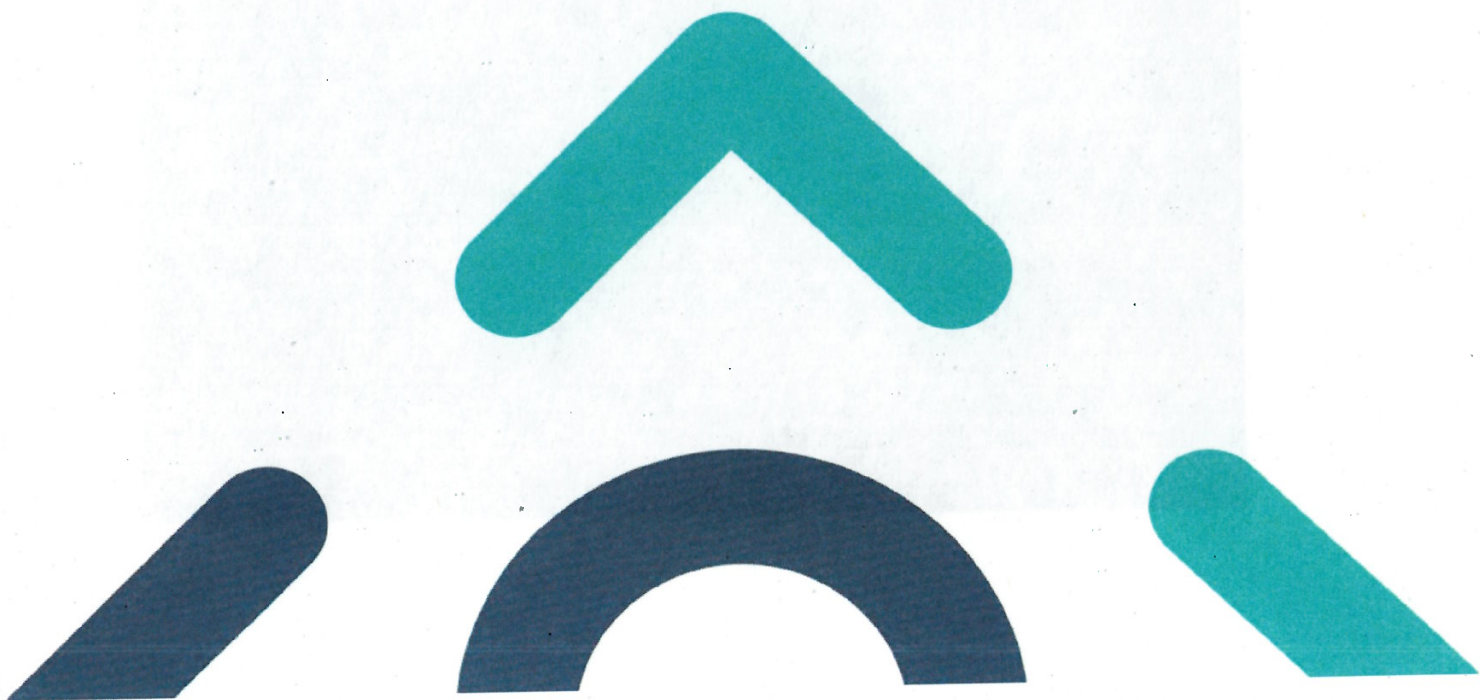


APPENDIX 4

REVISED BAT SURVEY REPORT

Appendix 6-2 – Bat Survey Report

Briskalagh Renewable
Energy Development, Co.
Kilkenny





DOCUMENT DETAILS

Client: **Briskalagh Ltd.**

Project Title: **Briskalagh Renewable Energy Development,
Co. Kilkenny**

Project Number: **230502-h**

Document Title: **Bat Survey Report**

Document File Name: **Appendix 6-2 Bat Survey Report - F -
2024.10.03 - 230502-h**

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Rev	Status	Date	Author(s)	Approved By
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F2	Final 2 (Amended)	16/10/2025	RC	AJ



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APPENDICES

Appendix 1 – Bat Habitat Suitability Appraisal

Appendix 2 – Site Risk Assessment

Appendix 3 – Overall Site Risk Assessment

INTRODUCTION

MKO was commissioned to complete a comprehensive assessment of the potential effects on bats, as part of an application for planning permission of a renewable energy development at Briskalagh and adjacent townlands, near Kilmanagh in Co. Kilkenny. This report provides details of the bat surveys undertaken, including survey design, methods and results, and the assessment of potential effects of the Proposed Project on bats. Where necessary, mitigation is prescribed to minimise any identified significant effects.

Bat surveys were predominantly undertaken throughout 2023, with surveys of the Proposed Grid Connection completed in March of 2024, and are consistent with the methodologies described in NatureScot 2021¹. Bat surveys employed a combination of methods, including desktop study, habitat and landscape assessments, roost inspections, manual activity surveys and static detector surveys at ground level. Surveys in 2023 were based on an indicative turbine layout of 8 turbines. The final design includes 7 no. turbines.

The assessment and mitigation provided in this report has been designed in accordance with NatureScot 2021. Consideration was also given to the Northern Ireland Environment Agency (NIEA) Natural Environment Division (NED) Guidance², which was produced in August 2021 (amended March 2024).

As detailed in Section 1.1.1 in Chapter 1, for the purposes of this EIAR, the various project components are described and assessed using the following references: 'Proposed Project', 'Proposed Wind Farm', 'Proposed Grid Connection' and the 'Site'. Please see Section 1.1.1 of this EIAR for further details.

A detailed description of the Proposed Project is provided in Chapter 4 of this EIAR.

Briskalagh Ltd. submitted an application to Kilkenny County Council on 3rd January 2025 for planning permission to construct the proposed renewable energy development (Planning Reference: KCC Pl. Ref. 2560003). On 27th February 2025, the Council refused permission for the development. Briskalagh Ltd. subsequently appealed this decision to An Coimisiún Pleanála on 26th March 2025.

On 15th July 2025, the Commission issued a Further Information Request seeking clarification on several items. A number of these items relate to biodiversity considerations addressed in the Biodiversity Chapter of the Environmental Impact Assessment Report (EIAR) submitted as part of the original application (KCC Pl. Ref. 2560003).

To fully respond to this request and provide a comprehensive assessment of potential biodiversity impacts, the Biodiversity Chapter and Bat Survey Report have been updated accordingly. In this document, updates to the Bat Report are shown in green text, while deletions are indicated with red strikethrough text.

Background

Wind energy provides a clean, sustainable alternative to fossil fuels in generating electricity. However, wind energy development can impact wildlife, directly through mortality and indirectly through disturbance and habitat loss. Bat fatalities have been reported at wind energy facilities around the world, raising concern about the cumulative impacts of such developments on bat populations (Arnett *et al.* 2016). No large-scale studies have been undertaken in Ireland to date. However, a study from the UK estimated bat fatalities at between 0 – 5.25 bats per turbine per month (Mathews *et al.* 2016). While these results are not directly applicable to Ireland due to differences in bat species and behaviour, Ireland

¹ NatureScot published *Bats and Onshore Wind Turbines: Survey, Assessment and Mitigation*. Version: August 2021 (NatureScot, 2021).

² Northern Ireland Environment Agency Natural Environment Division (NED) published *Guidance on Bat Surveys, Assessment and Mitigation for Onshore Wind Turbine Developments in Northern Ireland* (NIEA, 2021).

shares more similarities with bat assemblages of Great Britain, when compared to those of mainland Europe.

Investigative research in North America and mainland Europe have revealed the mechanisms for bat mortality at wind turbines. Fatalities arise from direct collision with moving turbine blades (Horn *et al.* 2008, Cryan *et al.* 2014) and barotrauma (Baer Wald *et al.* 2008), i.e. internal injuries caused by air pressure changes. The reason why bats fly in the vicinity of wind turbines has been attributed to several different behavioural and environmental factors, e.g. habitat associations, weather conditions and, species ecology.

Pre-construction bat surveys are undertaken to provide a baseline to gain an insight into bat activity in the absence of turbines and to predict and mitigate against any future risks identified. This report primarily focuses on surveys conducted within the Proposed Wind Farm site. The Proposed Grid Connection (including the underground cabling route) was assessed as part of the multidisciplinary survey effort detailed in Chapter 6. Further details of the bridge assessment along the Proposed Grid Connection underground cabling route are outlined below. Survey design and analyses of results at the Proposed Wind Farm site were undertaken with reference to the latest policy and legislation, scientific literature and industry guidelines. Any spatial, temporal or behavioural factors that may put bats at risk were fully considered.

Bat Survey and Assessment Guidance

Several guidelines for surveying bats at wind energy developments have been produced in Europe, the UK and Ireland.

At a European level, the Advisory Committee to the EUROBATS Agreement, to which Ireland is a signatory, have produced Guidelines for Consideration of Bats in Wind Farm Projects which outlines an approach for assessing the potential impacts of wind turbines on bats during planning, construction and operation phases (Rodrigues, 2015). However, these guidelines are based on continental scenarios and include more diverse species and behaviours than those typical of Ireland. As such, EUROBATS guidance may recommend a level of survey that may prove inappropriate in Irish scenarios. Nevertheless, the guidance is evidence-based and provides a useful European context, within which Member States are encouraged to produce specific national guidance, focusing on local circumstances.

Bat Conservation Ireland produced Wind Turbine/Wind Farm Development Bat Survey Guidelines (BCI, 2012a). This document provides advice to practitioners and decision makers in Ireland on necessary qualifications for surveyors, health and safety considerations, pre-construction and post-construction survey methodologies and information to be included in a report. In the absence of comprehensive Irish research, these guidelines provide generalised methodology rather than detailed technical advice.

The second edition of the UK Bat Conservation Trust Bat Survey Good Practice Guidelines (Hundt, 2012) includes a chapter (Chapter 10) on survey methodologies for assessing the potential impacts of wind turbines on bats. The document provides technical guidance for consultants carrying out impact assessments. However, the recommendations are not based on any research findings specific to the UK. A third edition to the guidelines, published in early 2016, removed the chapter on surveying wind turbine developments. Prior to the publication of the BCT guidelines, Natural England's *Bat and Onshore Wind Turbines: Interim Guidance* provided an interpretation of the EUROBATS recommendations, as applied to onshore wind energy facilities in the UK (Natural England, 2014). In addition, the Chartered Institute of Ecology and Environmental Management (CIEEM) publishes advice on best practice as well as updates on the current state of knowledge in the *Technical Guidance Series* and in the quarterly publication *In Practice*.

In August 2021, NatureScot (formerly Scottish Natural Heritage), published *Bats and Onshore Wind Turbines: Survey, Assessment and Mitigation* (NatureScot, 2021). The 2021 version supersedes the 2019 version of the guidance. The purpose of the guidance is to help planners, developers and ecological

consultants to consider the potential effects of onshore wind energy developments on bats. The emphasis is on direct impacts such as collision mortality, but there is reference throughout to the need for a full impact assessment requiring wider consideration of other (indirect) effects. The Guidance replaces previous guidance on the subject; notably that published by Natural England and Chapter 10 of the Bat Conservation Trust publication, *Bat Surveys: Good Practice Guidelines (2nd edition)*, (Hundt, 2012) and tailors the generic EUROBATS guidance on assessing the impact of wind turbines on European bats (Rodrigues *et al.* (2014)). The document guides the user through the key elements of survey, impact assessment and mitigation.

The NIEA (NED) recently published *Guidance on Bat Surveys, Assessment and Mitigation for Onshore Wind Turbine Developments in Northern Ireland*. This new guidance follows and builds upon the recently updated NatureScot 2021 guidance. The latter guidance has set the industry standard since its publication in 2019. The NED guidance does not aim to replace the NatureScot guidance, but it does provide additional clarifications and recommendations regarding survey requirements and impact assessment in an Irish context.

The survey scope and assessment provided in this report are in accordance with NatureScot 2021 Guidance. This guidance has set the industry standard for best practice surveys at wind farms since its initial publication in 2019.

Irish Bats: Legislation, Policy and Status

Ireland has nine resident bat species, comprising more than half of Ireland's native terrestrial mammals (Montgomery *et al.*, 2014). All Irish bats are protected under European legislation, namely the Habitats Directive (92/43/EEC). All Irish species are listed under Annex IV of the Directive, requiring strict protection for individuals, their breeding sites and resting places. The lesser horseshoe bat (*Rhinolophus hipposideros*) is further listed under Annex II of the Directive, requiring the designation of conservation areas for the species. Under this Directive, Ireland is obliged to maintain the favourable conservation status of Annex-listed species. This Directive has been transposed into Irish law through the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477/2011, as amended).

In addition, Irish species are further protected by national legislation (Wildlife Acts 1976, as amended). Under this legislation, it is an offence to intentionally disturb, injure or kill a bat, or disturb its roost. Any work at a roost site must be carried out with the agreement of the National Parks and Wildlife Service (NPWS).

The NPWS monitors the conservation status of European protected habitats and species and reports their findings to the European Commission every 6 years in the form of an Article 17 Report. The most recent report for the Republic of Ireland was submitted in 2019. Table 1-1 summarises the current conservation status of Irish bat species and identified threats to Irish bat populations.

Table 1-1 Irish Bat Species Conservation Status and Threats (NWS 2019)

Bat Species	Conservation Status	Principal Threats
Common pipistrelle <i>Pipistrellus pipistrellus</i>	Favourable	A05 Removal of small landscape features for agricultural land parcel consolidation (M)
Soprano pipistrelle <i>Pipistrellus pygmaeus</i>	Favourable	A14 Livestock farming (without grazing) [impact of anti-helminthic dosing on dung fauna] (M)
Nathusius' pipistrelle <i>Pipistrellus nathusii</i>	Unknown	
Leisler's bat <i>Nyctalus leisleri</i>	Favourable	B09 Clear-cutting, removal of all trees (M) F01 Conversion from other land uses to housing, settlement or recreational areas (M)
Daubenton's bat <i>Myotis daubentoni</i>	Favourable	
Natterer's bat <i>Myotis nattereri</i>	Favourable	F02 Construction or modification (e.g. of housing and settlements) in existing urban or recreational areas (M)
Whiskered bat <i>Myotis mystacinus</i>	Favourable	F24 Residential or recreational activities and structures generating noise, light, heat or other forms of pollution (M)
Brown long-eared bat <i>Plecotus auritus</i>	Favourable	
Lesser horseshoe bat <i>Rhinolophus hipposideros</i>	Inadequate	H08 Other human intrusions and disturbance not mentioned above (Dumping, accidental and deliberate disturbance of bat roosts (e.g. caving) (M) L06 Interspecific relations (competition, predation, parasitism, pathogens) (M) M08 Flooding (natural processes) D01 Wind, wave and tidal power, including infrastructure (M)

Statement of Authority

MKO employs a dedicated bat unit within its Ecology team, dedicated to scoping, carrying out, and reporting on bat surveys, as well as producing impact assessments in relation to bats. MKO ecologists have relevant academic qualifications and are qualified in undertaking surveys to the levels required. MKO's Ecology team holds a bat derogation licence from NPWS. The licence is intended for professionals carrying out surveys with the potential to disturb roosting bats (i.e. roost inspections). Graduate and seasonal ecologist staff are covered under the licence under condition of being accompanied by more experienced colleagues.

Survey scoping was prepared by Aoife Joyce (BSc., MSc.). The daytime walkover survey and inspections were carried out by Ryan Connors (B.Sc., M.Sc.), Laura Gránicz (BSc., MSc.) and David Culleton (BSc., MSc.). Manual activity surveys were carried out by Ryan Connors, Laura Gránicz, Nora Szijarto (B.Sc., M.Sc.) and Deirdre McCarthy. Data manual ID were carried out by Ryan Connors. This report was prepared by Ryan Connors and was reviewed and approved by Aoife Joyce. Staff's roles, relevant ecological experience and training is presented in Table 1-2 below.

Table 1-2 Project team experience, qualifications and training.

Staff	Role	Training
Aoife Joyce (B.Sc., M.Sc.) 5 Years	Project Director	B.Sc. (Hons) Environmental Science, University of Galway, Ireland. M.Sc. (Hons) Agribioscience, University of Galway, Ireland. Advanced Bat Survey Techniques – Trapping, biometrics, handling (BCI), Bat Impacts and Mitigation (CIEEM), Bat Tree Roost Identification and Endoscope Training (BCI), Bats in Heritage Structures (BCI), Bats and Lighting (BCI), Kaleidoscope Pro Analysis (Wildlife Acoustics).
Laura Gránicz (B.Sc., M.Sc.) 2 years	Project Ecologist	B.Sc. Biology, University of Szeged, Hungary. M.Sc. Biology, University of Pécs, Hungary. Structure & Tree Inspection (Internal), Manual Transect Survey (Internal), Bat Habitat Appraisal (Internal), Emergence and Re-Entry Surveys (Internal), Advanced Bat Survey Techniques (BCI), Kaleidoscope Pro Analysis (Wildlife Acoustics).
Ryan Connors (B.Sc., M.Sc.) 1.5 years	Bat Ecologist	B.Sc. (Hons) Zoology, University College Galway, Ireland. M.Sc. (Hons) Conservation Behaviour, Atlantic Technological University, Galway, Ireland. Surveying Trees for Bats (BRTS), Structure & Tree Inspection (Internal), Manual Transect Survey (Internal), Bat Habitat Appraisal (Internal), Emergence and Re-Entry Surveys (Internal), Kaleidoscope Pro Analysis (Internal), Winter Tree Identification (Internal), Wintering Bird Surveying (Internal).
David Culleton (B.Sc., M.Sc.) 1.5 years	Bat Ecologist	B.Sc. (Hons) Zoology, University College Cork, Ireland. M.Sc. (Hons) Conservation Behaviour, Atlantic Technological University, Galway, Ireland. Bat Detector and Survey Training (BCI), Kaleidoscope Pro Analysis (Internal), Endoscope Training (Internal), Structure &

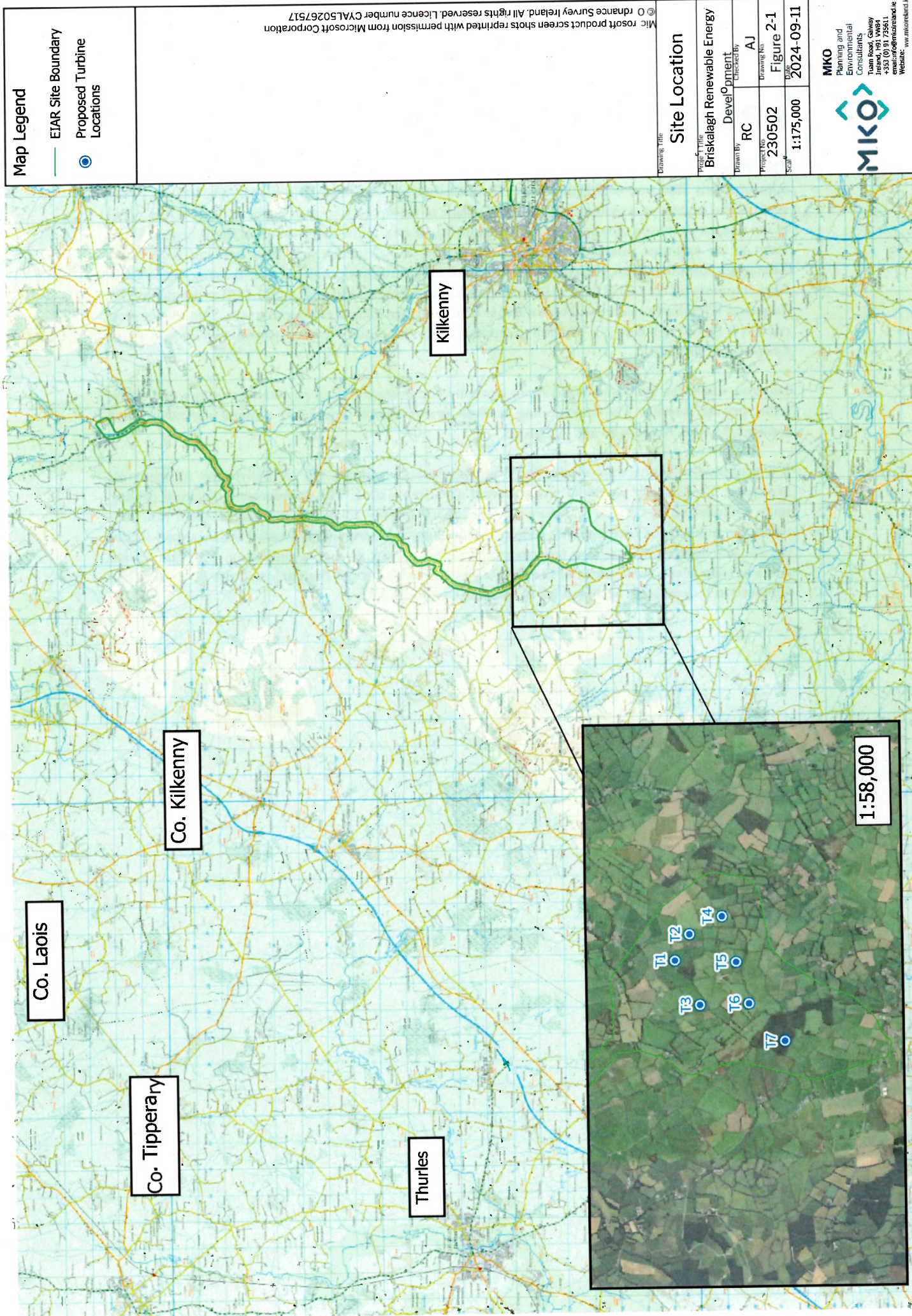
		Tree Inspection (Internal), Manual Transect Survey (Internal), Bat Habitat Appraisal (Internal), Emergence and Re-Entry Surveys (Internal).
Nora Szijarto (B.Sc., M.Sc.) 1.5 years	Bat Ecologist	B.Sc. Biology, University of Lausanne, Switzerland. M.Sc. Behaviour, Evolution and Conservation, University of Lausanne, Switzerland. Bat Detector and Survey Training (BCI), Kaleidoscope Pro Analysis (Wildlife acoustics), Endoscope Training (Internal), Structure & Tree Inspection (Internal), Manual Transect Survey (Internal), Bat Habitat Appraisal (Internal), Emergence and Re-Entry Surveys (Internal).
Deirdre McCarthy	Ecology Intern	Manual Transect Survey (Internal), Emergence and Re-Entry Surveys (Internal).

2. PROJECT DESCRIPTION

The Proposed Wind Farm is located within a rural, agricultural setting in northwest Kilkenny, approximately 9km west of Kilkenny City. The settlement of Kilmanagh is located approximately 1.2km south of the nearest proposed turbine, and the village of Tullaroan is located approximately 2.7km north of the nearest proposed turbine. The R695 regional road runs immediately south of the Proposed Wind Farm in an east-west orientation entering the village of Kilmanagh and then heading south from Kilmanagh towards Callan, passing within 1.3km of the nearest proposed turbine. Existing access is via farm entrances off the L5023 local road to the northwest, L5024 to the north, and L1009 to the south. The Proposed Wind Farm is traversed by a number of existing agricultural roads and tracks. The Site location context is shown in Figure 2-1. The full description of the Proposed Project is provided in Section 4.1 of Chapter 4 of this EIAR.

Landuse within the Proposed Wind Farm currently comprises a mix of pastoral agriculture and small-scale, private forestry. The surrounding landuse predominantly comprises pastoral agriculture and residential within Kilmanagh and Tullaroan.

It is proposed to connect the onsite 38 kV substation to the existing 110 kV Ballyragget substation in Moatpark, Co Kilkenny via 38 kV underground electrical cabling. The underground electrical cabling route is illustrated in Chapter 4, Figure 4-3. It is approximately 23km in length and located primarily within the public road corridor, with a short section (approximately 260m) located within a road within the Site and another short section (approximately 660m) passing through a number of agricultural fields and a private access track north of the Ballyragget substation. A full description of the Proposed Grid Connection is detailed in Section 4.1.2 of Chapter 4 of this EIAR.



3. METHODS

3.1 Consultation

A scoping exercise was undertaken as part of the EIAR for the Proposed Project. A Scoping Document, providing details of the application site and the Proposed Project, was prepared by MKO and circulated to consultees in November 2023. As part of this exercise, prominent Irish conservation groups were contacted, and Bat Conservation Ireland (BCI), and the Department of Housing, Local Government and Heritage-Development Applications Unit (NPWS) were specifically invited to comment on the potential of the Proposed Project to affect bats.

Details of consultation responses specifically related to bats are provided in Section 4.1 below.

3.2 Desk Study

A desk study of published material was undertaken prior to conducting field surveys. The aim was to provide context to the Proposed Wind Farm site in order to assist bat survey planning and assessment. This included the identification of designated sites, species of interest or any other potential risk factors within the Proposed Wind Farm site and the surrounding region. The results of the desk study including sources of information utilised are provided below.

3.2.1 Bat Records

The National Bat Database of Ireland holds records of bat observations received and maintained by BCI. These records include results of national monitoring schemes, roost records as well as ad-hoc observations. The most recent search examined bat presence and roost records within a 10km radius of a central point within the Proposed Wind Farm site (Grid Ref: S 39679 54103) (BCI 2012, Hundt 2012, NatureScot, 2021). Available bat records were provided by Bat Conservation Ireland on 04/06/2024. Results from the National Biodiversity Data Centre were also reviewed for bat species present within the relevant 10km grid squares of the Proposed Wind Farm site.

3.2.2 Bat Species' Range

EU member states are obliged to monitor the conservation status of natural habitats and species listed in the Annexes of the Habitats Directive. Under Article 17, they are required to report to the European Commission every six years. In April 2019, Ireland submitted the third assessment of conservation status for Annex-listed habitats and species, including all species of bats (NPWS, 2019).

The 2019 Article 17 Reports were reviewed for information on bat species' range and distribution in relation to the location of the Proposed Wind Farm site. The aim was to identify any high-risk species at the edge of their range (NatureScot, 2021).

3.2.3 Designated Sites

The National Parks and Wildlife Service (NPWS) map viewer and website provides information on rare and protected species, sites designated for nature conservation and their conservation objectives. A search was undertaken of sites designated for the conservation of bats within a 10km radius of the centre point of the Proposed Wind Farm site (BCI 2012, Hundt, 2012, NatureScot, 2021). This included European designated sites, i.e. SACs, and nationally designated sites, i.e. NHAs and pNHAs.

3.2.4 Landscape Features

3.2.4.1 Ordnance Survey Mapping

Ordnance survey maps (OSI 1:5,000 and 1:50,000) and aerial photographs were reviewed to identify any habitats and features likely to be used by bats. Maps and images of the Proposed Wind Farm site and general landscape were examined for suitable foraging or commuting habitats including woodlands and forestry, hedgerows, treelines and watercourses. In addition, any potential roost sites, such as buildings and bridges, were noted for further investigation.

3.2.4.2 Geological Survey Ireland

The Geological Survey Ireland (GSI) online mapping tool and University of Bristol Speleological Society (UBSS) Cave Database for the Republic of Ireland were consulted for any indication of natural subterranean bat sites, such as caves, within 10 km of the Proposed Wind Farm site centre (BCI, 2012) (last searched on the 2nd October 2024). Furthermore, the archaeological database of national monuments was reviewed for any evidence of manmade underground structures, e.g. souterrains, that may be used by bats (last searched on the 2nd October 2024).

3.2.4.3 National Biodiversity Data Centre Bat Landscape Mapping

The National Biodiversity Data Centre (NBDC) map viewer presents “Bat Landscape” maps for individual species and for all species combined. Lundy *et al.* (2011) used Maximum Entropy Models to examine the relative importance of bat landscape and habitat associations in Ireland. The resulting map provides a 5-point scale, ranging from highest habitat suitability index (presented in red) to lowest suitability index (presented in green). However, squares highlighted as less favourable may still have local areas of abundance.

The location of the Proposed Wind Farm site was reviewed in relation to bat habitat suitability indices. The aim of this was to assess habitat suitability for all bat species within the Proposed Wind Farm site. It is worth noting that these results are based on a modelling exercise and not confirmed bat species records. Regardless, they may provide a useful indication of potential favourable bat associations within the Proposed Wind Farm site.

3.2.4.4 Additional Projects in the Wider Landscape

A search was conducted to identify permitted, operational and proposed wind energy developments within 10km of the proposed turbine locations. (NatureScot, 2021). This search adhered to methodologies outlined in Chapter 2, Section 3.8 The Wind Energy Ireland (WEI) interactive wind map (windenergyireland.com) was reviewed in conjunction with wind farm planning applications from Kilkenny and Tipperary County Council. Other infrastructure developments and proposals (e.g. large road projects and extractive industries) were also noted. Information on the location and scale of these developments was gathered to inform cumulative effects. More details on other infrastructure developments within the vicinity of the Proposed Project can be found in Chapter 2 of the main EIAR.

3.2.5 Multidisciplinary Surveys

Multidisciplinary walkover surveys were undertaken throughout 2023 with additional visits in 2024 and 2025. The Site was systematically and thoroughly walked in a ground-truthing exercise with the habitats on the Site assessed and classified. The habitats (including any culverts/bridges) were assessed for bat commuting, foraging and roosting suitability.

Multidisciplinary walkover surveys were undertaken on the following dates:

Table 3-1 Multidisciplinary Survey Effort

Multidisciplinary Survey	Dedicated Bat Survey
27 th of July 2023	15 th May 2023
28 th of July 2023	6 th June 2023
24 th August 2023	18 th July 2023
13 th of September 2023	16 th Aug 2023
21 st of February 2024	27 th Sept 2023
12 th of March 2024	16 th Oct 2023
21 st of March 2024	21 st of March 2024
22 nd of March 2024	22 nd of March 2024
3 rd of September 2025	25 th of August 2025

3.3 Field Surveys

3.3.1 Bat Habitat Suitability Appraisal

Bat walkover surveys were carried out throughout 2023. During these surveys, habitats within the Proposed Wind Farm site were assessed for their suitability to support roosting, foraging and commuting bats. Connectivity with the wider landscape was also considered. Suitability was assessed according to Collins (2016) which provides a grading protocol for roosting habitats and for commuting and foraging areas. Suitability categories are divided into *High*, *Moderate*, *Low* and *Negligible*, and are described fully in Appendix 1.

3.3.2 Roost Surveys

Daytime Roost Inspections

A search for roosts was undertaken within 200m plus the rotor radius (i.e. 81.5m) of the proposed turbine locations. (NatureScot, 2021). The aim was to determine the presence of roosting bats and the need for further survey work or mitigation. The Proposed Wind Farm site was visited in May, June, July, September and October 2023. The watercourse crossings associated with the Proposed Grid Connection underground cabling route were assessed in March 2024. A walkover was carried out and structures were assessed for their potential to support roosting bats (see Appendix 1 for criteria in assessing roosting habitats).

Three structures, and their associated outbuildings, were identified as potential roost features within the Proposed Wind Farm site (Grid Ref: S 39916 54409, S 39583 54179 and S 40862 53911). Additionally, one farm complex was identified just outside the Proposed Wind Farm site (Grid Ref: S 40960 53830). These were subject to a roost assessment which comprised a detailed inspection of the interiors and exteriors to look for evidence of bat use, including live and dead specimens, droppings, feeding remains, urine splashes, fur oil staining and noises. Locations of all Potential Roost Features (PRFs) are presented in Figure 3-1.

Watercourse, drain and culvert crossing infrastructure along the Proposed Grid Connection underground cabling route was also assessed for any suitability to host roosting bats. Surveys were carried out on the 21st and 22nd of March 2024 and comprised a detailed inspection of existing infrastructure to look for evidence of bat use. **The crossing infrastructure was subsequently re-inspected on the 25th of August 2025.** Locations of the watercourse, drain and culvert crossing infrastructure inspected are presented in Chapter 4 and Appendix 4.1.

Any potential tree roosts within the Proposed Wind Farm site were examined for the presence of rot holes, hazard beams, cracks and splits, partially detached bark, knot holes, gaps between overlapping branches and any other potential roost features (i.e. PRFs) identified by Andrews (2018).

Emergence Surveys

Emergence surveys at dusk were carried out which focused on the PRFs identified during the habitat appraisal within the Proposed Wind Farm site. During these surveys, surveyors were equipped with Bat Logger M bat detectors (Elekon AG, Lucerne, Switzerland). The emergence surveys commenced 15 minutes before sunset and concluded 90 minutes after sunset. Table 3-2 summarises survey effort in relation to emergence surveys. Where possible, species identification was made in the field and any other relevant information was also noted, e.g., numbers, behaviour, features used, etc. All bat echolocation was recorded for subsequent analysis to confirm species identifications.

Surveyors were located at PRFs identified during the daytime roost inspection surveys with a focus on potential access point and roosting features. The purpose was to identify any bat species, numbers, access points and roosting locations within the PRF structure. Surveys were carried out in favourable weather conditions.

Table 3-2 2023 Survey Effort -- Emergence Surveys

Date	Surveyors	Sunrise/ Sunset	Type	Weather
3 rd May 2023	Laura Gránicz and Ryan Connors	21:40	Dusk Emergence	20-11°C, dry, calm, moon not visible, 0% cloud cover
27 th July 2023	Laura Gránicz, Ryan Connors, Nora Szijarto and Deirdre McCarthy	21:30	Dusk Emergence	19-17°C, dry, calm, 50% moon visible, 55%-40% cloud cover
12 th October 2023	Laura Gránicz and Ryan Connors	18:42	Dusk Emergence	17-15°C, dry, calm, moon not visible, 100% cloud cover

3.3.3

Manual Transects

Manual activity surveys comprised walked transects after dusk. A series of representative transect routes were selected throughout the Proposed Wind Farm site. The aim of these surveys was to identify bat species using the Proposed Wind Farm site and gather any information on bat behaviour and important features used by bats. Transect routes were prepared with reference to the Proposed Wind Farm site layout, desktop and walkover survey results as well as any health and safety considerations and access limitations. As such, transect routes generally followed existing roads and tracks. Transect routes undertaken in 2023 are presented in Figure 3-1.

Transects were walked by two surveyors, recording bats in real time. Transects commenced immediately after the dusk emergence surveys and were completed for up to 3 hours after sunset. Surveyors were equipped with active full spectrum bat detectors, the Batlogger M bat detector (Elekon AG, Lucerne, Switzerland), and all bat activity was recorded for subsequent analysis to confirm species identifications. Transect surveys were undertaken in spring, summer and autumn 2023. Table 3-3 summarises survey effort in relation to manual transects.

Table 3-3 Survey Effort - Manual Transects

Date	Surveyors	Sunrise/ Sunset	Survey Type	Time	Weather	Transect (km)
31 st May 2023	Laura Gránicz & Ryan Connors	21:40	Dusk Emergence and Transect	23:10 – 00:40	12-10 °C, dry, calm, moon not-visible, 0% cloud cover	4.6 km
27 th July 2023	Laura Gránicz & Ryan Connors	21:30	Dusk Emergence and Transect	23:00 – 00:36	22-15 °C, dry, calm, 50% moon visible, 40% cloud cover	6.3 km
12 th October 2023	Laura Gránicz & Ryan Connors	18:42	Dusk Emergence and Transect	20:12 – 21:42	15 °C, light rain, dry-light drizzle, calm, moon non-visible, 100% cloud cover	4.6 km

Map Legend

— EIAR Site Boundary

● Proposed Turbine Locations

Building Inspections

High

Moderate

Low

Negligible

Spring Transect Route

Summer Transect Route

Autumn Transect Route

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Drawing Title

Survey Effort 2023

Project Title

Briskalagh Renewable Energy Development

Drawn By

RC

Checked By

AJ

Project No.

230502

Drawing No.

Figure 3-1

Scale

1:18,000

Date

2024-09-11

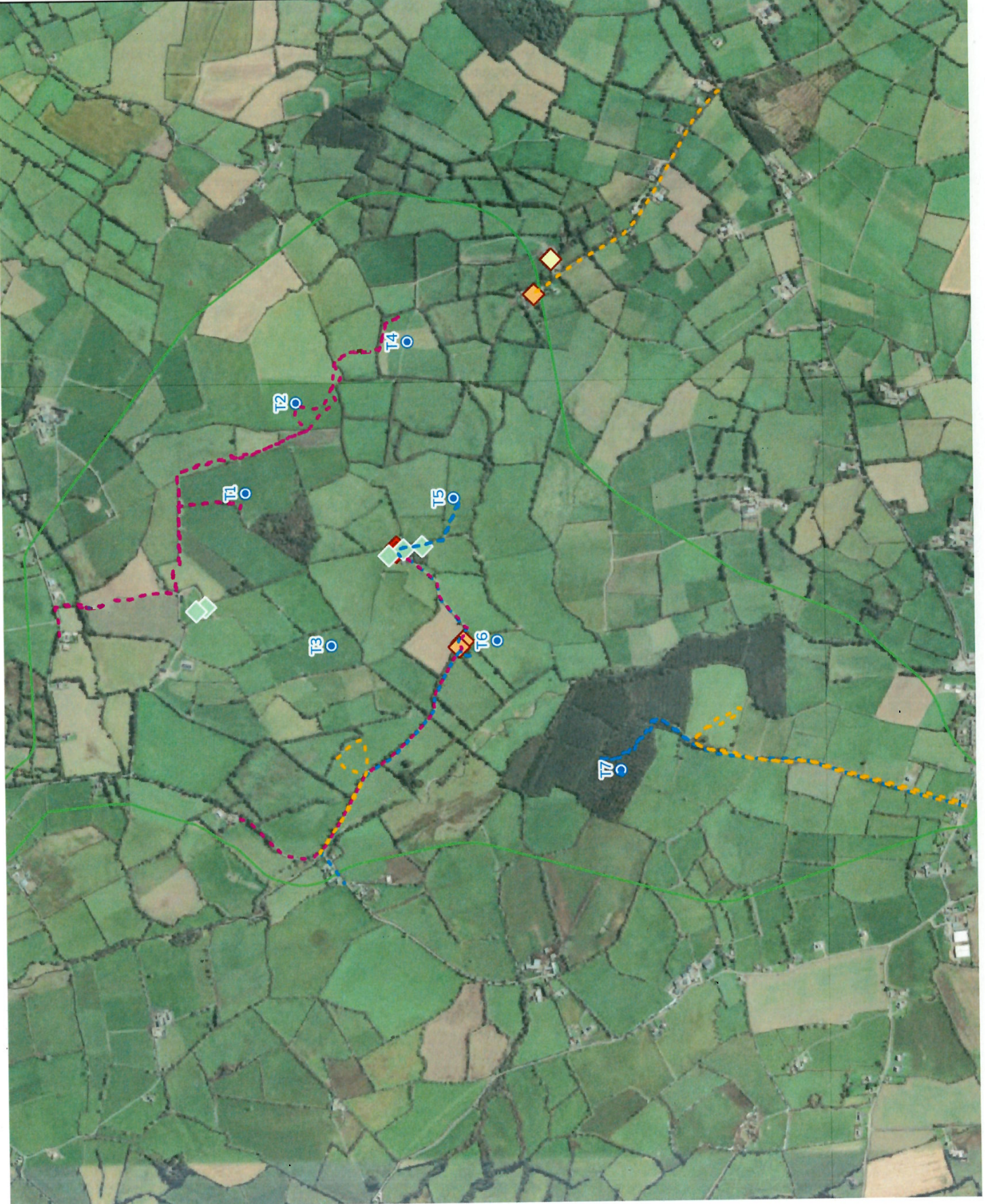
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3.3.4 Ground-level Static Surveys

Where developments have less than 10 turbines, NatureScot requires 1 detector per turbine (up to 10 plus 1 detector for every 3 additional turbines). Given that 8 no. turbines were proposed at the time of the surveys, 8 detectors were deployed to ensure compliance with NatureScot guidance. The final design includes 7 no. turbines. Automated bat detectors were deployed for at least 10 nights in spring (April-May), 20 nights of summer (June-mid August) and 10 nights of autumn (mid-August-October) (NatureScot, 2021/NIEA, 2021). Detector locations were based on indicative turbine locations. Figure 3-2 presents static detector locations in relation to the final proposed layout. Static detector locations are described in Table 3-4.

Table 3-4 Ground-level Static Detector Locations 2023

ID	Location (IG Ref)	Habitat	Linear Feature within 50m	Corresponding/ Nearest Turbine(s)
D01	S 40096 55016	Improved agricultural grassland (GA1)	WL1	T01
D02	S 40461 54783	Improved agricultural grassland (GA1)	N/A	T02
D03	S 40793 54400	Improved agricultural grassland (GA1)	Treelines (WL2)	T03
D04	S 39571 54674	Improved agricultural grassland (GA1)	N/A	T04
D05	S 40112 54177	Improved agricultural grassland (GA1)	Treelines (WL2)	T05
D06	S 39609 54056	Improved agricultural grassland (GA1)	Treelines (WL2)	T06
D07	S 39086 53585	Conifer plantation (WD4)	Treelines (WL2)	T07
D08	S 39332 53164	Improved agricultural grassland (GA1)	Hedgerow (WL1)	T07

Full spectrum bat detectors, Song Meter SM4BAT (Wildlife Acoustics, Maynard, MA, USA), were employed using settings recommended for bats, with minor adjustments in gain settings and band pass filters to reduce background noise when recording. Detectors were set to record from 30 minutes before sunset until 30 minutes after sunrise. The Song Meter automatically adjusts sunset and sunrise times using the Solar Calculation Method when provided with GPS coordinates.

Onsite weather monitoring was undertaken concurrently with static detector deployments. One Vantage Pro 2 (Davis Instruments, CA, UCS) was deployed each season and night-time hourly data was tracked remotely to ensure a sufficient number of nights (i.e. minimum 10-20 nights) with appropriate weather conditions were captured (i.e. dusk temperatures above 8°C, wind speeds less than 5m/s and no or only very light rainfall). Table 3-5 summarises survey effort achieved in 2023 for each of the detector locations.

Table 3-5 2023 Survey Effort - Ground-level Static Surveys

Season	Survey Period	Total Survey Nights per Detector Location	Nights with Appropriate Weather
Spring 2023	18 th May – 31 st May 2023	13	13
Summer 2023	29 th June – 27 th July 2023	28	25
Autumn 2023	28 th September – 12 th October 2023	14	14
Total Survey Effort		55	52

Bat Call Analysis

All recordings from were later analysed using bat call analysis software Kaleidoscope Pro v.5.4.8 (Wildlife Acoustics, MA, USA). The aim of this was to identify, to a species or genus level, what bats were present at the Proposed Wind Farm site. Bat species were identified using established call parameters, to create site-specific custom classifiers and were manually verified.

Echolocation signal characteristics (including signal shape, peak frequency of maximum energy, signal slope, pulse duration, start frequency, end frequency, pulse bandwidth, inter-pulse interval and power spectra) were compared to published signal characteristics for local bat species (Russ, 1999). Myotis species (potentially Daubenton's bat (*M. daubentonii*), Whiskered bat (*M. mystacinus*), Natterer's bat (*M. nattereri*) were considered as a single group, due to the difficulty in distinguishing them based on echolocation parameters alone (Russ, 1999). The echolocation of soprano pipistrelle (*P. pygmaeus*) and common pipistrelle (*P. pipistrellus*) are distinguished by having distinct frequencies (peak frequency of maximum energy in search flight) of ~55 kHz and ~46 kHz respectively (Jones & van Parijs, 1993).

Plate 3-1 below shows a typical sonogram of echolocation pulses for common pipistrelle recorded with a SM4BAT bioacoustic static bat recording device. The recorded file is illustrated using Wildlife Acoustics Kaleidoscope software.

Individual bats of the same species cannot be distinguished by their echolocation alone. Thus, 'bat passes' was used as a measure of activity (Collins, 2016). A bat pass was defined as a recording of an individual species/species group's echolocation containing at least two echolocation pulses and of maximum 15s duration. All bat passes recorded in the course of this study follow these criteria, allowing comparison.

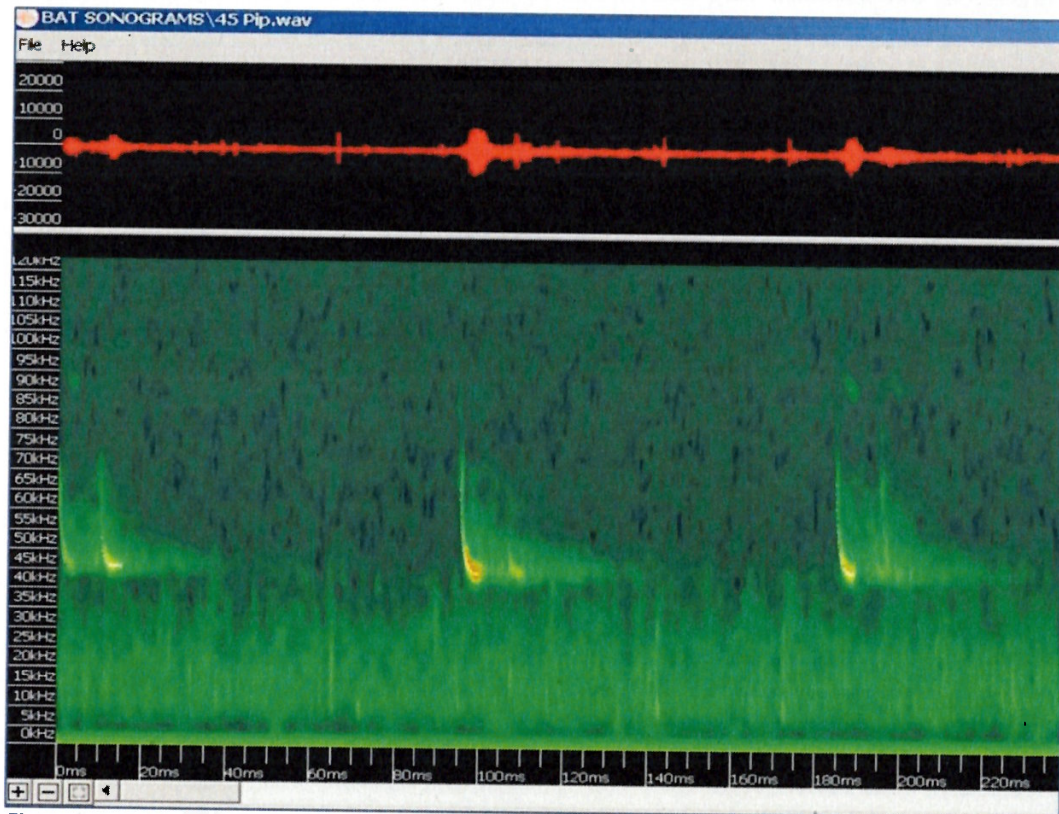


Plate 3-1 Sonogram of Echolocation Pulses of common pipistrelle (Peak Frequency 45kHz)

Assessment of Bat Activity Levels

The online database tool Ecobat (mammal.org.uk) is recommended by NatureScot 2021 to assess bat activity levels within a proposed wind-farm site. This web-based interface, launched in August 2016, allows users to upload activity data and to contrast results with a comparable reference range, allowing objective interpretation. Uploaded data then contributes to the overall dataset to provide increasingly robust outputs. Ecobat generates a percentile rank for each night of activity and provides a numerical way of interpreting levels of bat activity in order to provide objective and consistent assessments. Table 3-6 defines bat activity levels as they relate to Ecobat percentile values (NatureScot, 2021).

Table 3-6 Ecobat Percentile Score and Categorical Level of Activity (NatureScot, 2021)

Ecobat Percentile	Bat Activity Level
81 to 100	High
61 to 80	Moderate to High
41 to 60	Moderate
21 to 40	Low to Moderate
0 to 20	Low

Ecobat was unavailable for a cross-site analysis of 2023 data as the platform has been undergoing maintenance since late 2022 with no proposed timeline of a relaunch. Therefore, data were assessed on a site-specific basis.

Following preliminary analysis and manual verification using Kaleidoscope Pro, statistical analysis and visualisation was performed using RStudio (version 2023.12.1+402.) and R (version 4.3.3). RStudio, an integrated development environment for the R programming language, was employed for data cleaning, exploration, and data visualisation. The 'ggplot2' R package was particularly instrumental in creating the data visualisations shown in the results section. Data was standardised into bat pass rates, calculated as bat passes per hour (total bat passes / night length) to account for seasonal changes in night length (Mathews *et al.* 2016). Activity is often variable between survey nights. Therefore, the median Nightly Pass Rate was used as the most appropriate measure of bat activity (Lintott & Mathews, 2018). During all calculations, data was rounded to at least three decimal places. When visualising the bat pass rates per season, survey effort was defined as detector hours (sum of recorded hours across all detectors). This was defined to circumvent any issues arising from differences in survey effort between detectors in a season.

The methodology used to assess activity levels across the Proposed Wind Farm site was adapted from Mathews *et al.* (2016), where activity ranges of pipistrelle species were defined using an average of maximum nightly pass rates (in total passes during the survey period) across the Proposed Wind Farm site, divided into tertiles. Widespread pipistrelle species' activity ranges were determined using an average of maximum nightly pass rates (total passes during the survey period) across the Proposed Wind Farm site, divided into quartiles. The same process was applied to Leisler's bats. For all other species groups maximum nightly pass rate (bp/h) recorded across the Proposed Wind Farm site divided into quartiles was used. Activity levels were assessed separately for widespread pipistrelle species (*Pipistrellus pipistrellus*, *Pipistrellus pygmaeus*), noctules (*Nyctalus leisleri*), *Myotis* spp. and rare or hard to record species brown long-eared bat (*Plecotus auritus*) and Nathusius pipistrelle (*Pipistrellus nathusii*). Median and maximum nightly activity (bp/h) at each detector location were then categorized as Low, Medium, or High for each recorded season. Any figure below 25% of the maximum/average maximum nightly pass rate was considered Low activity, while figures above 75% were classified as High. Values falling between these two quartiles were defined as Medium. To prevent skewing the activity threshold towards high levels, any evident outliers recorded across the detectors were excluded. Table 3-7 presents activity ranges per species group identified.

Table 3-7 Site-specific Activity Level Categories based on Maximum Bat Passes per Hour (bpph)

Assessment Level	Activity Threshold as Bat Passes per Hour (bpph) for Bat Species				
	<i>Myotis spp.</i>	<i>Nyctalus spp.</i>	<i>Nathusius pipistrelle</i>	<i>Pipistrellus spp.</i>	<i>Brown long-eared bat</i>
Low	< 4.50	< 2.38	< 0.36	< 5.18	< 1.12
Medium	4.50 – 13.51	2.38 – 7.13	0.36 – 1.07	5.18 – 15.54	1.12 – 3.35
High	> 13.51	> 7.13	> 1.07	> 15.54	> 3.35

Based on experience gained surveying a large number of development sites, the calculated activity thresholds were considerably high for all species surveyed. Thresholds were therefore adapted to more representative activity levels for agricultural/wet grassland and woodland habitats based on MKO's experience with similar habitats, as presented in Table 3-8.

Table 3-8 Adapted Activity Level Categories

Assessment Level	Activity Threshold as Bat Passes per Hour (bpph) for Bat Species				
	<i>Myotis spp.</i>	<i>Nyctalus spp.</i>	<i>Nathusius pipistrelle</i>	<i>Pipistrellus spp.</i>	<i>Brown long-eared bat</i>
Low	< 1.14	< 0.91	< 0.17	< 3.81	< 0.34
Medium	1.14 – 3.42	0.91 – 2.73	0.17 – 0.51	3.81 – 11.44	0.34 – 1.03
High	> 3.42	> 2.73	> 0.51	> 11.44	> 1.03

3.6

Assessment of Collision Risk

3.6.1

Population Risk

NatureScot (2021) provides a generic assessment of bat collision risk for UK species, based on species behaviour and flight characteristics. In the guidelines, this measure of collision risk is used, in combination with relative abundance, to indicate the potential vulnerability of British bat populations. No such assessment is provided for Irish bat populations.

In Plate 3-2, an adapted assessment of vulnerability of Irish bat populations to collision with wind turbine blades is provided. This adaptation of the NatureScot Guidance Table 2 was based on collision risk and species abundance of Irish bat populations. Species' collision risk follows those described in NatureScot (2021). Relative abundance for Irish species was determined in accordance with Wray *et al.* (2010) using population data available in the 2019 Article 17 reports (NPWS, 2019). Feeding and commuting behaviours, and habitat preferences for bat species in Ireland were also considered.

Relative Abundance	Low Collision Risk	Medium Collision Risk	High Collision Risk
Common species			Common pipistrelle Soprano pipistrelle
Rarer species	Daubenton's bat Brown long-eared bat Lesser horseshoe bat		Lesser's bat
Rarest species	Natterer's bat Whiskered bat		Seetham's pipistrelle
	Low Population Vulnerability	Medium Population Vulnerability	High Population Vulnerability

Plate 3-2 Population Vulnerability of Irish Bat Species (Adapted from NatureScot, 2021)

3.6.2 Site Risk

The likely impact of a proposed development on bats is related to site-based risk factors, including habitat and development features. The cross-tabulation result of habitat risk and project size determines the site risk (i.e. Low, Medium or High) (Plate 3-3) i.e. Table 3a (NatureScot, 2021). Table 5-1 in the results section describes the criteria and site-specific characteristics used to determine an indicative risk level for the Proposed Wind Farm site. All site assessment levels, as per NatureScot (2021) are presented in **Appendix 2**.

		Project Size		
		Small	Medium	Large
Habitat Risk	Low	1	2	3
	Moderate	2	3	4
	High	3	4	5
		Low/Lowest Site Risk (1,2)	Medium Site Risk (3)	High/Highest Site Risk (4,5)

Plate 3-3 Site-risk Level Assessment Matrix (Table 3a, NatureScot, 2021)

3.6.3 Overall Risk Assessment

An overall assessment of risk was made by combining the site risk level (i.e. Medium) and the population risk (i.e. Ecobat bat activity outputs), as shown in the overall risk assessment matrix table (Plate 3-4) i.e. Table 3b (NatureScot, 2021). The assessment was carried out for both median and maximum activity categories in order to provide insight into typical bat activity (i.e. median values) and activity peaks (i.e. maximum values) (**Appendix 3**).

Site Risk Level	Ecobat Activity Category					
	Nil (0)	Low (1)	Low-Moderate (2)	Moderate (3)	Moderate-High (4)	High (5)
Lowest (1)	0	1	2	3	4	5
Low (2)	0	2	4	6	8	10
Medium (3)	0	3	6	9	12	15
High (4)	0	4	8	12	16	20
Highest (5)	0	5	10	15	20	25

Low Overall Risk (0-4)	Medium Overall Risk (5-12)	High Overall Risk (13-25)
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Plate 3-4 Overall Risk Assessment Matrix (Table 3b, NatureScot, 2021)

This exercise was carried out for each high collision risk species. Overall risk assessments were also considered in the context of any potential impacts at the population level, particularly for species identified as having high population vulnerability (Plate 3-2 above).

A comprehensive suite of bat surveys has been undertaken at the Proposed Wind Farm site in 2023 and at the Proposed Grid Connection in 2024. The surveys undertaken at the Proposed Wind Farm site, in accordance with NatureScot Guidance, provide the information necessary to allow a complete, comprehensive and robust assessment of the potential impacts of the Proposed Wind Farm site on bats receptors.

The information provided in this report accurately and comprehensively describes the baseline environment; provides an accurate prediction of the likely effects of the Proposed Project; prescribes mitigation as necessary; and describes the predicted residual impacts. The specialist studies, analysis and reporting have been undertaken in accordance with the appropriate guidelines.

No limitations in the scope, scale or context of the assessment have been identified. Overall, a comprehensive assessment has been achieved.

4. SURVEY RESULTS

4.1. Consultation

4.1.1 Bat Conservation Ireland

Bat Conservation Ireland were invited to comment on the potential of the Proposed Project to affect bats. As of 2nd October 2024, no response has been received.

4.1.2 Development Applications Unit - NPWS

The Development Applications Unit were also invited to provide any feedback, comments or suggestions they might have relating to the Proposed Project. A response was received from the Department of Housing, Local Government and Heritage on the 15th of January 2024, in which they stated that they were not in a position to make specific recommendations on this particular development at this time.

4.2 Desk Study

4.2.1 Bat Records

Bat Conservation Ireland

A data request was sent to Bat Conservation Ireland for records of bat activity and roosts within a 10km radius of an approximate central point in the Proposed Wind Farm site (Grid Ref: S 39679 54103); last search 13/06/2024). Available bat records were provided by BCI on 4th June 2024. The search included roosts, transects and ad-hoc observations. A number of ad-hoc observations (n=31) have been recorded. At least seven of Ireland's nine resident bat species were recorded within 10km of the Proposed Wind Farm site. The results of the database search are provided in Table 4-1.

Table 4-1 National Bat Database of Ireland Records within 10km of the Proposed Wind Farm site centre

Survey Type	Species	Grid reference	Date	Location
Roost	Pipistrellus pygmaeus	S4352	N/A	Ballycallan, County Kilkenny
	Myotis daubentonii, Plecotus auritus, Myotis nattereri	S48945636 20	N/A	Ballyraffon Wood, Jenkinstown, Co. Kilkenny
Transect	Myotis daubentonii, Unidentified bat	S34103471 08	N/A	Along railway track, River Suir
	Myotis daubentonii, Unidentified bat	S47890628 50	N/A	Dinin Bridge Transect
	Pipistrellus pipistrellus (45kHz), Pipistrellus spp. (45kHz/55kHz), Nyctalus leisleri, Pipistrellus pygmaeus, Unidentified bat	S39365499 54	N/A	S12 (1) 2004-
	Pipistrellus pygmaeus, Pipistrellus spp. (45kHz/55kHz), Pipistrellus pipistrellus (45kHz), Unidentified bat, Myotis spp., Nyctalus leisleri	S35216490 21	N/A	S12 (2) 2004-

	Pipistrellus pipistrellus (45kHz), Pipistrellus pygmaeus, Pipistrellus spp. (45kHz/55kHz), Nyctalus leisleri, Unidentified bat	S30864485 20	N/A	S12 (3) 2004-
	Pipistrellus pipistrellus (45kHz), Pipistrellus spp. (45kHz/55kHz), Nyctalus leisleri, Pipistrellus pygmaeus, Myotis spp.	S354628	N/A	S15 (2) 2005-
	Pipistrellus spp. (45kHz/55kHz), Nyctalus leisleri, Plecotus auritus, Pipistrellus nathusii, Pipistrellus pygmaeus, Pipistrellus pipistrellus (45kHz)	S354600	N/A	S15 (3) 2005-
	Unidentified bat, Pipistrellus pygmaeus, Pipistrellus spp. (45kHz/55kHz), Nyctalus leisleri, Pipistrellus pipistrellus (45kHz)	S345582	N/A	S15 (4) 2005-
	Myotis spp., Pipistrellus spp. (45kHz/55kHz), Nyctalus leisleri, Pipistrellus pygmaeus, Pipistrellus pipistrellus (45kHz)	S350552	N/A	S15 (5) 2005-
	Pipistrellus pygmaeus, Pipistrellus pipistrellus (45kHz), Unidentified bat, Nyctalus leisleri, Pipistrellus spp (45kHz/55kHz)	S306532	N/A	S15 (6) 2005-
	Myotis daubentonii, Unidentified bat	S465626	N/A	Three Castles Bridge, Spot 1- 10
	Pipistrellus pygmaeus, Unidentified bat, Myotis daubentonii	S45821627 09	N/A	Threecastles Bridge Transect
Ad-Hoc	Pipistrellus pipistrellus (45kHz), Pipistrellus pygmaeus	S490570	06/2009	Consultancy Survey
	Pipistrellus pipistrellus (45kHz), Pipistrellus pygmaeus, Nyctalus leisleri	S454513	29/05/2009	BATLAS 2010
	Pipistrellus pipistrellus (45kHz), Pipistrellus pygmaeus, Myotis spp	S460573	29/05/2009	BATLAS 2010
	Pipistrellus pipistrellus (45kHz), Pipistrellus pygmaeus, Myotis daubentonii	S495594	29/05/2009	BATLAS 2010
	Unidentified bat, Pipistrellus pygmaeus, Nyctalus leisleri	S377568	08/08/2009	BATLAS 2010
	Unidentified bat, Pipistrellus pipistrellus (45kHz), Pipistrellus spp. (45kHz/55kHz), Myotis daubentonii	S334544	08/08/2009	BATLAS 2010
	Pipistrellus pygmaeus, Plecotus auritus	S327621	08/08/2009	BATLAS 2010
	Pipistrellus pipistrellus (45kHz), Nyctalus leisleri, Myotis spp.	S397477	31/05/2009	BATLAS 2010
	Pipistrellus pipistrellus (45kHz)	S42957449 09	17/07/2017	BATLAS 2020

	Pipistrellus pipistrellus (45kHz), Myotis daubentonii	S39123467 06	09/06/2018	BATLAS 2020
	Pipistrellus pygmaeus	S47821469 21	14/07/2017	BATLAS 2020
	Pipistrellus pipistrellus (45kHz), Pipistrellus pygmaeus, Nyctalus leisleri, Myotis nattereri, Myotis spp.	S39680477 26	09/06/2018	BATLAS 2020
	Pipistrellus pygmaeus	S47627478 23	13/07/2017	BATLAS 2020
	Pipistrellus pygmaeus, Nyctalus leisleri	S31082484 10	10/06/2018	BATLAS 2020
	Pipistrellus pipistrellus (45kHz), Plecotus auritus	S42790520 59	22/09/2018	BATLAS 2020
	Pipistrellus pygmaeus, Plecotus auritus, Myotis nattereri	S39376523 16	21/09/2018	BATLAS 2020
	Pipistrellus pipistrellus (45kHz), Pipistrellus pygmaeus	S46524528 53	22/09/2018	BATLAS 2020
	Pipistrellus pipistrellus (45kHz), Pipistrellus pygmaeus	S46496528 88	22/09/2018	BATLAS 2020
	Pipistrellus pipistrellus (45kHz), Plecotus auritus	S42680537 92	22/09/2018	BATLAS 2020
	Pipistrellus pipistrellus (45kHz), Pipistrellus pygmaeus	S33418544 48	21/09/2018	BATLAS 2020
	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus	S41903563 12	22/09/2018	BATLAS 2020
	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus	S41899563 53	22/09/2018	BATLAS 2020
	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus,Nyctalus leisleri,Pipistrellus nathusii	S37715568 81	21/09/2018	BATLAS 2020
	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus,Plecotus auritus,Myotis nattereri	S45689572 67	22/09/2018	BATLAS 2020
	Nyctalus leisleri	S34334584 36	21/09/2018	BATLAS 2020
	Pipistrellus pipistrellus (45kHz)	S34397619 96	11/08/2018	BATLAS 2020
	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus,Nyctalus leisleri,Myotis daubentonii,Myotis nattereri	S45773626 80	10/08/2018	BATLAS 2020
	Pipistrellus pipistrellus (45kHz),Plecotus auritus,Myotis nattereri	S36893632 17	11/08/2018	BATLAS 2020
	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus,Nyctalus leisleri,Myotis daubentonii	S49000560 00	01/06/2007	Consultancy Survey
	Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus,Plecotus auritus,Nyctalus leisleri	S43300633 50	29/05/2007	Consultancy Survey

	Myotis daubentonii	S494644	22/06/2019	National Biodiversity Data Centre Bat Records
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National Bat Database of Ireland

The National Bat Database of Ireland was searched for records of bat activity and roosts within a 10km radius of the Proposed Wind Farm site centre (last search 13/06/2024). Hectad S35 and S45 lies within 10km of the Proposed Wind Farm site. Four of Ireland's nine resident bat species were recorded within 10km of the Proposed Wind Farm site works. The results of the database search are provided in Table 4-2.

Table 4-2 NBDC Bat Records within 10km of Proposed Project

Hectad	Species	Database	Designation
S35, S45	Common pipistrelle (<i>Pipistrellus pipistrellus</i>)	National Bat Database of Ireland	HD Annex IV, WA
S35, S45	Soprano pipistrelle (<i>Pipistrellus pygmaeus</i>)	National Bat Database of Ireland	HD Annex IV, WA
S35, S45	Daubenton's bat (<i>Myotis daubentonii</i>)	National Bat Database of Ireland	HD Annex IV, WA
S35, S45	Leisler's bat (<i>Nyctalus leisleri</i>)	National Bat Database of Ireland	HD Annex IV, WA

Bat Species Range

The potential for negative impacts is likely to increase where there are high risk species at the edge of their range (NatureScot, 2021). Therefore, range maps presented in the 2019 Article 17 Reports (NWPS, 2019) were reviewed in relation to the location of the Proposed Wind Farm site.

The Proposed Wind Farm site is located outside the current known range for lesser horseshoe bat, Natterer's bat and Whiskered bat and is within the range of all other species.

Designated Sites

Within Ireland, the lesser horseshoe bat is the only bat species requiring the designation of Special Areas of Conservation (SACs). The Proposed Wind Farm site is located outside the current known range of this species (NPWS, 2019) and is approximately 96 km away from the nearest designated SAC for the lesser horseshoe bat (Curraghchase Woods SAC).

Natural Heritage Areas (NHAs) and proposed Natural Heritage Areas (pNHAs) may be designated for any bat species. A search of NHAs and pNHAs within a 10km radius of the Proposed Wind Farm site centre found no sites designated for the conservation of bats.

Landscape Features and Habitat Suitability

A review of mapping and photographs provided insight into the habitats and landscape features present at the Proposed Wind Farm site. In summary, the primary land use within the Proposed Wind Farm site is improved agricultural grassland and conifer forestry.

A review of the GSI online mapper did not indicate the possible presence of any subterranean sites within the Proposed Wind Farm site and a search of the National Monuments Database did not reveal the presence of any manmade subterranean sites within the Proposed Wind Farm site.

A search of the UBSS Cave Database for the Republic of Ireland found no caves within the Proposed Wind Farm site and three within 10km of the Proposed Wind Farm site centre (Table 4-3).

A review of the NBDC bat landscape map provided a habitat suitability index of 24.78 (Yellow) to 31.56 (Orange). This indicates that the Proposed Wind Farm site has Low to Moderate habitat suitability for bat species.

Table 4-3 Caves and subterranean sites within 10km of the Proposed Wind Farm site centre

Caves	Distance from Site	Description
Within 10km of the Proposed Wind Farm site		
Holedensrath Cave	6.9 km	Seven muddy rifts totalling 71 metres
Ballintaggart Quarry Cave	7.2 km	100 metres of streamway to sumps
Kilbrickan Cave	9.7 km	Sink and chamber

4.2.5 Additional Projects in the Wider Landscape

Table 4-4 provides an overview of wind farm developments within 5 and 10 km of the proposed turbine locations.

Table 4-4 Wind farm developments within 10km of the proposed turbine locations

Wind Farm	Status	No. of Turbines	Turbine Height
Less than 5km			
Foyle Wind Farm*	Existing	5	Tip Height 121m
Kyleballyoughter Wind Farm	Permitted	2	Tip Height 121m
5 to 10km			
Ballybay Wind Farm	Existing	13	Tip Height 110m
Farranrory Wind Farm	Permitted	9	Tip Height 150m
An Cnoc Wind Farm	Existing	5	Tip height 99.5m

*4 existing turbines with an additional permitted turbine.

In addition to wind energy developments, four other EIA planning applications were noted within 10km of the proposed turbine locations. These include the following:

- EIA Portal Ref: 2023037 - Planning permission of 27yrs sought for continued use and extension of existing dimension stone quarry & provision of new maintenance workshop (160sq.m.) within application area of 15.8ha. and restoration to ecological/agricultural afteruse.
- EIA Portal Ref: 2021233 - The installation of 2250 metres of 38KV underground grid connection comprising cable ducting and associated electrical cabling and all other ancillary works including joint bays, culverts, maker posts and all associated development.
- EIA Portal Ref: 2021145 - The installation of 31.489 km of 38 KV cable ducting and associated electrical cabling and all other ancillary works including joint bays, culverts, maker posts and all associated development.
- EIA Portal Ref: 2019200 - A 10-year permission for a mixed-use permission consisting of 266 no. residential units, 2 no. office blocks, nursing home, 2 no. retail/commercial units with offices overhead, creche and delivery of 3.96 hectares of open parkland.

4.3.1 Bat Habitat Suitability Appraisal

4.3.1.1 Proposed Wind Farm Infrastructure

A total of fifteen habitats were recorded within and surrounding the Proposed Wind Farm infrastructure footprint, including:

- *Conifer Plantation (WD4)*
- *Mixed broadleaved/conifer woodland (WD2)*
- *Broad-leaved woodland (WD1)*
- *Semi-Native Woodland (WN6)*
- *Spoil and Bare Ground (ED2)*
- *Recolonising Bare Ground (ED3)*
- *Eroding/Upland rivers (FW1)*
- *Drainage Ditches (FW4)*
- *Improved Agricultural Grassland (GA1)*
- *Wet Grassland (GS4)*
- *Buildings and Artificial Surfaces (BL3)*
- *Dry Meadows and Grassy Verges (GS2)*
- *Scrub (WS1)*
- *Hedgerow (WL1)*
- *Treeline (WL2)*

Further details on habitats within the Proposed Wind Farm can be found in Chapter 6 of the main EIAR. Habitats within the Proposed Wind Farm are dominated by large areas of improved agricultural grassland, with smaller areas of wet grassland, treeline/hedgerow and forestry/woodland habitats.

Results from the desktop review and walkover surveys were used to assess habitats for their suitability to support foraging and commuting bats, and roosting bats, according to Collins (2016). Suitability categories, divided into *High*, *Moderate*, *Low* and *Negligible*, are described fully in Appendix 1.

With regard to foraging and commuting bats, exposed areas of grassland and farmland (tilled and arable) habitats outlined above, as well as spoil and bare ground and recolonising bare ground, were considered *Low* suitability, i.e. habitat that could be used by small numbers of commuting bats such as gappy hedgerow or unvegetated stream but isolated (Collins, 2016). Areas of scrub, conifer plantation and drainage ditches provide connectivity via linear features to the surrounding landscape. As such, they were assessed as having *Moderate* suitability i.e. habitat that is connected to the wider landscape that could be used by bats for foraging such as trees, scrub, grassland or water (Collins, 2016). Due to their varying levels of maturity and connectivity, treelines and hedgerows were assessed as having *Moderate* to *High* suitability. While mature mixed broadleaf woodland and depositing lowland rivers were assessed as having *High* suitability, i.e. continuous, high-quality habitat that is well connected to the wider landscape that is likely to be used regularly by commuting bats such as river valleys, streams, hedgerows, lines of trees and woodland edge. (Collins, 2016).

Trees present on the Proposed Wind Farm site comprise a mixture of mature and immature conifer and broadleaved species. With regards to roosting bats, a number of mature broadleaf trees were identified within the bat felling buffers which present *Negligible* to *Moderate* roosting potential. In relation to bat felling buffers, a minimum 50m buffer between turbine blade tip and nearest woodland (or other key habitat features) used by bats (e.g., hedgerows, treelines etc.) is recommended at all wind turbines (NatureScot, 2021). Further detail on bat felling buffers is outlined in Section 6.1.3 below.

The trees assessed varied in characteristics with some containing extensive ivy cover as well as branch damage and wounds providing potential roosting features suitable for opportunistic and/or regular roosting. Habitat suitability assessment for trees with potential for roosting bats are outlined in further detail in Section 4.3.2 below. Additionally, four structures and their associated outbuildings (*buildings and artificial surfaces*) are also further assessed for roosting potential in Section 4.3.2 below. All other habitats present were assigned a *Negligible* value for roosting bats.

4.3.1.2 Proposed Grid Connection

The Proposed Grid Connection underground cabling route has an approximate length of 23km. It will leave the on-site substation and travel north-west for 250m following an existing farm track. The Proposed Grid Connection underground cabling route will then join the public road classified as Buildings and artificial surfaces (BL3). The cable will pass beneath the River Nore via HDD. Improved agricultural grassland (GA1) habitat was also recorded along the Proposed Grid Connection underground cabling route.

The verges across much of the Proposed Grid Connection underground cabling route contained species typical of dry grassy verges (GS4) which were not mapped due to their small size and mosaic-like occurrence throughout and along the route.

Several drainage ditches (FW4) with and without water present were recorded along the Proposed Grid Connection underground cabling route during the surveys undertaken. Several watercourses are culverted, box culverted, or bridges created to allow watercourses to pass beneath the roads along the Proposed Grid Connection underground cabling route.

Habitats along the Proposed Grid Connection footprint include:

- *Buildings and artificial surfaces (BL3)*
- *Improved agricultural grassland (GA1)*
- *Dry meadows and grassy verges (GS4)*
- *Depositing/lowland river (FW1)*
- *Eroding river (FW2)*
- *Drainage ditches (FW4)*
- *Hedgerows (WL1)*
- *Treelines (WL2)*

Further details of habitats along the Proposed Grid Connection footprint are outlined in Chapter 6, Section 6.6.1.2.

The habitat at the proposed 38kV on-site substation and adjacent temporary construction compound consists primarily of improved agricultural grassland (GA1). Mature ivy-covered ash trees dominate the treeline habitat (WL2), located adjacent to the proposed on-site substation compound, while the understory is managed and comprises hawthorn, blackthorn, gorse and grey willow. The treeline was assessed as having *Moderate* suitability to support commuting bats. A drainage ditch (FW4) was also recorded at the treeline north of the proposed on-site substation. Two of the trees present within this treeline contain PRF's and were assessed as having *Moderate* suitability to support roosting bats while an additional two were assessed as *Low* due to the presence of dense ivy cover. These trees will be retained and avoided as part of the Proposed Project.

With regard to commuting and foraging bats, features along the Proposed Grid Connection underground cabling route such as stone walls, grassland habitats, drainage ditches, hedgerows and treelines were assessed as having *Low to Moderate* suitability i.e. Habitat that is connected to the wider landscape that could be used by bats for foraging such as trees, scrub, grassland or water (Collins, 2016).

With regard to roosting bats, habitat features along the Proposed Grid Connection underground cabling route, including grassland habitats, hedgerows and drainage ditches were assessed as having *Negligible* suitability i.e. Negligible habitat features likely to be used by roosting bats/trees of sufficient size and age to contain PRFs but with none seen from the ground or features seen with only very limited roosting potential (Collins, 2016). Mature trees containing PRFs, and stone walls were classified as having *Low to Moderate* suitability i.e. A structure or tree with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost of high conservation status.

Twelve existing watercourse crossing structures were recorded along the Proposed Grid Connection underground cabling route to the Ballyragget substation, excluding the crossing at the River Nore (WC1) where there is no structure present that could be used by roosting bats. A total of 9no. bridge crossings, 2no. culverts and 1no. concrete pipe will be traversed for the underground cabling route. Four crossings will require horizontal directional drilling including beneath the River Nore and all other works will be confined to the road structure.

The structures at the existing 12 no. watercourse crossings were inspected for signs of bat roosts and were assessed for bat roost potential on the 21st and 22nd of March 2024 with no evidence of roosting bats recorded at that time. Structures identified as having potential bat roost suitability were subsequently revisited on the 25th of August 2025 and again no evidence of roosting bats was found. The findings are summarized in Table 4-5 below. The locations of the watercourse crossings are shown in Chapter 4, Appendix 4-1.

In addition to the features listed in Table 4-5 below, several potential roost features in trees were identified along the underground cabling route. However, no trees are designated for removal as part of the Proposed Grid Connection underground cabling works. Further details on the Proposed Grid Connection can be found in Chapter 4, Section 4.3.2.

Table 4-5 Bat Roost Suitability of Bridges/culverts along the Proposed Grid Connection underground cabling route

Crossing ID	Grid Ref	Culvert type	Photo	Bat Roost Potential	Crossing Type Description
WC2	S 43633 68643	Stone Bridge		No evidence of bats found during inspection. No substantial cracks or crevices in blockwork, solid concrete on the undersurface of the bridge. <i>Negligible</i> bat roost potential.	Horizontal Directional Drilling
WC3	S 42177 67547	Stone Culvert		No evidence of bats found. Solid concrete undersurface with no cracks or crevices present. <i>Negligible</i> bat roost potential.	Flatbed Formation over Bridges/Culverts Horizontal Directional Drilling

Crossing ID	Grid Ref	Culvert type	Photo	Bat Roost Potential	Crossing Type Description
WC4	S 40678 65365	Stone Arch Bridge		No evidence of bats found. Small crevices present in stonework offering opportunistic roosting potential. Solid concrete undersurface. <i>Low bat roost potential.</i>	Flatbed Formation over Bridges/Culverts
WC5	S 40695 64845	Stone Arch Bridge		No evidence of bats found. Small gaps and dense ivy cover present on parts of the bridge. Undersurface is solid concrete construction. <i>Low bat roost potential.</i>	Flatbed Formation over Bridges/Culverts Horizontal Directional Drilling
WC6	S 40673 64486	Stone Arch Bridge		No evidence of bats found. Small but deep cracks on and underneath bridge arch that could be used opportunistically by roosting bats. <i>Low bat roost potential.</i>	Flatbed Formation over Bridges/Culverts Horizontal Directional Drilling

Crossing ID	Grid Ref	Culvert type	Photo	Bat Roost Potential	Crossing Type Description
WC7	S 40440 63066	Stone Arch Bridge		Very dense ivy cover. Access restricted due to health and safety in the form of a steep drop surrounding watercourse crossing. No obvious PRF visible but assessed as <i>Low</i> precautionarily due to uncertainty surrounding ivy cover.	Flatbed Formation over Bridges/Culverts Horizontal Directional Drilling
WC8	S 40421 62669	Stone Culvert		No evidence of bats found. Solid concrete culvert. No PRFs identified. <i>Negligible</i> bat roost potential.	Flatbed Formation over Bridges/Culverts
WC9	S 39949 61499	Stone Arch Bridge		No evidence of bats found. Dense ivy cover on one side of bridge. Some deep cracks and crevices on other side and on the undersurface of the bridge that could be used by bats for opportunistic roosting. <i>Low</i> bat roost potential.	Flatbed Formation over Bridges/Culverts

Crossing ID	Grid Ref	Culvert type	Photo	Bat Roost Potential	Crossing Type Description
WC10	S 38941 60236	Concrete Pipe		Piped culvert under road surface. <i>Negligible</i> bat roost potential.	Horizontal Directional Drilling Flatbed Formation over Bridges/Culverts
WC11	S 38041 58850	Stone Arch Bridge		No evidence of bats found. Minimal cracks with some ivy cover present that could be used by individual bats opportunistically. Solid concrete undersurface. <i>Low</i> bat roost potential.	Crossing Using Standard Prefold Formation Flatbed Formation over Bridges/Culverts
WC12	S 37810 57994	Stone Arch Bridge		No evidence of bats found. Cracks and crevices present above and below bridge that could be used by a small number of bats. Ivy cover also present. <i>Low</i> bat roost potential.	Flatbed Formation over Bridges/Culverts

Crossing ID	Grid Ref	Culvert type	Photo	Bat Roost Potential	Crossing Type Description
WC13	S 39108 55420	Stone Arch Bridge		No evidence of bats found. Crevices present above and below bridge that could be used opportunistically with some ivy cover also present. <i>Low bat roost potential.</i>	Horizontal Directional Drilling Flatbed Formation over Bridges/Culverts



4.3.1.3 Turbine Delivery Accommodation Works

As described in Chapter 4, Section 4.5.2 of this EIAR, no significant turbine delivery route accommodation works are required to facilitate the delivery of components to the Site. Therefore, no significant effects on bats associated with the turbine delivery route are anticipated.

4.32 Roost Surveys

4.32.1 Daytime Roost Inspections

Following the search for roosts in 2023, four structures and their associated outbuildings containing potential suitable bat roost features were identified within the Proposed Wind Farm site.

The grading protocol described by Collins (2016) was used: structures with *High* roosting potential present one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat; structures with *Moderate* roosting potential could be used by bats due to their size, shelter, protection, conditions and surrounding habitat, but are unlikely to support a roost of high conservation status; structures with *Low* potential present one or more potential roost sites that could be used by an individual bat opportunistically.

The structures were subject to interior (where accessible) and exterior inspections to search for evidence of bats. Details of the inspection surveys are presented below. All identified structures will be retained and avoided as part of the Proposed Project.

4.3.2.1.1 Farm Complex 1

A farm consisting of several corrugated iron hay sheds (Plate 4-1 & 4-2), and two stone sheds were identified on agricultural lands in the centre of the Proposed Wind Farm site (Grid Ref: S 39927 54413). The farm is approximately 275 m from the nearest proposed turbine (T05). The corrugated iron hay sheds (Grid Ref: S 39927 54393, S 39939 54325, S 39940 54320, S 39915 54376, S 39887 54397 and S 39905 54420) were open-facing and exposed to the elements. No evidence of bats was found in these sheds, and they were assessed as having *Negligible* potential to house roosting bats (Plates 4-1 & 4-2) i.e. *Negligible* habitat features on site likely to be used by roosting bats (Collins, 2016).

The two stone sheds were of stone block construction with corrugated iron roof structures. The eastern single-story shed (Grid Ref: S 39940 54421) consisted of two internal rooms with two open facing segments to the north of the structure and had no felt underlining (Plate 4-3). Both rooms had an open doorway with small windows at the front and rear allowing potential access for bats. Within the northern room, there were seed sacks draped from the rafters that could provide roosting potential for a number of bats (Plate 4-4). During the summer inspection 2no. brown long-eared bats were observed roosting within the seed sacks. Butterfly and moth wings in addition to bat droppings were found dispersed around the building. Small accumulations of droppings were discovered beneath the seed sacks (Plate 4-5). The building was assessed as having *Moderate* roosting potential i.e. A structure with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost of high conservation status (Collins, 2016).

The second stone building (Grid Ref: S 39920 54421) was also made up of two separate rooms with open doorways (Plates 4-6 & 4-7). The northern room included an attic space in which an unidentified bat carcass, accumulations of bat droppings and several butterfly wings were found (Plate 4-8). The southern room, with felt underlining in the roof, exhibited sparsely scattered bat droppings around the area. This structure was also assessed as having *Moderate* potential to house roosting bats.



Plate 4-1 Negligible corrugated iron shed to the south.



Plate 4-2 Another Negligible corrugated iron shed to the north.



Plate 4-3 Eastern stone shed offering Moderate roosting suitability.



Plate 4-4 Seed sacks in eastern shed where bats were found roosting.



Plate 4-5 Small accumulations of droppings and insect wings beneath seed sacks.



Plate 4-6 West aspect of western stone shed assessed as having Moderate suitability.



Plate 4-7 East aspect of western shed.

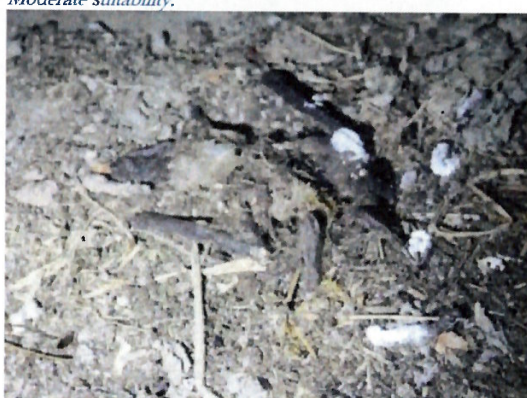


Plate 4-8 Bat carcass found in attic space of western shed.

Located approximately 425 meters to the south-west of Farm Complex 1 are two derelict stone block structures, positioned 125 meters north of the nearest proposed turbine (T06). Both structures exhibit compromised slate roofs, with cracks in their blockwork, offering potential access and roosting opportunities for bats. Additionally, dense ivy covers portions of both buildings.

The larger building to the east (Grid Ref: S 39588 54176), serves primarily as a hay storage facility (Plates 4-9 & 4-10). Scaffolding is evident both internally and externally, seemingly erected for the installation of a corrugated iron sheet integrated into the damaged roof structure. Although no underlining is present beneath the remaining slates, the observed damage to rafters and joists creates potential roosting opportunities for bats (Plate 4-11). Despite no evidence of bats found during the 2023 inspections, this structure was assessed as having *Moderate* suitability for roosting bats.

The western building (Grid Ref: S 39562 54194), consists of a main building with an adjoining lean-to extension featuring a corrugated iron roof (Plates 4-12 & 4-13). Similar to the larger building, the damaged roof structure and blockwork offer potential access and roosting opportunities for bats (Plate 4-14). Although no evidence of bats was discovered within this structure, it was also evaluated as having *Moderate* suitability for roosting bats.



Plate 4-9 Eastern stone shed with damaged roof offering *Moderate* suitability.



Plate 4-10 Dense ivy cover at the rear of the building.

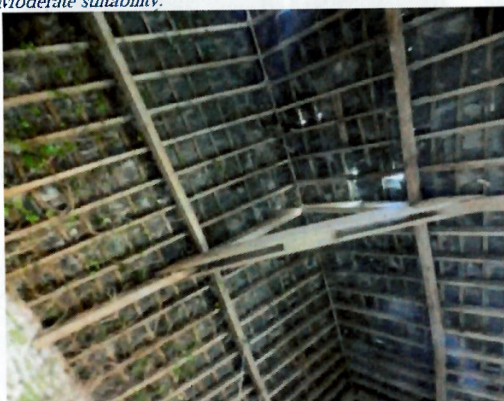


Plate 4-11 Internal roof structure.



Plate 4-12 Western stone shed with damaged roof offering *Moderate* suitability.



Plate 4-13 Dense ivy cover at rear.



Plate 4-14 Internal stonework of western shed.

4.3.2.13 Farm Complex 2

A second farm complex is situated in the south-east of the Proposed Wind Farm site (Grid Ref: S 40863 53902). It is located approximately 500m south of the nearest proposed turbine (T4). It consists of an inhabited dwelling to the south connected to a small storage building (Grid Ref: S 40863 53889), a hay storage shed to the west (Grid Ref: S 40839 53904), several sheds used for dairy farming and hay storage to the north (Grid Ref: S 40842 53927, S 40863 53937, S 40824 53937) and a derelict structure to the east (Grid Ref: S 40864 53911).

The inhabited dwelling is modern and well-sealed with no obvious access points for bats (Plate 4-15). An internal inspection of the dwelling was not deemed necessary. The connected shed is open-faced with an open window frame. However, it is cluttered with limited space for bats to fly within. Both structures were assessed as having *Low* roosting suitability i.e. A structure with one or more potential roost sites that could be used by individual bats opportunistically. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions and/or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats (Collins, 2016).

The open-fronted hay storage shed to the west consists of two adjoining rooms (Plate 4-16 & 4-17), one stocked with hay bales, while the other is spacious with some miscellaneous items spread around the room. The shed has a Perspex roof with a felt underlining with several tears offering potential roosting opportunity for bats. No evidence of bats was found in this building, but the lack of flat surfaces and the hay covered floor could be obscuring any accumulations of droppings. This structure was assessed as having *Moderate* suitability for roosting bats due to the presence of the felt underlining.

The hay storage and dairy sheds to the north are constructed with galvanised metal with corrugated iron roof structures (Plate 4-18). These lacked the necessary protection and appropriate conditions that could be used by bats and were universally assessed as having *Negligible* suitability for roosting bats.

The derelict building is of stone block construction with an open doorway and window frame providing access for bats (4-19). There is also damage to the slate roof that also provides potential access for bats (Plate 4-20). No evidence of roosting bats was found within the structure. However, the structure was assessed as having *Moderate* suitability for roosting bats.



Plate 4-15 Shed connected to inhabited dwelling. Both assessed as having Low suitability.



Plate 4-16 Open-fronted hay shed assessed as having Moderate suitability.



Plate 4-17 Felt underlining in open-fronted shed.



Plate 4-18 Galvanised metal hay storage shed assessed as having negligible roosting suitability.



Plate 4-19 Derelict building with open doorway and window frame assessed as having Moderate suitability.



Plate 4-20 South aspect of derelict building showing damage to slate roof.

A third farm is present adjacent to Farm Complex 2. This farm is not contained within the Proposed Wind Farm site and is situated approximately 600m from the nearest proposed turbine location (T4). It is comprised of eight structures that include an inhabited dwelling to the north (Grid Ref: S 40932 53842) a stone shed to the south (Grid Ref: S 40958 53830) and six sheds constructed either entirely of galvanized metal or with a stone block construction and a galvanized metal roof to the east (Grid Ref: S 40969 53866, S 41006 53868, S 40991 53852, S 41018 53837, S 40977 53838, S 40945 53818).

The inhabited dwelling is modern and displayed no obvious access points for bats (Plate 4-21). An internal inspection of the dwelling was not deemed necessary. The structure was precautionarily assessed as having *Low* suitability to support roosting bats.

The stone shed (Plate 4-22) is of stone block construction with a pebble dash finish. The slated roof exhibits small sections of damage around the ridge tiles and above the guttering, providing permanent access for bats. An open door was noted during inspection, and the presence of felt underlining further offers a potential roosting site for bats (Plate 4-23). The damage to the roof is further detailed in Plate 4-24 where daylight is visible from within the structure. The structure was assessed as having *Moderate* suitability to support roosting bats.

All galvanized metal sheds on the farm are open-faced and exposed to the elements (Plates 4-25 – 4-27) with no identified potential roosting features. The stone block sheds (Plates 4-28 & 4-29) also lacked features such as cracks in the blockwork that could support roosting bats. Consequently, all these structures were assessed as having *Negligible* roosting suitability.



Plate 4-21 Inhabited dwelling assessed as having *Low* suitability.



Plate 4-22 Stone shed with open door assessed as having *Moderate* suitability.



Plate 4-23 Interior of stone shed.



Plate 4-24 Felt underlining and damaged roof offering access and roosting potential for bats.



Plate 4-25 Galvanised metal sheds assessed as Negligible.



Plate 4-26 Exposed galvanised metal shed.



Plate 4-27 Another galvanised metal shed.



Plate 4-28 Stone block shed with corrugated iron roof structure. Assessed as having negligible suitability.



Plate 4-29 Another Negligible stone block shed with a corrugated iron roof structure.

4.3.2.1.5 Ground-Level Tree Assessments

Mature broadleaf tree species forming field boundaries consisted primarily of ash, sycamore, willow, oak, beech and birch. The majority of trees within the Proposed Wind Farm site will be retained as part of the Proposed Project; however, there will be some requirement to remove trees to facilitate the required bat buffers (outlined in Section 6.1.3). A summary of trees/tree groups of note within an 87m radius (requiring removal) of the proposed turbine locations. Their general location, PRFs and respective suitability for bat roosting, are outlined in Table 4-6 below. ~~Further details are included in the Figure 4-1.~~

Of these trees, a small number contained *Moderate* roosting potential, i.e. a tree with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost of high conservation status (Collins, 2016).

The majority of trees assessed were classified as having *Low* roosting potential i.e. a tree of sufficient size and age to contain potential roost features but with none seen from the ground or with features seen with only very limited roosting potential (Collins, 2016).

Conifer plantation to the southwest of the Proposed Wind Farm site do not provide potential roosting habitat of significance for bats and as such were assessed as having *Negligible* roosting potential i.e. negligible habitat features to be used by roosting bats, due to their size and lack of suitable PRFs.

The trees assessed along the Proposed Grid Connection underground cabling route varied in their suitability to support roosting bats, with the majority being assessed as *Negligible*, and a small number as having *Low* to *Moderate* suitability. None of the trees assessed are designated for removal to facilitate the Proposed Grid Connection.

A hedgerow, primarily consisting of hawthorn with brambles and individual ash trees, is located adjacent the site of the proposed met mast. The ash trees were evaluated as having *Negligible* potential for supporting roosting bats, and none are designated for removal to accommodate the installation of the mast.

Overall, the Proposed Wind Farm site contains a number of mature trees, hedgerows and treelines. All trees assessed are outlined in Table 4-6, Figure 4-1 and shown in Plates 4-30 to 4-45. Some of these features will require removal to facilitate the bat felling buffer (see Section 6.1.3). Several trees proposed for removal provide potential suitable habitat for roosting bats. However, no evidence of roosting bats was identified during the ground level assessment.

Following the Further Information Request, a more detailed assessment was undertaken in August 2025 of all trees proposed for removal to facilitate the bat felling buffers and associated site infrastructure (including the site entrance on the L1009, temporary construction compound, spoil management area, substation entrance, and access track to T7). This survey was completed by a licensed bat ecologist following the updated Collins (2023) guidance and Bat Tree Habitat Key (2018), using binoculars, a thermal camera, high powered torch, endoscope, and a ladder where required. In total, 83 no. trees were inspected, with features previously noted in the 2023 survey (e.g. broken branches, knot holes, cankers, ivy cover) determined on close inspection to be superficial, without cavities or crevices suitable for roosting bats. In line with Table 4.2 of Collins (2023), all trees requiring removal to facilitate construction were classified as *None*, with no *PRF-I* or *PRF-M* trees identified. While a small number of *PRF-I* trees were recorded within the wider Site, these are located outside the construction footprint and will be retained as part of the Proposed Project.

As outlined in Section 6.1.4 (Confirmatory Pre-construction Tree Survey), a precautionary pre-felling inspection will be carried out prior to removal to confirm the updated baseline status of trees. This does not represent a lacuna in the survey effort but reflects best practice, recognising that tree condition can change over time. The results of this survey are outlined in Figure 4-1.

Table 4-6: Summary of Trees/Tree Groups Inspected within the Proposed Wind Farm Site¹

Nearest Turbine	Inspection Date	PRFs	Trees/Hedgerows to be removed/retained. North, South, East or West of Turbine	Bat Suitability (2023 Survey)	2025 Reinspection Result
T01	31 st May 2023	Broken limbs, hollows and dense ivy cover.	Portion of treeline to west to be removed.	• Low	• No PRFs – classified as None (Aug 2025)
T02	31 st May 2023	Dense ivy cover	- Just outside felling buffer - Treeline to the west being retained.	• Low	• No PRFs – classified as None (Aug 2025)
T03	31 st May 2023	Canker, hollows, ivy cover	Sections of treeline to east and south to be removed.	- East treeline Low – Moderate - South treeline Low	• No PRFs – classified as None (Aug 2025)
T04	31 st May 2023	Ivy cover	All treelines outside bat buffer.	- North - Negligible - East - Negligible, one Low - South - Negligible - West - Negligible	• No PRFs – classified as None (Aug 2025)
T05	31 st May 2023	N/A	Hedgerows to north and portion of hedgerow to south to be removed.	• Negligible	• No PRFs – classified as None (Aug 2025)
T06	31 st May 2023	Broken limb, dead limbs, ivy cover	Treelines to west and east to be removed.	9 trees with Low suitability 1 south of turbine with Moderate	• No PRFs – classified as None (Aug 2025)
T07	31 st May 2023	N/A	3.57 ha of Conifer plantation to be felled.	• Negligible	• No PRFs – classified as None (Aug 2025)
Proposed Grid Connection	21 st /22 nd March 2024	Ivy cover, cracks, wounds	No vegetation removal proposed.	• Negligible - Moderate	• No PRFs – classified as None (Aug 2025)
Met Mast	31 st May 2023	N/A	No vegetation removal proposed.	• Negligible ³	• No PRFs – classified as None (Aug 2025)

³ Update (August 2025): All trees originally recorded as Low or Moderate suitability were subject to detailed re-inspection on 25th August 2025. On close inspection, no actual PRFs were identified, and all trees proposed for removal were reclassified as "None" (Collins, 2023).



Plate 4-30 T01 – Ash tree with broken limb – Low (August 2025 inspection confirmed no PRFs present)



Plate 4-31 T01 Gap in divergence of trunk – Low (August 2025 inspection confirmed feature superficial, no PRFs present)



Plate 4-32 T01 Cavity in Ash tree – Low (August 2025 inspection confirmed superficial cavity, no PRFs present)

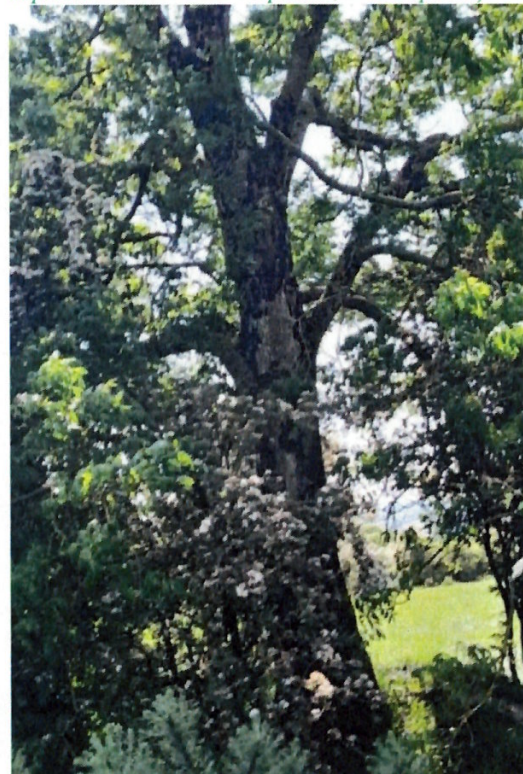


Plate 4-33 T01 Ash tree with broken limb – Low (August 2025 inspection confirmed no PRFs present)



Plate 4-34 T02 Sycamore with heavy ivy cover – Low (August 2025 inspection confirmed ivy cover superficial, no PRFs present)

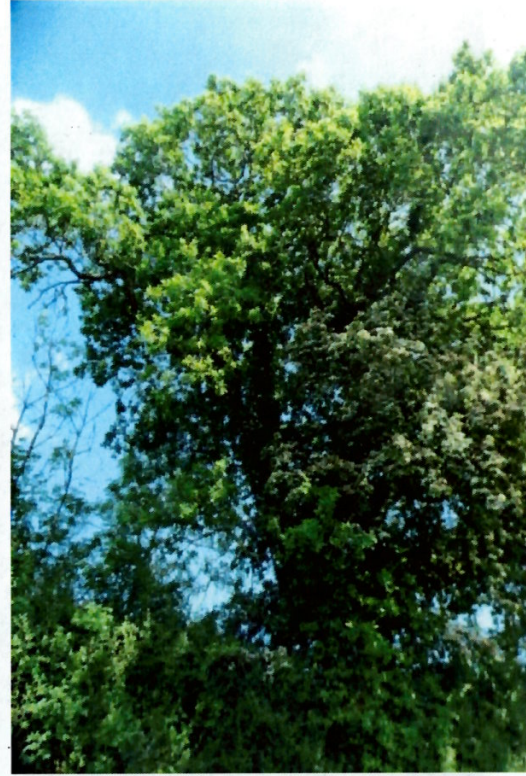


Plate 4-35 Mature Oak tree with heavy ivy cover – Low (August 2025 inspection confirmed ivy superficial, no PRFs present)



Plate 4-36 Oak tree with broken limb and large wound – Moderate (August 2025 inspection confirmed superficial wound, no PRFs present)

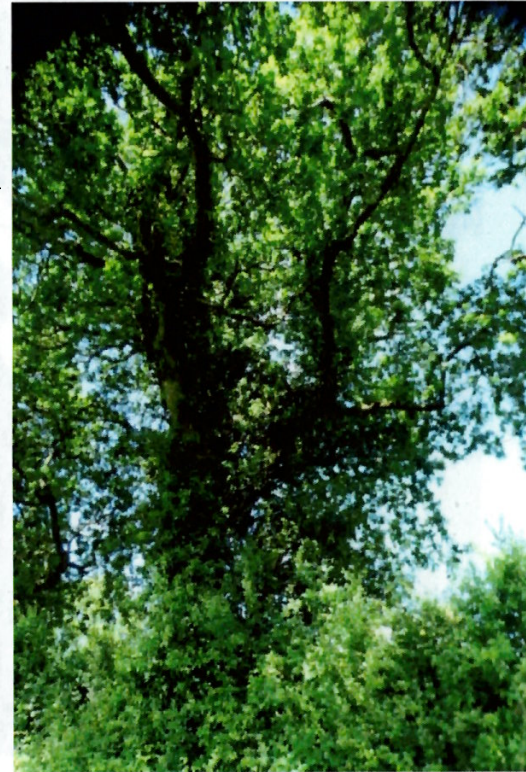


Plate 4-37 T03 Mature Oak with dense ivy cover – Low (August 2025 inspection confirmed ivy superficial, no PRFs present)



Plate 4-38 T03 Ash with cankers and broken limbs – Moderate
 (August 2025 inspection confirmed no PRFs present)



Plate 4-39 T04 Mature Willow – Outside buffer (August 2025
 inspection confirmed no PRFs present)



Plate 4-40 T06 Beech with fluting and dense ivy cover –
 Moderate (PRF-I) – Outside Bat Felling Buffer



Plate 4-41 T06 Ash with dead limbs and dense ivy cover – Low
 (August 2025 inspection confirmed no PRFs present)



Plate 4-12 T06 Ash tree with broken limb and dense ivy cover
--Low (August 2025 inspection confirmed no PRFs present)

4.3.2.2 Emergence Surveys

Emergence surveys were carried out in spring, summer and autumn of 2023. The spring dusk emergence survey was conducted by two surveyors on the 31st May at Farm Complex 1 with particular focus on the shed containing hanging seed sacks. This specific structure was confirmed as a roost, prompting a subsequent survey in summer on July 27th by two surveyors. Bats were again observed emerging from the roost during this follow-up survey. Concurrently, on the same date, another team of surveyors examined derelict buildings located approximately 400 meters southwest of Farm Complex 1. While no bats were observed emerging from these structures, a number of bats were seen foraging around the treeline and other structures.

An emergence survey was also conducted on 12th October during the autumn period at Farm Complex 2 in which two pipistrelles were observed emerging from the open-fronted hay shed, with two other species recorded foraging around the farm. Table 4-7 summarises the findings of the bat activity surveys carried out on the structures.

Table 4-7 Emergence Survey Results 2023

Structure	PRF Suitability	IG Ref	Survey Type	Date Surveyed	Survey Results
Farm Complex 1 - Shed with seed sacks	Moderate	S 39935 54423	Dusk Emergence Spring 2023	31 st May 2023	2no. soprano pipistrelle and 3no. brown long-eared bats observed emerging.
Farm Complex 1 - Shed with seed sacks	Moderate	S 39935 54423	Dusk Emergence Summer 2023	27 th July 2023	5no. soprano pipistrelle emerged with 5no. other specimens observed emerging that weren't recorded on bat logger (likely brown long-eared).
Derelict buildings	Low	S 39588 54182	Dusk Emergence Summer 2023	27 th July 2023	No bats emerging. 4-5no. bats observed foraging around treeline and derelict structures (2no. soprano pipistrelles, 2no. common pipistrelles and 1no. Leisler's bat).
Farm Complex 2	Negligible, Low and Moderate	S 40838 53906	Dusk Emergence Autumn 2023	12 th October 2023	One soprano and one common pipistrelle observed emerging from hay shed (S 40838 53906). 1-2no. common and sopranos pipistrelles, 2no. <i>Myotis spp.</i> and 1no. brown long-eared bat commutated foraging.

4.3.3 Manual Transects

Manual transects were undertaken in spring, summer and autumn 2023. Bat activity was recorded in all seasons. A total of 2,049 bat passes were recorded, including emergence survey activity. In general, soprano pipistrelle (n=940) was recorded most frequently, followed by common pipistrelle (n=885). Leisler's bat (n=159), *Myotis spp.* (n=53) and brown long-eared bat (n=12) were less frequent (Plate 4-43).

Species composition and activity levels varied between surveys. Transect survey results were calculated as bat passes per km surveyed (to account for differences in survey effort). Plate 4-44 presents the results for individual species per survey period. Figures 4-2 – 4-4 present the spatial distribution of bat activity across surveys. Bat activity was concentrated along treelines, hedgerows, and linear (road/track) habitats.

Soprano pipistrelle occurred more frequently in spring and autumn of 2023, while common pipistrelle occurred most often in summer. Leisler's bat was more prominently present in the spring, particularly within the conifer plantation at T07.

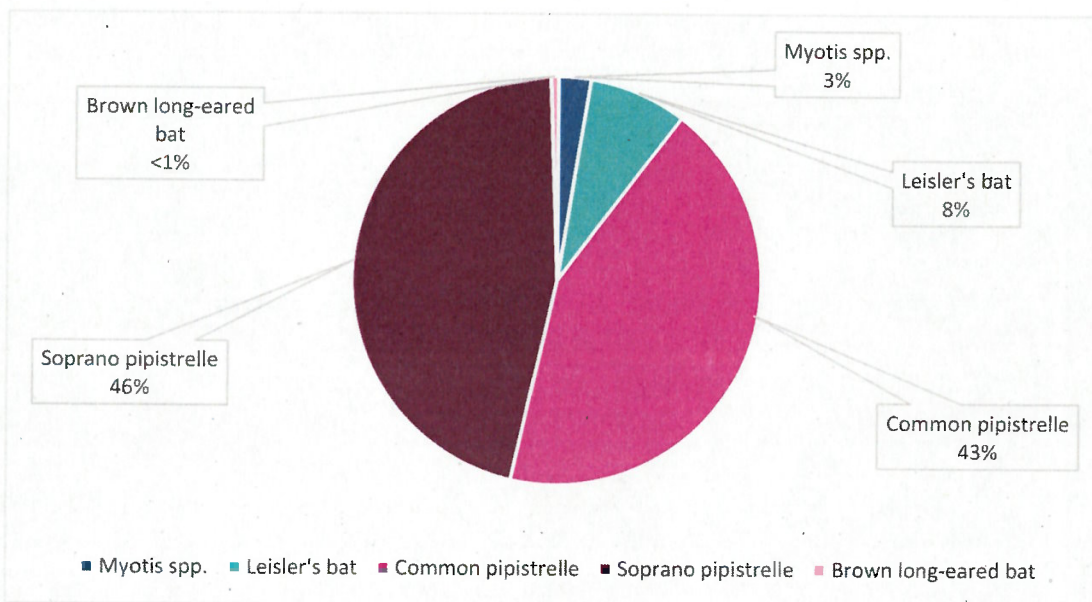


Plate 4-13 2023 Manual Activity Surveys (Total Species Composition)

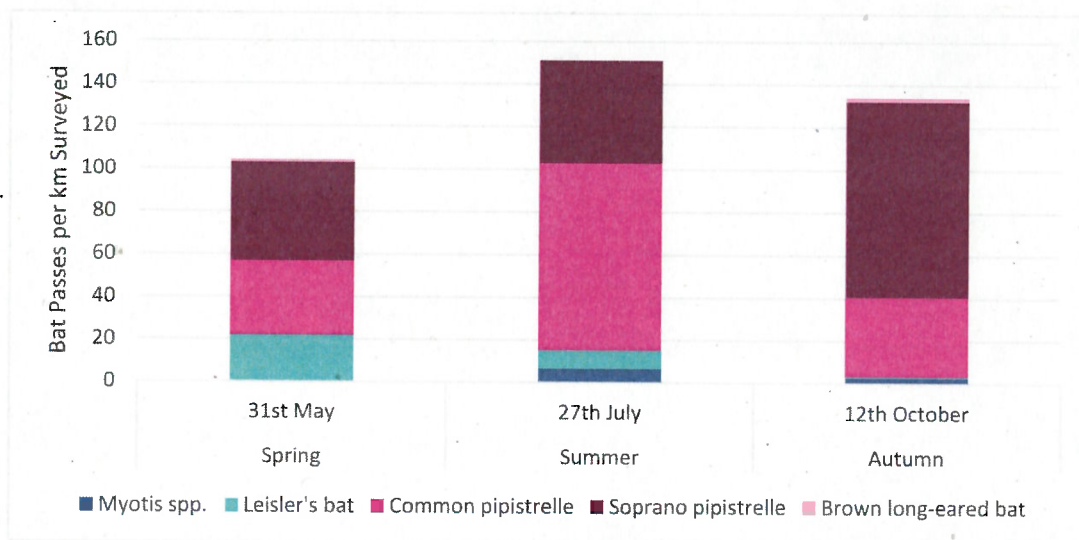


Plate 4-14 2023 Transect Results – Species Composition Per Survey Period

Map Legend

- EIR Site Boundary
- Proposed Turbine Locations
- Spring Transect Route 31st May 2023
- Spring Transect Results
- Leider's bat
- Common pipistrelle
- Soprano pipistrelle

Micro software product screen shots reprinted with permission from Microsoft Corporation
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Project Title
Spring Manual Transect
Results 2023

Project No.
Briskalagh Renewable Energy
Development

Drawn By
RC

Checked By
AJ

Project No.
230502

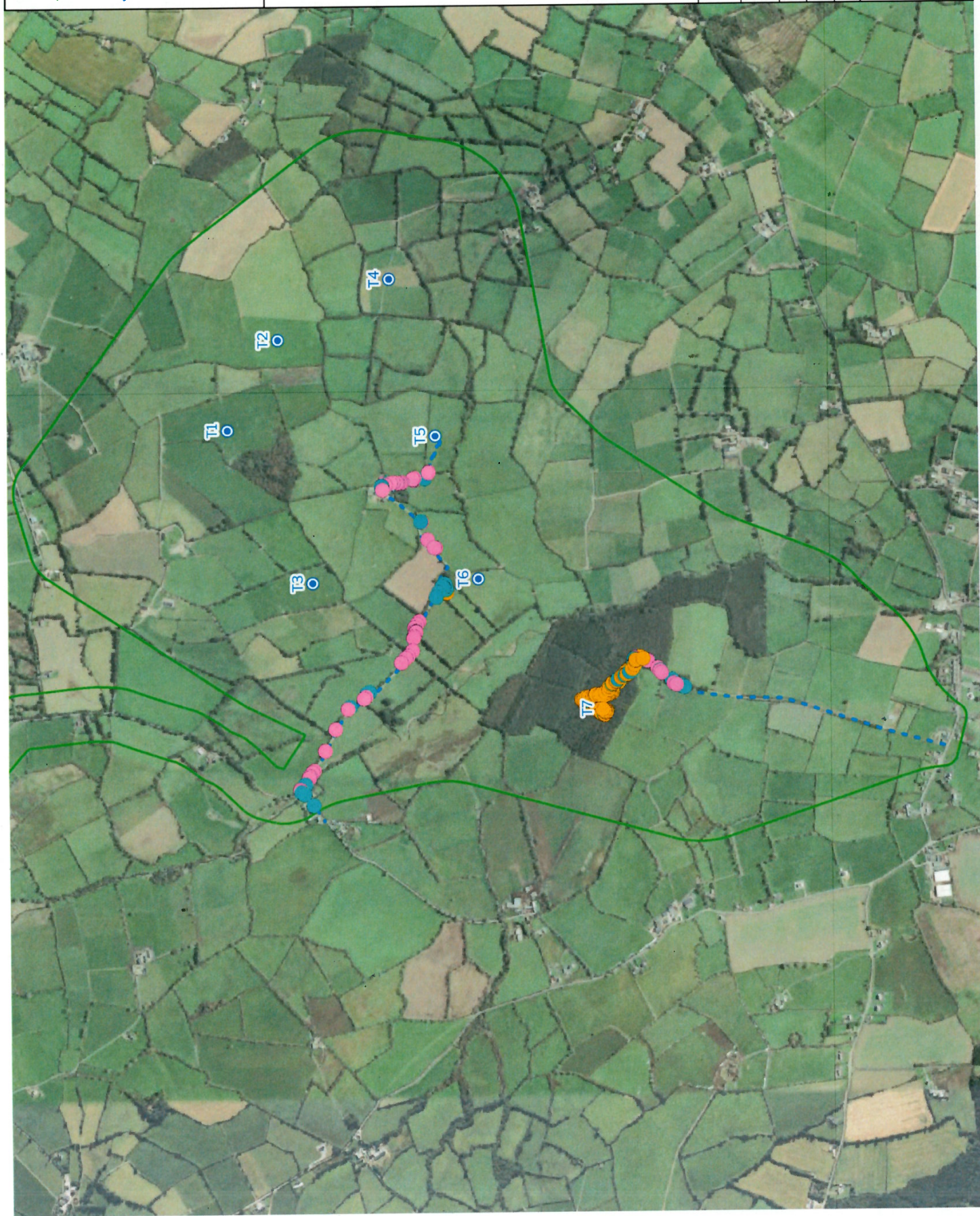
Figure 4-2

Scale
1:18,000

Date
2024-09-11



MKO
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Map Legend

- EIAR Site Boundary
- Proposed Turbine Locations
- - - Summer Transect Route 27th July 2023
- Summer Transect Results
 - Myotis spp.
 - Leisler's bat
 - Common pipistrelle
 - Soprano pipistrelle

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Drawing Title		Summer Manual Transect Results 2023	
Project Title		Briskalagh Renewable Energy Development	
Drawn By	RC	Checked By	AJ
Project No.	230502	Drawing No.	Figure 4-3
Scale	1:18,000	Date	2024-09-11

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Map Legend

- EIAF Site Boundary
- Proposed Turbine Locations
- - - Autumn Transect Route 12th October 2023
- Autumn Transect Results
 - Myotis spp.
 - Leisler's bat
 - Common pipistrelle
 - Soprano pipistrelle

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Drawing Title
Autumn Manual Transect Results 2023

Project Title
Briskalagh Renewable Energy Development

Drawn By
RC

Checked By
AJ

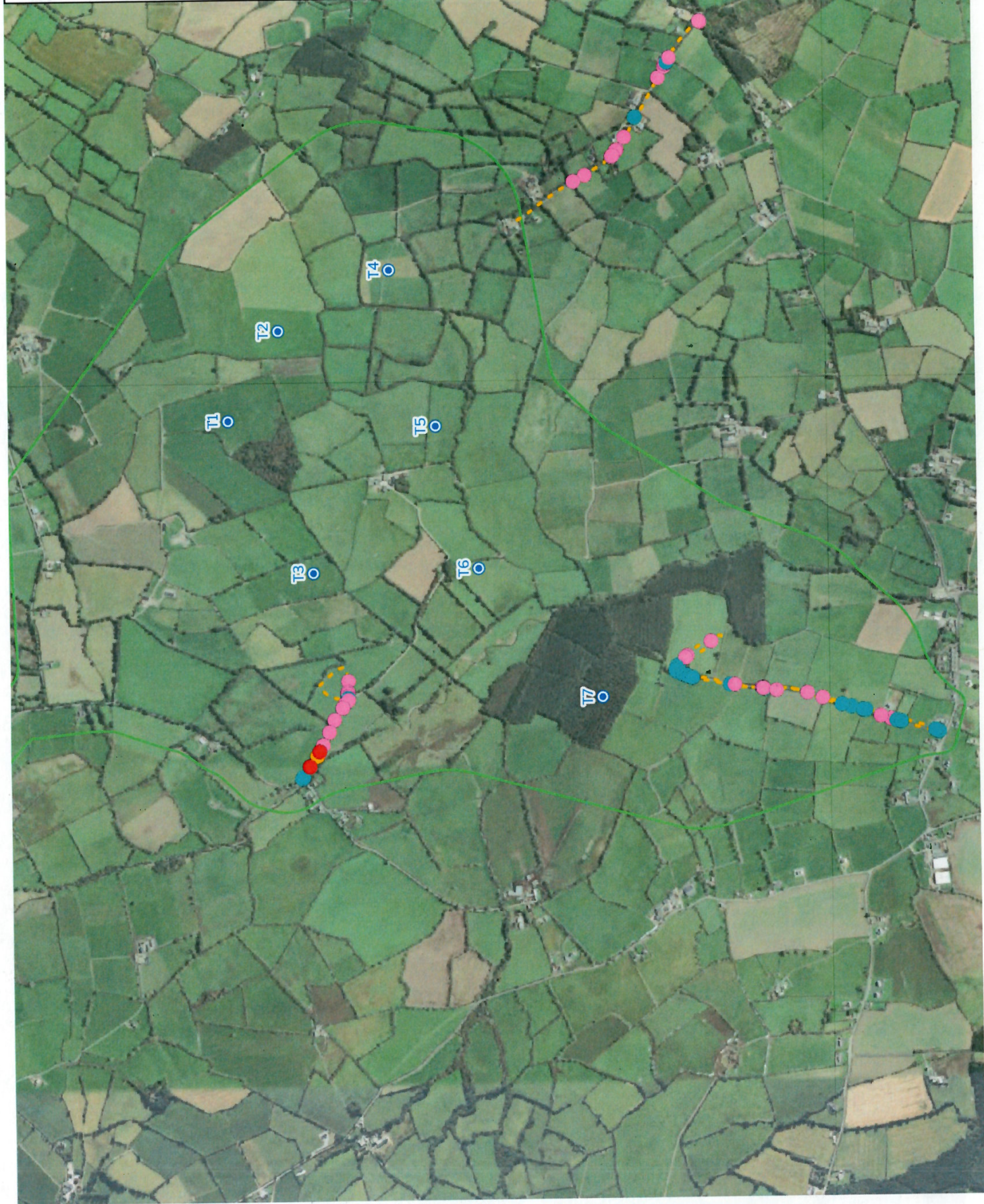
Project No.
230502

Drawing No.
Figure 4-4

Scale
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Ground-level Static Surveys

In total, 64,224 bat passes were recorded across all deployments. In general, common pipistrelle (n=23,217) occurred most frequently, followed by soprano pipistrelle (n=21,410) and Leisler's bat (n=14,362). Instances of *Myotis spp.* (n=4,484), Brown long-eared bat (n=673) and Nathusius' pipistrelle (n=78) were recorded less frequently during the 2023 survey period. Plate 4-45 presents relative species composition across all ground-level static detector surveys.

Bat Species Composition

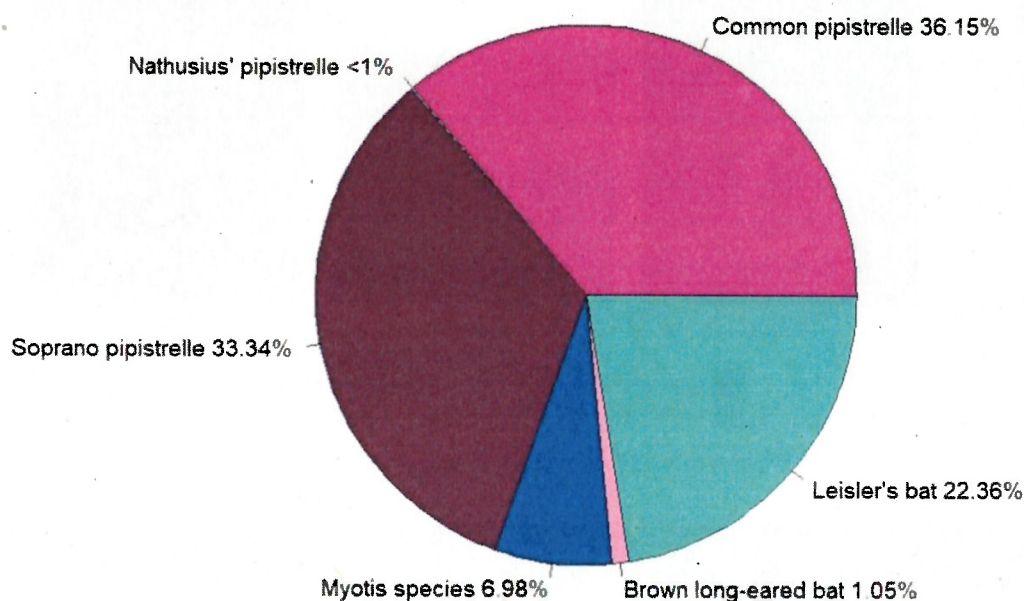


Plate 4-45 2023 Static Detector Surveys: Species Composition Across All Deployments (Total Bat Passes)

Bat activity was calculated as total bat passes per hour (bp/h) per season to account for any bias in survey effort, resulting from varying night lengths between seasons. Plates 4-46 and Table 4-8 presents these results for each species per season. Spring activity was dominated by Leisler's bat and common pipistrelle. During the summer and autumn, activity was more evenly distributed between common and soprano pipistrelle, with significant representation from Leisler's bat and *Myotis spp.* Instances of brown long-eared bat and Nathusius' pipistrelle were relatively rare throughout the survey periods.

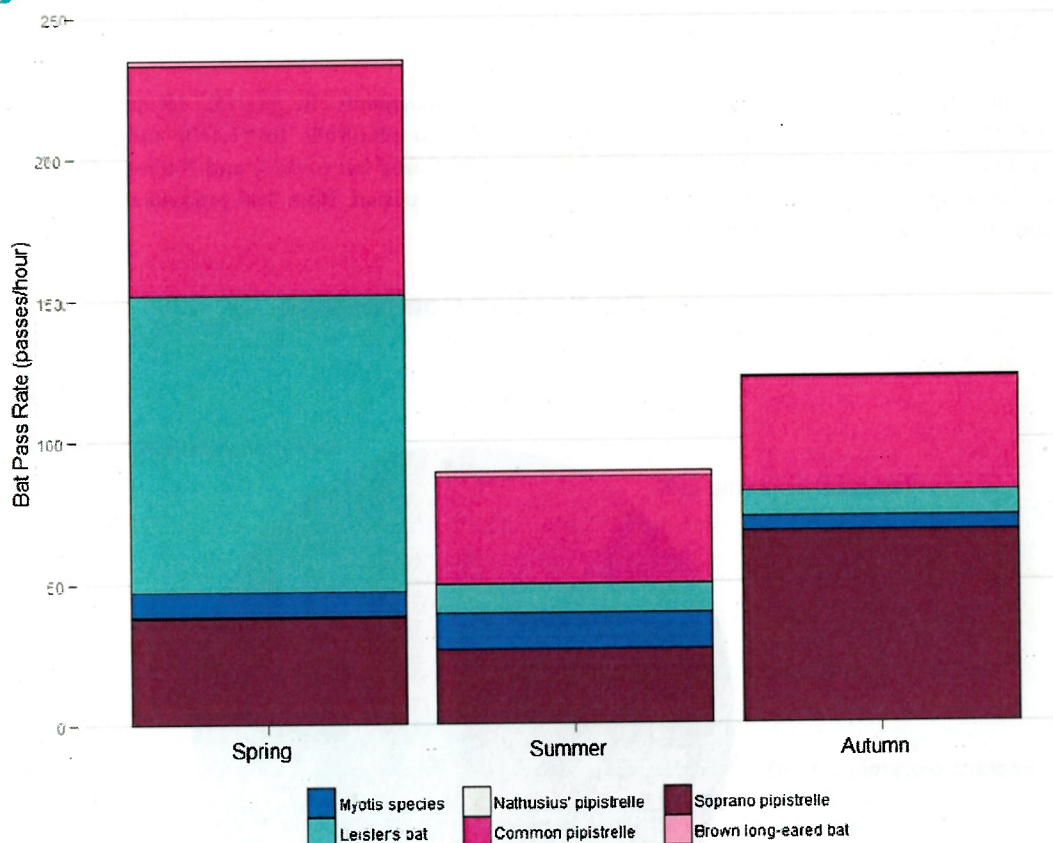


Plate 4-46 2023 Static Detector Surveys: Species Composition Across All Deployments (Total Bat Passes Per Hour, All Nights)

Table 4-8 Static Detector Surveys: Species Composition Across All Deployments (Total Bat Passes Per Hour, All Nights)

	Spring	Summer	Autumn
Total Survey Hours	101.5	212.1	176.6
<i>Myotis spp</i>	8.66	13.05	4.74
Leisler's bat	104.78	10.08	8.99
Nathusius' pipistrelle	0.47	0.11	0.03
Common pipistrelle	81.01	37.53	39.83
Soprano pipistrelle	37.94	26.22	67.94
Brown long-eared bat	1.77	1.83	0.59

The Median Bat Pass Rate, Per Detector, Per Survey period is shown in Plates 4-47 and 4-48 (varied axis scale). Bat activity varied across seasons and detector locations. Activity at D07 in spring was significantly higher than all other detector locations and largely dominated by Leisler's bat activity. This detector was located within dense conifer plantation. Activity in summer was substantially reduced, and species composition shifted to being common pipistrelle, soprano pipistrelle and *Myotis spp.* dominant, particularly at D05, D06 and D07. In autumn, D03 and D05 had the highest activity compared with other detector locations, with soprano and common pipistrelle dominating, respectively. The remaining detectors exhibited very low activity across the season.



The Median Nightly Pass Rate (i.e. total bat passes per hour, per night) was used to determine typical bat activity at the Proposed Wind Farm site (Plate 4-49). Activity was often variable between survey nights. Plates 4-50 to 4-52 (varied axis scales) illustrates the Median Nightly Pass Rate per species, per deployment. Therefore, the Median Nightly Pass Rate was used as the most appropriate measure of bat activity (Lintott & Mathews, 2018). Zero data, when a species was not detected on a night, was also included.



Plate 1-17 Static Detector Surveys: Median Bat Pass Rate (bph) Including Absences, Per Location Per Survey Period.

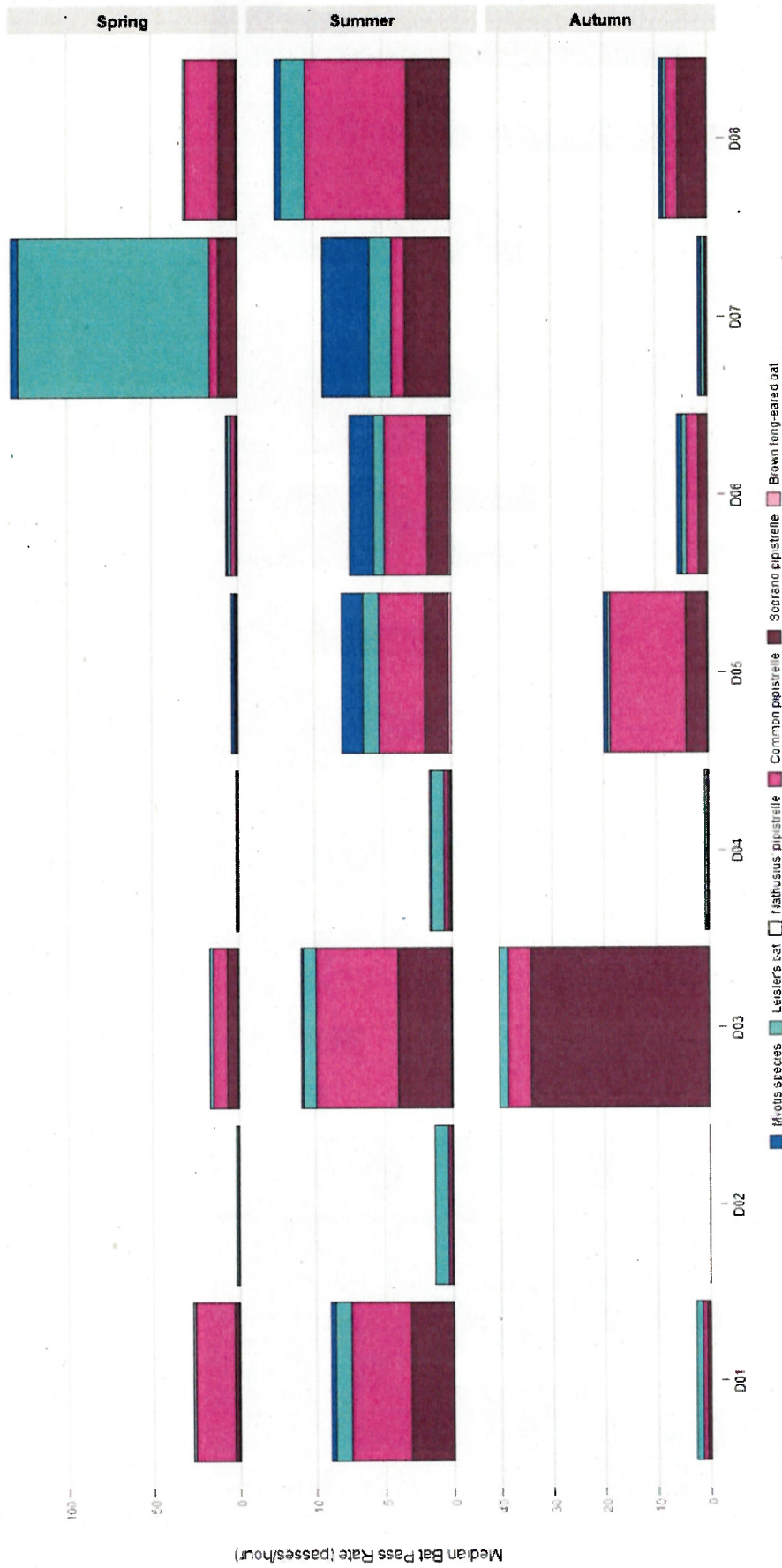


Plate 4-48 Static Detector Surveys: Median Bat Pass Rate (bph) Including Absences, Per Location Per Survey Period (Varied Axis Scale).

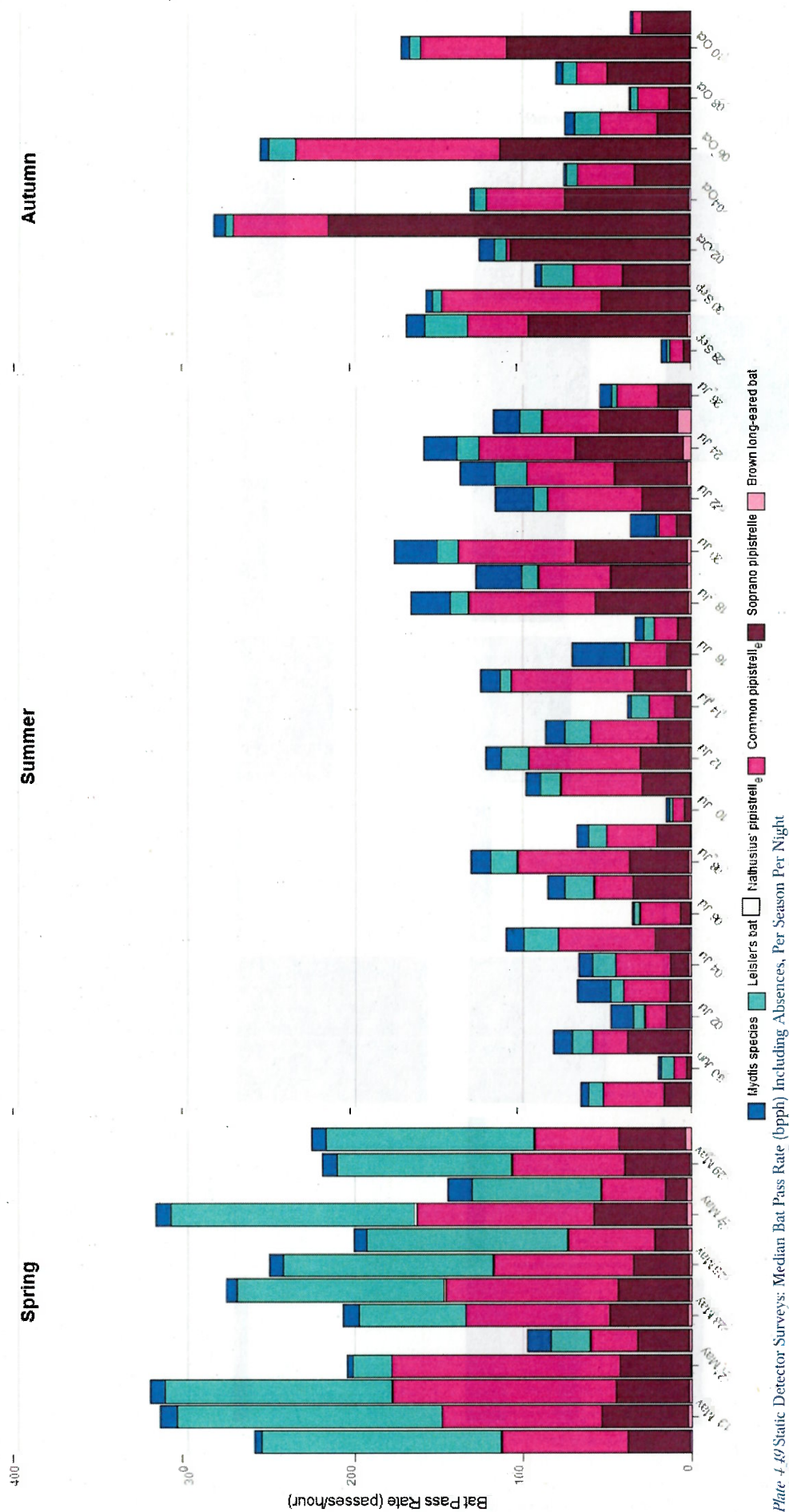


Plate 4-49 Static Detector Surveys: Median Bat Pass Rate (bp/h) Including Absences, Per Season Per Night

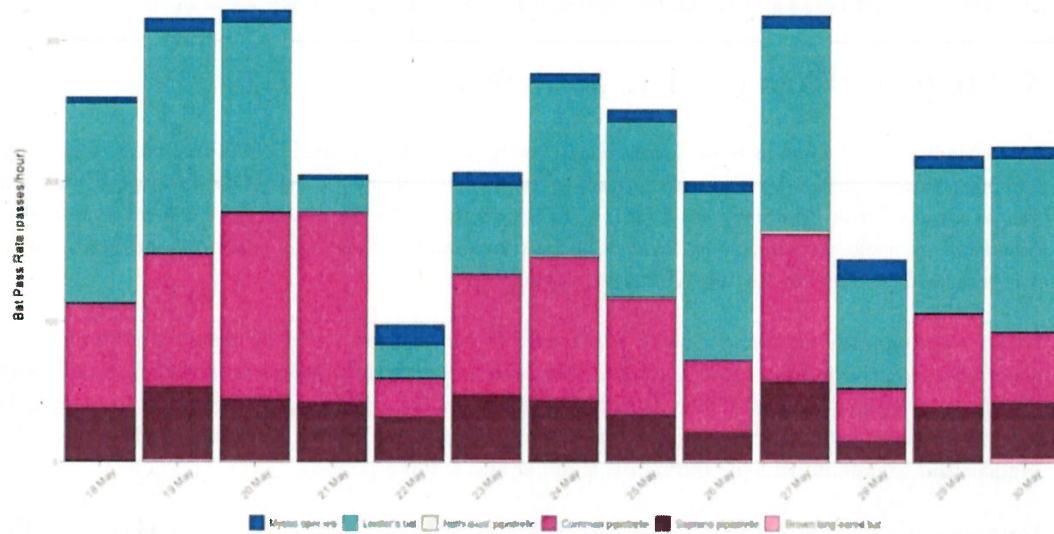


Plate 4-50 Static Detector Surveys: Spring Median Bat Pass Rate (bph) Including Absences, Per Night

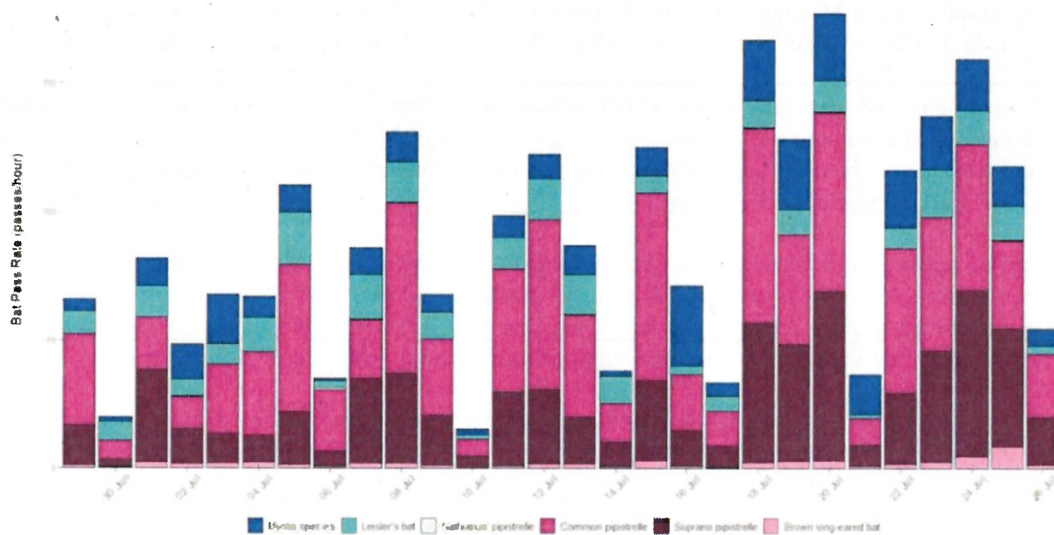


Plate 4-51 Static Detector Surveys: Summer Median Bat Pass Rate (bph) Including Absences, Per Night

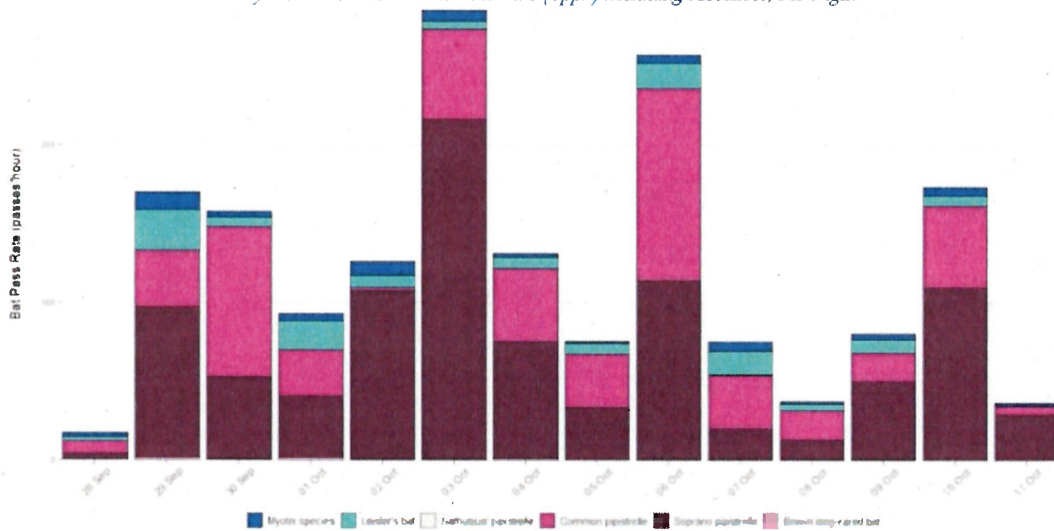


Plate 4-52 Static Detector Surveys: Autumn Median Bat Pass Rate (bph) Including Absences, Per Night

Assessment of Bat Activity Levels 2023

Adapted Site-specific Ranges

Low, Medium and High activity levels were assigned to median and maximum pass rates (bpph) identified during spring, summer and autumn at the detectors deployed across the Proposed Wind Farm site, as adapted from Mathews *et al.* (2016). Table 4-9 shows the results of the site-level assessment as calculated on a site-specific activity level. Where no maximum activity at a detector is reported, no data was recorded for that species throughout the deployment.

Leisler's bat typically exhibited *Low* to *Moderate* Median Activity Levels in spring and summer, with generally *Low* Activity observed in autumn. However, a significant outlier was detected at D07 during the spring, recording a *High* Median Activity of 112.5 bpph and a Maximum Activity of 144.5 bpph. This detector, situated within dense conifer plantation (WD4), experienced a substantial drop-off in both Median and Maximum Activity during the summer and autumn periods.

For common pipistrelle, Median Bat Activity was generally *Low* to *Moderate* across all seasons. Three detectors, D01 and D08 in spring, and D05 in autumn, recorded *High* Median Activity, accompanied by significantly higher Maximum Activity compared to the rest of the Proposed Wind Farm site during those periods. Similar to Leisler's bat, common pipistrelle exhibited increased activity during the spring season.

Soprano pipistrelle generally displayed *Low* Median Bat Activity, with occasional instances of *Moderate* Activity. D03 in autumn was the sole detector recording *High* Median Activity, with a rate of 34.1 bpph and a Maximum of 195.8 bpph. This reading was notably higher than all other locations, including the same location in spring and summer.

Myotis spp. recorded relatively *Low* activity compared to other species across the Proposed Wind Farm site. Median Activity was generally *Low* to *Moderate* in all three seasons, with the exception of D07, which recorded *High* Median Activity in summer and autumn. *High* Maximum Activity was also observed at D07 during these periods, with Maximum Activity peaking at D01 in summer.

Brown long-eared bat exhibited *Low* Median Activity at all detectors in all periods across the Proposed Wind Farm site. Maximum Bat Activity for the species peaked at D02 in autumn with a rate of 4.5 bpph.

Nathusius' pipistrelle also recorded *Low* Median Activity at all locations in all seasons throughout 2023, with a Median Activity of 0.00 bpph for all locations. D05 recorded *High* Maximum Activity in spring and summer, with activity peaking in spring at a rate of 1.43 bpph.

Table 49 Median Nightly Bat Activity (bph) per Species, per Season, per Detector Location 2024 Low, Moderate, High

2023 Season	Detector	Myotis spp.		Leisler's bat		Nathusius' pipistrelle		Common pipistrelle		Soprano pipistrelle		Brown long-eared bat	
		Median Bat Activity	Max Bat Activity	Median Bat Activity	Max Bat Activity	Median Bat Activity	Max Bat Activity	Median Bat Activity	Max Bat Activity	Median Bat Activity	Max Bat Activity	Median Bat Activity	Max Bat Activity
Spring	D01	0.26	1.03	0.65	1.76			23.59	97.28	2.47	7.47	0.13	2.38
	D02	0.26	0.63	0.87	2.49			0.37	1.13	0.00	0.39	0.13	0.39
	D03	0.38	1.43	1.56	4.13		0.53	8.42	35.28	6.41	26.33	0.25	0.53
	D04	0.00	0.13	0.40	1.79	0.00	0.13	0.25	0.88	0.13	0.26	0.13	0.62
	D05	1.29	2.79	1.03	2.35	0.00	1.43	0.38	1.69	0.00	0.50	0.39	1.30
	D06	1.52	2.33	1.56	2.88	0.00	0.26	2.84	5.08	0.51	1.38	0.13	0.51
	D07	4.28	9.95	112.55	144.55	0.00	0.13	5.89	34.53	10.40	39.44	0.00	0.25
	D08	0.13	0.53	1.30	4.08	0.00	0.12	20.11	71.89	9.56	37.79	0.25	0.51
Summer	D01	0.40	18.01	1.06	3.42	0.00	0.13	4.34	35.64	3.17	40.87	0.00	0.62
	D02	0.00	0.74	0.97	4.51	0.00	0.13	0.26	1.50	0.13	1.03	0.00	4.47
	D03	0.14	1.85	0.90	2.64	0.00	0.14	6.00	20.32	3.86	26.22	0.13	2.23
	D04	0.14	1.03	0.93	3.39	0.00	0.14	0.27	1.26	0.19	0.77	0.13	0.55
	D05	1.62	2.61	1.06	4.01	0.00	0.68	3.36	20.66	1.71	7.64	0.27	1.36
	D06	1.78	4.33	0.69	3.29	0.00	0.27	3.14	47.62	1.63	5.86	0.14	1.37
	D07	3.43	15.06	1.53	4.98			1.03	4.81	3.36	7.23	0.00	0.54
	D08	0.46	4.57	1.75	6.25			7.34	29.68	3.25	7.41	0.00	1.84
Autumn	D01	0.08	0.25	1.13	5.51			0.78	11.27	0.83	3.35	0.00	0.32
	D02	0.00	0.16	0.08	1.11	0.00	0.08	0.00	0.25	0.00	0.16	0.00	0.08
	D03	0.08	2.70	1.66	5.58	0.00	0.08	4.34	13.86	34.13	195.83	0.00	0.25
	D04	0.04	0.31	0.67	2.35			0.08	0.33	0.08	0.46	0.00	0.41
	D05	0.76	3.12	0.40	2.70	0.00	0.16	14.28	84.47	4.23	10.07	0.16	0.32
	D06	0.85	4.54	0.80	2.12	0.00	0.08	2.48	20.56	1.61	6.53	0.12	0.41
	D07	0.67	6.29	0.47	7.52			0.24	1.55	0.47	2.53	0.00	0.08
	D08	0.56	1.32	0.64	4.85			2.08	9.40	5.68	14.06	0.08	0.33

4.5

Importance of Bat Population Recorded at the Proposed Wind Farm site

Ecological evaluation within this section follows a methodology that is set out in Chapter three of the 'Guidelines for Assessment of Ecological Impacts of National Roads Schemes' (NRA, 2009).

All bat species in Ireland are protected under the Bonn Convention (1992), Bern Convention (1982) and the EU Habitats Directive (92/43/EEC). Additionally, in Ireland bat species are afforded further protection under the Birds and Natural Habitats Regulations (2011) and the Wildlife Acts 1976, as amended. Bats as an Ecological Receptor have been assigned **Local Importance (Higher value)** on the basis that the habitats within the Proposed Wind Farm site are utilized by a regularly occurring bat population of Local Importance.

During the 2023 surveys, three roosts containing soprano pipistrelles, *Myotis spp.* and brown long-eared bats were identified. However, these roosts were characterized by limited emergences, with only single-digit counts observed. No roosting site of National Importance (i.e. site greater than 100 individuals) was recorded within the Proposed Wind Farm site during the 2023 surveys.

5. RISK AND IMPACT ASSESSMENT

This risk and impact assessment has been undertaken in accordance with NatureScot Guidance. As per the NatureScot Guidance, wind farms present four potential risks to bats:

- Collision mortality, barotrauma and other injuries
- Loss or damage to commuting and foraging habitat
- Loss of, or damage to, roosts
- Displacement of individuals or populations

For each of these four risks, the detailed knowledge of bat distribution and activity within the Proposed Wind Farm site has been utilized to predict the potential effects of the Proposed Project on bats.

5.1 Collision Mortality

5.1.1 Assessment of Site-Risk

The likely impact of a proposed development on bats is related to site-based risk factors, including habitat and development features. The site risk assessment, as per Table 3a of the NatureScot guidance, is provided in Table 5-1 below.

Table 5-1 Site-risk Level Determination for the Proposed Project (Adapted from NatureScot, 2021)

Criteria	Site-specific Evaluation	Site Assessment
Habitat Risk	Three low-value roosts (≤ 10 specimens) containing soprano pipistrelles, <i>Myotis spp.</i> and brown long-eared bats were identified within the Proposed Wind Farm site. One other PRF complex was surveyed, and no evidence of the presence of roosting bats was identified. A number of trees with <i>Low-Moderate</i> potential as roost sites on or near the Proposed Wind Farm site turbine locations. The habitats within the Proposed Wind Farm site provide suitable commuting and foraging habitat for bats and is connected to the wider landscape by linear features such as tree lines, hedgerows and streams. Despite the presence of these linear features, it does not provide an extensive and diverse habitat mosaic of high quality or meet any of the criteria of a High risk site as set out in Table 3a of NatureScot, 2021.	Medium
Project Size	Following the criteria set out in NatureScot, 2021 the project is of Small scale as it consists of < 10 turbines (7 no. turbines). However, since these turbines exceed 100m in height, the project falls into the Medium project size category. The project is not a strategic infrastructural development and is well below the number of turbines that would constitute a Large development (NatureScot, 2021). The project has therefore been assessed as being of Medium size. There is one wind energy developments within 5km and three others within 10km.	Medium
Site Risk Assessment (from criteria in Plate 3-3)		Medium Site Risk (3)

The Proposed Wind Farm site is located in an area of predominantly Improved Agricultural Grassland with broadleaf treelines and hedgerows forming field boundaries throughout the Proposed Wind Farm site. As per Table 3a of the NatureScot Guidance (2021), the Proposed Wind Farm site has a *Moderate*

habitat risk and *Medium* project size (Small scale development including 7 turbines but comprised of turbines >100m in height). The cross tabulation of a *Medium* project on a *Moderate* risk site results in an overall risk score of *Medium* (NatureScot Table 3a).

5.1.2 Assessment of Collision Risk

The following high-risk species were recorded during the dedicated surveys:

- Leisler's bat,
- Common pipistrelle
- Soprano pipistrelle
- Nathusius' pipistrelle

The Overall Risk Assessment for high collision risk species is provided in the sections below. Overall Risk was determined, in accordance with Table 3b of NatureScot 2021 guidance (**Appendix 3**), by a cross-tabulation of the site risk level (i.e. *Medium*). The assessment was carried out for both median and maximum activity categories in order to provide insight into typical bat activity (i.e. median values) and activity peaks (i.e. maximum values). NatureScot recommends that the most appropriate activity level (i.e. median or maximum) be utilised to determine the overall risk assessment for a species.

As per NatureScot guidance there is no requirement to complete an Overall Risk Assessment for low-risk species. During the extensive suite of surveys undertaken the following low risk species were recorded:

- *Myotis spp.*
- Brown long-eared bat

Overall activity levels for brown long-eared bat were low. While there were peaks in median activity levels for *Myotis spp.* at D07 for summer and autumn, the overall activity levels for the species were low; therefore, no significant collision related effects are anticipated. Loss of habitat is assessed further in Section 5.2 and 5.3. below. Activity levels for these species will continue to be assessed during operational monitoring following the implementation of best practice mitigations provided. Further mitigation will be implemented after Year 1 if deemed necessary.

5.1.2.1 Leisler's bat

The Proposed Wind Farm site is within the current range of the Leisler's bat (NPWS, 2019). Leisler's bats are classed as a rarer species of a high population vulnerability which have a high collision risk (Plate 3-2). Leisler's bats were recorded during all activity surveys across the Proposed Wind Farm site. When assessed in the context of the identified site risk and in line with Table 3b (NatureScot, 2021), overall activity risk for Leisler's bat was found to be *Medium* in spring and summer, and *Low* in autumn at typical activity levels. *High* peak activity levels were recorded across all seasons in 2023 (See Table 5-2 below).

Based on site visit and survey data, including walked transects, it is determined that the Typical Activity (i.e. Median) is reflective of the nature of the Proposed Wind Farm site, which is primarily agricultural grassland, treelines/hedgerows and small areas of conifer plantations with moderate levels of bat activity recorded during the walked transects undertaken at the Proposed Wind Farm site.

Thus, the overall collision risk level for the local population of Leisler's bat is generally assessed as *Medium* across all seasons and detectors with the sole exception of D07, which was assessed as having a *High* collision risk level in spring.

Table 5-2 Leisler's bat - Overall Risk Assessment

Survey Period	Site Risk	Typical Activity (Median)	Typical Risk Assessment (as per Table 3b NatureScot 2021)	Activity Peaks (Maximum)	Peak Risk Assessment (as per Table 3b NatureScot 2021)
Spring 2023	Medium (3)	Medium (3)*	Typical Risk is Medium (9)	High (5)	Peak Risk is High (15)
Summer 2023		Medium (3)	Typical Risk is Medium (9)	High (5)	Peak Risk is High (15)
Autumn 2023		Medium (3)	Typical Risk is Low (3)	High (5)	Peak Risk is High (15)

*The spring median value for D07 was excluded from the overall assessment of Typical Activity as it considerably skews the data, providing an inaccurate representation of the typical activity observed across the Proposed Wind Farm site.

5.1.2.2 Soprano pipistrelle

The Proposed Wind Farm site is within range for soprano pipistrelle bat (NPWS, 2019). Soprano pipistrelle are classed as a common species of a medium population vulnerability which have a high potential collision risk (Plate 3-2). Soprano pipistrelle was recorded during activity surveys across the Proposed Wind Farm site. When assessed in the context of the identified site risk and in line with Table 3b (NatureScot 2021) overall activity risk for soprano pipistrelle was found to be **Low** at typical activity levels for spring and summer, and **Medium** for autumn. Peak activity levels were **High** across all seasons (See Table 5-3 below).

Based on site visit and survey data, including walked transects, it is determined that the Typical Activity (i.e. Median) is reflective of the nature of the Proposed Wind Farm site, which is primarily agricultural grassland, treelines/hedgerows and small areas of conifer plantations with moderate levels of bat activity recorded during the walked transects undertaken at the Proposed Wind Farm site.

Thus, there is **Low - Medium** collision risk level assigned to the local population of soprano pipistrelle in all seasons.

Table 5-3 Soprano pipistrelle - Overall Risk Assessment

Survey Period	Site Risk	Typical Activity (Median)	Typical Risk Assessment (as per Table 3b NatureScot 2021)	Activity Peaks (Maximum)	Peak Risk Assessment (as per Table 3b NatureScot 2021)
Spring 2023	Medium (3)	Low (1)	Typical Risk is Low (3)	High (5)	Peak Risk is High (15)
Summer 2023		Low (1)	Typical Risk is Low (3)	High (5)	Peak Risk is High (15)
Autumn 2023		Medium (3)	Typical Risk is Medium (9)	High (5)	Peak Risk is High (15)

5.1.2.3 Common pipistrelle

The Proposed Wind Farm site is within the current range of the common pipistrelle bat (NPWS, 2019). Common pipistrelle are classed as a common species of a medium population vulnerability which have a high collision risk (Plate 3-2). Common pipistrelle were recorded during all activity surveys across the Proposed Wind Farm site. When assessed in the context of the identified site risk and in line with Table 3b (NatureScot 2021); overall activity risk for common pipistrelle at Typical Activity levels was found to be **Low** in spring and summer, and **Medium** in autumn. Peak risk levels for common pipistrelle was found to be **High** in all seasons. (See Table 5-4 below).

Based on site visit and survey data, including walked transects, it is determined that the Typical Activity (i.e. Median) is reflective of the nature of the Proposed Wind Farm site, which is primarily agricultural grassland, treelines/hedgerows and small areas of conifer plantations with moderate levels of bat activity recorded during the walked transects undertaken.

Thus, there is a **Low – Medium** collision risk level assigned to the local population of common pipistrelle in all seasons.

Table 5-4 Common pipistrelle Overall Risk Assessment

Survey Period	Site Risk	Typical Activity (Median)	Typical Risk Assessment (as per Table 3b NatureScot 21)	Activity Peaks (Maximum)	Peak Risk Assessment (as per Table 3b NatureScot 2021)
Spring 2023	Medium (3)	Low (1)	Typical Risk is Low (3)	High (5)	High (15)
Summer 2023		Low (1)	Typical Risk is Low (3)	High (5)	High (15)
Autumn 2023		Medium (3)	Typical Risk is Medium (9)	High (5)	High (15)

5.1.2.1 Nathusius' pipistrelle

The Proposed Wind Farm site is within the current range of the Nathusius' pipistrelle bat (NPWS, 2019). Nathusius' pipistrelle bats are classed as a rarer species of a high population risk which have a high collision risk (Plate 3-4). Nathusius' pipistrelle bats were recorded during activity surveys across most of the Proposed Wind Farm site. When assessed in the context of the identified site risk and in line with Table 3b (NatureScot, 2021) overall activity risk for Nathusius' pipistrelle bats was found to be **Low** at both typical and peak activity levels across all seasons (See Table 5-5 below).

Based on site visit and survey data, including walked transects, it is determined that the Typical Activity (i.e. Median) is reflective of the nature of the Proposed Wind Farm site, which is primarily agricultural grassland, treelines/hedgerows and small areas of conifer plantations, with no activity recorded during the walked transects undertaken.

Thus, there is **Low** collision risk level assigned to the local population of Nathusius' pipistrelle.

Table 5-5 Nathusius' pipistrelle Overall Risk Assessment

Survey Period	Site Risk	Typical Activity (Median)	Typical Risk Assessment (as per Table 3b NatureScot 2021)	Activity Peaks (Maximum)	Peak Risk Assessment (as per Table 3b NatureScot 2021)
Spring	Medium (3)	Nil(0)	Typical Risk is Low (0)	Low (1)	Peak Risk is Low (3)
Summer		Nil (0)	Typical Risk is Low (0)	Low (1)	Peak Risk is Low (3)
Autumn		Nil (0)	Typical Risk is Low (0)	Low (1)	Peak Risk is Low (3)

5.1.3 Collision Risk Summary

Site-level collision risk for high collision risk bat species was typically **Low to Medium**. Overall bat activity levels were typical of the nature of the Proposed Wind Farm site, which is predominantly agricultural grassland, treelines, hedgerows, and small segments of conifer plantation with moderate levels of bat activity recorded during the static detector surveys and the walked transects undertaken.

However, following per detector R-analysis, Detectors D01, D03, D05 and D07 recorded **High** Median Activity levels in either spring or autumn (Table 5-6). During manual transect surveys, the majority of Leisler's bat activity was focused around D07, while soprano and common pipistrelle activity was distributed more evenly across the Proposed Wind Farm site.

While **High** median activity was recorded at four locations, it is noted that habitats at these locations will change during the construction phase of the Proposed Project with the required implementation of the bat felling buffers (Section 6.1.3). A monitoring and mitigation strategy has been devised for the Proposed Project, in line with the case study example provided in Appendix 5 of the NatureScot 2021 Guidance and based on the site-specific data. After year 1 monitoring, if a curtailment requirement is identified, a curtailment programme, in line with relevant guidelines, will be devised around key activity periods and weather parameters, as well as a potential increase in buffers if deemed necessary.

Table 5-6 Detector Location Recording High Median Activity in 2023 for High-risk Bat Species

Detector ID	Turbine	Species	High Median Activity Survey Period
D01	T01	Common pipistrelle	Spring 2023
D03	T03	Soprano pipistrelle	Autumn 2023
D05	T05	Common pipistrelle	Autumn 2023
D07	T07	Leisler's bat	Spring 2023

Loss or Damage to Commuting and Foraging Habitat

In the absence of appropriate design, the loss or degradation of commuting/foraging habitat has potential to reduce feeding opportunities and/or displace bat populations. The Proposed Wind Farm site is predominantly located on improved agricultural grassland with mature (managed and unmanaged) hedgerows and treelines delineating the vast majority of field boundaries. Smaller areas of conifer plantation are also present.

Approximately 3.57 ha of conifer forestry and 0.73 ha of mixed broadleaved/conifer woodland will be felled to accommodate Turbine 7 and its associated infrastructure. Chapter 4, Figure 4-14 shows the extent of the commercial forestry to be permanently felled as part of the Proposed Wind Farm site. The felling of trees is required to achieve the required buffer distance for the protection of bats, from the turbines to the canopy of the nearest habitat feature, as recommended by the Natural England (2014) and NatureScot (2021). Further details on buffer calculations can be found in section 6.1.3 of this report. It should be noted that conifer forestry on the Proposed Wind Farm site was originally planted as a commercial crop and will be felled in the future should the proposed renewable energy development proceed or not. The felling of commercial forestry will have a positive effect by opening up large areas of formerly closed canopy commercial forestry i.e. there will be more linear forestry edge habitat created. This will have a positive impact on bats as it will provide more commuting and foraging opportunities. Overall, the proposed works will retain areas of linear forestry edge habitats.

The majority of turbines will be located in agricultural grassland resulting in minimal loss of linear habitat features. Approximately 1,508m of linear vegetation removal will be required within and around the Proposed Wind Farm site infrastructure footprint to allow for the construction of the turbine bases, access roads, and the other ancillary infrastructure. This also includes vegetation removal in accordance with the proposed bat buffers detailed in Section 6.1.3. In addition, a small section of heavily managed hedgerow will require removal at the northern site entrance, the entrance to the temporary construction compound, the proposed substation entrance, and a section of hedgerow where the access track meets the conifer block to the south of T7. Additional linear vegetation will also be removed to facilitate widening of the existing access road.

Further details on vegetation removal required within and around development footprint is detailed in Chapter 4, Section 4.3.1.6 of this EIAR and Section 6.1.5 below. As such, it is proposed to incorporate additional and enhancement native hedgerow planting (approx. 3,640m) within the Site to offset the anticipated loss of hedgerow to the footprint of the Proposed Project. Further details on tree removal required within and around development footprint is detailed in Chapter 6 of this EIAR. Existing hedgerow habitat throughout the Site will be enhanced through additional native hedgerow species. It is proposed to plant some native tree species within the hedgerow habitat to further increase the biodiversity value within the Site. The enhancement design will ensure habitat connectivity is maintained and improved around the Site. No permanent loss of, or damage to, commuting or foraging habitats is anticipated as a result of the Proposed Wind Farm site or associated infrastructure. The proposed replanting area is shown and discussed in Appendix 6-4, Biodiversity Management and Enhancement Plan (BMEP). Following the implementation of the replanting plan as outlined in the BMEP, no significant effects in relation to habitat fragmentation or loss of foraging habitat for bats is anticipated.

The habitat within the location of the proposed 38kV substation and adjacent temporary construction compound consists entirely of Improved agricultural grassland (GA1) with no linear vegetation removal proposed. Therefore, no loss of significant commuting/foraging habitat are anticipated.

As described in Chapter 4, Section 4.5.2 of this EIAR, no significant turbine delivery route accommodation works are required to facilitate the delivery of components to the Site. Therefore, no

significant effects on commuting and foraging bats associated with the turbine delivery route are anticipated.

Given the extensive area of habitat that will remain undisturbed throughout the Proposed Wind Farm site and the avoidance of the most significant areas of faunal habitat (i.e. natural woodlands and mature treelines), no significant effects with regard to loss of commuting and foraging habitat are anticipated.

5.3

Loss of, or Damage to, Roosts

The Proposed Wind Farm site is predominantly located within agricultural grassland surrounded by treelines and hedgerows, with smaller areas of conifer plantation. The trees contained within the commercial conifer forestry do not provide the optimal roosting habitat for bats.

Four structures, and their associated outbuildings, were identified within the Proposed Wind Farm site and were subjected to inspections and dusk activity surveys. Three roosts were identified within two of the farm complexes, each with fewer than 10 observations of emerging bats. These structures and the surrounding linear habitat features will be retained and avoided as part of the Proposed Project.

There will be some requirement to remove trees to facilitate the proposed bat felling buffers, as detailed in Section 6.1.3 below. The August 2025 tree inspection confirmed that none of the trees proposed for removal contained Potential Roost Features (PRFs), with all assessed as *None* following close inspection in line with Collins (2023) guidance. As such, no trees requiring removal are considered to provide roosting habitat for bats. While no direct or indirect effects on roosting bats are predicted, a precautionary approach will still be adopted. The proposed linear vegetation removal has been designed to retain suitable treelines where possible, and a confirmatory pre-construction tree survey will be conducted prior to removal to ensure the updated baseline remains accurate. ~~Trees within the bat buffers varied in suitability from *Negligible* to *Moderate* for roosting bats. A small number of trees identified during the roost surveys as having potential to host roosting bats were located within the bat buffers detailed in Section 4.3.2. Although no evidence of bat use was found during daytime inspections, there is a potential for indirect effects on bats, such as the loss of roosting habitats, and direct effects, including temporary disturbance, harm, or death due to the proposed tree felling. On a precautionary basis, as the trees provide some potential roosting habitat, the proposed linear vegetation removal has been designed to retain suitable treelines where possible and post construction monitoring will be carried out. A confirmatory pre-construction tree survey will be conducted on trees identified as having roosting potential prior to removal to ensure no bats are present. Mitigation will be provided through the provision of alternative roosting features, as detailed in Section 6.1.4 to ensure no potential significant effects on bats can arise as a result of the Proposed Project.~~

The habitat within the proposed substation and temporary construction compound is comprised of *Improved agricultural grassland (GA1)*, with no linear vegetation proposed for removal. Additionally, the underground cabling will be following existing roads and agricultural grassland and does not require the removal of any linear vegetation to facilitate its construction. Therefore, no loss of roosting habitat is anticipated.

Twelve watercourse crossings are present along the Proposed Grid Connection underground cabling route, excluding the crossing at the River Nore. All works will either be confined to the existing road infrastructure or completed using temporary construction methods such as horizontal directional drilling (Launch pads set-back from crossing infrastructure) or flatbed formation within the existing road network. The structures located at these watercourse crossings present *Negligible* to *Low* suitability for roosting bats. No evidence of bat roosts was found at any of these structures during the surveys undertaken in 2024 or 2025. On a precautionary basis, confirmatory pre-construction surveys will be carried out at all crossings assessed as having *Low* suitability immediately prior to works, to ensure that no bats are present and to inform any further mitigation if required (See Section 6.1.6). Based on the proposed construction

methodologies for the provision of the Proposed Grid Connection underground cabling outlined in Section 4.3.1.2 above, no loss of roosting habitat associated with these works is anticipated.

The turbine delivery route traverses habitats including hedgerows (WL1), treelines (WL2), stone walls (BL1), grassy verges (GS2) and eroding/upland watercourses (FW1). No significant accommodation works associated with the TDR are proposed and as such, no loss of roosting habitat is anticipated.

No potential for significant effect with regard to the loss of, or damage to roosting habitat as a result of the Proposed Wind Farm site, Proposed Grid Connection or the turbine delivery route is anticipated.

5.4

Displacement of Individuals or Populations

The Proposed Project is predominantly located within agricultural grassland with treelines/hedgerows delineating field boundaries with smaller areas of conifer plantation also present. A number of treelines within the turbine buffers to be removed provide potential roosting and foraging/commuting habitat. Mitigation measures are detailed in Section 6.1 below. There will be no net loss of linear landscape features for commuting and foraging bats and there will be no loss of any roosting site of ecological significance. The habitats on the Proposed Wind Farm site will remain suitable for bats and no significant displacement of individuals or populations is anticipated.

Following a number of roost assessments (2024 and 2025) on the Proposed Grid Connection watercourse crossing infrastructure, no evidence of roosting bats was identified; however there remains potential for opportunistic roosting by individual bats at 8 no. crossing points (Section 4.3.1.2). All works pertaining to the Proposed Grid Connection crossing points will either be confined to the existing road infrastructure or completed using temporary construction methods such as horizontal directional drilling (Launch pads setback from crossing infrastructure) or flatbed formation within the existing road network. No works are proposed on the underside or abutments of the crossing infrastructure. Potential noise and vibration associated with temporary works at crossing points are not expected to be out of character with existing traffic activity or typical roadworks, to which any potential roosting bats in the area would likely already be accustomed. Given the short-term nature of these works, significant disturbance or displacement of bats is not anticipated.

BEST PRACTICE AND MITIGATION MEASURES

This section describes the best practice and site-specific mitigation measures that are in place to avoid and reduce the potential for significant effects on local bat populations.

Standard Best Practice Measures

Noise Restrictions

During the construction phase, plant machinery will be turned off when not in use and all plant and equipment for use will comply with the Construction Plant and Equipment Permissible Noise Levels Regulations (S.I. No. 632 of 2001).

Lighting Restrictions

Where lighting is required, directional lighting will be used to prevent overspill on to woodland/forestry edges. Exterior lighting, during construction and post construction, shall be designed to minimize light spillage, thus reducing the effect on areas outside the Proposed Wind Farm, and consequently on bats i.e. Lighting will be directed away from mature trees/treelines around the periphery of the site boundary to minimize disturbance to bats. Directional accessories can be used to direct light away from these features, e.g. through the use of light shields (Stone, 2013). The luminaries will be of the type that prevent upward spillage of light and minimize horizontal spillage away from the intended lands.

The proposed lighting around the Proposed Wind Farm shall be designed with consideration of the Institute of Lighting Professionals Guidance Note 08/23 Bats and Artificial Lighting at Night (ILP, 2023).

In addition, the applicant commits to the use of lights during construction, operation and decommissioning (such that they are necessary) having consideration of the following guidance that is provided in the Dark Sky Ireland Lighting Recommendations:

- Every light needs to be justifiable,
- Limit the use of light to when it is needed,
- Direct the light to where it is needed,
- Reduce the light intensity to the minimum needed,
- Use light spectra adapted to the environment,
- When using white light, use sources with a “warm” colour temperature (less than 3000K).

With regard to the potential for lighting to increase collision risk, it is noted that there will be limited illumination of the turbines in the form of aviation lighting. Post construction monitoring will be carried out (as outlined below) to assess any potential changes in bat activity patterns and collision risk. Significant effects as a result of lighting are not anticipated; however, if in the course of this monitoring, any potential for significant effects on bats is identified, the site-specific mitigation measures will be reviewed and any changes necessary will be implemented to avoid any such impacts.

In accordance with NatureScot and NIEA Guidance, a minimum 50m buffer to all habitat features used by bats (e.g., hedgerows, tree lines etc.) should be applied to the siting of all wind turbines (See example provided in Plate 6-1 below). However, Eurobats No. 6 guidance and NIEA recommends increased buffers of 100m and 200m around woodland/forestry areas, however, there is no scientific evidence to support these increased buffer distances in Ireland or the UK.

NatureScot recommends that a distance of 50m between turbine blade tip and nearest woodland (or other key habitat features) is adequate mitigation. This 50m buffer will be implemented from the outset and monitored as per the post-construction monitoring. The success of the buffer mitigation will be assessed as part of post construction monitoring (outlined in Section 6.2 below) and updated where necessary.

The formula below is presented to provide appropriate mitigation in relation to bats, and the relevant input required from turbine parameters, is the combination of the blade length and hub height. The turbine model to be installed on the Proposed Wind Farm will have an overall ground-to-blade tip height of 185m, rotor diameter of 163m, and hub height of 103.5m.

There will be a requirement to fell an area of conifer forestry (at T7) and to remove some linear vegetation i.e. treelines/hedgerows, to facilitate the required bat buffers at the Proposed Wind Farm. This is outlined in further detail in Section 6.1.4 below. These vegetation-free areas will be maintained during the operational life of the Proposed Project.

It is necessary to calculate the distance between the edge of the habitat feature and the centre of the tower (b). Using the formula:

$$b = \sqrt{(50 + bl)^2 - (hh - fh)^2}$$

Where, bl = Blade length, hh = hub height, fh = feature height all in metres. E.g. (below) b = 69.3m (Plate 6-1). Based on the turbine parameters provided, the formula calculates a bat felling buffer of 87m.

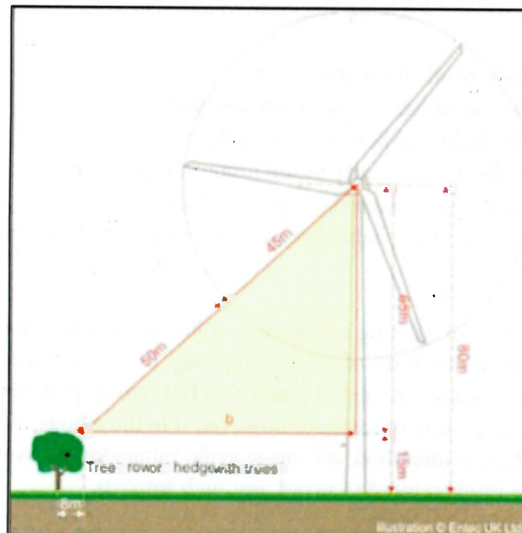


Plate 6-1 Calculate buffer distances (Natural England, 2014).

Confirmatory Pre-construction Tree Survey

The August 2025 tree inspection confirmed that none of the trees proposed for removal contained Potential Roost Features (PRFs), with all assessed as *None* following close inspection in line with Collins (2023) guidance. As such, no loss of roosting habitat is anticipated as a result of the Proposed Project. Areas subject to removal are shown in Figure 6-1.

On a highly precautionary basis, a confirmatory pre-commencement survey will be carried out by a suitably qualified ecologist prior to felling to ensure the updated baseline remains accurate. This approach reflects best practice, recognising that tree condition can change over time and bats comprise mobile species that can readily exploit new opportunities.

If the confirmatory survey identifies the presence of PRFs or an active bat roost in any trees proposed for removal/pruning, the following procedures will apply:

~~A number of mature trees presenting potential roosting features were identified within the bat felling buffers. Areas subject to removal are shown in Figure 6.1. Although no evidence of bats was found at these locations, bats comprise mobile species that can move regularly between tree roosts. As such, the trees with potential roosting features have been considered as a “roost resource” and compensation will be provided to cover the loss of the resource. The following procedures are proposed prior to felling trees with PRFs:~~

- ~~• A pre-commencement survey will be carried out by a suitably qualified ecologist on trees with PRFs proposed for felling.~~
- If a bat roost is identified within any of the trees to be removed/pruned, a bat derogation licence will be obtained from the NPWS, prior to removal and the removal activity will be supervised by a qualified ecologist.
- On a precautionary basis, works will be undertaken at an appropriate time of year, as determined by a suitably qualified ecologist, to avoid disrupting sensitive life cycle periods for bats. Tree-felling of mature deciduous trees will be carried out according to the following standard mitigating procedures:
 - Trees with suitable potential roost features proposed for felling will be checked for bats by a suitably qualified arborist/ecologist at the time of felling.
 - Trees will be nudged two or three times prior to limb removal, with a pause of 30 seconds in between, to allow bats to wake and move.
 - Rigged felling shall be used to lower the limbs and trunk carefully to ground level and cavities searched by a qualified ecologist.
 - Felled trees will be left in-situ for a minimum of 24 hours prior to sawing or mulching, to allow any bats present to escape (National Roads Authority, 2006).

~~Compensation for the loss of trees with alternative potential roosting features will be implemented on a like for like basis, through the provision of bat boxes. A count of all potential roosting features lost will be required to ensure all features are accounted for by compensation measures.~~ Where the confirmatory survey identifies new PRFs, compensation will be implemented on a like-for-like basis through the provision of bat boxes equivalent to the number and type of features lost. Details regarding the installation, maintenance and monitoring of bat boxes are outlined in Appendix 6-4 in Chapter 6 of this EIAR.

A replanting plan is also proposed to compensate for the loss of commuting/foraging habitat. Details of the proposed habitat replacement are outlined in Section 6.1.5 below and in Appendix 6-4 in Chapter 6 of this EIAR.

In the absence of appropriate design, the loss or degradation of commuting/foraging habitat has potential to reduce feeding opportunities and/or displace bat populations. However, the Proposed Project is predominantly located within agricultural grasslands and linear landscape features such as hedgerows, trees and drains which will be largely retained or avoided.

Linear vegetation within the required turbine bat buffers will be removed (Figure 6-1). A replanting design has been curated to provide alternative commuting corridors within the Site. To comply with NatureScot recommendations in relation to habitat buffering to avoid bat fatalities, a total of 1,508m of linear vegetation habitat will be lost as a result of the Proposed Project, including the recommended buffers applied for bats. Further details are outlined in Appendix 6-4 BMEP.

Linear landscape features in the wider area that will be retained, and the loss of gappy hedgerow/treelines is not anticipated to have a significant effect on local bat populations. However, it is proposed to plant new linear features and bolster existing habitat features to offset any potential loss in linear habitat features and to provide additional new opportunities for commuting and foraging bats. Approximately 3,640m of heavily managed hedgerow will be enhanced through additional planting with native species. It is proposed to plant some native tree species within the hedgerow habitat to further increase the biodiversity value within the Site. In addition, around 270 meters of new native hedgerow habitat will be established within the Proposed Wind Farm site. It is also proposed to create a new native riparian buffer zone adjacent the Tullaroan stream within the Site. Approximately 17,115m² of riparian planting is proposed to be planted on both banks of the Tullaroan stream. The proposed planting and enhancement of linear habitat will enhance foraging and commuting opportunities for bats using the Site.

The locations in which the proposed linear hedgerow planting and enhancement will take place will be carried out along selected boundaries of fields within the Site. Refer to the BMEP outlined in Appendix 6-4 of the EIAR for hedgerow/treeline planting details.

Overall, the proposed planting of new hedgerow, enhancement of existing hedgerow and riparian planting will result in a net gain of the linear landscape features within the Proposed Wind Farm. Planting will be of species indigenous to the local area. Further details are provided in BMEP attached as Appendix 6-4.

Confirmatory Pre-construction Bridge Survey

A total of 9 no. bridge crossings, 2 no. culverts and 1 no. concrete pipe will be traversed for the Proposed Grid Connection underground cabling route. Six of these crossings will be completed using Horizontal Directional Drilling (HDD), including beneath the River Nore, while the remaining seven crossings will be undertaken via flatbed formation confined to the existing road corridor.

Surveys undertaken in March 2024 and reinspected in August 2025 confirmed that no bat roosts were present at any of the watercourse crossings (See Section 4.3.1.2). Of the HDD crossings, one location (WC1) had no structure associated with it, two (WC2 and WC3) were assessed as having *Negligible* potential, and three (WC5, WC6, and WC7) had *Low* potential for opportunistic roosting. For the flatbed crossings, suitability varied from *Negligible* (2 no.) to *Low* (5 no.), with no evidence of roosting bats identified.

On a precautionary basis, and recognising that baseline conditions can change over time, confirmatory pre-construction inspections will be carried out at all crossings assessed as having *Low* suitability (8 no.). These surveys will be undertaken by a suitably qualified ecologist immediately prior to works to ensure no bats are roosting in the structures and to safeguard compliance with relevant legislation.

This measure does not represent a lacuna in the survey effort but reflects standard best practice and the precautionary principle. If roosting bats are identified during the pre-construction surveys, a derogation licence will be obtained from NPWS and mitigation measures will be prescribed by a licensed ecologist before works proceed.

Blade Feathering

NIEA Guidelines also recommend that, in addition to buffers applied to habitat features, all wind turbines are subject to 'feathering' of turbine blades when wind speeds are below the cut-in speed of the proposed turbine. This means that the turbine blades are pitched at 90 degrees or parallel to the wind to reduce their rotation speed to below two revolutions per minute while idling. This measure has been shown to significantly reduce bat fatalities (by up to 50%) in some studies (NIEA, 2021).

In accordance with NIEA Guidelines, blade feathering will be implemented as a standard across all proposed turbines when wind speeds are below the cut-in speed of the turbine.

Bat Monitoring Plan

Overall risk levels for high collision risk bat species were typically *Low* to *Medium*. This risk level is reflective of the nature of the Proposed Wind Farm site, which is agricultural grassland surrounded by treelines and hedgerows, with smaller areas of wet grasslands, broadleaf woodland and commercial forestry with low levels of bat activity recorded during the walked transects undertaken.

However, taking a precautionary approach and given that high collision risk was recorded at median and peak activity levels, an adaptive monitoring and mitigation strategy has been devised for the Proposed Project, in line with the case study example provided in Appendix 5 of the NatureScot, (2021) and based on the site-specific data.

Operational Monitoring

To assess the effects of the Proposed Project on bat activity, at least 3 years of post-construction monitoring is proposed. Post-construction monitoring will include static detector surveys, walked survey transects and corpse searching to record any bat fatalities resulting from collision.

The results of post-construction monitoring shall be utilised to assess any potential changes in bat activity patterns and to monitor the implementation of the mitigation strategy as outlined in Section 6 above. If the monitoring identifies a curtailment requirement (i.e. significant bat fatalities encountered), a curtailment programme, in line with relevant guidelines, will be devised around key activity periods and weather parameters, as well as a potential increase in buffers.

At the end of each year, the efficacy of the mitigation and monitoring plan will be reviewed, and any identified efficiencies incorporated into the programme. This approach allows for an evidence-based review of the potential for bat fatalities at the Proposed Wind Farm, post construction, to ensure that the necessary measures, based on a new baseline post-construction, are implemented for the protection of bat species locally. The effectiveness of any mitigation/curtailment needs to be monitored in order to determine (a) whether it is working effectively (i.e. the level of bat mortality is incidental), and (b) whether the curtailment regime can be refined such that turbine down-time can be minimised whilst ensuring that it remains effective at preventing casualties.

The below subsections provide additional detail on the proposed survey effort, timing, and mitigation.

6.2.11 Monitoring Year 1

Bat activity surveys

The post-construction surveys will be carried out as per the pre-construction survey effort. Static monitoring will take place at each turbine during the bat activity season (between April and October) (NatureScot, 2021, NIEA, 2021). Full spectrum recording detectors will be utilised for the same duration as during pre-application surveys and at the same density (NatureScot, 2021). As described in Section 3.5 above, the assessment of bat activity levels will include the use of 'Ecobat' (or similar alternative), a web-based interface, allowing uploaded activity data to be contrasted with a comparable reference range, allowing objective and robust interpretation. Walked survey transects will also be conducted.

Key weather parameters and other factors that are known to influence collision risk will be monitored and shall include:

- Windspeed in m/s (measured at nacelle height)
- Temperature (°C)
- Precipitation (mm/hr)

Carcass searches

Carcass searches, to monitor and record bat fatalities, shall be conducted at each turbine in accordance with NIEA Guidance. This shall include searcher efficiency trials and an assessment of scavenger removal rates to determine the appropriate correction factor to be applied in relation to determining an accurate estimate of collision mortality. Surveys should cover all activity seasons and the use of a trained dog detection team will be carried out to ensure maximum efficiency.

6.2.12 Monitoring Years 2 & 3

Monitoring surveys shall continue in Year 2 and 3, and where a curtailment requirement has been identified, the success of the curtailment strategy shall be assessed in line with the baseline data collected in the preceding year(s). The performance of any curtailment programme in terms of its ability to respond to the changes in bat abundance based on temperature and wind speed shall be analysed to confirm it is neither significantly over- nor under- curtailment during different periods of bat activity.

At the end of each year, the efficacy of any mitigation/curtailment programme shall be reviewed, and any identified efficiencies incorporated into the programme. The requirement for continued post-consent



monitoring will also be considered. Should no bat fatalities be recorded in Year 1, curtailment (where applicable) in Year 2 and Year 3 could be reduced/re-evaluated or removed with monitoring continuing to inform this strategy.

6.3 Residual Impacts

Not Significant Effect

Taking into consideration the sensitive design of the project, the proposed best practice and adaptive mitigation measures; significant residual effects on bats with regard to 1) Collision mortality, barotrauma and other injuries, 2) Loss or damage to commuting and foraging habitat, 3) Loss of, or damage to, roosts and 4) Displacement of individuals or populations are not anticipated.

6.4 Cumulative Effects

The Proposed Project was considered in combination with other projects and/or plans (existing approved and pending decision), in the surrounding area that could result in cumulative impacts on bats. This included a review of online Planning Registers and served to identify past, present and future plans and projects, their activities and their predicted environmental effects. The projects and/or plans considered are detailed in Section 2.8 in Chapter 2 of the EIAR.

Following the detailed assessment provided in the preceding sections, it is concluded that, the Proposed Project will not result in any residual adverse effects on bats, when considered on its own. There are two existing, permitted or proposed wind farms located within 5km of the Proposed Wind Farm, and three located within 10km. There are four further EIA projects including one extractive industry within 10km. No potential for the Proposed Project to contribute to any cumulative adverse effects on any bat populations is anticipated when considered in-combination with other plans and projects.

In the review of the projects that was undertaken, no connection, that could potentially result in additional or cumulative impacts was identified. Neither was any potential for different (new) impacts resulting from the combination of the various projects and plans in association with the Proposed Project.

Taking into consideration the reported residual impacts from other plans and projects in the area and the predicted impacts with the current proposal, no residual cumulative impacts have been identified regarding bats.

7. CONCLUSION

This report provides a full and comprehensive assessment of the potential for impact on bat populations arising from the Proposed Project. The surveys provided in this report are in accordance with NatureScot guidance and assessment/mitigation are in accordance with NatureScot guidance. Following consideration of the residual effects (post mitigation) it is noted that the Proposed Project will not result in any significant effects on bats.

Provided that the Proposed Project is constructed and operated in accordance with the design, best practice and mitigation that is described within this report, significant effects on bats are not anticipated at any geographic scale.

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APPENDIX 1

BAT HABITAT SUITABILITY
APPRAISAL

HABITAT SUITABILITY ASSESSMENT

Guidelines for assessing the potential suitability of a site for bats, based on the presence of habitat features (taken from Collins, 2016)

Suitability	Roosting Habitats	Commuting and Foraging Habitats
Negligible	Negligible habitat features on site likely to be used by roosting bats.	Negligible habitat features on site likely to be used by commuting or foraging bats.
Low	A structure with one or more potential roost sites that could be used by individual bats opportunistically. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions and/or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats, i.e. unlikely to be suitable for maternity or hibernation. A tree of sufficient size and age to contain potential roost features but with none seen from the ground or features seen with only very limited roosting potential.	Habitat that could be used by small numbers of commuting bats such as a gappy hedgerow or unvegetated stream, but isolated, i.e. not very well connected to the surrounding landscape by other habitats. Suitable, but isolated habitat that could be used by small numbers of foraging bats such as a lone tree (not in a parkland situation) or a patch of scrub.
Moderate	A structure or tree with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type only – the assessments in this table are made irrespective of species conservation status, which is established after presence is confirmed).	Continuous habitat connected to the wider landscape that could be used by bats for commuting such as lines of trees and scrub or linked back gardens. Habitat that is connected to the wider landscape that could be used by bats for foraging such as trees, scrub, grassland or water.
High	A structure or tree with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat.	Continuous, high-quality habitat that is well connected to the wider landscape that is likely to be used regularly by commuting bats such as river valleys, streams, hedgerows, lines of trees and woodland edge. High-quality habitat that is well connected to the wider landscape that is likely to be used regularly by foraging bats such as broadleaved woodland, tree-lined watercourses and grazed parkland. Site is close to and connected to known roosts.

¹ For example, in terms of temperature, humidity, height above ground, light levels or levels of disturbance.

² Larger numbers of Common pipistrelle may be present during autumn and winter in large buildings in highly urbanised areas, based on evidence from the Netherlands (Korsten et al. 2015).

³ Categorisation aligns with BS 8596:2015 Surveying for bats in trees and woodland (BSI, 2015).



APPENDIX 2

SITE RISK ASSESSMENT

Table 3a: Stage 1 - Initial site risk assessment

Site Risk Level (1-5)*	Project Size			
		Small	Medium	Large
Habitat Risk	Low	1	2	3
	Moderate	2	3	4
	High	3	4	5

Key: Green (1-2) - low/lowest site risk; Amber (3) - medium site risk; Red (4-5) - high/highest site risk.

* Some sites could conceivably be assessed as being of no (0) risk to bats. This assessment is only likely to be valid in more extreme environments, such as above the known altitudinal range of bats, or outside the known geographical distribution of any resident British species.

Habitat Risk	Description
Low	Small number of potential roost features, of low quality. Low quality foraging habitat that could be used by small numbers of foraging bats. Isolated site not connected to the wider landscape by prominent linear features.
Moderate	Buildings, trees or other structures with moderate-high potential as roost sites on or near the site. Habitat could be used extensively by foraging bats. Site is connected to the wider landscape by linear features such as scrub, tree lines and streams.
High	Numerous suitable buildings, trees (particularly mature ancient woodland) or other structures with moderate-high potential as roost sites on or near the site, and/or confirmed roosts present close to or on the site. Extensive and diverse habitat mosaic of high quality for foraging bats. Site is connected to the wider landscape by a network of strong linear features such as rivers, blocks of woodland and mature hedgerows. At/near edge of range and/or on an important flyway. Close to key roost and/or swarming site.

Project Size	Description
Small	Small scale development (≤ 10 turbines). No other wind energy developments within 10km. Comprising turbines < 50m in height.
Medium	Larger developments (between 10 and 40 turbines). May have some other wind developments within 5km. Comprising turbines 50-100m in height.
Large	Largest developments (> 40 turbines) with other wind energy developments within 5km. Comprising turbines > 100m in height.



APPENDIX 3

OVERALL SITE RISK

Bat Survey Report

Appendix 3 – Overall Risk
Assessment (Table 3b,
NatureScot)



Table 3b: Stage 2 - Overall risk assessment

Site risk level (from Table 3a)	Ecobat activity category (or equivalent justified categorisation)					
	Nil (0)	Low (1)	Low-moderate (2)	Moderate (3)	Moderate-high (4)	High (5)
Lowest (1)	0	1	2	3	4	5
Low (2)	0	2	4	6	8	10
Med (3)	0	3	6	9	12	15
High (4)	0	4	8	12	15	18
Highest (5)	0	5	10	15	20	25

The scores in the table are a product of multiplying site risk level and the Ecobat activity category (or equivalent). The activity categories equate to those given in Table 1 for high collision risk species. Nil (0) means no bat activity was recorded across the whole site, but caution is needed here, because although the values given in this column are "0", at sites where pre-construction surveys found no bat activity, there remains the possibility that new turbines could attract some bat species, thereby altering the level of risk that applies in reality.

Overall assessment:

Low (green) 0-4
Medium (amber) 5-12
High (red) 15-25

It is important to have an understanding of both "typical" and unusually high levels of bat activity at a site so that potentially important peaks in activity are not overlooked. It is therefore recommended that both the highest Ecobat activity category and the most frequent activity category (i.e. the median) are assessed separately in Table 3b and presented in the overall risk assessment. A judgement can then be made on which is the most relevant. It should be noted that presenting mean activity levels can be highly misleading where the data are highly skewed, as is frequently the case with bat activity at wind turbines (Lintott & Mathews, 2018).

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