



APPENDIX 12-3

**CARROW BASELINE
NOISE SURVEY**



Trinity
Consultants

*awn*consulting

Background Noise Survey

Project Title: Carrow Wind Farm, Co Tipperary

CLIENT
MKO

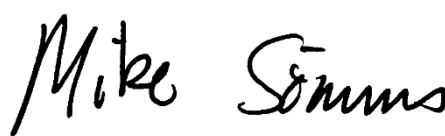

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1. INTRODUCTION

This note has been prepared to provide details and methodology of the background noise survey undertaken and confirm the derived background noise levels at the various Noise Monitoring Locations (NMLs), for the Proposed Project.

2. BACKGROUND NOISE SURVEY

The noise survey and subsequent data analysis was carried out in accordance with best practice following the guidance contained in the Institute of Acoustics publication *A Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise* (May 2013), (IOA GPG).

2.1 Measurement Locations

The background noise survey was conducted through installing unattended sound level meters at 5 no. representative locations in the surrounding area. The co-ordinates for selected locations for the noise monitoring locations are outlined in Table 2-1 and identified on a map in Figure 2-1.

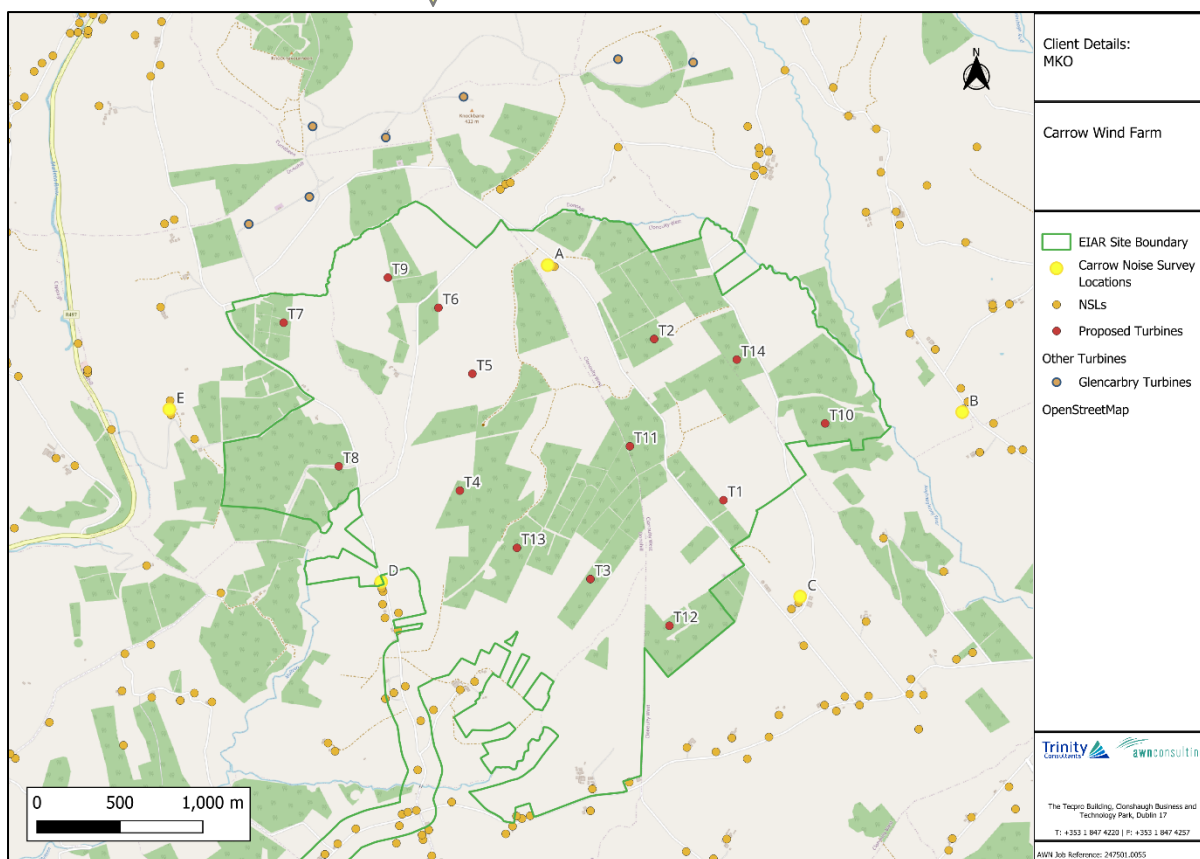
Table 2-1. Coordinates of Noise Monitoring Equipment

Location	Coordinates (ITM)	
	Easting	Northing
A (H227)	594,667	651,652
B (H201)	597,166	650,766
C (H152)	596,189	649,654
D (H164)	593,663	649,743
E (H200)	592,386	650,783

Site visits by survey personnel were carried out during morning and afternoon periods; during these visits, primary noise sources contributing to noise environment were noted as being distant traffic movements, activity in and around the residences and wind generated noise from local foliage and other typical anthropogenic sources typically found in such rural settings.

There were no perceptible sources of vibration noted at any of the survey locations.

Figure 2-1. Noise Monitoring Locations



2.2 Measurement Periods

The periods of noise measurements used in the background noise monitoring assessment are outlined in Table 2-2. The survey was deemed completed when an adequate number of datasets had been measured as recommended in the IOA GPG to determine a suitable representation of the typical background noise.

Table 2-2. Measurement periods of Noise Monitoring Equipment

Location Reference	Survey Period	
	Start Date	End Date
A (H227)	14:50 hrs on 06 June 2024	09:20 hrs on 14 July 2024
B (H201)	11:40 hrs on 06 June 2024	09:50 hrs on 17 July 2024
C (H152)	12:20 hrs on 06 June 2024	12:20 hrs on 17 July 2024
D (H164)	12:20 hrs on 06 June 2024	11:40 hrs on 17 July 2024
E (H200)	13:30 hrs on 06 June 2024	06:00 hrs on 15 July 2024

A variety of wind speed and weather conditions were encountered over the survey periods in question.

2.3 Measurement Procedure

Measurements were conducted at all locations over the survey periods outlined in Table 2-2. Data samples for all measurements (noise, rainfall, and wind) were logged continuously at 10-minute interval periods for the duration of the survey. The $L_{Aeq,10min}$ and $L_{A90,10min}$ noise parameters were measured in this instance and the results were saved to the instrument memory for later analysis.

Survey personnel noted potential primary noise sources contributing to noise build-up during the installation and removal of the sound level meters from site.

2.4 Instrumentation

Table 2-3 confirms the details of the noise monitoring instrumentation installed at each location.

Table 2-3. Details of Noise Measurement Instrumentation

Location Reference	Equipment Make and Model	Serial Number
A (H227)	RION – NL-52	186668
B (H201)	RION – NL-52	164426
C (H152)	RION – NL-52	564809
D (H164)	RION – NL-52	564808
E (H200)	RION – NL-52	575785

Before and after the survey the measurement apparatus was check calibrated using a Brüel & Kjær type 4231 Sound Level Calibrator where appropriate. Instruments were calibrated on each interim visit and any drift noted. All calibration drifts were less than ±0.2 dB and within acceptable tolerances outlined in the IOA GPG.

2.5 Rainfall Data

Rain fall was monitored and logged using a Texas Instruments TR-525 console and a data logger that was installed on-site for the duration of the surveys. This allows for the identification of periods of rain fall to allow for the removal sample periods affect by rainfall from the noise monitoring data sets in line with best practice when calculating the prevailing background noise levels.

2.6 Wind Data

Wind data was measured at a meteorological mast located within the site of the proposed development at the coordinates indicated in Table 2-4, and was supplied to AWN for data analysis.

Table 2-4. Wind Measurement Location

Co-ordinates (ITM)	
Easting	Northing
593,211	650,916

2.6.1 Wind Shear

Wind speed collected at 79 m and 102 m were used to correct the wind speed up to an assessment hub height (HH) at 103.5 m, as per the methodology outlined in the IOA GPG.

The calculated HH wind speeds were then corrected to the 'standardised' 10 m height wind speed in accordance with the IOA GPG. The 'standardised' wind speed is the industry standard for referencing wind speeds with respect to wind turbines.

The calculated hub height wind speeds have been corrected standardised to 10 m height using a fixed correction. The standardised is a wind speed measured at a height different than 10 m (generally measured at the turbine hub height) which is expressed to a reference height of 10 m using a roughness length of 0.05 for standardisation purpose in accordance with the IEC 61400-11 standard:

Roughness Length Shear Profile: $U_1 = U_2 \times [(\ln(H_1/z))/ (\ln(H_2/z))]$

Where:

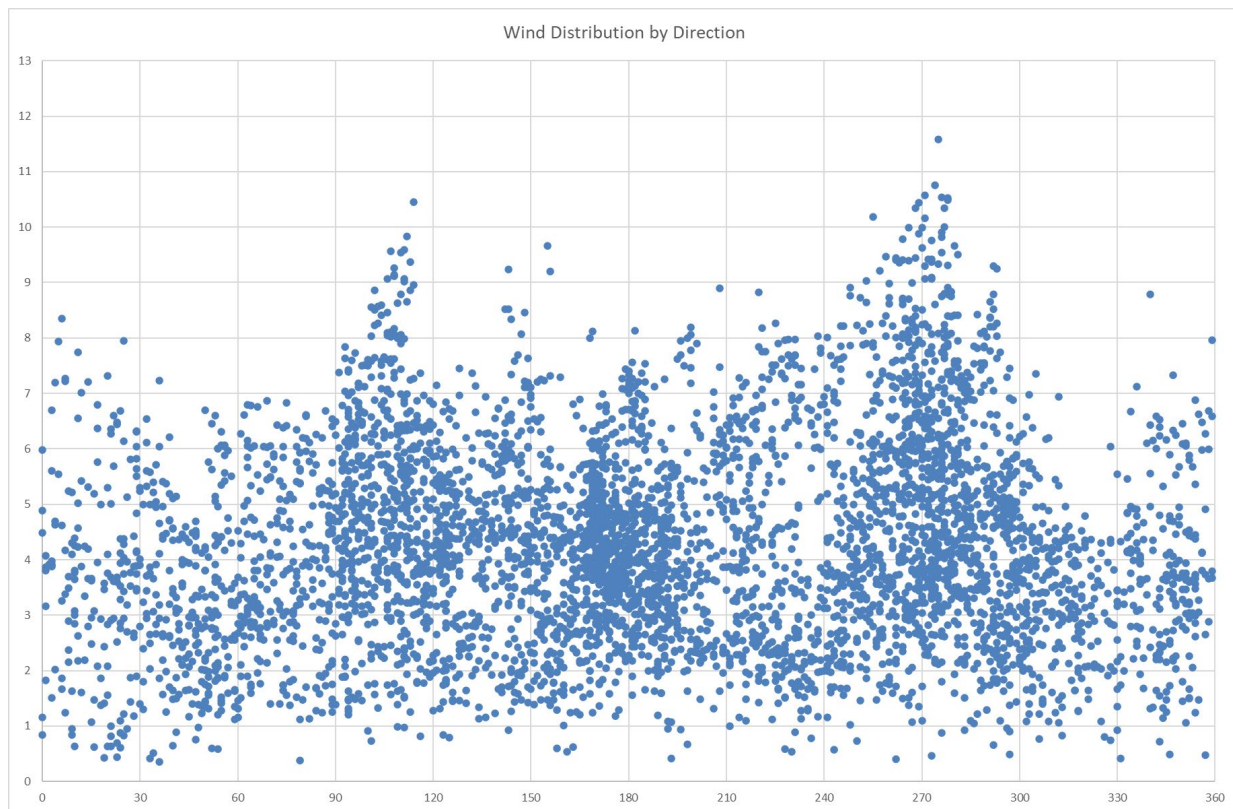
H ₁	The height of the wind speed to be calculated (10m)
H ₂	The height of the measured or calculated HH wind speed.
U ₁	The wind speed to be calculated.
U ₂	The measured or calculated HH wind speed.
Z	The roughness length.

Note: A roughness length of 0.05m is used to standardise hub height wind speeds to 10m height in the IEC 61400-11:2003 standard, regardless of what the actual roughness length seen on a site may have been. This 'normalisation' procedure was adopted for comparability between test results for different turbines.

Any reference to wind speed in this chapter should be understood to be the standardised 10 m height wind speed unless otherwise stated.

Figure 2-2 presents the distributions of the measured wind speed and wind direction over the survey period.

Figure 2-2 Distributions of wind speeds and directions over the survey period



2.7 Selection of Measurement Locations and Methodology

The purpose of the noise survey is to determine the background noise at representative noise sensitive locations (NSLs) within the receiving environment surrounding the Proposed Wind Farm site.

The survey locations were identified with consideration of the potential turbine noise contribution from the Proposed Wind Farm assessed using noise prediction modelling and supported by reviewing aerial images and street side images where available on website e.g., Google Earth and Bing Maps.

The assessment methodology in the EIAR is in accordance with the Institute of Acoustics document A Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise (2013) hereafter referred to as the IOA GPG.

The following text summaries the guidance from the IOA GPG for the selection of background noise survey locations:

- ▶ The selection of suitable noise monitoring locations for background noise surveys is not straightforward and only general guidance can be given as it is not possible to be prescriptive.
- ▶ Often there are practical constraints on where equipment can be placed, and a considerable degree of experience-based judgement is required when selecting these positions.
- ▶ Any contribution to background noise levels from an existing wind farm must be excluded when assigning background noise and setting noise limits for a new development.
- ▶ No general guidance can therefore be given on the number of measurement locations as this will be site-specific.

A robust assessment of the noise impacts of the wind farm necessitates a detailed survey of the background noise at houses in the vicinity of the Proposed Wind Farm.

2.8 Data Analysis

The following sections present a summary of the statistical analysis carried out on the noise monitoring data to derive the background noise curves at each NML. Background noise data sets can be re-analysed for various scenarios should this be required, for instance, if the proposed hub height changes or alternative hub heights are considered.

2.8.1 Assessment Periods

The results presented in the following sections refer to the noise data collated during 'quiet periods' of the day and night as defined in the IOA GPG. These periods are defined in Table 2-5.

Table 2-5. Daytime and Night Periods

Period Description	Period Definition
Daytime (Amenity Hours)	ETSU-R-97 defines the amenity hours as: 18.00 to 23.00 Monday to Friday. 13.00 to 23.00 on Saturdays; and, 07.00 to 23.00 on Sundays.
Night	ETSU-R-97 defines the night-time hours as 23.00 to 07.00 every day

The data sets have been assessed separately for both daytime and night-time periods as outlined in Table 2-5 and analysed with respect to the methods outlined in the IOA GPG.

2.8.2 Atypical Noise Data

The data sets have been filtered to remove issues such as the dawn chorus and the influence of other atypical noise sources. An example of atypical sources would be short, isolated periods of raised noise levels attributable to local sources, vehicles, agricultural activity, boiler flues, operation of gardening equipment etc. In addition, sample periods affected by rainfall or when rainfall resulted in prolonged periods of atypical noise levels have also been removed from the data sets. This approach is in line with the guidance contained in the IOA GPG.

In accordance with the guidance, noise from existing operational windfarms must not form part of the background noise. In this instance, the measured noise levels have been corrected by subtracting the predicted noise levels due to existing wind farms and/or by the filtering out data from wind directions downwind of existing wind farm. The selected method in each case is presented in Appendix C. In this way, the lowest background noise conditions are captured to provide a worst-case assessment.

2.9 Derived Background Noise Levels

The derived background noise levels dB $L_{A90,10min}$ for daytime and nighttime are presented in Table 2-6 and Table 2-7 respectively. These levels have been derived using regression analysis carried out on the data sets measured in line with best practice guidance contained in the IOA GPG and its SGN No. 2 Data Collection; Background noise levels are calculated based on the assessment hub height of 103.5 m. Appendix C presents the regression analysis charts for daytime and night-time periods from each NML.

These background noise levels will be used to determine the appropriate turbine noise limits in accordance with the adopted turbine noise criteria as set out in Chapter 12 (Noise and Vibration) of the EIAR.

Table 2-6. Derived Background Noise Levels at Assessment Hub Height - Daytime

Locations	Period	Background Noise Levels dB L_{A90} at standardised 10m height wind speed m/s for 103.5 m Hub Height						
		3	4	5	6	7	8	9
A (H227)	Day	27.3	31.1	34.2	36.4	37.8	37.8	37.8
B (H201)	Day	24.5	26.0	27.4	28.5	30.2	31.7	31.7
C (H152)	Day	26.4	27.8	29.3	30.4	31.6	32.0	32.0
D (H164)	Day	26.2	28.9	31.1	32.8	34.1	34.1	34.1
E (H200)	Day	29.5	31.3	32.8	33.7	34.7	34.7	34.7

Table 2-7. Derived Background Noise Levels at Assessment Hub Height – Night-time

Locations	Period	Background Noise Levels dB L_{A90} at standardised 10m height wind speed m/s for 103.5 m Hub Height						
		3	4	5	6	7	8	9
A (H227)	Night	30.9	33.1	34.8	36.0	37.6	37.6	37.6
B (H201)	Night	22.8	24.6	26.1	27.2	27.9	28.0	28.0
C (H152)	Night	22.6	25.0	26.6	27.5	28.8	30.4	30.4
D (H164)	Night	22.9	25.6	28.3	31.2	34.1	37.1	37.1
E (H200)	Night	27.9	29.8	30.9	31.2	31.2	31.2	31.2

APPENDIX A. GLOSSARY OF ACOUSTIC TERMS

Background noise	The noise level rarely fallen below in any given location over any given time period, often classed according to daytime, evening or night-time periods.
dB	Abbreviation for 'decibel'.
dB(A)	Abbreviation for the decibel level of a sound that has been A-weighted.
Dawn Chorus	Noise due to birds which can occur at sunrise.
Decibel	The unit normally employed to measure the magnitude of sound.
Directivity	The property of a sound source that causes more sound to be radiated in one direction than another.
L_{A90}	The noise level exceeded 90% of the time during a measurement period, often used for the measurement of background noise.
Level	The general term used to describe a sound once it has been converted into decibels.
Sound level meter	An instrument for measuring sound pressure level.

APPENDIX B. INSTALLATION PHOTOGRAPHS

Appendix Figure B-1. Location A Installation



Appendix Figure B-2. Location B Installation



Appendix Figure B-3. Location C Installation



Appendix Figure B-4. Location D Installation



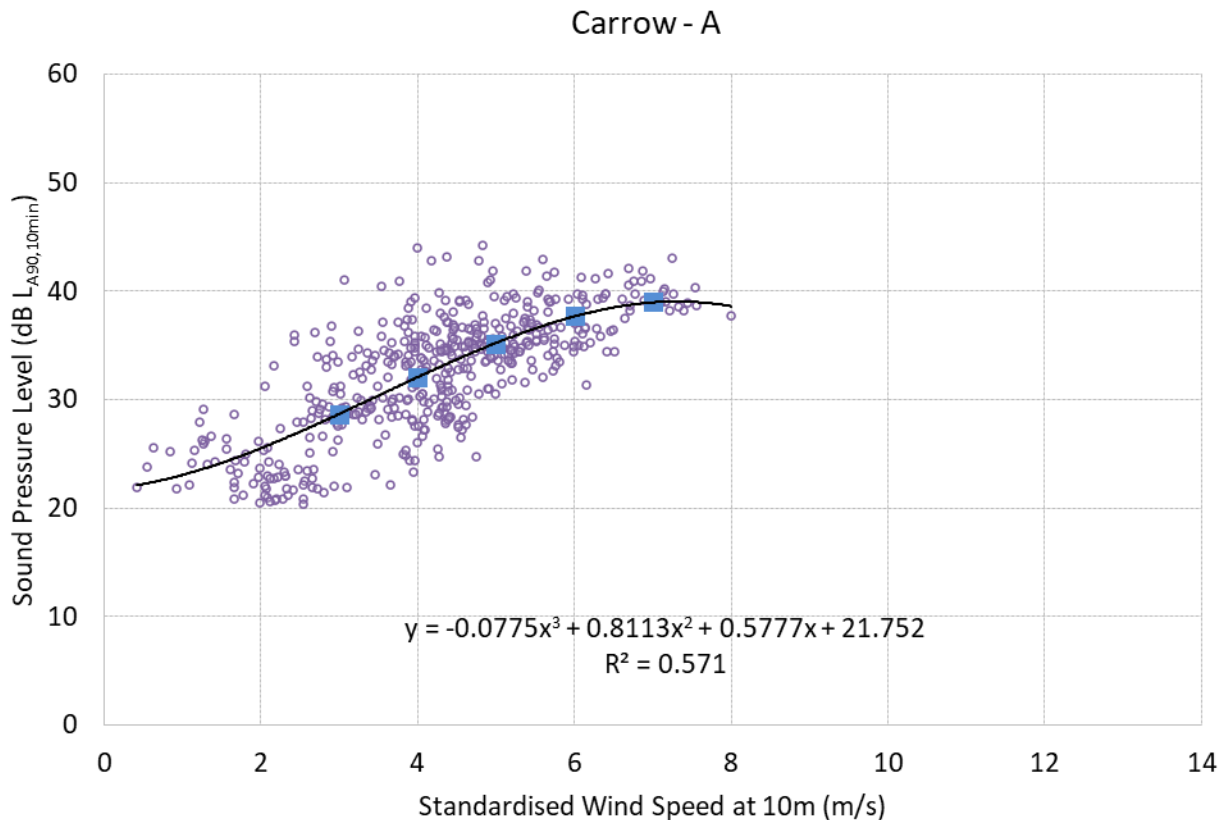
Appendix Figure B-5. Location E Installation



APPENDIX C. REGRESSION ANALYSIS ON DATA SETS

The following graphs present the data sets for each location. Where necessary, the contribution to measured noise levels from existing turbines was addressed by subtracting the calculated noise levels from measured levels, for wind directions sectors where the measurement locations upwind of the existing turbines, as presented in the following table. A logarithmic subtraction is used to derive the background noise levels.

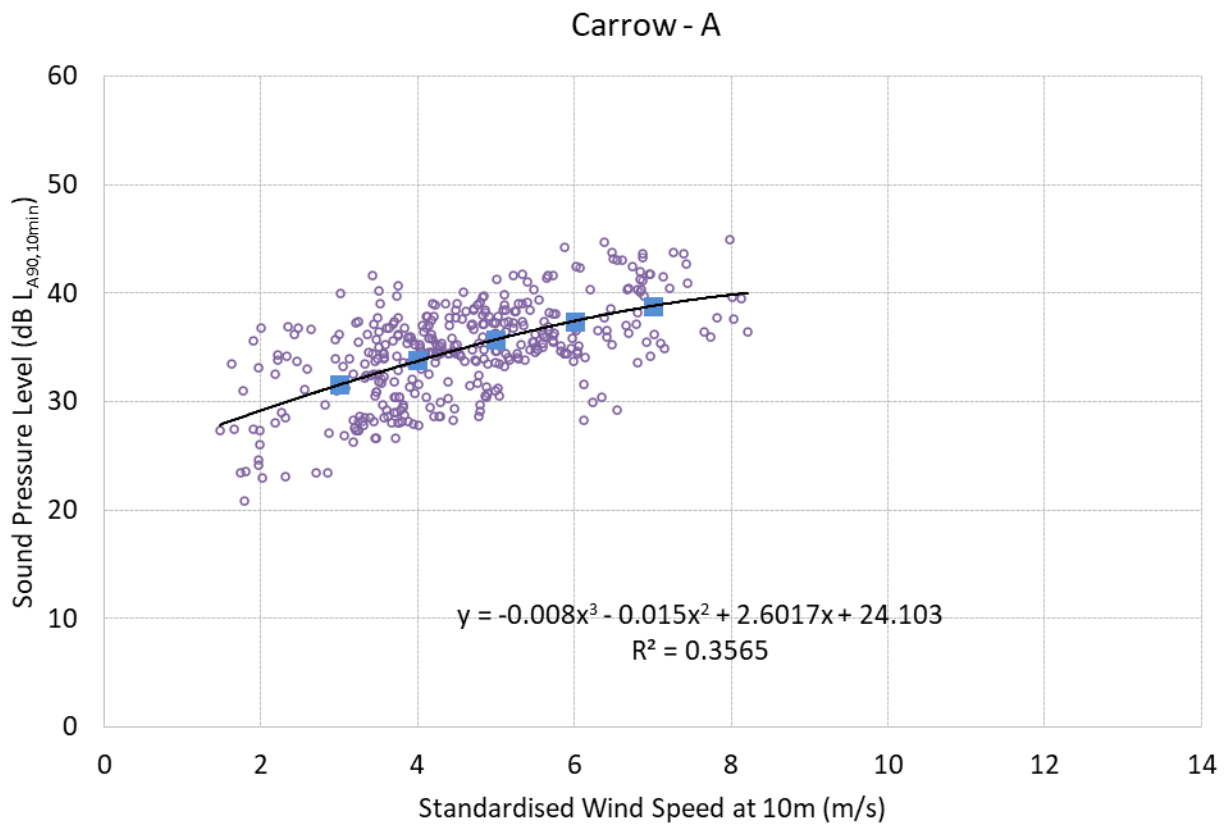
Appendix Figure C-1. Location A Daytime noise levels



Appendix Table C-1. Location A: Derived Background Noise Levels – Daytime

Parameter	Period	Noise Levels dB LA90 at standardised 10m height wind speed m/s for 103.5 m Hub Height				
		3	4	5	6	7
Measured Upwind	Day	28.7	32.1	35.2	37.7	39.0
Calculated Upwind		23.2	25.3	28.4	31.7	32.7
Background Noise Level		27.3	31.1	34.2	36.4	37.8

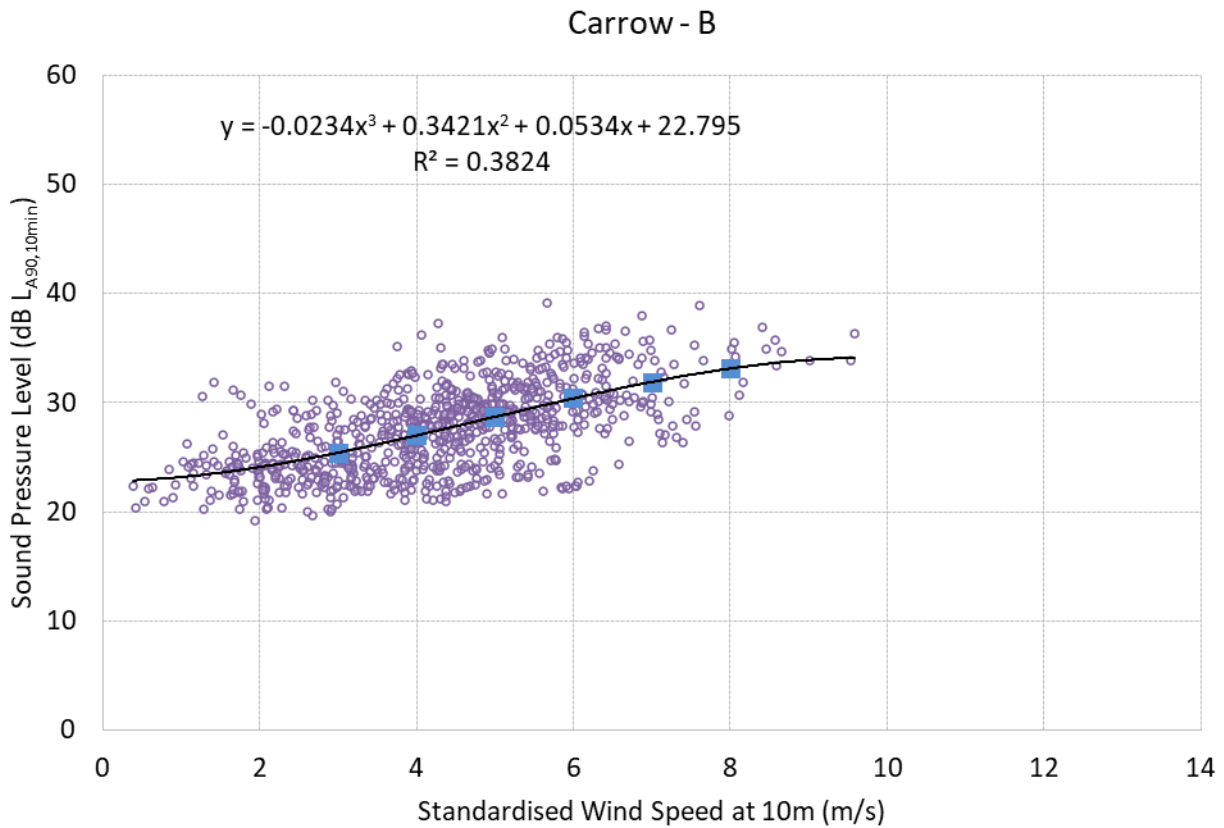
Appendix Figure C-2. Location A Night-time noise levels



Appendix Table C-2. Location A: Derived Background Noise Levels – Night-time

Parameter	Period	Noise Levels dB LA90 at standardised 10m height wind speed m/s for 103.5 m Hub Height				
		3	4	5	6	7
Measured Upwind	Day	31.6	33.8	35.7	37.4	38.8
Calculated Upwind		23.2	25.3	28.4	31.7	32.7
Background Noise Level		30.9	33.1	34.8	36.0	37.6

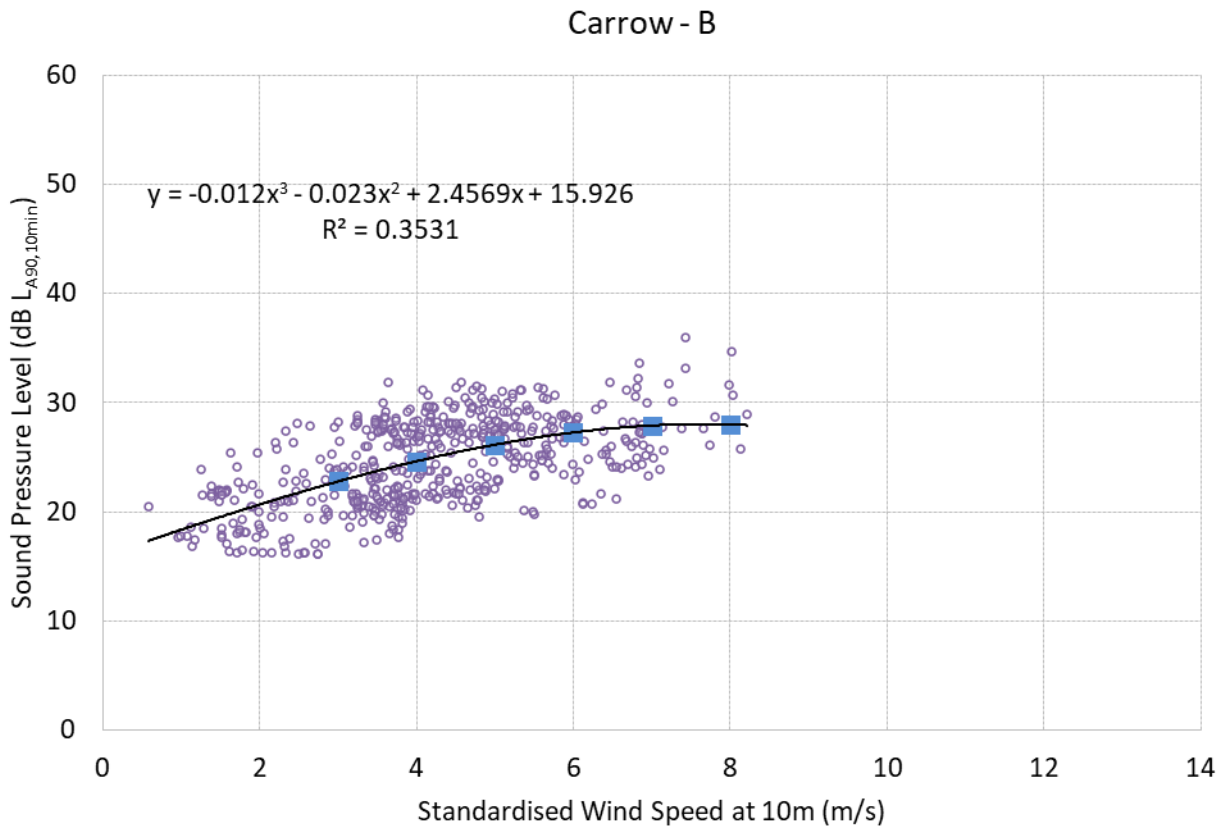
Appendix Figure C-3. Location B Daytime noise levels



Appendix Table C-3. Location B: Derived Background Noise Levels - Daytime

Parameter	Period	Noise Levels dB LA90 at standardised 10m height wind speed m/s for 103.5 m Hub Height					
		3	4	5	6	7	8
Measured Upwind	Day	25.4	27.0	28.7	30.4	31.9	33.1
Calculated Upwind		17.9	20.0	22.9	25.9	27.1	27.6
Background Noise Level		24.5	26.0	27.4	28.5	30.2	31.7

Appendix Figure C-4. Location B Night-time noise levels

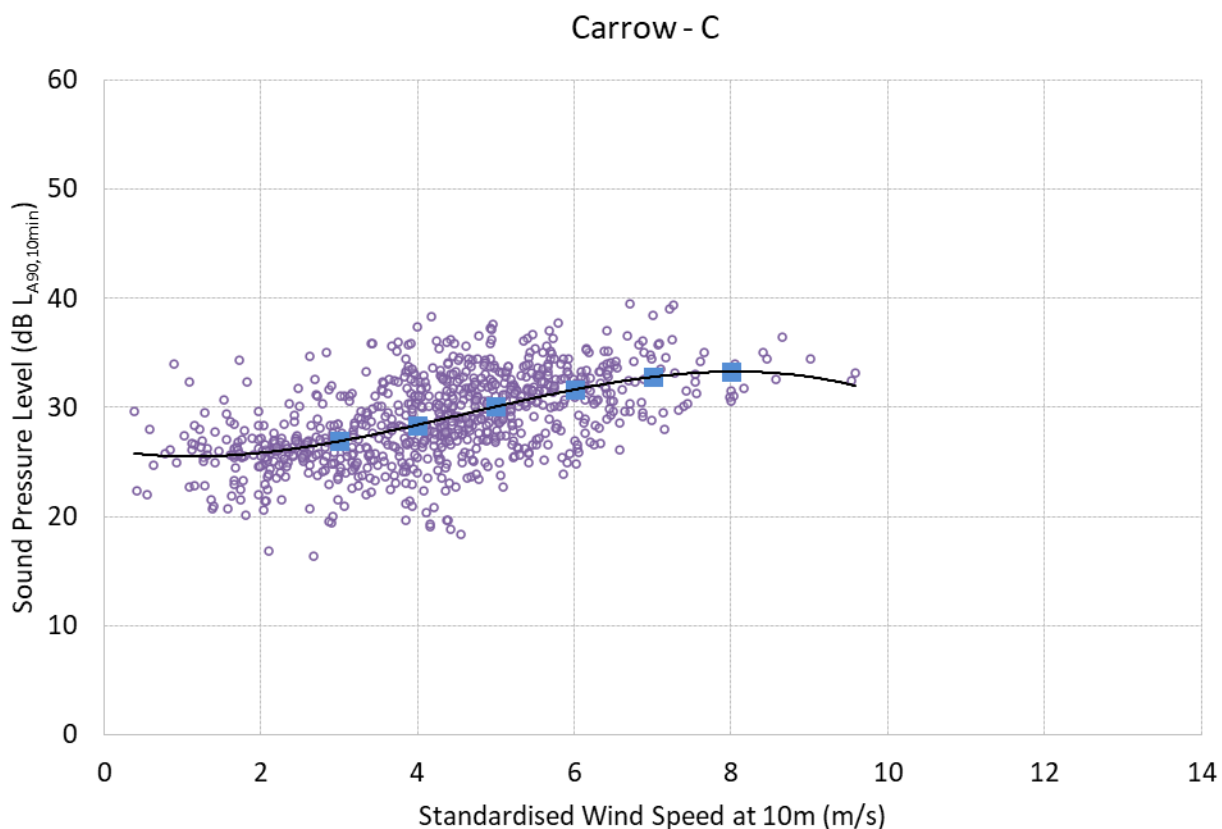


In this instance the measured noise levels were used as the background noise levels.

Appendix Table C-4. Location B: Derived Background Noise Levels – Night-time

Locations	Period	Noise Levels dB LA90 at standardised 10m height wind speed m/s for 103.5 m Hub Height					
		3	4	5	6	7	8
Measured Upwind	Night	22.8	24.6	26.1	27.2	27.9	28.0

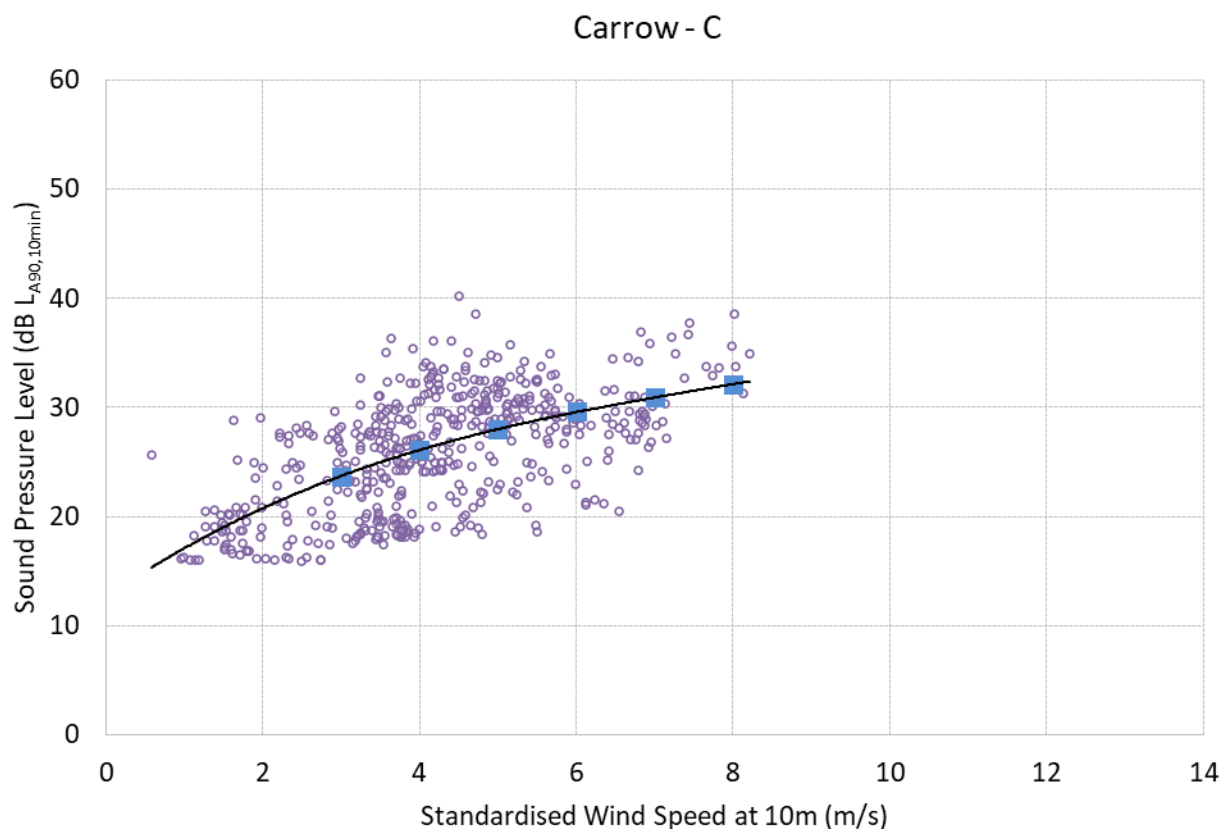
Appendix Figure C-5. Location C Daytime noise levels



Appendix Table C-5. Location C: Derived Background Noise Levels - Daytime

Parameter	Period	Noise Levels dB LA90 at standardised 10m height wind speed m/s for 103.5 m Hub Height					
		3	4	5	6	7	8
Measured Upwind	Day	26.9	28.4	30.1	31.6	32.8	33.3
Calculated Upwind		17.3	19.5	22.5	25.5	26.7	27.3
Background Noise Level		26.4	27.8	29.3	30.4	31.6	32.0

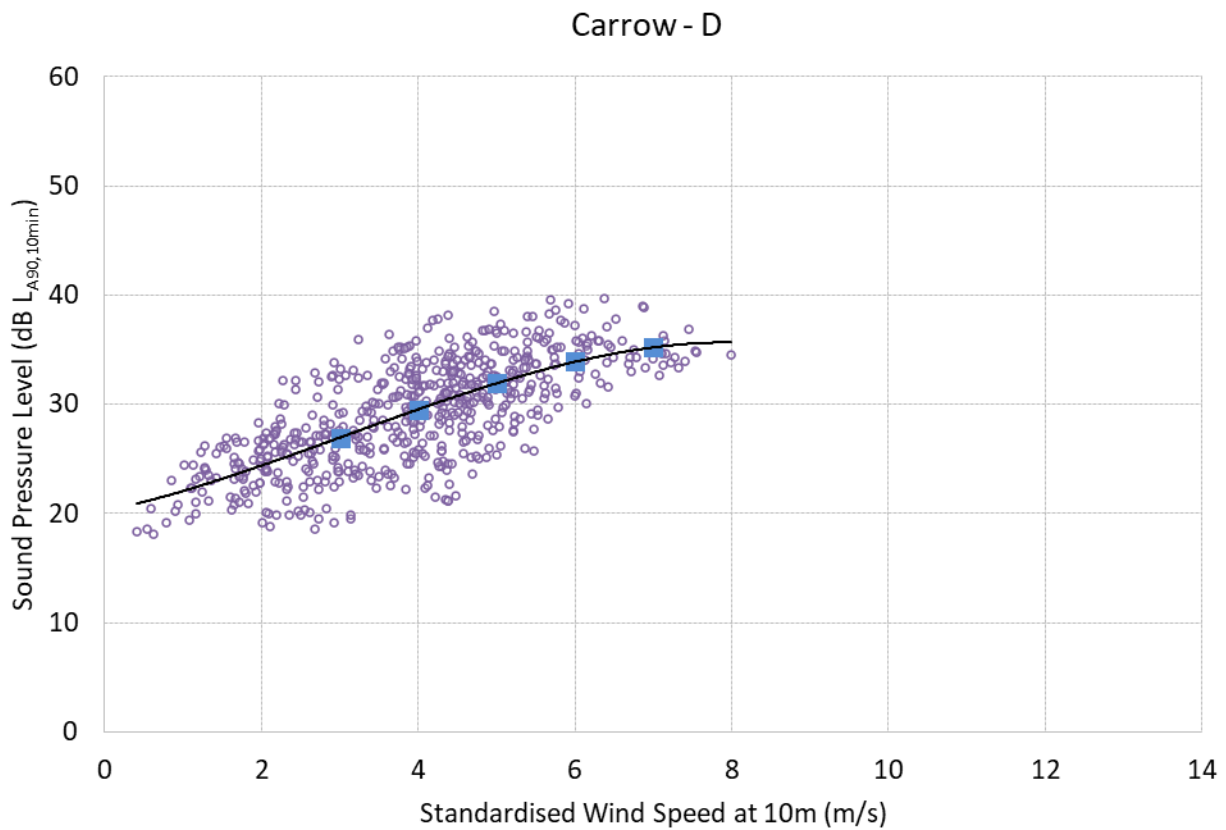
Appendix Figure C-6. Location C Night-time noise levels



Appendix Table C-6. Location C: Derived Background Noise Levels – Night-time

Parameter	Period	Noise Levels dB LA90 at standardised 10m height wind speed m/s for 103.5 m Hub Height					
		3	4	5	6	7	8
Measured Upwind	Night	26.9	28.4	30.1	31.6	32.8	33.3
Calculated Upwind		17.3	19.5	22.5	25.5	26.7	27.3
Background Noise Level		26.4	27.8	29.3	30.4	31.6	32.0

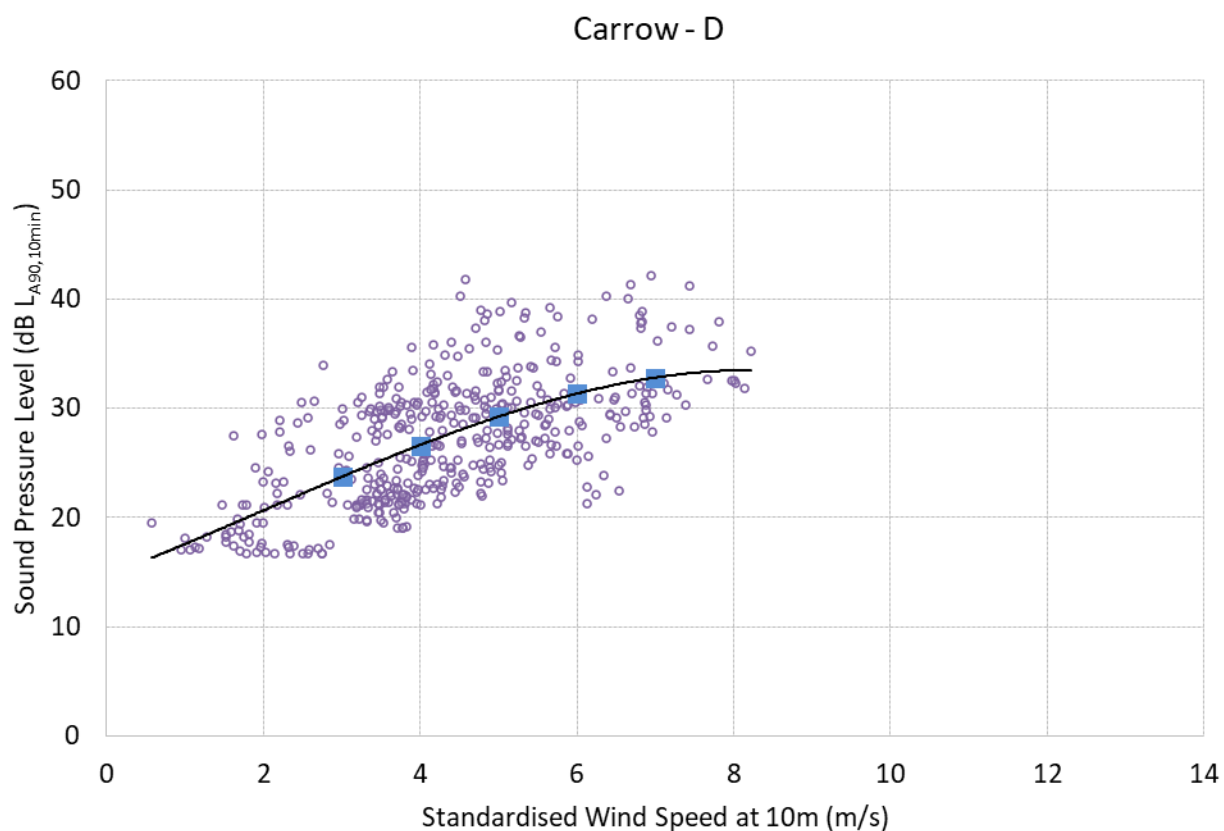
Appendix Figure C-7. Location D Daytime noise levels



Appendix Table C-7. Location D: Derived Background Noise Levels – Daytime

Parameter	Period	Noise Levels dB LA90 at standardised 10m height wind speed m/s for 103.5 m Hub Height				
		3	4	5	6	7
Measured Upwind	Day	26.9	29.5	31.9	33.9	35.2
Calculated Upwind		18.7	20.5	24.0	27.4	28.6
Background Noise Level		26.2	28.9	31.1	32.8	34.1

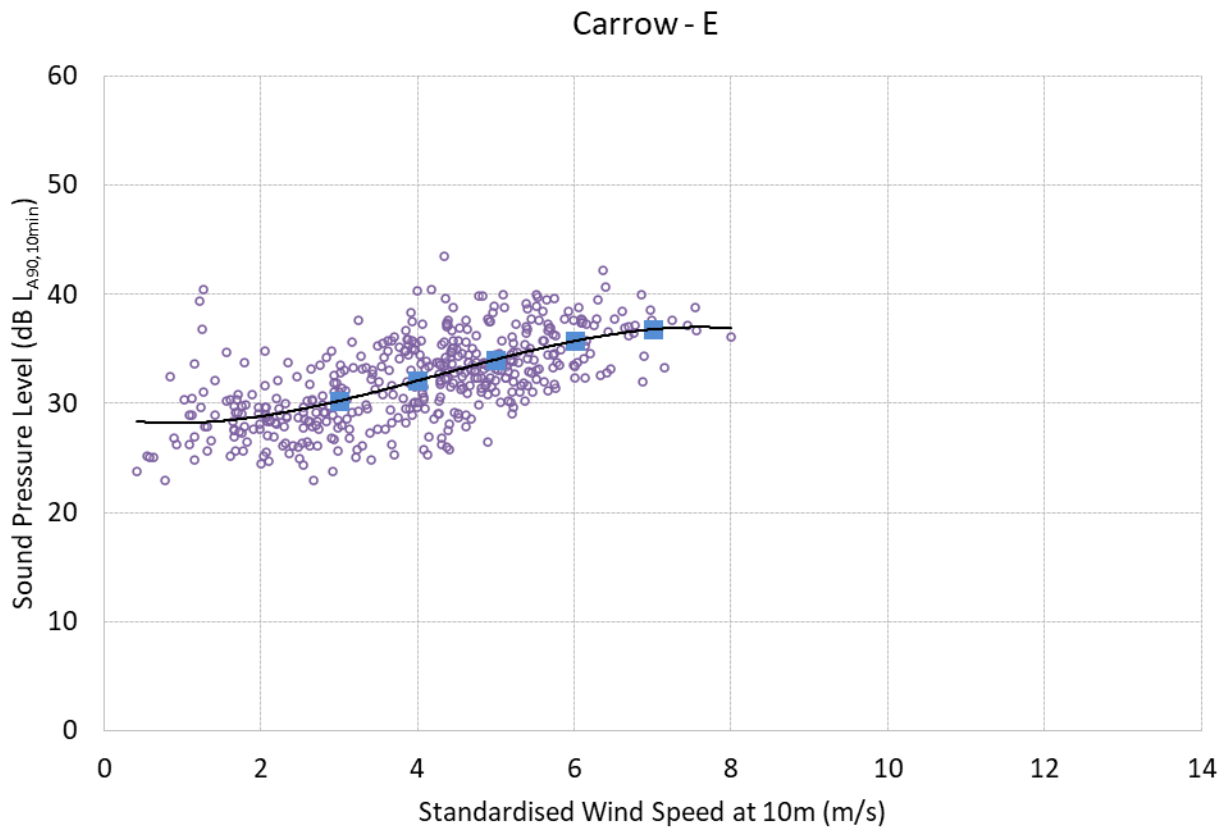
Appendix Figure C-8. Location D Night-time noise levels



Appendix Table C-8. Location C: Derived Background Noise Levels – Night-time

Parameter	Period	Noise Levels dB LA90 at standardised 10m height wind speed m/s for 103.5 m Hub Height				
		3	4	5	6	7
Measured Upwind	Night	23.7	26.6	29.2	31.3	32.8
Calculated Upwind		18.7	20.5	24.0	27.4	28.6
Background Noise Level		22.0	25.4	27.6	29.0	30.7

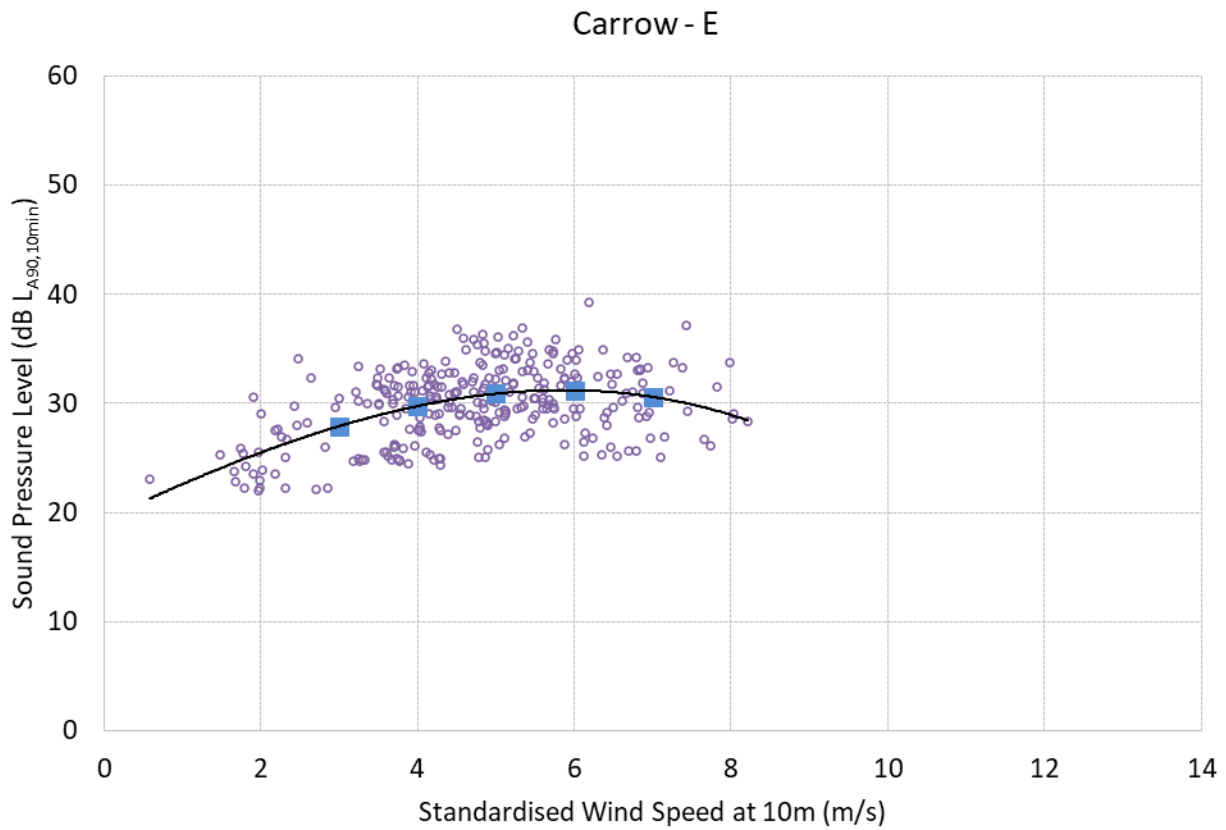
Appendix Figure C-9. Location E Daytime noise levels



Appendix Table C-9. Location E: Derived Background Noise Levels – Daytime

Parameter	Period	Noise Levels dB LA90 at standardised 10m height wind speed m/s for 103.5 m Hub Height				
		3	4	5	6	7
Measured Upwind	Day	30.2	32.1	34	35.7	36.8
Calculated Upwind		22.1	24.2	27.8	31.3	32.6
Background Noise Level		29.5	31.3	32.8	33.7	34.7

Appendix Figure C-10. Location E Nighttime noise levels



Appendix Table C-10. Location E: Derived Background Noise Levels – Night-time

Parameter	Period	Noise Levels dB LA90 at standardised 10m height wind speed m/s for 103.5 m Hub Height				
		3	4	5	6	7
Measured Upwind	Night	27.9	29.8	30.9	31.2	31.2

APPENDIX D. CALIBRATION CERTIFICATES

Location A



CERTIFICATE OF CALIBRATION



0653

Date of Issue: 13 June 2023

Certificate Number: UCRT23/1774

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 Limited The Tecpro Building IDA Business and Technology Park Clonshaugh Dublin D17 XD90 Ireland			
Order No.	AWN200423			
Description	Sound Level Meter / Pre-amp / Microphone / Associated Calibrator			
Identification	<i>Manufacturer</i>	<i>Instrument</i>	<i>Type</i>	<i>Serial No. / Version</i>
	Rion	Sound Level Meter	NL-52	00186668
	Rion	Firmware		2.1
	Rion	Pre Amplifier	NH-25	76701
	Rion	Microphone	UC-59	12813
	Rion	Calibrator	NC-74	34536109
		Calibrator adaptor type if applicable		NC-74-002
Performance Class	1			
Test Procedure	TP 10. SLM 61672-3:2013 <i>Procedures from IEC 61672-3:2013 were used to perform the periodic tests.</i>			
Type Approved to IEC 61672-1:2013	Yes <i>If YES above there is public evidence that the SLM has successfully completed the applicable pattern evaluation tests of IEC 61672-2:2013</i>			
Date Received	13 June 2023	ANV Job No.	UKAS23/06399	
Date Calibrated	13 June 2023			

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
	03 May 2022	UCRT22/1600	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.

Location B



**CERTIFICATE
OF
CALIBRATION**



0653

Date of Issue: 21 March 2024

Certificate Number: UCRT24/1471

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 The Tecpro Building IDA Business and Technology Park Clonsaugh Dublin 17 D17 XD90 Ireland			
Order No.	2365			
Description	Sound Level Meter / Pre-amp / Microphone / Associated Calibrator			
Identification	<i>Manufacturer</i>	<i>Instrument</i>	<i>Type</i>	<i>Serial No. / Version</i>
	Rion	Sound Level Meter	NL-52	00164426
	Rion	Firmware		2.0
	Rion	Pre Amplifier	NH-25	54559
	Rion	Microphone	UC-59	09207
	Brüel & Kjær	Calibrator	4231	2022651
		Calibrator adaptor type if applicable		UC 0210
Performance Class	1			
Test Procedure	TP 10. SLM 61672-3:2013 <i>Procedures from IEC 61672-3:2013 were used to perform the periodic tests.</i>			
Type Approved to IEC 61672-1:2013	Yes <i>If YES above there is public evidence that the SLM has successfully completed the applicable pattern evaluation tests of IEC 61672-2:2013</i>			
Date Received	20 March 2024	ANV Job No.	UKAS24/03253	
Date Calibrated	21 March 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	<i>Dated</i>	<i>Certificate No.</i>	<i>Laboratory</i>
	04 November 2021	UCRT21/2362	0653

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Location C



**CERTIFICATE
OF
CALIBRATION**




0653

Date of Issue: 13 January 2023

Certificate Number: UCRT23/1053

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 Limited
The Tecpro Building
IDA Business and Technology Park
Clonshaugh
Dublin
D17 XD90, Ireland

Order No. DOD/22/Cal045
Description Sound Level Meter / Pre-amp / Microphone / Associated Calibrator
Identification

Manufacturer	Instrument	Type	Serial No. / Version
Rion	Sound Level Meter	NL-52	00564809
Rion	Firmware		2.0
Rion	Pre Amplifier	NH-25	64934
Rion	Microphone	UC-59	09447
Brüel & Kjær	Calibrator	4231	2263026
	Calibrator adaptor type if applicable		UC 0210

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 09 January 2023 ANV Job No. UKAS23/01009
Date Calibrated 13 January 2023

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
	15 September 2020	UCRT20/1868	0653

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Location D



**CERTIFICATE
OF
CALIBRATION**




0653

Date of Issue: 05 September 2022

Certificate Number: UCRT22/2064

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

Page 1 of 2 Pages
Approved Signatory

K. Mistry

Acoustics Noise and Vibration Ltd trading as ANV Measurement Systems

Customer **AWN Consulting Limited**
The Tecpro Building
IDA Business and Technology Park
Clonshaugh
Dublin, D17 XD90
Ireland

Order No. **2243**
Description **Sound Level Meter / Pre-amp / Microphone / Associated Calibrator**
Identification

Manufacturer	Instrument	Type	Serial No. / Version
Rion	Sound Level Meter	NL-52	00564808
Rion	Firmware		2.0
Rion	Pre Amplifier	NH-25	64933
Rion	Microphone	UC-59	21306
Rion	Calibrator	NC-75	34313057
	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 **01 September 2022** ANV Job No. **UKAS22/09555**
Date Calibrated **05 September 2022**

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
	15 September 2020	UCRT20/1867	0653

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Location E



**CERTIFICATE
OF
CALIBRATION**



0653

Date of Issue: 29 September 2023

Certificate Number: UCRT23/2261

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
 The Tecpro Building
 17
 Clonshaugh Business & Technology Park
 Dublin

Order No. AWN200923
 Description Sound Level Meter / Pre-amp / Microphone / Associated Calibrator
 Identification

Manufacturer	Instrument	Type	Serial No. / Version
Rion	Sound Level Meter	NL-52	00575785
Rion	Firmware		2.1
Rion	Pre Amplifier	NH-25	68512
Rion	Microphone	UC-59	11406
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 28 September 2023 ANV Job No. UKAS23/09669
 Date Calibrated 29 September 2023

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
	09 September 2021	UCRT21/2108	0653

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