



APPENDIX 12-3

**CAHERMURPHY BASELINE
NOISE SURVEY**



Trinity
Consultants

awnconsulting

Background Noise Survey

Project Title: Cahermurphy West Wind Farm, Co Clare

CLIENT
MKO

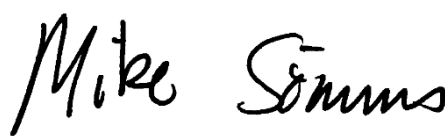

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Signature		
Name	Mike Simms	Miguel Cartuyvels
Title	Principal Acoustic Consultant	Acoustic Consultant
Date	24 February 2026	

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 note has been prepared to provide details and methodology of the background noise survey undertaken and confirm the derived background noise levels 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

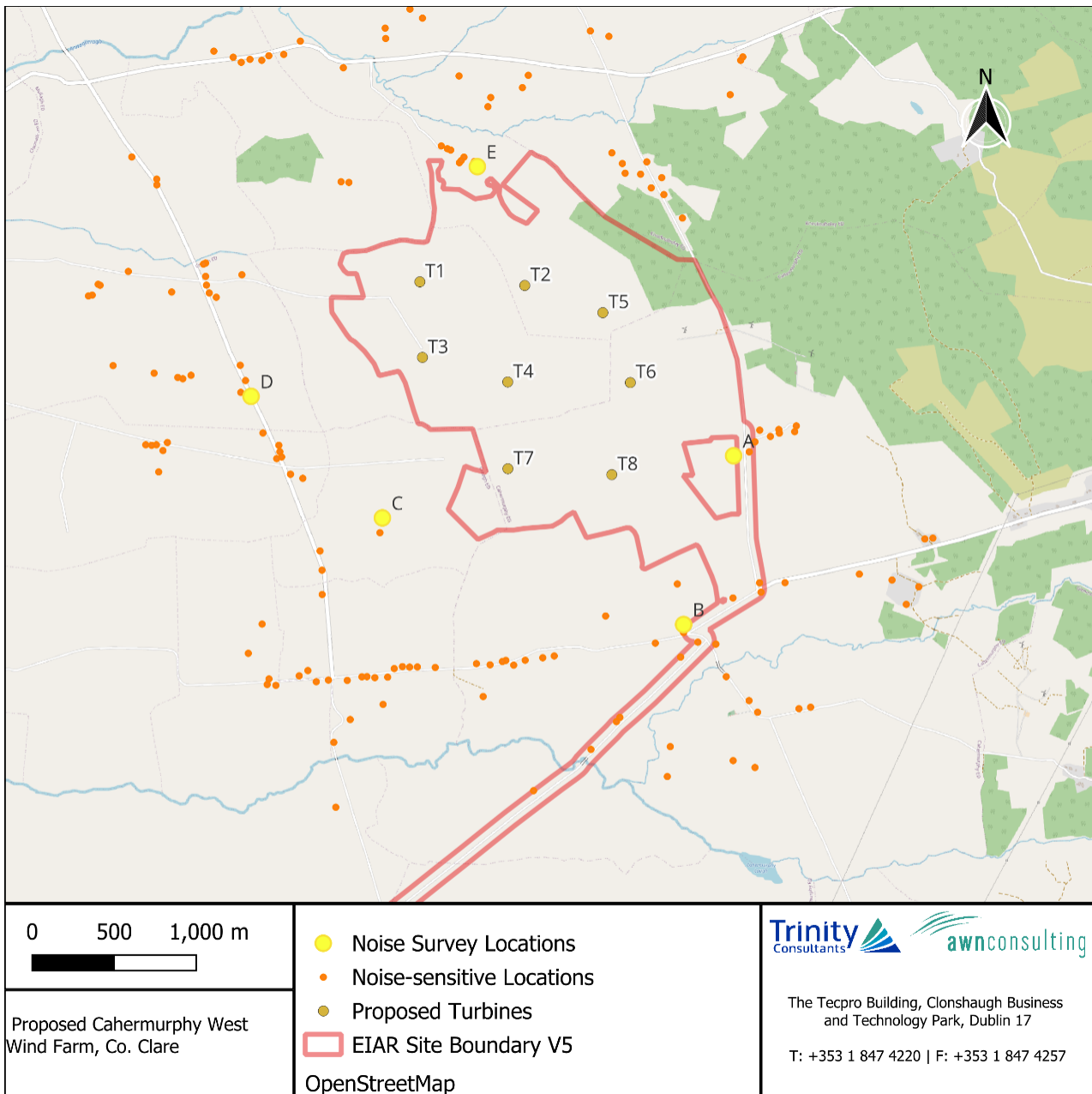
Location	Coordinates (ITM)	
	Easting	Northing
A (H029)	509684	668702
B (H016)	509379	667675
C (H023)	507544	668324
D (H068)	506739	669068
E (H028)	508122	670462

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.

Both locations, B and C, were moved on 20 August 2019 to accommodate cattle in their previous measurement positions. In both cases, the change in location was minor and did not significantly affect the measured noise levels.

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 (H029)	26 July 2019	30 August 2019
B (H016)	26 July 2019	30 August 2019
C (H023)	26 July 2019	30 August 2019
D (H075)	26 July 2019	30 August 2019
E (H028)	26 July 2019	30 August 2019

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 (H029)	RION – NL-52	186667
B (H016)	RION – NL-52	186668
C (H023)	RION – NL-52	186669
D (H075)	RION – NL-52	186671
E (H028)	RION – NL-52	586944

Before and after the survey the measurement apparatus was checked 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 affected 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 and was supplied to AWN for data analysis. Table 2-4 presents the coordinates where the wind was measured.

Table 2-4. Wind Measurement Location

Co-ordinates (ITM)	
Easting	Northing
509974	669163

2.6.1 Wind Shear

Wind speed collected at 90 m and 75 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:
$$U_1 = U_2 \times \left[\frac{\ln(H_1/z)}{\ln(H_2/z)} \right]$$

Where:

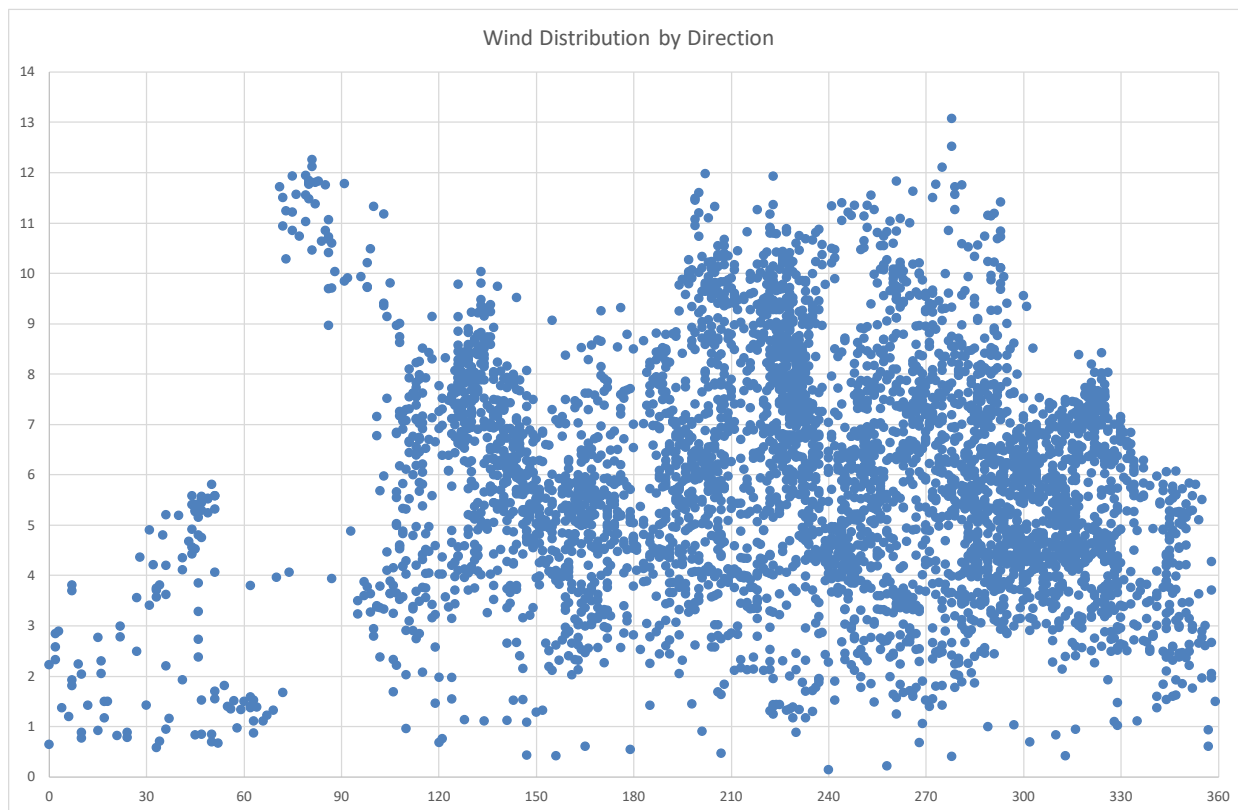
H ₁	The height of the wind speed to be calculated (10m)
H ₂	The height of the measured or calculated HH wind speed.
U ₁	The wind speed to be calculated.
U ₂	The measured or calculated HH wind speed.
Z	The roughness length.

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 summarizes 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 of noise 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 HH 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. The data sets collected at all locations have been directionally filtered to exclude periods where the measurement locations were downwind of Kiltumper Wind Farm. As such, the lowest background noise conditions are captured to provide a worst-case assessment. Cahermurphy One had not yet been constructed at the time of the noise survey.

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 LA90 at standardised 10m height wind speed m/s for 103.5 m Hub Height							
		3	4	5	6	7	8	9	10
A	Day	21.5	23.2	25.2	27.5	30.1	32.9	36.1	39.5
B	Day	23.6	24.8	26.5	28.7	31.2	34.2	37.6	41.4
C	Day	22.9	24.8	27.0	29.4	31.9	34.7	37.6	40.7
D	Day	20.5	22.0	23.6	25.6	27.8	30.3	33.0	36.0
E	Day	20.3	21.8	23.6	25.6	27.8	30.3	33.0	36.0

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

Locations	Period	Background Noise Levels dB LA90 at standardised 10m height wind speed m/s for 103.5 m Hub Height							
		3	4	5	6	7	8	9	10
A	Night	18.7	19.7	21.3	23.4	26.0	29.2	33.0	37.3
B	Night	20.2	20.9	22.3	24.3	27.0	30.4	34.5	39.2
C	Night	17.6	18.9	20.9	23.6	26.9	30.8	35.3	40.5
D	Night	18.0	18.8	20.2	22.0	24.4	27.3	30.7	34.7
E	Night	17.5	18.4	19.8	21.6	24.0	26.9	30.2	34.1

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 B Installation (Second Location)



Appendix Figure B-4. Location C Installation



Appendix Figure B-5. Location C Installation (Second Location)



Appendix Figure B-6. Location D Installation



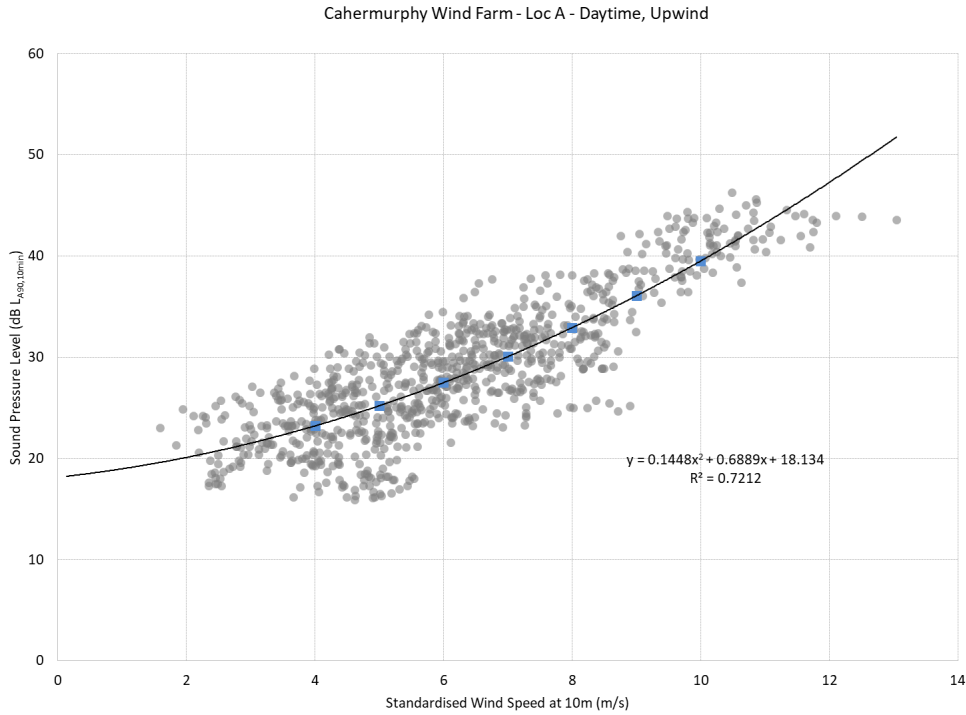
Appendix Figure B-7. Location E Installation



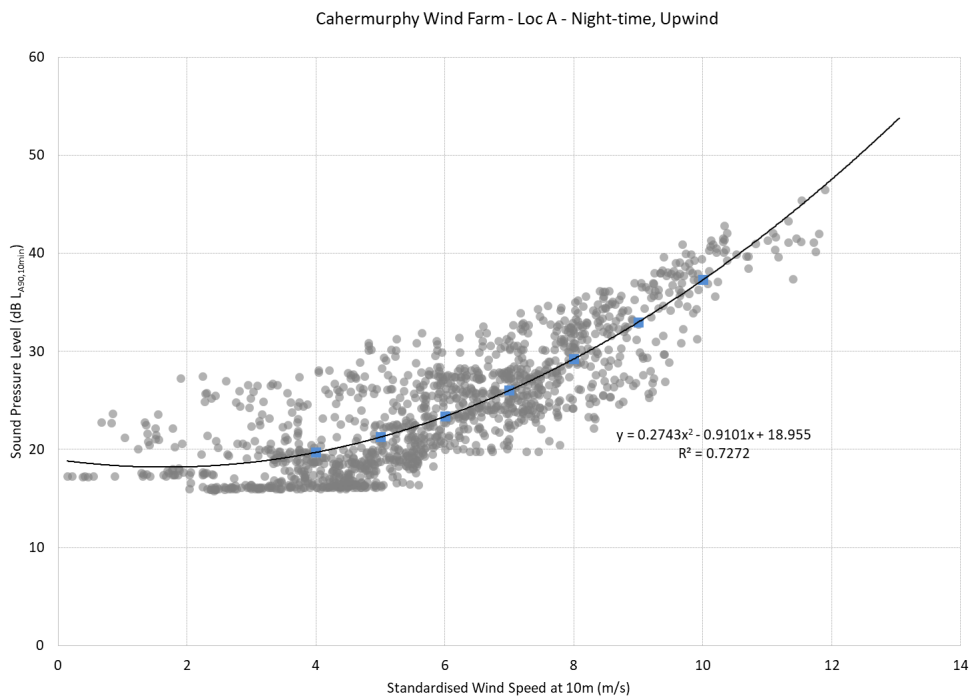
APPENDIX C. REGRESSION ANALYSIS ON DATA SETS

The following graphs present the data sets for each location. In each case, the daytime data is presented first and the night-time data below.

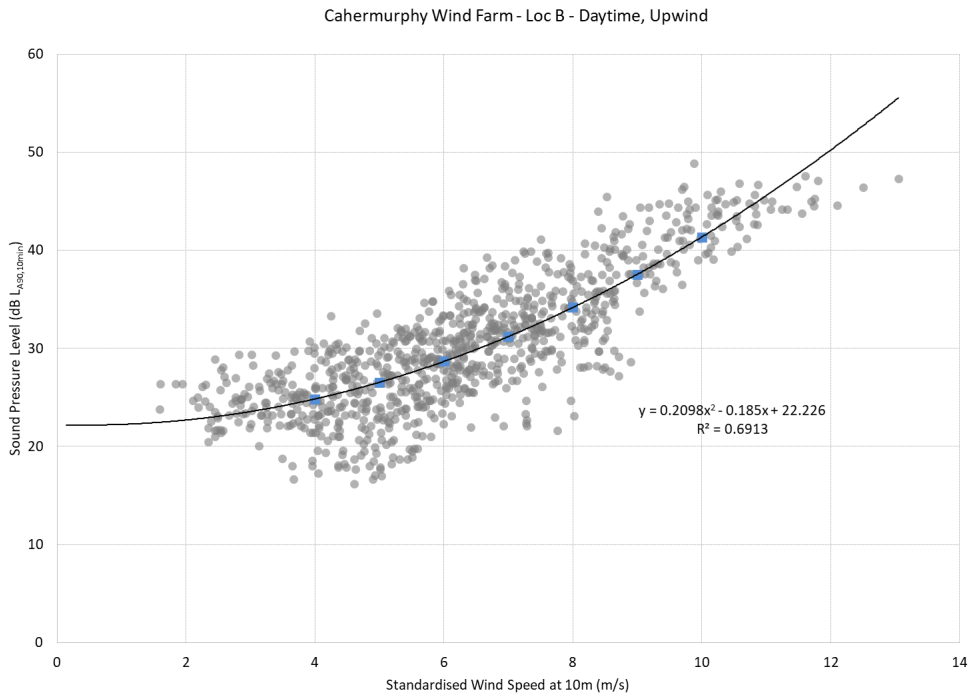
Appendix Figure C-1. Location A Daytime noise levels



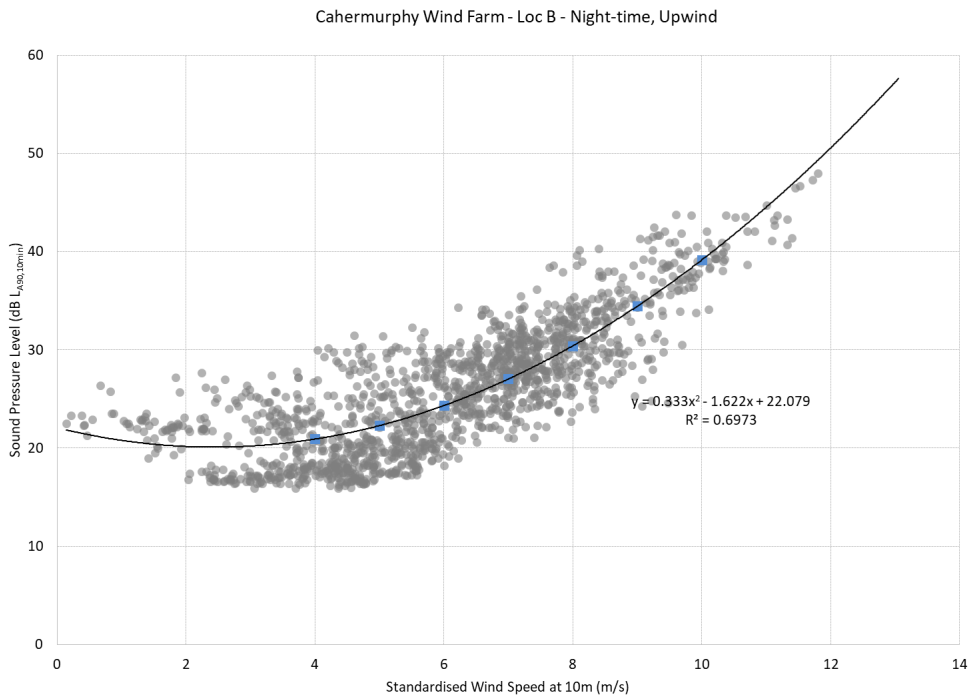
Appendix Figure C-2. Location A Night-time noise levels



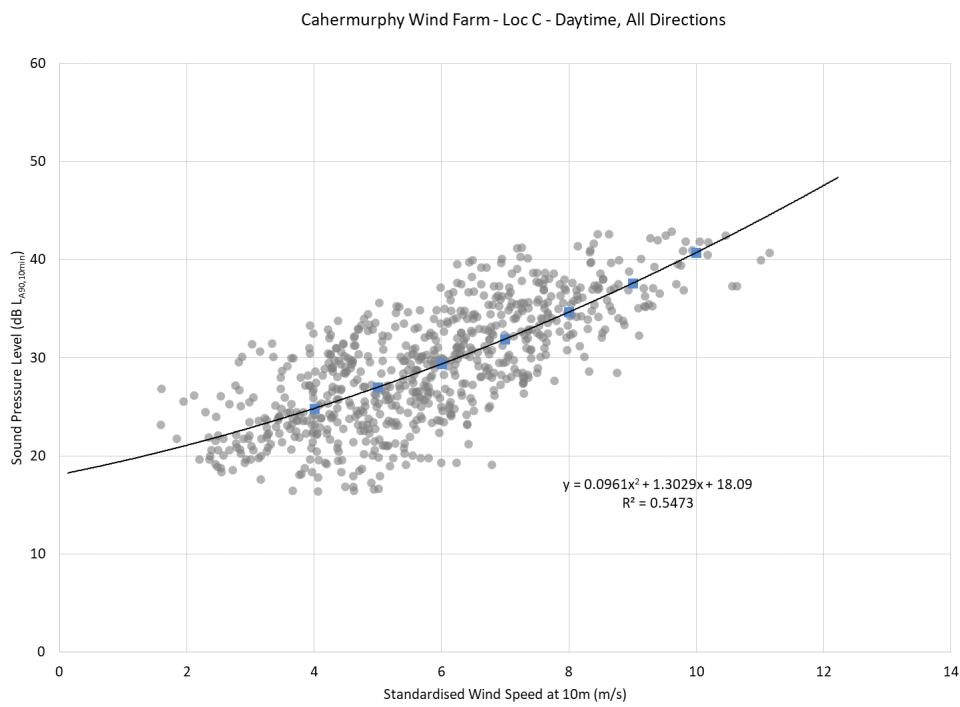
Appendix Figure C-3. Location B Daytime noise levels



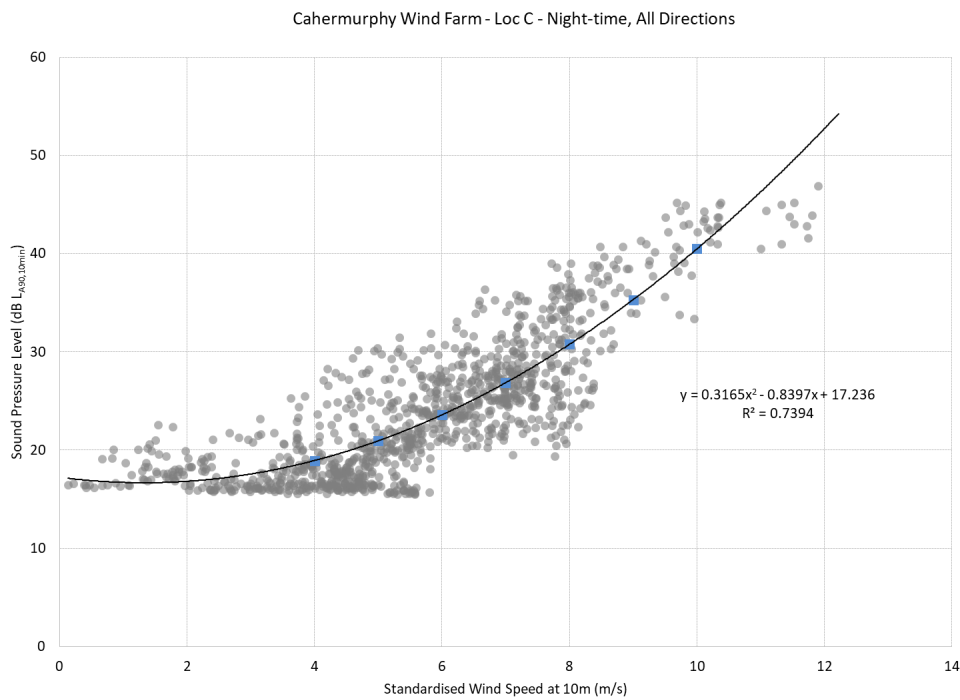
Appendix Figure C-4. Location B Night-time noise levels



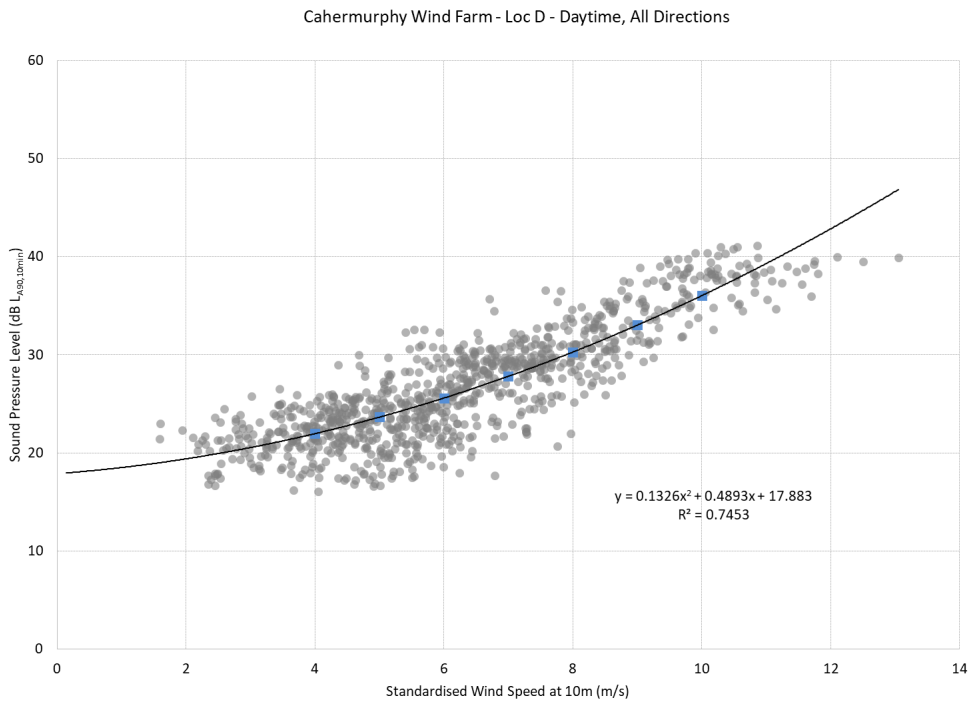
Appendix Figure C-5. Location C Daytime noise levels



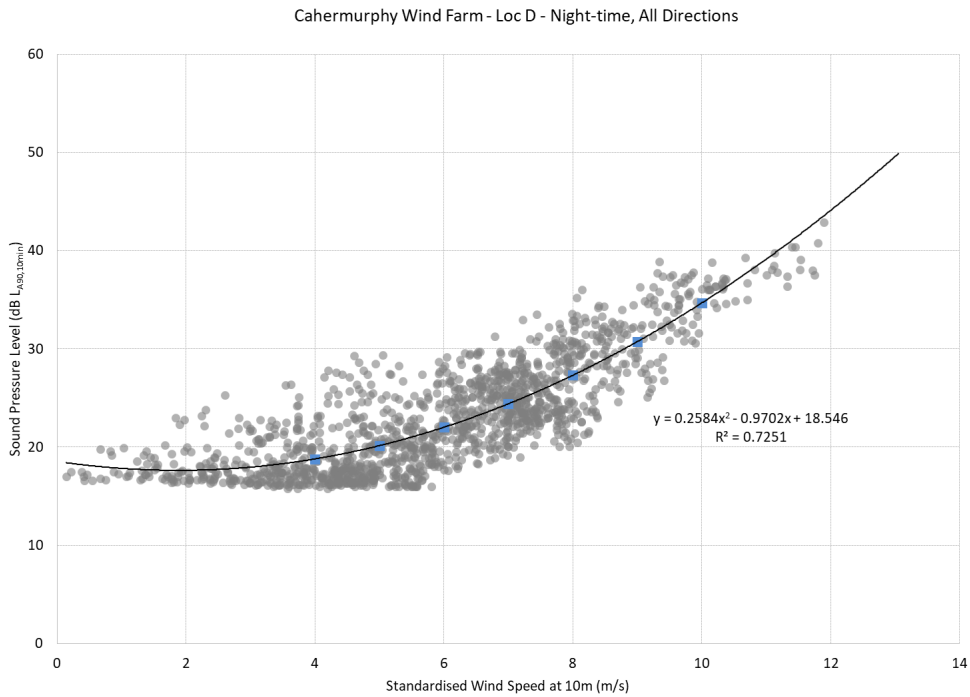
Appendix Figure C-6. Location C Night-time noise levels



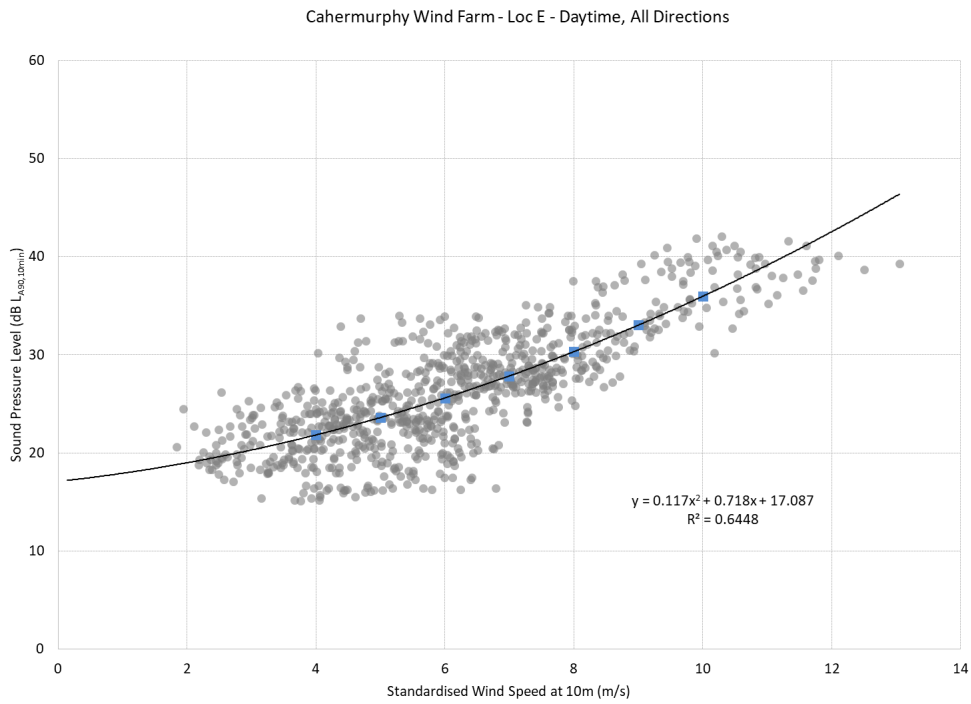
Appendix Figure C-7. Location D Daytime noise levels



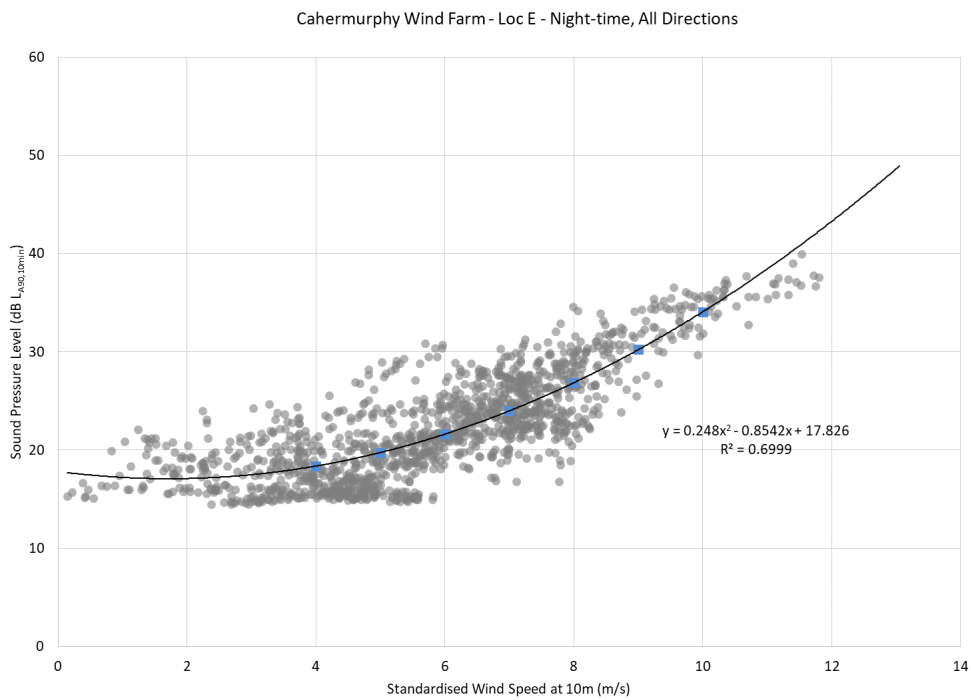
Appendix Figure C-8. Location D Night-time noise levels



Appendix Figure C-9. Location E Daytime noise levels



Appendix Figure C-10. Location E Nighttime noise levels



APPENDIX D. CALIBRATION CERTIFICATES

Location A



CERTIFICATE OF CALIBRATION



Date of Issue: 20 April 2018

Certificate Number: UCRT18/1432

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
Clonsaugh Business and Technology Park
Dublin 17
Ireland
D17 NX50

Order No.				
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	00186667
	Rion	Firmware		1.9
	Rion	Pre Amplifier	NH-25	76817
	Rion	Microphone	UC-59	12812
	Rion	Calibrator	NC-74	34536109
		Calibrator adaptor type if applicable		NC-74-002

Performance Class 1
Test Procedure TP 2.SLM 61672-3 TPS-49
Procedures from IEC 61672-3:2006 were used to perform the periodic tests.
Type Approved to IEC 61672-1:2002 YES Approval Number 21.21 / 13.02
If YES above there is public evidence that the SLM has successfully completed the applicable pattern evaluation tests of IEC 61672-2:2003
Date Received 20 April 2018 ANV Job No. UKAS18/04261
Date Calibrated 20 April 2018

The sound level meter submitted for testing has successfully completed the class 1 periodic tests of IEC 61672-3:2006, for the environmental conditions under which the tests were performed. As public evidence was available, from an independent testing organisation responsible for approving the results of pattern evaluation tests performed in accordance with IEC 61672-2:2003, to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1:2002, the sound level meter submitted for testing conforms to the class 1 requirements of IEC 61672-1:2002.

Previous Certificate	<i>Dated</i>	<i>Certificate No.</i>	<i>Laboratory</i>
	Initial Calibration		

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

UCRT18/1432

UKAS Accredited Calibration Laboratory No. 0653

Page 2 of 2 Pages

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

SLM instruction manual title	Sound Level Meter	NL-42 / NL-52
SLM instruction manual ref / issue		11-03
SLM instruction manual source		Manufacturer
Internet download date if applicable		N/A
Case corrections available		Yes
Uncertainties of case corrections		Yes
Source of case data		Manufacturer
Wind screen corrections available		Yes
Uncertainties of wind screen corrections		Yes
Source of wind screen data		Manufacturer
Mic pressure to free field corrections		Yes
Uncertainties of Mic to F.F. corrections		Yes
Source of Mic to F.F. corrections		Manufacturer
Total expanded uncertainties within the requirements of IEC 61672-1:2002	Yes	
Specified or equivalent Calibrator		Specified
Customer or Lab Calibrator		Lab Calibrator
Calibrator adaptor type if applicable		NC-74-002
Calibrator cal. date		05 April 2018
Calibrator cert. number		UCRT18/1348
Calibrator cal cert issued by		0653
Calibrator SPL @ STP	93.98	dB Calibration reference sound pressure level
Calibrator frequency	1001.90	Hz Calibration check frequency
Reference level range	25 - 130	dB

Accessories used or corrected for during calibration - Extension Cable & Wind Shield WS-15

Note - if a pre-amp extension cable is listed then it was used between the SLM and the pre-amp.

Environmental conditions during tests	Start	End	
Temperature	22.18	22.93	± 0.30 °C
Humidity	53.1	51.5	± 3.00 %RH
Ambient Pressure	101.32	101.34	± 0.03 kPa

Response to associated Calibrator at the environmental conditions above.

Initial indicated level	94.0	dB	Adjusted indicated level	94.0	dB
The uncertainty of the associated calibrator supplied with the sound level meter ±			0.10		

Self Generated Noise This test is currently not performed by this Lab.

Microphone installed (if requested by customer) = Less Than	N/A	dB	A Weighting
Uncertainty of the microphone installed self generated noise ±	N/A	dB	

Microphone replaced with electrical input device - UR = Under Range indicated

Weighting	A	C	Z
	12.7	16.7	22.7
	dB	dB	dB
	UR	UR	UR

Uncertainty of the electrical self generated noise ± 0.12 dB

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.

For the test of the frequency weightings as per paragraph 12. of IEC 61672-3:2006 the actual microphone free field response was used.

The acoustical frequency tests of a frequency weighting as per paragraph 11 of IEC 61672-3:2006 were carried out using an electrostatic actuator.

END

Calibrated by: A Patel

R 1

Additional Comments

None

Location B



**CERTIFICATE
OF CALIBRATION**



0653

Date of Issue: 20 April 2018

Certificate Number: UCRT18/1436

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
 Clonshaugh Business and Technology Park
 Dublin 17
 Ireland
 D17 NX50

Order No.

Description

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

Identification

Manufacturer	Instrument	Type	Serial No. / Version
Rion	Sound Level Meter	NL-52	00186668
Rion	Firmware		1.9
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 2.SLM 61672-3 TPS-49

Procedures from IEC 61672-3:2006 were used to perform the periodic tests.

Type Approved to IEC 61672-1:2002

YES

Approval Number

21.21 / 13.02

If YES above there is public evidence that the SLM has successfully completed the applicable pattern evaluation tests of IEC 61672-2:2003

Date Received

20 April 2018

ANV Job No.

UKAS18/04261

Date Calibrated

20 April 2018

The sound level meter submitted for testing has successfully completed the class 1 periodic tests of IEC 61672-3:2006, for the environmental conditions under which the tests were performed. As public evidence was available, from an independent testing organisation responsible for approving the results of pattern evaluation tests performed in accordance with IEC 61672-2:2003, to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1:2002, the sound level meter submitted for testing conforms to the class 1 requirements of IEC 61672-1:2002.

Previous Certificate

Dated

Certificate No.

Laboratory

Initial Calibration

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CERTIFICATE OF CALIBRATION

Certificate Number
UCRT18/1436

UKAS Accredited Calibration Laboratory No. 0653

Page 2 of 2 Pages

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

SLM instruction manual title	Sound Level Meter	NL-42 / NL-52
SLM instruction manual ref / issue		11-03
SLM instruction manual source	Manufacturer	
Internet download date if applicable	N/A	
Case corrections available	Yes	
Uncertainties of case corrections	Yes	
Source of case data	Manufacturer	
Wind screen corrections available	Yes	
Uncertainties of wind screen corrections	Yes	
Source of wind screen data	Manufacturer	
Mic pressure to free field corrections	Yes	
Uncertainties of Mic to F.F. corrections	Yes	
Source of Mic to F.F. corrections	Manufacturer	
Total expanded uncertainties within the requirements of IEC 61672-1:2002	Yes	
Specified or equivalent Calibrator	Specified	
Customer or Lab Calibrator	Lab Calibrator	
Calibrator adaptor type if applicable	NC-74-002	
Calibrator cal. date	05 April 2018	
Calibrator cert. number	UCRT18/1348	
Calibrator cal cert issued by	0653	
Calibrator SPL @ STP	93.98	dB Calibration reference sound pressure level
Calibrator frequency	1001.90	Hz Calibration check frequency
Reference level range	25 - 130	dB

Accessories used or corrected for during calibration - Extension Cable & Wind Shield WS-15
 Note - if a pre-amp extension cable is listed then it was used between the SLM and the pre-amp.

Environmental conditions during tests	Start	End	
Temperature	23.07	23.73	± 0.30 °C
Humidity	51.8	46.8	± 3.00 %RH
Ambient Pressure	101.35	101.35	± 0.03 kPa

Response to associated Calibrator at the environmental conditions above.			
Initial indicated level	94.0	dB	Adjusted indicated level
		94.0	dB
The uncertainty of the associated calibrator supplied with the sound level meter ±			0.10 dB

Self Generated Noise	This test is currently not performed by this Lab.		
Microphone installed (if requested by customer) = Less Than	N/A	dB	A Weighting
Uncertainty of the microphone installed self generated noise ±	N/A	dB	

Microphone replaced with electrical input device -	UR = Under Range indicated		
Weighting	A	C	Z
	12.1	16.1	21.9
	dB	dB	dB
	UR	UR	UR
Uncertainty of the electrical self generated noise ±	0.12		dB

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.

For the test of the frequency weightings as per paragraph 12. of IEC 61672-3:2006 the actual microphone free field response was used.

The acoustical frequency tests of a frequency weighting as per paragraph 11 of IEC 61672-3:2006 were carried out using an electrostatic actuator.

..... END

Calibrated by: A Patel R 1

Additional Comments
None

Location C



**CERTIFICATE
OF CALIBRATION**



0653

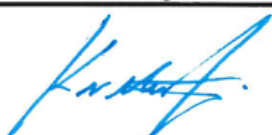
Date of Issue: 20 April 2018

Certificate Number: UCRT18/1440

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
Clonsaugh Business and Technology Park
Dublin 17
Ireland
D17 NX50

Order No.

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

Manufacturer	Instrument	Type	Serial No. / Version
Rion	Sound Level Meter	NL-52	00186669
Rion	Firmware		1.9
Rion	Pre Amplifier	NH-25	76819
Rion	Microphone	UC-59	12814
Rion	Calibrator	NC-74	34536109
	Calibrator adaptor type if applicable		NC-74-002

Performance Class 1

Test Procedure TP 2.SLM 61672-3 TPS-49
Procedures from IEC 61672-3:2006 were used to perform the periodic tests.

Type Approved to IEC 61672-1:2002 YES Approval Number 21.21 / 13.02
If YES above there is public evidence that the SLM has successfully completed the applicable pattern evaluation tests of IEC 61672-2:2003

Date Received 20 April 2018 ANV Job No. UKAS18/04261

Date Calibrated 20 April 2018

The sound level meter submitted for testing has successfully completed the class 1 periodic tests of IEC 61672-3:2006, for the environmental conditions under which the tests were performed. As public evidence was available, from an independent testing organisation responsible for approving the results of pattern evaluation tests performed in accordance with IEC 61672-2:2003, to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1:2002, the sound level meter submitted for testing conforms to the class 1 requirements of IEC 61672-1:2002.

Previous Certificate	Dated	Certificate No.	Laboratory
	Initial Calibration		

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

UCRT18/1440

UKAS Accredited Calibration Laboratory No. 0653

Page 2 of 2 Pages

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

SLM instruction manual title	Sound Level Meter	NL-42 / NL-52
SLM instruction manual ref / issue		11-03
SLM instruction manual source		Manufacturer
Internet download date if applicable		N/A
Case corrections available		Yes
Uncertainties of case corrections		Yes
Source of case data		Manufacturer
Wind screen corrections available		Yes
Uncertainties of wind screen corrections		Yes
Source of wind screen data		Manufacturer
Mic pressure to free field corrections		Yes
Uncertainties of Mic to F.F. corrections		Yes
Source of Mic to F.F. corrections		Manufacturer
Total expanded uncertainties within the requirements of IEC 61672-1:2002	Yes	
Specified or equivalent Calibrator		Specified
Customer or Lab Calibrator		Lab Calibrator
Calibrator adaptor type if applicable		NC-74-002
Calibrator cal. date		05 April 2018
Calibrator cert. number		UCRT18/1348
Calibrator cal cert issued by		0653
Calibrator SPL @ STP	93.98	dB Calibration reference sound pressure level
Calibrator frequency	1001.90	Hz Calibration check frequency
Reference level range	25 - 130	dB

Accessories used or corrected for during calibration - Extension Cable & Wind Shield WS-15

Note - if a pre-amp extension cable is listed then it was used between the SLM and the pre-amp.

Environmental conditions during tests	Start	End	
Temperature	23.35	23.84	± 0.30 °C
Humidity	38.4	35.6	± 3.00 %RH
Ambient Pressure	101.37	101.36	± 0.03 kPa

Response to associated Calibrator at the environmental conditions above.

Initial indicated level	94.0	dB	Adjusted indicated level	94.0	dB
The uncertainty of the associated calibrator supplied with the sound level meter ±				0.10	dB

Self Generated Noise This test is currently not performed by this Lab.

Microphone installed (if requested by customer) = Less Than	N/A	dB	A Weighting
Uncertainty of the microphone installed self generated noise ±	N/A	dB	

Microphone replaced with electrical input device -	UR = Under Range indicated			
Weighting	A	C	Z	
	11.6	15.5	21.4	dB UR
Uncertainty of the electrical self generated noise ±	0.12			dB

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.

For the test of the frequency weightings as per paragraph 12. of IEC 61672-3:2006 the actual microphone free field response was used.

The acoustical frequency tests of a frequency weighting as per paragraph 11 of IEC 61672-3:2006 were carried out using an electrostatic actuator.

END

Calibrated by: A Patel

R 1

Additional Comments

None

Location D




**CERTIFICATE
OF CALIBRATION**



Date of Issue: 20 April 2018

Certificate Number: UCRT18/1437

Issued by:
ANV Measurement Systems
Beaufort Court
17 Roebuck Way
Milton Keynes MK5 8HL
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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
 Clonshaugh Business and Technology Park
 Dublin 17
 Ireland
 D17 NX50

Order No. Sound Level Meter / Pre-amp / Microphone / Associated Calibrator
Description Sound Level Meter / Pre-amp / Microphone / Associated Calibrator
Identification *Manufacturer Instrument Type Serial No. / Version*
 Rion Sound Level Meter NL-52 00186671
 Rion Firmware 1.9
 Rion Pre Amplifier NH-25 76821
 Rion Microphone UC-59 12817
 Rion Calibrator NC-74 34536109
 Calibrator adaptor type if applicable NC-74-002

Performance Class 1
Test Procedure TP 2.SLM 61672-3 TPS-49
 Procedures from IEC 61672-3:2006 were used to perform the periodic tests.
Type Approved to IEC 61672-1:2002 YES Approval Number 21.21 / 13.02
 If YES above there is public evidence that the SLM has successfully completed the applicable pattern evaluation tests of IEC 61672-2:2003
Date Received 20 April 2018 ANV Job No. UKAS18/04261
Date Calibrated 20 April 2018

The sound level meter submitted for testing has successfully completed the class 1 periodic tests of IEC 61672-3:2006, for the environmental conditions under which the tests were performed. As public evidence was available, from an independent testing organisation responsible for approving the results of pattern evaluation tests performed in accordance with IEC 61672-2:2003, to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1:2002, the sound level meter submitted for testing conforms to the class 1 requirements of IEC 61672-1:2002.

Previous Certificate	<i>Dated</i>	<i>Certificate No.</i>	<i>Laboratory</i>
	Initial Calibration		

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CERTIFICATE OF CALIBRATION

Certificate Number
UCRT18/1437

UKAS Accredited Calibration Laboratory No. 0653

Page 2 of 2 Pages

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

SLM instruction manual title	Sound Level Meter	NL-42 / NL-52
SLM instruction manual ref / issue		11-03
SLM instruction manual source	Manufacturer	
Internet download date if applicable		N/A
Case corrections available		Yes
Uncertainties of case corrections		Yes
Source of case data	Manufacturer	
Wind screen corrections available		Yes
Uncertainties of wind screen corrections		Yes
Source of wind screen data	Manufacturer	
Mic pressure to free field corrections		Yes
Uncertainties of Mic to F.F. corrections		Yes
Source of Mic to F.F. corrections	Manufacturer	
Total expanded uncertainties within the requirements of IEC 61672-1:2002	Yes	
Specified or equivalent Calibrator	Specified	
Customer or Lab Calibrator	Lab Calibrator	
Calibrator adaptor type if applicable		NC-74-002
Calibrator cal. date		05 April 2018
Calibrator cert. number		UCRT18/1348
Calibrator cal cert issued by		0653
Calibrator SPL @ STP	93.98	dB Calibration reference sound pressure level
Calibrator frequency	1001.90	Hz Calibration check frequency
Reference level range	25 - 130	dB

Accessories used or corrected for during calibration - Extension Cable & Wind Shield WS-15

Note - if a pre-amp extension cable is listed then it was used between the SLM and the pre-amp.

Environmental conditions during tests	Start	End	
Temperature	23.57	23.78	± 0.30 °C
Humidity	47.7	45.5	± 3.00 %RH
Ambient Pressure	101.35	101.36	± 0.03 kPa

Response to associated Calibrator at the environmental conditions above.

Initial indicated level	94.1	dB	Adjusted indicated level	94.0	dB
The uncertainty of the associated calibrator supplied with the sound level meter ±			0.10		

Self Generated Noise This test is currently not performed by this Lab.

Microphone installed (if requested by customer) = Less Than	N/A	dB	A Weighting
Uncertainty of the microphone installed self generated noise ±	N/A	dB	

Microphone replaced with electrical input device - UR = Under Range indicated

Weighting	A	C	Z
	12.5	16.6	22.8
	dB	dB	dB
	UR	UR	UR

Uncertainty of the electrical self generated noise ± 0.12 dB

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.

For the test of the frequency weightings as per paragraph 12. of IEC 61672-3:2006 the actual microphone free field response was used.

The acoustical frequency tests of a frequency weighting as per paragraph 11 of IEC 61672-3:2006 were carried out using an electrostatic actuator.

END

Calibrated by: B. Bogdan

R 2

Additional Comments

None

Location E



**CERTIFICATE
OF CALIBRATION**



Date of Issue: 16 August 2018

Certificate Number: UCRT18/1839

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
J. Harriman

Customer AWN Consulting Limited
The Tecpro Building
IDA Business and Technology Park
Dublin 17
Ireland

Order No. 1869
Description Sound Level Meter / Pre-amp / Microphone / Associated Calibrator
Identification

Manufacturer	Instrument	Type	Serial No. / Version
Rion	Sound Level Meter	NL-52	00586944
Rion	Firmware		1.9
Rion	Pre Amplifier	NH-25	87063
Rion	Microphone	UC-59	13407
Rion	Calibrator	NC-74	34536109
	Calibrator adaptor type if applicable		NC-74-002

Performance Class 1
Test Procedure TP 2.SLM 61672-3 TPS-49
Procedures from IEC 61672-3:2006 were used to perform the periodic tests.
Type Approved to IEC 61672-1:2002 YES Approval Number 21.21 / 13.02
If YES above there is public evidence that the SLM has successfully completed the applicable pattern evaluation tests of IEC 61672-2:2003
Date Received 15 August 2018 ANV Job No. UKAS18/08525
Date Calibrated 16 August 2018

The sound level meter submitted for testing has successfully completed the class 1 periodic tests of IEC 61672-3:2006, for the environmental conditions under which the tests were performed. As public evidence was available, from an independent testing organisation responsible for approving the results of pattern evaluation tests performed in accordance with IEC 61672-2:2003, to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1:2002, the sound level meter submitted for testing conforms to the class 1 requirements of IEC 61672-1:2002.

Previous Certificate	Dated	Certificate No.	Laboratory
	Initial Calibration		

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CERTIFICATE OF CALIBRATION	Certificate Number
	UCRT18/1839
UKAS Accredited Calibration Laboratory No. 0653	Page 2 of 2 Pages

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

SLM instruction manual title	Sound Level Meter	NL-42 / NL-52
SLM instruction manual ref / issue		11-03
SLM instruction manual source	Manufacturer	
Internet download date if applicable		N/A
Case corrections available		Yes
Uncertainties of case corrections		Yes
Source of case data	Manufacturer	
Wind screen corrections available		Yes
Uncertainties of wind screen corrections		Yes
Source of wind screen data	Manufacturer	
Mic pressure to free field corrections		Yes
Uncertainties of Mic to F.F. corrections		Yes
Source of Mic to F.F. corrections	Manufacturer	
Total expanded uncertainties within the requirements of IEC 61672-1:2002		Yes
Specified or equivalent Calibrator		Specified
Customer or Lab Calibrator		Lab Calibrator
Calibrator adaptor type if applicable		NC-74-002
Calibrator cal. date		06 August 2018
Calibrator cert. number		UCRT18/1784
Calibrator cal cert issued by		0653
Calibrator SPL @ STP	93.99	dB Calibration reference sound pressure level
Calibrator frequency	1001.97	Hz Calibration check frequency
Reference level range	25 - 130	dB

Accessories used or corrected for during calibration - Extension Cable & Wind Shield WS-15
 Note - if a pre amp extension cable is listed then it was used between the SLM and the pre-amp.

Environmental conditions during tests	Start	End	
Temperature	21.53	22.10	± 0.30 °C
Humidity	60.5	62.5	± 3.00 %RH
Ambient Pressure	100.16	100.15	± 0.03 kPa

Response to associated Calibrator at the environmental conditions above.			
Initial indicated level	94.0	dB	Adjusted indicated level
			94.0
The uncertainty of the associated calibrator supplied with the sound level meter ±			0.10
			dB

Self Generated Noise	This test is currently not performed by this Lab.		
Microphone installed (if requested by customer) = Less Than	N/A	dB	A Weighting
Uncertainty of the microphone installed self generated noise ±	N/A	dB	

Microphone replaced with electrical input device -	UR = Under Range indicated					
Weighting	A	C		Z		
	11.3	dB	UR	15.3	dB	UR
				21.4	dB	UR
Uncertainty of the electrical self generated noise ±				0.12	dB	

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.

For the test of the frequency weightings as per paragraph 12. of IEC 61672-3:2006 the actual microphone free field response was used.

The acoustical frequency tests of a frequency weighting as per paragraph 11 of IEC 61672-3:2006 were carried out using an electrostatic actuator.

..... END

Calibrated by: A Patel R 1

Additional Comments

None