APPENDIX 12-1

Glossary of Accoustic Terminology

APPENDIX 12.1 - GLOSSARY OF ACOUSTIC TERMINOLOGY

A – Weighting	The "A" suffix denotes the fact that the sound levels have been "A-weighted" in order to account for the non-linear nature of human hearing.
Background Noise	The noise level rarely fallen below in any given location over any given time period, often classed according to day time, evening or night time periods. The $L_{A90,10min}$ is the parameter that is used to define the background noise level in this instance. L_{A90} is the sound level that is exceeded for 90% of the sample period. It is typically used as a descriptor for background noise.
dB (decibel)	The unit normally employed to measure the magnitude of sound. It is defined as 20 times the logarithm of the ratio between the RMS pressure of the sound field and the reference pressure of 20 micro-pascals (20 μPa).
dB(A)	An 'A-weighted decibel' – a measure of the overall noise level of sound across the audible frequency range (20 Hz – 20 kHz) with A-frequency weighting (i.e. A – Weighting) to compensate for the varying sensitivity of the human ear to sound at different frequencies.
Hub Height Wind Speed	The wind speed at the centre of the turbine rotor.
Hertz (Hz)	The unit of sound frequency in cycles per second.
$L_{Aeq,T}$	This is the equivalent continuous sound level. It is a type of average and is used to describe a fluctuating noise in terms of a single noise level over the sample period (T).The closer the L_{Aeq} value is to either the L_{AF10} or L_{AF90} value indicates the relative impact of the intermittent sources and their contribution. The relative spread between the values determines the impact of intermittent sources such as traffic on the background.
L_{AF90}	Refers to those A-weighted noise levels in the lower 90 percentile of the sampling interval; it is the level which is exceeded for 90% of the measurement period. It will therefore exclude the intermittent features of traffic and is used to estimate a background level. Measured using the "Fast" time weighting.
L_{den}	Refers to the L_{Aeq} noise levels over a whole day, but with a penalty of 10 dB(A) for night-time noise (23:00-07:00) and 5 dB(A) for evening noise (19:00-23:00), also known as the day evening night noise indicator.
Low Frequency Noise	LFN - noise which is dominated by frequency components towards the lower end of the frequency spectrum.
Noise	Sound that evokes a feeling of displeasure in the environment in which it is heard, and is therefore unwelcomed by the receiver
Noise Sensitive Location (NSL)	Any dwelling house, hotel or hostel, health building, educational establishment, place of worship or entertainment, or any other facility or other area of high amenity which for its proper enjoyment requires the absence of noise at nuisance levels.

octave band	A frequency interval, the upper limit of which is twice that of the lower limit. For example, the 1,000Hz octave band contains acoustical energy between 707Hz and 1,414Hz. The centre frequencies used for the designation of octave bands are defined in ISO and ANSI standards.
Pascal (Pa)	Pascal is a unit of pressure and so sound pressures are measured in Pascals.
Sound Power Level (LW)	The sound power level radiated by a source is defined as: $L_W = 10\log_{10}\left(\frac{W}{W_0}\right)$ dB where W is the acoustic power of the source in Watts (W) and W_0 is a reference sound power chosen in air to be 10^{-12} W.
Sound Pressure Level (Lp)	The sound pressure level at a point is defined: $L_P = 20\log_{10}\left(\frac{P}{P_0}\right)$ dB where P is the sound pressure and P_0 is a reference pressure for propagation of sound in air and has a value of $2\text{x}10^{-5}$Pa.
Tonal	Sounds which cover a range of only a few Hz which contains a clearly audible tone i.e. distinguishable, discrete or continuous noise (whine, hiss, screech, or hum etc.) are referred to as being ‘tonal’.
10 Minute Average Wind Speed (m/s)	The wind speed measured by an anemometer at a specified height above ground level, averaged over a 10-minute period.
Wind Shear	The increase of wind speed with height above ground.

APPENDIX 12-2

Copies of Calibration Certificates

CERTIFICATE OF CALIBRATION

ANV MEASUREMENT SYSTEMS

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

Approved Signatory

K. Mistry

Customer	AWN Consulting The Tecpro Building IDA Business and Technology Park Clonshaugh Dublin 17 D17 XD90 Ireland			
Order No.	2365			
Description	Sound Level Meter / Pre-amp / Microphone / Associated Calibrator			
Identification	*Manufacturer*	*Instrument*	*Type*	*Serial No. / Version*
	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 *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	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	*Dated*	*Certificate No.*	*Laboratory*
	04 November 2021	UCRT21/2362	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	Equivalent		
Customer or Lab Calibrator	Customers Calibrator		
Calibrator adaptor type if applicable	UC 0210		
Calibrator cal. date	21 March 2024		
Calibrator cert. number	UCRT24/1467		
Calibrator cal cert issued by Lab	0653		
Calibrator SPL @ STP	94.01	dB	Calibration reference sound pressure level
Calibrator frequency	999.82	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	23.16	22.76	±	0.30	°C
Humidity	56.4	55.9	±	3.00	%RH
Ambient Pressure	101.38	101.36	±	0.03	kPa

Indication at the Calibration Check Frequency

Initial indicated level	94.1	dB	Adjusted indicated level	94.0	dB
Uncertainty of calibrator used for Indication at the Calibration Check Frequency ±				0.10	dB

Self Generated Noise

Microphone installed -	Less Than	18.8	dB A Weighting

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

Weighting	A			C			Z		
	12.3	dB	UR	15.6	dB	UR	21.5	dB	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

.... END ....

Calibrated by: K. Zablocki R 1

CERTIFICATE OF CALIBRATION

MEASUREMENT SYSTEMS

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

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	*Manufacturer*	*Instrument*	*Type*	*Serial No. / Version*
	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

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 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

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-74-002		
Calibrator cal. date	30 May 2023		
Calibrator cert. number	UCRT23/1727		
Calibrator cal cert issued by Lab	0653		
Calibrator SPL @ STP	94.02	dB	Calibration reference sound pressure level
Calibrator frequency	1001.99	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	24.08	24.03	±	0.30	°C
Humidity	41.0	35.8	±	3.00	%RH
Ambient Pressure	100.41	100.43	±	0.03	kPa

Indication at the Calibration Check Frequency

Initial indicated level	94.0	dB	Adjusted indicated level	94.0	dB
Uncertainty of calibrator used for Indication at the Calibration Check Frequency ±				0.10	dB

Self Generated Noise

Microphone installed - Less Than | 19.2 | dB | A Weighting

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

Weighting	A			C			Z		
	14.5	dB	UR	16.5	dB	UR	22.0	dB	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.

Prior to calibration the instrument's main PCB was replaced and the meter was realigned.

.... END ....

Calibrated by: K. Zablocki

CERTIFICATE OF CALIBRATION

0653

Date of Issue: 20 February 2024

Certificate Number: UCRT24/1283

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

Approved Signatory

K. Mistry

Customer	AWN Consulting Limited The Tecpro Building IDA Business and Technology Park Clonshaugh Dublin D17 XD90 Ireland			
Order No.	2358			
Description	Sound Level Meter / Pre-amp / Microphone / Associated Calibrator			
Identification	*Manufacturer*	*Instrument*	*Type*	*Serial No. / Version*
	Rion	Sound Level Meter	NL-52	00998409
	Rion	Firmware		2.0
	Rion	Pre Amplifier	NH-25	98623
	Rion	Microphone	UC-59	15915
	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 19 February 2024 ANV Job No. UKAS24/02147

Date Calibrated 20 February 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*
	01 February 2022	UCRT22/1142	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	Equivalent			
Customer or Lab Calibrator	Customers Calibrator			
Calibrator adaptor type if applicable	UC 0210			
Calibrator cal. date	20 February 2024			
Calibrator cert. number	UCRT24/1274			
Calibrator cal cert issued by Lab	0653			
Calibrator SPL @ STP	93.95	dB	Calibration reference sound pressure level	
Calibrator frequency	999.97	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	22.58	22.72	±	0.30	°C
Humidity	48.3	53.9	±	3.00	%RH
Ambient Pressure	101.11	101.10	±	0.03	kPa

Indication at the Calibration Check Frequency					
Initial indicated level	94.2	dB	Adjusted indicated level	93.9	dB
Uncertainty of calibrator used for Indication at the Calibration Check Frequency ±				0.10	dB

Self Generated Noise

Microphone installed -	Less Than	18.1	dB	A Weighting

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

Weighting	A			C			Z		
	11.9	dB	UR	15.0	dB	UR	20.4	dB	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

.... END ....

Calibrated by: K. Zablocki

APPENDIX 12-3

Background Noise Survey

REPORT

Trinity Consultants awnconsulting

Background Noise Survey

Project Title: Taurbeg Wind Farm Extension of Operating Life

CLIENT	DOCUMENT REFERENCE	DATE
MKO	237501.0702NT03	18 June 2025

DOCUMENT CONTROL SHEET

Document Control Sheet	
Our Reference	237501.0702NT03
Original Issue Date	18 June 2025
Client:	MKO
Client Address:	Tuam Road, Galway, H91 VW84

Revision	Revision Date	Description

Details	Written by	Approved by
Signature		
Name	Miguel Cartuyvels	Dermot Blunnie
Title	Acoustic Consultant	Associate (Acoustics)
Date	18 June 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.

ENVIRONMENT
I.S. EN ISO 14001:2015
NSAI Certified

HEALTH & SAFETY
I.S. ISO 45001:2018
NSAI Certified

QUALITY
I.S. EN ISO 9001:2015
NSAI Certified

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1. INTRODUCTION

AWN Consulting, A trinity Consultants Company, completed a background noise survey at strategic locations surrounding the existing Taurbeg Wind Farm Co. Cork. The noise survey was undertaken as part of the environmental noise impact assessment for the proposed continued operation of the Wind Farm. This note has been prepared to provide details of the background noise levels derived at the relevant Noise Monitoring Locations (NMLs). A description of the assessment methodology is outlined.

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 Selection of Measurement Locations and Methodology

The intent of the survey was to measure background noise at representative locations for typical noise sensitive locations surrounding the development. As the wind farm was operational the survey locations were identified with consideration of the potential turbine noise contribution from the existing Taurbeg turbines 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 suitability of any location to be representative of, or a 'proxy' for, other locations, is determined through on-site observations and review of the measured background noise data.

The assessment methodology in the EIAR will be 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 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 wind farm. As mentioned in section 2.2.2 of the IOA GPG: '*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*.' There are a number of ways of achieving this, as described in section 5.2 of IOA GPG:

> *5.2.2 Where a new wind farm is proposed and a receptor is also within the area acoustically affected by an already operational wind farm, then noise from*

the existing wind farm must not be allowed to influence the background noise measurements for the proposed development.

5.2.3 In the presence of an existing wind farm, suitable background noise levels can be derived by one of the following methods:

1. switching off the existing wind farm during the background noise level survey (with associated significant cost implications);
2. accounting for the contribution of the existing wind farm in the measurement data e.g. directional filtering (only including background data when it is not influenced by the existing turbines e.g. upwind of the receptor, but mindful of other extraneous noise sources e.g. motorways) or subtracting a prediction of noise from the existing wind farm from the measured noise levels.
3. utilising an agreed proxy location removed from the area acoustically affected by the existing wind farm/s; or
4. utilising background noise level data as presented within the Environmental Statement/s for the original wind farm/s (the suitability of the background noise level data should be established).

Option 1 will have commercial cost implications and a negative impact on renewable energy production, on that basis it is the least preferred. In this instance, a combination of option 2 (directional filtering and subtracting a prediction of the noise from existing wind turbines, and option 3 selecting locations where that will provide directional wind data upwind of operational turbines.

The locations were selected to provide an opportunity to determine the background noise levels through directional filtering in so far as practicable upwind from all operational turbines. The option to subtraction of predicted turbine noise from the total measured noise levels was also considered. Additionally, survey data may be utilised to validate turbine noise levels, particularly in specific locations where turbine noise is expected to be contributing to downwind conditions. The methodology employed to determine background noise levels is this document.

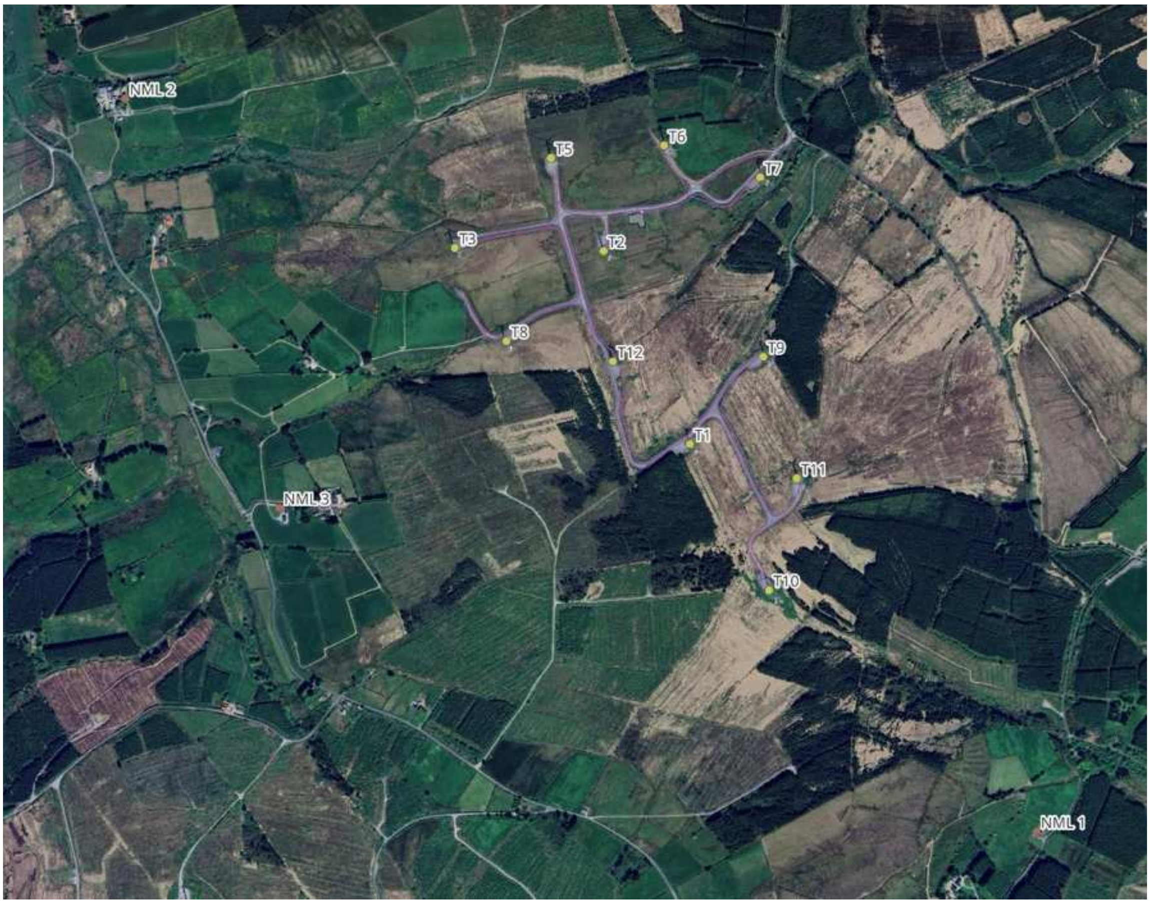
2.2 Measurement Locations

Table 2-1 Coordinates of Noise Monitoring Equipment

Location	Coordinates (ITM)	
	Easting	Northing
NML1 (H040)	523,693	610,287
NML2 (H034)	521,032	612,392
NML3 (H033)	521,477	611,213

Table 2-1 shows the locations of each of the monitoring locations in the context of the surrounding area.

Figure 1 Location of NMLs



Site visits by survey personnel were carried out during morning and afternoon periods; during these visits, primary noise sources contributing to noise build-up were noted. In respect of night-time periods, when noise due to traffic on local roads, agricultural activities and other sources tend to reduce, there was no indication of any significant local night-time sources of background noise at any location. No sources of vibration were noted at any of the survey locations.

In general, the significant noise sources in the area were noted to be local traffic movements, activity in and around the residences, wind generated noise from local foliage and other typical anthropogenic sources typically found in such rural settings.

At some locations noise from the operation of existing wind turbines was noted to be audible to varying degrees during site visits. It should be noted that the level of wind turbine noise is variable, it is dependent on the operational condition of the turbine, wind speed and direction, distance from the turbines, and the levels of background noise at the location.

As previously outlined in this document any noise from the existing wind turbines in the area should not form part of the background noise environment at noise sensitive locations. In contrast, the terms 'baseline noise level' or the 'existing noise levels' environment, incorporate current noise contributions from the operation of the existing turbines.

2.3 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	Start Date	End Date
NML1 (H040)	30 August 2024	20 November 2024
NML2 (H034)	30 August 2024	19 November 2024
NML3 (H033)	30 August 2024	20 November 2024

Before, after and during each survey period, the measurement instrument was checked and calibrated using a Brüel & Kjær type 4231 Sound Level Calibrator. 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. Wind data measurements commenced on 4 October 2024.

2.4 Noise Data

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

Table 2-3 Details of Noise Measurement Instrumentation

Location	Equipment Make and Model	Serial Number
NML1 (H040)	Rion NL-52	164426
NML2 (H034)	Rion NL-52	186668
NML3 (H033)	Rion NL-52	998409

Copies of the relevant calibration certificates are included in Appendix 10-2 of the EIAR Chapter.

2.5 Rainfall Data

Rainfall was monitored and logged using two Texas Instruments TR-525 data loggers that were installed at Locations NML1 and NML2 over the duration of the survey.

2.6 Wind Data

Average wind speed and direction data from each turbine in 10-minute intervals was measured at the turbine hubs and provided to AWN. Wind speed measurements were obtained from a Zephir ZX300 Lidar unit installed and operated by MKO. A copy of the Lidar installation report is included in Appenidx 10.7 of the EIAR Chapter.

These wind speeds were then corrected to the 'standardised' 10 m 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.

2.6.1 Wind Shear

The measured wind speeds are corrected to the 'standardised' 10 m 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.

Wind speed measurements were made at 67 m hub height. The measured hub height wind speeds were then corrected to standardised 10 metre height wind speed.

The Calculated hub height wind speeds have been standardised to 10 m height using the following equation:

Roughness Length Shear Profile: $U1 = U2 \times [(\ln(H1/z))/ (\ln(H2/z))]$

Where:

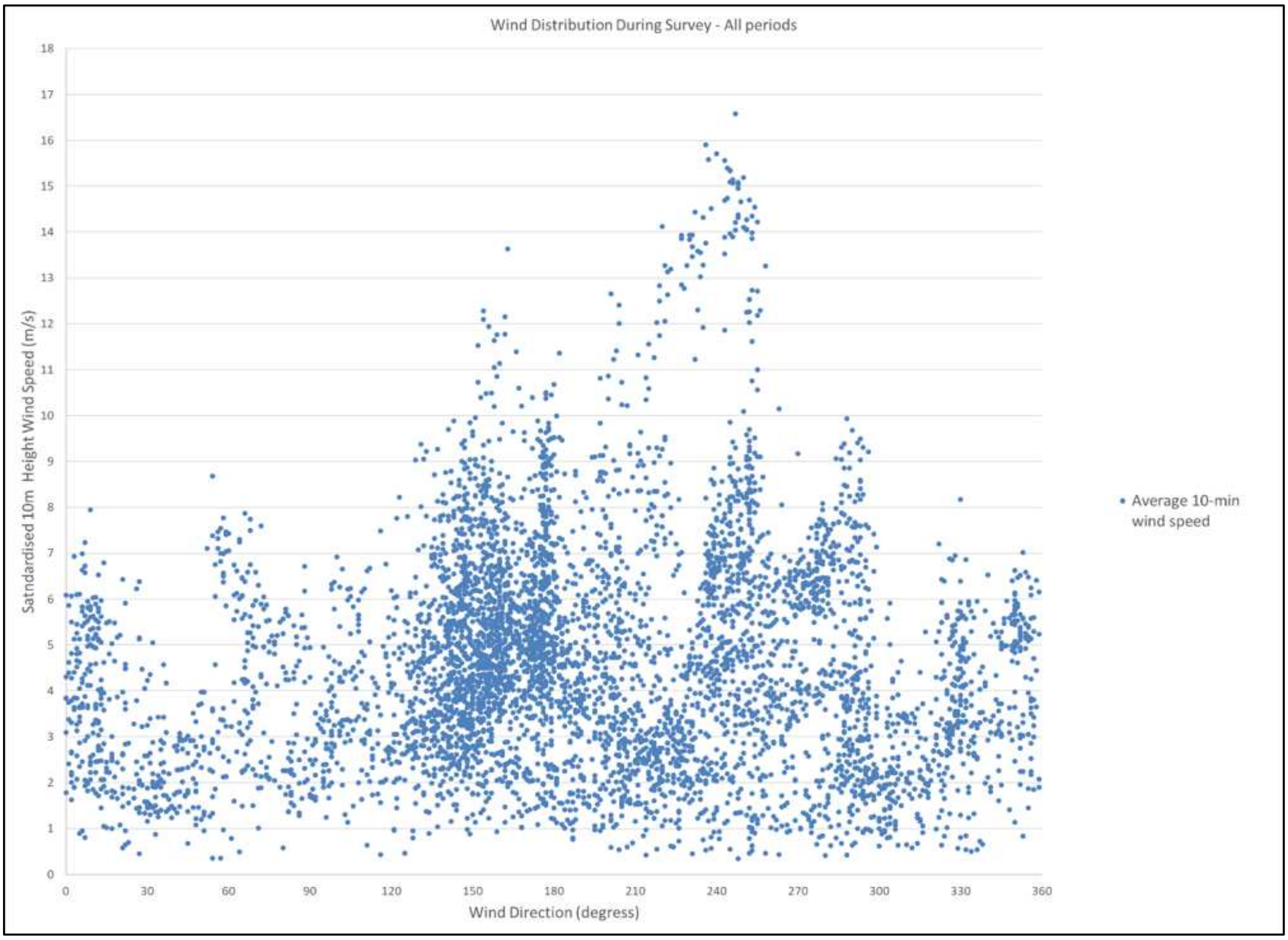
H_1	The height of the wind speed to be calculated (10m)
H_2	The height of the measured or calculated HH wind speed.
U_1	The wind speed to be calculated.
U_2	The measured or calculated HH wind speed.
Z	The roughness length.

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 reference unless otherwise stated.

Figure 2 presents the distributions of wind speed and wind direction standardised to 10 m height over the survey period.

Figure 2 Distributions of Wind Speeds and Directions Over the Survey Period



3. RESULTS

3.1 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 background noise levels are required to be derived for specific wind direction sectors not identified as part of this assessment.

3.1.1 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 3-1.

Table 3-1 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 3 and analysed with respect to the methods outlined in the IOA GPG.

3.1.2 Noise from Existing Turbines

As discussed above in Section 2.1, to derive background noise levels in the presence of exiting turbine noise, the methodology from the IOA GPG has been applied to the assessment. The following table summarises important information relevant to this aspect of the methodology.

Table 3-2 Location-specific methodology details

Location	Nearest turbine to measurement location	Analysis details
NML1 (H040)	T10 – 1,040 m	Directional analysis applied - background noise represented by upwind sectors South and Southwest.
NML2 (H034)	T03 – 1,035 m	Directional analysis applied - background noise represented by upwind sectors North and Northwest.
NML3 (H033)	T08 – 810 m	Estimate of background noise levels obtained by filtering for upwind sectors West Northwest and Southwest and subtracting predicted turbine noise levels as there was some contribution in the filtered wind direction from operational turbines.

3.1.3 Atypical Noise Data

The data sets have been filtered to remove issues such as periods affected by rainfall, 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, agricultural activity, boiler flues, operation of gardening equipment etc. This approach is in line with the guidance contained in the IOA GPG.

3.2 Derived Background Noise Levels

Appendix B presents the preliminary regression analysis for daytime and night-time periods from each NML from which the background noise levels have been derived. The derived background noise levels dB $L_{A90,10min}$ for daytime and nighttime are presented in Table 3-3 and Table 3-4 respectively. These background noise levels will be used to determine the appropriate turbine noise limits in accordance with the adopted turbine noise criteria and will be set out in the Noise and Vibration Chapter for the Proposed Project.

Table 3-3 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 67 m Hub Height							
		3	4	5	6	7	8	9	10
NML 1	Day	22.6	25.3	28.0	30.8	33.6	36.4	39.1	41.7
NML 2	Day	26.5	28.3	30.2	32.1	34.0	35.9	37.8	39.6
NML 3	Day	31.1	33.8	34.8	35.2	37.5	40.1	42.3	44.3

Table 3-4 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 67 m Hub Height							
		3	4	5	6	7	8	9	10
NML 1	Night	19.9	22.7	25.9	29.4	32.8	36.0	38.7	40.7
NML 2	Night	26.0	27.2	28.6	30.4	32.8	36.0	40.1	-
NML 3	Night	30.5	33.4	34.5	34.6	36.5	38.8	-	-

APPENDIX A
GLOSSARY OF 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

Figure 3 NML 1 Installation Photo

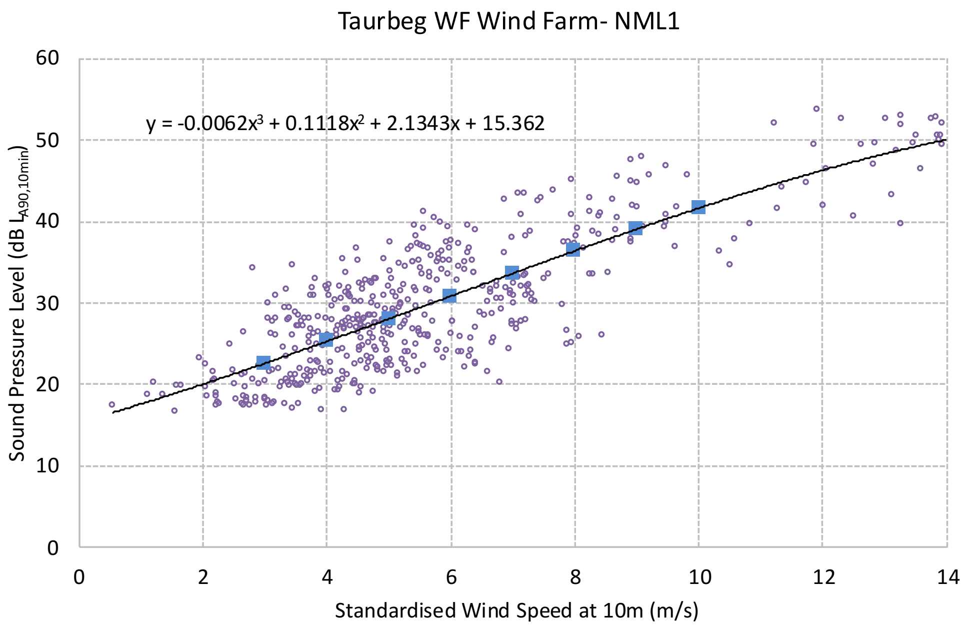
Figure 4 NML 2 Installation Photo

Figure 5 NML 3 Installation Photo

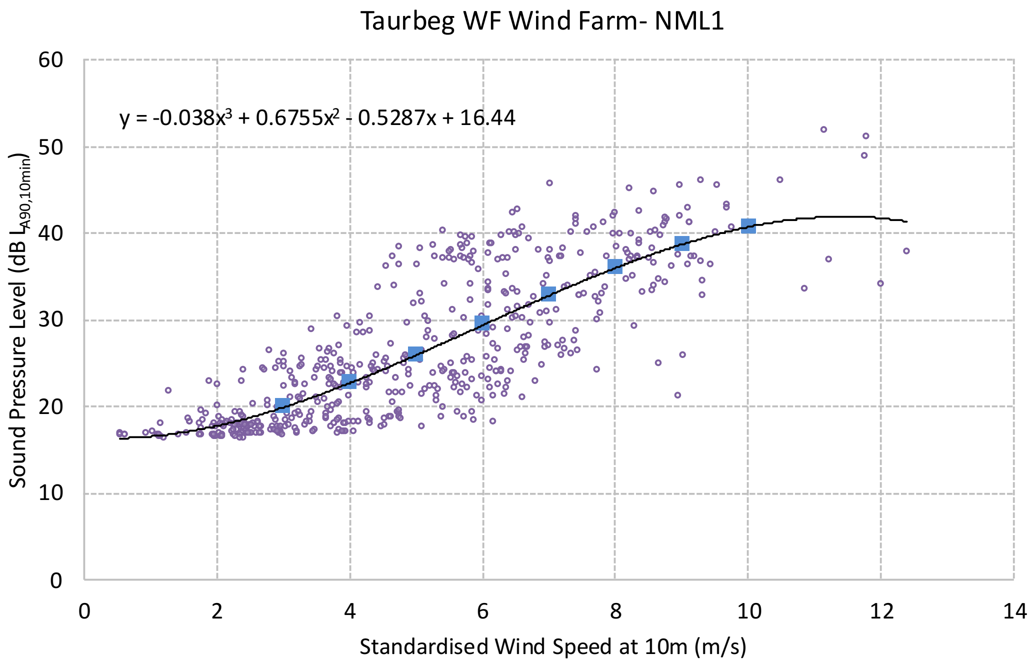
APPENDIX C
REGRESSION ANALYSIS ON DATA SETS

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

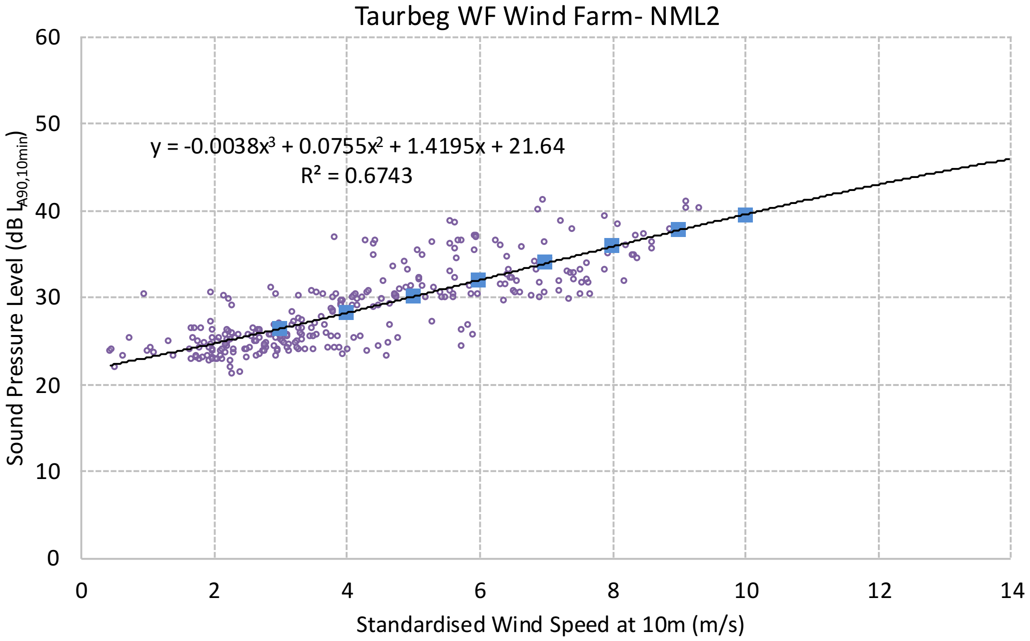
NML 1 Daytime - Upwind South and Southwest



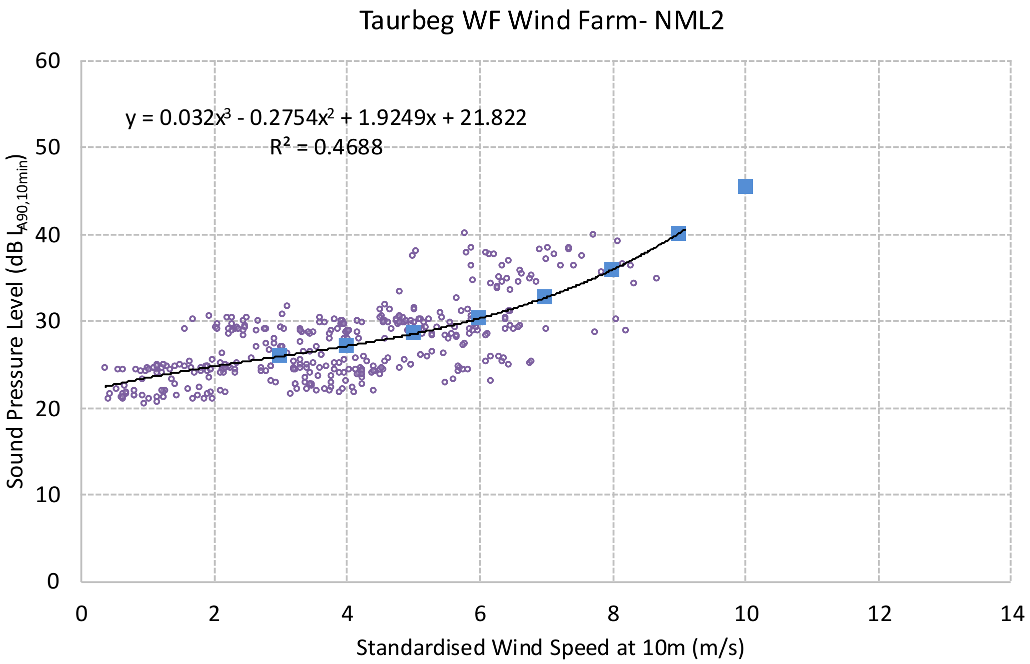
NML 1 Night - Upwind South and Southwest



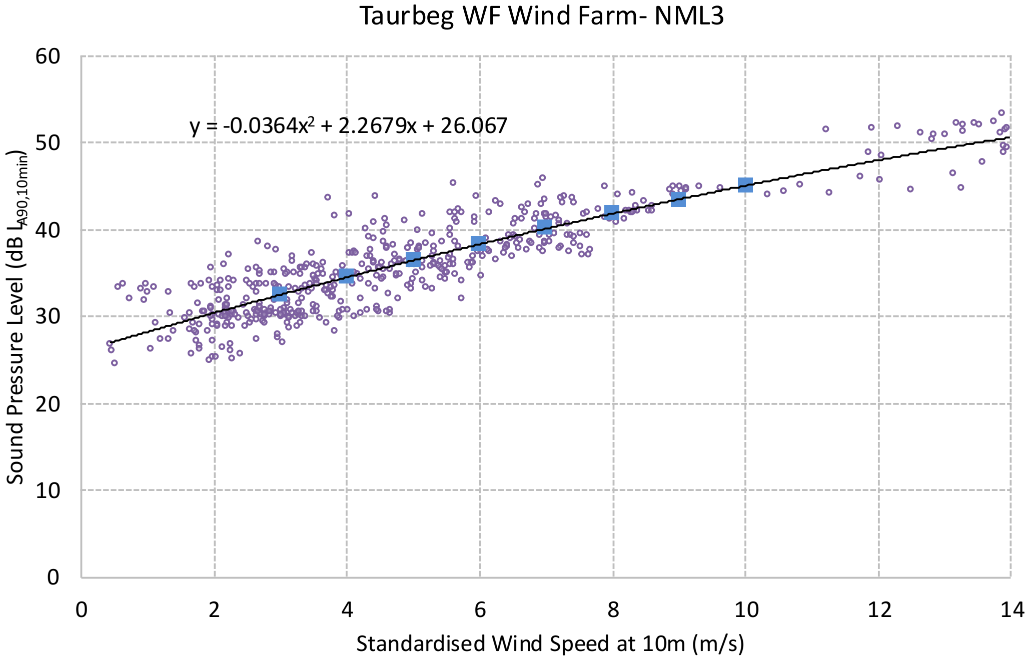
NML 2 Day - Upwind West and Northwest



NML 2 Night - Upwind West, Northwest, North and Northeast

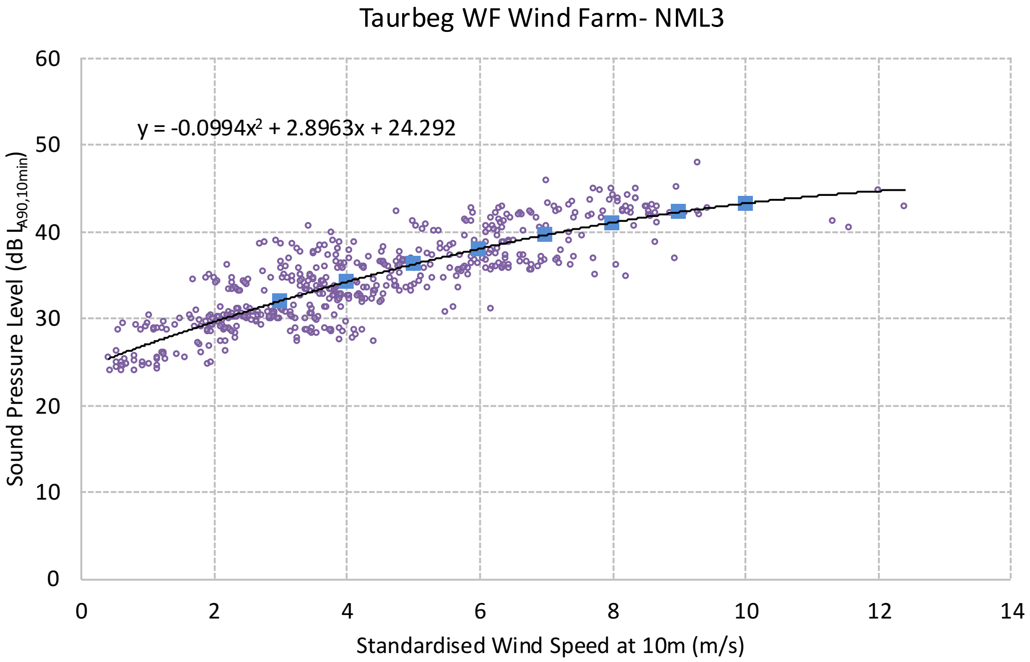


NML 3 Day – Upwind West, Northwest and Southwest



Predicted turbine noise level has been subtracted from the regression analysis data sets for NML3 to determine the background noise levels.

NML 3 Night – Upwind West, Northwest and Southwest



Predicted turbine noise level has been subtracted from the regression analysis data sets for NML3 to determine the background noise levels.

APPENDIX 12-4

Noise Model Parameters

APPENDIX 12.4 – NOISE MODEL PARAMETERS

Prediction calculations for turbine noise have been conducted in accordance with ISO 9613: *Acoustics – Attenuation of sound during propagation outdoors, Part 2: Engineering method for the prediction of sound pressure levels outdoors*, 2014. Guidance in terms of the calculation settings has been obtained from the *Institute of Acoustics (IOA) Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise* (2013) (IOA GPG) and its associated supplementary guidance notes. The following are the main aspects that have been considered in terms of the noise predictions presented in this instance.

Ground Effect:

Ground effect is the result of sound reflected by the ground interfering with the sound propagating directly from source to receiver. The prediction of ground effects is inherently complex and depend on source height receiver height propagation height between the source and receiver and the ground conditions.

The ground conditions are described according to a variable defined as G, which varies between 0.0 for hard ground (including paving, ice concrete) and 1.0 for soft ground (includes ground covered by grass trees or other vegetation).

Noise predictions have been carried out using a source height corresponding to the hub height of the proposed turbines, a receiver height of 4m and a ground effect factor of G=0.5.

Geometrical Divergence

This term relates to the spherical spreading in the free-field from a point sound source resulting in an attenuation depending on distance according to the following equation:

$$A_{geo} = 10\log(d) - 11 \text{ dB}$$

where d = distance from the source

A wind turbine may be considered as a point source beyond a distance corresponding to one rotor diameter.

Atmospheric Adsorption

Sound propagation through the atmosphere is attenuated by the conversion of the sound energy into heat. This attenuation is dependent on the temperature and relative humidity of the air through which the sound is travelling and is frequency dependent with increasing attenuation towards higher frequencies.

In accordance with the guidance set out in the IOA GPG for calculations, a temperature of 10°C and a relative humidity of 70% have been used, which give relativity low levels of atmosphere attenuation and corresponding worst case noise predictions.

Topographic Screening

In the IOA GPG, section 4.3.11 the following is stated: "*Topographic screening effects of the terrain (ISO 9613-2, Equation 12) should be limited to a reduction of no more than 2 dB, and then only if there is no direct line of sight between the highest point on the turbine rotor and the receiver location.*" The modelling software takes account of these limitations on the degree of screening from terrain. The "valley correction" from section 4.3.9 of the IOA GPG is also applied to noise prediction calculations (where relevant).

Table A.12.4.1 presents the turbine sound power noise emission values used the assessment of the Knockacummer and Glentane / Glentanemacelligot Wind Farm (Glentane Phase 1 & Phase 2).

Wind Speed (m/s)	Octave Band (Hz) Sound Power Levels (dB re 10^{-12}W)								dB(A)
	63	125	250	500	1k	2k	4k	8k	
3	78.7	82.8	87.2	87.6	86.1	85.0	81.0	73.4	93.5
4	82.7	86.8	91.2	91.6	90.1	89.0	85.0	77.4	97.5
5	86.2	90.3	94.7	95.1	93.6	92.5	88.5	80.9	101
6	89.2	93.3	97.7	98.1	96.6	95.5	91.5	83.9	104
7	90.2	94.3	98.7	99.1	97.6	96.5	92.5	84.9	105
≥8	90.7	94.8	99.2	99.6	98.1	97.0	93.0	85.4	105.5

Table 12.4.1 Sound Power Levels used for 80 m HH

Table A.12.4.2 presents the coordinates for all the Noise Sensitive Locations (receptors) included in the noise prediction modelling.

NSL Ref.	Occupancy	ITM X	ITM Y	NSL Ref.	Occupancy	ITM X	ITM Y
H01	occupied	521921	613930	H36	occupied	523522	609605
H02	occupied	520292	612927	H37	occupied	524867	610625
H03	occupied	520329	612353	H38	occupied	522733	609933
H04	occupied	521612	610670	H39	occupied	522930	609969
H05	occupied	520664	612443	H40	occupied	523666	610274
H06	unoccupied/derelict	524514	611392	H41	occupied	523525	609612
H07	occupied	523574	609674	H42	occupied	523544	609239
H08	occupied	522811	609978	H43	occupied	521338	613400
H09	occupied	521657	610628	H44	occupied	521723	613818
H10	occupied	521589	611206	H45	occupied	521677	613893
H11	occupied	522721	613510	H46	occupied	520963	612165
H12	occupied	521667	613898	H47	occupied	520570	612874
H13	occupied	520362	612922	H48	occupied	520504	612865
H14	occupied	520400	612681	H49	occupied	520564	612916
H15	occupied	520579	612869	H50	occupied	520535	612948
H16	occupied	521728	610732	H51	occupied	520433	613159
H17	occupied	521662	610649	H52	occupied	520300	613080
H18	occupied	521579	610688	H53	occupied	523725	613665
H19	occupied	521139	611915	H54	occupied	521906	613917
H20	occupied	521952	613901	H55	occupied	523493	609727
H21	occupied	524728	610762	H56	occupied	520763	610848
H22	occupied	524426	611318	H57	occupied	520961	611303
H23	occupied	524872	611972	H58	occupied	523510	609518
H24	occupied	523530	609795	H59	occupied	523433	609829
H25	occupied	523436	610141	H60	occupied	523529	609905
H26	occupied	523344	609838	H61	occupied	521869	610642
H27	occupied	522993	609949	H62	occupied	522181	610345
H28	occupied	522359	610340	H63	occupied	523544	609322
H29	occupied	522065	609261	H64	occupied	523280	609884
H30	occupied	523477	609131	H65	occupied	520449	612988
H31	occupied	523193	609009	H66	occupied	520956	613796
H32	unoccupied/ derelict	521490	609587	H67	occupied	520773	613807
H33	occupied	521492	611181	H68	unoccupied	521816	609981
H34	occupied	521032	612356	H69	unoccupied/ derelict	523511	609640

NSL Ref.	Occupancy	ITM X	ITM Y	NSL Ref.	Occupancy	ITM X	ITM Y
H35	occupied	523608	609301	H70	unoccupied/ derelict	523911	610638

Table 12.4.2 List of Receptors

Table A.12.4.3 presents the coordinates of the Knockacummer and Glentane / Glentanemacelligot Wind Farm (Glentane Phase 1 & Phase 2) turbine used in the noise prediction modelling.

Turbine Ref	Development	ITM X	ITM Y
K-T01	Knockacummer	523516	612759
K-T02	Knockacummer	523395	613023
K-T03	Knockacummer	523687	613216
K-T04	Knockacummer	523911	612871
K-T05	Knockacummer	524119	613180
K-T06	Knockacummer	524271	612778
K-T07	Knockacummer	524610	612961
K-T08	Knockacummer	524476	613320
K-T09	Knockacummer	524832	613216
K-T10	Knockacummer	525230	613219
K-T11	Knockacummer	525604	613295
K-T12	Knockacummer	525929	613511
K-T13	Knockacummer	524324	613663
K-T14	Knockacummer	524678	613657
K-T15	Knockacummer	525099	613584
K-T16	Knockacummer	525480	613665
K-T17	Knockacummer	525929	613862
K-T18	Knockacummer	526199	614176
K-T19	Knockacummer	525823	614325
K-T20	Knockacummer	525559	614044
K-T21	Knockacummer	525180	613960
K-T22	Knockacummer	524276	614092
K-T23	Knockacummer	525371	614429
K-T24	Knockacummer	525071	612888
K-T25	Knockacummer	524776	612596
K-T26	Knockacummer	524450	612433
K-T27	Knockacummer	523990	612054
K-T28	Knockacummer	524346	612052
K-T29	Knockacummer	524332	611659
GT-T01	Glentane/ Glentanemacelligot	519191	610133
GT-T02	Glentane/ Glentanemacelligot	519563	609904
GT-T03	Glentane/ Glentanemacelligot	519946	609815
GT-T04	Glentane/ Glentanemacelligot	520315	609969
GT-T05	Glentane/ Glentanemacelligot	520311	609614
GT-T06	Glentane/ Glentanemacelligot	520687	609607
GT-T07	Glentane/ Glentanemacelligot	520776	609931
GT-T08	Glentane/ Glentanemacelligot	521223	610098
GT-T09	Glentane/ Glentanemacelligot	521131	609040
GT-T10	Glentane/ Glentanemacelligot	520653	608849
GT-T11	Glentane/ Glentanemacelligot	520769	609241

APPENDIX 12-5

Noise Contour Maps

REPORT

Trinity Consultants

awnconsulting

Noise Contour Maps

Project Title: Taurbeg Wind Farm

CLIENT	DOCUMENT REFERENCE	DATE
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AWN Consulting Ltd, The Tecpro Building, IDA Business & Technology Park, Clonshaugh, Dublin 17, D17 XD90

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Title	Acoustic Consultant	Associate (Acoustics)
Date	22 April 2025	

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APPENDIX A. NOISE CONTOUR MAPS

Figure 1 Noise Contour Map of proposed Development only (Higher Range of Noise Emissions)

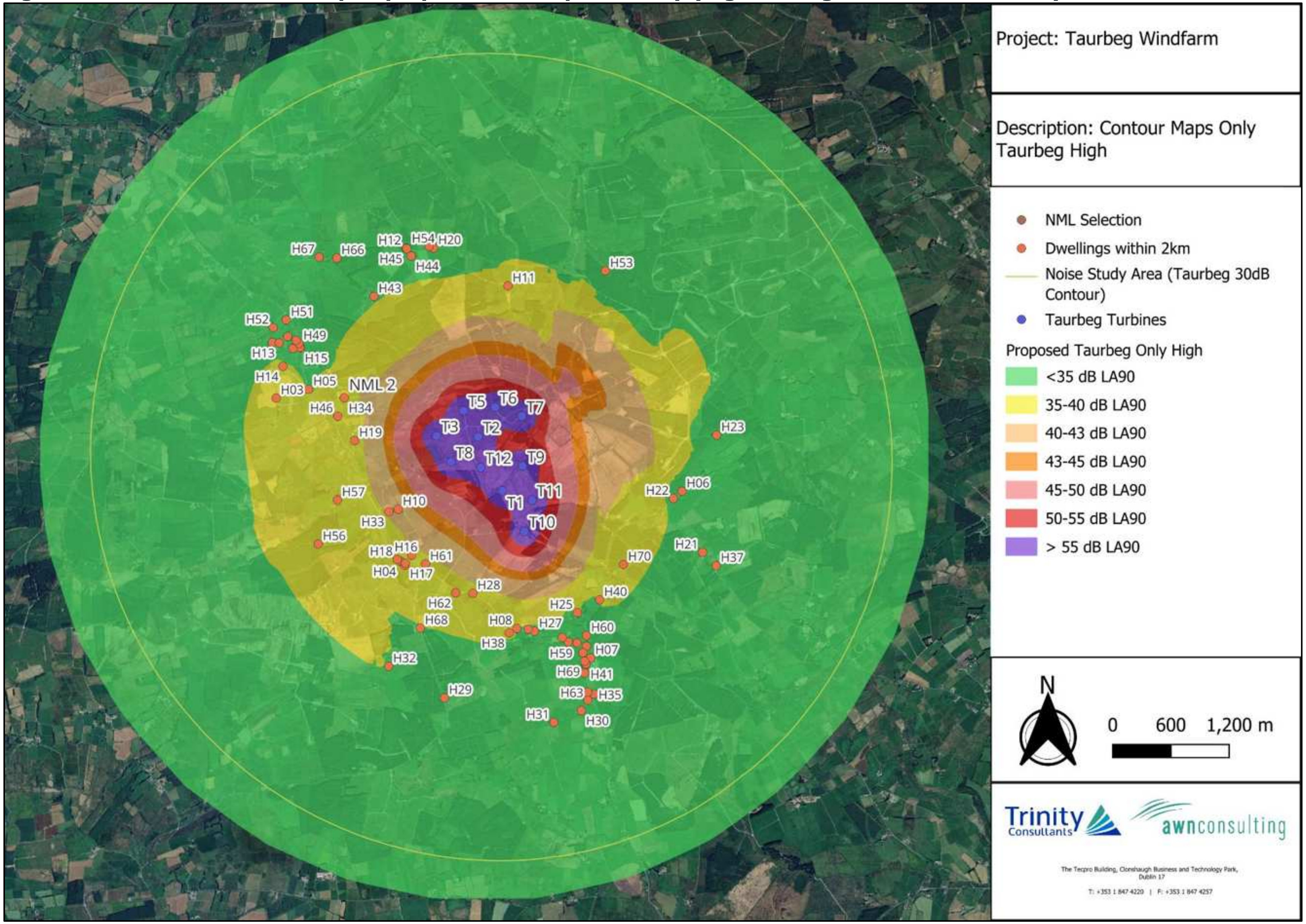


Figure 2 Noise Contour Map of proposed Cumulative Development (Higher Range of Noise Emissions)

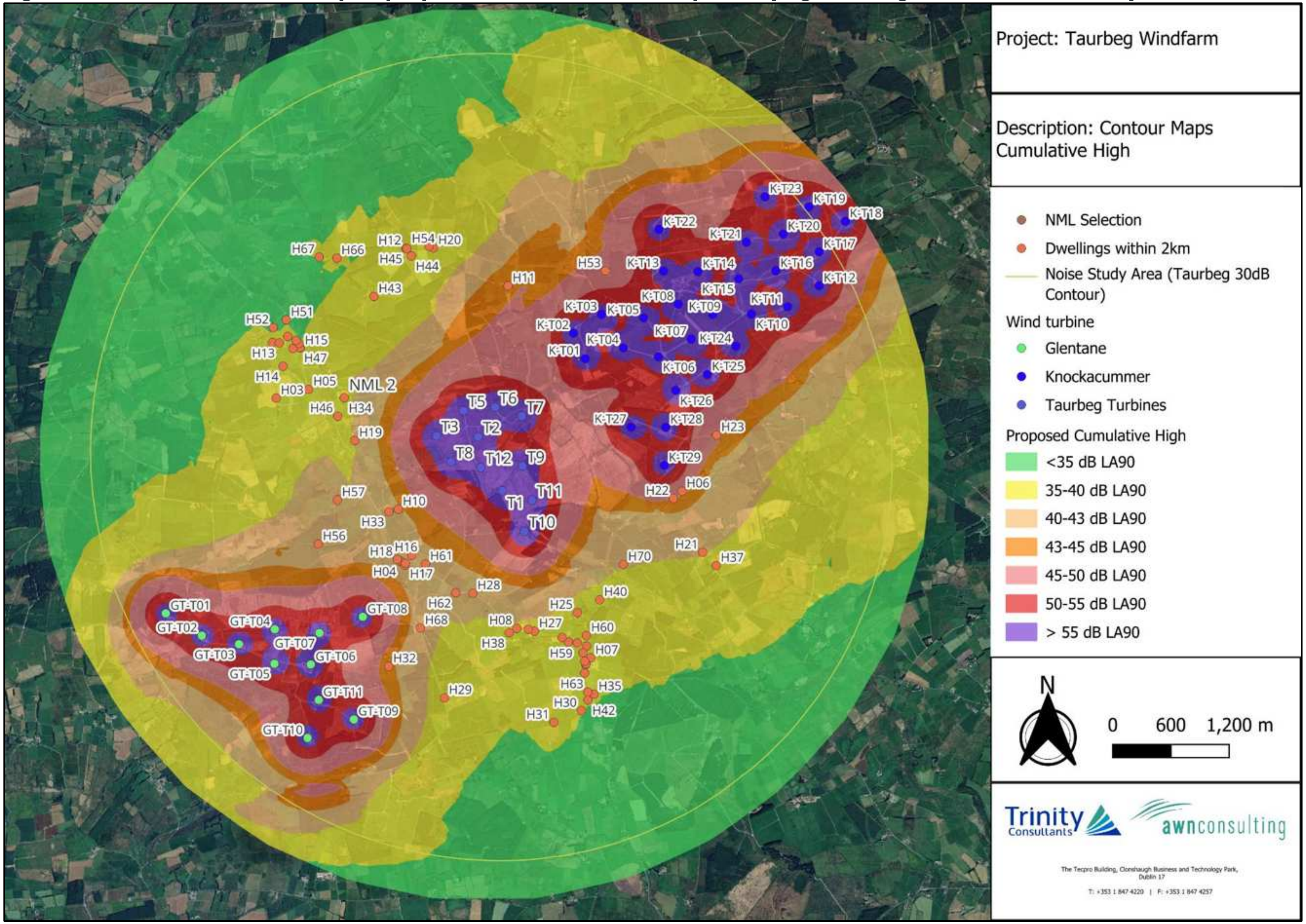


**Figure 3	Noise Contour Map of proposed Development only (Lower Range of Noise Emissions)**

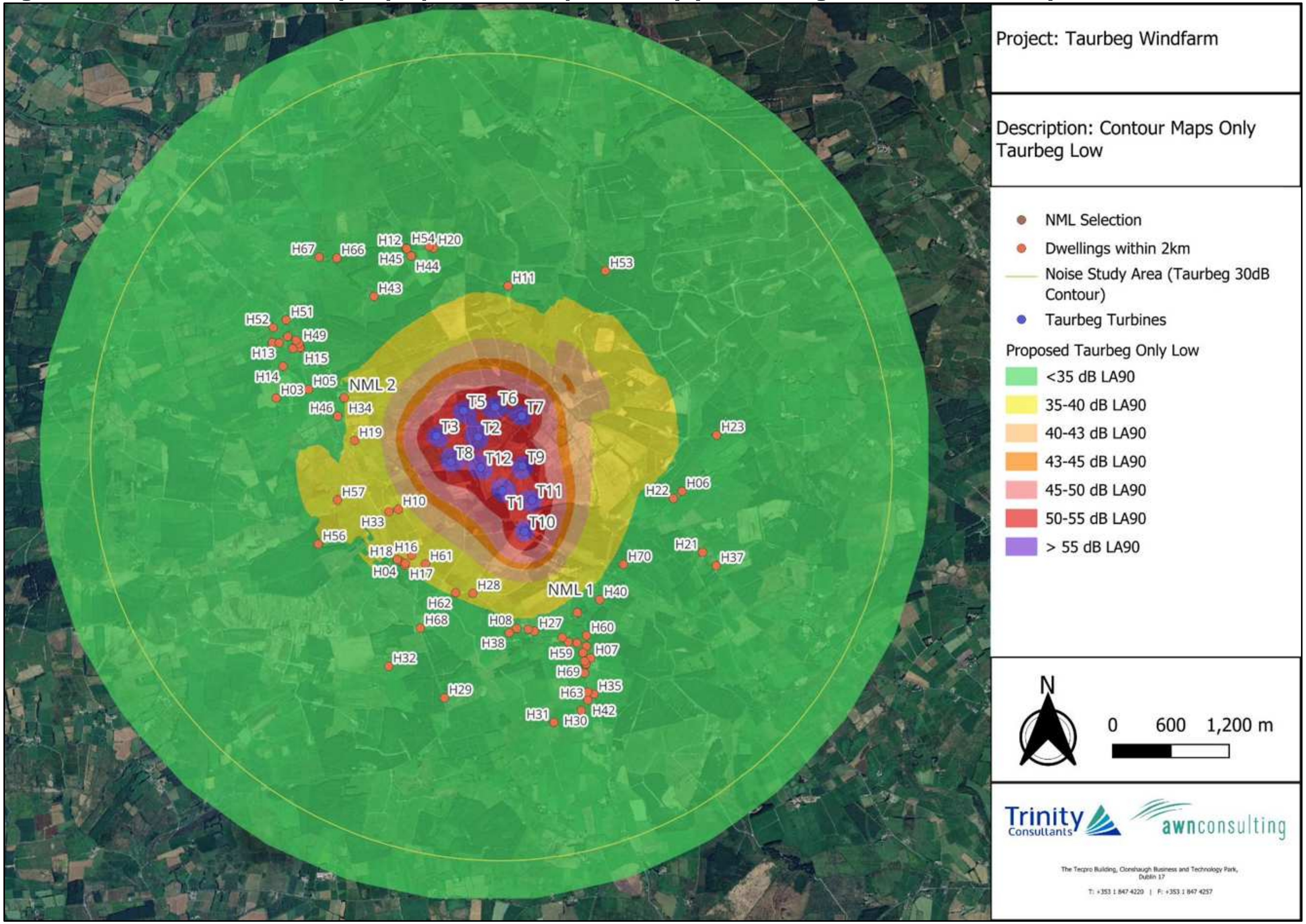
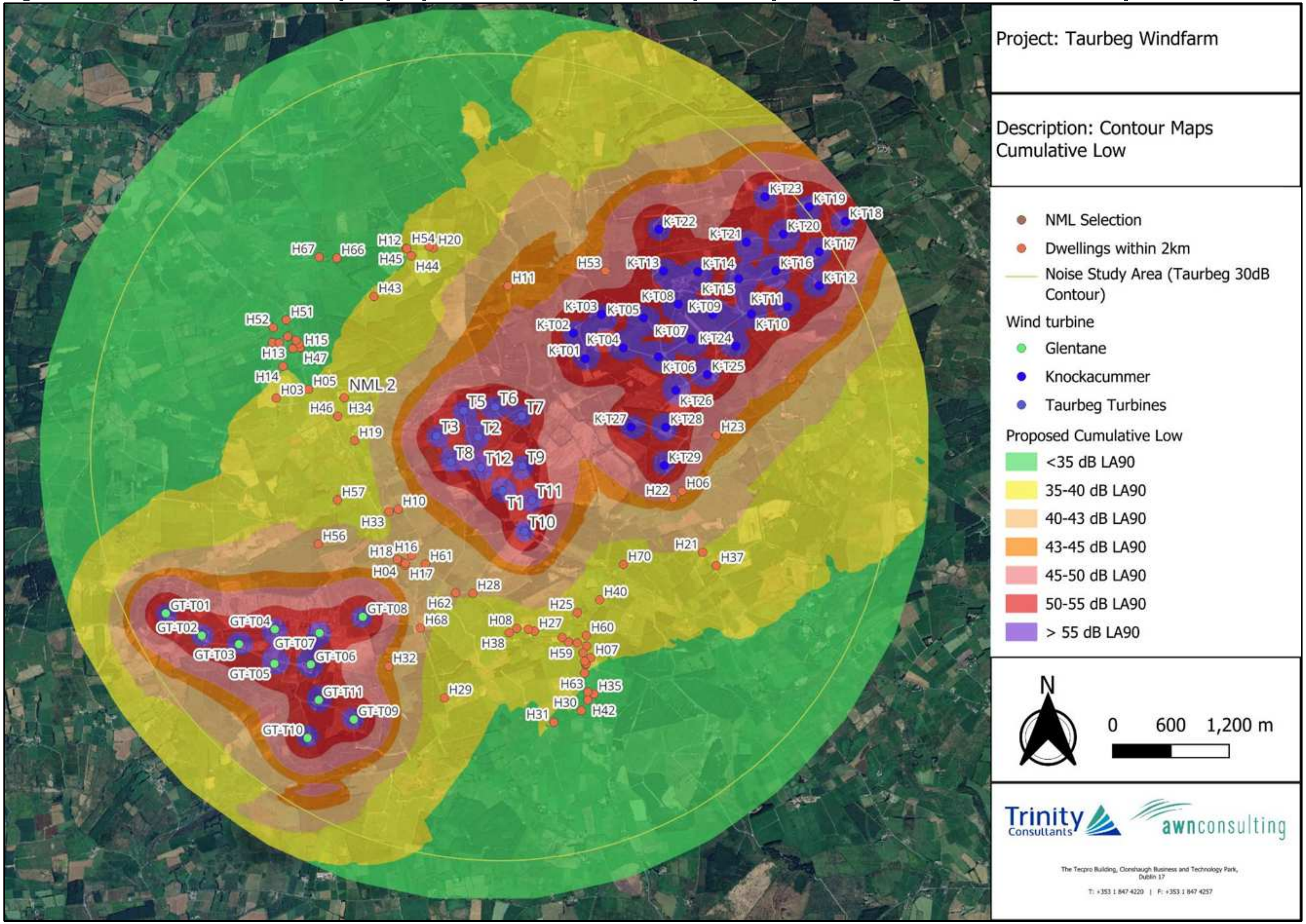


Figure 4 **Noise Contour Map of proposed Cumulative Development (Lower Range of Noise Emissions)**



APPENDIX 12-6

Tables of Results

REPORT

Tabulated Turbine Noise Prediction Results

Project Title: Taurbeg Wind Farm

CLIENT	DOCUMENT REFERENCE	DATE
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AWN Consulting Ltd, The Tecpro Building, IDA Business & Technology Park, Clonshaugh, Dublin 17, D17 XD90

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Title	Acoustic Consultant	Associate (Acoustics)
Date	18 June 2025	

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HEALTH & SAFETY
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QUALITY
I.S. EN ISO 9001:2015
NSAI Certified

LIST OF TABLES

1. TABULATED NOISE PREDICTION RESULTS FOR HIGHER NOISE EMISSION SCENARIO (OMNI-DIRECTIONAL)

Table 1-1 Predicted Turbine Noise Levels Cumulative (higher noise emission scenario)

Location Ref	Predicted Noise Level dB L_{A90} at Standardised Wind Speed at 10m				
	6m/s	7m/s	8m/s	9m/s	10m/s
H01	34.4	35.6	36.1	36.7	37.1
H02	31.6	33	33.7	35	35.9
H03	33.3	34.7	35.4	36.8	37.7
H04	39	40.1	40.6	41.3	41.8
H05	32.6	33.9	34.5	35.7	36.5
H06	43.9	44.9	45.4	45.5	45.6
H07	33.4	34.5	35.1	35.8	36.4
H08	35.9	37	37.6	38.3	38.8
H09	39	40.1	40.7	41.4	41.8
H10	38.3	39.5	40.3	41.7	42.6
H11	42.4	43.4	43.9	44.2	44.4
H12	33.5	34.6	35.2	35.8	36.3
H13	31.4	32.8	33.5	34.7	35.6
H14	32.4	33.8	34.5	35.9	36.8
H15	31.4	32.7	33.3	34.4	35.2
H16	38.4	39.6	40.2	41.1	41.8
H17	38.9	40	40.6	41.3	41.8
H18	38.9	40	40.6	41.3	41.8
H19	36	37.2	37.9	39.3	40.2
H20	34.6	35.7	36.3	36.9	37.3
H21	37.9	38.9	39.5	39.8	40.1
H22	43.2	44.3	44.8	44.9	45
H23	43.9	44.9	45.4	45.4	45.5
H24	33.8	35	35.6	36.3	36.9
H25	34.5	35.7	36.3	37.1	37.7
H26	34.8	35.9	36.5	37.3	37.8
H27	35	36	36.6	37.2	37.6
H28	37.9	39	39.7	40.6	41.3
H29	36.4	37.5	38	38.4	38.7
H30	32.7	33.8	34.4	34.9	35.2
H31	33.3	34.4	34.9	35.4	35.7
H32	42	43	43.5	43.7	43.9
H33	37.9	39.1	39.8	41.1	42
H34	34.8	36	36.7	38.1	38.9
H35	32.4	33.5	34.1	34.7	35.2
H36	33.4	34.6	35.2	35.8	36.4
H37	36.7	37.8	38.3	38.7	39
H38	36.3	37.4	38	38.7	39.3
H39	35.2	36.3	36.9	37.5	37.9
H40	35	36.2	36.8	37.6	38.2

Location Ref	Predicted Noise Level dB L_{A90} at Standardised Wind Speed at 10m				
	6m/s	7m/s	8m/s	9m/s	10m/s
H41	33.4	34.6	35.2	35.9	36.4
H42	32.7	33.8	34.4	34.9	35.3
H43	33.3	34.5	35.2	36.2	36.9
H44	33.5	34.6	35.2	36	36.5
H45	33.5	34.6	35.2	35.9	36.4
H46	34.3	35.6	36.3	37.7	38.6
H47	31.4	32.6	33.3	34.4	35.1
H48	31.5	32.8	33.5	34.7	35.5
H49	31.3	32.6	33.2	34.3	35
H50	31.2	32.4	33.1	34.2	34.9
H51	30.9	32.2	32.9	34.1	34.9
H52	30.9	32.2	32.9	34.1	34.9
H53	45.4	46.4	46.9	47	47
H54	34.4	35.5	36.1	36.7	37.1
H55	33.8	35	35.6	36.3	36.8
H56	39.2	40.3	40.9	41.5	41.9
H57	37.1	38.4	39	40.2	41
H58	33.1	34.3	34.9	35.5	36
H59	34.2	35.4	36	36.8	37.3
H60	34.1	35.3	35.9	36.7	37.3
H61	39.3	40.5	41.1	41.8	42.4
H62	38.4	39.5	40.1	40.9	41.4
H63	32.8	34	34.6	35.1	35.6
H64	35.2	36.4	37	37.6	38.2
H65	31.4	32.7	33.4	34.6	35.4
H66	31.6	32.9	33.5	34.5	35.2
H67	31.5	32.7	33.4	34.4	35.1
H68	39.5	40.5	41.1	41.4	41.6
H69	33.5	34.7	35.3	36	36.5
H70	37.3	38.4	39	39.8	40.3

Table 1-2 Predicted Turbine Noise Taurbeg Turbines Only (higher noise emission scenario)

Location Ref	Predicted Noise Level dB L_{A90} at Standardised Wind Speed at 10m				
	6m/s	7m/s	8m/s	9m/s	10m/s
H01	26.6	28.3	29.2	31.4	32.8
H02	28.2	30.0	30.9	33.2	34.4
H03	30.3	32.0	32.9	35.1	36.4
H04	32.0	33.6	34.5	36.7	38.0
H05	28.6	30.2	31.1	33.4	34.7
H06	27.7	29.4	30.3	32.6	33.8
H07	26.7	28.4	29.3	31.5	32.8
H08	28.6	30.3	31.3	33.6	34.8
H09	32.0	33.5	34.4	36.7	38.0
H10	35.4	36.9	37.8	40.1	41.4
H11	30.9	32.5	33.4	35.7	37.0
H12	26.3	28.0	28.9	31.2	32.5
H13	27.7	29.4	30.4	32.6	33.9
H14	29.3	31.0	31.9	34.2	35.4
H15	26.9	28.6	29.5	31.7	33.0
H16	33.1	34.6	35.5	37.8	39.0
H17	32.1	33.7	34.6	36.8	38.1
H18	32.0	33.5	34.4	36.7	38.0
H19	33.0	34.5	35.4	37.6	38.9
H20	26.8	28.5	29.4	31.6	32.9
H21	27.7	29.4	30.3	32.5	33.8
H22	28.3	29.9	30.8	33.1	34.4
H23	25.8	27.6	28.5	30.7	32.0
H24	27.5	29.1	30.0	32.3	33.6
H25	28.5	30.2	31.1	33.4	34.7
H26	28.3	29.9	30.8	33.1	34.4
H27	27.1	28.7	29.6	31.9	33.2
H28	32.7	34.2	35.1	37.4	38.7
H29	26.3	28.0	28.9	31.2	32.5
H30	24.1	25.9	26.8	29.1	30.4
H31	23.9	25.7	26.6	28.9	30.2
H32	28.8	30.5	31.4	33.7	35.0
H33	34.4	35.9	36.8	39.1	40.4
H34	31.5	33.0	33.9	36.2	37.5
H35	24.7	26.5	27.4	29.7	31.0
H36	26.4	28.1	29.0	31.3	32.6
H37	26.7	28.4	29.4	31.6	32.9
H38	29.7	31.3	32.2	34.4	35.7
H39	27.7	29.3	30.2	32.5	33.8
H40	29.0	30.6	31.5	33.8	35.1
H41	26.5	28.2	29.1	31.3	32.6
H42	24.5	26.3	27.2	29.5	30.8
H43	28.4	30.1	31.0	33.2	34.5
H44	26.8	28.5	29.4	31.7	33.0

Location Ref	Predicted Noise Level dB L_{A90} at Standardised Wind Speed at 10m				
	6m/s	7m/s	8m/s	9m/s	10m/s
H45	26.4	28.0	29.0	31.2	32.5
H46	31.1	32.7	33.6	35.9	37.2
H47	26.9	28.6	29.5	31.7	33.0
H48	27.5	29.2	30.1	32.4	33.7
H49	26.8	28.4	29.3	31.6	32.9
H50	26.6	28.3	29.2	31.5	32.8
H51	26.8	28.6	29.5	31.7	33.0
H52	27.0	28.7	29.6	31.9	33.2
H53	27.2	28.9	29.8	32.1	33.4
H54	26.6	28.3	29.2	31.5	32.8
H55	27.2	28.9	29.8	32.0	33.3
H56	31.6	33.2	34.1	36.4	37.7
H57	33.3	34.8	35.7	38.0	39.3
H58	26.0	27.7	28.6	30.9	32.2
H59	28.0	29.6	30.5	32.8	34.1
H60	28.1	29.8	30.6	32.9	34.2
H61	33.1	34.6	35.5	37.8	39.1
H62	32.1	33.6	34.5	36.8	38.1
H63	24.9	26.7	27.6	29.9	31.2
H64	28.5	30.1	31.0	33.3	34.6
H65	27.5	29.2	30.1	32.4	33.7
H66	26.6	28.3	29.2	31.5	32.8
H67	26.4	28.2	29.1	31.4	32.6
H68	28.7	30.3	31.2	33.5	34.8
H69	26.7	28.4	29.2	31.5	32.8
H70	30.7	32.3	33.2	35.4	36.7

2. TABULATED NOISE PREDICTION RESULTS FOR LOWER NOISE EMISSION SCENARIO (OMNI-DIRECTIONAL)

Table 2-1 Predicted Turbine Noise Levels Cumulative (lower noise emission scenario)

Location Ref	Predicted Noise Level dB L_{A90} at Standardised Wind Speed at 10m				
	6m/s	7m/s	8m/s	9m/s	10m/s
H01	27.5	31.3	34.7	35.8	36.2
H02	23.6	28.3	32.3	33.4	33.8
H03	25.2	30	34.1	35.3	35.6
H04	31.9	35.8	39.3	40.4	40.8
H05	24.9	29.4	33.2	34.4	34.8
H06	37.3	40.9	43.9	44.9	45.4
H07	26.2	30.2	33.7	34.8	35.2
H08	28.8	32.8	36.2	37.3	37.7
H09	31.9	35.9	39.3	40.4	40.9
H10	30.1	35	39.1	40.4	40.8
H11	35.6	39.3	42.5	43.5	44
H12	26.4	30.3	33.8	34.8	35.3
H13	23.6	28.2	32.1	33.2	33.6
H14	24.4	29.1	33.2	34.4	34.7
H15	23.8	28.2	32	33.1	33.5
H16	31.1	35.3	38.9	40.1	40.5
H17	31.8	35.8	39.2	40.4	40.8
H18	31.9	35.8	39.3	40.4	40.8
H19	27.8	32.7	36.7	38	38.4
H20	27.6	31.5	34.9	35.9	36.4
H21	31.1	34.8	38	39.1	39.5
H22	36.7	40.2	43.3	44.3	44.8
H23	37.3	40.8	43.9	44.9	45.4
H24	26.6	30.7	34.2	35.3	35.7
H25	27.3	31.4	34.9	36	36.4
H26	27.6	31.7	35.1	36.3	36.7
H27	28	31.8	35.2	36.3	36.8
H28	30.5	34.7	38.4	39.6	40
H29	29.6	33.4	36.6	37.6	38.1
H30	25.8	29.6	32.9	33.9	34.4
H31	26.4	30.2	33.4	34.5	35
H32	35.3	38.9	42	43.1	43.6
H33	30	34.6	38.6	39.9	40.3
H34	26.8	31.5	35.5	36.7	37.1
H35	25.4	29.3	32.6	33.7	34.2
H36	26.4	30.3	33.7	34.8	35.3
H37	29.9	33.6	36.8	37.9	38.4
H38	29.2	33.2	36.6	37.8	38.2
H39	28.2	32.1	35.4	36.6	37
H40	27.8	31.9	35.4	36.6	37

Location Ref	Predicted Noise Level dB L_{A90} at Standardised Wind Speed at 10m				
	6m/s	7m/s	8m/s	9m/s	10m/s
H41	26.4	30.3	33.8	34.9	35.3
H42	25.7	29.6	32.9	34	34.4
H43	25.8	30.1	33.8	35	35.4
H44	26.4	30.4	33.8	34.9	35.4
H45	26.4	30.4	33.8	34.9	35.3
H46	26.3	31.1	35.1	36.4	36.7
H47	23.8	28.2	31.9	33.1	33.5
H48	23.8	28.3	32.1	33.3	33.7
H49	23.7	28.1	31.8	33	33.4
H50	23.6	28	31.7	32.8	33.3
H51	23.2	27.6	31.5	32.6	33
H52	23.1	27.6	31.5	32.6	33
H53	38.9	42.4	45.4	46.4	46.9
H54	27.4	31.3	34.6	35.7	36.2
H55	26.7	30.7	34.1	35.2	35.7
H56	32.2	36.1	39.5	40.6	41
H57	29.3	33.9	37.8	39	39.4
H58	26.1	30	33.4	34.5	35
H59	27	31.1	34.6	35.7	36.1
H60	26.9	31	34.5	35.7	36.1
H61	32.1	36.2	39.7	40.9	41.3
H62	31.2	35.3	38.8	39.9	40.4
H63	25.9	29.7	33.1	34.2	34.6
H64	28.1	32.1	35.5	36.6	37.1
H65	23.6	28.1	32	33.1	33.5
H66	24.2	28.5	32.1	33.2	33.7
H67	24	28.3	31.9	33	33.5
H68	32.7	36.4	39.6	40.6	41.1
H69	26.4	30.4	33.9	35	35.4
H70	30.2	34.2	37.7	38.8	39.2

Table 2-2 Predicted Turbine Noise Taurbeg Turbines Only (lower noise emission scenario)

Location Ref	Predicted Noise Level dB L_{A90} at Standardised Wind Speed at 10m				
	6m/s	7m/s	8m/s	9m/s	10m/s
H01	15.8	23	28	29.3	29.6
H02	17.5	24.6	29.6	30.9	31.2
H03	19.5	26.6	31.6	33	33.3
H04	21.4	28.5	33.5	34.9	35.2
H05	17.9	25	30	31.4	31.7
H06	17	24.1	29.1	30.4	30.8
H07	16	23.1	28.1	29.4	29.7
H08	17.9	25	30	31.4	31.7
H09	21.3	28.4	33.4	34.8	35.2
H10	24.8	31.9	36.9	38.4	38.7
H11	20.2	27.3	32.3	33.8	34.1
H12	15.6	22.7	27.7	29	29.3
H13	17	24.1	29.1	30.4	30.7
H14	18.6	25.7	30.7	32	32.3
H15	16.2	23.2	28.2	29.6	29.9
H16	22.4	29.5	34.5	36	36.3
H17	21.5	28.6	33.6	35	35.3
H18	21.3	28.4	33.4	34.9	35.2
H19	22.3	29.4	34.4	35.9	36.2
H20	16.1	23.2	28.2	29.5	29.8
H21	16.9	24	29	30.4	30.7
H22	17.6	24.6	29.6	31	31.3
H23	15.1	22.2	27.2	28.5	28.8
H24	16.8	23.9	28.9	30.3	30.6
H25	17.7	24.8	29.8	31.2	31.5
H26	17.6	24.7	29.7	31.1	31.4
H27	16.4	23.5	28.5	29.9	30.2
H28	22	29.2	34.2	35.6	35.9
H29	15.5	22.6	27.6	28.9	29.2
H30	13.4	20.4	25.4	26.7	27
H31	13.1	20.2	25.2	26.5	26.8
H32	18	25.1	30.1	31.5	31.8
H33	23.8	30.9	35.9	37.4	37.7
H34	20.8	27.9	32.9	34.4	34.7
H35	13.9	21	26	27.3	27.6
H36	15.7	22.8	27.8	29.2	29.5
H37	16	23	28	29.4	29.7
H38	19	26.1	31.1	32.5	32.8
H39	17	24.1	29.1	30.5	30.8
H40	18.2	25.4	30.4	31.8	32.1
H41	15.7	22.8	27.8	29.2	29.5
H42	13.7	20.8	25.8	27.1	27.4
H43	17.7	24.8	29.8	31.2	31.5
H44	16.1	23.2	28.2	29.6	29.9

Location Ref	Predicted Noise Level dB L_{A90} at Standardised Wind Speed at 10m				
	6m/s	7m/s	8m/s	9m/s	10m/s
H45	15.6	22.7	27.7	29	29.4
H46	20.5	27.6	32.6	34	34.3
H47	16.1	23.2	28.2	29.6	29.9
H48	16.8	23.9	28.9	30.2	30.5
H49	16	23.1	28.1	29.4	29.8
H50	15.9	23	28	29.3	29.6
H51	16.1	23.2	28.2	29.5	29.8
H52	16.2	23.3	28.3	29.6	29.9
H53	16.5	23.6	28.6	29.9	30.2
H54	15.9	23	28	29.4	29.6
H55	16.5	23.6	28.6	30	30.3
H56	20.9	28	33	34.4	34.6
H57	22.6	29.7	34.7	36.2	36.5
H58	15.3	22.4	27.4	28.7	29
H59	17.3	24.4	29.4	30.8	31.1
H60	17.4	24.5	29.5	30.9	31.2
H61	22.5	29.6	34.6	36	36.4
H62	21.4	28.5	33.5	35	35.3
H63	14.2	21.2	26.2	27.6	27.9
H64	17.8	24.9	29.9	31.3	31.6
H65	16.7	23.8	28.8	30.2	30.5
H66	15.8	22.9	27.9	29.2	29.5
H67	15.6	22.7	27.7	29	29.3
H68	18	25.1	30.1	31.5	31.8
H69	15.9	23	28	29.4	29.7
H70	20.1	27.2	32.2	33.6	33.9

APPENDIX 12-7

LiDAR installation Report

Planning and Environmental Consultants

Lidar Installation Report

Taurbeg Wind Farm Extension of Operational Life

DOCUMENT DETAILS

Client: **Taurbeg Ltd.**

Project Title: **Taurbeg Wind Farm Extension of Operational Life**

Project Number: **231030**

Document Title: **Lidar Installation Report**

Document File Name: **LiDAR Installation Report_Statkraft Taurbeg WF - 2024.10.02 - 231030**

Prepared By: **MKO**
Tuam Road
Galway
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H91 VW84

MKO Planning and Environmental Consultants

Rev	Status	Date	Author(s)	Approved By
01	Draft	02/10/2024	JS	NOD
02	Final	02/10/2024	JS	NOD

Site Details			
Site Name:	Taurbeg Windfarm	**Client Name**	Taurbeg Ltd.
Project Number	231030		

Site Information			
Deployment Start date & Time	02/10/2024 @ 18.30	**Client Contact Details**	Damien.Lyons@statkraft.com
Landowner contact details	Damien.Lyons@statkraft.com	**Site Access Procedure**	Damien.Lyons@statkraft.com
Site Access Route	52°15'24.8"N 9°07'42.5"W	**Nearest Town/ Postcode**	Newmarket

Observed Conditions			
Wind Speed	Wind Direction	Precipitation	Visibility
4.12m/s	092 degrees	0.0mm	>10KM

Deployment Information	
Installation Engineer(s)	James Sturt/ Adam Scott
Model of Device	Zephir ZX300
Device Serial Number	1379

Location Information	
Unit Location Grid Coordinates	**52.25481 -9.13534**
Elevation	376m
Location Description	Within compound of substation
Road Type	Rough gravel road.
Distance from Access Road	10m
Vehicle Requirements	Opel Movano LWB
Terrain Type	Gravel

Location Information	
Current Land Use	Wind Farm Substation
Seasonal Land Use (e.g., crops)	Wind Farm Substation

Communications			
Router Hardware	Sim Card Number	Sim Card IP address	Signal Strength
Waltz Software	No SIM card	n/a	n/a

Power Supply			
Type	Distance From Device (Cable Length)	Fuel Level	Lifespan
Mains	15m	n/a	n/a

Device Configuration		
Alignment	Due North	
Scan Type	FD Horizontal Wind Speed (m/s) at Scan Centre at Rm	
Max Range	Met Station is positioned on the ZX300. Clear span around field is approx. 15m	
VAD Processing	ON	~~OFF~~
Hourly Scan Home	ON	~~OFF~~
Hourly Window Wipe	ON	~~OFF~~
Auto Clean	ON	~~OFF~~
Heat up Before Start	ON	~~OFF~~
Software Version	Zephir Lidar ZP573	
Target Description	N/A	
Distance to Target	N/A	

Device Configuration	
Target Coordinates	52.25481 -9.13534
Target Elevation	64m to 199m

Notes
ZX300 measurement heights set to: 199m ,190m, 180m, 170m, 160m, 150m, 109m, 99m, 79m, 64m, 38m
Site Description: From the ZX300 – • North – 1.5m bank 10m away. • East – Substation building 10m away. • South – 3.5m bank 25m away. • West – 3.5m bank 15m away. **Note:** ZX300 is elevated off ground level so therefore a 1m offset approx. in reported height vs ground level set in software. **Note:** Due to the high elevation of the site, Fog, Cloud and other weather may result in filtering of unreliable data.

PHOTOGRAPHS

UNIT CONFIGURATION