TOBIN

Rooaunalaghta Green Energy Project

Appendix 12-3

Background Noise Report

ROOAUNALAGHTA
Green Energy

BUILT ON KNOWLEDGE

REPORT



Rooaunalaghta Wind Farm

Project Title: Summary of Background Noise Levels for 82 m Hub Height

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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Details	Written by	Approved by
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Name	Miguel Cartuyvels	Mike Simms
Title	Acoustic Consultant	Principal Acoustic Consultant
Date	5 February 2026	

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1. INTRODUCTION

AWN has completed a background noise survey that will inform a wind turbine environmental noise impact assessment for the proposed Rooaunalaghta Wind Farm at Co. Mayo (Proposed Development). This note has been prepared to provide the background noise levels derived at the relevant Noise Monitoring Locations (NMLs). A brief description of the assessment methodology is outlined in the note.

Appendix A provides a brief glossary of acoustic terms used in this technical note.

1.1 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 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 guidance remains applicable with the publication of ARWTN.
The following text summarises 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. 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

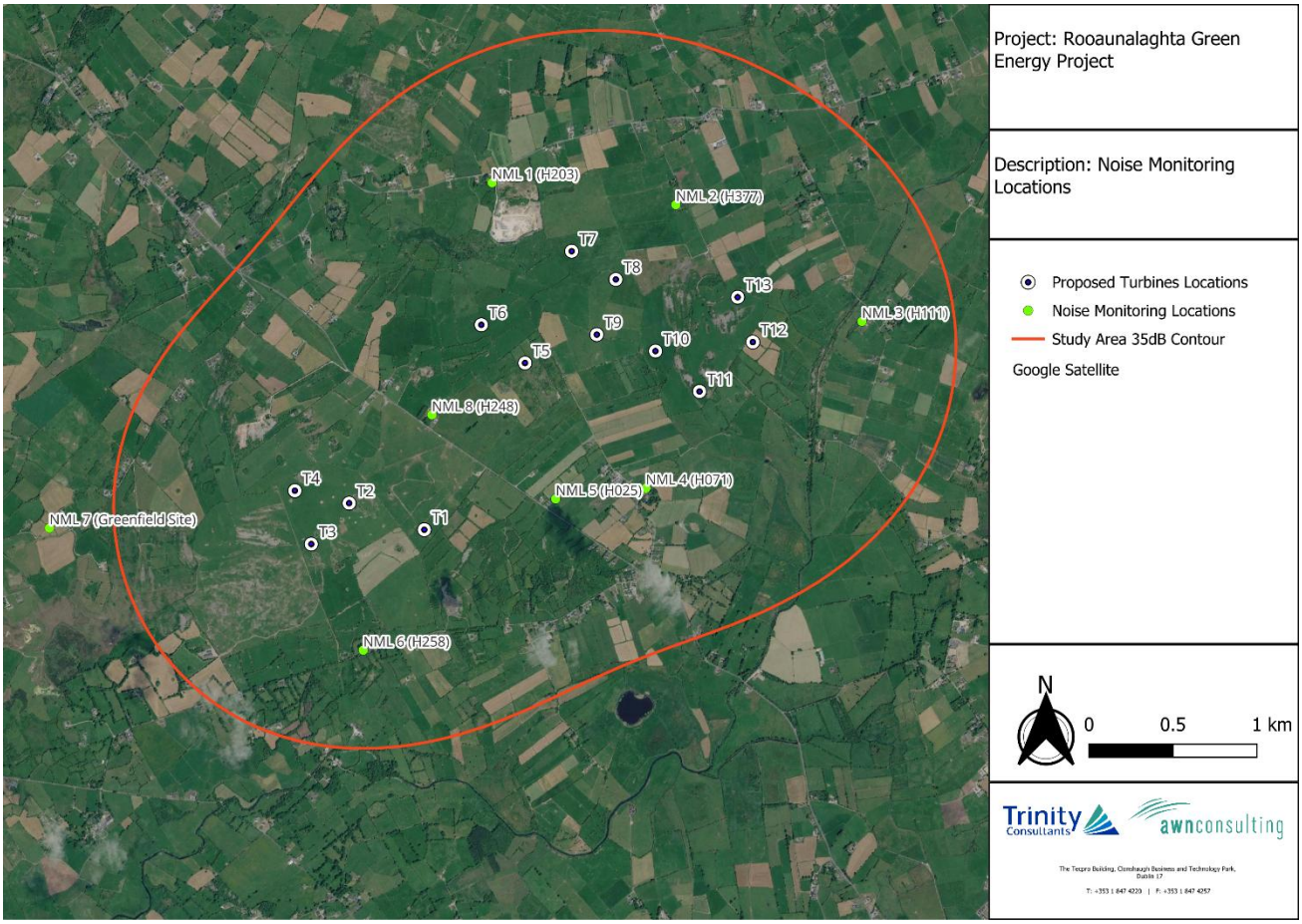
Table 2-1 Co-Ordinates of Noise Monitoring Equipment

NML Ref.	Noise Sensitive Location Ref.	Co – Ordinates (ITM)	
		Easting	Northing
NML 1	H203	524,051	752,079
NML 2	H163	525,146	751,948
NML 3	H111	526,255	751,252
NML 4	H071	524,967	750,258
NML 5	H025	524,430	750,194
NML 6[Note 1]	H258	523,283	749,292
NML 7	Greenfield site	521,413	750,020
NML 8	H248	523,692	750,695

Note 1: On review of survey location NML6 and data gathered, it was determined that the positioning of the noise monitoring equipment was representative of the dwelling surrounded by trees and was the only location where the noise meter could be installed in consultation with the resident.

Figure 2-1 shows each monitoring location in the context of the surrounding area. Appendix B presents pictures of the equipment installed at each location.

Figure 2-1 Map of Noise Survey Locations



2.2 Survey Notes

During the equipment installations and each location visit, notes were taken to record notable activity or noise sources at each location. In general, the noise environment was typical of rural environment including wind-related foliage noise, birdsong and distant road traffic.

2.3 Instrumentation

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 Instrumentation Details

NML Ref.	NSL Ref.	Type	Serial Number	Calibration Date
NML 1	H203	Rion NL-52	998410	20 February 2024
NML 2	H377	Rion NL-52	564808	10 September 2024
NML 3	H111	Rion NL-52	998413	22 March 2024
NML 4	H071	Rion NL-52	186667	3 June 2023
NML 5	H025	Rion NL-52	764925	29 September 2023
NML 6	H258	Rion NL-52	998411	20 February 2024
NML 7	Greenfield site	Rion NL-52	575785	29 September 2023

NML Ref.	NSL Ref.	Type	Serial Number	Calibration Date
NML 8	H248	Rion NL-52	564809	13 January 2023

2.4 Measurement Periods

The periods of noise measurements used in the background noise monitoring assessment are outlined in Table 2-3. 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 2-3 Measurement Periods of Noise Monitoring Equipment

NML Ref.	NSL Ref.	Start Date	End Date
NML 1	H203	13 November 2024	18 December 2024
NML 2	H377	13 November 2024	16 December 2024
NML 3	H111	13 November 2024	18 December 2024
NML 4	H071	13 November 2024	18 December 2024
NML 5	H025	13 November 2024	18 December 2024
NML 6	H258	4 December 2024	18 December 2024
NML 7	Greenfield site	13 November 2024	18 December 2024
NML 8	H248	13 November 2024	18 December 2024

Before and after the survey the measurement apparatus was check calibrated using a Brüel & Kjær type 4231 Sound Level Calibrator where appropriate. Instruments were calibrated on each interim visit and any drift noted. All calibration drifts were less than ±0.5 dB and within acceptable tolerances outlined in the IOA GPG.

2.5 Rainfall Data

Rainfall was monitored and logged using Texas Instruments TR-525 data loggers that were installed at Location NML-2 and NML-7 over the duration of the survey as noted in Table 2-3.

2.6 Measurement of Wind Data

Average wind speed and direction was measured in 10-minute intervals at an on-site Lidar and provided to AWN. Location coordinates for the on-site Lidar are indicated in Table 2-4.

Table 2-4 Co-Ordinates of Meteorological Mast

Item	Co – Ordinates (ITM)	
	Easting	Northing
Rooaunalaghta Lidar	523,754	750,797

Wind speed measurements made at 80 m and 65 m were used to correct the wind speed up to a provisional assessment HH at 82 m, as per the methodology outlined in the IOA GPG. The calculated HH wind speeds were then corrected to the 'standardised' 10 m wind speed in accordance with the IOA GPG.

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 the proposed hub height changes or 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 3-1 and analysed with respect to the methods outlined in the IOA GPG.

3.1.2 Noise from Existing Turbines

The IOA GPG states that any contribution to the background noise levels from an existing wind turbine must be excluded when assigning background noise and setting noise limits for a new development.

The nearest existing wind turbines are located at a distance >10 km. The contribution of noise from existing wind turbines at any of the NMLs is not significant and therefore no correction or directional data filtering is required in the data analysis.

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 C 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 are presented in Table 3-2

Table 3-2 Derived Background Noise Levels at Assessment Hub Height – Daytime

NML Ref.	Period	Background Noise Levels dB L_{A90} at standardised 10m height wind speed m/s for 82 m Hub Height							
		3	4	5	6	7	8	9	10
NML-1	Day	26	27.2	28.9	31	33.5	36.3	39.4	42.7
NML-2	Day	24	25.4	27.1	29	31.3	33.8	36.5	39.4
NML-3	Day	25.8	26.7	27.8	29.3	31	33	35.2	37.6
NML-4	Day	30.8	31.9	33	34.2	35.4	36.8	38.4	40.2
NML-5	Day	34	34.8	35.5	36.3	37.1	38.1	39.3	40.8
NML-6	Day	26	27.5	29.2	31.2	33.3	35.8	38.5	41.5
NML-7	Day	23.3	24.4	26	28.1	30.5	33.3	36.3	39.4
NML-8	Day	32	33	34.6	36.5	38.8	41.3	44	46.6

The derived background noise levels dB $L_{A90,10min}$ for night-time are presented in Table 3-3.

Table 3-3 Derived Background Noise Levels at Assessment Hub Height – Night-time

NML Ref.	Period	Background Noise Levels dB L_{A90} at standardised 10m height wind speed m/s for 82 m Hub Height							
		3	4	5	6	7	8	9	10
NML-1	Night	19.3	19.9	21.8	24.7	28.3	32.4	36.9	41.5
NML-2	Night	18.1	18.9	20.6	23.1	26.1	29.7	33.5	37.5
NML-3	Night	19.6	20.2	21.6	23.6	26.1	29	32.3	35.9
NML-4	Night	24.5	24.8	25.6	26.9	28.7	30.9	33.4	36.3
NML-5	Night	20.6	21	22.2	24	26.4	29.2	32.3	35.6
NML-6	Night	22.4	23.4	25.1	27.6	30.6	34	37.6	41.4
NML-7	Night	18.5	19.7	21.7	24.6	28	31.8	35.8	39.9
NML-8	Night	19.7	21.2	23.9	27.3	31.4	35.9	40.5	45.1

4. APPLICABLE NOISE LIMITS AND GUILDLINES

The current guidelines applicable to wind farm development in Ireland are contained in the document *Wind Energy Development Guidelines for Planning Authorities* published by the Department of the Environment, Heritage, and Local Government (DEHLG) in 2006 (WEDG06).

WEDG06 outlines the appropriate noise criteria in relation to wind farm developments that is currently applied as a best practice approach in Ireland as follows:

- 35 to 40 dB $L_{A90,10min}$ for quiet daytime environments of less than 30 dB $L_{A90,10min}$;
- 45 dB $L_{A90,10min}$ for daytime environments ≥30 dB $L_{A90,10min}$, or a maximum increase of 5 dB(A) above background noise, whichever is the highest; and,
- 43 dB $L_{A90,10min}$ for night-time.

Whilst the caveat of an increase of 5 dB(A) above background for night-time operation is not explicit within the current guidance, it is commonly applied in noise assessments prepared and is detailed in numerous examples of planning conditions issued by local authorities and An Bórd Pleanála (ABP).

Table 4-1 presents the details of noise criteria that are espoused by the current national guidance.

Table 4-1 Turbine Noise Criteria Definitions

Period	Criterion Description	Applicable Criterion	Acronym
Day	Daytime environments with background noise levels less than 30 dB $L_{A90,10min}$	An appropriate threshold of between 35 to 40 dB $L_{A90,10min}$	Daytime Lower Threshold (DLT)
	Daytime environments with background noise levels between 30 to 40 dB $L_{A90,10min}$	A threshold of 45 dB $L_{A90,10min}$	Daytime Threshold (DT)
	Daytime environments with background noise levels >40 dB $L_{A90,10min}$	A threshold equal to the Background Noise Level + 5 dB	Daytime Background Noise + 5 dB (DBG+5)
Night	Night background noise levels ≤38 dB $L_{A90,10min}$	A threshold of 43 dB $L_{A90,10min}$	Night Threshold (NT)
	Night background noise levels ≥38 dB $L_{A90,10min}$	A threshold equal to the Background Noise Level + 5 dB	Night-time Background Noise + 5 dB (NBG+5)

The preliminary wind turbine noise limits applicable at NMLs are set out in Table 4-2.

Table 4-2 Preliminary Turbine Noise Limits at NMLs for 82 m HH

NML Ref.	Period	Cumulative Turbine Noise limits dB L_{A90} at standardised 10m height wind speed for 82 m HH based on 2006 WED Guidelines							
		3	4	5	6	7	8	9	10
NML-1	Day	DLT	DLT	DLT	DT	DT	DT	DT	DBG + 5
	Night	NT	NT	NT	NT	NT	NT	NT	NBG + 5
NML-2	Day	DLT	DLT	DLT	DLT	DT	DT	DT	DT
	Night	NT	NT	NT	NT	NT	NT	NT	NT
NML-3	Day	DLT	DLT	DLT	DLT	DT	DT	DT	DT
	Night	NT	NT	NT	NT	NT	NT	NT	NT
NML-4	Day	DT	DT	DT	DT	DT	DT	DT	DBG + 5
	Night	NT	NT	NT	NT	NT	NT	NT	NT

NML Ref.	Period	Cumulative Turbine Noise limits dB L_{A90} at standardised 10m height wind speed for 82 m HH based on 2006 WED Guidelines							
		3	4	5	6	7	8	9	10
NML-5	Day	DT	DT	DT	DT	DT	DT	DT	DBG + 5
	Night	NT	NT	NT	NT	NT	NT	NT	NT
NML-6	Day	DLT	DLT	DLT	DT	DT	DT	DT	DBG + 5
	Night	NT	NT	NT	NT	NT	NT	NT	NBG + 5
NML-7	Day	DLT	DLT	DLT	DLT	DT	DT	DT	DT
	Night	NT	NT	NT	NT	NT	NT	NT	NBG + 5
NML-8	Day	DT	DT	DT	DT	DT	DBG + 5	DBG + 5	DBG + 5
	Night	NT	NT	NT	NT	NT	NT	NBG + 5	NBG + 5

4.1 Comments on lower threshold for Low Background Noise

Several factors must be considered when determining a fixed lower limited in the range of 35 – 40 dB for low background noise scenarios i.e. background noise levels < 30 dB L_{A90}. The guidance is not prescriptive and requires a degree of interpretation and professional judgment. One of the factors to be considered when making this decision is the potential noise impacts from the proposed turbines relative to the background noise levels at specific locations. This will not be known until a review of the final turbine layout and turbine type is complete.

A lower threshold of 40 or 43 dB $L_{A90,10min}$ is commonly adopted in planning conditions for similar developments that have been granted planning permission by An Bord Pleanala (ABP) and local planning authorities in recent years for example, Derrinlough Wind Farm (ABP Ref: 306706-20), Derryadd Wind Farm (ABP Ref: PL14.303592), Coole Wind Farm (ABP Ref: PL25M.300686), Cloncreen Wind Farm (ABP Ref: PA0047) and Meenbog Wind Farm (ABP Ref: PL05E.300460).

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 day time, 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 1 NML 1 Installation Photo



Appendix Figure 2 NML 2 Installation Photo



Appendix Figure 3 NML 3 Installation Photo



Appendix Figure 4 NML 4 Installation Photo



Appendix Figure 5 NML 5 Installation Photo



Appendix Figure 6 NML 6 Installation Photo



Appendix Figure 7 NML 7 Installation Photo

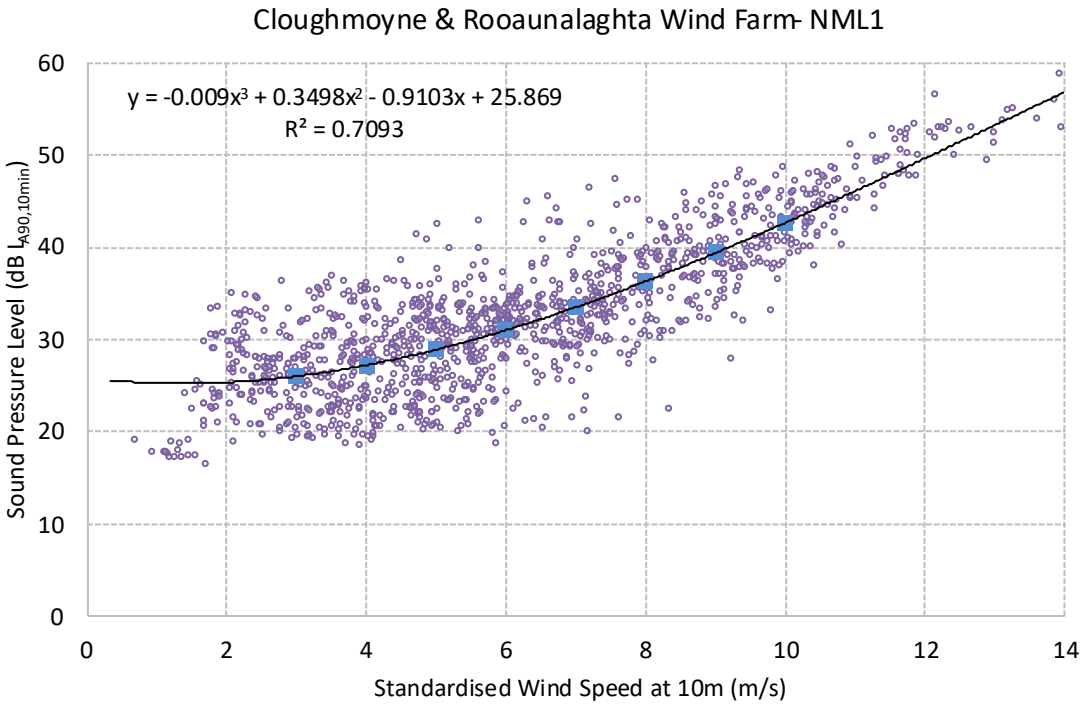


Appendix Figure 8 NML 8 Installation Photo

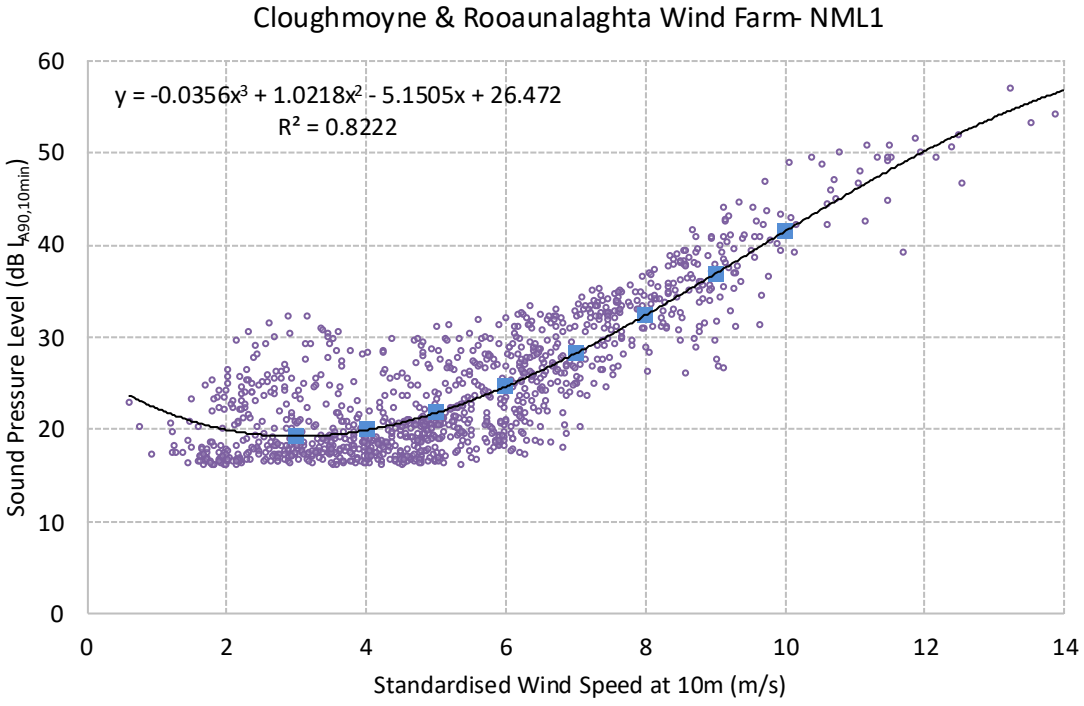


APPENDIX C. PRELIMINARY REGRESSION CURVES

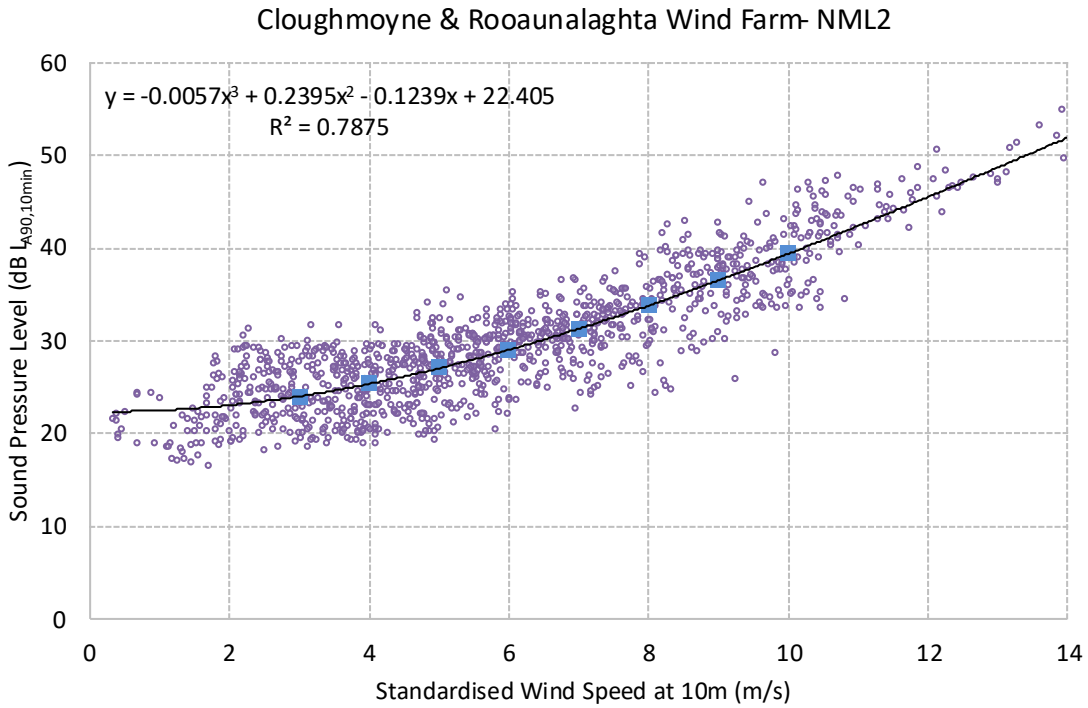
Appendix Figure 9 NML 1 – Daytime



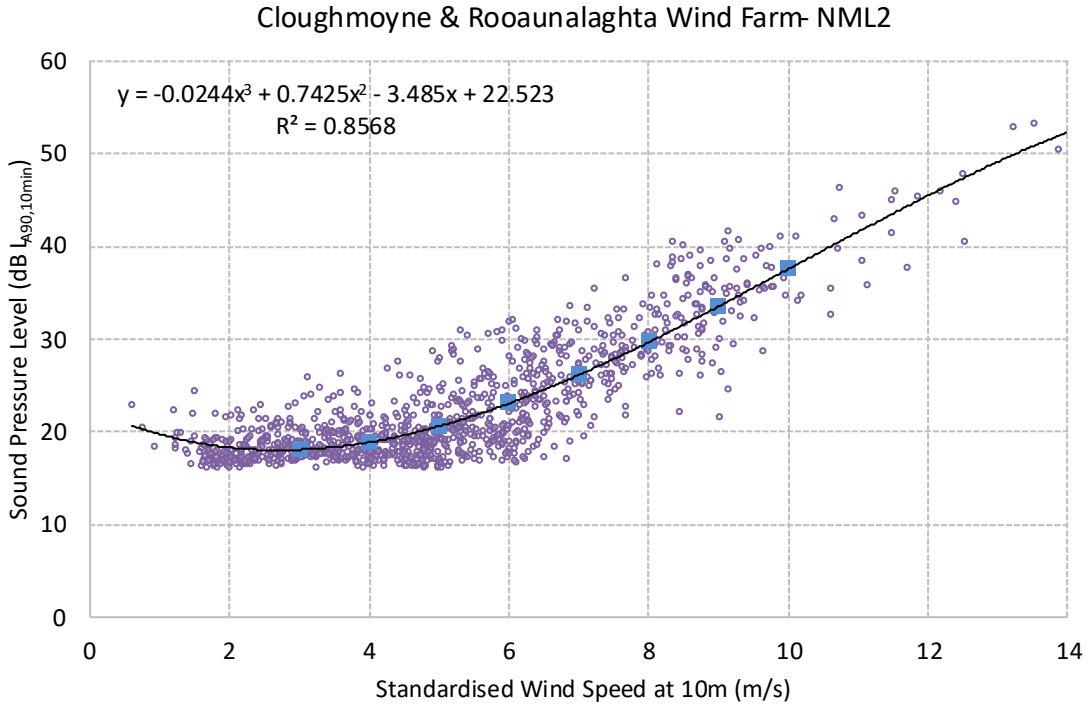
Appendix Figure 10 NML 1 – Night



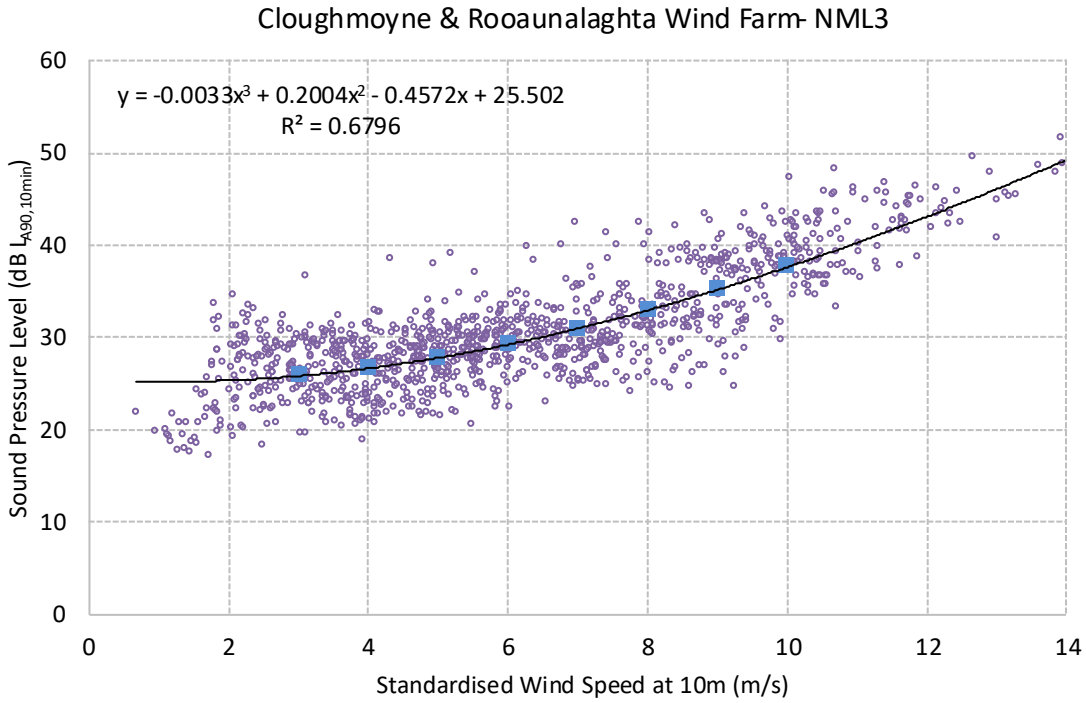
Appendix Figure 11 NML 2 – Daytime



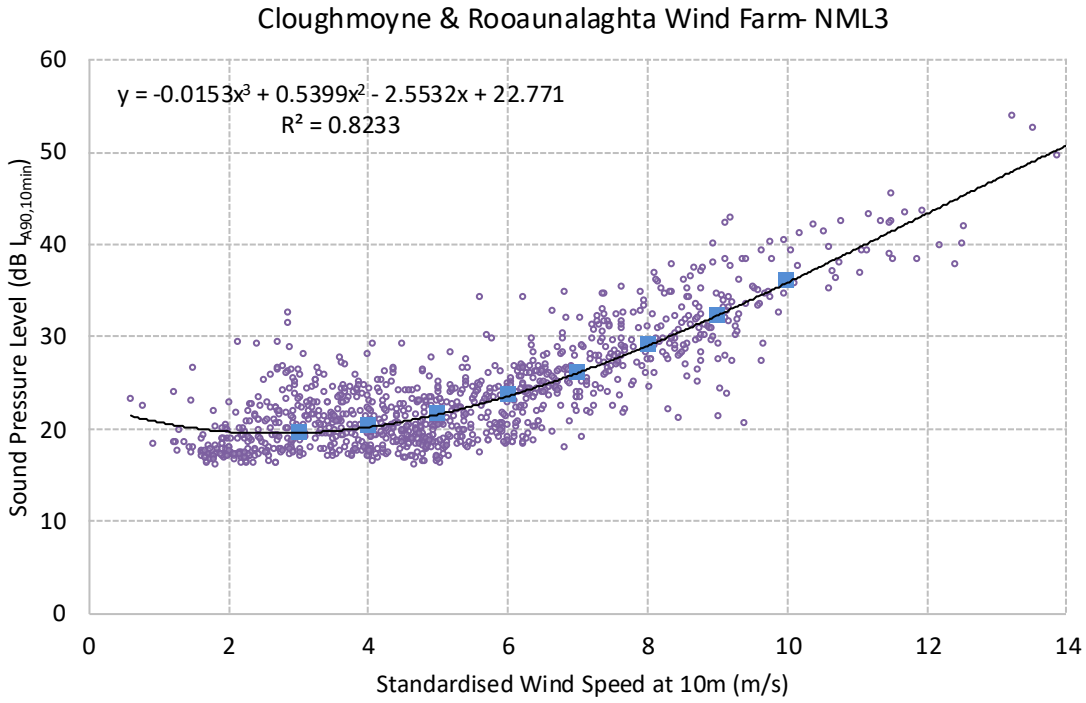
Appendix Figure 12 NML 2 – Night



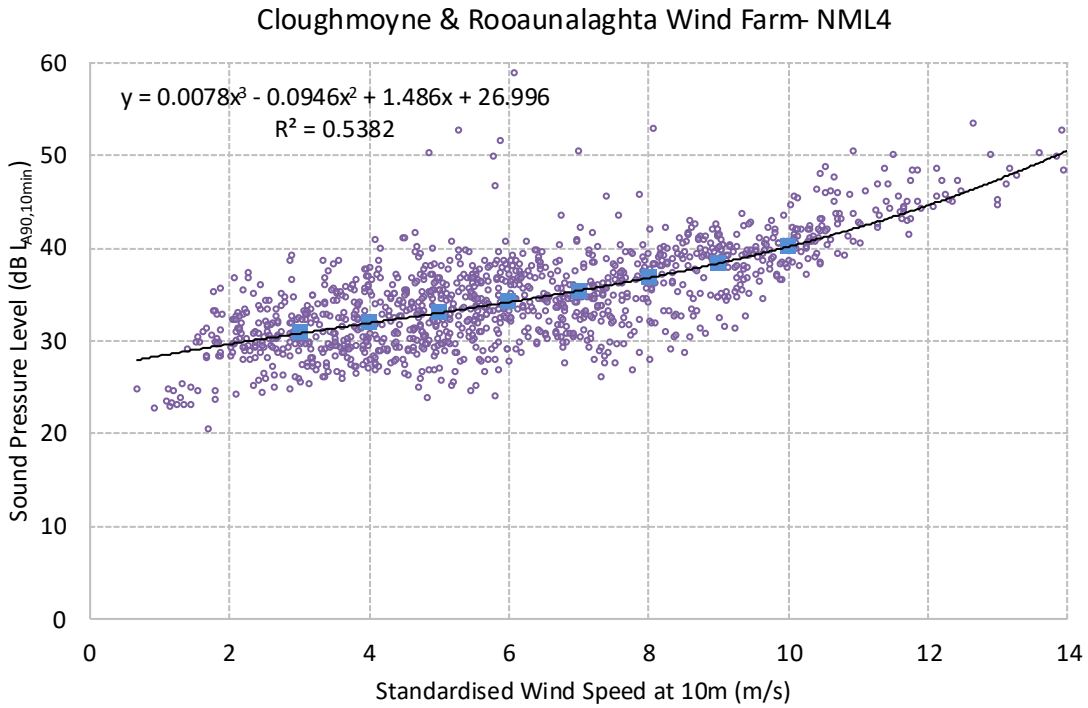
Appendix Figure 13 NML 3 – Daytime



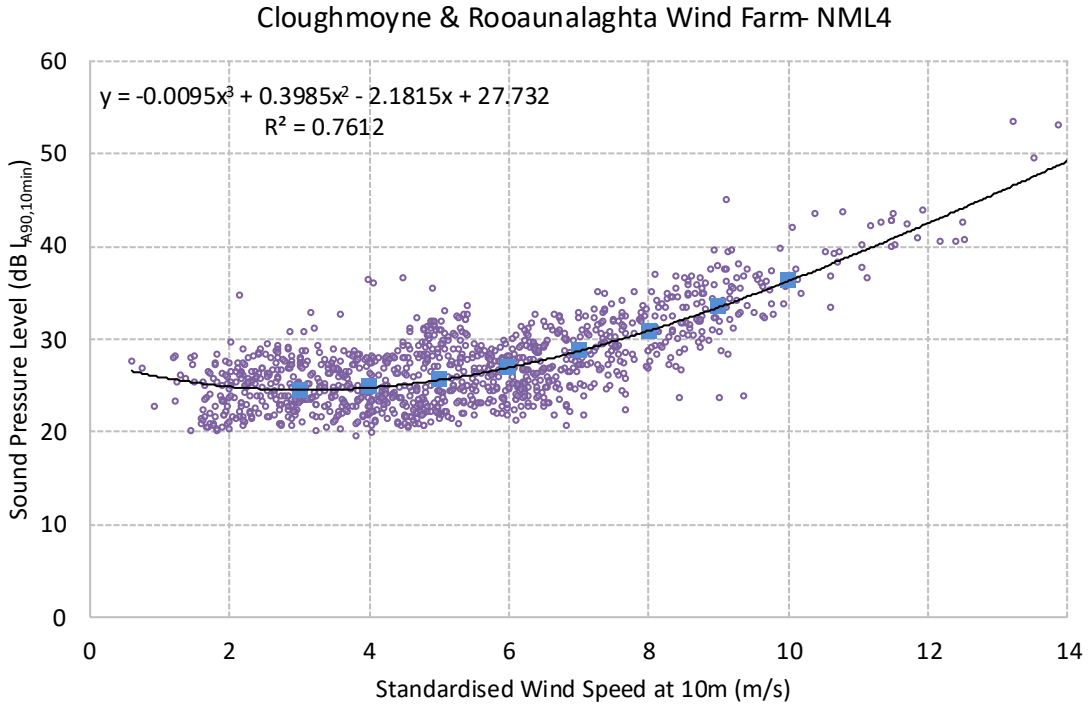
Appendix Figure 14 NML 3 – Night



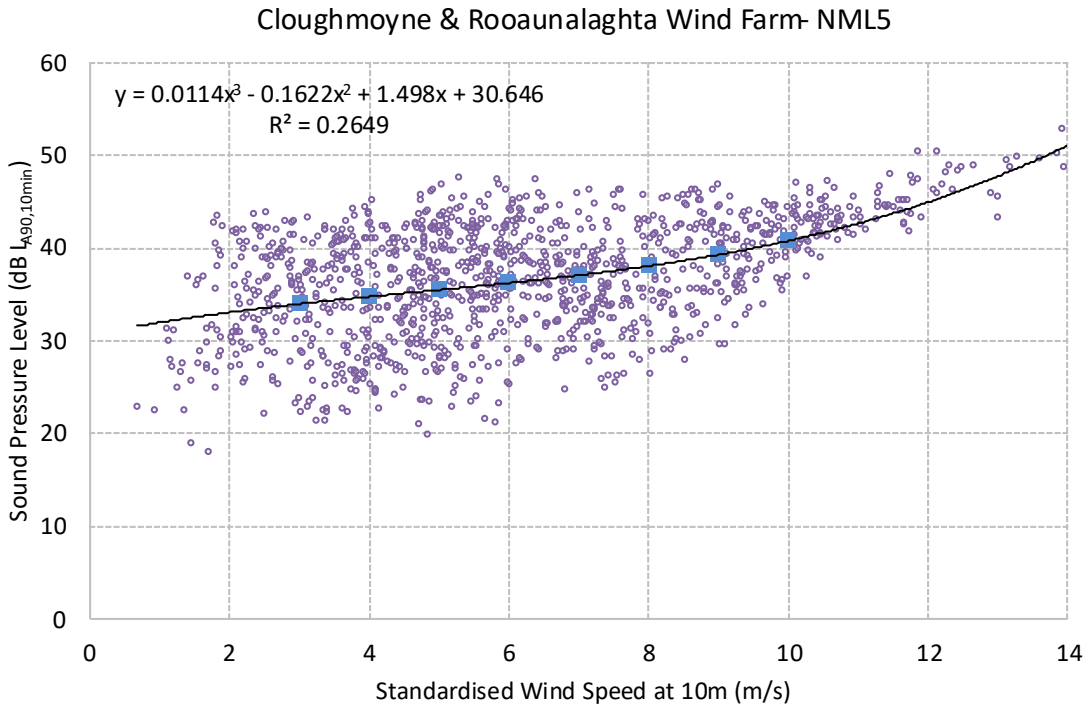
Appendix Figure 15 NML 4 – Daytime



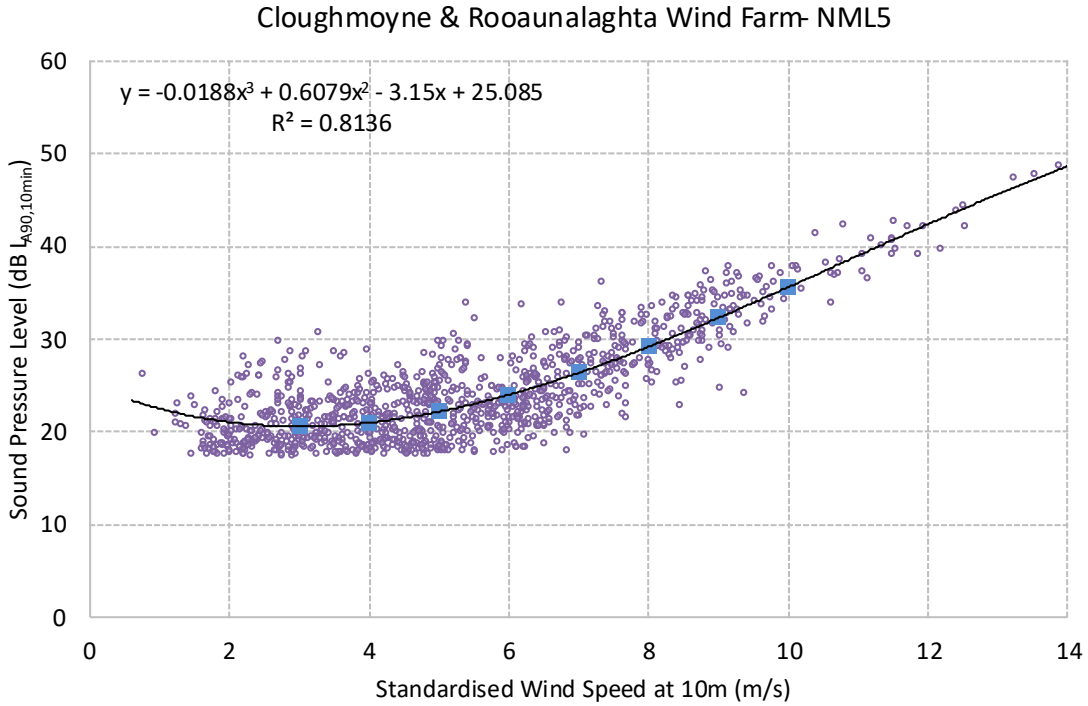
Appendix Figure 16 NML 4 – Night



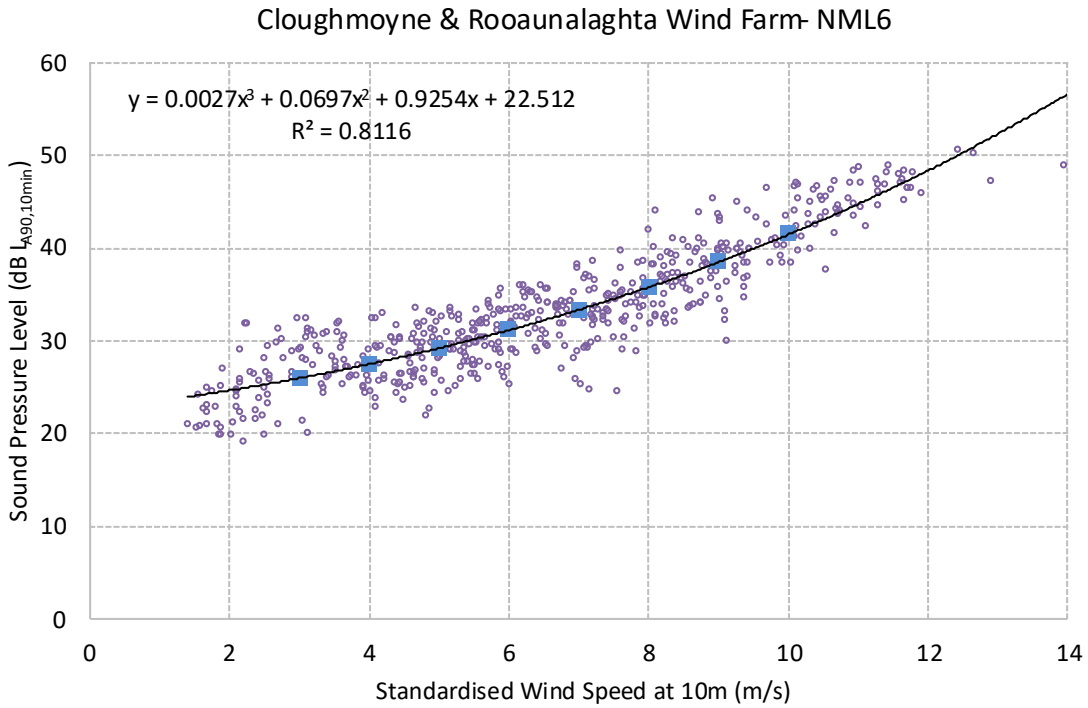
Appendix Figure 17 NML 5 – Daytime



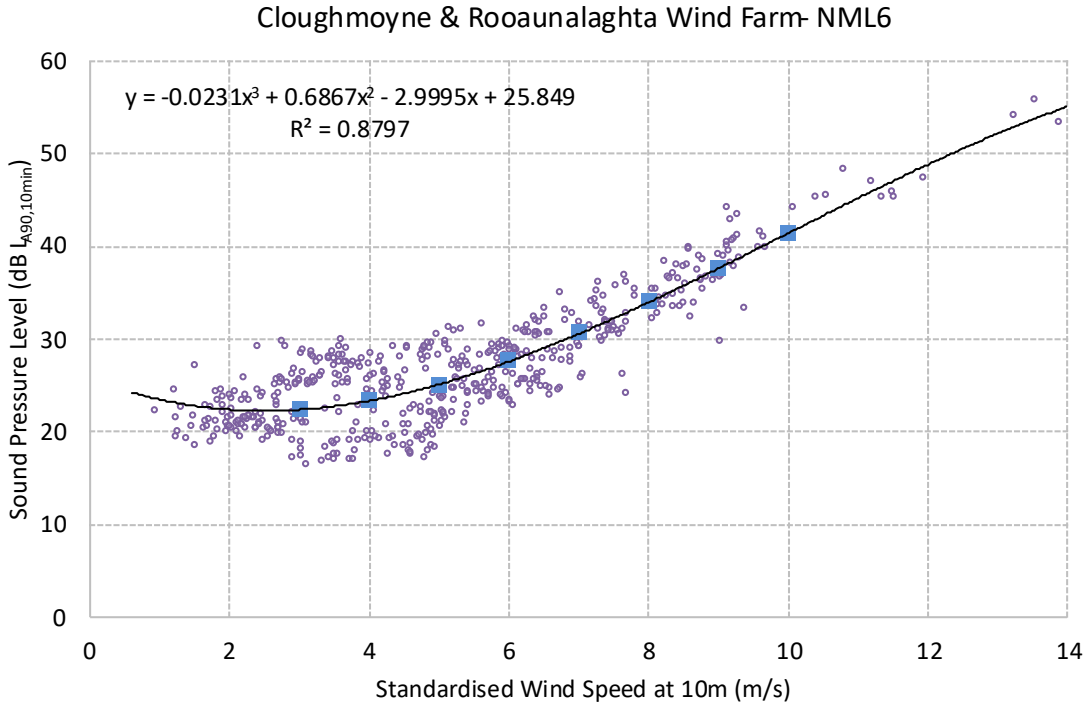
Appendix Figure 18 NML 5 – Night



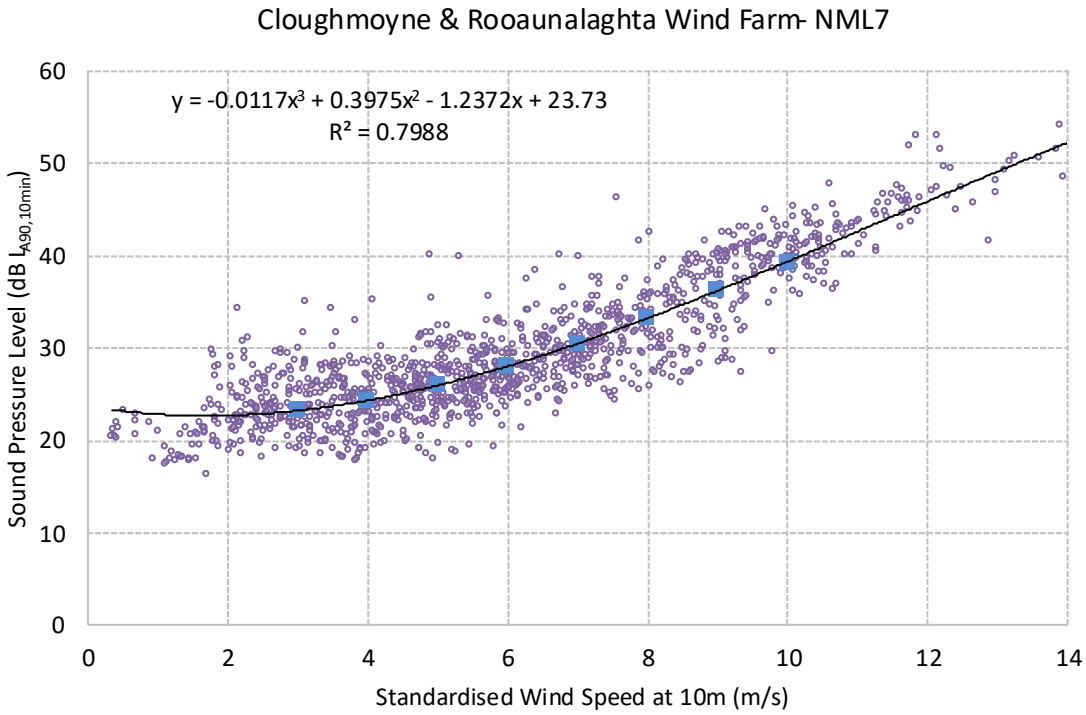
Appendix Figure 19 NML 6 – Daytime



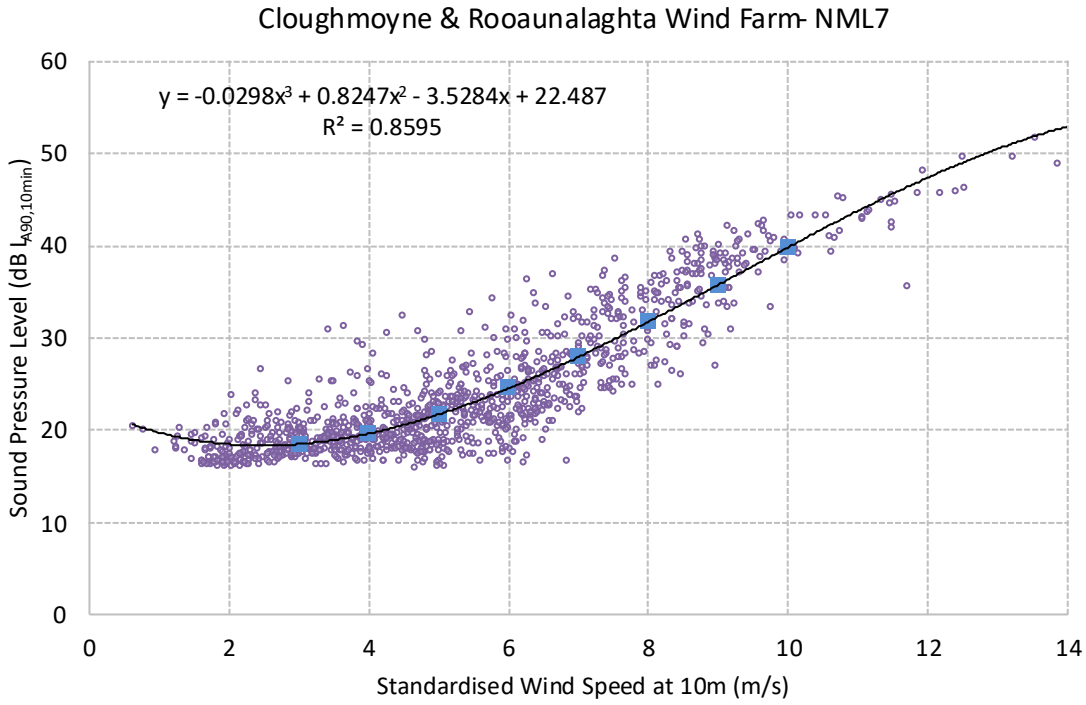
Appendix Figure 20 NML 6 – Night



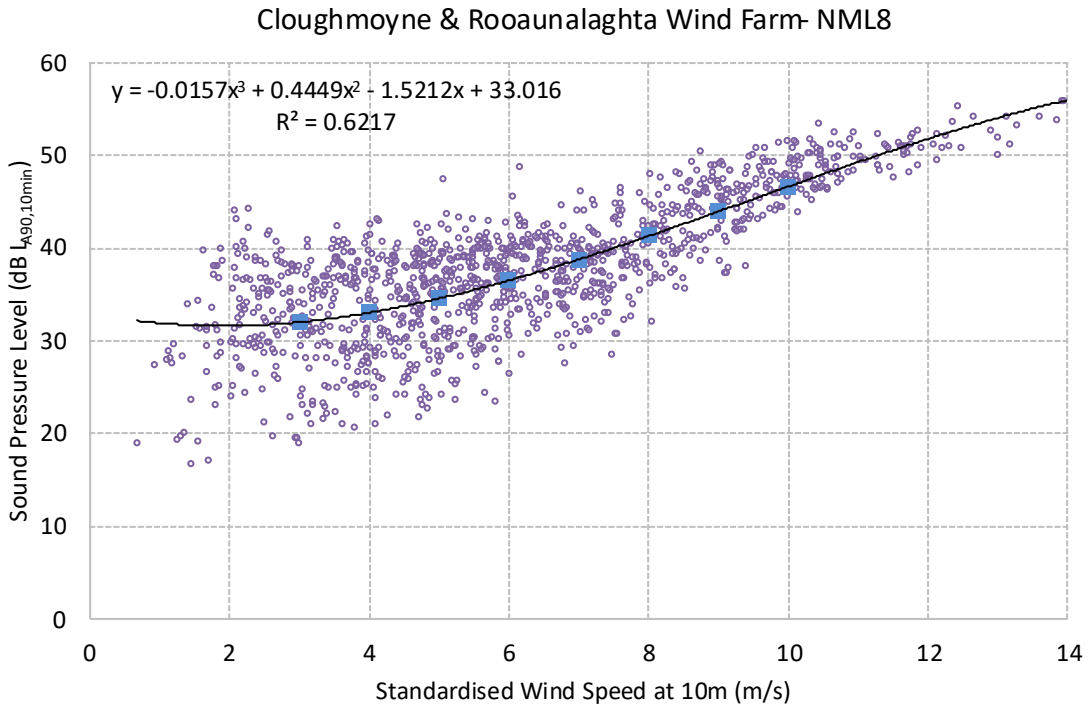
Appendix Figure 21 NML 7 – Day



Appendix Figure 22 NML 7 – Night



Appendix Figure 23 NML 8 – Daytime



Appendix Figure 24 NML 8 – Night

