



# **Sporad na Mara Offshore Wind Farm**

## **Offshore Project**

### **Environmental Impact Assessment Report**

#### **Appendix 19.5: Baseline Noise Conditions – All Wind Directions, Volume 2c**

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# 1 INTRODUCTION

## 1.1 OVERVIEW

1.1.1.1 This appendix of the Environmental Impact Assessment Report (EIAR) presents the results of analysis of the site baseline noise survey relevant to the assessment of offshore airborne noise of the proposed Spiorad na Mara Offshore Wind Farm (hereafter referred to as 'the Offshore Project'). This appendix accompanies **Chapter 19: Offshore Airborne Noise, Volume 2a** of the EIAR.

1.1.1.2 This appendix should be read in conjunction with the project description provided in **Chapter 3: Project Description, Volume 1a** and the relevant parts of the following chapters and appendices:

- **Chapter 19, Volume 2a;**
- **Appendix 19.1: Policy, Guidance and Legislative Context, Volume 2c;**
- **Appendix 19.2: Noise Modelling and Prediction, Volume 2c;**
- **Appendix 19.3: Baseline Noise Survey, Volume 2c;**
- **Appendix 19.4: Wind Shear Correction, Volume 2c;**
- **Appendix 19.6: Baseline Noise Analysis Comparison - Option 1 vs Option 2, Volume 2c;**
- **Appendix 19.7: Baseline Noise Conditions - Directional Split, Volume 2c;**
- **Appendix 19.8: Existing Wind Turbine Contribution Check, Volume 2c;**
- **Appendix 19.9: Modelled Receptor Noise Levels, Volume 2c;**
- **Appendix 19.10: Noise Limits, Volume 2c;**
- **Appendix 19.11: Cumulative Wind Turbine Noise Assessment, Volume 2c.**

## 1.1.2 PROJECT BACKGROUND

1.1.2.1 Spiorad na Mara Limited (hereafter referred to as 'the Applicant') is proposing to develop the Project. The Project is an offshore wind farm (OWF) that will consist of up to 60 fixed-bottom wind turbine generators (WTGs).

1.1.2.2 The Project will include both offshore and onshore infrastructure. This EIAR supports the application for the offshore components of the Project as outlined in **Chapter 1: Introduction, Volume 1a**. The offshore components of the Project (the Offshore Project) includes all infrastructure and activities located seaward of Mean High Water Springs (MHWS) within the Array Area and Offshore Cable Area of Search (OCAS) (**Figure 1.2: Offshore Project Location, Volume 1b**). Further detailed information is provided in **Chapter 3, Volume 1a**.

1.1.2.3 The Offshore Project is situated off the northwest coast of Isle of Lewis/Eilean Leòdhais and the Array Area is located approximately 5-13 km offshore and is approximately 161 km<sup>2</sup> in size. It will comprise WTGs, foundations, Offshore Cables, Offshore Substation Platform (OSP) (if required), and Landfall. The Array Area combined with the OCAS is defined as the Offshore Project Boundary. The

water depths across the Turbine Area range from 37 m-67 m with the southwest corner of the Array Area reaching 72 m. The proposed WTGs and fixed foundations will be located within a Turbine Area of approximately 140 km<sup>2</sup>, within the Array Area.

## 1.2 PURPOSE OF THIS APPENDIX

1.2.1.1 This appendix describes the following:

- Determine the relationship between the measured background noise levels and standardised 10 m wind speed, based on the Turbine Layout Option 2 (Option 2) maximum hub height of 198.4 m;
- The completed analysis includes the measurement data obtained under all wind direction conditions ('all data');
- Separate analysis graphs are presented for each measurement location, and for quiet daytime and night-time periods;
- Background noise curves (polynomial lines of best fit) are calculated for each measurement location, and for quiet daytime and night-time periods;
- The background noise curves are used to determine operational WTG site-specific noise limits.

## 2 ALL DATA ANALYSIS

### 2.1 MEASUREMENT LOCATION LT1

Plate 2-1: LT1 – Quiet Daytime Background Noise ( $L_{A90,10\text{mins}}$  dB(A)) versus Wind Speed (m/s) – All Data - Standardised from 198.4 m hub height

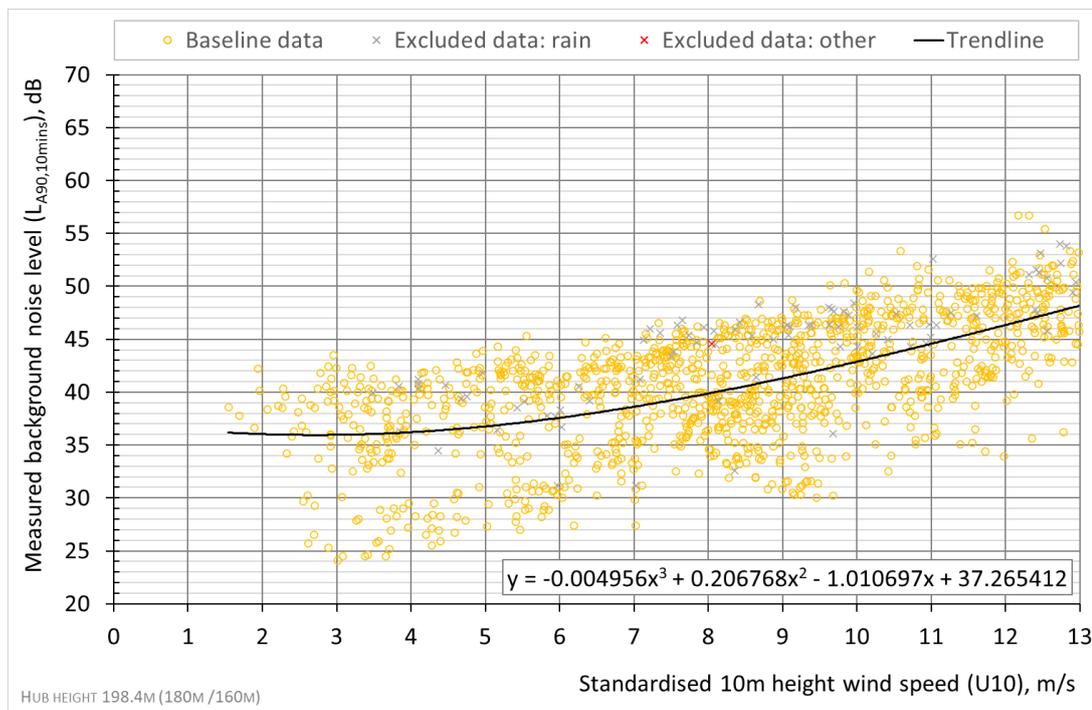
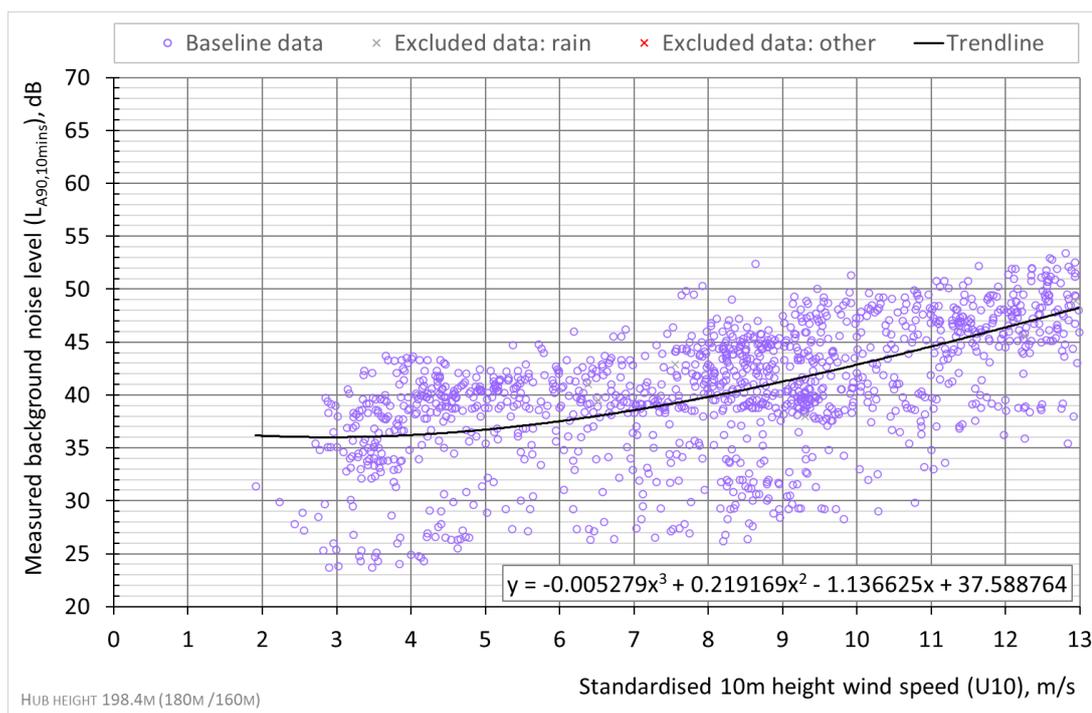


Plate 2-2: LT1 – Night-time Background Noise ( $LA_{90,10\text{mins}}$  dB(A)) versus Wind Speed (m/s) – All Data - Standardised from 198.4 m hub height



## 2.2 MEASUREMENT LOCATION LT2

Plate 2-3: LT2 – Quiet Daytime Background Noise ( $L_{A90, 10\text{mins}}$  dB(A)) versus Wind Speed (m/s) – All Data - Standardised from 198.4 m hub height

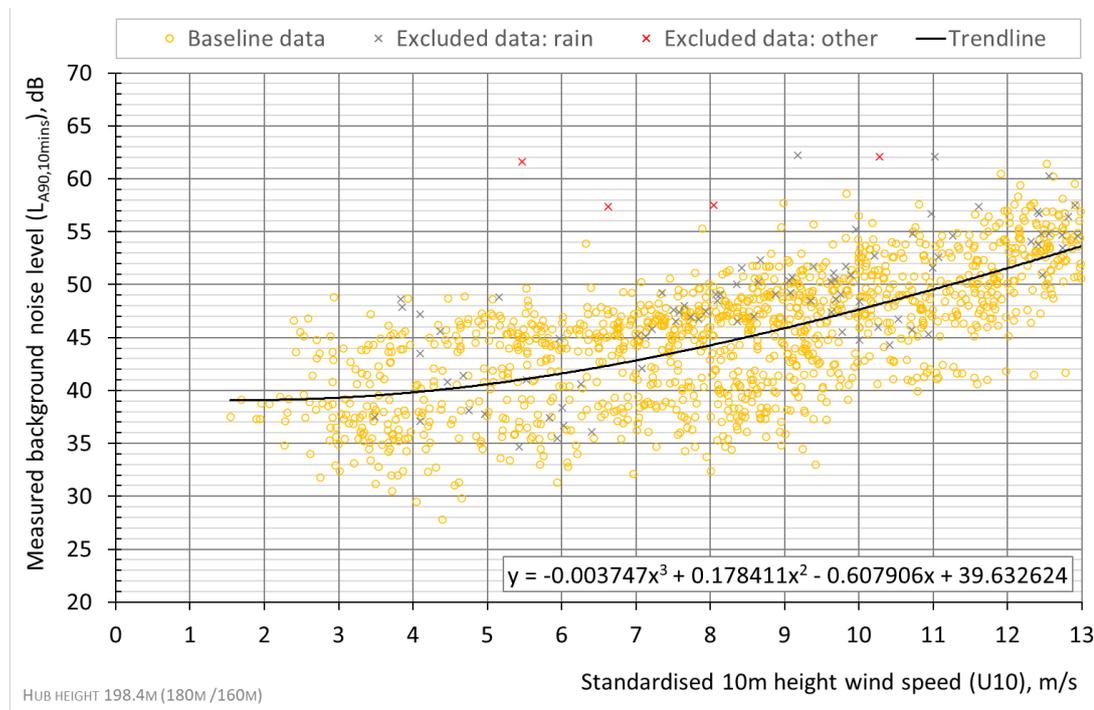
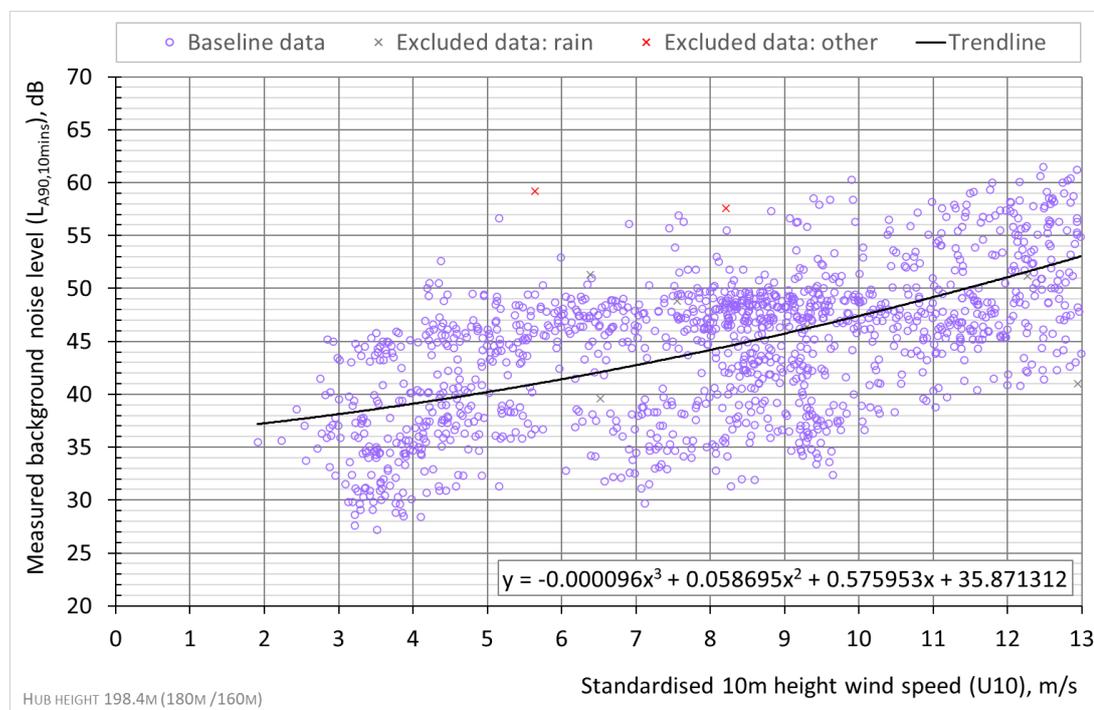


Plate 2-4: LT2 – Night-time Background Noise ( $L_{A90, 10\text{mins}}$  dB(A)) versus Wind Speed (m/s) – All Data - Standardised from 198.4 m hub height



## 2.3 MEASUREMENT LOCATION LT3

Plate 2-5: LT3 – Quiet Daytime Background Noise ( $L_{A90, 10\text{mins}}$  dB(A)) versus Wind Speed (m/s) – All Data - Standardised from 198.4 m hub height

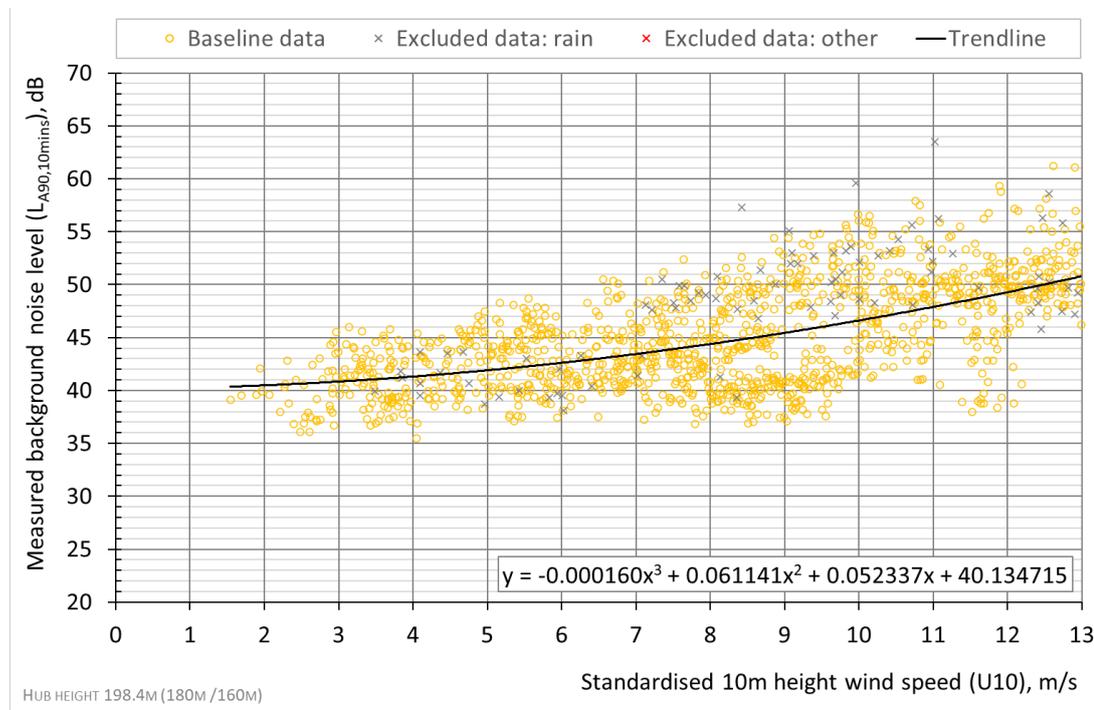
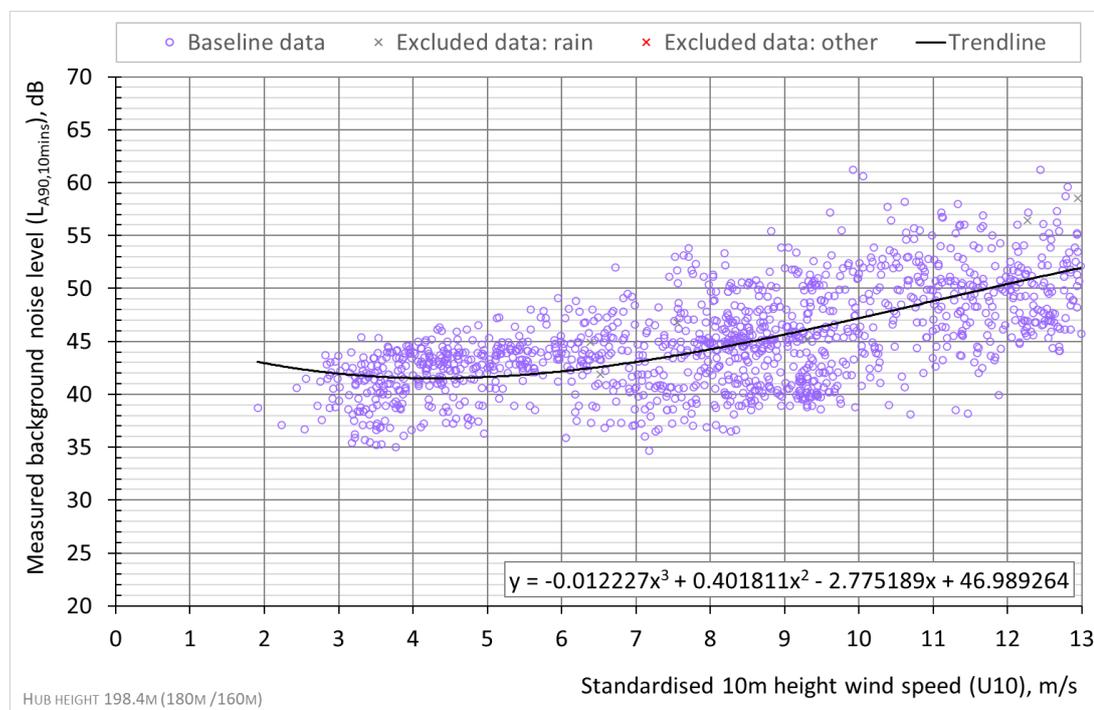


Plate 2-6: LT3 – Night-time Background Noise ( $L_{A90, 10\text{mins}}$  dB(A)) versus Wind Speed (m/s) – All Data - Standardised from 198.4 m hub height



## 2.4 MEASUREMENT LOCATION LT4

Plate 2-7: LT4 – Quiet Daytime Background Noise ( $L_{A90, 10\text{mins}}$  dB(A)) versus Wind Speed (m/s) – All Data - Standardised from 198.4 m hub height

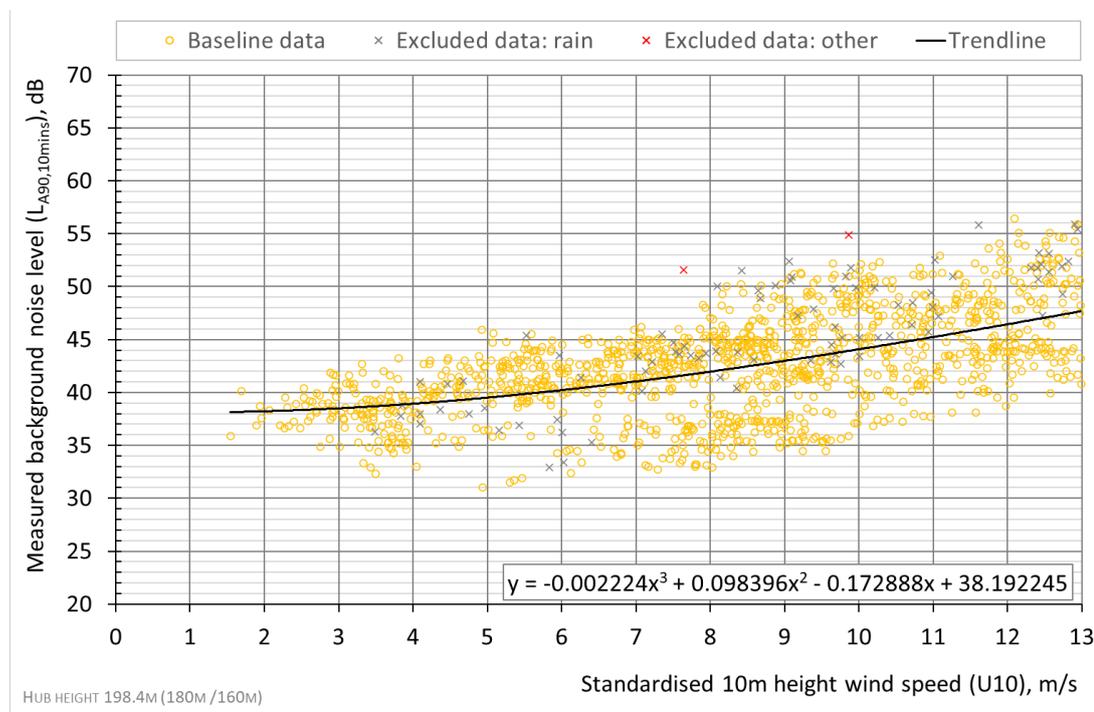
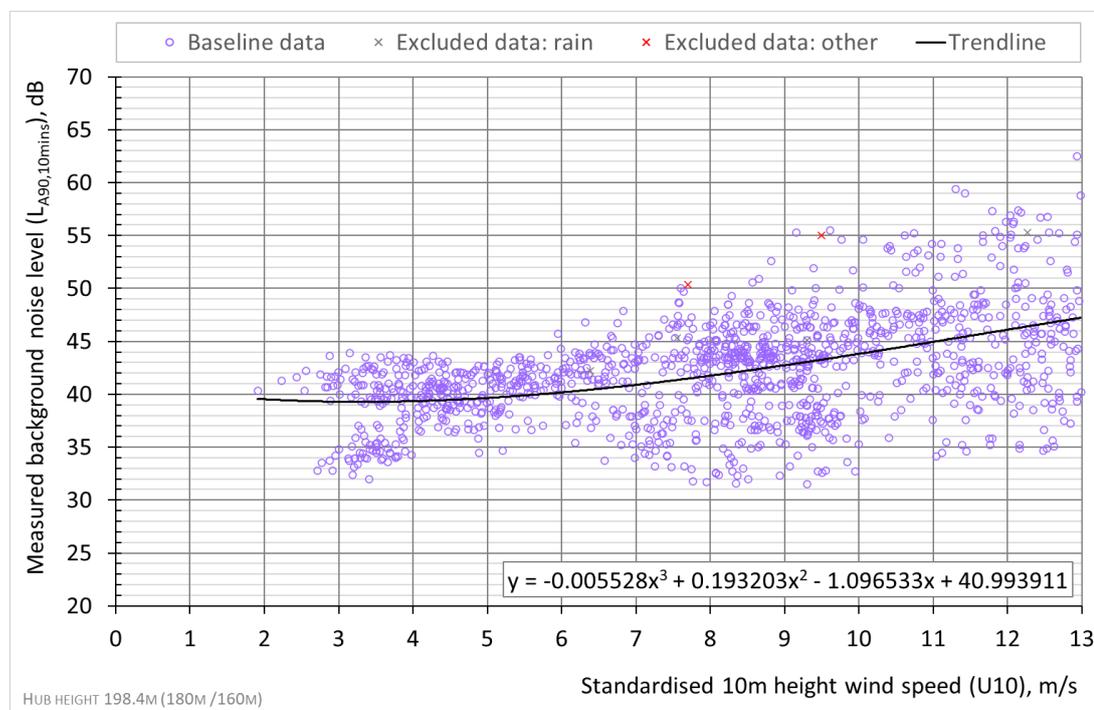


Plate 2-8: LT4 – Night-time Background Noise ( $L_{A90, 10\text{mins}}$  dB(A)) versus Wind Speed (m/s) – All Data - Standardised from 198.4 m hub height



## 2.5 MEASUREMENT LOCATION LT5

Plate 2-9: LT5 – Quiet Daytime Background Noise ( $L_{A90,10\text{mins}}$  dB(A)) versus Wind Speed (m/s) – All Data - Standardised from 198.4 m hub height

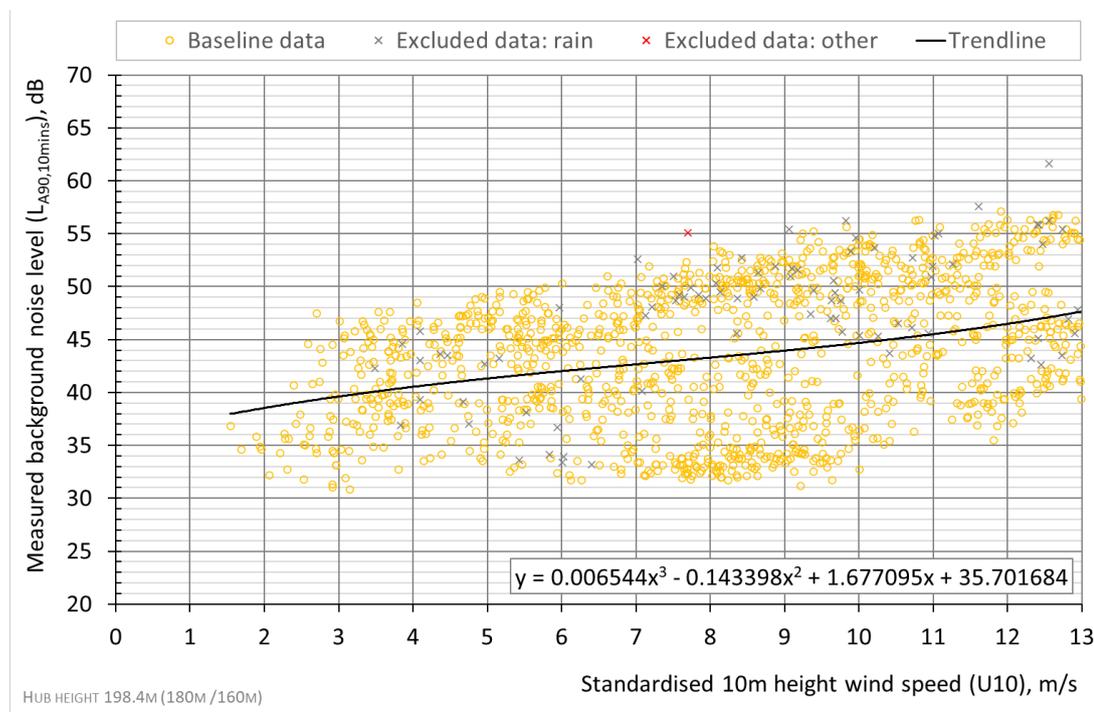
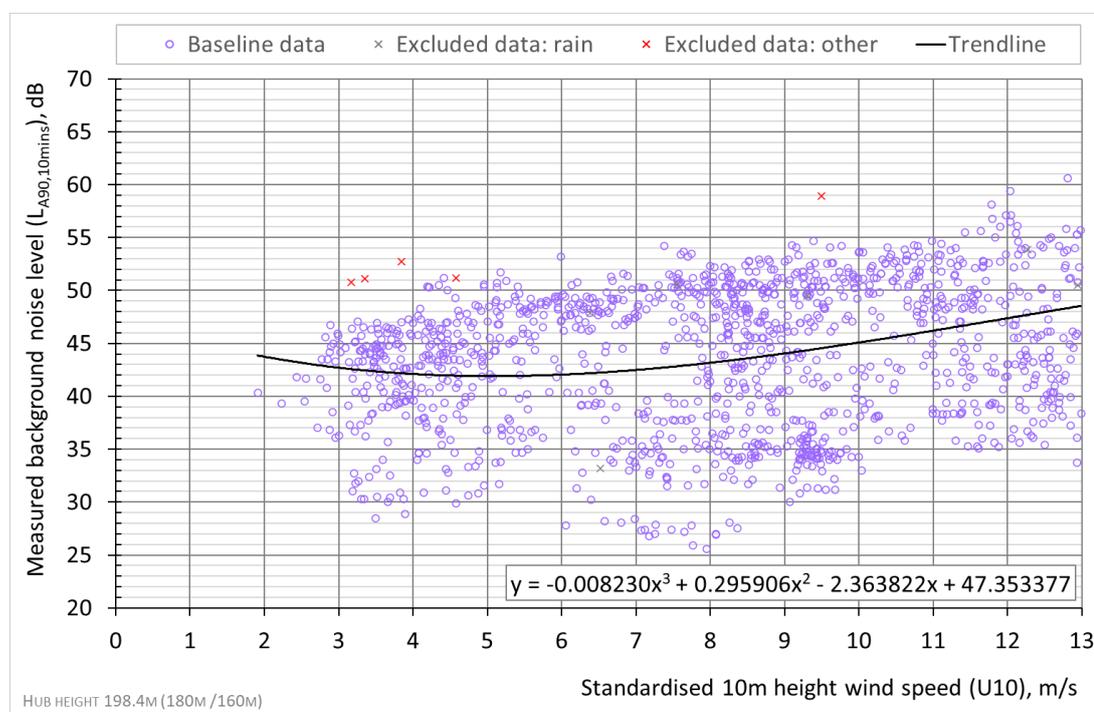


Plate 2-10: LT5 – Night-time Background Noise ( $L_{A90,10\text{mins}}$  dB(A)) versus Wind Speed (m/s) – All Data - Standardised from 198.4 m hub height



## 2.6 MEASUREMENT LOCATION LT6

Plate 2-11: LT6 – Quiet Daytime Background Noise ( $L_{A90, 10\text{mins}}$  dB(A)) versus Wind Speed (m/s) – All Data - Standardised from 198.4 m hub height

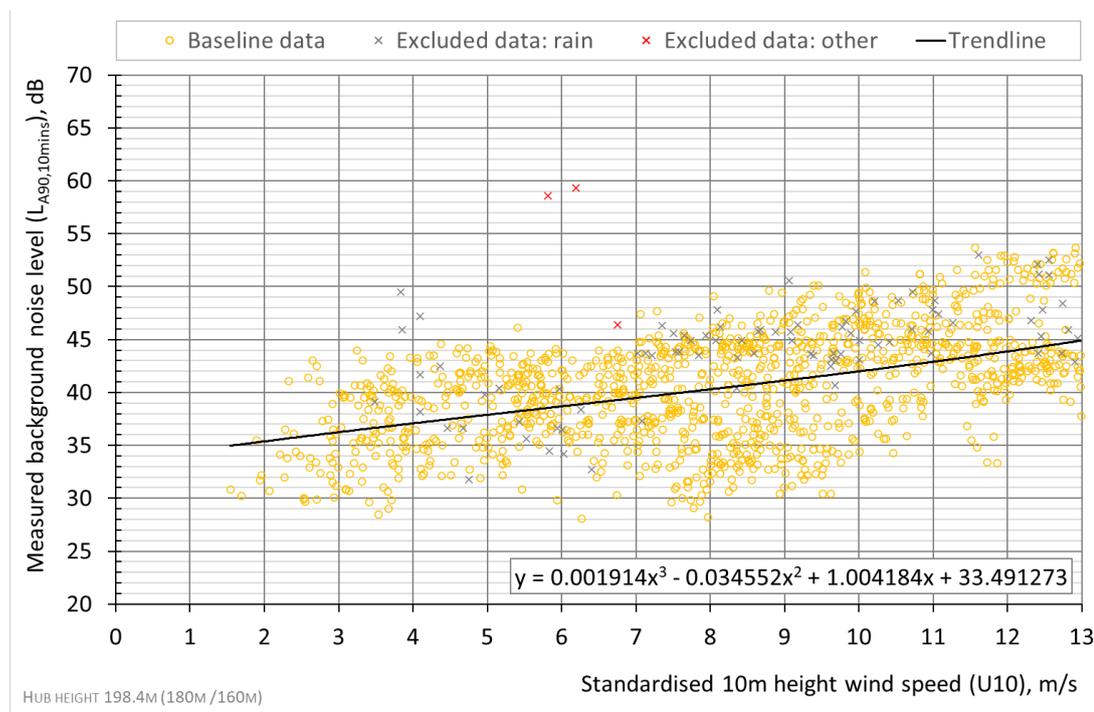
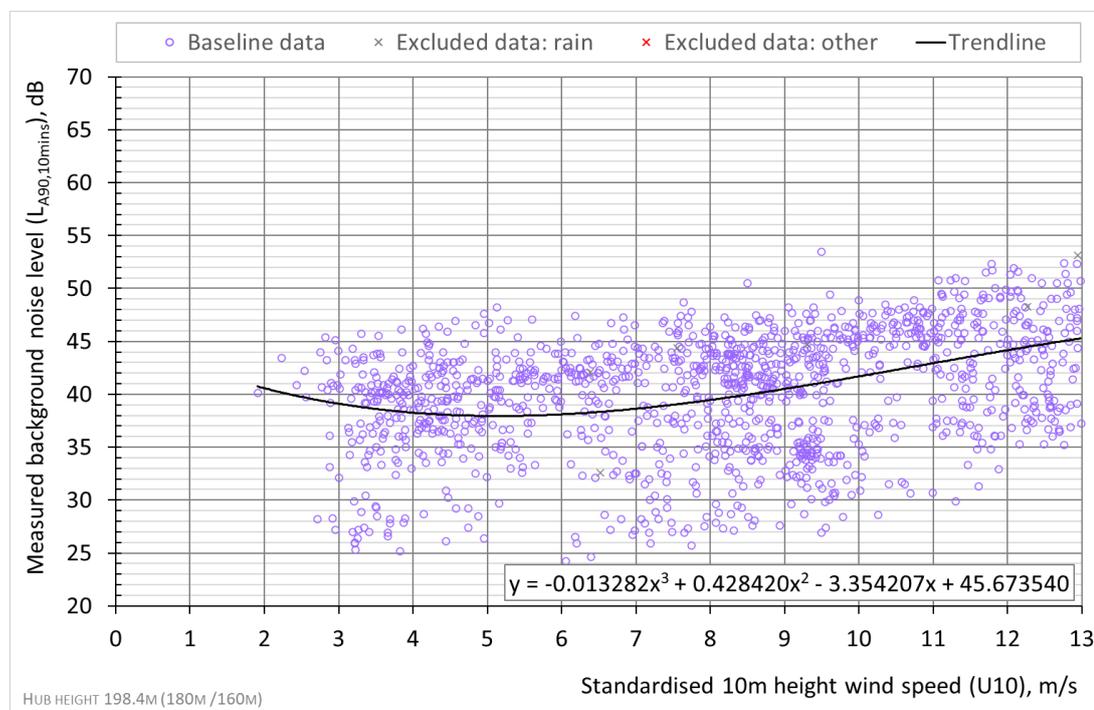


Plate 2-12: LT6 – Night-time Background Noise ( $L_{A90, 10\text{mins}}$  dB(A)) versus Wind Speed (m/s) – All Data - Standardised from 198.4 m hub height



### 3 GLOSSARY OF TERMS AND ABBREVIATIONS

3.1.1.1 A list of key terms and acronyms used in this appendix are provided in **Table 3-1** and **Table 3-2**.

Table 3-1 Acronyms and abbreviations

Term	Definition
dB	Decibel
dB(A)	A-weighted decibel
EIAR	Environmental Impact Assessment Report
m	metres
m/s	Metres per second
MHWS	Mean High Water Springs
OCAS	Offshore Cable Area of Search
OSP	Offshore Substation Platform
OWF	Offshore Wind Farm
WTG	Wind turbine generator

Table 3-2 Glossary

Term	Meaning
A-weighting	Frequency weighted sound level, weighted according to the A-scale, which takes into account the increased sensitivity of the human ear at some frequencies.
$L_{A90,T}$	A statistical noise index defined as the level that is exceeded for 90% of the time over the measurement time-period T. The 'A' denotes that the level is determined with 'A-weighting' applied.
$U_{10}$	Wind speed at standardised 10 m height

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