Iarnród Éireann
Irish Rail

Rosslare ORE Hub

EIAR Technical Appendices

Technical Appendix 19:

Baseline Noise Monitoring Survey

venterra | GDG GAVIN & DOHERTY GEOSOLUTIONS | NICHOLAS O'DWYER an RSK company

Co-funded by the European Union

CLIENT: Irish Rail

PROJECT: Rosslare Europort Baseline Noise Monitoring Survey

Prepared by: AONA Environmental Consulting Ltd.

Date: July 2023

REPORT CONTROL

Client: Irish Rail

Project: Proposed Rosslare Europort Offshore Renewable Energy Hub. Baseline Noise Monitoring Report.

Job Number: ENV-9069

Document Checking:

Author:	Mervyn Keegan, B.Sc, M.Sc.	Initialed:
Review By:	Olivia Maguire, B.Sc, M.Sc.	Initialed:

Issue	Date	Status	Checked for Issue
1	31/07/2023	Final Report	MK
2			

AONA Environmental Consulting Ltd.
Unit 8A, Northwest Business Park
Sligo
F91 E285
www.aonaenvironmental.ie

Registered in Ireland
(Company Registration No. 588684)

Table of Contents

1 Introduction

AONA Environmental has been commissioned by Irish Rail to undertake a continuous baseline noise monitoring survey for the proposed Rosslare Europort Offshore Renewable Energy Hub development. The aim of the noise monitoring survey is to produce a baseline dataset of noise measurements for the proposed Rosslare Europort Offshore Renewable Energy Hub. Baseline noise monitoring surveys have been conducted at four monitoring locations in the area surrounding Rosslare Europort, as shown in Figure 1 and set out in

Table 1. The monitoring locations have been selected with Wexford County Council's Environment Team (as the relevant noise planning authority) to be representative of all groups of sensitive receptors.

Figure 1: Noise monitoring survey station locations.

Table 1: Noise monitoring survey location coordinates (WGS 84/UTM zone 29N)

Noise monitoring survey location reference	Latitude	Longitude
STN 1	52.24997	-6.35355
STN 2	52.2512	-6.34706
STN 3	52.25037	-6.34045
STN 4	52.25004	-6.33587

The assessment and evaluation of the baseline noise environment in proximity to the proposed Rosslare Europort Offshore Renewable Energy Hub development has been undertaken in accordance with the following methodology:

- Baseline Noise Survey – long-term noise monitoring survey including continuous daytime, evening and night-time measurement periods over the course of approximately 3 months at the selected monitoring locations in proximity to the proposed development location. The selected noise monitoring locations are representative of the existing noise climate at the nearest residential receivers to the proposed development site.
- Reference to the EPA Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4) (January 2016 Update).
- Reference to ISO 1996-1:2016 Acoustics — Description, measurement and assessment of environmental noise — Part 1: Basic quantities and assessment procedures and ISO 1996-2, Acoustics - Description, measurement and assessment of environmental noise – Part 2: Determination of environmental noise levels.
- A comparison of the measured existing noise levels and the predicted noise levels at the nearest residential receivers as well as a comparison against relevant noise guidelines such as the World Health Organisation (WHO) *Guidelines for Community Noise*.

2 Methodology

2.1 RELEVANT GUIDELINES

Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4) January 2016

This guidance note assists licensed sites with the assessment of their potential and actual noise impact on the local environment. This guidance is used for assessment of developments other than licenced sites/ applications. This guidance note was updated in January 2016 to provide clear guidance in relation to the background understanding of environmental noise, monitoring and assessment of noise impact as well as applying applicable noise criteria and outlining suitable approaches to noise mitigation design and Best Available Techniques (BAT). The guidance note advises that noise assessment periods are now expressed in terms of day, evening and night and outlines recommended minimum durations for environmental noise surveys. The January 2016 update also provides additional information and clarifications including the following:

- Updated guidance to reflect the publication of BS 4142: 2014,
- Examples of circumstances where it may be appropriate to use detailed reference methods for the assessment of tonality and impulsivity, and;
- Guidance on the use of L_{AF90} in instances where extraneous noise sources may have an influence on measured L_{Aeq} values.

In the EPA Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4) the steps to be followed in order to derive appropriate noise limit criteria are outlined as follows;

Step 1 – Quiet Area Screening of the Development Location

Step 2 – Baseline Environmental Noise Survey

Step 3 – Screen for Areas of Low Background Noise

Step 4 – Determine Appropriate Noise Criteria

Figure 2: Flow Chart for the Identification of Appropriate Noise Criteria

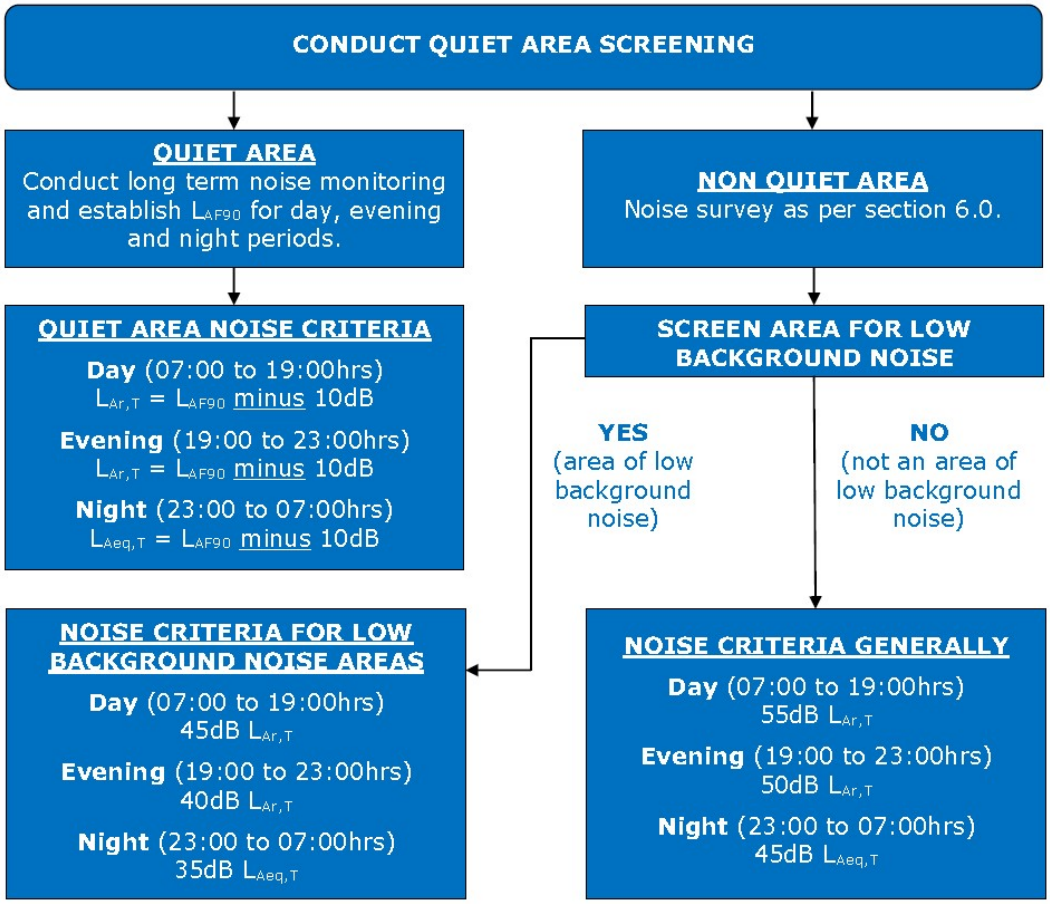


Table 2 outlines the noise limit criteria to be applied depending on the results of the screening processes in Steps 1 and 3, and the noise survey discussed in Step 2.

Table 2: The noise limit criteria to be applied depending on the results of the screening processes.

Scenario	Daytime Noise Criterion, dB $L_{Ar,T}$ (07:00 to 19:00hrs)	Evening Noise Criterion, dB $L_{Ar,T}$ (19:00 to 23:00hrs)	Night-time Noise Criterion, dB $L_{Aeq,T}$ (23:00 to 07:00hrs)
Quiet Area	Noise from the site to be at least 10dB below the average daytime background noise level measured during the baseline noise survey.	Noise from the site to be at least 10dB below the average evening background noise level measured during the baseline noise survey.	Noise from the site to be at least 10dB below the average night-time background noise level measured during the baseline noise survey.
Areas of Low Background Noise	45dB	40dB	35dB
All other Areas	55dB	50dB	45dB

World Health Organisation Guidelines

The World Health Organisation (WHO) published *Guidelines for Community Noise* in April 1999. The WHO guidelines recommend a daytime limit of 50 – 55 dB(A) for outdoor living areas. The report states that "*to protect the majority of people from being seriously annoyed during the daytime, the outdoor sound level from steady continuous noise should not exceed 55 dB L_{Aeq} on balconies, terraces and in outdoor living areas. To protect the majority of people from being moderately annoyed during the daytime, the outdoor sound level should not exceed 50 dB L_{Aeq}. Where it is practical and feasible, the lower outdoor sound level should be considered the maximum desirable sound level for new development*". According to the WHO guidelines noise impacts within dwellings include annoyance, speech interference and sleep disturbance. WHO considers that for bedrooms, the critical effect is sleep disturbance. Guideline values for bedrooms consider that the sleep disturbance criteria should be taken as internal noise levels of 30 dB L_{Aeq} or 45 dB L_{Amax} or external levels of 45 dB L_{Aeq} or 60 dB L_{Amax}. Table 3 shows the WHO Guideline noise levels applicable to residential properties.

Table 3: Guideline values for community noise in specific environments (World Health Organisation, 1999)

Specific Environment	Critical Health Effects	L_{Aeq} (dB)	Time Base (Hrs)	L_{Amax} Fast (dB)
Outdoor Living Area during daytime	Serious Annoyance, daytime & evening Moderate Annoyance, daytime & evening	55 50	16 16	- -
Outside Bedrooms during night-time	Sleep disturbance, window open (outdoor values)	45	8	60

The World Health Organisation (WHO) *Night Noise Guidelines for Europe* (2009) consider that *"below the level of 30 dB $L_{night,outside}$, no effects on sleep are observed except for a slight increase in the frequency of body movements during sleep due to night noise. There is no sufficient evidence that the biological effects observed at the level below 40 dB $L_{night,outside}$ are harmful to*

health. However, adverse health effects are observed at the level above 40 dB $L_{night,outside}$, such as self-reported sleep disturbance, environmental insomnia, and increased use of somnifacient drugs and sedatives. Therefore, 40 dB $L_{night,outside}$ is equivalent to the lowest observed adverse effect level (LOAEL) for night noise".

In recent years, there has been a substantial increase in the number and quality of studies on environmental noise exposure and health impacts. Also, newer studies included noise from sources such as railways and wind turbines. In light of this new evidence, the World Health Organisation (WHO) *Environmental Noise Guidelines for the European Region* (2018) have been published. The main purpose of these guidelines is to provide recommendations for protecting human health from exposure to environmental noise originating from various sources: transportation (road traffic, railway and aircraft) noise, wind turbine noise and leisure noise. Leisure noise in this context refers to all noise sources that people are exposed to due to leisure activities, such as attending nightclubs, pubs, fitness classes, live sporting events, concerts or live music venues and listening to loud music through personal listening devices.

WHO has conducted national surveys on noise annoyance. According to these large-scale surveys, road traffic noise is the most important source of annoyance, generally followed closely by neighbour noise. Aircraft noise can also be a substantial source of annoyance. Railway noise and industrial noise are enumerated less frequently.

WHO has published the following 'strong' recommendations in relation to noise levels produced by road traffic. For average noise exposure, the Guideline Development Group (GDG) strongly recommends reducing noise levels produced by road traffic below 53 dB L_{den}, as road traffic noise above this level is associated with adverse health effects. For night noise exposure, the GDG strongly recommends reducing noise levels produced by road traffic during night time below 45 dB L_{night}, as night-time road traffic noise above this level is associated with adverse effects on sleep. To reduce health effects, the GDG strongly recommends that policy-makers implement suitable measures to reduce noise exposure from road traffic in the population exposed to levels above the guideline values for average and night noise exposure. For specific interventions, the GDG recommends reducing noise both at the source and on the route between the source and the affected population by changes in infrastructure.

2.2 BASELINE NOISE SURVEY METHODOLOGY

A continuous daytime, evening and night-time baseline noise survey at the selected monitoring locations representative of the surrounding residential properties in proximity to the Proposed Rosslare Europort Offshore Renewable Energy Hub site has been undertaken from 23rd March 2023 – 18th July 2023.

The noise measurements were conducted according to international standard ISO 1996-1:2016 *Description and Measurement of Environmental Noise*. EM2010 sound level meters were used during the long-term noise monitoring survey, fitted with a suitable outdoor noise measurement kit, which allows the microphone to retain its Class 1 specifications according to IEC6051 and IEC61672-1 when the weather protection system is in place. Noise measurements were taken at a height of approximately 1.5m above ground level. The noise monitoring location was selected to be representative of the existing background noise level in the area. The sound level meter was set to record data over 15-minute intervals. The meters were calibrated before and after the survey period. The Time Weighting used was Fast and the Frequency Weighting was A-weighted.

The measurement parameters recorded and reported during the baseline noise survey are defined as follows:

- A-weighted Decibel dB(A): Decibels measured on a sound level meter incorporating a frequency weighting (A Weighting) which differentiates between sound of different frequency (pitch) in a similar way to the human ear. This takes account of the fact that the human ear has different sensitivities to sound at different frequencies.
- L_{Aeq} is the A-weighted equivalent continuous steady sound level during the sample period.
- L_{A10} is the A-weighted sound level that is exceeded for 10% of the sample period and is generally used to quantify traffic noise.
- L_{A90} is the A-weighted sound level that is exceeded for 90% of the sample period and is generally used to quantify background noise.

STN 1 - Caragh Lodge (Dennis & Kathleen Lawlor, Caragh Lodge)

A noise and dust combination unit (DM30 (00153) & EM2030 (10153)) and Bergerhoff dust monitoring stand were installed in the back garden of this dwelling. It is located circa. 70 metres from the railway line and circa 600 metres from what was deemed to be the nearest port activity. A water treatment plant is also located towards the back of the house circa 275 metres.

Notes;

Rural location. Quiet area with little or no influence from Rosslare harbour activities.

STN 2 – Irish Rail Employee (Joe Quirke - Dwelling at the end of Cliff Road)

A EM2030 Noise unit with Solar Panel and Bergerhoff dust monitoring stand were installed in the front garden of a dwelling located at the end of the Cliff Road. The entrance to the dwelling is overlooking the west border of the port. The dwelling is located circa 70 metres from the railway line and circa 175 metres from the nearest port activity.

Notes;

Suburban location overlooking Rosslare harbour. Noise climate is influenced by Rosslare harbour activities.

STN 3 – (Tony Keogh House Dwelling at the entrance of Cliff Road)

A noise and dust combination unit (DM30 (00219) & EM2030 (10219)) and Bergerhoff dust monitoring stand were installed in the back garden of this dwelling. It is circa. 40 metres to the railway and circa 120 meters to port activity. This dwelling is overlooking the main loading area for HGVs.

	**Notes;** Suburban location overlooking Rosslare harbour. Noise climate is influenced by Rosslare harbour activities.

STN 4 (noise and dust) - RNLI Station

A noise and dust combination unit (DM30 (00218) & EM2030-A (10218)) and Bergerhoff dust monitoring stand were installed on the RNLI Lookout. It is located circa 120 metres to the main entrance to the port and circa 75 metres to the Irish Rail turntable. This location is between the port and dwellings located on the Bay view Road.

	**Notes;** Suburban location overlooking Rosslare harbour. Noise climate is influenced by Rosslare harbour activities.

3 Description of Existing Environment

3.1 BACKGROUND NOISE LEVELS & OPERATIONAL NOISE LIMITS

The existing environment in the area of the proposed Rosslare Harbour is described in accordance with the EPA Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4).

The surrounding area is mainly commercially developed harbour estate and the surrounding urbanised area includes relatively densely built-up residential, infrastructure and commercial development. The area includes a main arterial route, the N25, and existing railway to the Rosslare Europort.

Step 1 – Quiet Area Screening of the Development Location

Site Details	
Site Name	Proposed Rosslare Europort Offshore Renewable Energy Hub
Licence Application Reference	N/A
Site Address	Rosslare Harbour, Co. Wexford
Quiet Area Screening of the Development Location	
Screening Question	**Answer – Yes / No**
Is the site >3km away from urban areas with a population >1,000 people?	No, ~3Km to Rosslare.
Is the site >10km away from urban areas with a population >5,000 people?	Yes, ~12Km to Wexford
Is the site >15km away from urban areas with a population >10,000 people?	No, ~12Km to Wexford
Is the site >3km away from any local industry?	No, some local small scale industry.
Is the site >10km away from any major industry centre?	Yes, ~12Km to Wexford
Is the site >5km away from any national primary route?	No, <200m to N25 / E30
Is the site >7.5km away from any motorway or dual carriageway?	Yes.
QUIET AREA?	No.
Other Relevant Comments	The site is not considered to be a "Quiet Area" as per EPA NG4.

Step 2 – Baseline Environmental Noise Survey

While the screening process in Step 1 has not identified a quiet area, a continuous daytime, evening and night-time noise measurement survey has been undertaken at the application site boundary closest to the nearest residential property. The noise monitoring location (NML 1) is shown in Figure 2 which is representative of the prevailing background noise level for the area.

The site area is dominated by traffic noise on the N25 and existing Rosslare Harbour noise sources dominating the noise sources in proximity to the site.

Site Details		
Site Name		Proposed Rosslare Europort Offshore Renewable Energy Hub
Licence Application Reference		N/A
Site Address		Rosslare Harbour, Co. Wexford
Baseline Noise Survey – Set Up of Equipment		
Start Date		23rd March 2023 – 18th July 2023
Start Time & Duration (hh:mm)		Continuous
Noise Meter Set to Record	L_{Aeq}	Yes
	L_{AF90}	Yes
	L_{AFMax}	Yes
	Set to record LLeq in 1/3 octaves	No
	At 15-minute intervals	Yes – 15-minute intervals
	Set to nearest 15-minute period	Yes – to nearest 15-minute interval

A summary of the results of the background noise monitoring survey are presented in Table 4 below. All noise measurement data is available to Irish Rail in a Microsoft Excel Sheet format.

Table 4: Summary of the results of the baseline noise monitoring survey period (Average values obtained during each reporting period, Daytime, Evening & Night-time).

DAYTIME – 12-hour (0700 – 1900)				
Location	**$L_{Aeq, 12\ Hour}$**	**L_{AMax}**	**$L_{A10, 12\ Hour}$**	**$L_{A90, 12\ Hour}$**
STN 1	47.0	61.4	49.4	40.9
STN 2	44.2	57.7	46.2	40.0
STN 3	54.7	67.9	57.4	49.3
STN 4	57.7	70.3	60.0	53.2
EVENING – 4-hour (1900 – 2300)				
Location	**$L_{Aeq, 4\ Hour}$**	**L_{AMax}**	**$L_{A10, 4\ Hour}$**	**$L_{A90, 4\ Hour}$**
STN 1	43.0	54.9	45.1	38.3
STN 2	42.7	53.9	44.5	39.4
STN 3	52.4	65.3	54.8	47.3
STN 4	56.3	68.6	58.4	52.3
NIGHT-TIME – 8-hour (2300 – 0700)				
Location	**$L_{Aeq, 8\ Hour}$**	**L_{AMax}**	**$L_{A10, 8\ Hour}$**	**$L_{A90, 8Hour}$**
STN 1	40.3	51.2	42.7	35.4
STN 2	40.4	50.7	42.2	37.4
STN 3	49.9	61.4	51.9	45.9
STN 4	53.0	64.3	54.9	49.3

Step 3 – Screen for Areas of Low Background Noise

For all areas not identified as Quiet Areas in Step 1, the existing background noise levels measured during the environmental noise survey, should be examined to determine if they satisfy the following criteria:

- Average Daytime Background Noise Level ≤40dB L_{AF90} - **No**
- Average Evening Background Noise Level ≤35dB L_{AF90} - **No**
- Average Night-time Background Noise Level ≤30dB L_{AF90} - **No**

As all three of the above criteria are not satisfied, this location is not deemed to be an area of low background noise, and the reduced noise limits detailed in Step 4 are not applicable at receivers in proximity to this proposed development location.

Step 4 – Determine Appropriate Noise Criteria

The noise limit criteria, as outlined below, have been determined based on the results of the screening processes discussed in Steps 1 and 3, and the noise survey discussed in Step 2 above.

Table 5: Recommended Operational Noise Limits.

Scenario	Daytime Noise Criterion, dB $L_{Ar,T}$ (07:00 to 19:00hrs)	Evening Noise Criterion, dB $L_{Ar,T}$ (19:00 to 23:00hrs)	Night-time Noise Criterion, dB $L_{Aeq,T}$ (23:00 to 07:00hrs)
'All other areas'	55dB	50dB	45dB

3.2 CONSTRUCTION NOISE LIMITS

There are no Irish statutory limits regarding construction noise. BS5228-1:2009+A1:2014 '*Code of practice for noise and vibration control on construction and open site – Part 1: Noise'*, provides guidance on assessing the potential significance of noise effects from construction activities in Annex E. In relation to Construction Noise Limits, BS 5228-1:2009+A1: 2014 Noise and Vibration Control on Construction and Open Sites Part 1: Noise details the 'ABC method', which recommends a construction noise limit based on the existing ambient noise level. General and short-term construction noise impacts that are deemed typical of any construction site noise sources, including activities such as ground preparation, site clearance, foundation earthworks, roadway construction, erection of new buildings, etc. are assessed in accordance with the 'ABC method' defined in BS 5228. The ambient noise levels have been determined through the baseline noise survey and then rounded to the nearest 5dB to determine the appropriate category (A, B or C) and subsequent threshold value. A potential significant effect is indicated if the construction noise level exceeds the appropriate category threshold value. If the existing ambient level exceeds the threshold category threshold values, then a potential significant impact is indicated if the total

noise level, including both the ambient noise and the various contributions of construction noise, is greater than the ambient noise level by more than 3dB. Table 6, reproduced from BS 5228, demonstrates the criteria for selection of a noise limit for a specific receptor location.

Table 6: Construction noise threshold levels based on the BS 5228 'ABC' method.

Assessment Category and Threshold value period (L_{Aeq})	**Threshold value, in decibels (dB)**		
	Category A (A)	**Category B (B)**	**Category C (C)**
Night time (23.00 to 07.00)	45	50	55
Evening and weekends (D)	55	60	65
Daytime (07.00 – 19.00) and Saturdays (07.00 - 13.00)	**65**	70	75

Notes:

Category A: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are less than these values.

Category B: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are the same as category A values.

Category C: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are higher than category A values.

19.00–23.00 weekdays, 13.00–23.00 Saturdays and 07.00–23.00 Sundays.

No night-time or evening construction works will take place. At the nearest noise sensitive receptors, the ambient noise levels (rounded to the nearest 5 dB) are approximately 55 dB $L_{Aeq,T}$ during daytime. Therefore, all noise sensitive receptors fall into Category A of the 'ABC' assessment methodology. Hence, daytime construction noise will be subject to a limit of 65 dB $L_{Aeq,T}$.

4 Conclusions

AONA Environmental has been commissioned by Irish Rail to undertake a continuous baseline noise monitoring survey for the proposed Rosslare Europort Offshore Renewable Energy Hub development. Baseline noise monitoring surveys have been conducted at four monitoring locations in the area surrounding Rosslare Europort.

The baseline noise monitoring surveys have allowed for a comparison of the measured background noise levels in proximity to the nearest noise sensitive properties to the relevant guideline noise limits outlined in the World Health Organisation (WHO) noise guidelines and the EPA Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4).

The measured existing noise levels are broadly in accordance with the relevant guideline noise levels outlined in the World Health Organisation (WHO) noise guidelines at the monitoring locations STN 1, STN 2 and STN 3. The measured existing noise levels are broadly in accordance with the relevant daytime guideline noise levels outlined in the World Health Organisation (WHO) noise guidelines at the monitoring location STN 4 but are in excess of the relevant night-time guideline noise levels outlined in the World Health Organisation (WHO) noise guidelines at the monitoring location STN 4.

APPENDIX A

Summary of Noise Levels recorded at STN 1 – STN 4

Chart 1: Summary of noise levels recorded at STN 1.

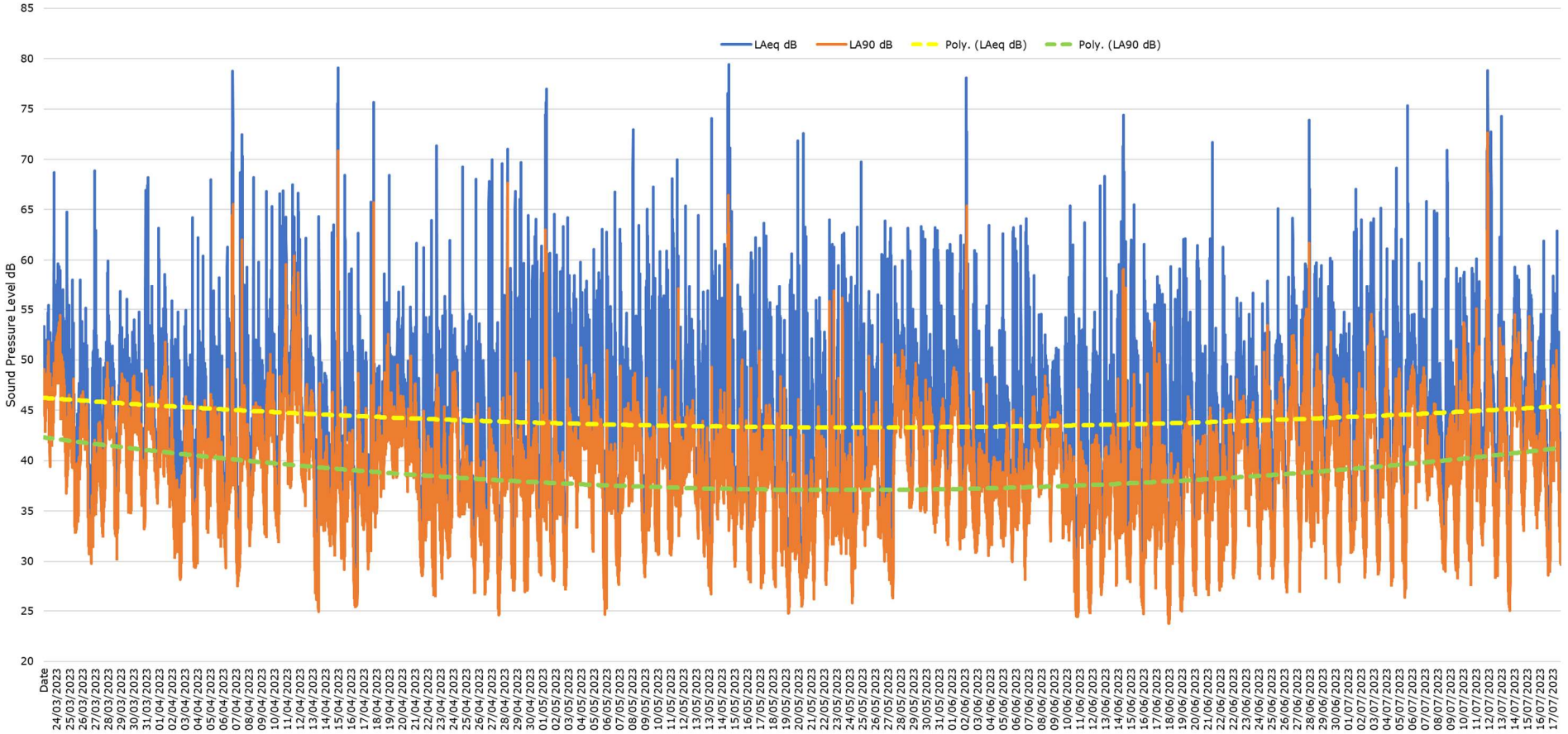


Chart 2: Summary of noise levels recorded at STN 2.

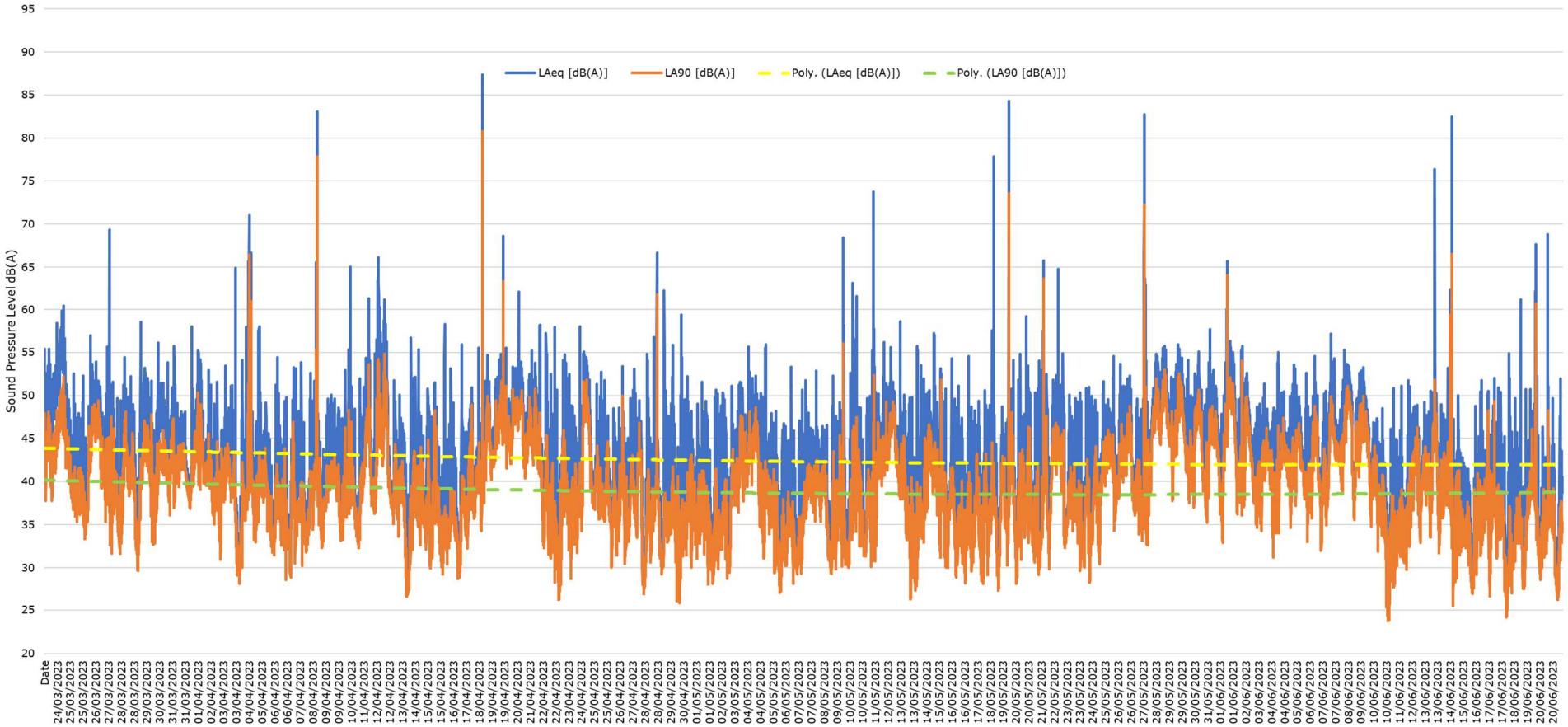
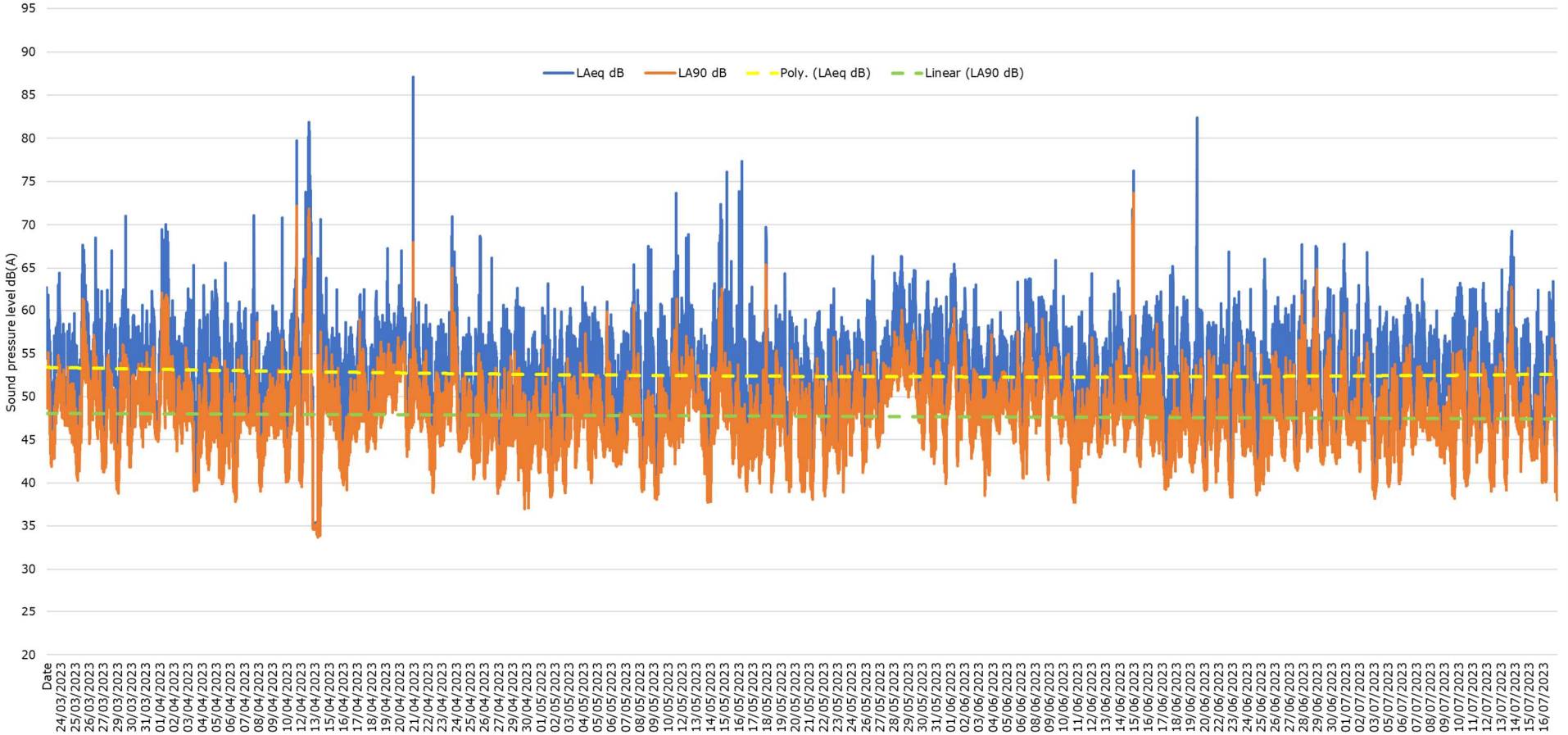


Chart 3: Summary of noise levels recorded at STN 3.



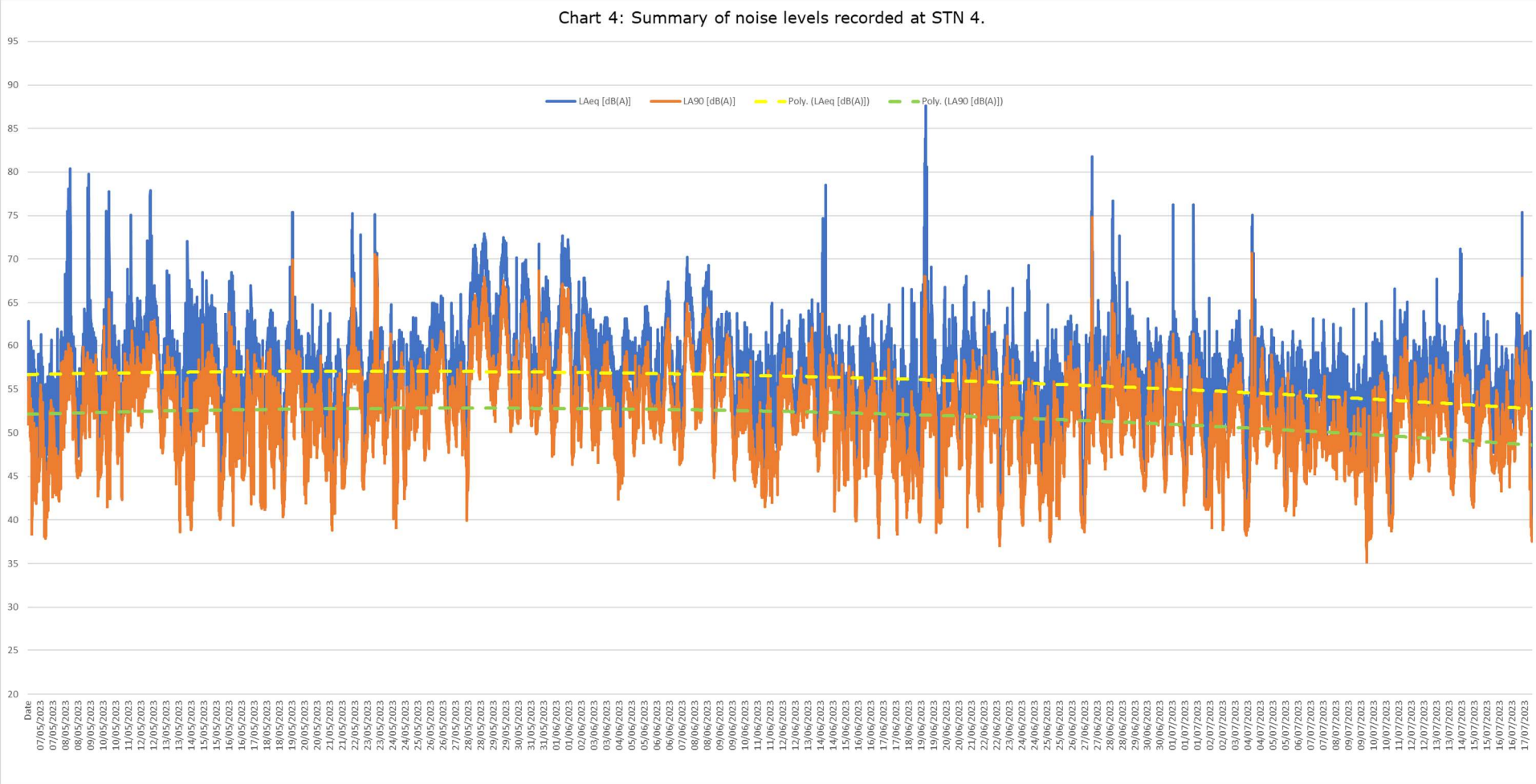


Chart 4: Summary of noise levels recorded at STN 4.
LAeq [dB(A)]
LA90 [dB(A)]
Poly. (LAeq [dB(A)])
Poly. (LA90 [dB(A)])
95
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
Date