



**Independent Acoustic
Consultancy Practice**

Environmental Noise Assessment

**Proposed CFBT Facility
Neath**

6514/ENS1_REV1

Environmental Noise Assessment

Project:	Proposed CFBT Facility
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1. INTRODUCTION

We understand that a Carbonaceous Fire Training Unit (CFBT) Facility is to be developed at Mid & West Fire Service's Earlswood Training Centre, Jersey Marine, Neath, SA10 6NG.

It is understood the CFBT Facility is to comprise a 'burn house' with associated smoke extract and smoke cleaning plant. The proposed operating hours of the facility are:

- Monday to Friday 0900-2200hrs
- Saturday and Sunday 0900-1700hrs

This report has therefore been commissioned to assess existing ambient and background noise levels on the development site in order to set atmospheric plant noise limits at nearest sound sensitive receivers.

2. CRITERIA

2.1 Planning Conditions

Neath Port Talbot County Borough Council has included the following conditions on the planning consent:

3. Prior to commencement of the development, the applicant shall submit a scheme detailing how the specified sound rating levels within the noise impact assessment hereby approved will be achieved. The scheme, which shall be submitted to and approved in writing by the local planning authority, shall include specific details of any sound attenuation equipment that may be necessary to achieve the stipulated sound rating levels within the report. Development shall thereafter only proceed in accordance with the approved scheme and details contained therein.

9. The noise rating level of the extractor plant shall not be greater than the background sound level +5dB when measured at the nearest sensitive receptor, when assessed in accordance with the methodology and principles set out in 'BS4142:2014 Methods for rating and assessing industrial and commercial sound'.

2.2 British Standard 4142:2014

British Standard 4142:2014 "Methods for rating and assessing industrial and commercial sound", provides current guidance for the assessment of industrial noise affecting residential receivers.

This standard describes a rating method comparing L_{Aeq} noise levels from the industrial source with pre-existing background L_{A90} levels at the residential receiver. It advises at a difference (industrial noise - background) of:

- +10dB or higher, likely to be an indication of a significant adverse impact, depending on the context.
- A difference of + 5dB, likely to be an indication of an adverse impact, depending on the context.
- The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.

A sliding scale of penalties can be applied to industrial/commercial sound levels which have acoustically distinguishing characteristics, including tonality, impulsivity and intermittency.

Tonality – A penalty of 2dB for a tone which is just perceptible at the noise receptor, 4dB where it is clearly perceptible, and 6dB where it is highly perceptible.

Impulsivity – A penalty of 3dB for impulsivity which is just perceptible at the noise receptor, 6dB where it clearly perceptible, and 9dB where it is highly perceptible.

Other sound characteristics – Where the specific sound features characteristics that are neither tonal nor impulsive, though otherwise are readily distinctive against the residual acoustic environment, a penalty of 3dB can be applied

Intermittency – If intermittency is readily distinctive against the residual acoustic environment, a penalty of 3dB can be applied.

BS 4142:2014 states under section 11;

“Where the initial estimate of the impact needs to be modified due to the context, take all pertinent factors into consideration, including the following.

- 1) The absolute level of sound. For a given difference between the rating level and the background sound level, the magnitude of the overall impact might be greater for an acoustic environment where the residual sound level is high than for an acoustic environment where the residual sound level is low.*

Where background sound levels and rating levels are low, absolute levels might be as, or more, relevant than the margin by which the rating level exceeds the background. This is especially true at night.

Where residual sound levels are very high, the residual sound might itself result in adverse impacts or significant adverse impacts, and the margin by which the rating level exceeds the background might simply be an indication of the extent to which the specific sound source is likely to make those impacts worse.”

3. ENVIRONMENTAL NOISE SURVEY

3.1 Sound Sensitive Receivers (SSRs)

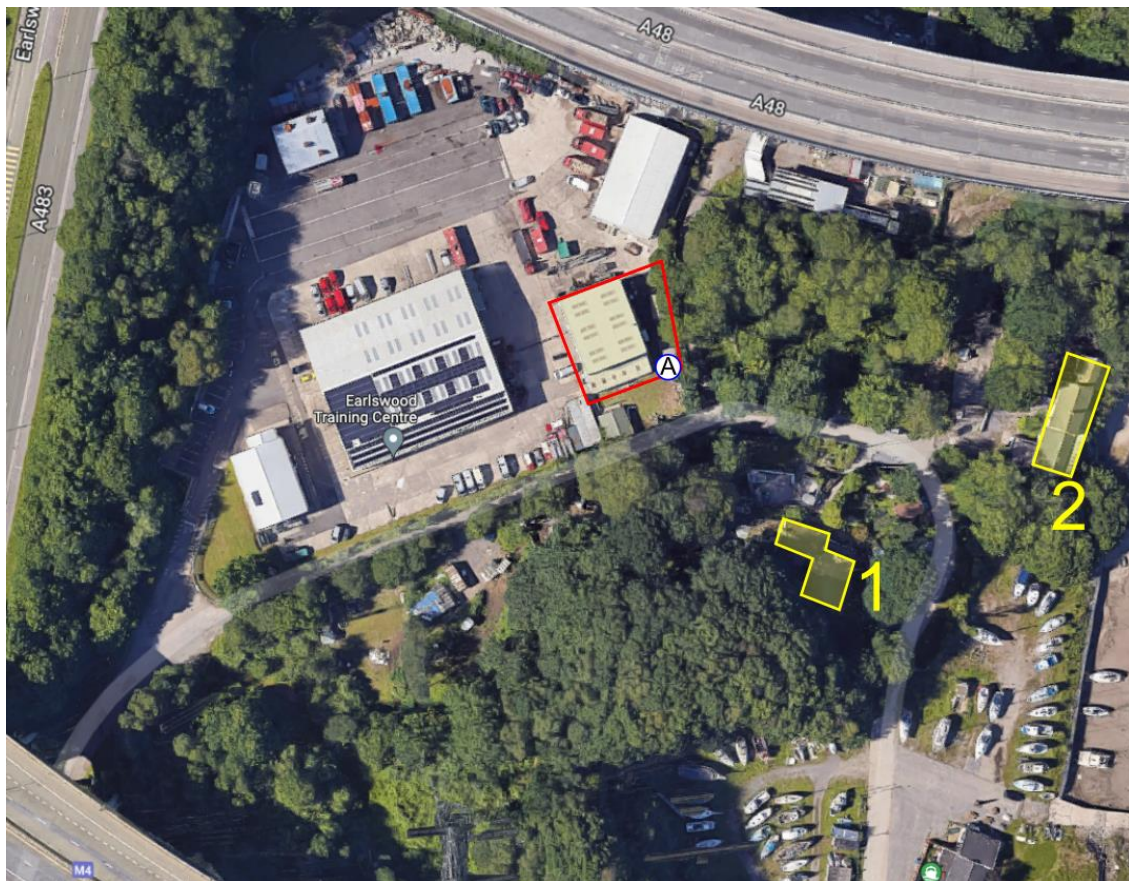
The nearest SSRs to the development site include:

The closest noise sensitive receivers are Earlswood Cottages (<50m south-east) and Ferryboat House (90m to the east).

1. Earlswood Cottages (<50m south-east)
2. Ferryboat House (90m to the east)

These are highlighted in Figure 3.1 below;

Figure 3.1 – Nearest Sound Sensitive Receivers (SSRs)



3.2 Procedure

Continuous noise monitoring was carried out from 1300hrs on Thursday, 07 April 2022 to 1300hrs on Friday, 08 April 2022 at position A.

Data including L_{Amax} , L_{Aeq} and background L_{A90} was logged at 15 minute intervals over the monitoring period, along with continuous audio and 100ms data to allow source identification and further detailed analysis of results if required.

Site plan in Figure 3.1 above shows the development site and continuous monitoring positions used, namely:

Table 3.1 – Continuous Monitoring Location Details

Position	Description
A	Microphone attached to fence post near south-eastern site boundary. Position deemed representative of nearest SSRs.

Note: Microphone position approximately 1.5m above local ground level (free-field).

3.3 Meteorological Conditions

Approximate weather conditions are shown in time history graph in Figure B.1 and Figure B.2 of Appendix B.

To summarise, the weather conditions during the monitoring period were generally dry and calm. Wind speeds were generally below 18km/h (<5m/s referenced in BS 4142:2014) during the assessment period.

A short shower occurred for approx. 45mins from 0945hrs on the 8th April – this is not shown to have significantly affected monitoring results.

3.4 Measurement Equipment

The following measurement equipment was used during the surveys:

Table 3.2 – Noise Monitoring Equipment List

Make	Description	Model	Serial Number	Last Calibrated	Certificate No.
Norsonic AS	Calibrator (114.08dB @ 1kHz)	1251	31429	01 March 2022	UCRT21/1323
NTi	Type 1 - Sound Level Meter	XL2-TA	A2A-10021-E0	17 August 2021	TCRT21/1568
	Preamplifier	MA220	5435	17 August 2021	TCRT21/1568
	Microphone Capsule	MC230	8547	17 August 2021	TCRT21/1568

Measurement systems were calibrated before and after the surveys and no variation occurred.

Note: Copies of traceable calibration certificates for all equipment are available upon request.

3.5 Results

Time history graph in Figure B.3 of Appendix B show L_{Amax} , L_{Aeq} and L_{A90} sound pressure levels measured at position A. Referring to the time history chart background sound levels from road traffic noise remain consistent between 0900hrs and 1800hrs, but drop off afterwards.

Graph Figure B.4 of Appendix B shows a statistical analysis of background sound levels measured at position A. For a robust assessment $L_{A90,15min}$ values have been analysed for the evening period.

The following minimum consistent background $L_{A90,1hr}$ sound levels have been determined;

Table 3.3 – Minimum Consistent Daytime Background L_{A90} Results

Period	Position A
Daytime (0900-1800hrs) $L_{A90,1hr}$ (dB)	55
Evening (1800-2200hrs) $L_{A90,15min}$ (dB)	50

Ambient & background sound climate at Position A was controlled by M4, A48 & A483 road traffic noise.

4. PLANT NOISE LIMITS

At this stage, based on results of noise monitoring at Position A, the following plant rating limits are proposed for CFBT plant at the nearest sound sensitive receivers (SSRs) in line with planning conditions:

Table 4.1 – Proposed Plant Rating Limits at Nearest SSRs

Period	Plant Rating Limits $L_{Ar,Tr}$ (dB)
Daytime Operational Hours (0900-2200hrs)	55dB

These criteria are to apply at the closest Sound Sensitive Receivers with all plant operating normally.

5. CONCLUSION

An environmental noise survey has been carried out for the Proposed CFBT Facility, Earlswood Training Centre, Neath, SA10 6NG.

Road traffic is indicated to control the ambient and background sound climate at the sound sensitive receivers during the proposed operating hours.

Based on survey results, noise criteria at existing sound sensitive receivers have been proposed for new CFBT plant in line with the planning conditions.

APPENDIX A - ACOUSTIC TERMINOLOGY

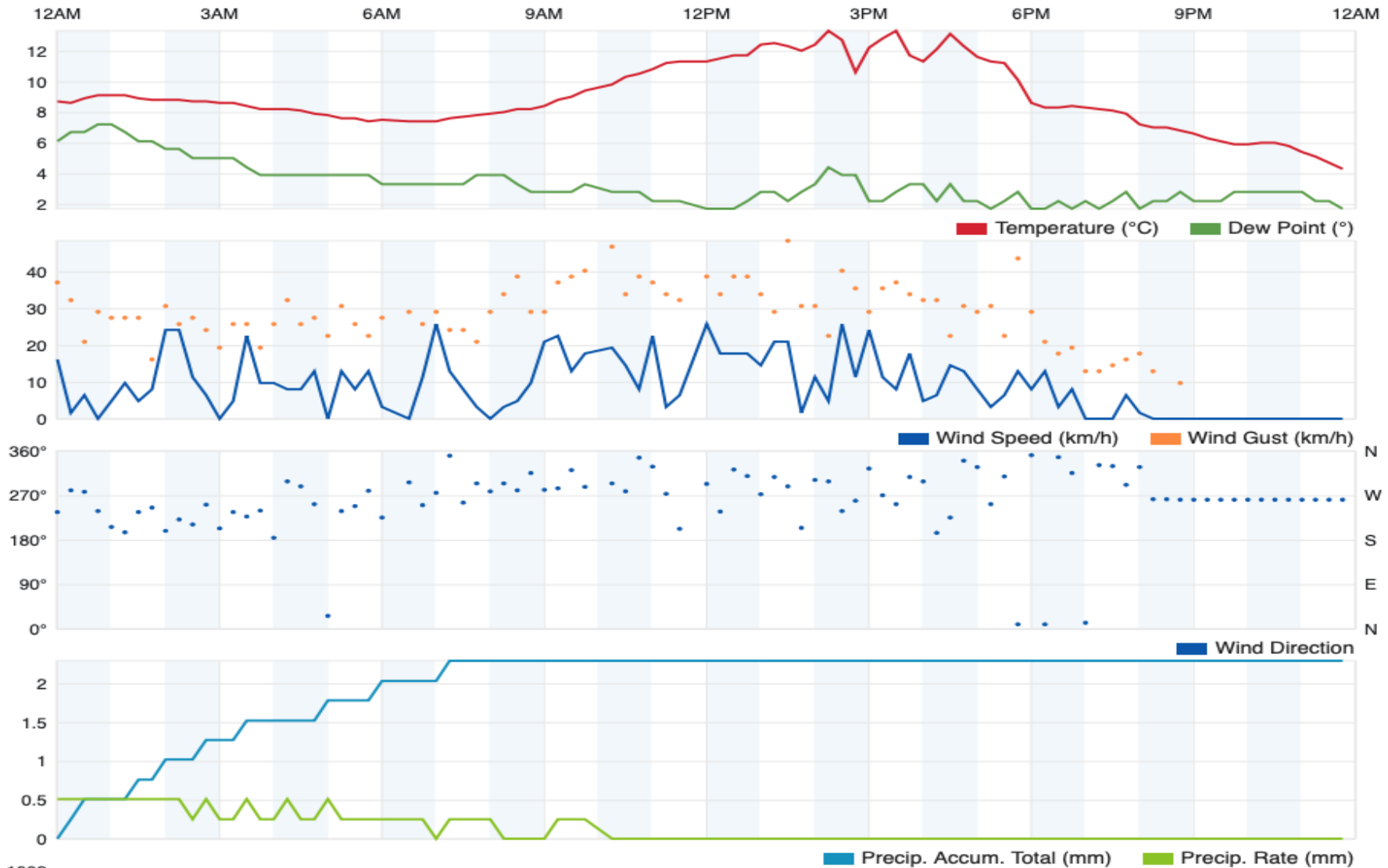
Human response to noise depends on a number of factors including loudness, frequency content and variations in level with time. Various frequency weightings and statistical indices have been developed in order to objectively quantify 'annoyance'.

The following units have been used in this report:

dB(A)	The sound pressure level A-weighted to correspond with the frequency response of the human ear and therefore a persons' subjective response to frequency content.
L_{eq}	The equivalent continuous sound level is a notional steady state level which over a quoted time period would have the same acoustic energy content as the actual fluctuating noise measured over that period.
L_{max}	The highest instantaneous sound level recorded during the measurement period.
L_{10}	The sound level which is exceeded for 10% of the measurement period. i.e. The level exceeded for 6 minutes of a 1 hour measurement - used as a measure of background noise.
L_{90}	The sound level which is exceeded for 90% of the measurement period. i.e. The level exceeded for 54 minutes of a 1 hour measurement - used as a measure of background noise.
$L_{Ar,Tr}$	The 'rating' level, as described in BS 4142:2014 – the specific noise plus any adjustment for the characteristic features of the noise.
SSR	Sound sensitive receiver

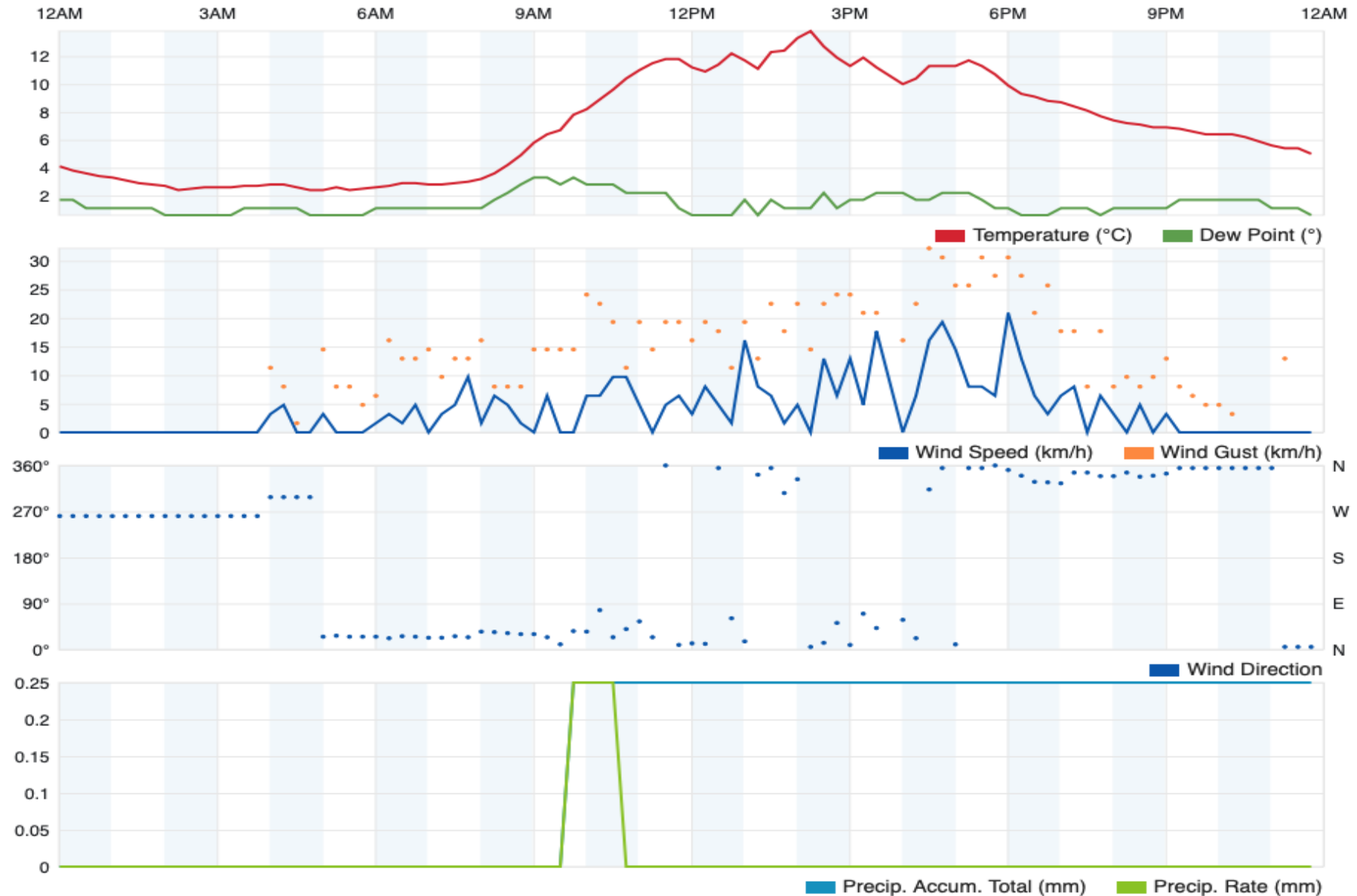
APPENDIX B - DIAGRAMS, GRAPHS AND TABLES

Figure B.1 – Approximate Weather History for Thursday, 07 April 2022



Note: Taken from www.wunderground.com - weather station ISOUTHWA2 located in Briton Ferry [Elev 8m, 51.642° N, 3.818° W]

Figure B.2 – Approximate Weather History for Friday, 08 April 2022



Note: Taken from www.wunderground.com - weather station ISOUTHWA2 located in Briton Ferry [Elev 8m, 51.642° N, 3.818° W]

Figure B.3 – Time History at Position A

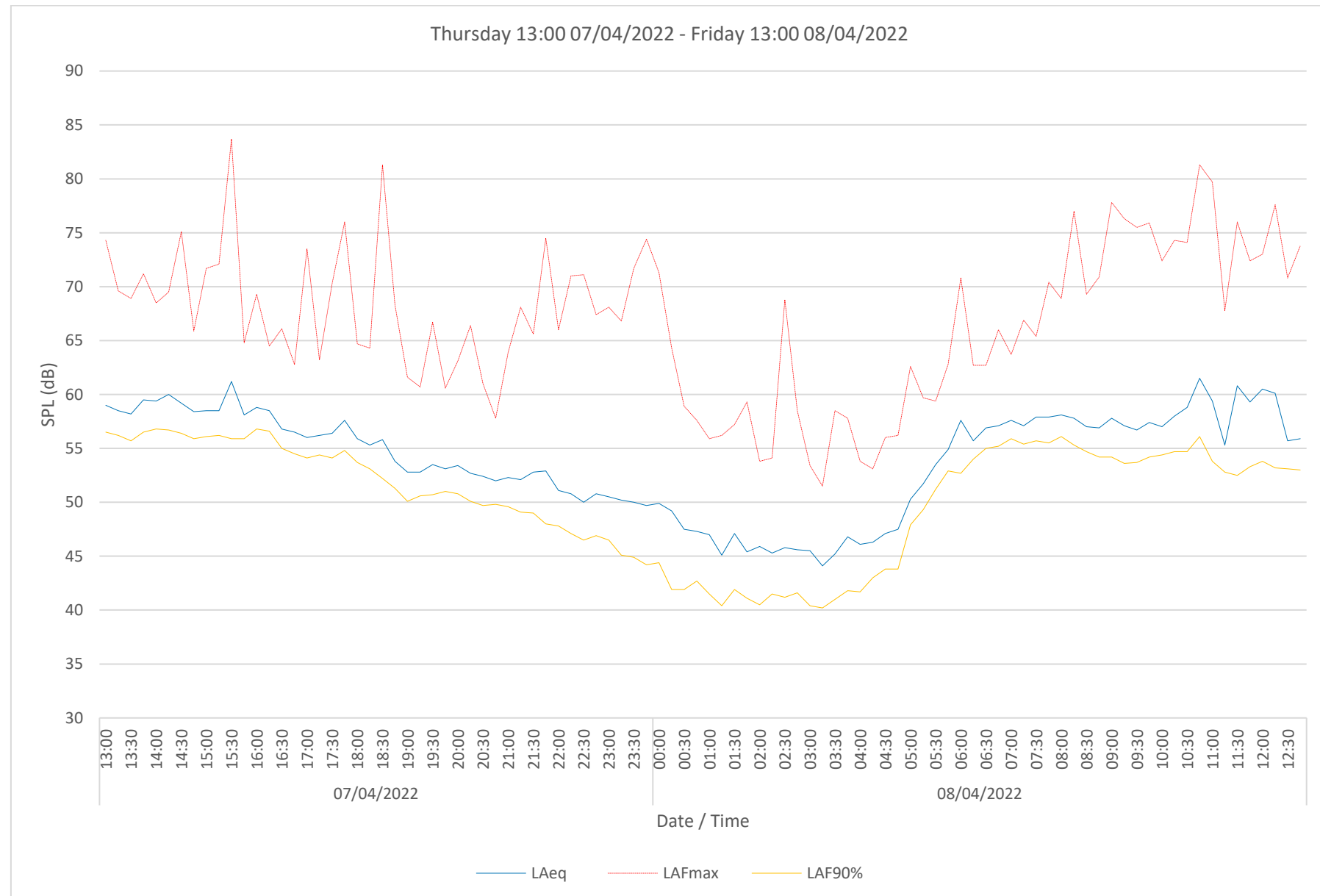


Figure B.4 – Statistical Analysis of Background Sound Levels Measured at Position A (Proposed CFBT Operational Hours)

