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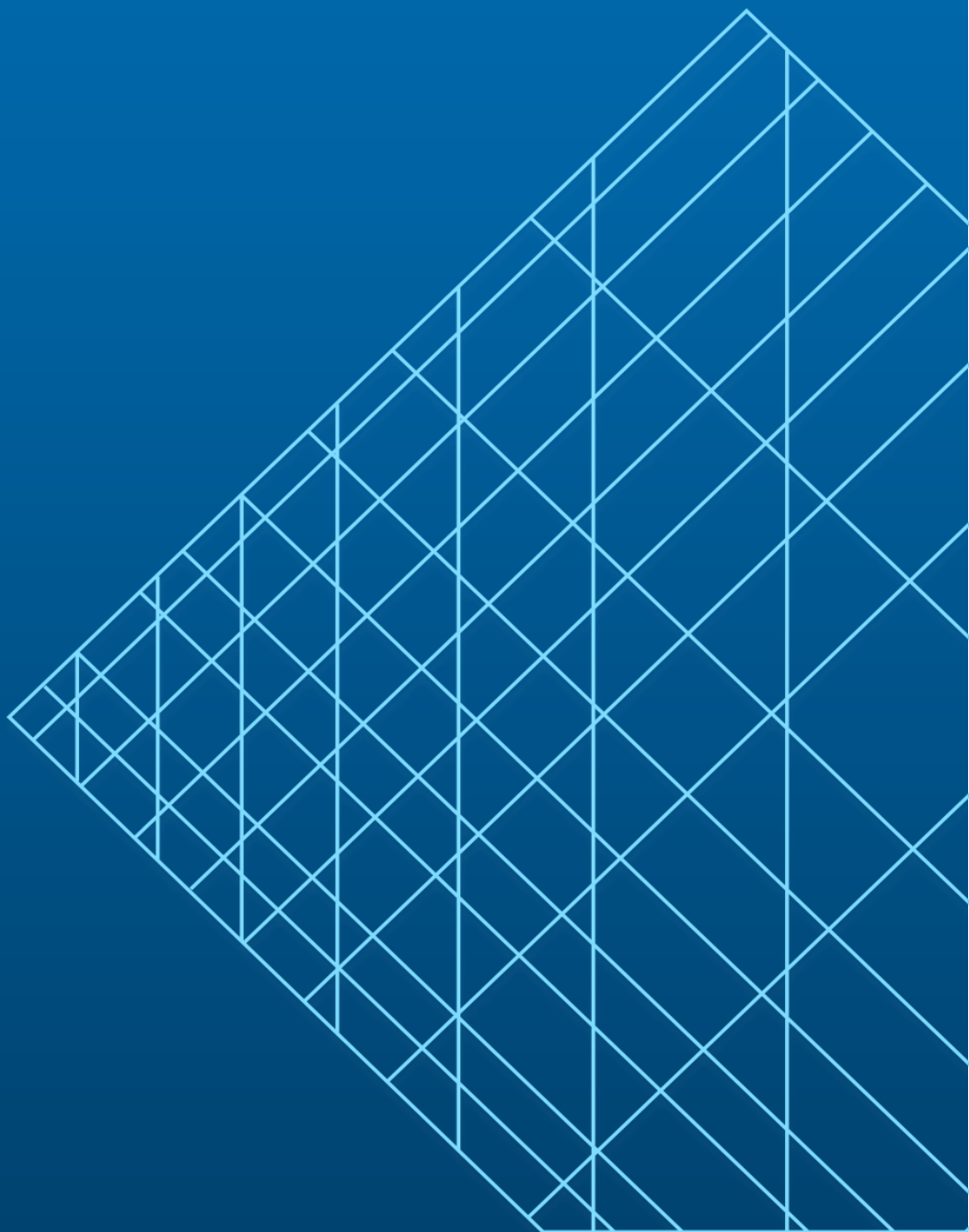
Independent Acoustic Consultancy Practice

Noise Impact Assessment

S L Recycling
New Inn

5852/NIA3_NRW



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Hunter ACOUSTICS

Independent Acoustic Consultancy Practice

Henstaff Court Business Centre
Llantrisant Road, Cardiff
CF72 8NG

t: +44(0)2920 891020

e: enquiries@hunteracoustics.co.uk

w: www.hunteracoustics.co.uk

Noise Impact Assessment

Project:	**S L Recycling**
Site Address:	Pont Y Felin Ind. Estate New Inn Pontypool NP4 0SH
HA Reference:	5852/NIA3_NRW
Date:	15/10/2021
Client:	S L Recycling Ltd Pont Y Felin Industrial Estate New Inn Pontypool NP4 0SH
Contact:	Becky@slrecyclingltd.co.uk

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			Prepared by:	**Checked by:**
		Name	Meirion Townsend BSc(Hons) MIOA	Paul McGrath BSc(Hons) MIOA
		Signature		

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1. INTRODUCTION

A new metal shredding plant has been installed at SL Recycling's site on Pont Y Felin Ind. Estate in New Inn, Pontypool.

We understand an application to vary the permit to include the shredding of metal outside is being submitted.

This report documents methodology and results of a week-long survey recently undertaken at the critical residential receivers to the east at the Coed Y Felin housing estate.

At the time of the measurements, the new shredder plant was in full operation throughout the week.

The existing shear was not in use while the shredder was in operation, and we understand that both items of plant would not run simultaneously - it is one or the other.

2. CRITERIA

As stated in the latest Guidance 'Noise and vibration management: environmental permits' produced jointly by The Environment Agency, Scottish Environment Protection Agency (SEPA), Natural Resources Wales and Northern Ireland Environment Agency and published 23 july 2021, our assessment is based on BS 4142:2014+A1:2019.

2.1 British Standard 4142:2014 + A1:2019

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.

2) *The character and level of the residual sound compared to the character and level of the specific sound. Consider whether it would be beneficial to compare the frequency spectrum and temporal variation of the specific sound with that of the ambient or residual sound to assess the degree to which the specific sound source is likely to be distinguishable and will represent an incongruous sound by comparison to the acoustic environment that would occur in the absence of the specific sound. Any sound parameters, sampling periods and averaging time periods used to undertake character comparisons should reflect the way in which sound of an industrial and/ or commercial nature is likely to be perceived and how people react to it.*

   NOTE 3 Consideration should be given to evidence on human response to sound and, in particular, industrial and/or commercial sound where it is available. A number of studies are listed in the "Effects on humans of industrial and commercial sound" portion of the "Further reading" list in the Bibliography.

3) *The sensitivity of the receptor and whether dwellings or other premises used for residential purposes will already incorporate design measures that secure good internal and/or outdoor acoustic conditions, such as:*

   i) facade insulation treatment;
   ii) ventilation and/or cooling that will reduce the need to have windows open so as to provide rapid or purge ventilation; and
   iii) acoustic screening."

"

3. SOUND SENSITIVE RECEIVERS

In order to set environmental noise limits, it is first necessary to define the existing ambient and background noise climate at the agreed nearest Sound Sensitive Receivers (SSR's).

Figure 3.1 below shows the development site and the two closest existing SSRs.

Figure 3.1 – Site Plan Showing Nearest SSRs

Table 3.1 – Nearest Sound Sensitive Receivers (Distance to Nearest Boundary)

SSR	Description	Approx. Distance (m)
1	Dwellings on Coed Y Felin (new housing estate) to the east on opposite side of Pont-Y-Felin Road	65
2	Dwellings on Parc Panteg to the west on opposite side of A4042 and rail line	330

4. ENVIRONMENTAL NOISE SURVEY

4.1 Procedures

Continuous noise monitoring was carried out daily from 0800-1700hrs on Monday 6th September 2021 to Friday, 10 September 2021 at Position 1.

Data including L_{Amax}, L_{Aeq} and background L_{A90} was logged at 1 minute intervals over the monitoring period, along with continuous audio and 100ms data to allow source identification and further detailed analysis of results.

The site plan below shows the site and monitoring position used;

Figure 4.1 – Site Plan Showing Monitoring Location (September 2021)

Table 4.1 – Monitoring Location at Receivers

Position	Description
1	Located on pavement on opposite site of road to 24/25 Ceod Y Felin. Measurements taken at 4.2m above local ground height, representative of noise levels at first floor level of receivers. See photo in Appendix C.

4.2 Meteorological Conditions

Weather conditions including temperature, wind speed and direction were measured next to the noise monitoring equipment for the duration of the survey and logged at 5minute intervals using a Davis Vantage Pro2 weather station.

Results for each day are shown in weather history graphs in Figure B.1 to Figure B.5 of Appendix B.

To summarise;

- Wind speeds were generally below 1m/s with gusts all below 5m/s
- Wind direction was generally in a southerly direction with exception of periods of northerly winds in the mornings of Tuesday 7th and Wednesday 8th September 2021
- There was no rainfall throughout the monitoring with exception of a heavy shower at 0810hrs on Thursday 9th September 2021 which was followed by a few light showers/periods of drizzle throughout the day.

4.3 Measurement Equipment

The following measurement equipment was used during the surveys:

Table 4.2 – Noise Monitoring Equipment List

Make	Description	Model	Serial Number	Last Calibrated	Certificate No.
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	8547	17 August 2021	TCRT21/1568
Rion	Calibrator (94.03dB @ 984Hz)	NC-73	10355197	01 June 2021	UCRT20/1265
Davis	Weather station	Vantage Pro2	-	-	-

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.

4.4 Results

Time history graphs for each day of monitoring are included in Figure B.6 to Figure B.10 of Appendix B.

4.4.1 $L_{Aeq,1hr}$ Levels (Continuous Plant)

$L_{Aeq.1hr}$ noise levels measured at Position 1 are shown in Table 4.3 below, controlled by road traffic, and falling in the range of 55-57dB (with exception of periods containing extraneous sources highlighted below).

Table 4.3 – Summary of $L_{Aeq,1hr}$ Levels Measured at Position 1

Time	Monday 06/09/2021	Tuesday 07/09/2021	Wednesday 08/09/2021	Thursday 09/09/2021	Friday 10/09/2021
0800-0900	56.3	56.0	56.1	59.5[4]	57.7
0900-1000	56.6	*58.2*[1]	58.2[2]	58.3[4]	56.8
1000-1100	56.2	*60.9*[1]	56.2	57.7	56.9
1100-1200	56.7	*67.3*[1]	56.4	57.6	59.0[5]
1200-1300	55.0	*63.8*[1]	54.8	57.4	58.9[5]
1300-1400	56.4	*61.9*[1]	55.3	56.7	57.0
1400-1500	56.3	55.7	56.1	57.2	59.6[5]
1500-1600	57.1	55.3	58.1[3]	56.7	59.5[5]
1600-1700	55.3	55.3	57.9[3]	56.1	56.6

1 *Grass cutting on housing estate in close proximity to microphone from 0900-1345hrs*

2 *Refuse lorries around housing estate in close proximity to microphone*

3 *Increased vehicle movements on housing estate and children playing in close proximity to microphone*

4 *Elevated due to rain showers and vehicle movements on housing estate*

5 *Busier periods of traffic with loud exhausts*

On analysing the spectrograph, clear on/off periods of continuous plant are evident. This is generally masked by the ambient noise from traffic subjectively on site but is visually identifiable on the spectrograph – example shown in Figure B.11 of Appendix B.

The L_{A90} level can be used to help determine the level of continuous running plant, as it effectively excludes car pass-bys (it is the level exceeded for 90% of the time).

The following summarises L_{A90} levels for the periods when the spectrograph shows continuous plant on and off for each day;

Table 4.4 – Continuous Plant Levels Using L_{A90} Parameter

Date	$L_{A90,1hr}$ (dB)		Delta (dB)
	Plant On	Plant Off	
Monday 06/09/2021	52	49	3
Tuesday 07/09/2021	51	49	2
Wednesday 08/09/2021	52	49	3
Thursday 09/09/2021	54	51	3
Friday 10/09/2021	55	52	3

This therefore indicates a consistent 2-3dB difference in the background L_{A90} with the continuous plant on and off.

4.4.2 $L_{Amax,F}$ Events (Impulsive Noises / Bangs)

Continuous audio for each day has been analysed to identify sources of the highest $L_{Amax,F}$ events (those greater than 65dB, as typical road traffic $L_{Amax,F}$ events at this location are in the range 60-65dB).

These are shown in Figure B.12 to Figure B.16 of Appendix B.

The number and range of $L_{Amax,F}$ events from the site (in bold) along with other sources of noise are included below for context;

Table 4.5 – No. of $L_{Amax,F}$ Events > 65dB (range included in brackets)

Source	Monday 06/09/2021	Tuesday* 07/09/2021	Wednesday 08/09/2021	Thursday 09/09/2021	Friday 10/09/2021
Bird Song	53 events (66-80dB)	68 events (65-80dB)	42 events (65-78dB)	33 events (66-75dB)	15 events (65-81dB)
Site Activity	**12 events (65-83dB)**	**10 events (66-69dB)**	**43 events (65-78dB)**	**29 events (64-71dB)**	**69 events (64-70dB)**
Loud Exhaust / Vehicles	13 events (65-79dB)	10 events (66-73dB)	21 events (65-73dB)	11 events (65-70dB)	34 events (66-77dB)
Siren	2 events (66-82dB)	1 event (78dB)	4 events (66-70dB)	1 event (69dB)	3 events (66-69dB)
Activity Near Mic	8 events (66-73dB)	6 events (67-82dB)	81 events (64-82dB)	3 events (67-69dB)	4 events (66-71dB)
Car Door Near Mic	2 events (70-72dB)	-	-	3 events (65-71dB)	-
Brake Squeal	1 event (72dB)	1 event (66dB)	3 events (68-71dB)	-	-
Vehicle Near Mic	8 events (65-70dB)	4 events (66-69dB)	13 events (66-81dB)	27 events (66-73dB)	10 events (66-72dB)
Horn	3 events (67dB)	1 event (71dB)	1 event (69dB)	-	-

** 0900-1400hrs on Tuesday 07/09/2021 has been excluded due to grass cutting activity.*

A breakdown of the $L_{Amax,F}$ event values identified as being site related, are included in Table B.1 to Table B.5 of Appendix B.

The data shows that in general, the $L_{Amax,F}$ events from the site identified from the analysis of events >65dB, are generally in the range 65-68dB, with very few exceeding this, as shown below;

Table 4.6 – No. of Site Related $L_{Amax,F}$ Events > 68dB (range included in brackets)

Source	Monday 06/09/2021	Tuesday* 07/09/2021	Wednesday 08/09/2021	Thursday 09/09/2021	Friday 10/09/2021
Site Activity	3 events (68-83dB)	1 event (69dB)	8 events (70-78dB)	4 events (68-71dB)	12 events (68-70dB)

** 0900-1400hrs on Tuesday 07/09/2021 has been excluded due to grass cutting activity.*

5. DISCUSSION

There are two main elements of noise from the site, continuous plant (shredder/shear plant) and impulsive events from metal drops and loading. These are broken down in the subsequent sections.

5.1 Continuous Plant Noise

As discussed in Section 4.4.1, clear on/off periods were identifiable visually in the spectrograph however on site, this was masked somewhat by the road traffic dominated climate. The L_{A90} parameter was used to determine plant on vs plant off levels as shown in Table 4.4.

Using these levels, an assessment in line with British Standard 4142:2014+A1:2019 has been carried out, as detailed in Table B.6 of Appendix B.

Note: With the difference between plant on and off consistently being 3dB (with exception of Tuesday 07/09/2021), only one day has been used for the assessment (Monday 06/09/2021), as the resultant excess over background would be the same.

The continuous plant noise is neither impulsive, tonal or intermittent. At 51-55dB $L_{Aeq,1hr}$ in an environment controlled by road traffic noise at 56-57dB, subjectively continuous plant did not appear readily distinguishable, however a 3dB penalty has been included in the assessment for robustness.

Results of the assessments for the continuous plant elements therefore indicate an adverse impact is unlikely depending on context.

5.1.1 Context

As set out in our previous noise impact assessments report (5852/NIA1_Rev1 dated 16/12/2021 and 5852/NIA2 dated 13/04/2021), we would describe the context as;

- The receivers are new dwellings built adjacent to a well-established existing industrial estate where an element of industrial noise within the daytime noise climate can be expected.
- The overall noise climate is controlled by road traffic noise
- The recycling operations are carried out during reasonable daytime hours only (0800-1700hrs Mon-Fri and 0800-1200hrs Sat) with no Sunday or Bank Holiday operations.

In addition, we would advise that the context is at an assessment at first floor level, and this should also include losses through the building fabric of the dwelling as the receiver is located inside the building, as set out in BS 4142 Section 11 (refer to Section 2.1).

Previous measured levels (documented in our report 5852/NIA2 dated 13/04/2021) indicate road traffic noise levels of 48dB L_{Aeq} within first floor bedrooms from road traffic noise alone with windows partially open. This is well above the 35dB BS 8233:2014 guideline figure for bedrooms during the daytime.

Due to levels of road traffic noise, it is likely the dwellings were designed to have windows closed with trickle ventilators open to control road traffic noise intrusion. Noise levels from the site activities with windows closed and trickle ventilators open are therefore indicated to fall well below the 35dB L_{Aeq} guideline value for bedrooms during the daytime.

5.2 Impulsive Noise Events

Section 4.4.2 shows the majority of $L_{Amax,F}$ events (identified as site generated), were in the range of 65-68dB, with occasional events in the range 70-83dB.

The duration of these events is very short, as they are isolated events of metal dropping and are not continuous/repetitive by nature.

The following has been used to form a robust 1hr assessment of the impulses using BS 4142:2014+A1:2019, based on measured data from the week;

- 2no $L_{Amax,F}$ events at 82dB 2second duration each at 71dB L_{Aeq}
- 25no $L_{Amax,F}$ events at 68dB 2second duration each at 65dB L_{Aeq}

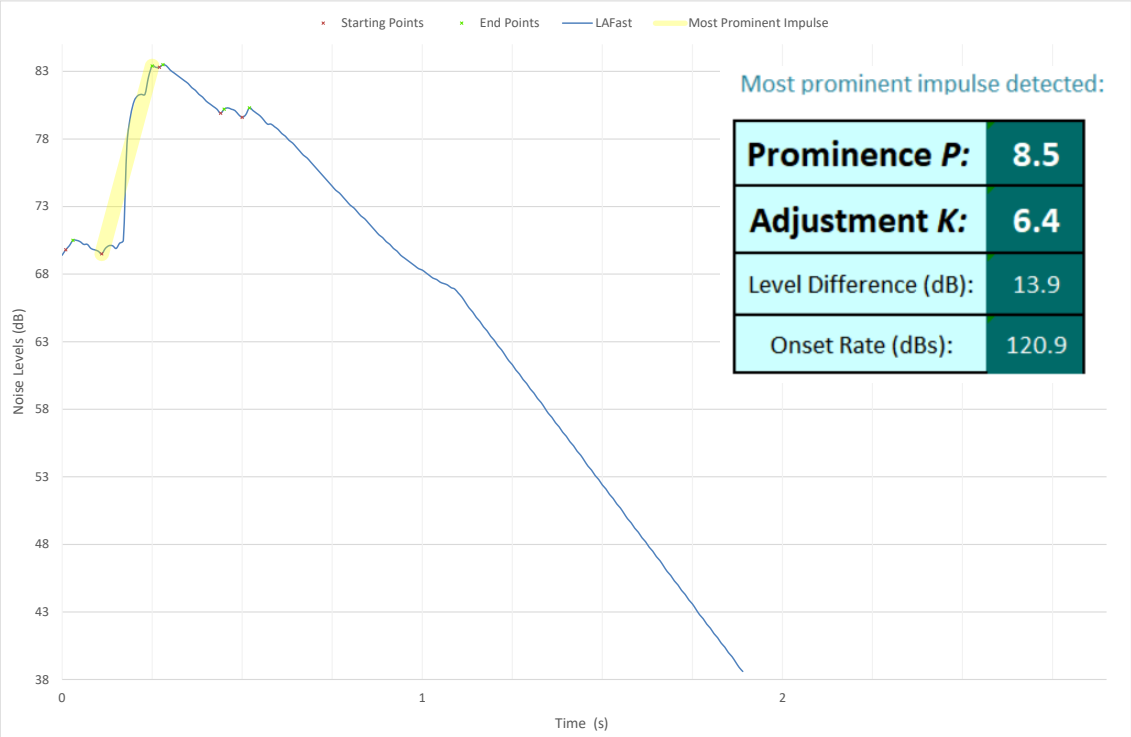
Table 5.1 – $L_{Aeq,1hr}$ from $L_{Amax,F}$ Events

L_{Aeq} of Event (dB)	Total Duration of Events (secs)	1hr Reference Period (secs)	On-Time Correction (dB)	Contribution to $L_{Aeq,1hr}$ (dB)
71	2 x 2 = 4	3600	-29.5	41.5
65	25 x 2 = 50	3600	-18.6	46.4
			Resultant $L_{Aeq,1hr}$ =	**47.6**

Time correcting the above, results in an overall $L_{Aeq,1hr}$ specific noise source from impulsive events at 48dB.

The reference method detailed in Annex E of BS 4142:2014 has been used to analyse one of the typical $L_{Amax,F}$ events from Monday 6th September as shown below;

Figure 5.1 – Impulsivity Analysis for 1430hrs Event on 06/09/2021



A 6dB penalty has therefore been included in the assessment for impulsivity being 'clearly perceptible', which is in line with our subjective impression on site.

An assessment in line with British Standard 4142:2014+A1:2019 has been carried out, as detailed in Table B.7 of Appendix B.

5.2.1 Context

From week-long monitoring (refer to Table 4.5 and Table 4.6), it is clear that $L_{Amax,F}$ events in the range 68-70dB are occasional and those up around 80dB are exceptional.

Presuming best practice is maintained on site (minimising drop heights and using the scrap pile to screen noisier loading/unloading activities), the majority of $L_{Amax,F}$ events are likely to fall below 70dB. These events are therefore likely to be less prominent within the existing road traffic L_{Amax} climate; the overall $L_{Aeq,1hr}$ should also reduce accordingly.

It should also be noted that monitoring has been carried out at a worst case location, at first floor level. This is unlikely to be afforded the same screening as receivers at ground floor level and therefore this is a worst case assessment.

As discussed in Section 5.1.1 above, we would advise that the context at first floor level should also include losses through the building fabric of the dwelling, as the receiver is located inside the building. With windows closed and trickle ventilators open, the majority of $L_{Amax,F}$ events would fall well below a reasonable 50dB $L_{Amax,F}$ daytime criteria (45dB $L_{Amax,F}$ typically used at night in bedrooms, 5dB relaxation allowed for daytime).

6. CONCLUSION

A week long noise survey has been carried out at the S L Recycling site on Pont Y Felin Ind. Estate, New Inn, Pontypool, NP4 0SH to assess noise impact at critical receivers.

Monitoring was undertaken at the Coed Y Felin housing estate at 4.2m above local ground height, representative of first floor facades which may not benefit from the same level of acoustic screening as those at ground floor level (i.e. worst case position).

A more detailed analysis of the $L_{Amax,F}$ events has been undertaken and a BS 4142:2014+A1:2019 assessment indicates an adverse impact depending on context.

The context of the site is set out in Section 5.1.1 and Section 5.2.1. Taking the context into consideration, an adverse impact is indicated unlikely based on measured levels and identified events over the week-long monitoring period.

SL Recycling have provided copies of their weighbridge logs for 06/09/2021-10/09/2021 which show that the site was operating normally during our monitoring in terms of materials in and out.

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 – Weather History for Monday, 06 September 2021

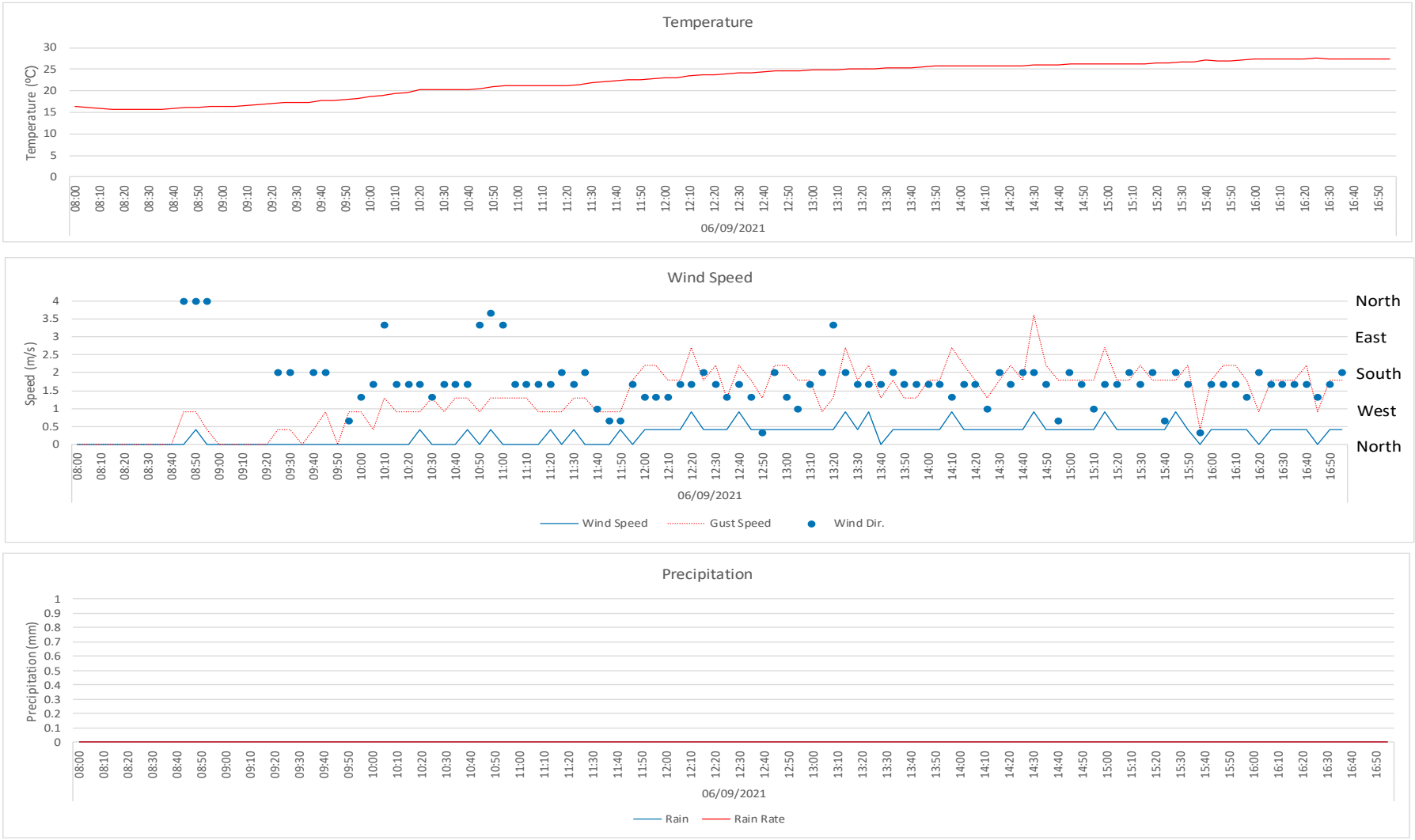


Figure B.2 – Weather History for Tuesday, 07 September 2021

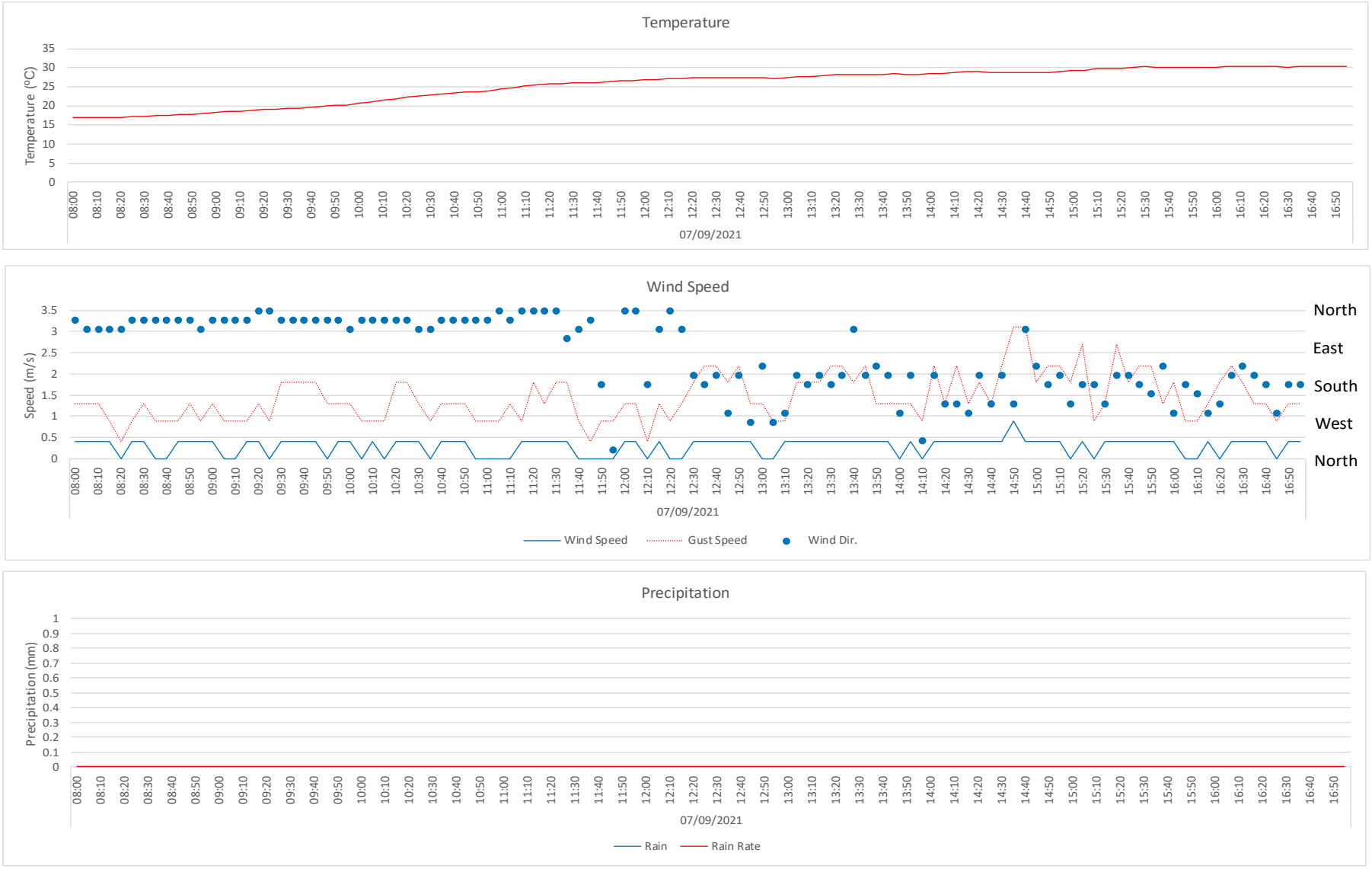


Figure B.3 – Weather History for Wednesday, 08 September 2021

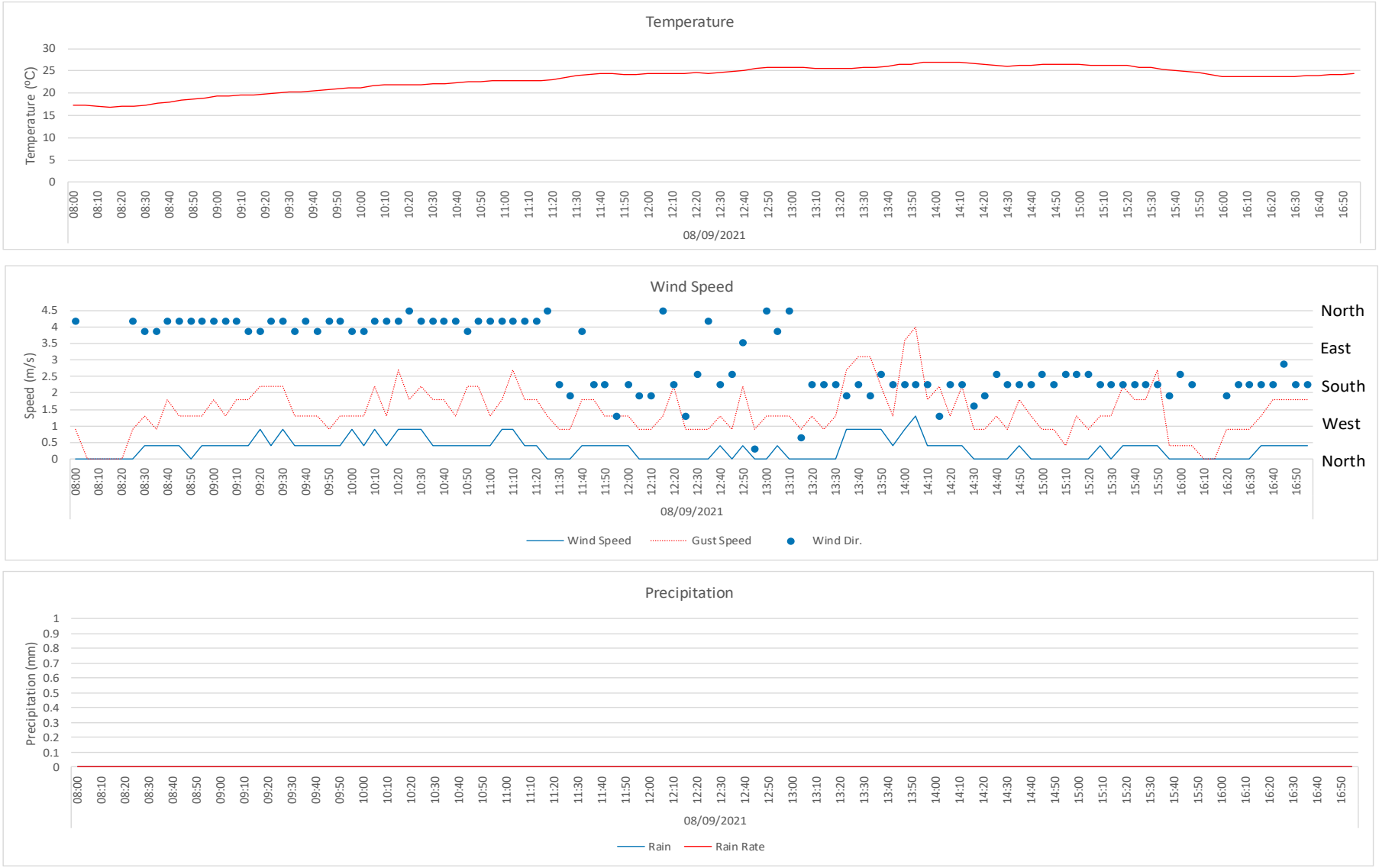


Figure B.4 – Weather History for Thursday, 09 September 2021

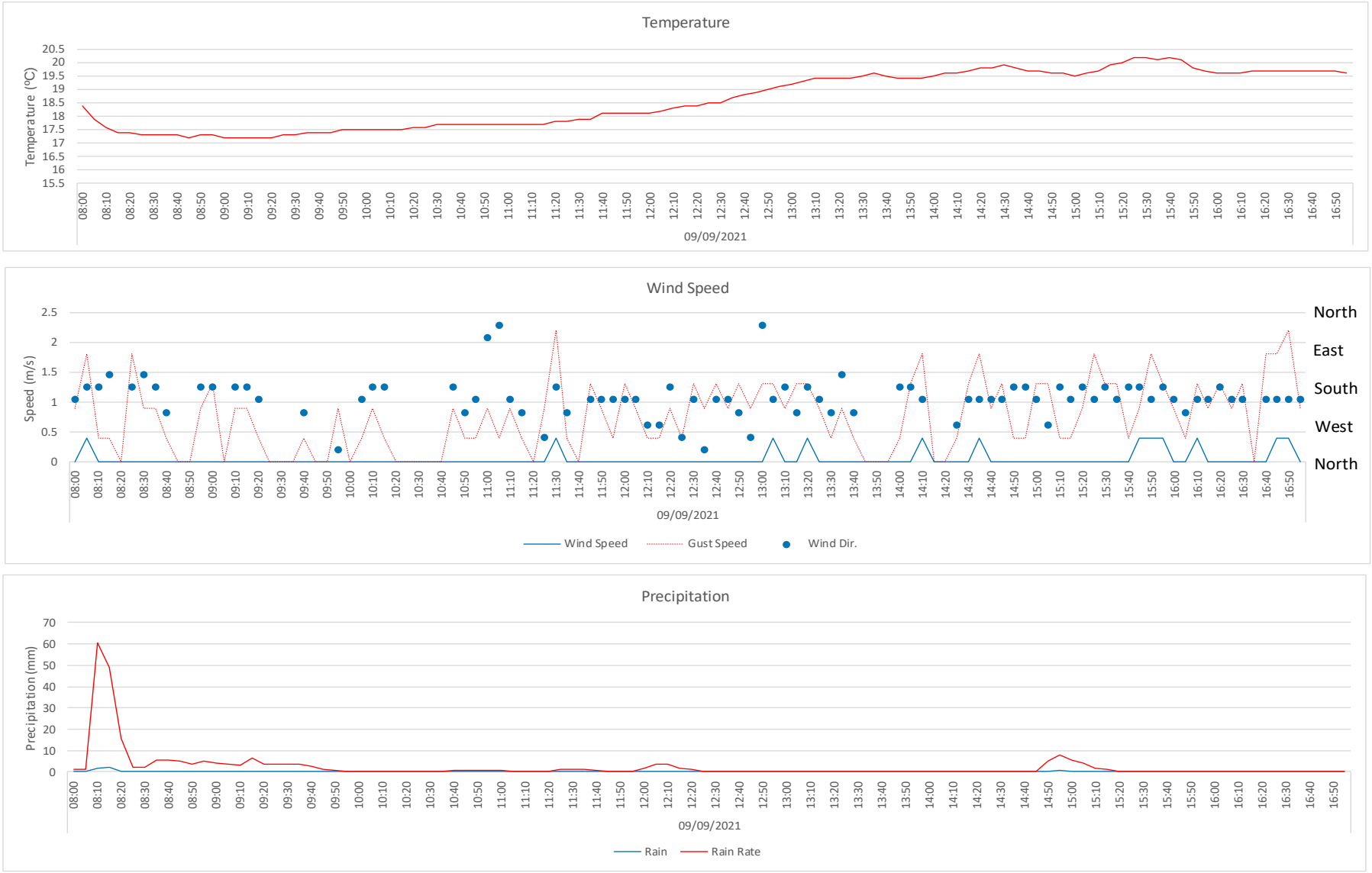
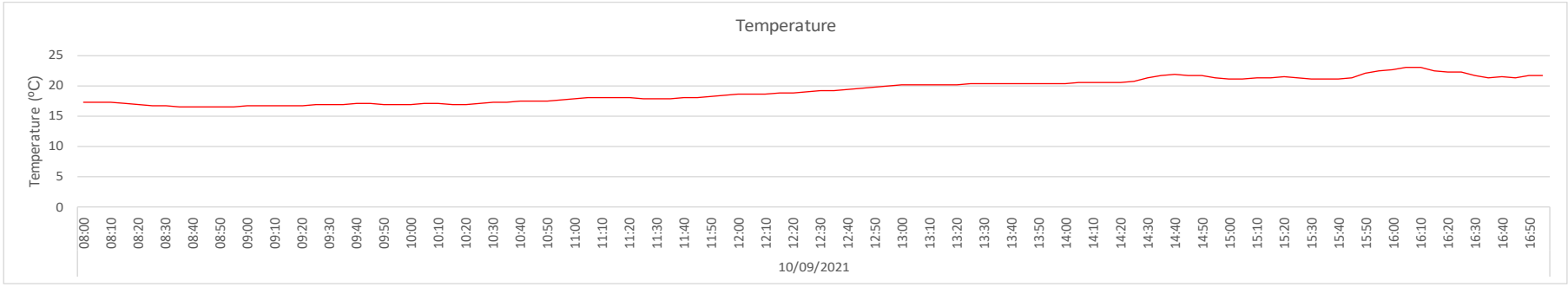
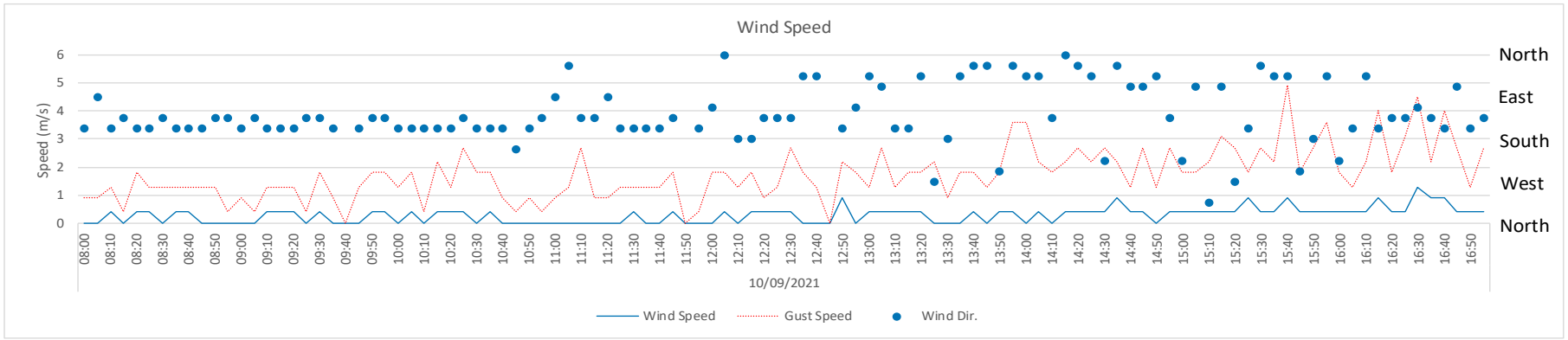


Figure B.5 – Weather History for Friday, 10 September 2021





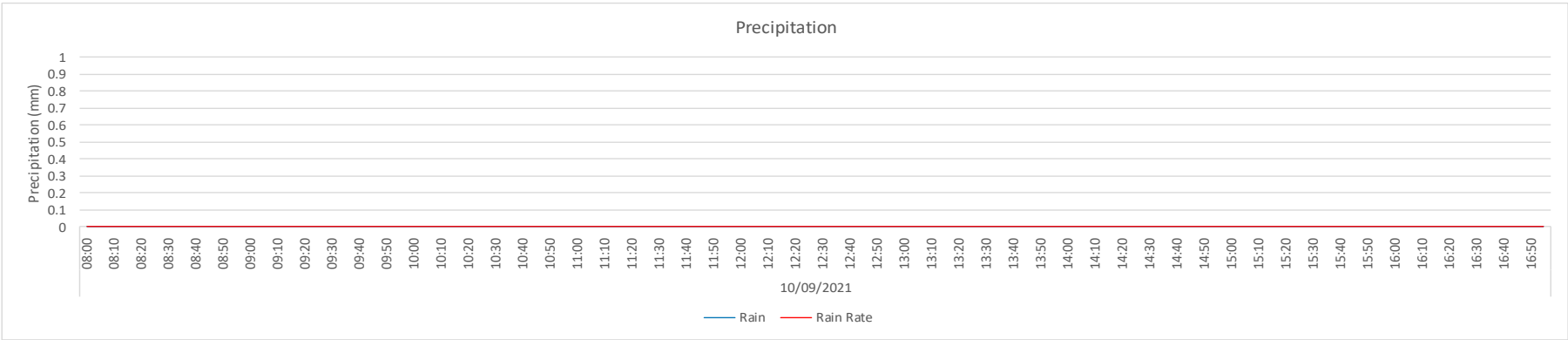


Figure B.6 – Time History at Position 1 (Monday, 06 September 2021)

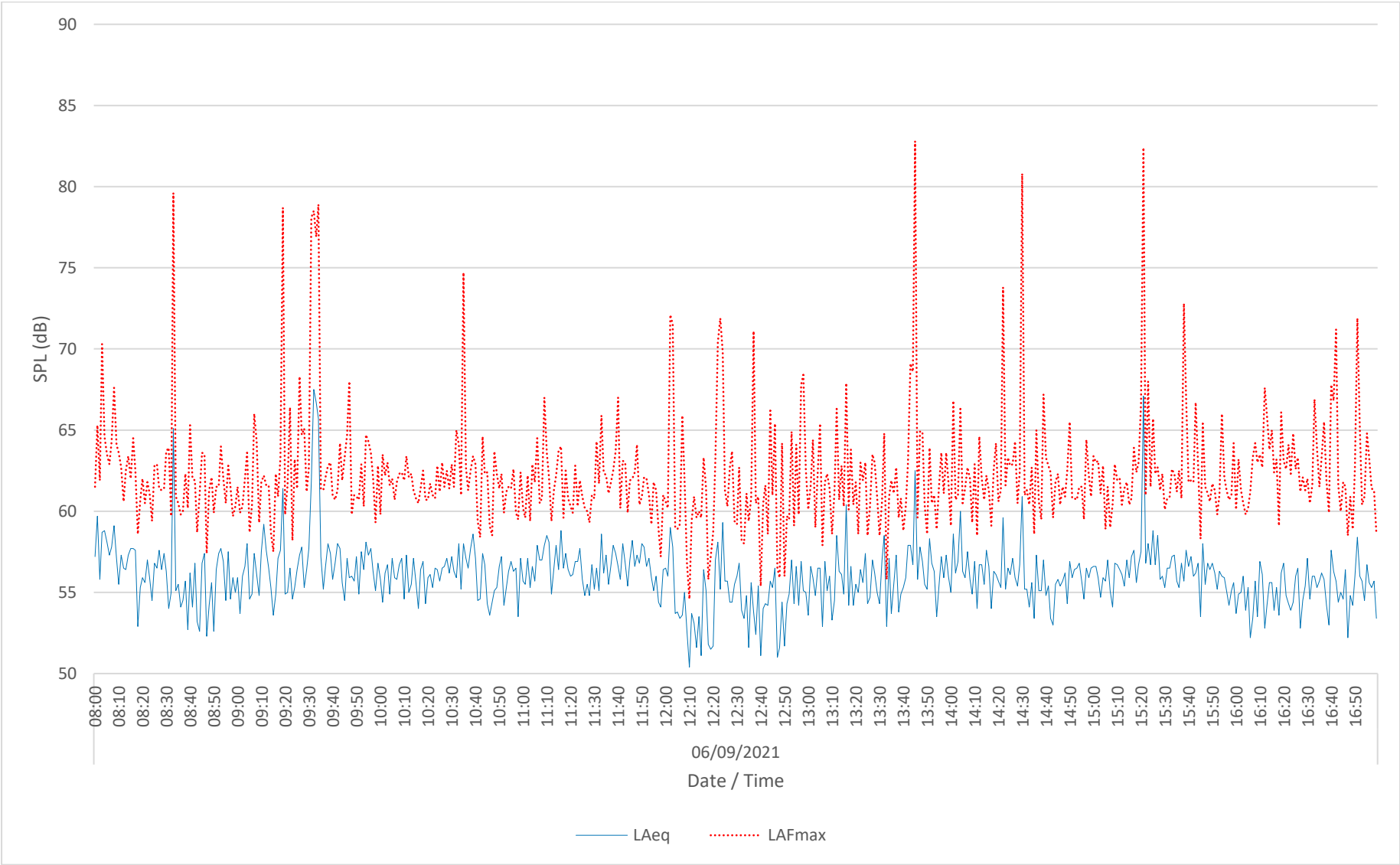


Figure B.7 – Time History at Position 1 (Tuesday, 07 September 2021)

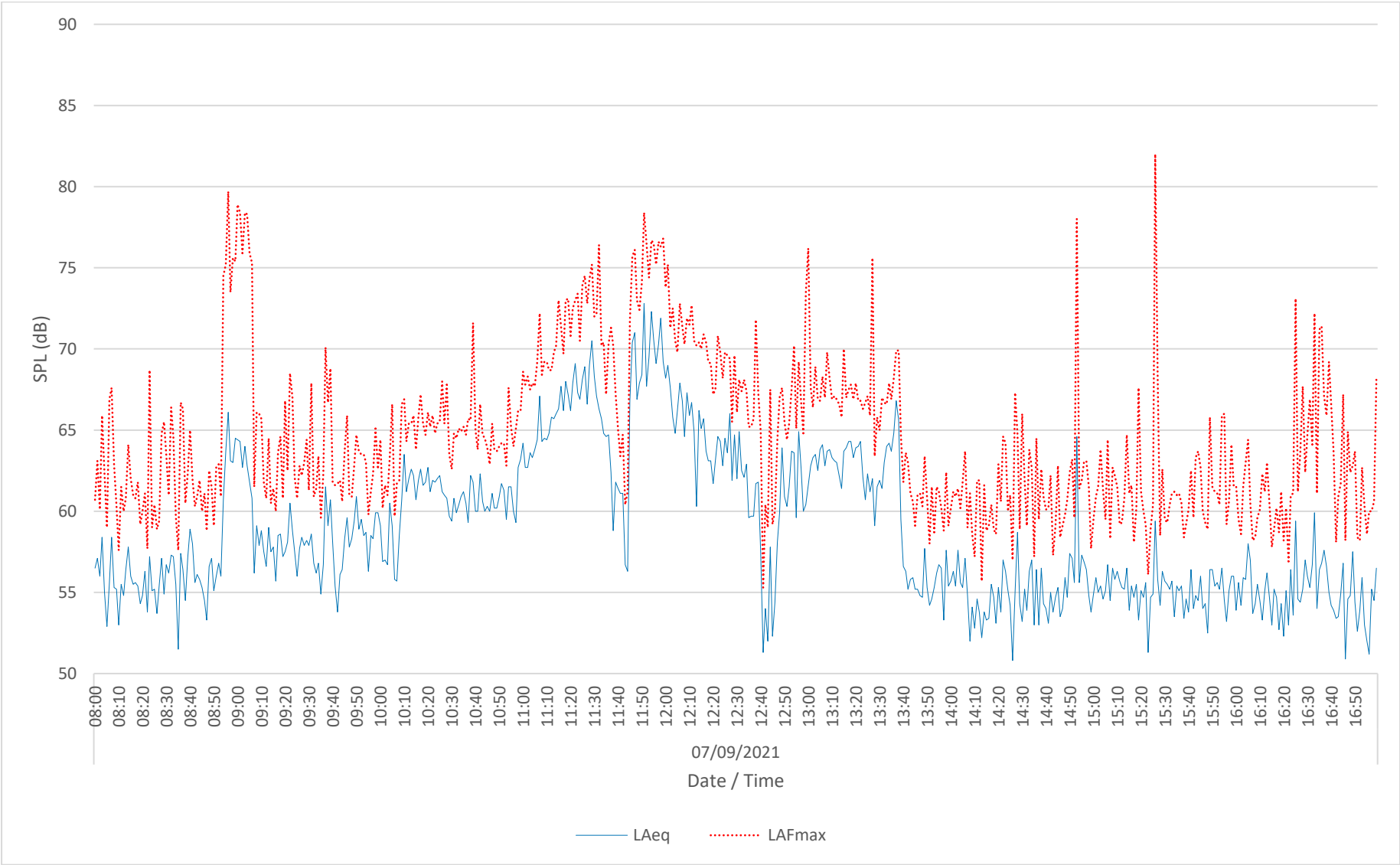


Figure B.8 – Time History at Position 1 (Wednesday, 08 September 2021)

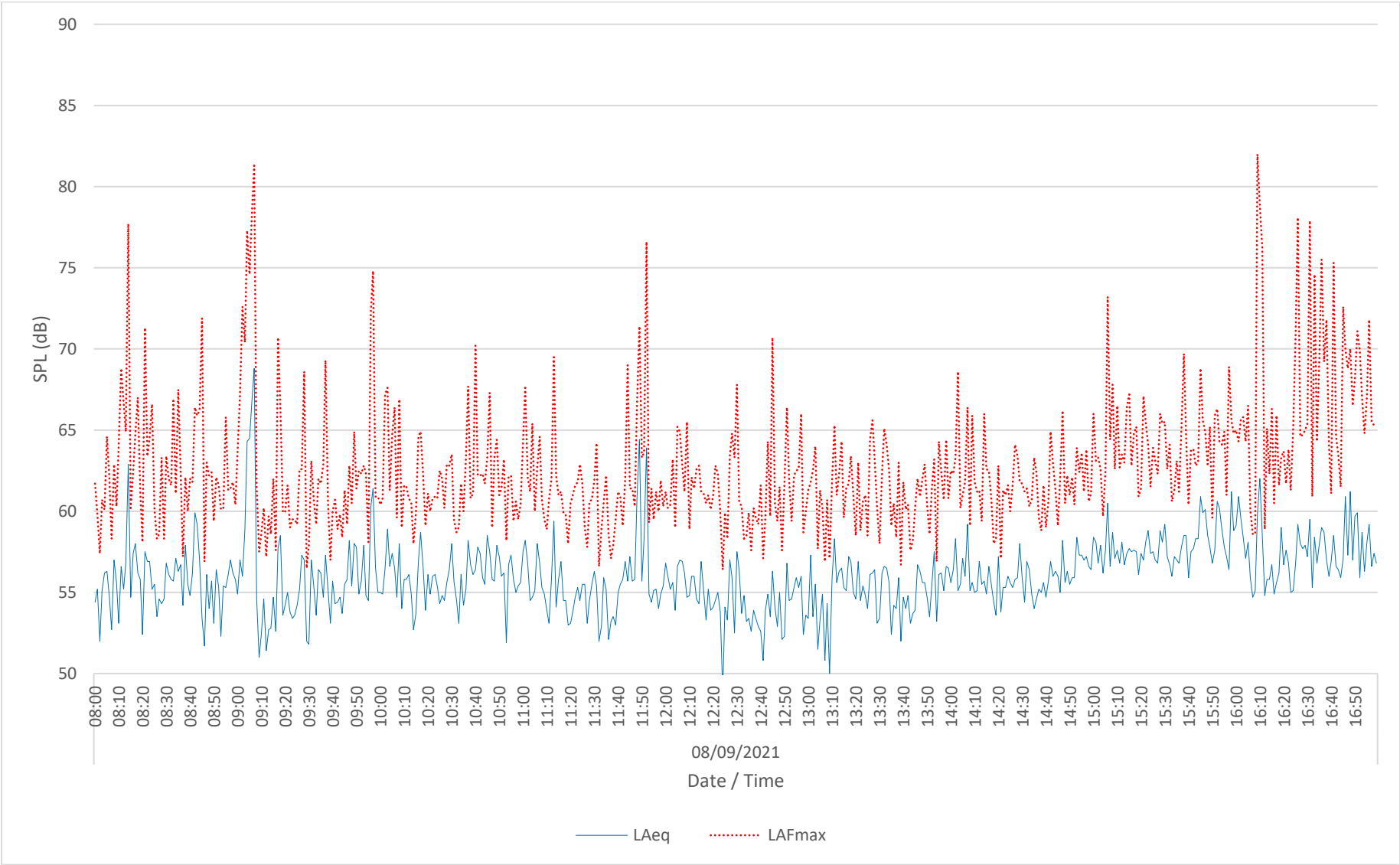


Figure B.9 – Time History at Position 1 (Thursday, 09 September 2021)

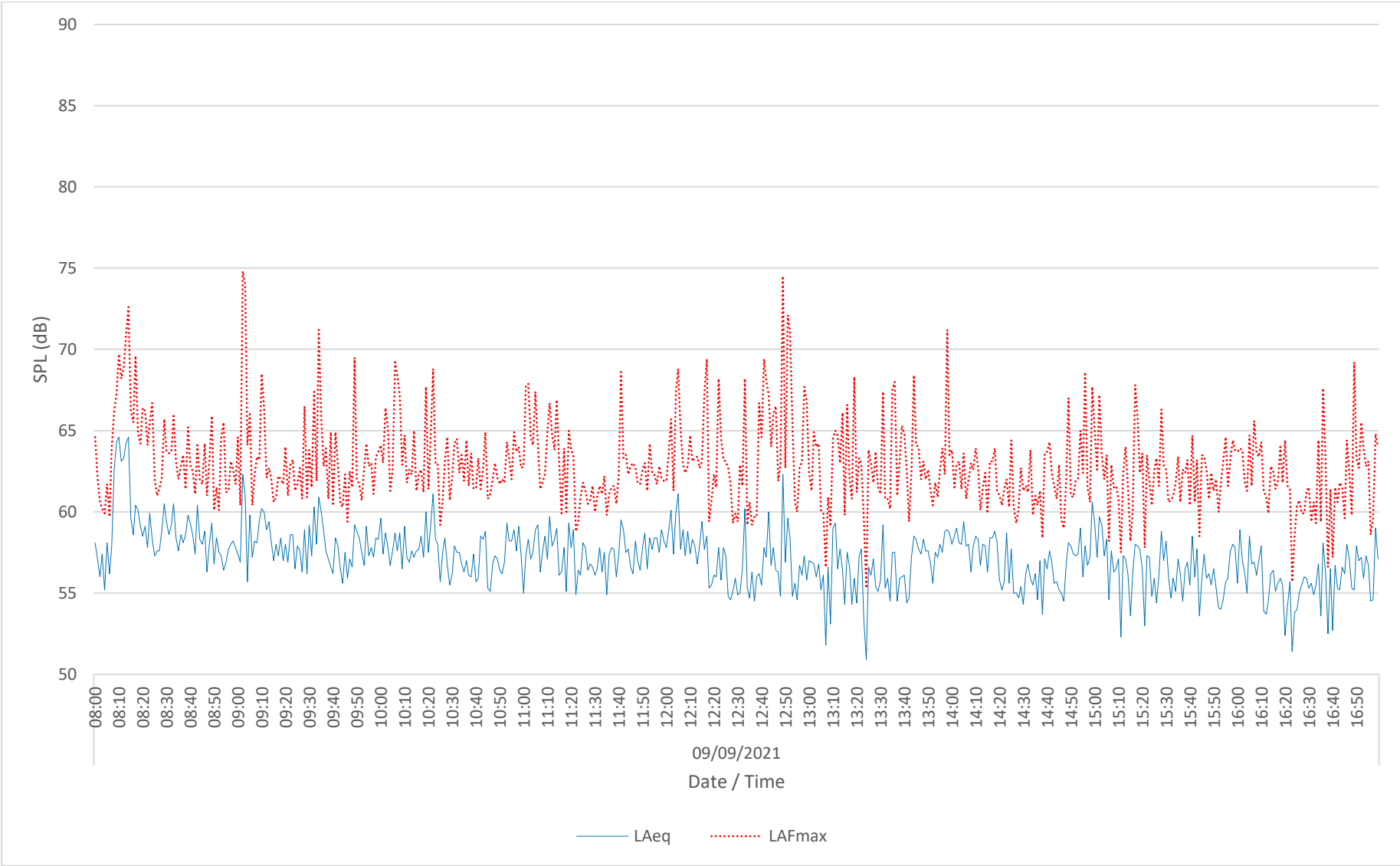


Figure B.10 – Time History at Position 1 (Friday, 10 September 2021)

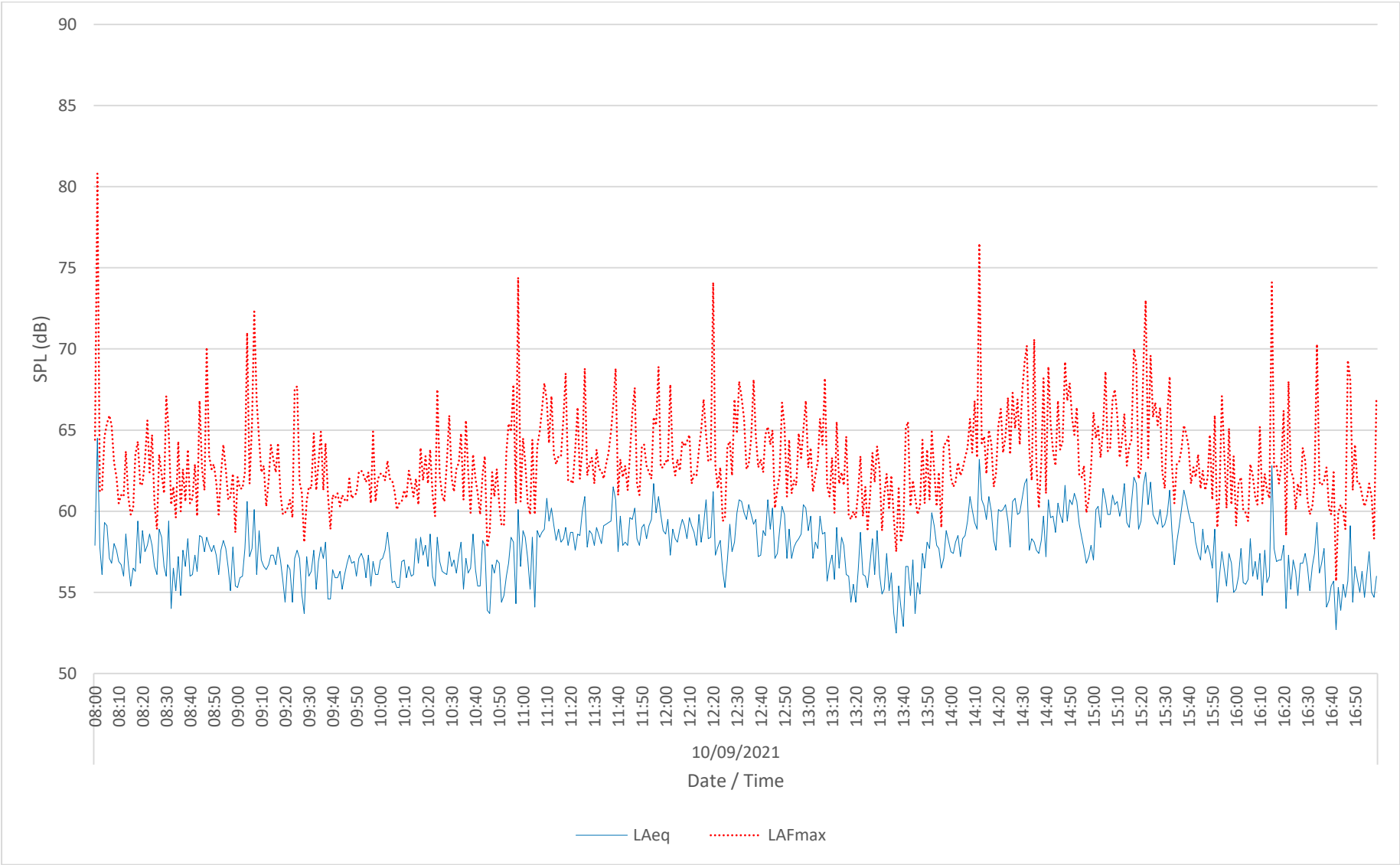


Figure B.11 – Spectrograph Analysis at Position 1 (Thursday, 09 September 2021) Showing Clear On/Off Periods of Continuous Plant

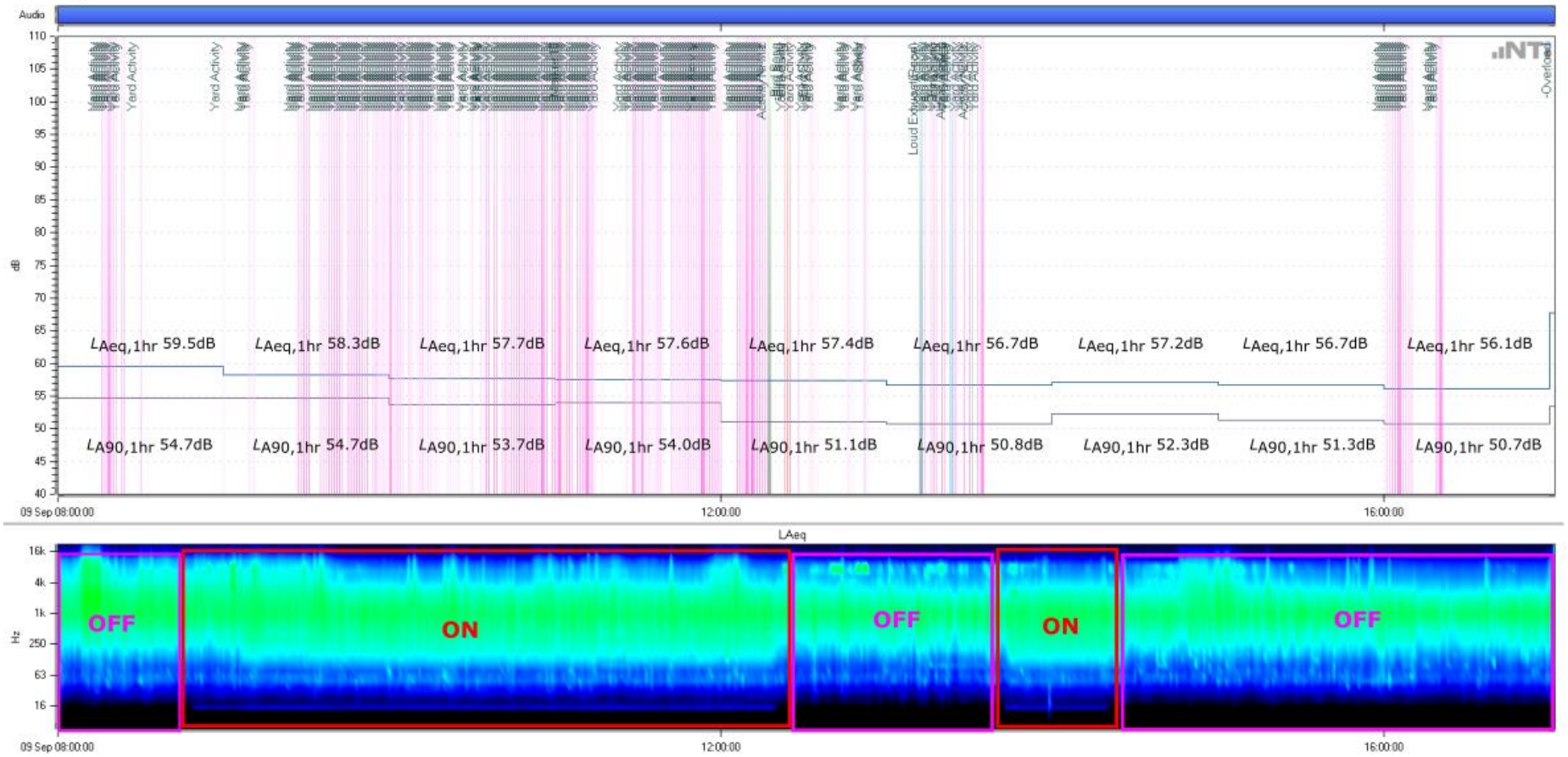


Figure B.12 – $L_{Amax,F}$ >65dB Analysis at Position 1 (Monday, 06 September 2021)

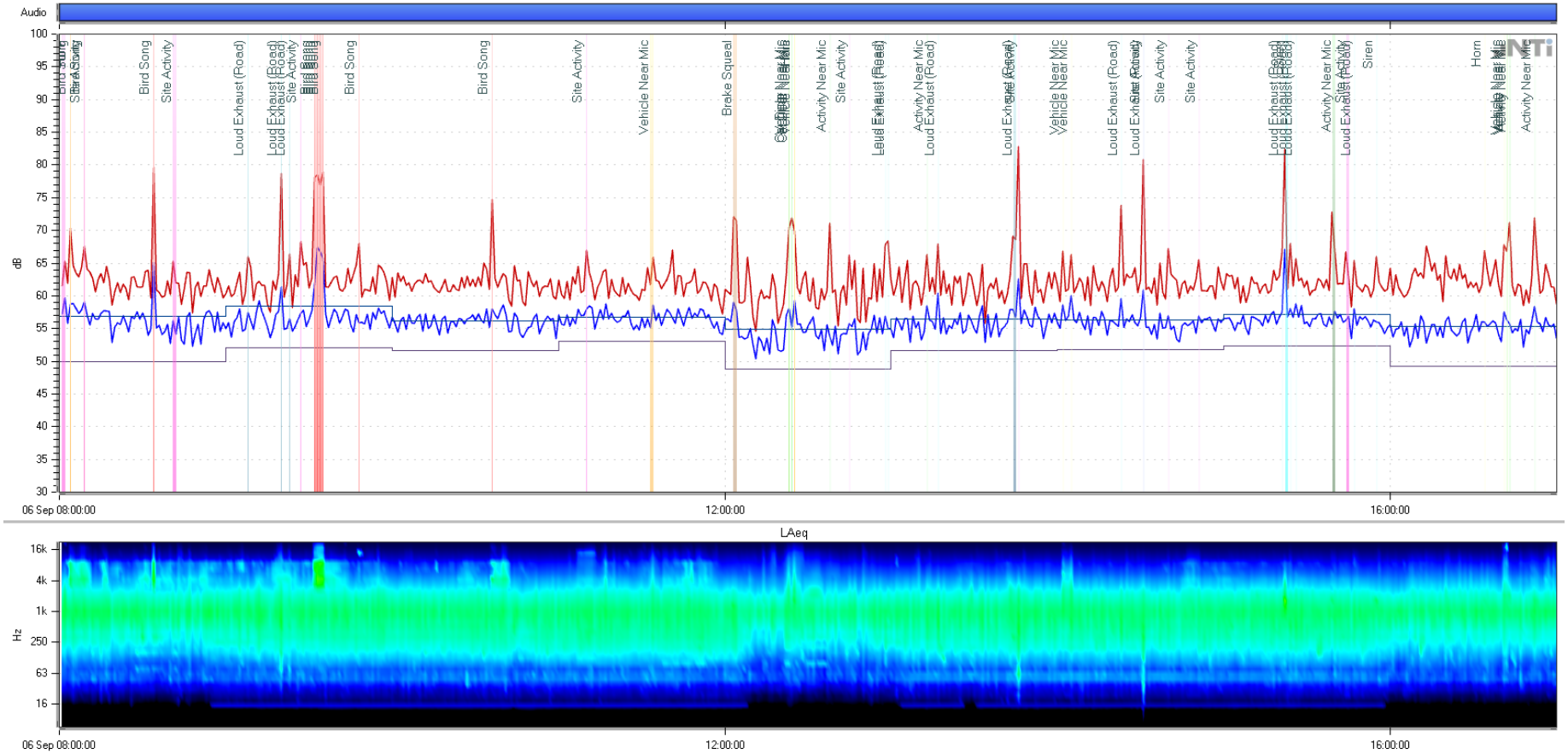
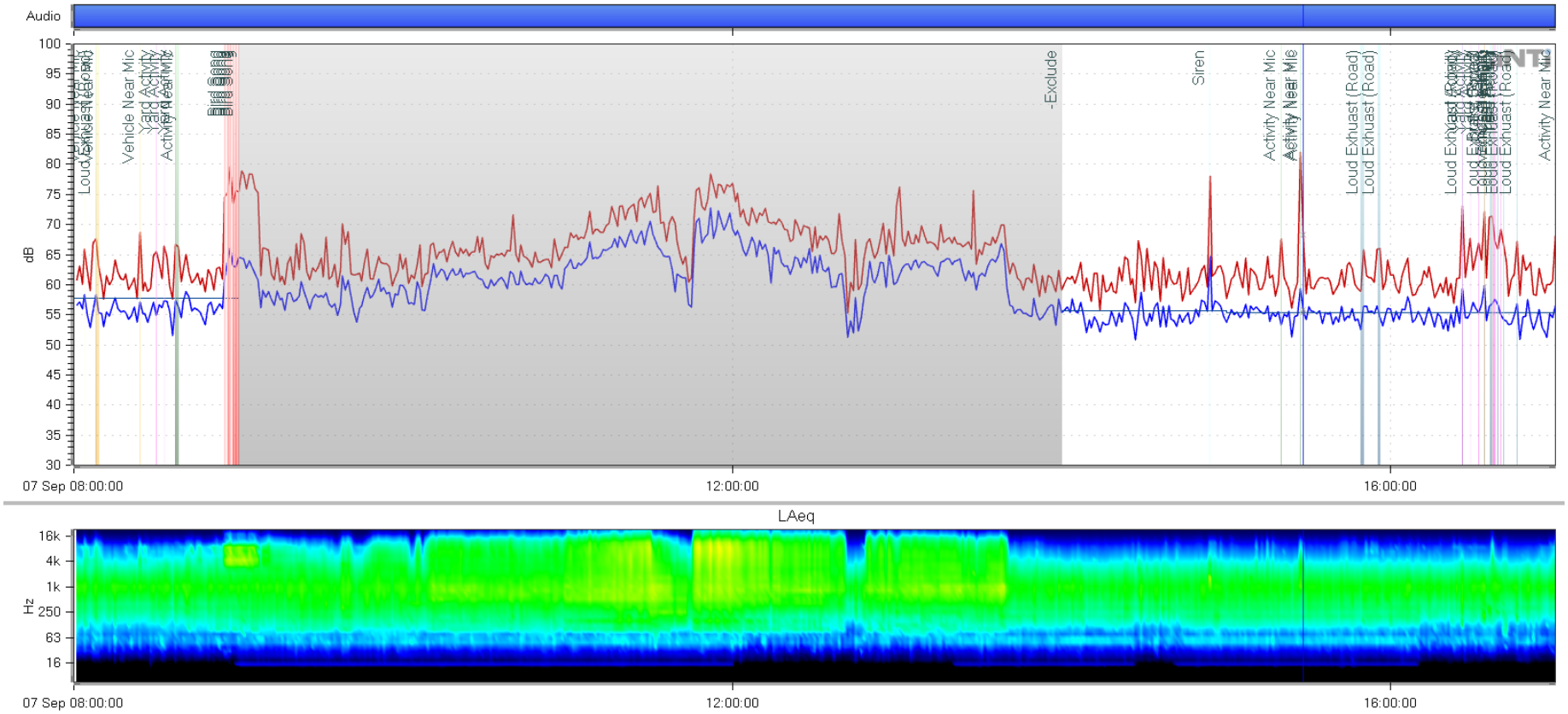


Figure B.13 – $L_{Amax,F}$ >65dB Analysis at Position 1 (Tuesday, 07 September 2021)



Note: Grey excluded marker is main period of grass cutting at the attenuation pond on the housing estate in close proximity to the microphone.

Figure B.14 – $L_{Amax,F}$ >65dB Analysis at Position 1 (Wednesday, 08 September 2021)

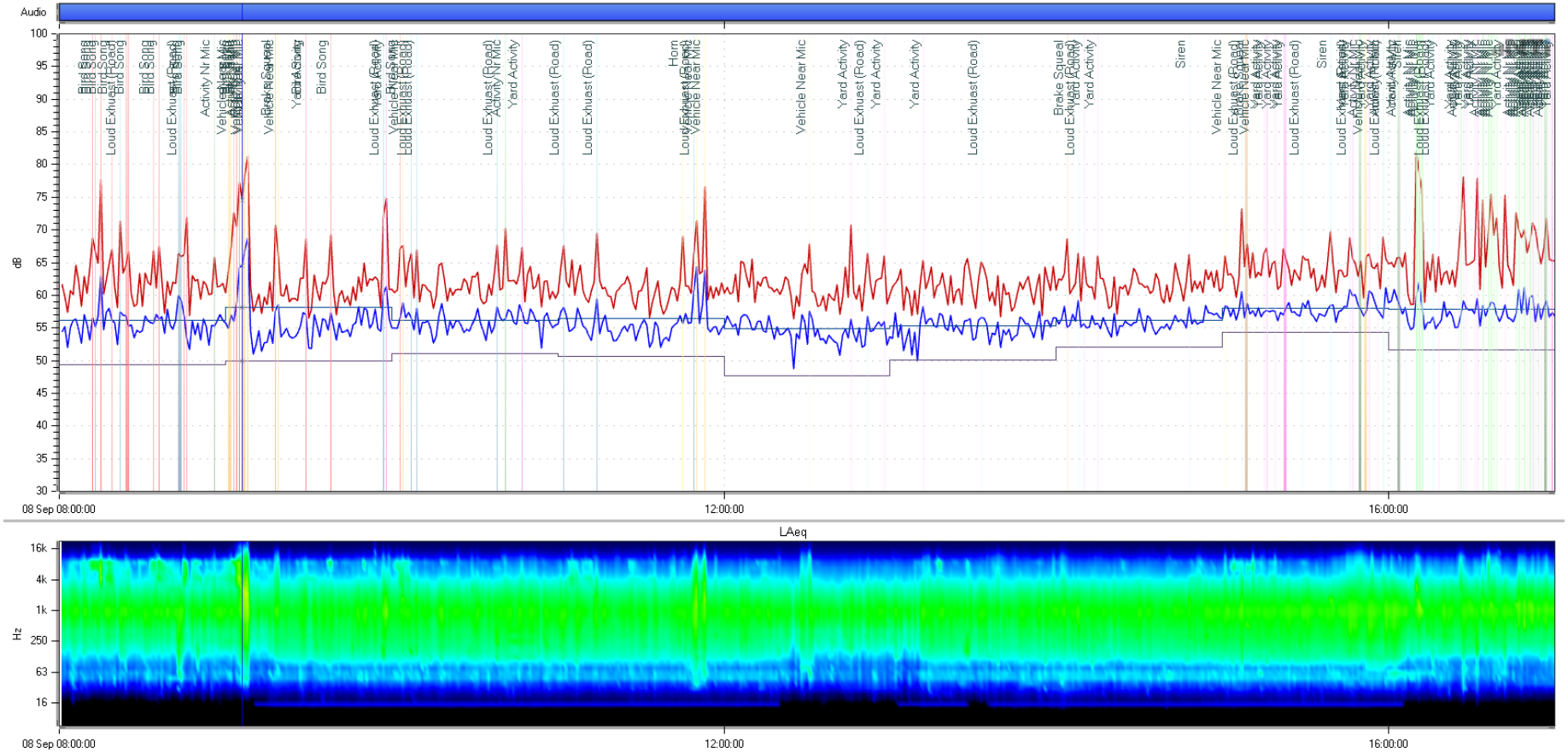


Figure B.15 – $L_{Amax,F}$ >65dB Analysis at Position 1 (Thursday, 09 September 2021)

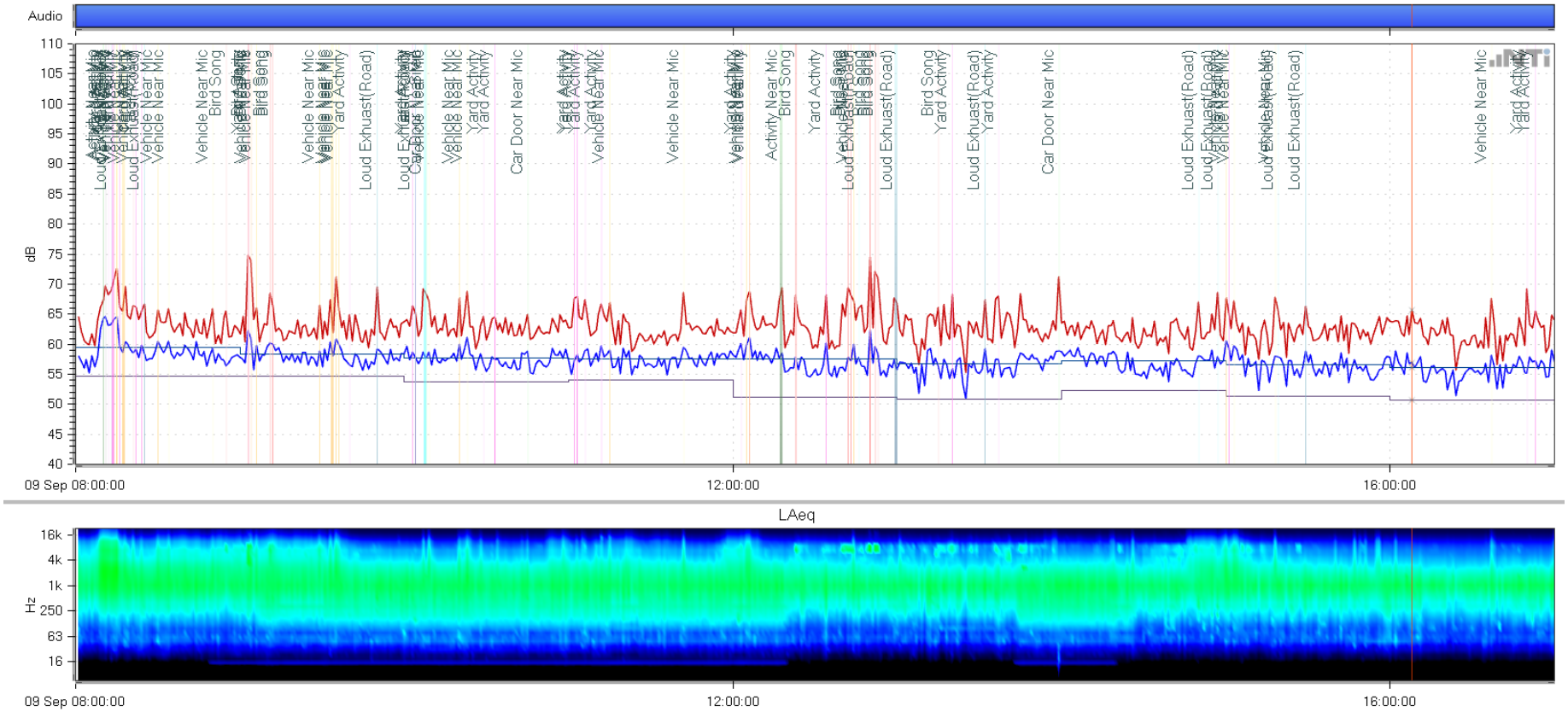


Figure B.16 – $L_{Amax,F}$ >65dB Analysis at Position 1 (Friday, 10 September 2021)

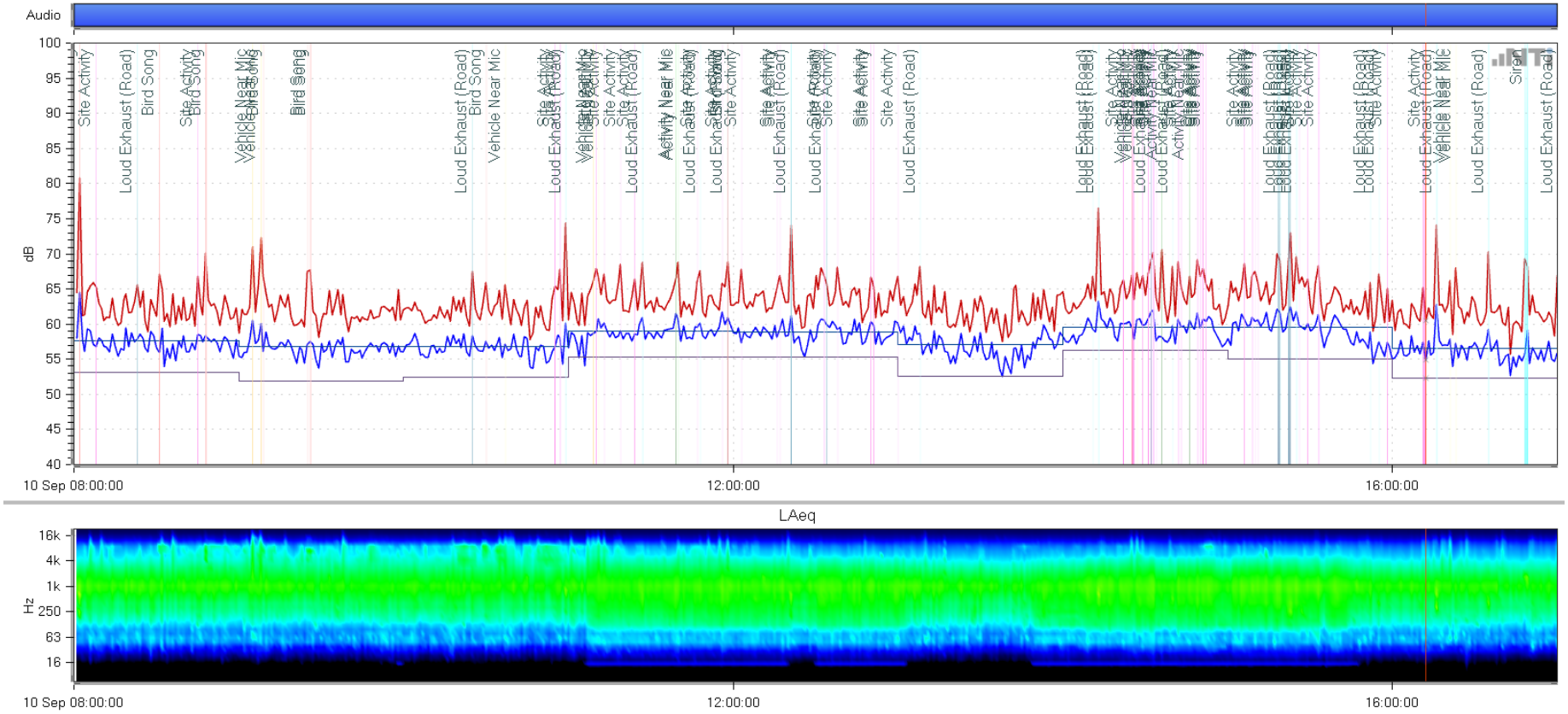


Table B.1 – $L_{Amax,F}$ Values for Events Identified as Site Related on Mon 06/09/2021

Date & Time	Duration (h:mm:ss:ms)	L_{Aeq} (dB)	$L_{Amax,F}$ (dB)
06/09/2021 08:00	0:00:21.0	61.9	65.3
06/09/2021 08:08	0:00:00.4	65.8	66.2
06/09/2021 08:08	0:00:01.0	62.8	67.6
06/09/2021 08:40	0:00:11.7	61.2	65.3
06/09/2021 09:26	0:00:00.6	66.1	68.3
06/09/2021 11:09	0:00:01.1	62.2	67.0
06/09/2021 12:44	0:00:03.3	59.8	66.2
06/09/2021 13:45	0:00:03.0	74.5	82.8
06/09/2021 14:30	0:00:01.2	75.0	80.8
06/09/2021 14:39	0:00:01.8	62.3	67.2
06/09/2021 14:50	0:00:03.0	60.5	65.5
06/09/2021 15:43	0:00:08.2	58.5	66.7

Table B.2 – $L_{Amax,F}$ Values for Events Identified as Site Related on Tue 07/09/2021

Date & Time	Duration (h:mm:ss:ms)	L_{Aeq} (dB)	$L_{Amax,F}$ (dB)
07/09/2021 08:29	0:00:02.0	58.7	65.5
07/09/2021 08:32	0:00:20.0	59.3	66.4
07/09/2021 08:36	0:00:06.0	57.1	65.6
07/09/2021 16:25	0:00:01.5	61.9	65.3
07/09/2021 16:28	0:00:06.0	57.7	67.7
07/09/2021 16:31	0:00:07.0	60.3	66.9
07/09/2021 16:36	0:00:18.0	59.9	65.8
07/09/2021 16:37	0:00:05.0	59.6	67.1
07/09/2021 16:38	0:00:05.0	58.3	65.8
07/09/2021 16:39	0:00:01.0	62.9	69.2

Table B.3 – $L_{Amax,F}$ Values for Events Identified as Site Related on Wed 08/09/2021

Date & Time	Duration (h:mm:ss:ms)	L_{Aeq} (dB)	$L_{Amax,F}$ (dB)
08/09/2021 09:28	0:00:03.0	60.6	65.9
08/09/2021 09:57	0:00:07.8	69.1	74.8
08/09/2021 10:46	0:00:05.0	61.3	67.3
08/09/2021 12:45	0:00:07.5	60.7	70.7
08/09/2021 12:57	0:00:03.0	60.2	66.0
08/09/2021 13:11	0:00:04.3	63.5	65.3
08/09/2021 14:09	0:00:06.0	59.6	65.9
08/09/2021 14:14	0:00:01.2	59.9	66.0
08/09/2021 15:14	0:00:01.7	62.5	66.4
08/09/2021 15:15	0:00:03.0	60.2	65.8
08/09/2021 15:15	0:00:03.0	59.8	65.9
08/09/2021 15:15	0:00:02.0	61.6	67.2
08/09/2021 15:18	0:00:02.1	60.8	65.2
08/09/2021 15:21	0:00:03.0	59.4	67.1
08/09/2021 15:22	0:00:04.0	59.8	65.5
08/09/2021 15:45	0:00:09.4	61.6	66.0
08/09/2021 15:46	0:00:02.0	63.4	65.6
08/09/2021 15:46	0:00:01.4	62.8	65.3
08/09/2021 15:52	0:00:01.7	62.9	65.7
08/09/2021 15:52	0:00:02.3	63.9	66.3
08/09/2021 15:55	0:00:01.6	58.9	64.9
08/09/2021 16:03	0:00:07.3	62.6	65.8
08/09/2021 16:17	0:00:01.4	60.7	65.9
08/09/2021 16:24	0:00:01.6	62.8	65.1
08/09/2021 16:26	0:00:02.3	71.3	78.1
08/09/2021 16:27	0:00:00.8	61.1	64.6
08/09/2021 16:30	0:00:01.6	62.1	65.4
08/09/2021 16:31	0:00:02.6	71.2	77.9
08/09/2021 16:31	0:00:03.3	62.4	70.2
08/09/2021 16:41	0:00:01.6	69.1	75.3
08/09/2021 16:49	0:00:01.9	63.4	66.5
08/09/2021 16:50	0:00:03.4	63.9	66.8
08/09/2021 16:51	0:00:02.0	62.2	66.6
08/09/2021 16:51	0:00:03.0	66.7	71.1
08/09/2021 16:52	0:00:04.8	61.6	69.9
08/09/2021 16:53	0:00:03.0	63.8	67.0
08/09/2021 16:54	0:00:01.9	62.1	64.8
08/09/2021 16:55	0:00:02.2	62.6	67.1
08/09/2021 16:56	0:00:02.5	63.6	66.8
08/09/2021 16:57	0:00:02.8	60.4	65.5
08/09/2021 16:58	0:00:02.6	61.0	65.1
08/09/2021 16:58	0:00:03.4	61.3	65.3
08/09/2021 16:59	0:00:01.5	63	65.3

Table B.4 – $L_{Amax,F}$ Values for Events Identified as Site Related on Thu 09/09/2021

Date & Time	Duration (h:mm:ss:ms)	L_{Aeq} (dB)	$L_{Amax,F}$ (dB)
09/09/2021 08:10	0:00:01.0	65.7	68.0
09/09/2021 08:11	0:00:00.3	65.1	65.9
09/09/2021 08:13	0:00:05.7	62.7	65.2
09/09/2021 08:15	0:00:01.7	63.0	66.2
09/09/2021 08:20	0:00:02.8	61.6	65.6
09/09/2021 08:21	0:00:11.0	61.1	66.2
09/09/2021 08:23	0:00:05.0	62.6	65.5
09/09/2021 09:02	0:00:00.6	68.7	71.0
09/09/2021 09:39	0:00:01.4	62.2	64.9
09/09/2021 10:02	0:00:01.2	62.8	66.4
09/09/2021 10:03	0:00:01.2	62.9	64.4
09/09/2021 10:28	0:00:00.7	63.0	64.6
09/09/2021 10:32	0:00:01.1	61.7	63.9
09/09/2021 10:32	0:00:00.6	62.4	64.5
09/09/2021 11:01	0:00:04.0	59.3	67.7
09/09/2021 11:02	0:00:04.0	59.8	65.6
09/09/2021 11:02	0:00:02.0	61.3	66.0
09/09/2021 11:02	0:00:00.9	64.8	67.9
09/09/2021 11:05	0:00:02.0	64.3	67.4
09/09/2021 11:11	0:00:03.0	63.3	66.7
09/09/2021 11:11	0:00:03.0	60.5	65.2
09/09/2021 12:02	0:00:03.0	63.3	65.7
09/09/2021 12:05	0:00:00.5	66.0	66.7
09/09/2021 12:33	0:00:17.8	63.5	68.2
09/09/2021 13:19	0:00:03.0	60.1	68.3
09/09/2021 13:36	0:00:00.4	67.3	68.0
09/09/2021 15:00	0:00:03.3	61.3	65.0
09/09/2021 16:49	0:00:03.0	59.3	69.2
09/09/2021 16:52	0:00:06.0	58.9	65.5

Table B.5 – $L_{Amax,F}$ Values for Events Identified as Site Related on Fri 10/09/2021

Date & Time	Duration (h:mm:ss:ms)	L_{Aeq} (dB)	$L_{Amax,F}$ (dB)
10/09/2021 08:07	0:00:02.0	60.6	65.3
10/09/2021 08:44	0:00:01.3	62.7	66.8
10/09/2021 10:54	0:00:00.9	62.3	65.4
10/09/2021 10:54	0:00:04.6	60.7	64.1
10/09/2021 10:56	0:00:00.9	63.8	66.8
10/09/2021 10:56	0:00:01.5	64.7	67.8
10/09/2021 10:56	0:00:02.4	59.0	64.1
10/09/2021 11:09	0:00:01.1	64.3	67.9
10/09/2021 11:12	0:00:02.0	64.2	67.1
10/09/2021 11:18	0:00:01.7	65.4	68.5
10/09/2021 11:23	0:00:03.0	61.4	66.4
10/09/2021 11:46	0:00:01.4	64.3	66.1
10/09/2021 11:55	0:00:01.6	65.3	65.8
10/09/2021 12:02	0:00:01.2	63.5	67.8
10/09/2021 12:15	0:00:01.0	62.9	65.0
10/09/2021 12:16	0:00:01.3	63.2	66.9

10/09/2021 12:32	0:00:00.4	64.2	65.4
10/09/2021 12:32	0:00:01.7	64.0	65.8
10/09/2021 12:32	0:00:02.2	64.1	67.0
10/09/2021 12:37	0:00:01.0	64.8	68.1
10/09/2021 12:49	0:00:13.0	62.3	66.7
10/09/2021 12:50	0:00:11.0	62.3	65.3
10/09/2021 12:59	0:00:01.1	64.6	66.8
10/09/2021 14:21	0:00:00.6	65.1	66.3
10/09/2021 14:21	0:00:00.4	64.4	65.2
10/09/2021 14:24	0:00:01.4	63.1	65.1
10/09/2021 14:28	0:00:01.1	63.7	66.9
10/09/2021 14:30	0:00:00.8	65.3	67.0
10/09/2021 14:30	0:00:00.6	65.6	67.3
10/09/2021 14:31	0:00:00.6	62.5	64.3
10/09/2021 14:31	0:00:00.7	63.6	64.8
10/09/2021 14:31	0:00:00.7	66.9	69.2
10/09/2021 14:32	0:00:01.2	67.5	70.2
10/09/2021 14:32	0:00:00.5	66.6	67.0
10/09/2021 14:32	0:00:00.3	64.5	64.9
10/09/2021 14:32	0:00:00.8	65.8	68.7
10/09/2021 14:32	0:00:00.5	67.2	68.2
10/09/2021 14:32	0:00:00.7	63.6	64.8
10/09/2021 14:32	0:00:00.9	63.8	67.4
10/09/2021 14:33	0:00:00.7	61.9	63.8
10/09/2021 14:41	0:00:00.5	67.9	68.9
10/09/2021 14:41	0:00:02.2	64.7	68.3
10/09/2021 14:41	0:00:00.5	62.6	63.9
10/09/2021 14:42	0:00:00.7	63.3	65.4
10/09/2021 14:42	0:00:00.7	63.1	64.4
10/09/2021 14:48	0:00:02.5	65.1	69.1
10/09/2021 14:48	0:00:00.8	62.7	64.9
10/09/2021 14:48	0:00:00.9	66.0	69.2
10/09/2021 14:49	0:00:00.8	63.9	65.6
10/09/2021 14:49	0:00:00.6	62.9	63.8
10/09/2021 14:49	0:00:02.3	63.8	66.8
10/09/2021 14:50	0:00:01.1	65.8	67.9
10/09/2021 14:50	0:00:00.7	63.6	65.4
10/09/2021 14:50	0:00:00.7	63.0	65.0
10/09/2021 14:51	0:00:00.8	63.6	65.0
10/09/2021 15:05	0:00:00.7	67.3	68.6
10/09/2021 15:08	0:00:00.6	63.9	65.3
10/09/2021 15:08	0:00:00.5	65.8	65.8
10/09/2021 15:08	0:00:01.5	64.8	66.9
10/09/2021 15:09	0:00:02.8	64.5	67.5
10/09/2021 15:10	0:00:01.0	64.5	65.9
10/09/2021 15:25	0:00:01.1	63.3	65.8
10/09/2021 15:28	0:00:00.8	62.8	66.4
10/09/2021 15:32	0:00:01.8	65.8	67.4
10/09/2021 15:32	0:00:00.7	65.7	66.5
10/09/2021 15:32	0:00:01.4	66.6	68.3
10/09/2021 15:32	0:00:00.5	65.4	67.1
10/09/2021 15:57	0:00:01.2	61.7	65.1
10/09/2021 16:10	0:00:18.0	60.5	65.2

Table B.6 – BS 4142:2014 Assessment at Position 1 (Continuous Plant)

Results		Clause	Commentary
Measured Level of Daytime Industrial Activity at Position 1 (Continuous Plant)	L_{Aeq} = 52dB	7.3.2	L_{A90} used to determine level of continuous plant between car pass bys
Residual sound level	L_{Aeq} = 49dB	7.3.3	L_{A90} used to determine residual noise between car pass-bys with plant off
Background sound level (daytime)	$L_{A90(1200\text{-}1300hrs)}$ = 49dB	8.1.1 8.1.3 8.3	Background sound level measured at Position 1 with plant off
Assessment made during the daytime so the reference time interval is 1hr.		7.2	
Specific sound level calculated by correcting the ambient sound level to remove the contribution of the residual sound level.	$L_{Aeq,1hr}$ = 49dB	7.3.4	
Acoustic feature correction	3dB	9.2	In the context of a road traffic not easily distinguishable, however included for robustness
Rating Level	(49 + 3) = 52dB		
Background sound level (daytime)	$L_{A90(1200\text{-}1300hrs)}$ = 49dB	8.3	
Excess of rating over background sound level	(52 - 49) dB = 3dB	11	
Assessment indicates adverse impact unlikely depending on context		11	With only a 3dB excess over background, BS 4142:2014 advises: "this is an indication of the specific sound source having Low Impact, depending on the context" Context discussed in Section 5.1.1
Uncertainty of assessment		10	Continuous industrial noise is not easily isolated from the relatively high road traffic noise. Therefore there is an element of uncertainty in the measured levels. Predicted levels in our previous reports indicate lower levels of industrial noise and therefore this approach would appear robust.

Table B.7 – BS 4142:2014 Assessment at Position 1 (Impulsive Noise Events)

Results		Clause	Commentary
Estimated Level of Daytime Industrial Activity at Position 1 (Impulses Plant)	L_{Aeq} = 48dB	7.3.2	Robust period generated based on measured $L_{Amax,F}$ events over the week at Position 1 – see Section 5.2
Residual sound level	L_{Aeq} = 0dB	7.3.3	No residual correction taken as based on predicted level
Background sound level (daytime)	$L_{A90(1200\text{-}1300hrs)}$ = 49dB	8.1.1 8.1.3 8.3	Background sound level measured at Position 1 with plant off
Assessment made during the daytime so the reference time interval is 1hr.		7.2	
Specific sound level calculated by correcting the ambient sound level to remove the contribution of the residual sound level.	$L_{Aeq,1hr}$ = 48dB	7.3.4	
Acoustic feature correction	6dB	9.2	Impulsivity clearly perceptible
Rating Level	(48 + 6) = 54dB		
Background sound level (daytime)	$L_{A90(1200\text{-}1300hrs)}$ = 49dB	8.3	
Excess of rating over background sound level	(54 - 49) dB = 5dB	11	
Assessment indicates an adverse impact depending on context		11	At 5dB excess over background, BS 4142:2014 advises: "this is likely to be an indication of an adverse impact depending on the context" Context discussed in Section 5.2.1
Uncertainty of assessment		10	Impact noise events have been isolated in our analysis and a robust assessment in terms of number of events and level of events to form a 1hr period has been carried out.

APPENDIX C – PHOTOGRAPHS

Figure C.1 – Monitoring Setup at Position 1 (Coed-Y-Felin)