

## **Construction noise and vibration Monthly Report – November 2020**

### **London Borough of Camden**

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# Non-Technical Summary

This Noise and Vibration Monitoring Report fulfils HS2 Limited's commitment detailed in the Environmental Minimum Requirements (EMRs), Annex 1, Code of Construction Practice, to present the results of noise and vibration monitoring carried out within the London Borough of Camden during the month of November 2020.

Within this period monitoring was undertaken at the following worksites:

- Noise monitoring was undertaken in the vicinity of The Adelaide Road Ventilation Shaft (ref.: ARVS), where vegetation removal, surveying, site setup, hoarding works, groundworks, construction of working platforms, construction of access ramp and installation of utilities were underway.
- Noise monitoring was undertaken in the vicinity of Euston Cavern worksite (ref.: ECAV), where vegetation removal, surveying and site setup activities were underway.
- Noise monitoring was undertaken in the vicinity of Euston Scissor Box worksite (ref.: ESC), where site setup, surveys, site clearance, hoarding works, construction of drilling fluid slabs, piling preparations, extension and widening of access ramp and abnormal load deliveries were underway.
- Noise monitoring was undertaken in the vicinity of Euston Throat Retained Cut worksite (ref.: ETRC) where piling preparations were underway.
- Noise and vibration monitoring was undertaken in the vicinity of the Hampstead Road Bridge worksite (ref.: HRB), where removal of street assets was underway.
- Noise monitoring was undertaken in the vicinity of On-Network worksites (ref.: C, D & E), where wall repair works, delivery and installation of signal equipment, surveys, relocation of assets, removal and tamping of sidings, signal bulb works, cabling works, asbestos removal and troughing.
- Noise monitoring was undertaken in the vicinity of On-Network worksites (ref.: G and ref.: H), where cable management system installation, demolition, platform resurfacing and lighting column installation were underway.
- Noise monitoring was undertaken in the vicinity of the 132 and 140 Hampstead Road and Petrol Station worksite (ref.: S001-WS02), where groundworks and site setup were underway.
- Noise and vibration monitoring were undertaken in the vicinity of the Wolfson House, Walkden House, 67-75 & 77-79 Euston Road worksite (ref.: S003-WS03) where demolition and groundworks were underway.
- Noise monitoring was undertaken in the vicinity of the Former National Temperance Hospital, 110 Hampstead Road worksite (ref.: S003-WS06), where piling platform construction, wall construction and deliveries were underway.

- Noise monitoring was undertaken in the vicinity of the Former National Temperance Hospital - Euston North worksite (ref.: NTH-EN), piling, hoarding works, groundworks and modification of internal access ramp were underway.
- Noise monitoring was undertaken in the vicinity of the Vehicle Holding Area worksite (ref.: VHA), where surveys, vegetation clearance, hoarding works and site setup were underway.
- Vibration monitoring was undertaken in the vicinity of the Royal College of General Practitioners (RCGP) worksite (ref.: S003-WS08). Whilst works were not undertaken on worksite ref.: S003-WS08, vibration levels at the associated monitors may be influenced by work undertaken on nearby worksite ref.: S003-WS03.

Further works were also undertaken on Stephenson Way, Melton Street, North Gower Street, Ragnart Buildings and Harrington Street, where utilities works were underway.

There were four (4) exceedances of the HS2 threshold levels for significant noise effects during the reporting period at three (3) monitoring positions.

There were no exceedances of trigger levels as defined in section 61 consents during the reporting period at any monitoring position.

Ten (10) complaints were received during the monitoring period. A description of complaints, the results of investigations and any actions taken are detailed in Table 8 of this report.

Monitor N046 was offline for most of November due to an electrical fault with the lamppost which supplies power to the monitor. Contact was made with the Local Authority and Power Supply Company to resolve this issue resulting with the power supply to the lamppost being reconnected on Tuesday 22nd December.

No data was recorded at monitor N052 during the month of November due to the corruption of the SD card within the monitoring station.

# Abbreviations and Descriptions

The abbreviations, descriptions and project terminology used within this report can be found in Table 1.

Table 1: Table of Abbreviations

Acronym/Term	Definition
$L_{Aeq,T}$	See equivalent continuous sound pressure level
Ambient sound	A description of the all-encompassing sound at a given location and time which will include sound from many sources near and far. Ambient sound can be quantified in terms of the equivalent continuous sound pressure level, $L_{pAeq,T}$
Decibel(s), or dB	Between the quietest audible sound and the loudest tolerable sound there is a million to one ratio in sound pressure (measured in Pascal (Pa)). Because of this wide range, a level scale called the decibel (dB) scale, based on a logarithmic ratio, is used in sound measurement. Audibility of sound covers a range of approximately 0-140dB.
Decibel(s) A-weighted, or dB(A)	The human ear system does not respond uniformly to sound across the detectable frequency range and consequently instrumentation used to measure sound is weighted to represent the performance of the ear. This is known as the 'A weighting' and is written as 'dB(A)'.
Equivalent continuous sound pressure level, or $L_{Aeq,T}$	An index used internationally for the assessment of environmental sound impacts. It is defined as the notional unchanging level that would, over a given period of time (T), deliver the same sound energy as the actual time-varying sound over the same period. Hence fluctuating sound levels can be described in terms of an equivalent single figure value, typically expressed as a decibel level.
Exclusion of data	Measurement of noise levels can be affected by weather conditions such as prolonged periods of rain, winds speeds higher than 5m/s and snow/ice ground cover. Noise levels measured during these periods are considered not representative of normal noise conditions at the site and, for the purposes of this report, are excluded from the assessment of exceedances and calculation of typical noise levels and are also greyed out in charts. Identifiable incongruous noise and vibration events not attributable to HS2 construction noise are also excluded.
Façade	A facade noise level is the noise level 1m in front of a large reflecting surface. The effect of reflection, is to produce a slightly higher (typically +2.5 to +3 dB) sound level than it would be if the reflecting surface was not there.
Free-field	A free-field noise level is the noise level measured at a location where no reflective surfaces, other than the ground, lies within 3.5 metres of the microphone position.
LOAEL	Lowest Observed Adverse Effect Level - the level above which adverse effects on health and quality of life can be detected.
Peak particle velocity, or PPV	Instantaneous maximum velocity reached by a vibrating element as it oscillates about its rest position. The PPV is a simple indicator of perceptibility and risk of damage to structures due to vibration. It is usually measured in mm/s.
SOAEL	Significant Observed Adverse Effect Level - the level above which significant adverse effects on health and quality of life occur.
Sound pressure level	The parameter by which sound levels are measured in air. It is measured in decibels. The threshold of hearing has been set at 0dB, while the threshold of pain is approximately 120dB. Normal speech is approximately 60dB at a distance of 1 metre and a change of 3dB in a time varying sound signal is commonly regarded as being just detectable. A change of 10dB is subjectively twice, or half, as loud.
Vibration dose value, or VDV	An index used to evaluate human exposure to vibration in buildings. While the PPV provides information regarding the magnitude of single vibration events, the VDV provides a measure of the total vibration experienced over a specified period of time (typically 16h daytime and 8h night-time). It takes into account the magnitude, the number and the duration of vibration events and can be used to quantify exposure to continuous, impulsive, occasional and intermittent vibration. The vibration dose value is measured in $m/s^{1.75}$ .

# 1 Introduction

1.1.1 HS2 is required to undertake noise (and vibration) monitoring as necessary to comply with the requirements of the High Speed Rail (London-West Midlands) Environmental Minimum Requirements, including specifically Annex 1: Code of Construction Practice, in addition to any monitoring requirements arising from conditions imposed through consents under Section 61 of the Control of Pollution Act, 1974 or through Undertakings & Assurances given to third parties. Such monitoring may be undertaken for the following purposes:

- monitoring the impact of construction works;
- to investigate complaints, incidents and exceedance of trigger levels; or
- monitoring the effectiveness of noise and vibration control measures.

Monitoring data and interpretive reports are to be provided to each relevant local authority on a monthly basis and shall include a summary of the construction activities occurring, the data recorded over the monitoring period, any complaints received, any periods in exceedance of agreed trigger levels, the results of any investigations and any actions taken or mitigation measures implemented. This report provides noise data, and interpretation thereof, for monitoring carried out by HS2 within the London Borough of Camden (LBC) for the period 1<sup>st</sup> to 30<sup>th</sup> November 2020.

1.1.2 Active construction sites in the local authority area where monitoring was undertaken during this period include:

- The Adelaide Road ventilation shaft, (see plan 2 in Appendix A), where work activities included:
  - vegetation removal;
  - hoarding works;
  - construction of pedestrian walkways;
  - groundworks;
  - maintenance works on welfare cabins;
  - installation of edge protection along retaining wall;
  - installation of generators;
  - ground penetrating radar surveys;
  - construction of working platforms;
  - construction of access ramp;
  - construction of concrete slabs;
  - installation of utilities;

- installation of lighting
- Euston Cavern worksite ref.: ECAV (see plan 2 in Appendix A), where work activities included:
  - vegetation removal;
  - surveying of assets;
  - site setup.
- Euston Scissor Box worksite ref.: ESC (see plan 2 in Appendix A), where work activities included:
  - installation of site services, working platforms and scaffolding;
  - surveying and monitoring of assets and surrounding structures;
  - site clearance including vegetation clearance;
  - installation, adaption and removal of hoarding;
  - construction of drilling fluid slabs;
  - preparation activities for the main piling works, including removal of DB Cargo shed foundations and slab construction;
  - extension and widening of access ramp;
  - deliveries of abnormal loads (crane).
- Euston Throat Retained Cut worksite ref.: ETRC (see plan 2 in Appendix A), where work activities included:
  - setup of site offices;
  - installation, adaption and removal of hoarding;
  - preparations for and undertaking of test piling including pile mat installation, plate bearing tests, test piling rig mobilisation, anchor pile installation and test pile installation.
- Hampstead Road Bridge worksite ref.: HRB (see plan 3 in Appendix A), where work activities included:
  - removal of assets;
- On-Network worksite ref.: C, D and E (see plan 3 in Appendix A), where work activities included:
  - wall repair works at Gloucester Avenue, including lift and shift cable containment works;
  - delivery and installation of signal disconnection boxes and tail cables;
  - surveys, including heights and staggers survey, overhead line equipment switch survey, ground investigations, Ultrasonic Rail Flaw Detector Operator inspections, crossing inspections
  - relocation of signalling assets;

- removal and tamping of sidings;
- LED (signal bulb) works;
- cabling works;
- removal of asbestos,
- troughing;
- On-Network worksite ref.: G and ref.: H (see plan 3 in Appendix A), where work activities included:
  - cable management system installation;
  - cutline demolition works;
  - platform resurfacing and lighting columns installation.
- 132 and 140 Hampstead Road and Petrol Station worksite ref.: S001-WS02 (see plan 2 in Appendix A), where work activities included:
  - groundworks (ground remediation);
  - site setup.
- Wolfson House, Walkden House, 67-75 & 77-79 Euston Road worksite ref.: S003-WS03 (see plan 3 in Appendix A), where work activities included:
  - demolition;
  - groundworks (backfilling);
  - propping.
- Former National Temperance Hospital, 110 Hampstead Road worksite ref.: S003-WS06 (see plan 3 in Appendix A), where work activities included:
  - piling platform construction
  - guide wall construction;
  - deliveries.
- National Temperance Hospital - Euston North worksite ref.: NTH-EN (see plan 1 in Appendix A), where work activities included:
  - piling;
  - hoarding modification;
  - propping alteration;
  - modification of internal access ramp.
- Vehicle Holding Area worksite ref.: VHA (see plan 1 in Appendix A), where work activities included:
  - surveying and monitoring of assets and surrounding structures;
  - site clearance including vegetation clearance;



- installation, adaption and removal of hoarding;
- installation of lighting systems.

1.1.3 Vibration monitoring was also undertaken in the vicinity of the Royal College of General Practitioners (RCGP) worksite (ref.: S003-WS08). Whilst works were not undertaken on worksite ref.: S003-WS08, vibration levels at the associated monitors may be influenced by work undertaken on nearby worksite ref.: S003-WS03.

1.1.4 Further works, where monitoring did not take place, were also undertaken at the following locations:

- Stephenson Way, Melton Street, North Gower Street, Ragnart Buildings and Harrington Street, where utilities works were undertaken.

1.1.5 The applicable standards, guidance, and monitoring methodology is outlined in the construction noise and vibration monitoring methodology report which can be found at the following location <https://www.gov.uk/government/collections/monitoring-the-environmental-effects-of-hs2>. Noise and vibration monitoring reports for previous months can also be found at this location.

## 1.2 Measurement Locations

1.2.1 Thirty-two (32) noise and seven (7) vibration monitoring installations were active across twelve (12) worksites in November in the LBC area. Table 2 summarises the position of noise and vibration monitoring installations within the LBC area in November 2020.

1.2.2 Maps showing the position of noise and vibration monitoring installations are presented in Appendix B.

1.2.3 Two additional noise monitors were installed at location N051 and N052, on Adelaide Road, worksite ref. ARVS, on the 1<sup>st</sup> of November.

1.2.4 The noise monitor at measurement location N019, worksite ref.: S001-WS02, was relocated on the 21<sup>st</sup> of October to allow the hoarding works to be undertaken and was connected to power at the new location on the 12<sup>th</sup> of November.

Table 2: Monitoring Locations

Worksite Reference	Measurement Reference	Address
ARVS	N051	Opposite 68 Adelaide Road
	N052	Adelaide Road-Beaumont Walk
B	JC	Juniper Crescent
ESC	N022	External to 34 Mornington Terrace
	N024	External to Park Village Studios, Park Village East
	N046	Lamppost opposite to 49 Mornington Terrace
	N047	Park Village East/Mornington Street bridge, lamppost #13
ETRC	N001	Park Village East, lamppost #1 (external to Cubitt Court, 100 Park Village East)
	N002	Park Village East, lamppost #2 (external to Richmond Court)
	N003	Park Village East, lamppost #9 (external to Silsoe House)
	N004	Mornington Terrace, lamppost #7 (junction of Mornington Terrace, Mornington Place and Clarkson Row)
	N005	5A Granby Terrace
	N023	Lamppost #21 on Hampstead Road
HRB	N020	Mackworth Street, lamppost #1
	N021	Stanhope Street, lamppost #2
	N044	Regents Park Estate west, near Langdale (temporarily removed from site on 31 <sup>st</sup> August)
	N045	Regents Park Estate south, external to Coniston
	V039	Coniston, Regents Park Estate
	V043	Cubitt Court, Park Village East
G	HH	Euston Station Parcel Deck, Barnby Street
	BS	Roof of Stockbeck House, Barnby Street
S001-WS02	N018	Outside replacement housing, Hampstead Road
	N019	Outside Cartmel, Hampstead Road
S003-WS03	N006	Royal College of General Practitioners roof level
	N008	Stephenson's Way lamppost (external to RCGP)
	N010	Wesley Hotel
	N011	Euston Street, lamppost #4 (external to 82 Euston Street)
	V002	Royal College of General Practitioners basement boiler room by Stephenson Way
	V037	Magic Circle, basement
	V038	Wesley Hotel, basement lightwell, Euston Street
S003-WS07	N012	Drummond Street, lamppost #14 (opposite to 92-94 Drummond Street)
S003-WS08	N007	Royal College of General Practitioners, Melton Street

<b>Worksite Reference</b>	<b>Measurement Reference</b>	<b>Address</b>
	V003	Royal College of General Practitioners basement vaults under Melton St
Vehicle Holding Area (VHA)	N025	External to 3 Prince Albert Road
	N026	Thames Water Compound (temporarily removed from site on 21 <sup>st</sup> June)
NTH-EN	N014	Starcross Street lamppost (external to Exmouth Arms)
	N016	Margaret Centre roof
	N017	Hampstead Road, lamppost #48
	V021	42-44 Cobourg Street

## 2 Summary of Results

### 2.1 Summary of Measured Noise and Vibration Levels

- 2.1.1 Table 3 presents a summary of the measured noise levels at each monitoring location over the reporting period. The  $L_{Aeq,T}$  is presented for each of the relevant time periods averaged over the calendar month, along with the highest single period  $L_{Aeq,T}$  that was found to occur within the month.
- 2.1.2 Monitor N046 was offline for most of November due to an electrical fault with the lamppost which supplies power to the monitor. Contact was made with the Local Authority and Power Supply Company to resolve this issue resulting with the power supply to the lamppost being reconnected on Tuesday 22nd December.
- 2.1.3 No data was recorded at monitor N052 during the month of November due to the corruption of the SD card within the monitoring station.

Table 3: Summary of Measured dB L<sub>Aeq</sub> Data over the Monitoring Period

Worksite Reference	Measurement Reference	Site Address	Free-field or Façade Measurement	Weekly Average L <sub>Aeq,T</sub> (Highest Day L <sub>Aeq,T</sub> )					Saturday Average L <sub>Aeq,T</sub> (highest day L <sub>Aeq,T</sub> )					Sunday / Public Holiday Average L <sub>Aeq,T</sub> (highest day L <sub>Aeq,T</sub> )		
				0700 - 0800	0800 - 1800	1800 - 1900	1900 - 2200	2200 - 0700	0700 - 0800	0800 - 1300	1300 - 1400	1400 - 2200	2200 - 0700	0700 - 2200	2200 - 0700	
ARVS	N051	Opposite 68 Adelaide Road	Free-field	62.4 (70.0)	64.8 (74.0)	62.7 (74.5)	62.4 (72.4)	58.6 (76.0)	60.2 (61.6)	61.0 (63.3)	61.1 (62.9)	61.1 (68.6)	58.1 (69.9)	60.4 (67.6)	56.7 (61.9)	
	N052	Adelaide Road-Beaumont Walk	Free-field	_* (-)*	_* (-)*	_* (-)*	_* (-)*	_* (-)*	_* (-)*	_* (-)*	_* (-)*	_* (-)*	_* (-)*	_* (-)*	_* (-)*	
B	JC	Juniper Crescent	Free-field	58.6 (62.5)	59.6 (61.0)	59.3 (62.1)	59.2 (68.0)	55.9 (61.9)	57.7 (59.9)	58.4 (59.8)	58.4 (59.9)	58.2 (61.6)	53.1 (59.5)	57.1 (60.6)	55.9 (61.7)	
ESC	N022	External to 34 Mornington Terrace	Free-field	60.9 (65.8)	61.6 (62.9)	60.7 (62.3)	59.9 (63.3)	55.4 (65.0)	59.7 (60.8)	59.9 (60.7)	59.9 (60.8)	60.2 (70.4)	53.3 (61.8)	58.8 (62.7)	56.1 (63.7)	
	N024	External to Park Village Studios, Park Village East	Free-field	59.6 (64.5)	60.9 (64.2)	59.2 (63.7)	58.1 (65.1)	53.3 (62.6)	55.0 (56.3)	58.1 (58.6)	58.8 (60.0)	58.7 (67.4)	54.8 (71.7)	56.9 (62.1)	53.4 (59.7)	
	N046	Mornington Terrace near The Edinboro Castle pub, lamppost #18	Free-field	_* (-)**	_* (-)**	_* (-)**	_* (-)**	_* (-)**	_* (-)**	_* (-)**	_* (-)**	_* (-)**	_* (-)**	53.9 (56.8)	62.4 (64.0)	64.7 (64.8)
	N047	Park Village East/Mornington Street bridge, lamppost #13	Free-field	58.8 (60.8)	61.3 (63.8)	60.1 (63.7)	58.9 (65.5)	53.6 (62.1)	55.5 (57.0)	58.5 (59.3)	59.9 (61.6)	60.2 (70.8)	53.5 (59.8)	58.5 (69.9)	53.5 (59.2)	

Worksite Reference	Measurement Reference	Site Address	Free-field or Façade Measurement	Weekly Average $L_{Aeq,T}$ (Highest Day $L_{Aeq,T}$ )					Saturday Average $L_{Aeq,T}$ (highest day $L_{Aeq,T}$ )					Sunday / Public Holiday Average $L_{Aeq,T}$ (highest day $L_{Aeq,T}$ )	
				0700 - 0800	0800 - 1800	1800 - 1900	1900 - 2200	2200 - 0700	0700 - 0800	0800 - 1300	1300 - 1400	1400 - 2200	2200 - 0700	0700 - 2200	2200 - 0700
ETRC	N001	External to Cubitt Court, 100 Park Village East	Free-field	59.4 (62.6)	67.9 (69.9)	60.8 (72.1)	58.9 (70.3)	54.3 (59.5)	57.0 (58.2)	68.4 (71.6)	60.3 (61.5)	59.1 (65.4)	54.0 (59.5)	57.4 (62.6)	53.8 (62.3)
	N002	Richmond Court, Park Village East	Free-field	57.7 (59.9)	63.6 (65.7)	60.5 (67.9)	58.6 (70.7)	52.8 (60.3)	55.1 (55.5)	60.1 (61.5)	59.7 (61.9)	59.5 (64.0)	53.4 (59.1)	57.7 (62.2)	52.6 (56.7)
	N003	Silsoe House, Park Village East	Façade	58.2 (60.4)	61.8 (63.5)	60.6 (65.2)	58.9 (70.0)	52.8 (60.0)	54.5 (56.0)	58.8 (60.0)	60.3 (63.0)	60.1 (67.4)	53.5 (58.8)	58.1 (63.2)	52.8 (57.5)
	N004	Mornington Terrace, lamppost #7	Free-field	64.1 (65.4)	66.2 (68.6)	64.2 (66.9)	63.7 (71.3)	59.7 (78.2)	63.0 (63.8)	64.5 (64.8)	63.2 (63.4)	63.7 (72.3)	56.9 (66.4)	63.0 (68.5)	60.1 (66.2)
	N005	5A Granby Terrace	Free-field	65.7 (66.4)	68.7 (70.0)	65.5 (68.2)	64.7 (68.0)	62.9 (66.5)	64.7 (65.1)	67.5 (68.9)	65.2 (65.9)	64.4 (65.9)	63.2 (67.2)	64.7 (70.1)	63.9 (68.4)
	N023	Amphill Estate, Hampstead Road	Free-field	69.9 (71.3)	71.8 (74.5)	69.7 (74.4)	68.6 (77.2)	65.5 (72.8)	67.4 (67.8)	70.0 (72.2)	70.4 (73.2)	68.7 (71.8)	65.6 (71.1)	68.1 (71.9)	65.7 (70.8)

Worksite Reference	Measurement Reference	Site Address	Free-field or Façade Measurement	Weekly Average $L_{Aeq,T}$ (Highest Day $L_{Aeq,T}$ )					Saturday Average $L_{Aeq,T}$ (highest day $L_{Aeq,T}$ )					Sunday / Public Holiday Average $L_{Aeq,T}$ (highest day $L_{Aeq,T}$ )	
				0700 - 0800	0800 - 1800	1800 - 1900	1900 - 2200	2200 - 0700	0700 - 0800	0800 - 1300	1300 - 1400	1400 - 2200	2200 - 0700	0700 - 2200	2200 - 0700
HRB	N020	Mackworth Street	Free-field	53.3 (56.7)	62.7 (66.1)	55.0 (71.7)	53.1 (66.7)	48.8 (62.9)	50.5 (51.3)	57.9 (64.0)	52.9 (54.3)	52.6 (58.1)	49.0 (59.4)	51.8 (57.6)	48.7 (58.2)
	N021	Stanhope Street, lamppost #2	Free-field	57.4 (60.4)	64.2 (66.0)	59.3 (70.9)	57.5 (68.9)	51.7 (58.8)	53.7 (55.0)	63.2 (66.1)	58.8 (60.2)	57.2 (61.7)	53.0 (64.6)	56.2 (62.4)	52.4 (61.5)
	N044	Regents Park Estate west	Free-field	56.4 (63.9)	69.0 (71.7)	57.6 (73.4)	54.7 (72.9)	50.6 (61.9)	54.2 (55.9)	67.7 (71.4)	54.3 (57.7)	52.9 (56.3)	49.8 (59.5)	51.6 (55.6)	49.5 (55.1)
	N045	Regents Park Estate south, external to Coniston	Free-field	55.8 (68.3)	69.5 (79.5)	57.1 (76.4)	55.6 (67.8)	52.6 (68.1)	54.2 (55.4)	63.2 (69.3)	56.7 (59.2)	55.4 (58.5)	53.0 (59.9)	54.1 (60.1)	51.8 (55.9)
G	HH	Euston Station Parcel Deck, Barnby Street	Free-field	61.6 (67.5)	62.5 (65.0)	63.3 (71.4)	62.3 (68.0)	58.4 (64.5)	61.4 (64.9)	63.8 (66.3)	62.9 (67.6)	62.8 (67.9)	60.4 (67.7)	63.2 (71.1)	58.6 (67.2)
	BS	Roof of Stockbeck House, Barnby Street	Free-field	59.9 (61.6)	62.4 (62.9)	62.2 (79.4)	61.1 (71.3)	56.4 (61.7)	58.9 (60.1)	60.6 (61.4)	59.8 (60.6)	60.0 (62.7)	57.8 (67.3)	59.7 (63.7)	58.9 (64.6)
S001-WS02	N018	Outside replacement housing, Hampstead Road	Free-field	69.5 (71.6)	71.1 (73.5)	70.5 (77.9)	70.0 (83.5)	66.6 (78.1)	67.0 (67.1)	69.3 (70.9)	70.4 (72.9)	69.7 (72.9)	66.6 (70.3)	69.1 (75.9)	66.3 (71.5)
	N019	Outside Cartmel, Hampstead Road	Free-field	58.6 (59.4)	65.4 (68.3)	59.0 (62.6)	59.1 (69.3)	56.2 (68.6)	57.8 (58.4)	63.8 (65.9)	65.4 (69.3)	59.3 (62.2)	56.6 (60.6)	58.2 (62.0)	55.3 (59.6)

Worksite Reference	Measurement Reference	Site Address	Free-field or Façade Measurement	Weekly Average $L_{Aeq,T}$ (Highest Day $L_{Aeq,T}$ )					Saturday Average $L_{Aeq,T}$ (highest day $L_{Aeq,T}$ )					Sunday / Public Holiday Average $L_{Aeq,T}$ (highest day $L_{Aeq,T}$ )	
				0700 - 0800	0800 - 1800	1800 - 1900	1900 - 2200	2200 - 0700	0700 - 0800	0800 - 1300	1300 - 1400	1400 - 2200	2200 - 0700	0700 - 2200	2200 - 0700
S003-WS03	N006	RCGP Roof level	Free-field	55.9 (66.4)	61.2 (67.3)	54.8 (64.4)	55.0 (65.1)	53.5 (68.3)	53.7 (54.5)	59.1 (61.4)	55.2 (56.2)	53.9 (57.0)	53.3 (62.0)	54.0 (57.9)	53.2 (57.6)
	N008	RCGP Stephenson Way	Façade	58.6 (64.9)	66.7 (75.4)	54.3 (63.5)	54.8 (63.1)	53.6 (70.6)	57.1 (60.9)	65.4 (76.5)	53.8 (54.5)	53.8 (55.7)	53.4 (61.3)	54.1 (59.7)	53.0 (56.6)
	N010	Wesley Hotel	Façade	57.2 (64.7)	67.0 (74.0)	50.9 (53.3)	52.8 (79.9)	51.4 (72.1)	54.8 (61.7)	65.6 (68.8)	56.3 (65.4)	52.8 (65.3)	51.2 (62.2)	51.1 (60.0)	49.2 (50.7)
	N011	Outside 82 Euston Street	Free-field	55.3 (61.3)	57.8 (60.2)	53.3 (61.7)	54.4 (69.9)	53.0 (81.4)	52.8 (53.1)	56.1 (59.2)	54.2 (55.4)	53.1 (55.6)	51.4 (62.2)	53.6 (61.1)	51.5 (59.2)
S003-WS07	N012	Opposite 92-94 Drummond Street	Free-field	58.3 (63.5)	61.1 (62.9)	58.4 (63.4)	58.5 (66.1)	56.2 (70.5)	58.3 (60.6)	59.6 (62.2)	58.8 (59.9)	59.4 (64.9)	55.9 (62.1)	58.7 (69.8)	55.3 (59.5)
S003-WS08	N007	RCGP, Melton Street	Free-field	64.0 (71.8)	67.9 (73.2)	62.9 (66.0)	62.5 (68.2)	60.7 (65.6)	61.8 (62.8)	65.6 (70.8)	63.4 (66.1)	62.5 (67.1)	60.5 (64.8)	62.0 (66.8)	59.6 (62.2)
VHA	N025	External to 3 Prince Albert Road	Free-field	67.1 (69.1)	70.8 (73.6)	66.9 (73.7)	66.2 (72.5)	62.5 (75.3)	64.9 (65.5)	68.5 (73.4)	66.6 (67.7)	66.4 (71.5)	63.1 (70.6)	65.0 (71.0)	62.2 (66.7)
	N026	Thames Water Compound	Free-field	60.5 (62.0)	68.9 (73.0)	61.1 (77.7)	60.0 (77.2)	55.9 (63.2)	56.3 (57.9)	60.5 (65.5)	58.7 (61.3)	57.6 (60.7)	54.6 (57.1)	55.8 (58.8)	54.9 (58.0)
NTH-EN	N014	Starcross Street lamppost (external to Exmouth Arms)	Free-field	55.3 (59.1)	60.6 (64.4)	55.0 (62.8)	54.9 (65.1)	50.6 (59.7)	53.7 (54.6)	58.3 (60.2)	56.6 (57.3)	55.4 (61.2)	49.7 (62.4)	54.5 (59.1)	50.6 (56.2)
	N016	Margaret Centre roof	Free-field	54.7 (57.4)	61.8 (64.4)	55.3 (66.5)	54.9 (64.8)	51.9 (57.7)	53.4 (53.7)	57.6 (60.8)	56.0 (58.4)	54.6 (58.1)	52.1 (60.8)	54.3 (59.7)	52.1 (60.2)

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Worksite Reference	Measurement Reference	Site Address	Free-field or Façade Measurement	Weekly Average $L_{Aeq,T}$ (Highest Day $L_{Aeq,T}$ )					Saturday Average $L_{Aeq,T}$ (highest day $L_{Aeq,T}$ )					Sunday / Public Holiday Average $L_{Aeq,T}$ (highest day $L_{Aeq,T}$ )	
				0700 - 0800	0800 - 1800	1800 - 1900	1900 - 2200	2200 - 0700	0700 - 0800	0800 - 1300	1300 - 1400	1400 - 2200	2200 - 0700	0700 - 2200	2200 - 0700
	N017	42-44 Cobourg Street	Free-field	69.9 (71.1)	71.9 (74.4)	70.6 (80.2)	69.7 (74.9)	66.4 (74.8)	67.8 (68.2)	69.6 (70.8)	70.8 (74.3)	69.7 (73.6)	67.2 (72.0)	69.5 (75.8)	66.3 (72.5)

\* No data measured to due SD card corruption.

\*\* Data not measured within noted periods due to an electrical fault with the lamppost which resulted in a loss of power at the noise monitor.

2.1.4 Table 4 presents a summary of the measured vibration levels at each monitoring location over the reporting period. The highest PPV measured during the monitoring along any axis is presented in the table.

Table 4: Summary of Measured PPV Data over the Monitoring Period

Worksite Reference	Measurement Reference	Monitor Address	Highest PPV measured in any axis, mm/s
HRB	V039	Coniston, Regents Park Estate	10.30* (Y-Axis)
	V043	Cubitt Court, Park Village East	2.88 (Y-Axis)
S003-WS03	V002	RCGP. basement boiler room. 305 Euston Road	1.05 (Z-axis)
	V037	Magic Circle, basement	2.52 (Y-axis)
	V038	Wesley Hotel, basement lightwell, Euston Street	0.80 (Z-axis)
S003-WS09	V003	RCGP. basement vaults, 305 Euston Road	0.35 (Z-axis)
NTH-EN	V021	42-44 Cobourg Street (floor)	0.89 (Z-axis)

\* High vibration levels are due to the siting of the monitor resulting in poor coupling between the monitor and the ground, and extraneous vibration events.

2.1.5 Monitor V039 is currently sited on a concrete block which is attached to the site hoarding, resulting in poor coupling between the monitor and ground, and interference due to extraneous vibration events, such as the closing of the site gate. A review is underway to determine a more suitable monitoring location.

2.1.6 Appendix C presents graphs of the noise and vibration monitoring data over the month for each of the measurement locations. Noise data presented consists of the hourly  $L_{Aeq}$  values and, where relevant, the  $L_{Aeq,T}$  values (where the time period T has been taken to be the averaging period as specified in Table 1 of HS2 Information Paper E23). Vibration data presented consist of hourly PPV values. The full data set for the monitoring equipment can be found at the following location: <https://data.gov.uk/dataset/24542ae7-dd44-444f-b259-871c4cc43b5e/environmental-monitoring-data>.

## 2.2 Exceedances of the SOAEL

2.2.1 The significant observed adverse effect level (SOAEL) is defined in the 'Planning Practice Guidance – Noise' as the level above which "noise causes a material change in behaviour and/or attitude, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area."

2.2.2 HS2 Phase One Information Paper E23: Control of Construction Noise and Vibration sets out the SOAELs for construction noise.

2.2.3 Where construction noise levels exceed the SOAEL, relevant periods will be identified, and summary statistics provided in order to evaluate ongoing qualification for noise insulation and temporary rehousing.

2.2.4 Table 5 presents a summary of recorded exceedances of the SOAEL at each measurement location over the reporting period, including the number of exceedances during each time period.

Table 5: Summary of Exceedances of SOAEL

Worksite Reference	Measurement Reference	Site Address	Day (Weekday, Saturday, Sunday, Night)	Time period	Number of exceedances of SOAEL
B	JC	Juniper Crescent	All days	All periods	No exceedance
ESC	N022	External to 34 Mornington Terrace	All days	All periods	No exceedance
	N024	External to Park Village Studios, Park Village East	All days	All periods	No exceedance
	N046	Lamppost opposite to 49 Mornington Terrace	All days	All periods	No exceedance
	N047	Park Village East/Mornington Street bridge, lamppost #13	All days	All periods	No exceedance
ETRC	N001	Park Village East Lamppost #1	Weekday	18:00-19:00	1
				19:00-22:00	1
	N002	Park Village East Lamppost #2	Weekday	19:00-22:00	1
	N003	Park Village East Lamppost #9	Weekday	19:00-22:00	1
	N004	Mornington Terrace, lamppost #7	All days	All periods	No exceedance
	N005	5A Granby Terrace	All days	All periods	No exceedance
	N023	Ampthill Estate, lamppost #21, Hampstead Road	All days	All periods	No exceedance
HRB	N020	Mackworth Street, lamppost #1	All days	All periods	No exceedance
	N021	Stanhope Street, lamppost #2	All days	All periods	No exceedance
	N044	Regents Park Estate West, near Langdale	All days	All periods	No exceedance
	N045	Regents Park Estate south, external to Coniston	All days	All periods	No exceedance

Worksite Reference	Measurement Reference	Site Address	Day (Weekday, Saturday, Sunday, Night)	Time period	Number of exceedances of SOAEL
G	HH	Euston Station Parcel Deck, Barnby Street	All days	All periods	No exceedance
	BS	Barnby Street	All days	All periods	No exceedance
S001-WS02	N018	132 and 140 Hampstead Road and Petrol Station	All days	All periods	No exceedance
	N019	132 and 140 Hampstead Road and Petrol Station	All days	All periods	No exceedance
S003-WS03	N006	Royal College of General Practitioners Roof level	All days	All periods	No exceedance
	N008	Walkden House, 67-75 & 77-79 Euston Rd	All days	All periods	No exceedance
	N010	Wesley Hotel	All days	All periods	No exceedance
	N011	Walkden House, 67-75 & 77-79 Euston Rd	All days	All periods	No exceedance
S003-WS07	N012	93-103 Drummond Street, 11-15 Melton Street, 54-64 Euston Street, 69 Cobourg Street	All days	All periods	No exceedance
S003-WS08	N007	Euston Square Gardens (west)	All days	All periods	No exceedance
VHA	N025	External to 3 Prince Albert Road	All days	All periods	No exceedance
	N026	Thames Water Compound	All days	All periods	No exceedance
NTH-EN	N014	Ibis Hotel, 3 Cardington Street & 1-3 Cobourg Street	All days	All periods	No exceedance
	N016	Margarete Centre roof	All days	All periods	No exceedance
	N017	Hampstead Road, lamppost #48	All days	All periods	No exceedance

2.2.5 Four exceedances of the SOAEL were recorded due to HS2 construction works during November 2020. The exceedances occurred at monitoring locations N001, N002 and N003 during evening working periods and were due to alterations to the site hoarding.

2.2.6 For the purpose of assessing eligibility for noise insulation or temporary rehousing, multiple exceedances of the SOAEL in a 24-hour period would be counted as a single exceedance during that day. Over the reporting period, the overall number of SOAEL exceedances at each measurement location is shown in Table 6 and may be lower than the total sum of individual exceedances reported in Table 5 for each location.

Table 6: Summary of Total Exceedances of SOAEL

Worksite Reference	Measurement Reference	Monitor Address	Total of SOAEL exceedances in the month
ETRC	N001	Park Village East Lamppost #1	1
ETRC	N002	Park Village East Lamppost #2	1
ETRC	N003	Park Village East Lamppost #9	1

## 2.3 Exceedances of Trigger Level

2.3.1 Table 7 provides a summary of exceedances of the S61 trigger noise levels determined to be due to HS2 related construction noise measured during the reporting period, along with the findings of any investigation.

Table 7: Summary of Exceedances of Trigger Levels

Complaint Reference Number (if applicable)	Worksite Reference	Date and Time Period	Identified Source	Results of Investigation (including noise monitoring results)	Actions Taken
-	-	-	-	-	-

## 2.4 Complaints

2.4.1 Table 8 provides a summary of complaint information related to noise and vibration received during the reporting period, along with the findings of any investigation.

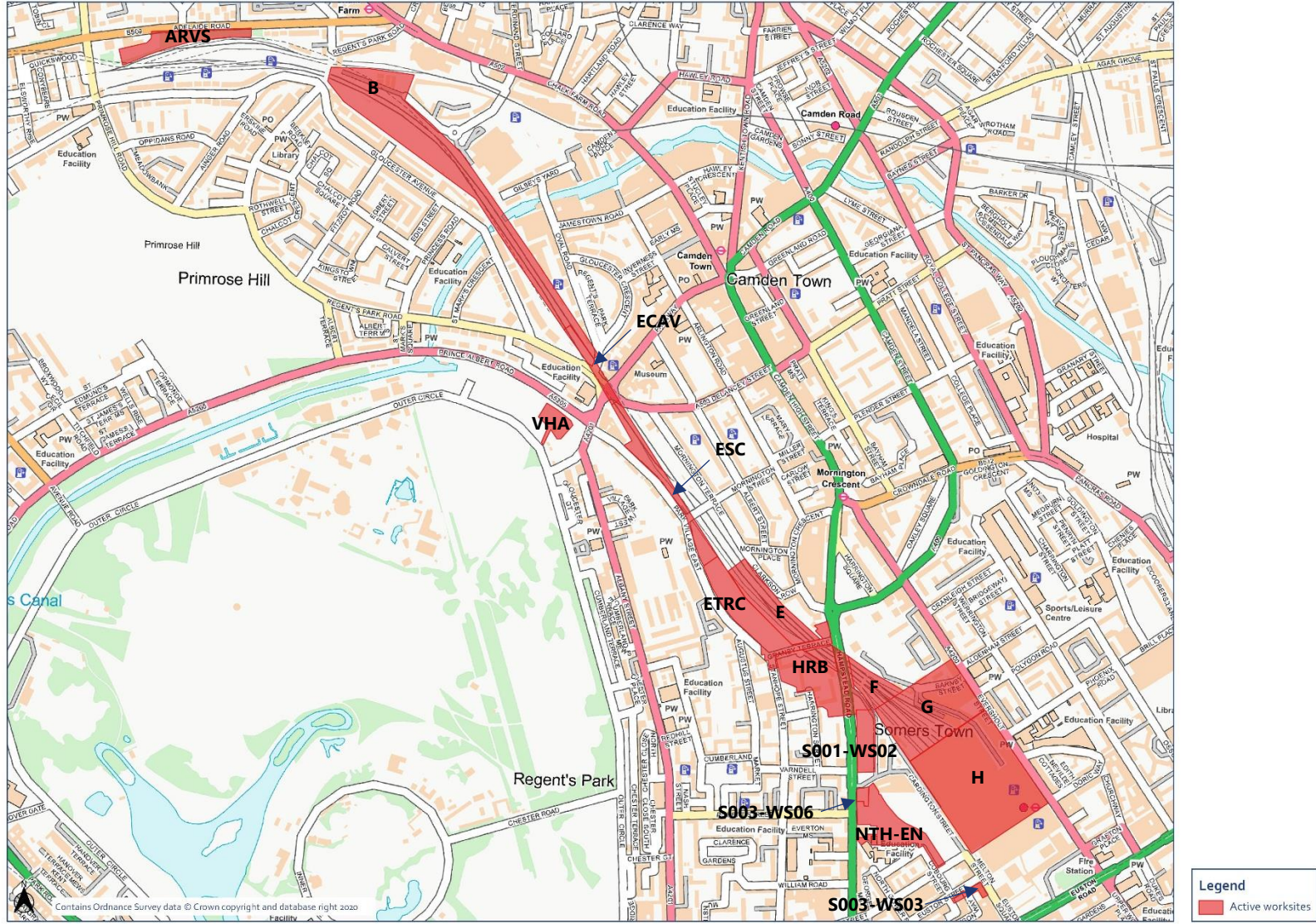
Table 8: Summary of Complaints

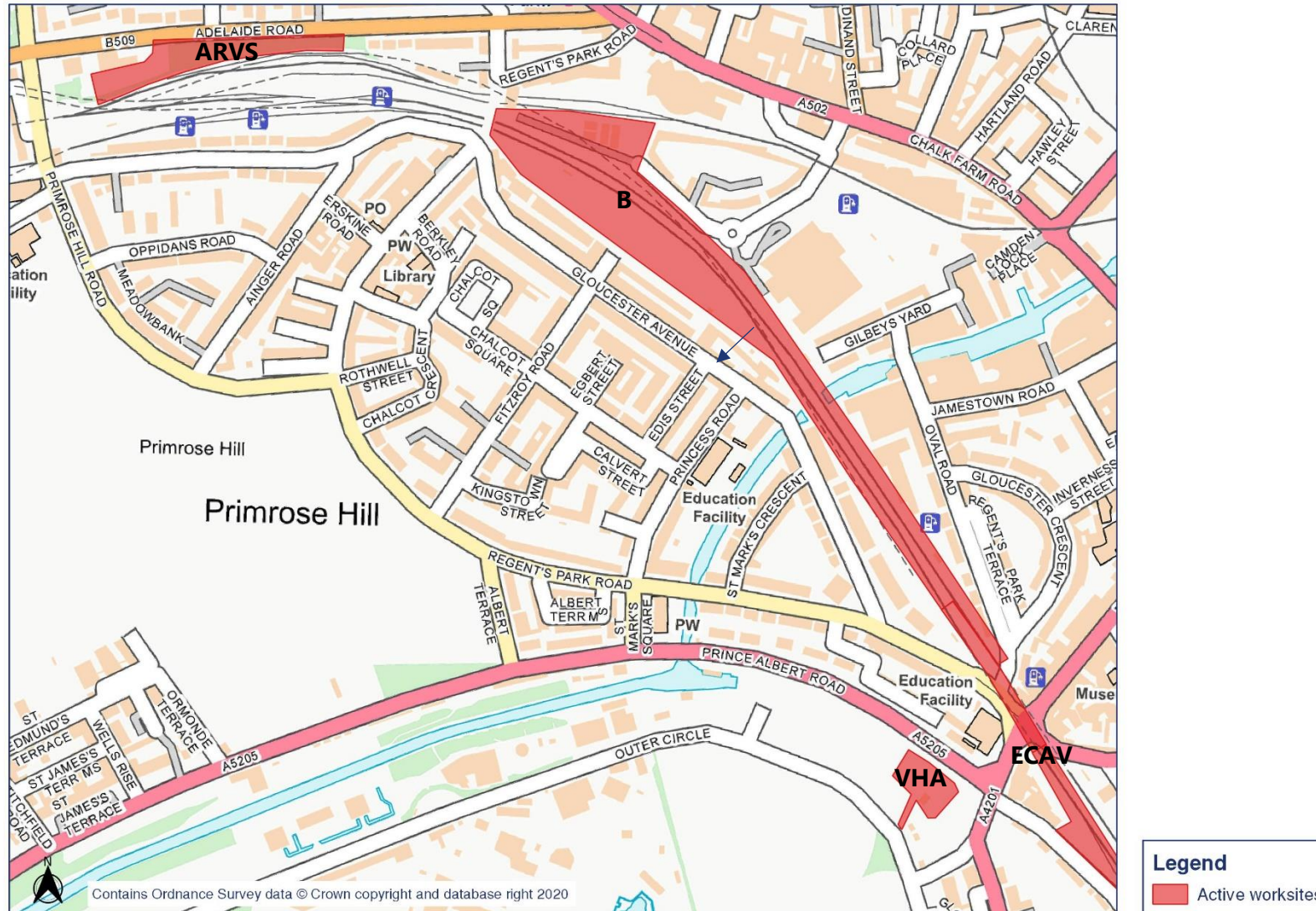
Complaint Reference Number	Worksite Reference	Description of Complaint	Results of Investigation	Actions Taken
HS2-20-40880-C	S001-WS02	General complaint about ongoing construction noise and vibration during the day causing cosmetic building damage.	Following investigation it was found that the damage was not caused by HS2 works.	Results of the investigation were communicated to the stakeholder. The Stakeholder has also enquired regarding prolonged disturbance compensation scheme, this is being taken forward by the community engagement team.
HS2-20-40915-C	HRB S001-WS02	Complaint about ongoing construction noise.	Stakeholder lives in an area near to major construction sites.	Stakeholder has been considered by special cases panel. Options have been presented to stakeholder outside of the complaints process.
HS2-20-40902-C	HRB	Complaint about ongoing construction noise and vibration.	Routine works were ongoing. Monitoring data demonstrates compliance with Section 61 and works were in line with best practical means.	Confirmed the information to the stakeholder. Contractor continuing to maintain regular contact with stakeholder.
HS2-20-40966-C	HRB	General complaint about ongoing construction noise.	Contractors have previously attempted to identify and fit the most suitable form of noise insulation, however stakeholder has declined the offer.	Stakeholder was reminded of the offer of noise insulation and encouraged to apply.
HS2-20-40932-C	HRB	General complaint about ongoing construction noise.	Ongoing investigation.	Ongoing investigation.
HS2-20-40973-C	HRB S001-WS02	General complaint about ongoing construction noise.	Stakeholder lives in an area near to major construction sites.	Stakeholder has been considered by special cases panel. Options have been presented to stakeholder outside of the complaints process.

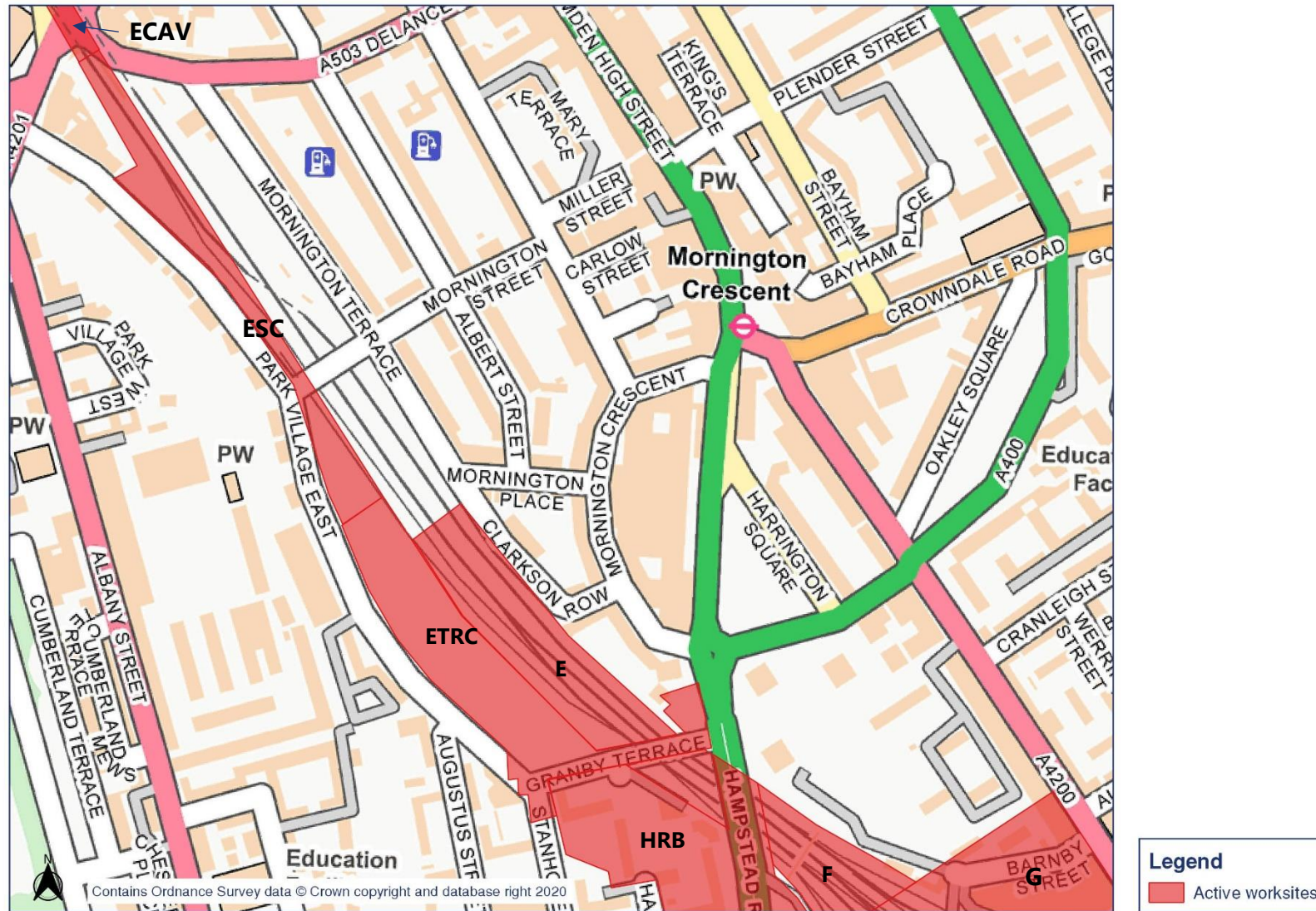
Complaint Reference Number	Worksite Reference	Description of Complaint	Results of Investigation	Actions Taken
HS2-20-40976-C	HRB	General complaint about construction noise. Enquiry was also made regarding noise insulation.	No HS2 works underway at the time reported.	Confirmed the results of the investigation to the stakeholder, and passed stakeholders enquiry regarding noise insulation to contractors in line with process.
HS2-20-40998-C	ETRC / HRB	Complaint about vibration felt during the day and occasionally at night.	Ongoing investigation.	Ongoing investigation.
HS2-20-41021-C	HRB	Complaint about noise from a generator	Ongoing investigation.	Ongoing investigation.
HS2-20-50402-E	ARVS	Complaint about noise during the night-time	HS2 works were not being undertaken during the night-time. A hybrid power is being used to power site security and welfare which runs off batteries at night. The generator would only fire up for short periods if battery level falls too low. Use of Hybrid set-up represents use of Best Practicable Means and monitoring data shows compliance with Section 61.	Contact made with complainant to resolve the issue.

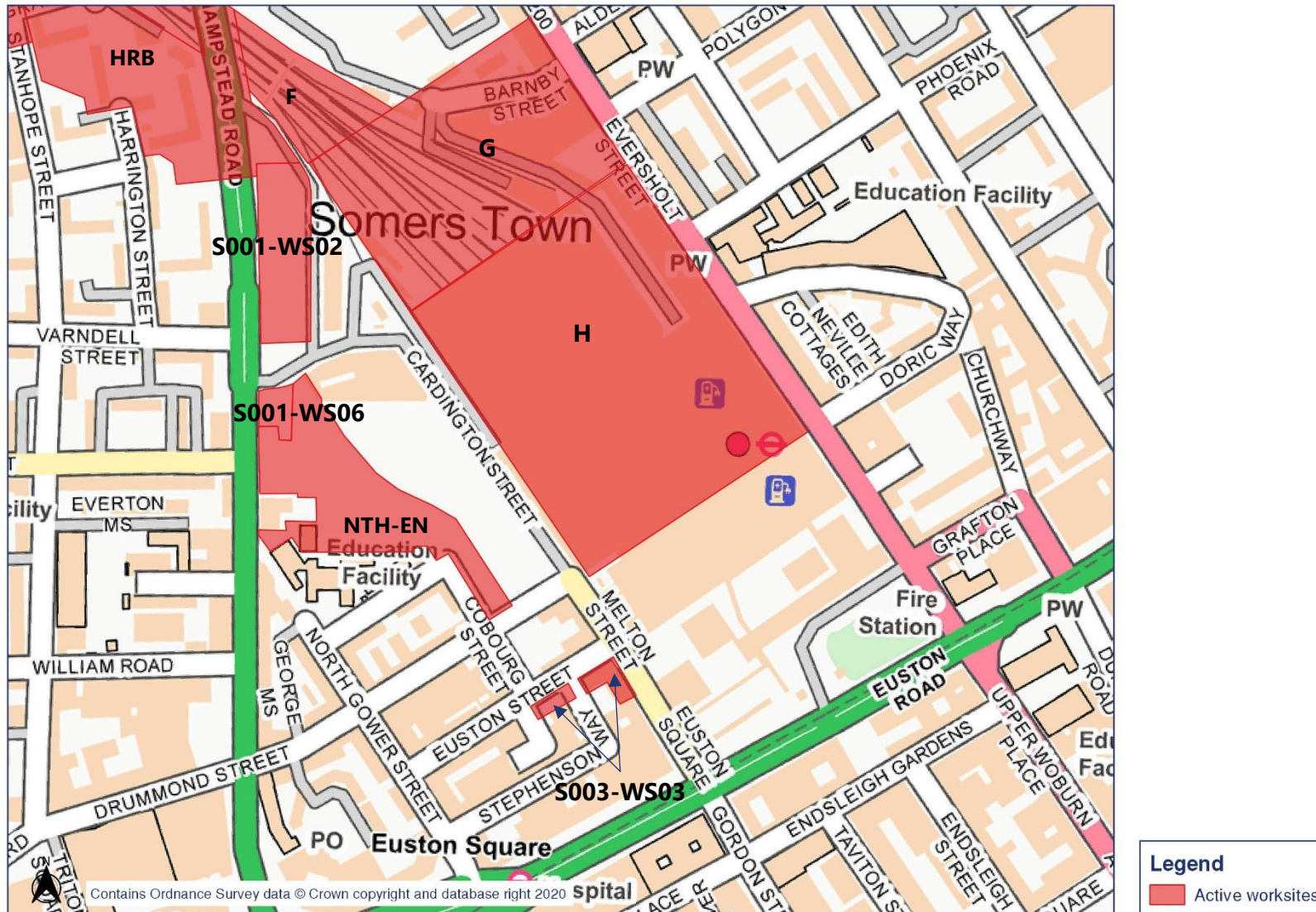
# Appendix A Site Locations



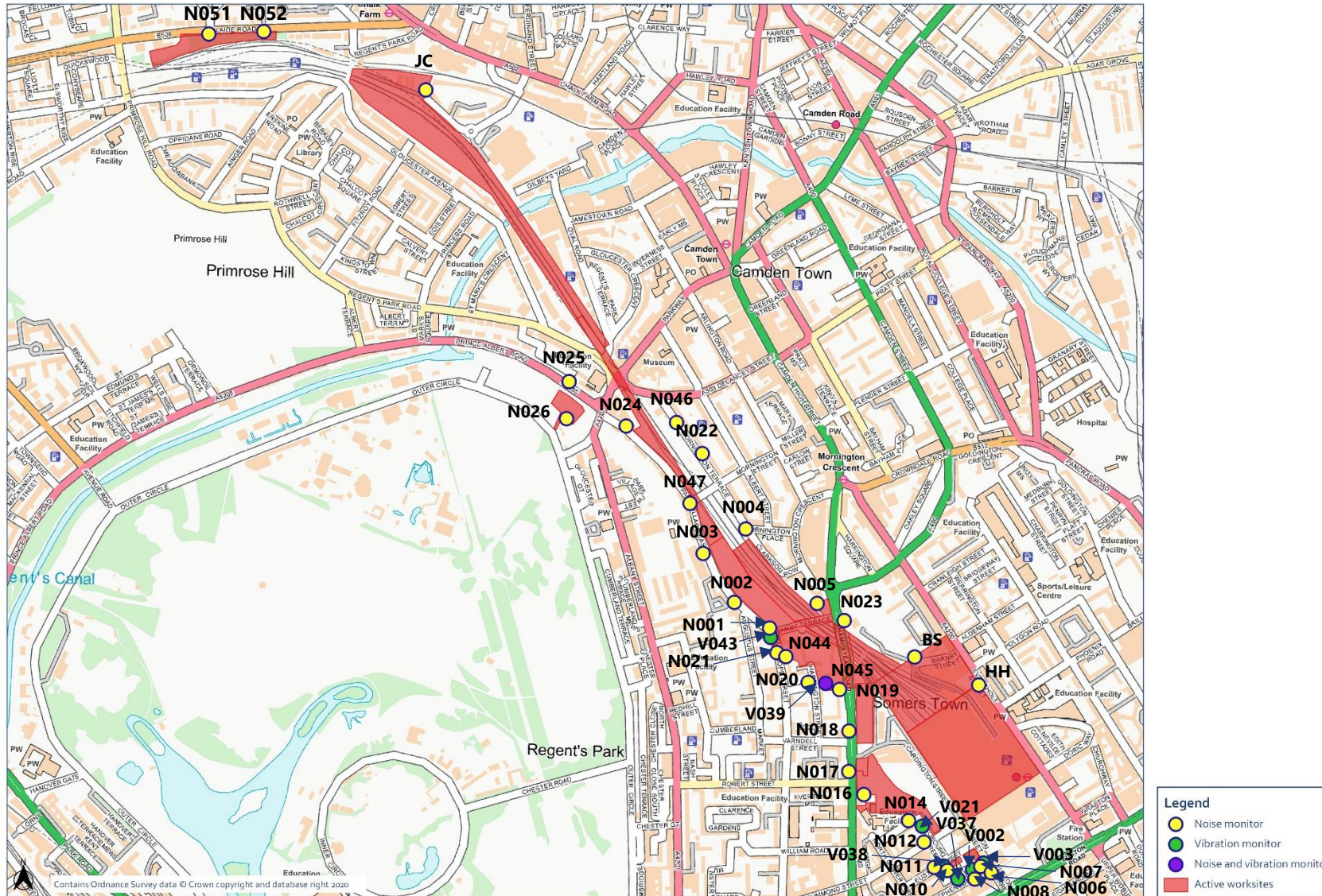


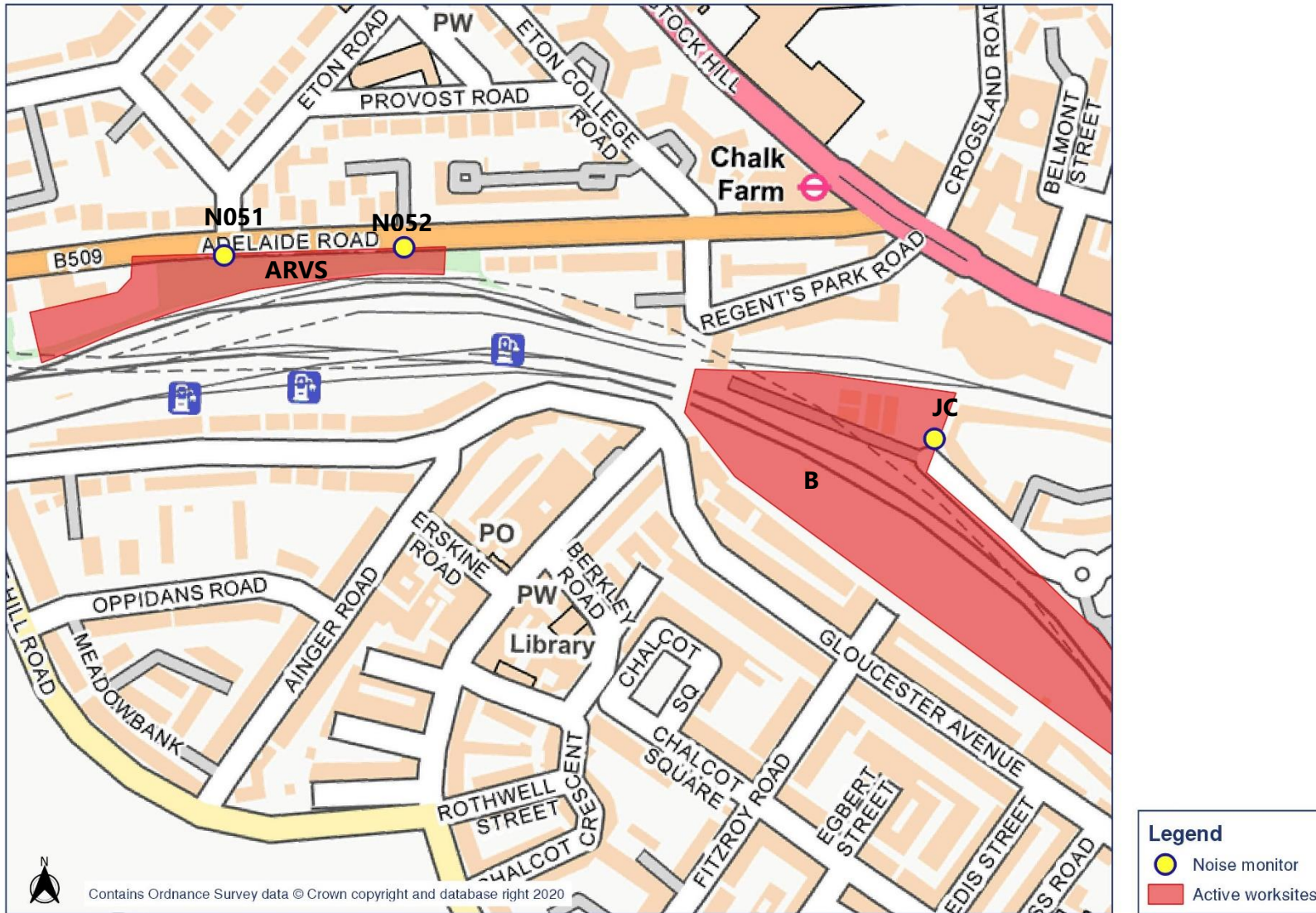


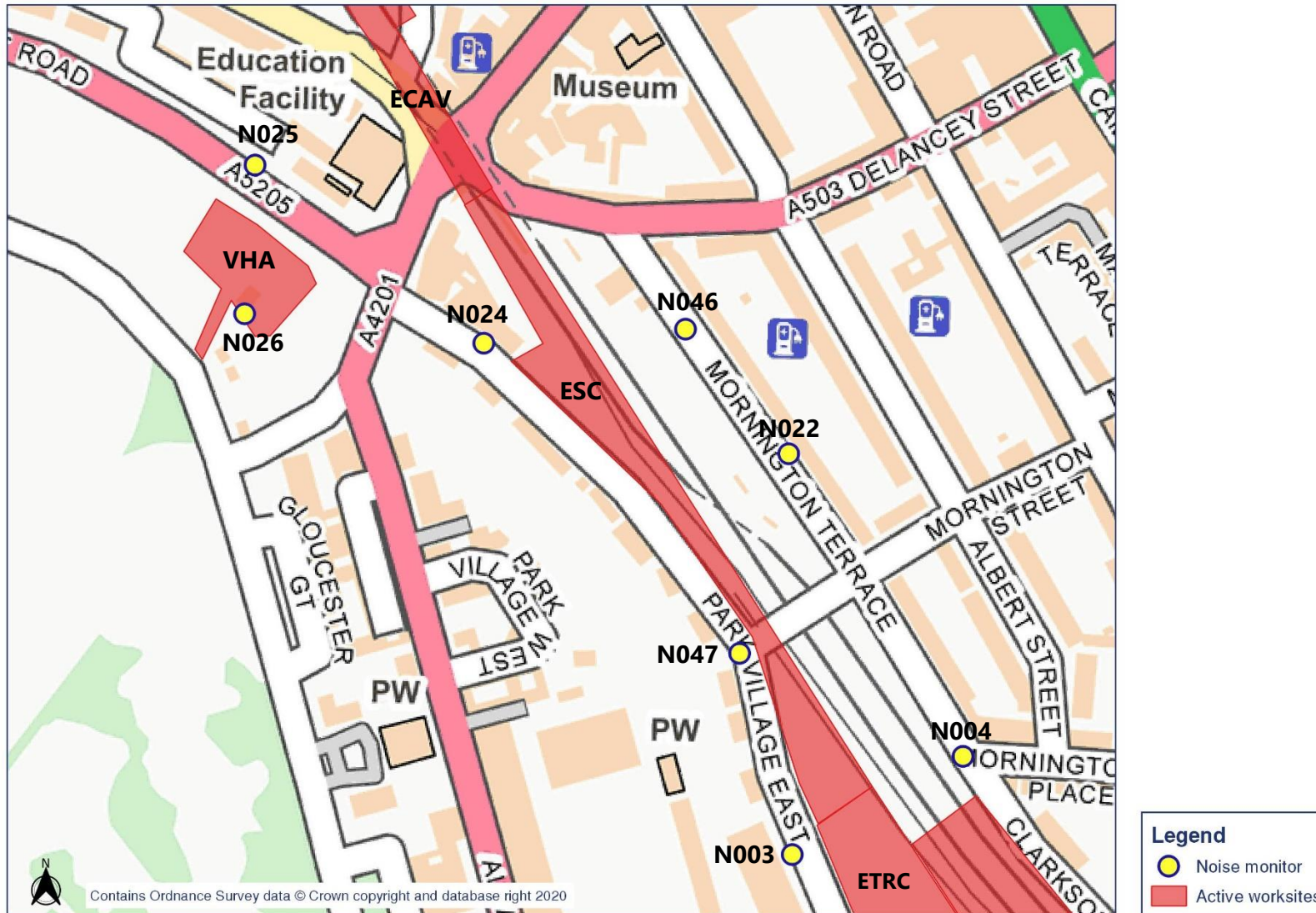




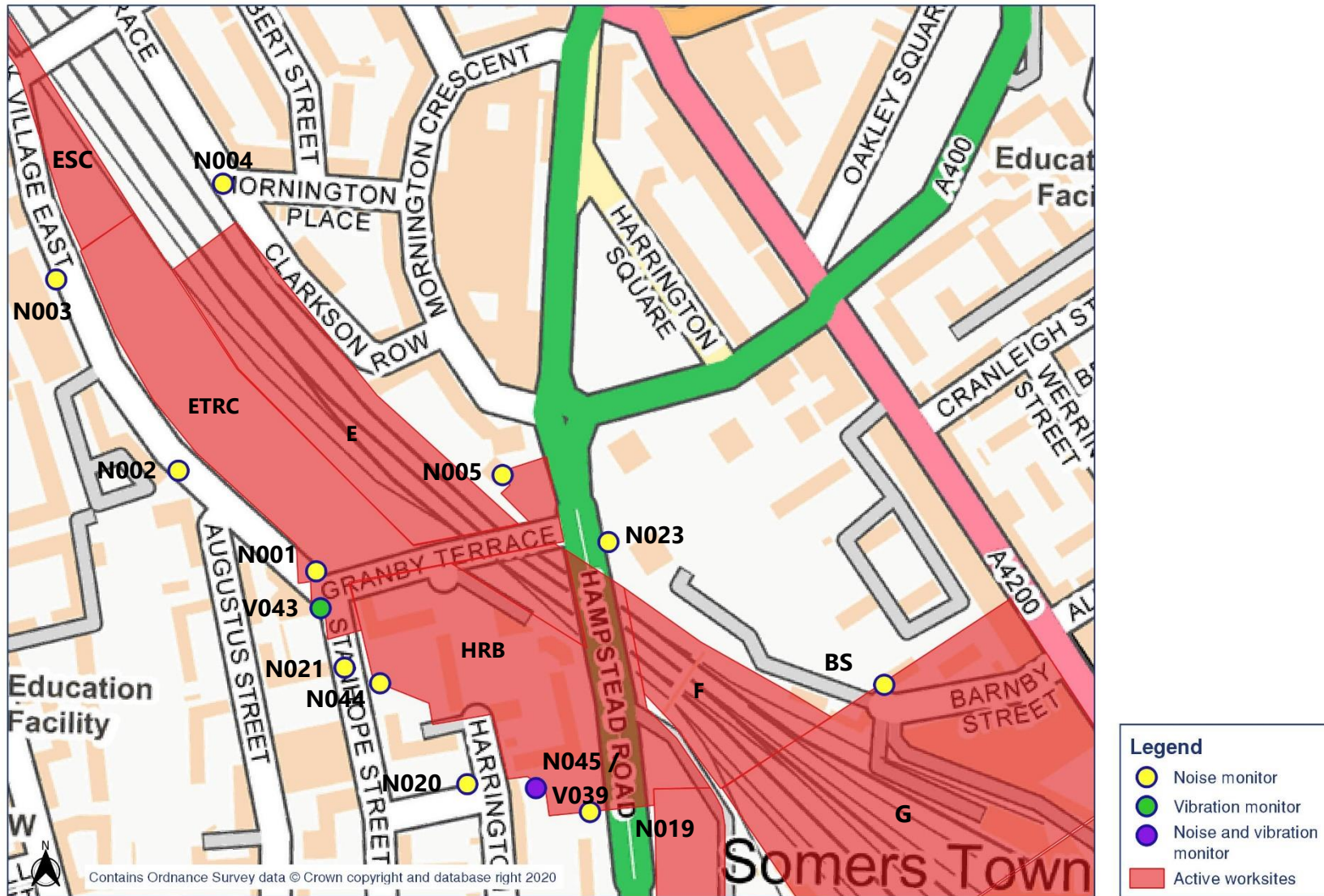
# Appendix B Monitoring Locations

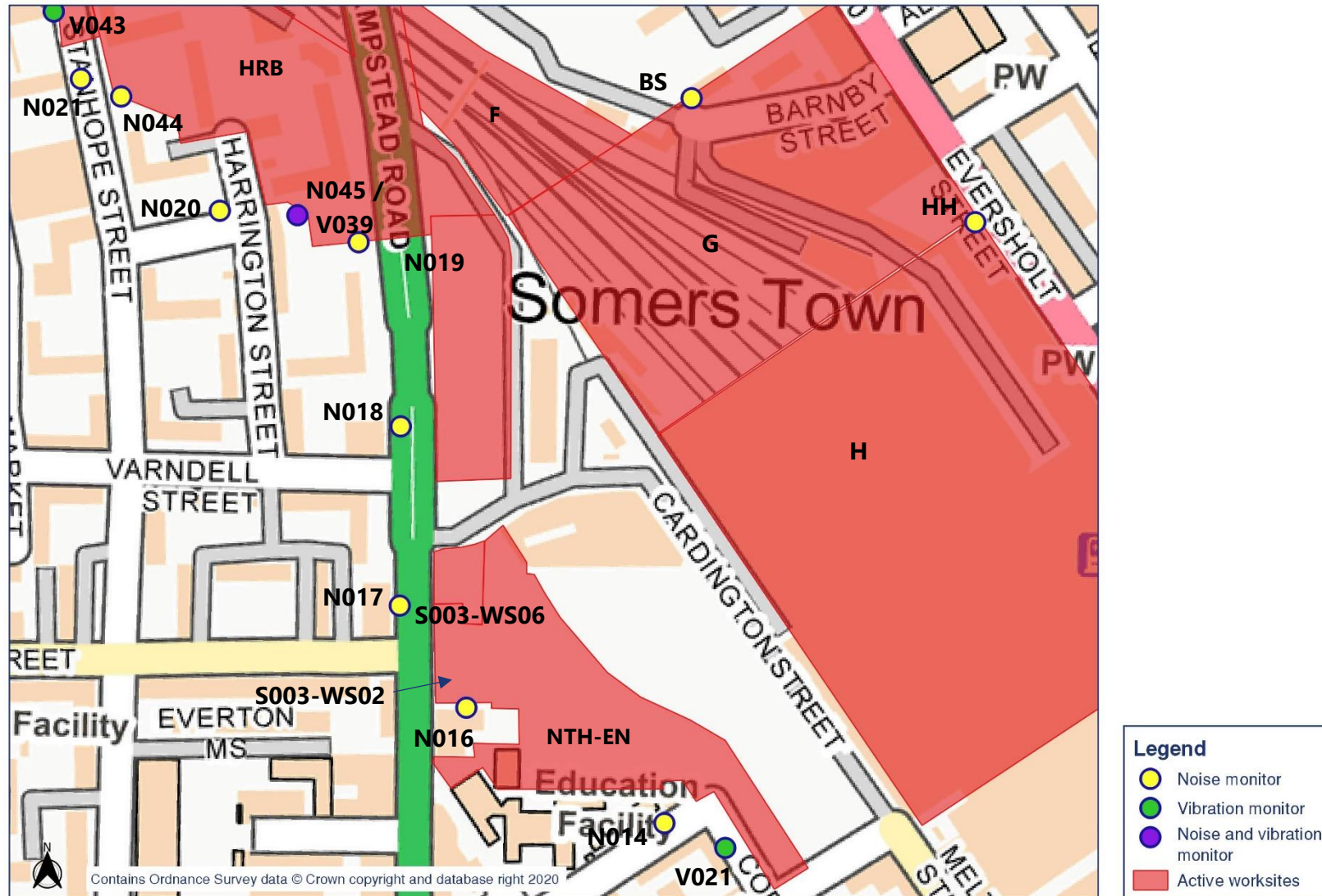


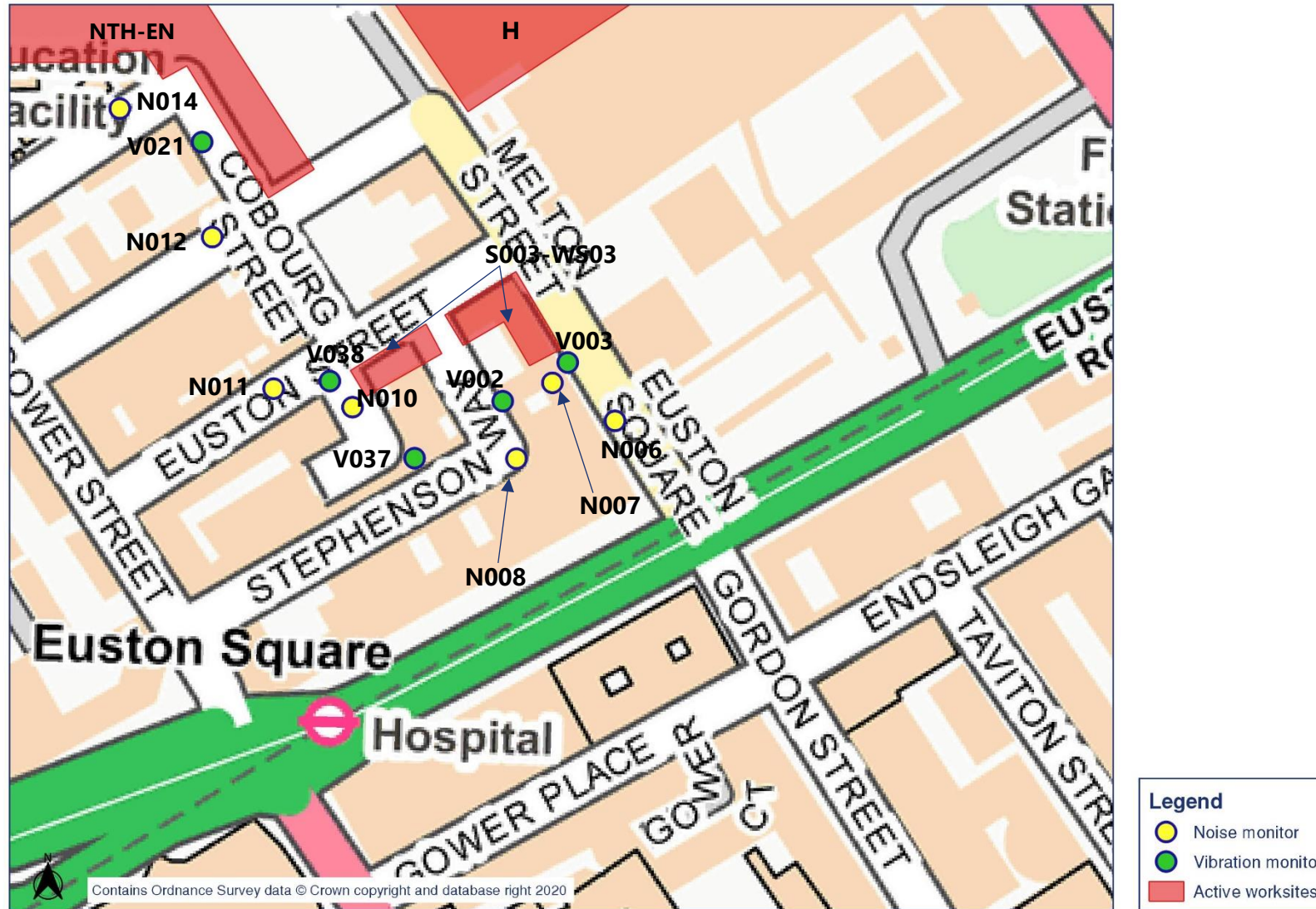










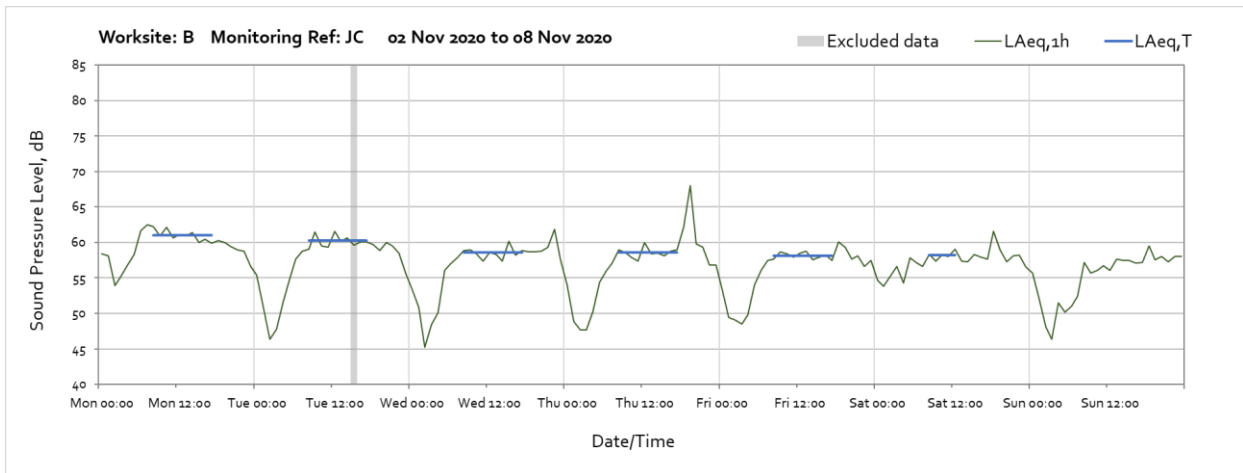
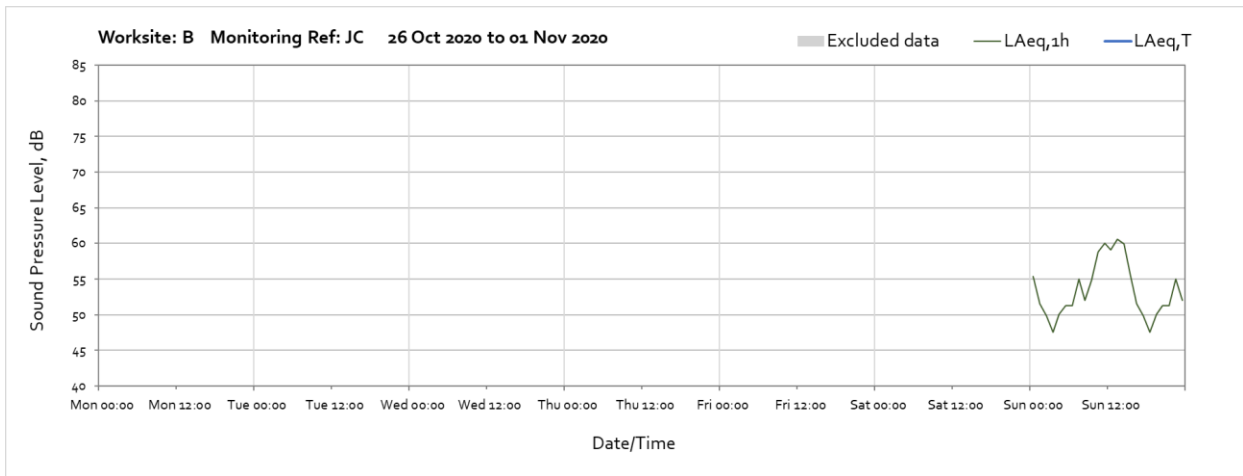


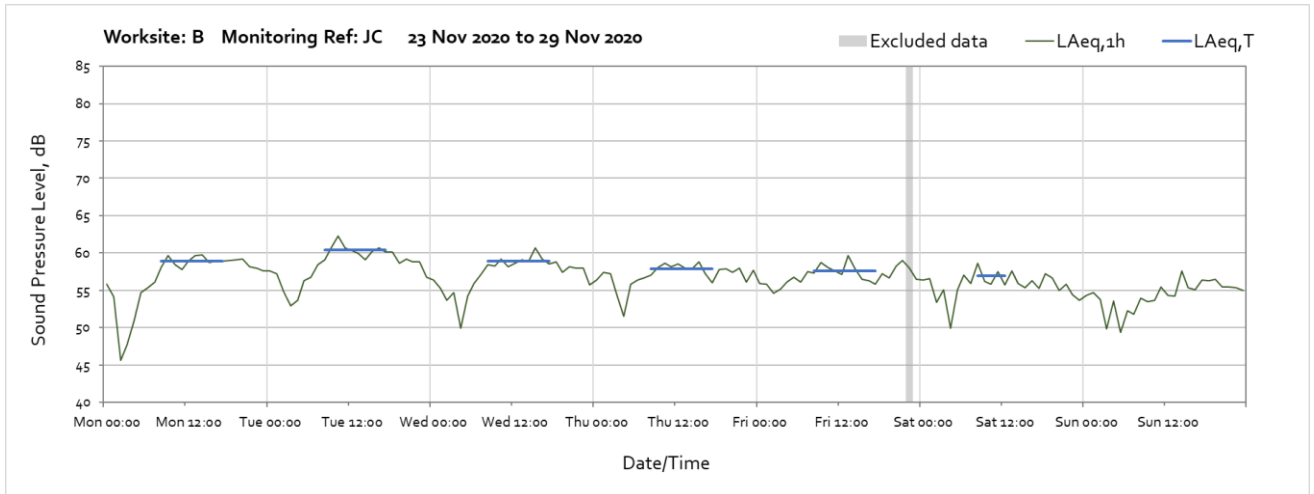
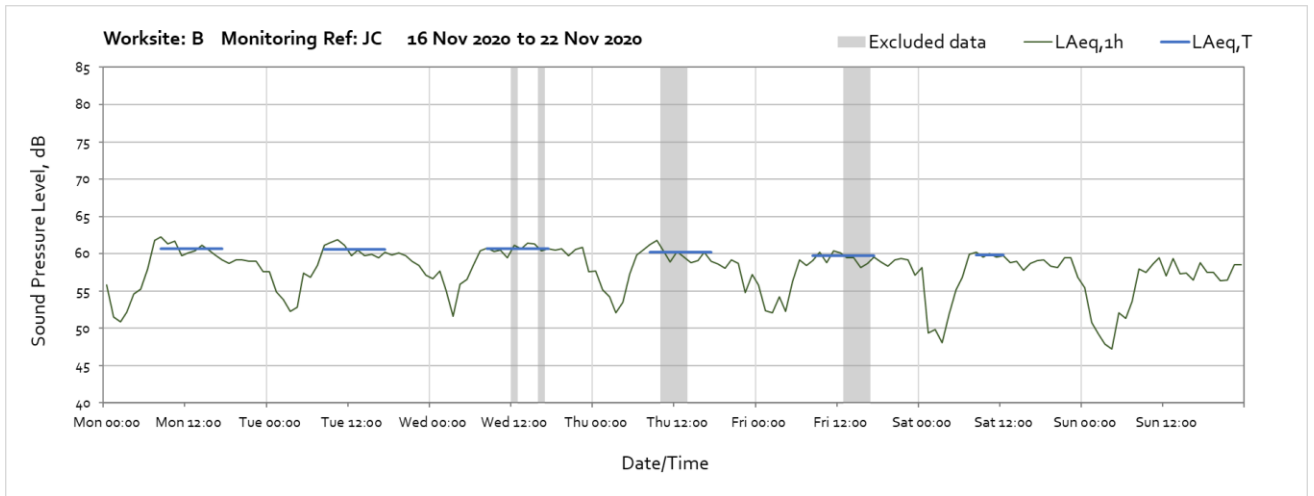
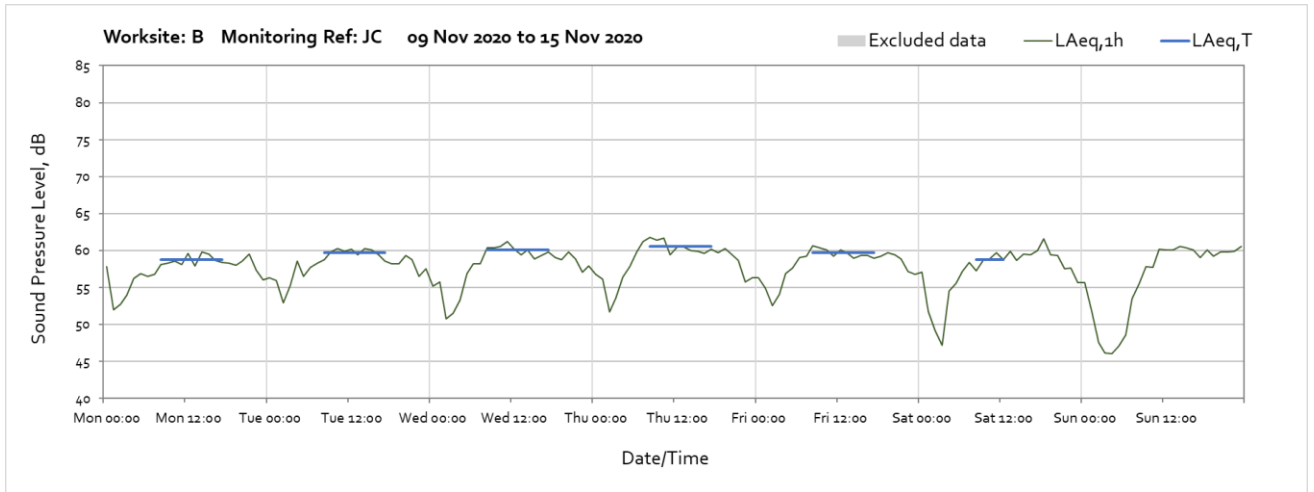
# Appendix C Data

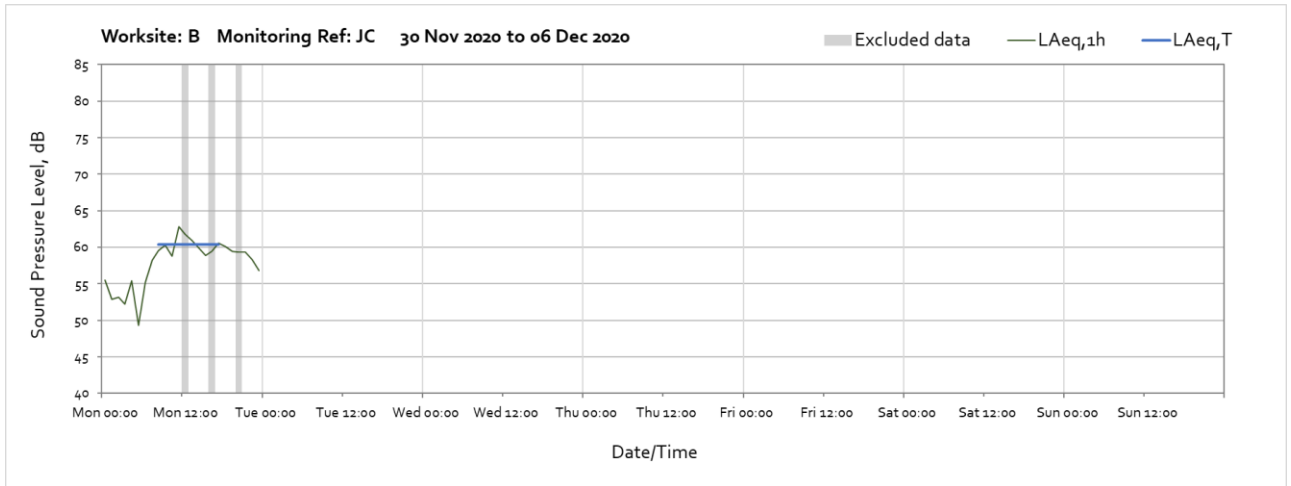
The following graphs show the hourly measured ambient noise level  $L_{Aeq,1h}$  and, where relevant, the averaged noise level  $L_{Aeq,T}$  values, where the time period T is as specified in Table 1 of HS2 Information Paper E23. Periods with adversely weather affected noise levels are greyed out and have been excluded from the calculation of the  $L_{Aeq,T}$  values in Table 3 of the main report.

## Noise

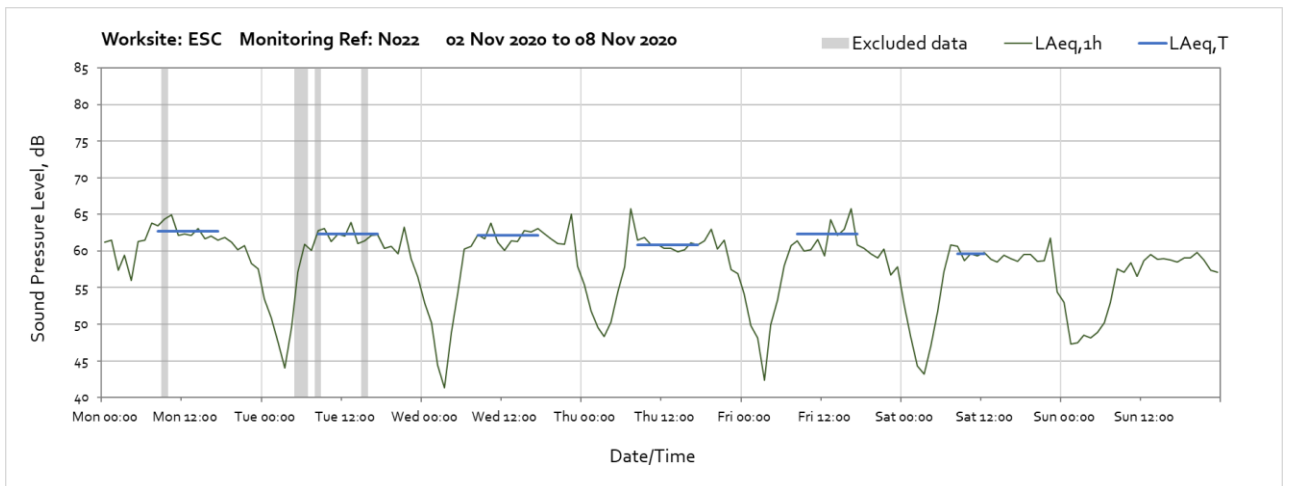
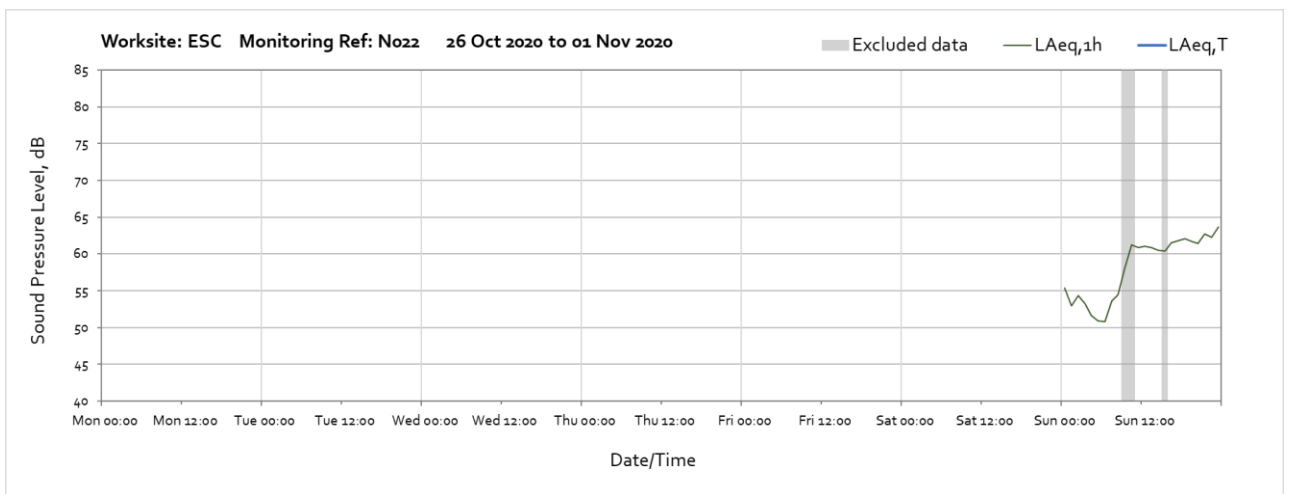
### Worksite: B – Monitoring Ref: JC

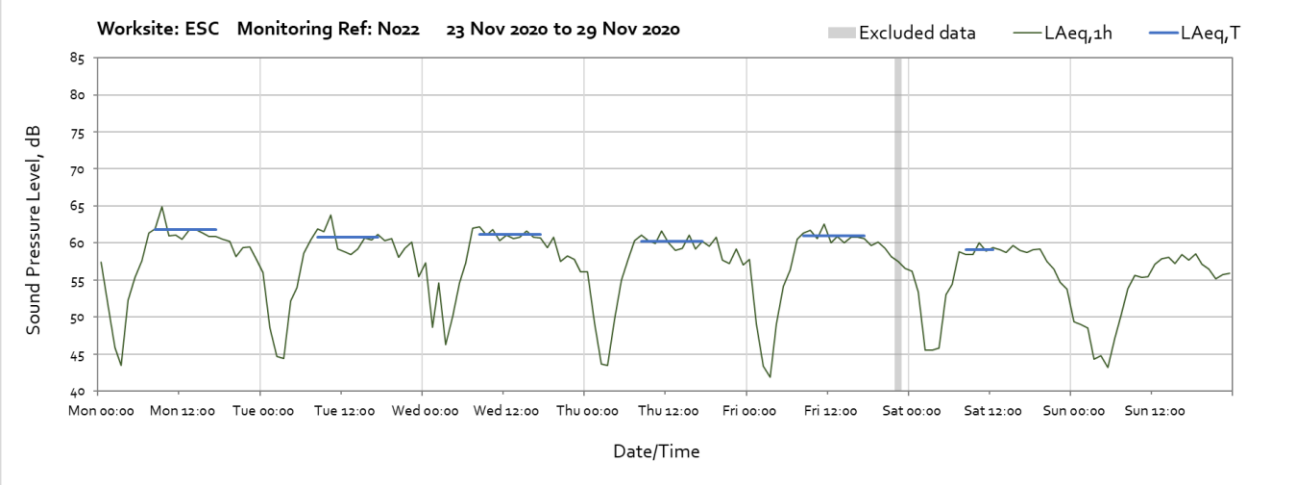
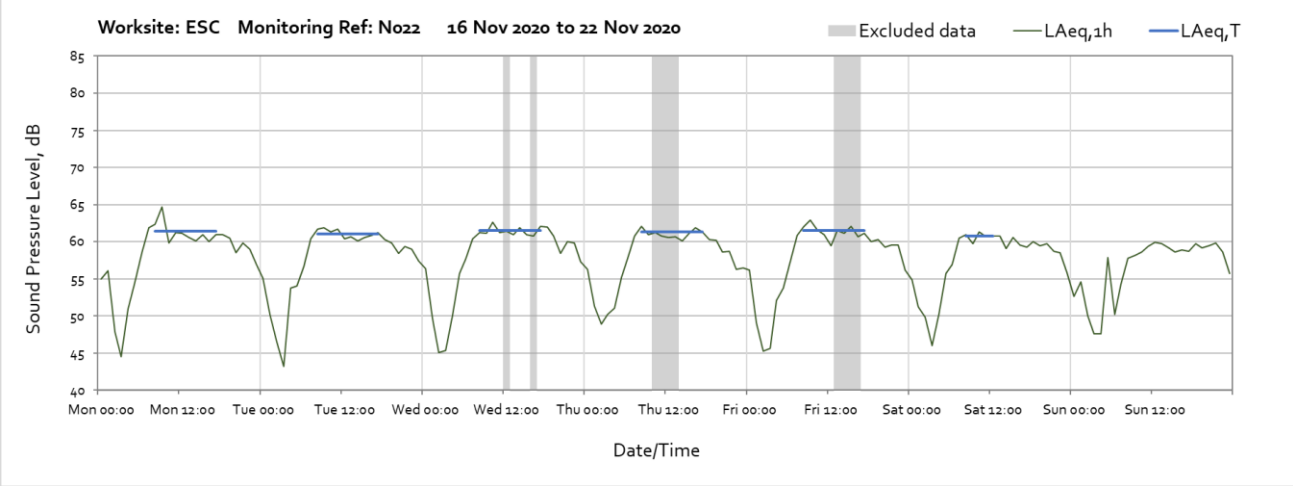
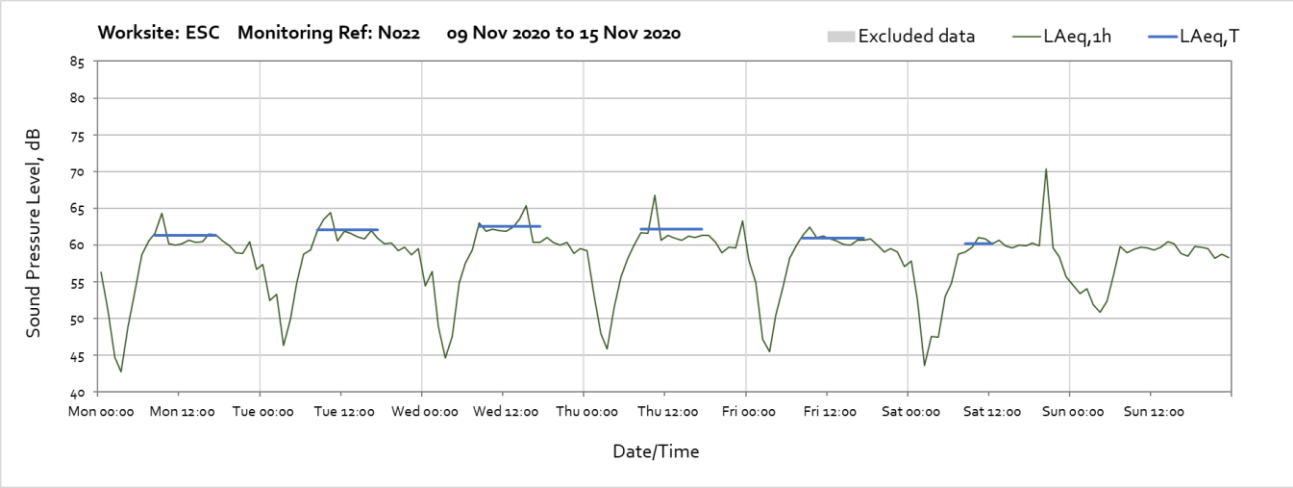


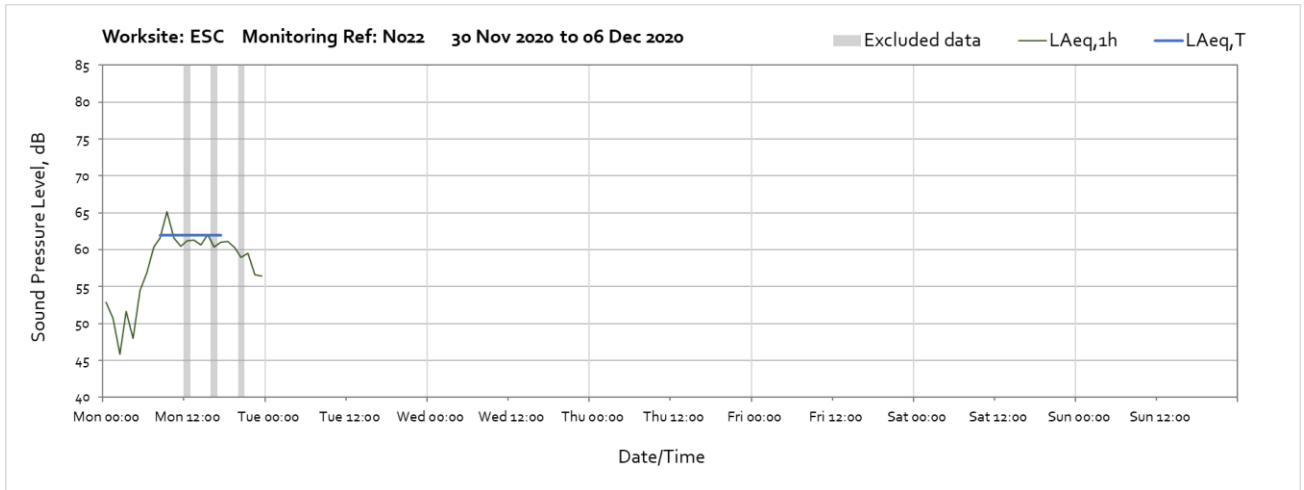




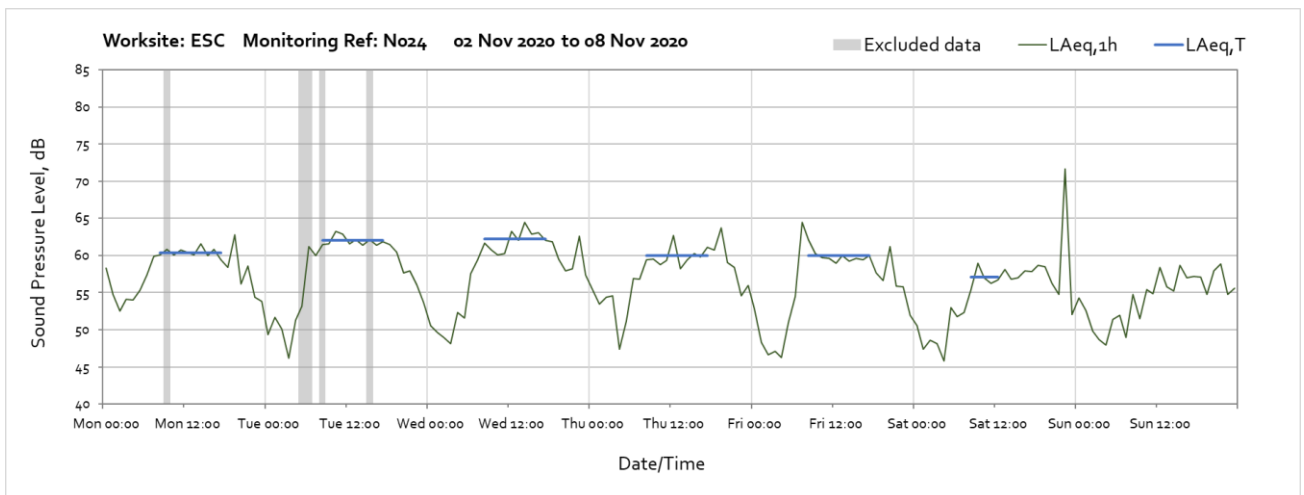
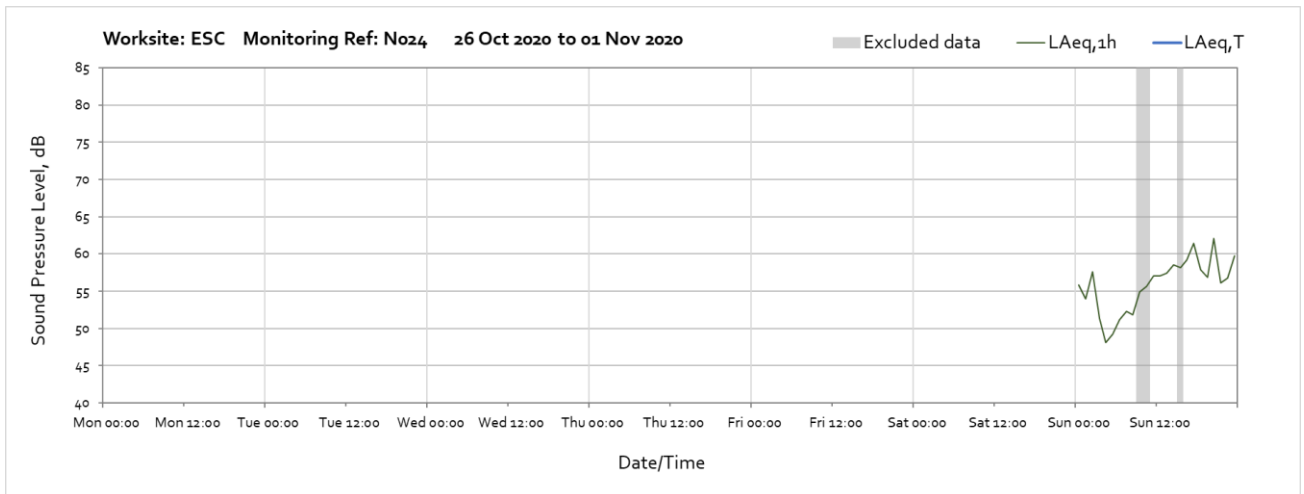
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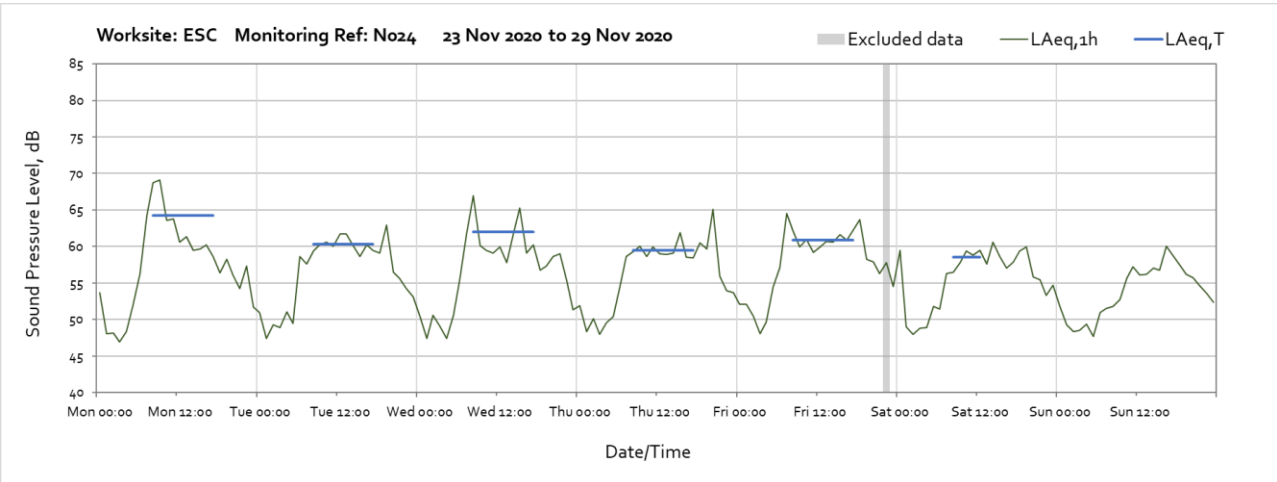
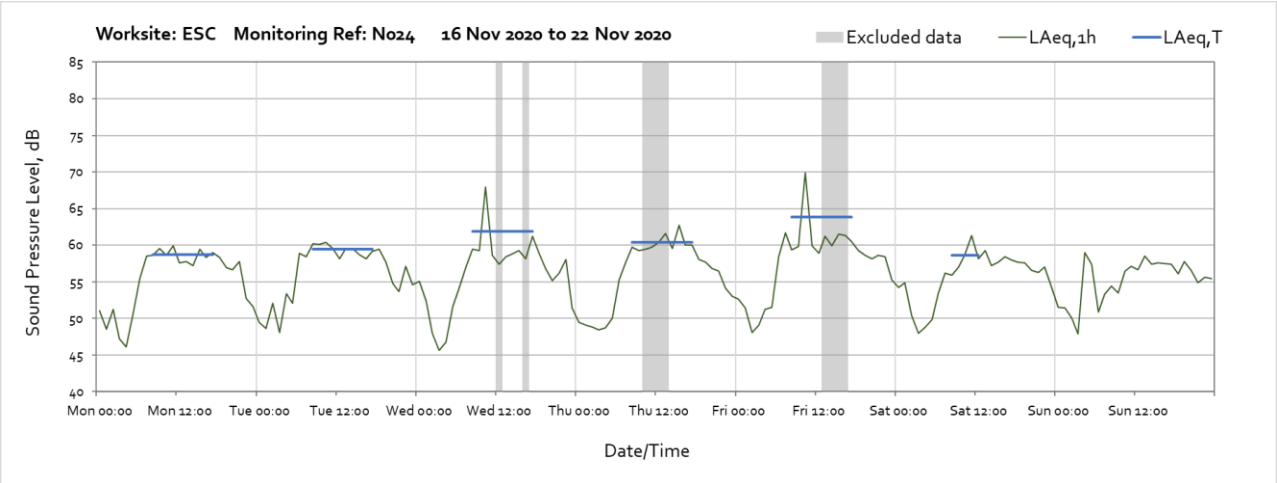
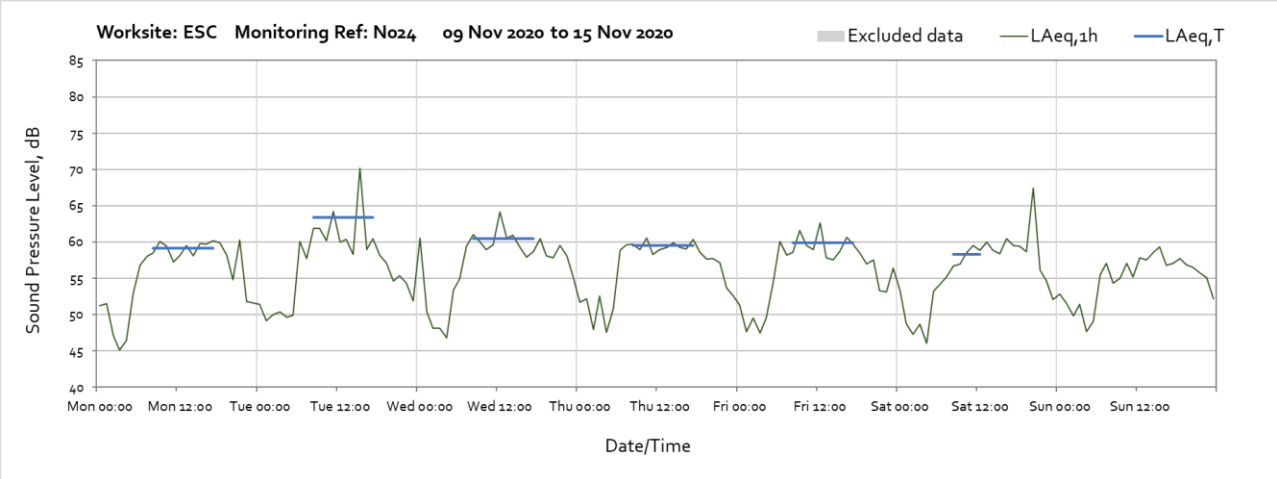


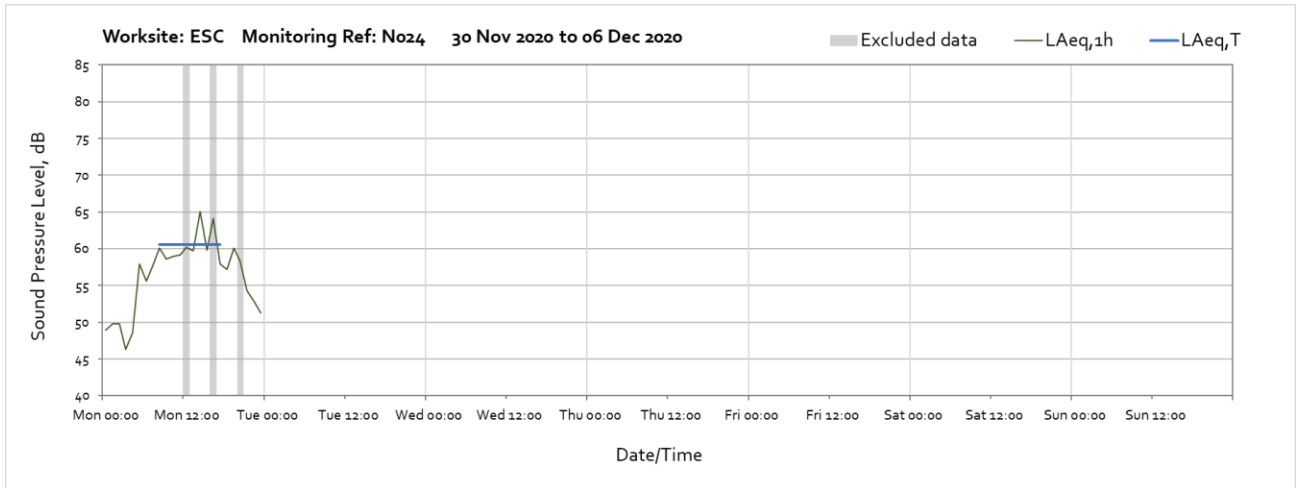


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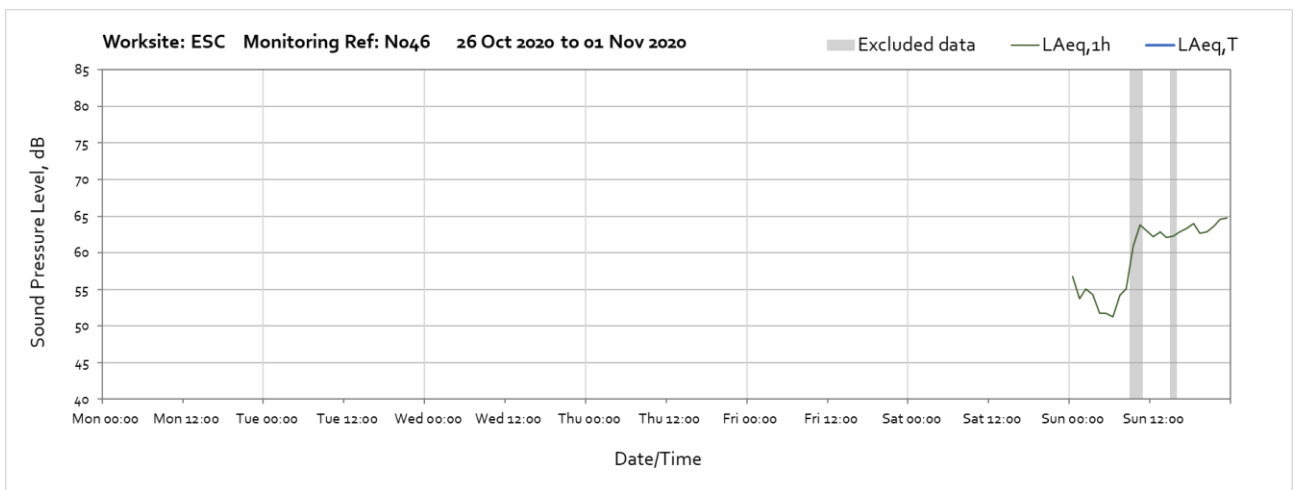






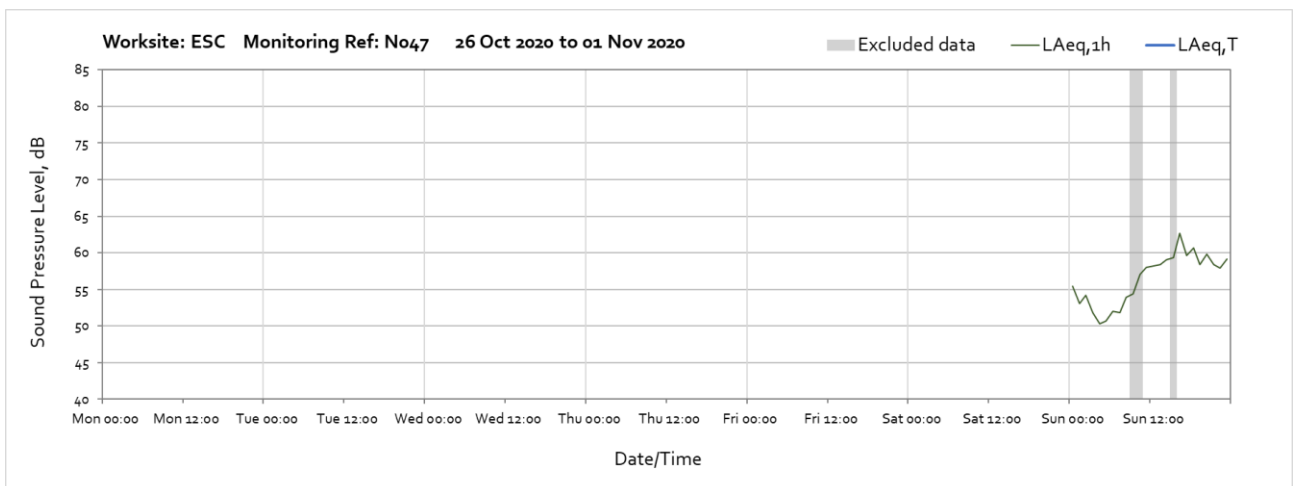


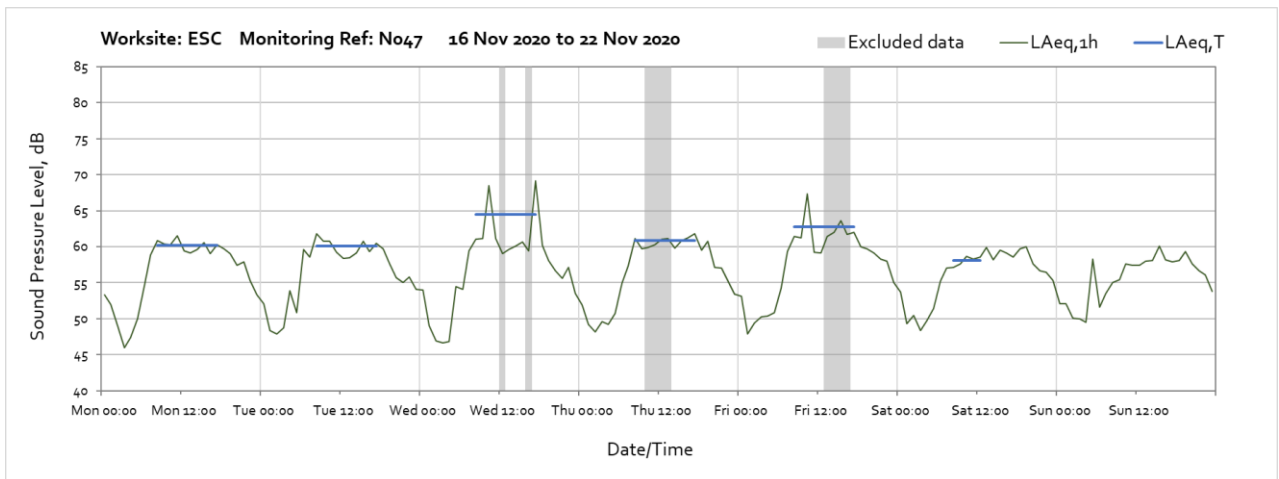
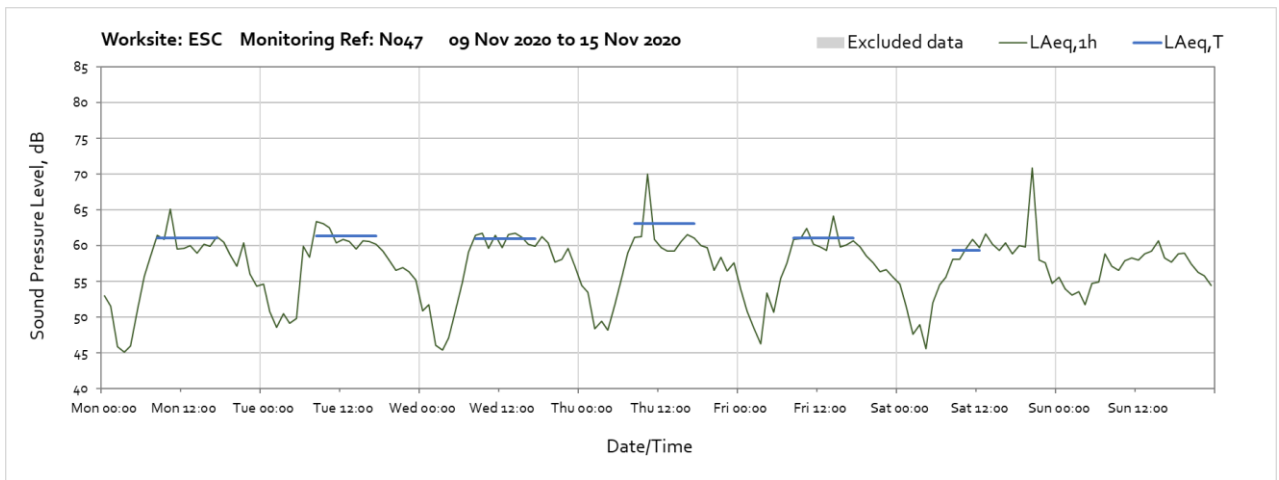
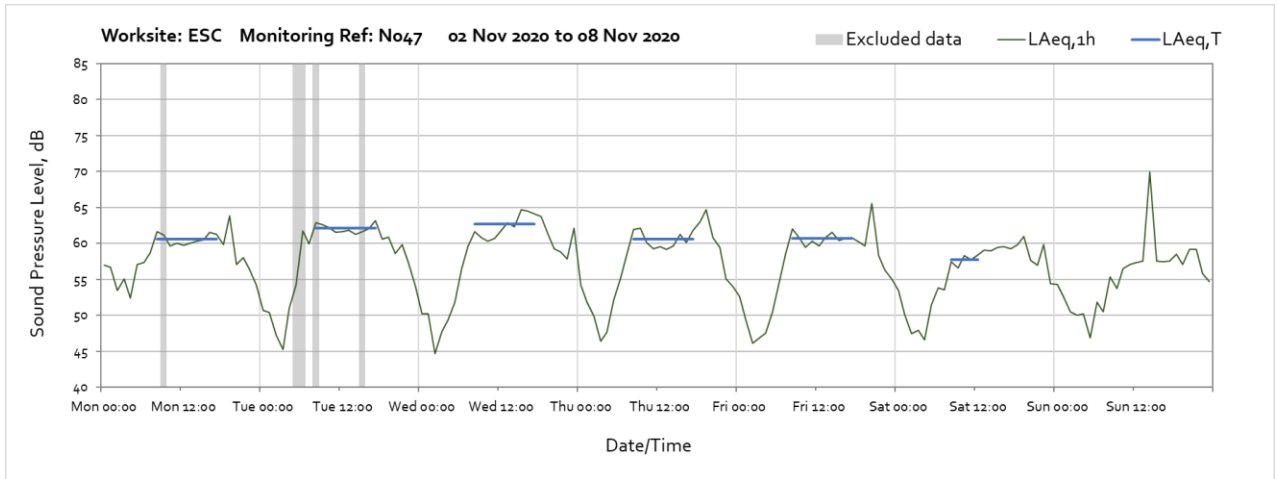
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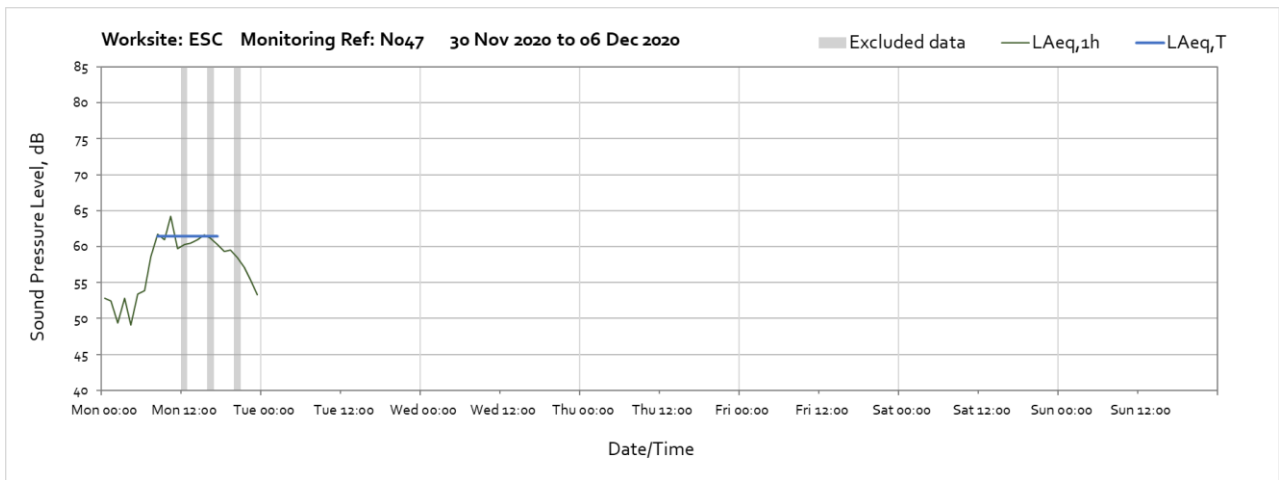
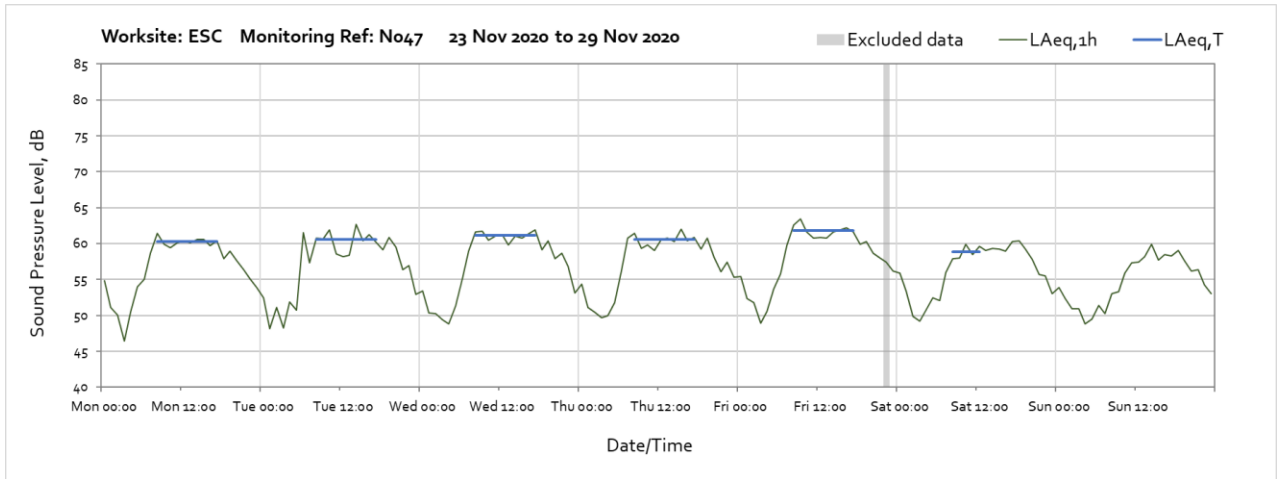


Note: Missing data from 00:00 on Monday 2<sup>nd</sup> November until the end of the month was due to an electrical fault with the lamppost which resulted in a loss of power at the noise monitor.

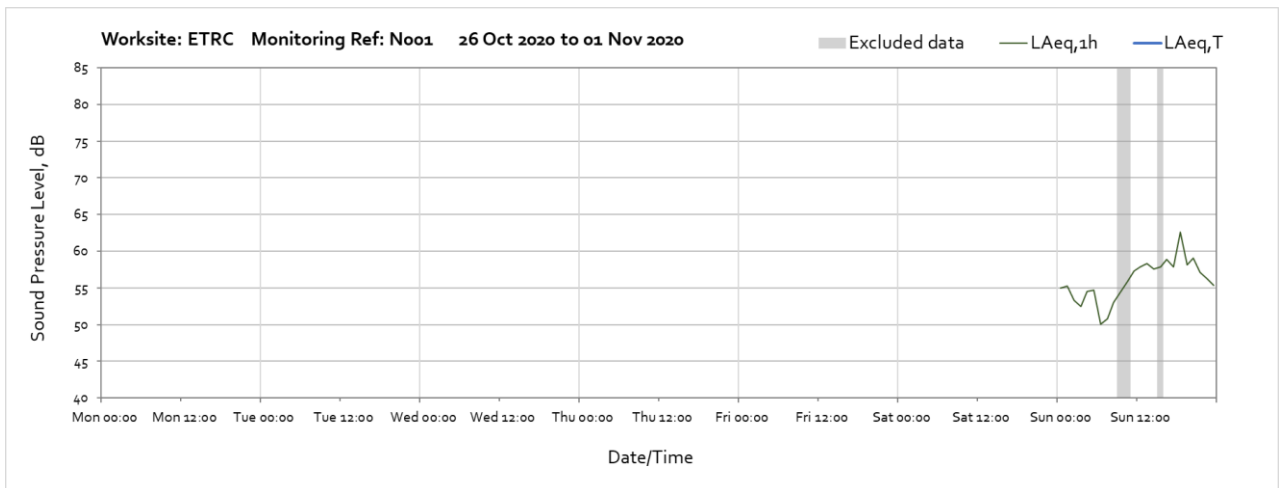
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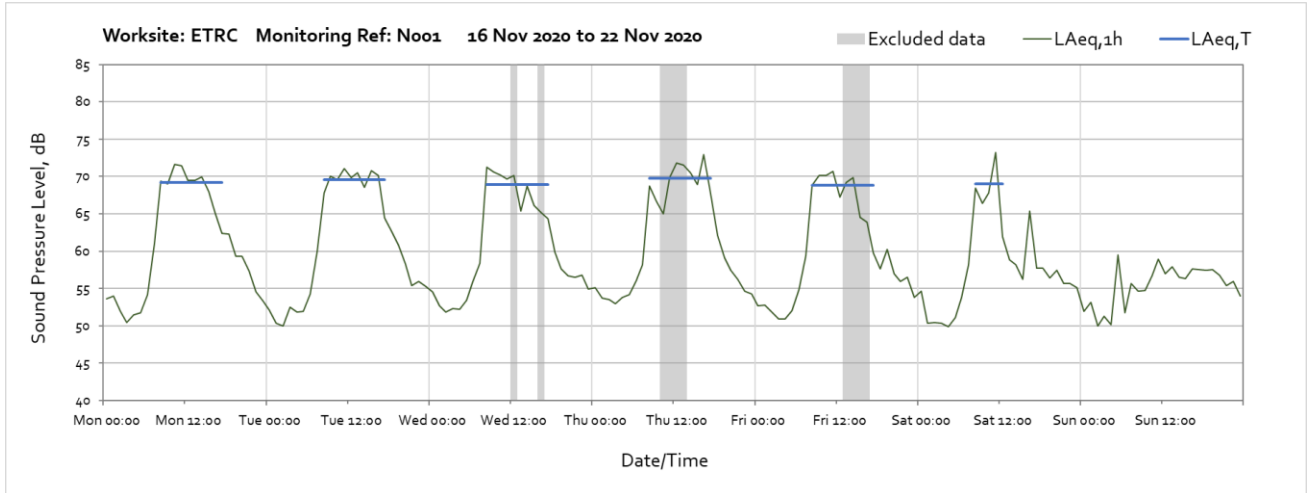
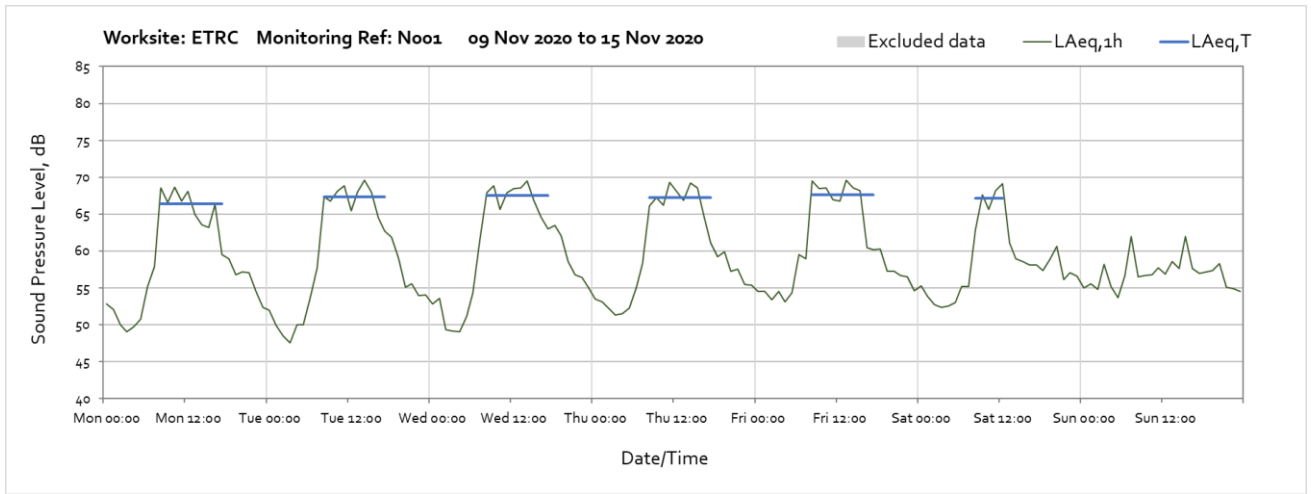
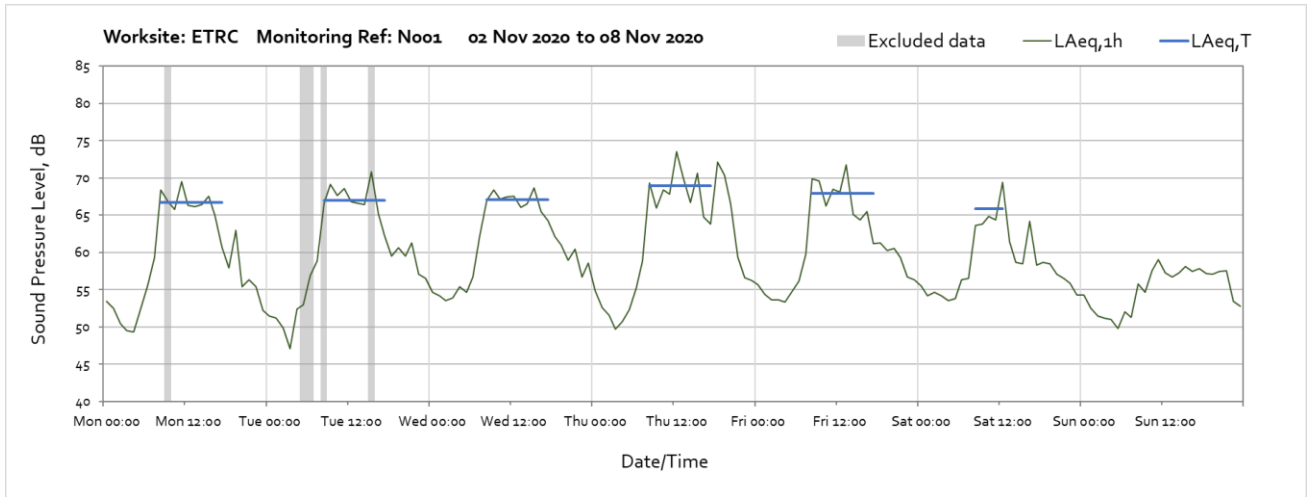


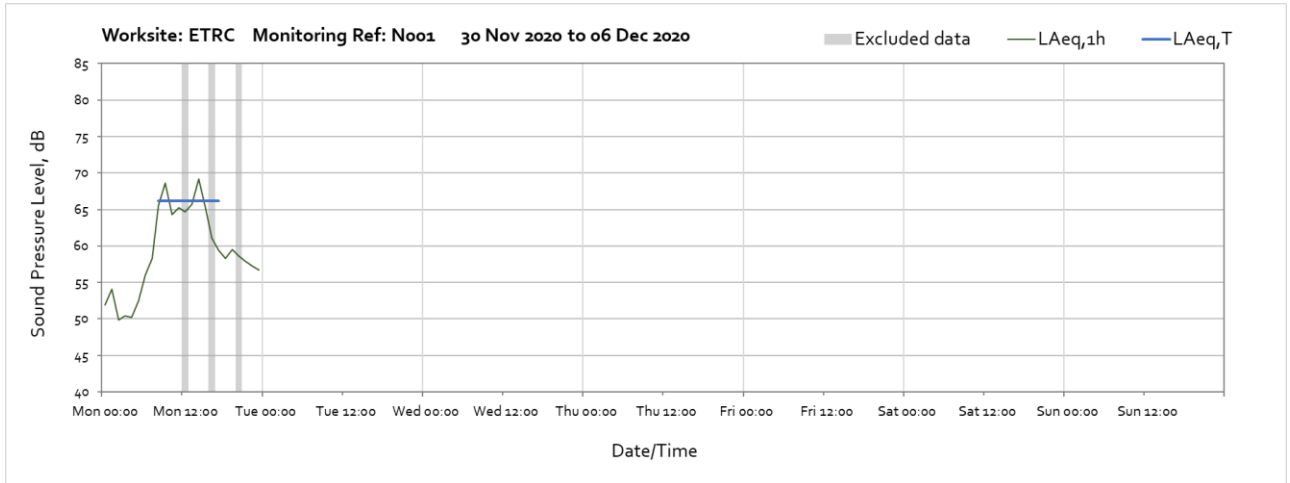
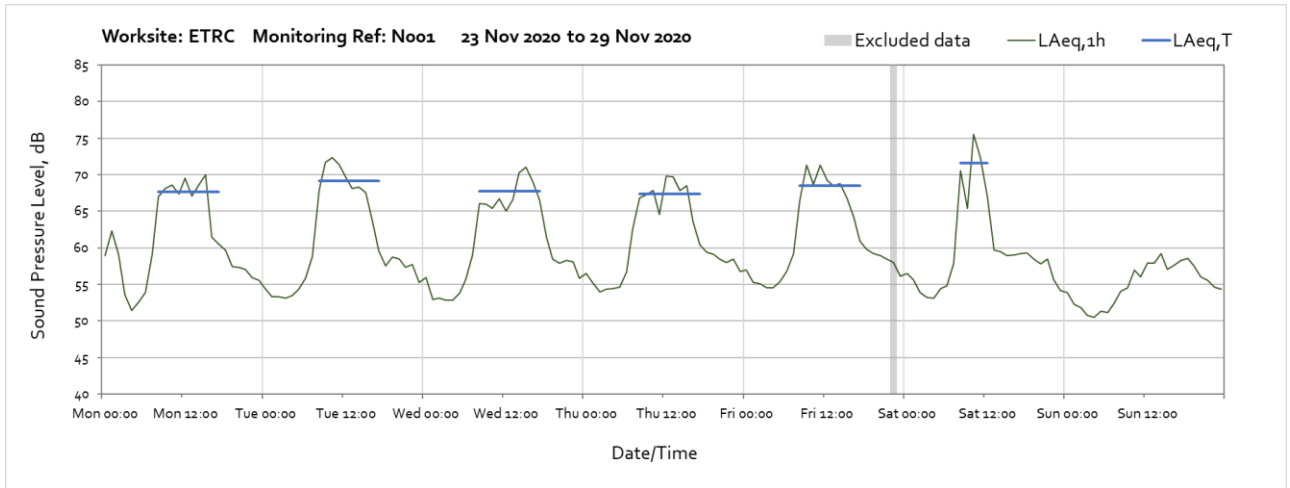




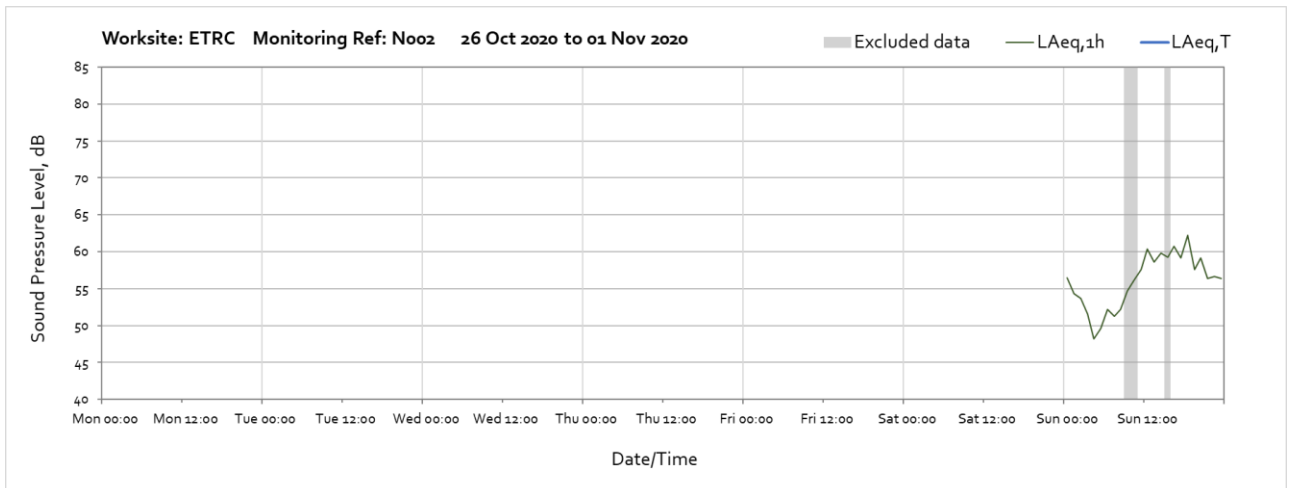
**Worksite: ETRC – Monitoring Ref: N001**

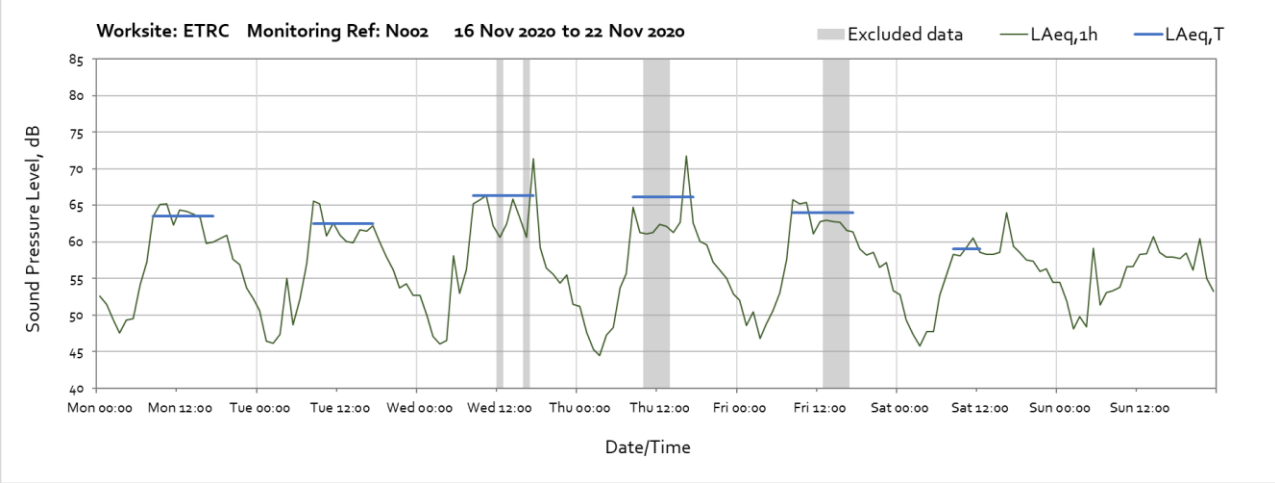
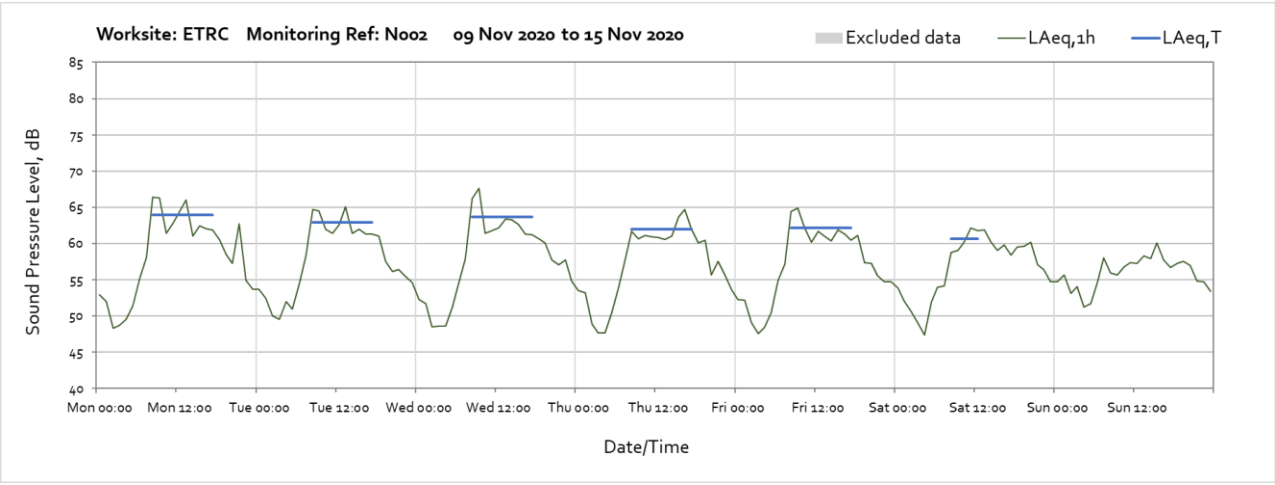
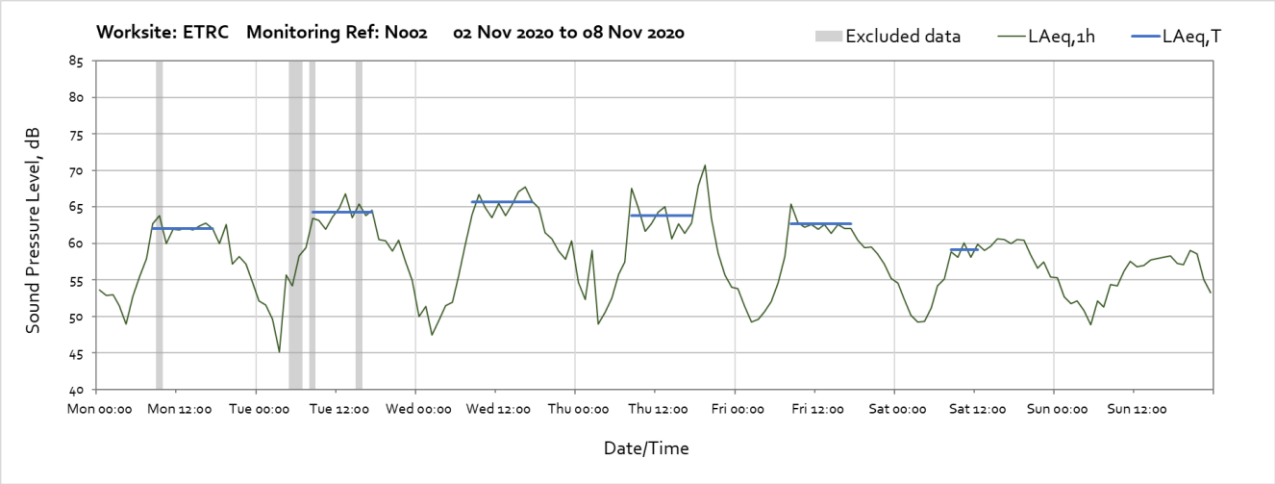


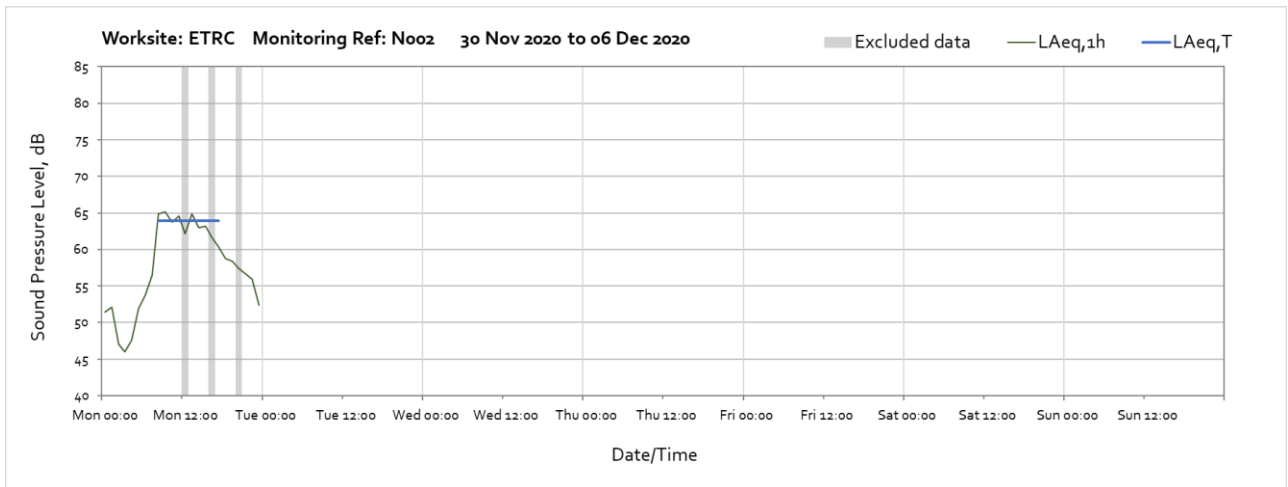
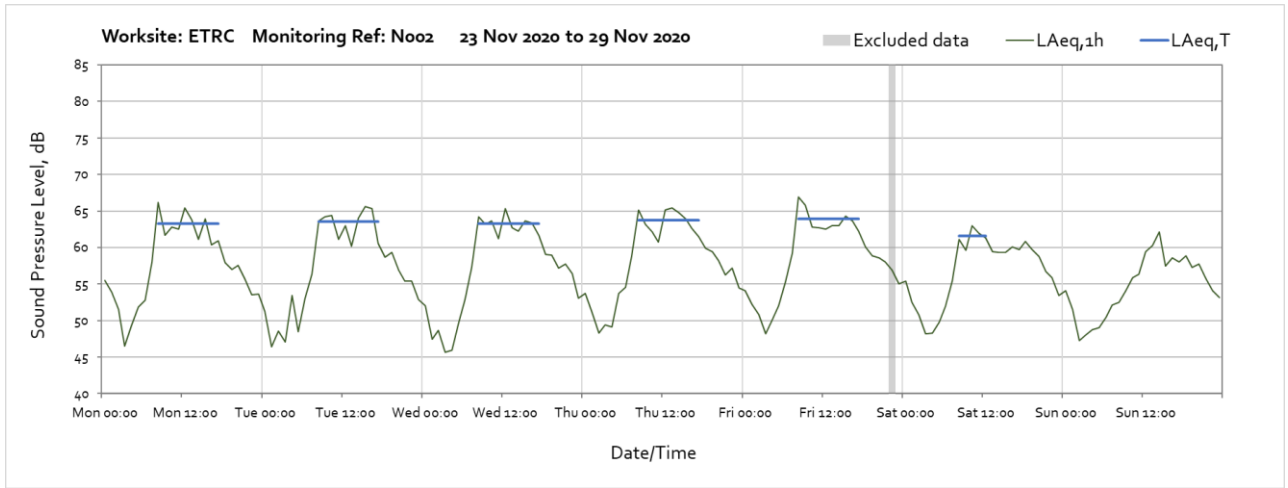




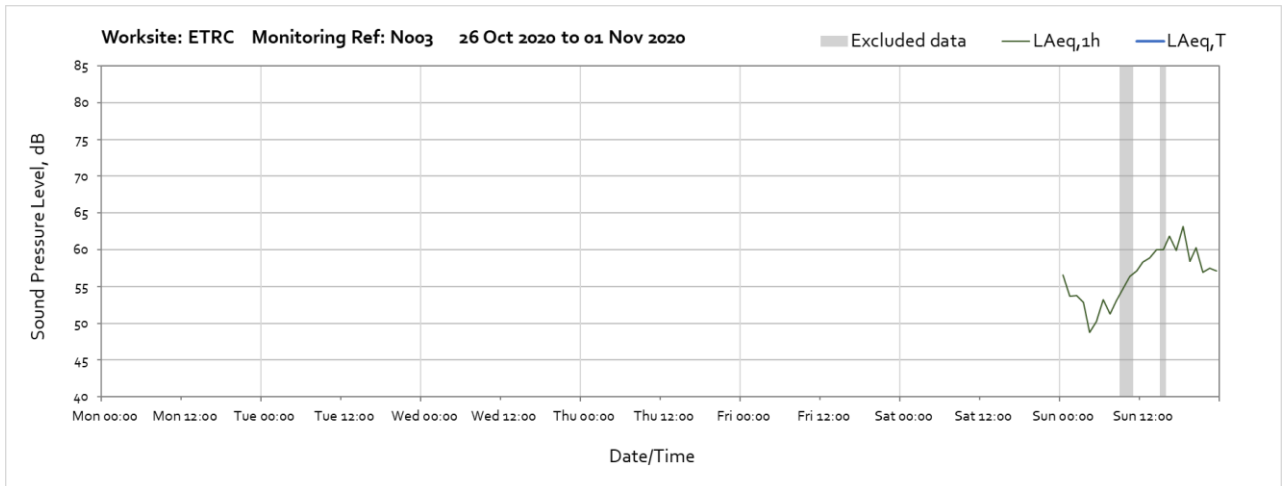
**Worksite: ETRC – Monitoring Ref: N002**



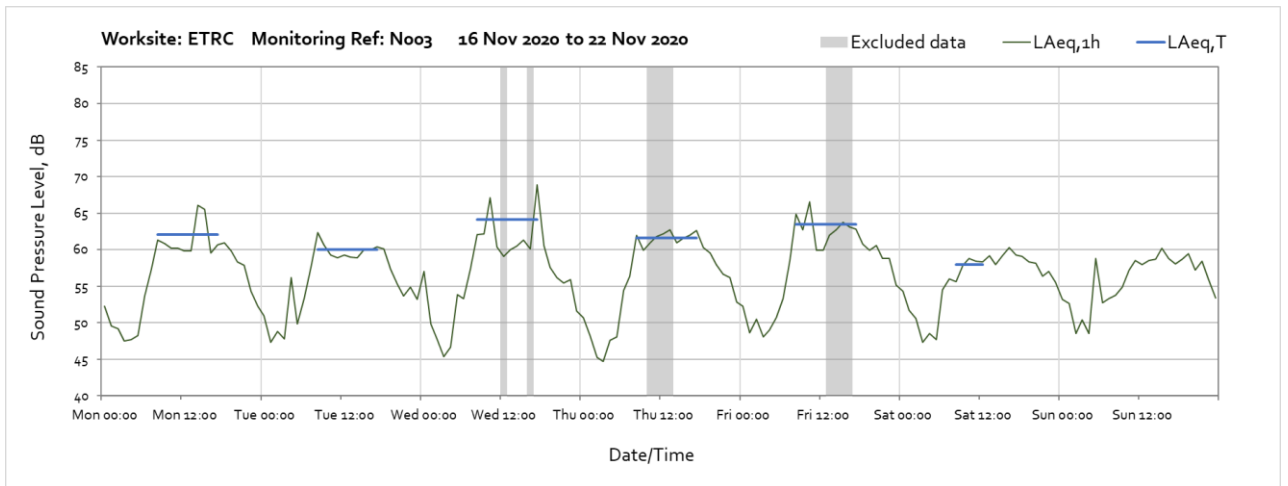
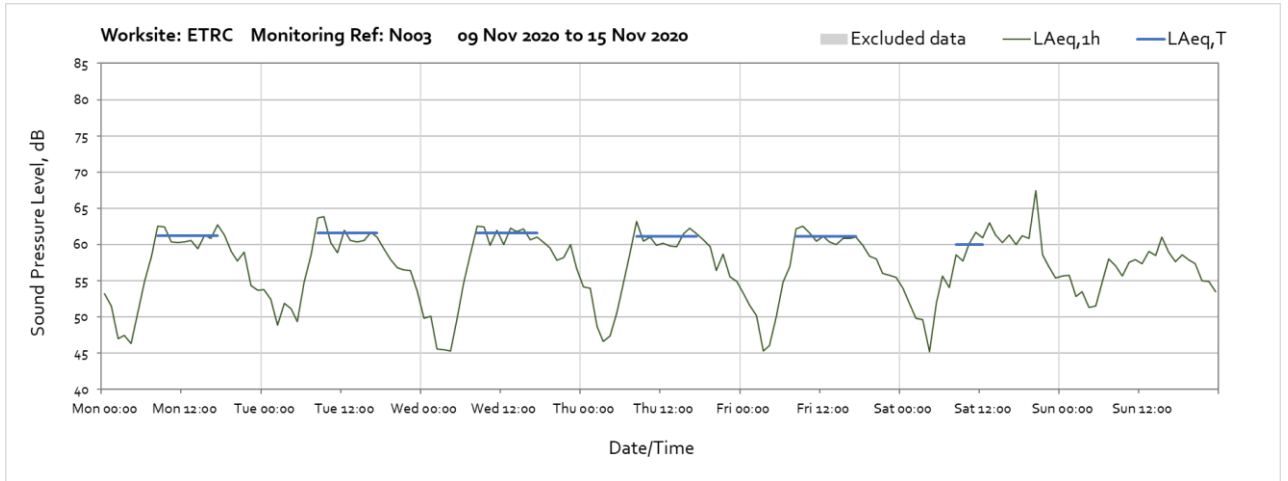
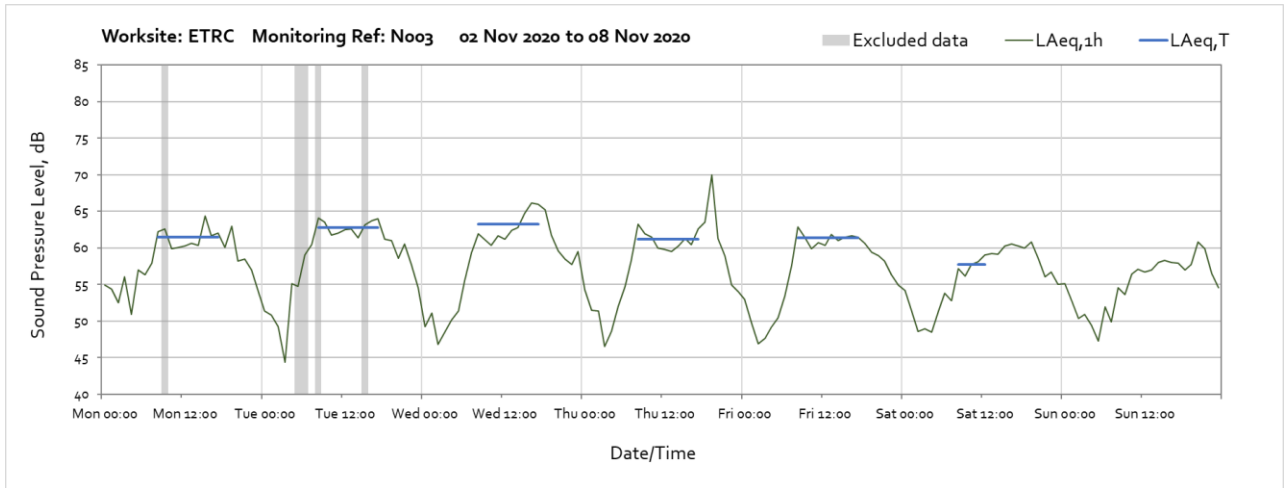


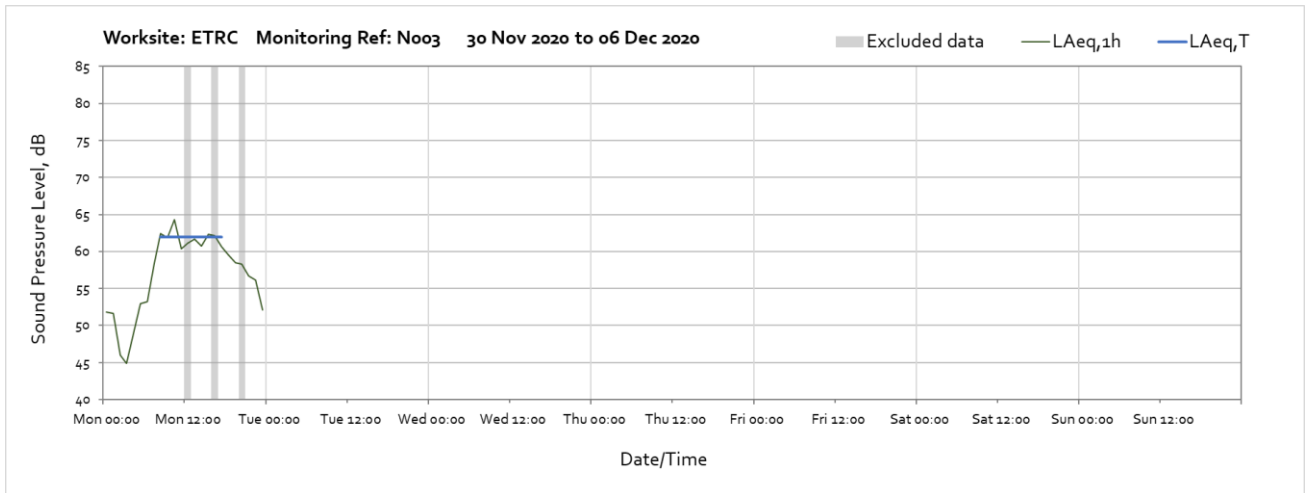
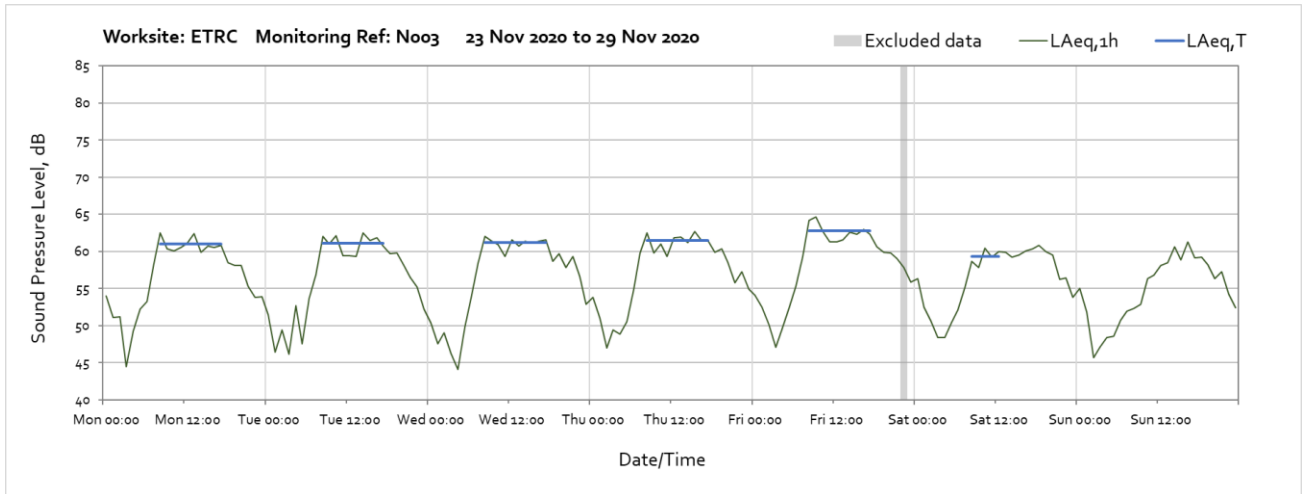


**Worksite: ETRC – Monitoring Ref: N003**

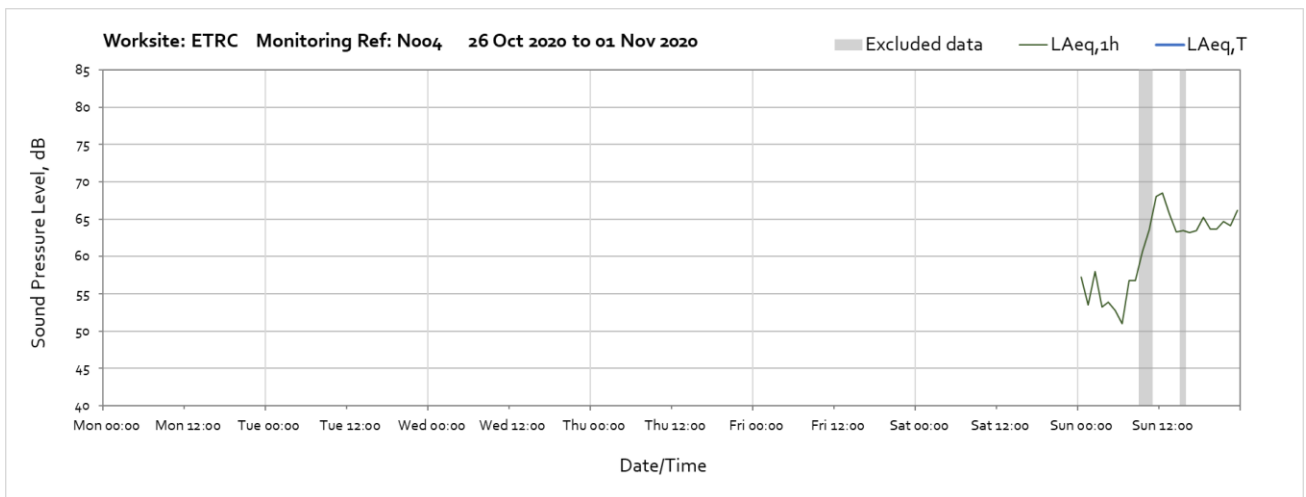


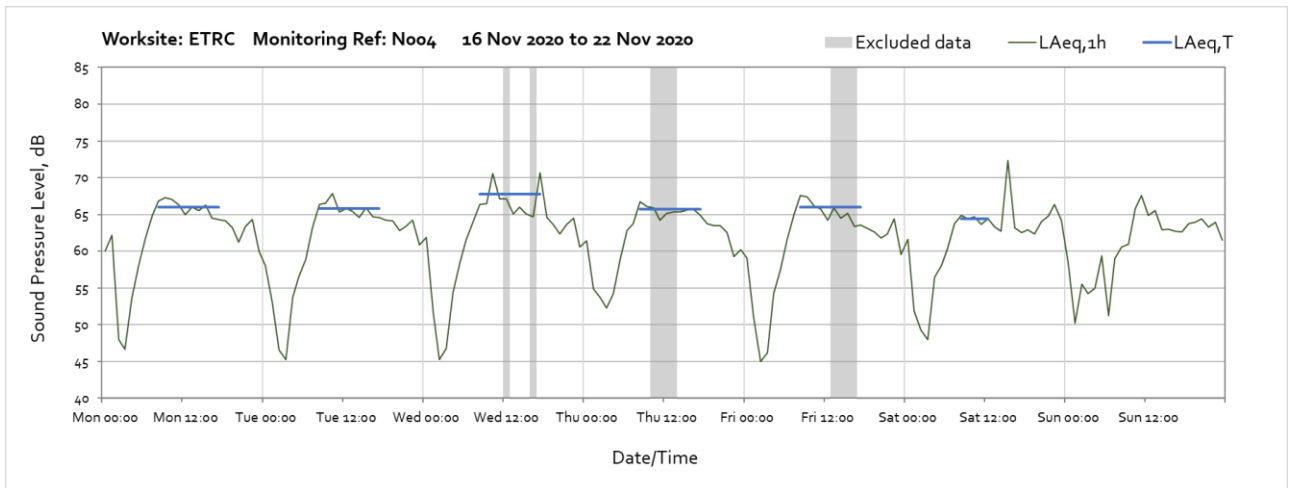
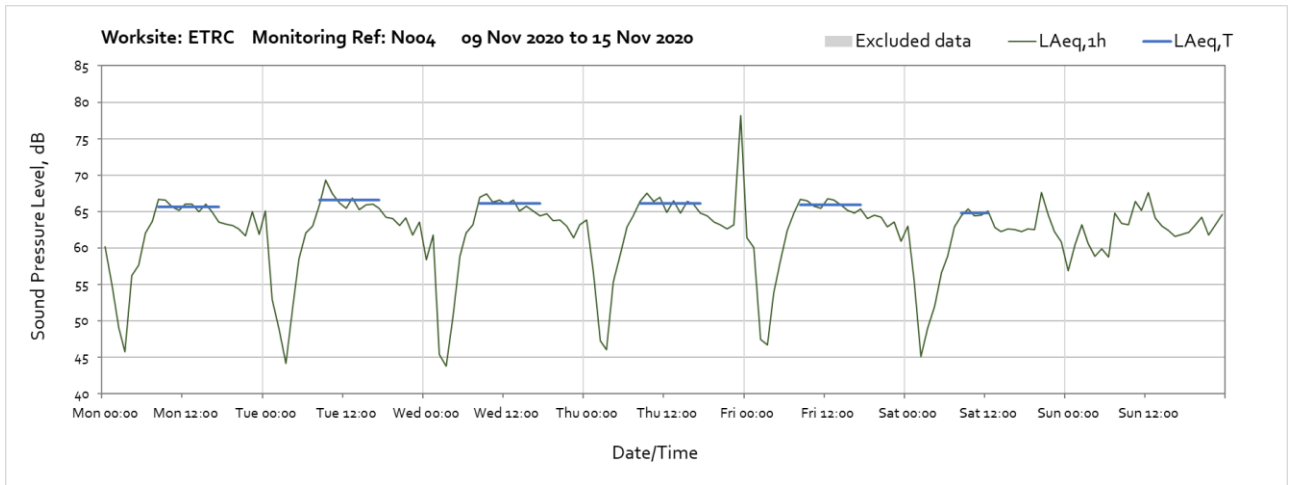
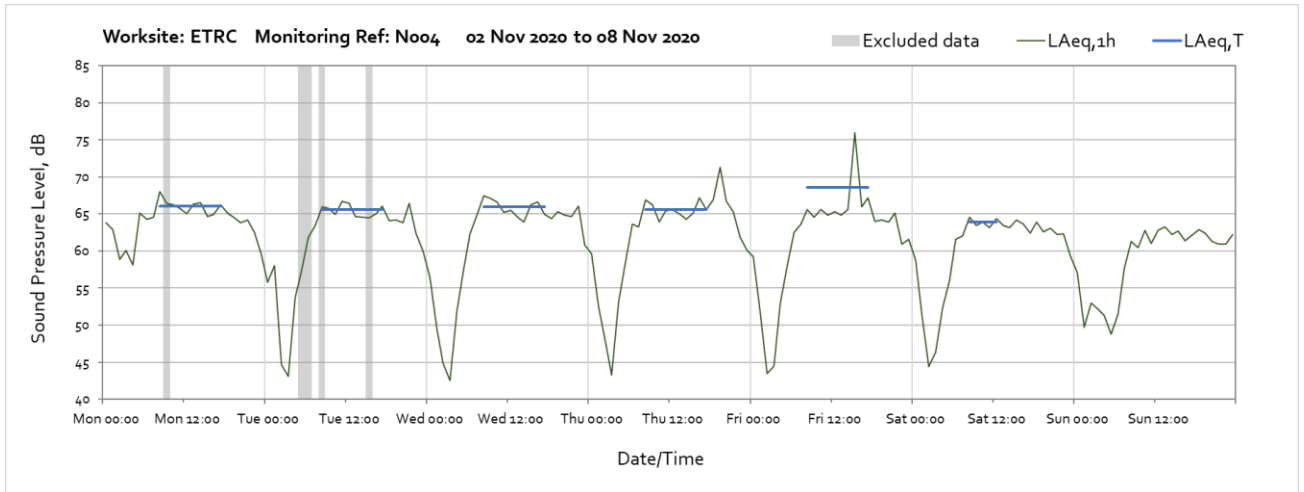


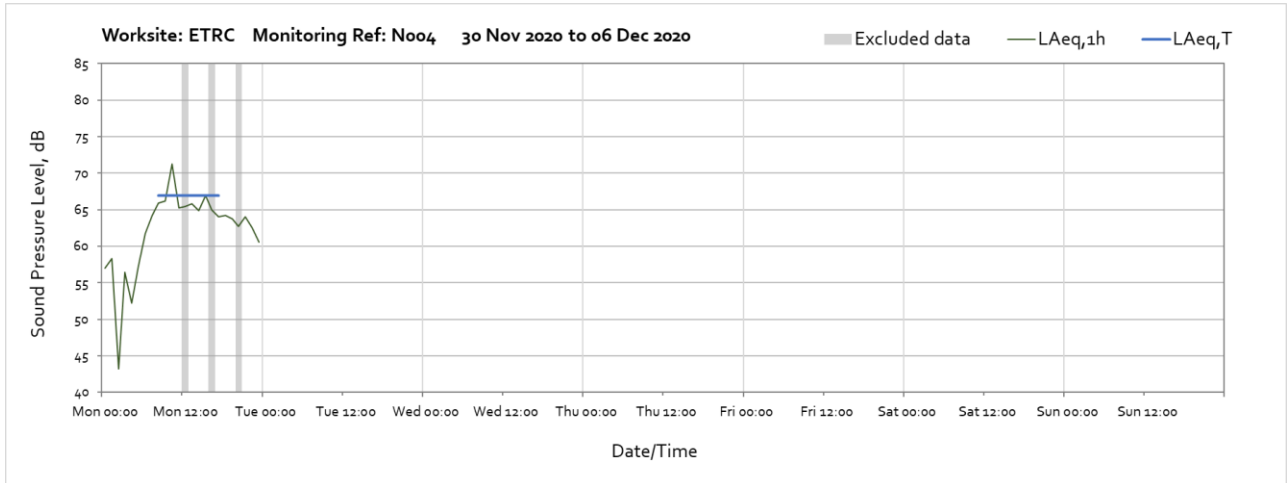
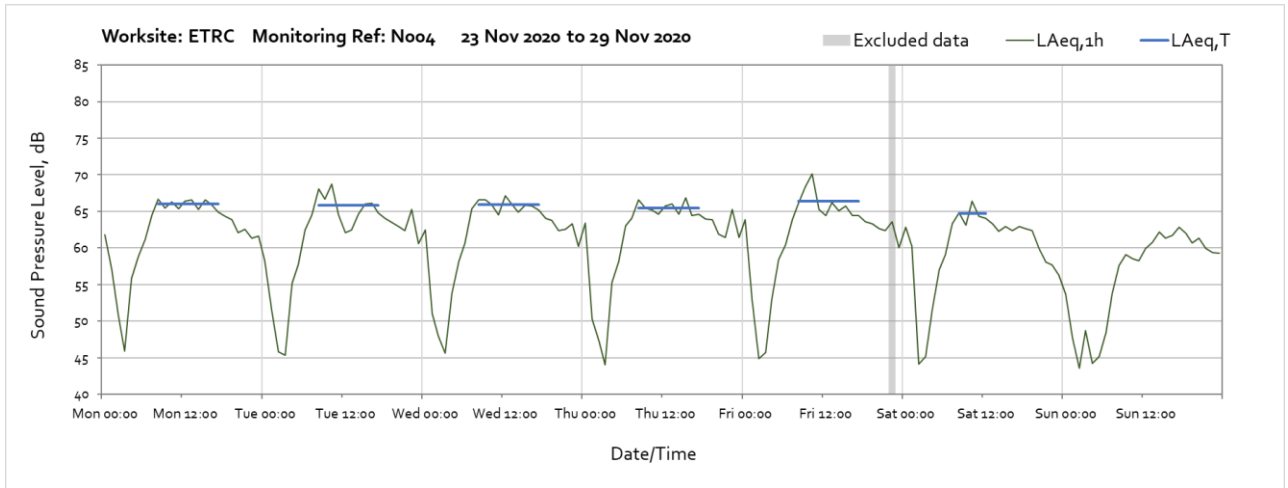




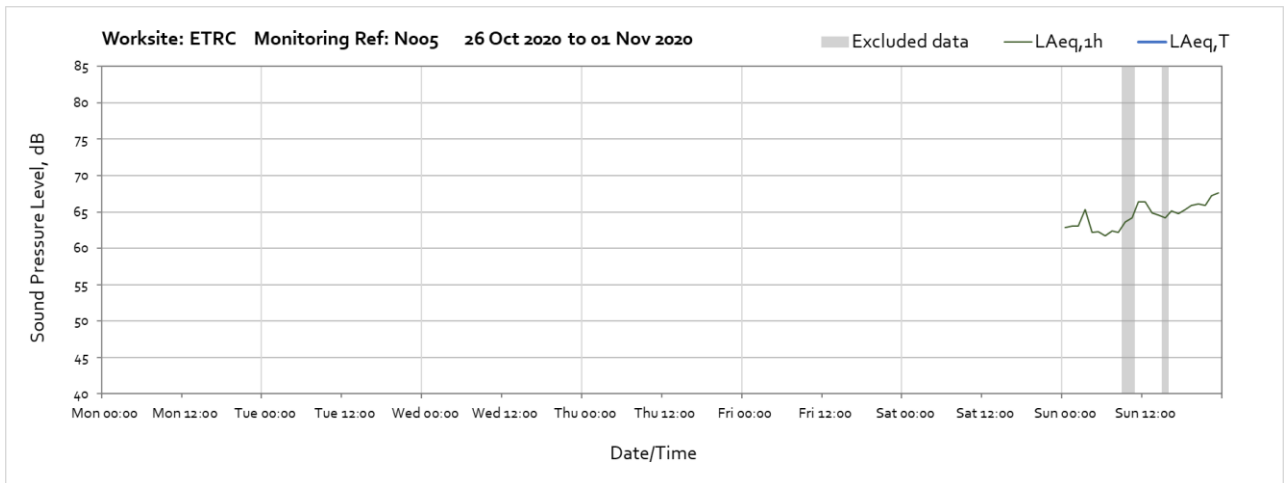
**Worksite: ETRC – Monitoring Ref: N004**

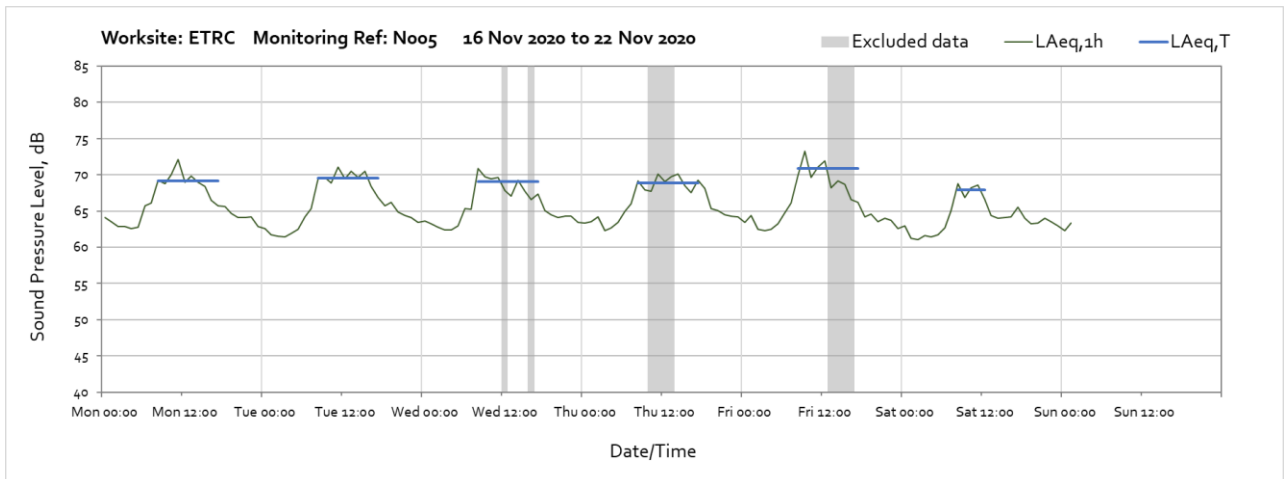
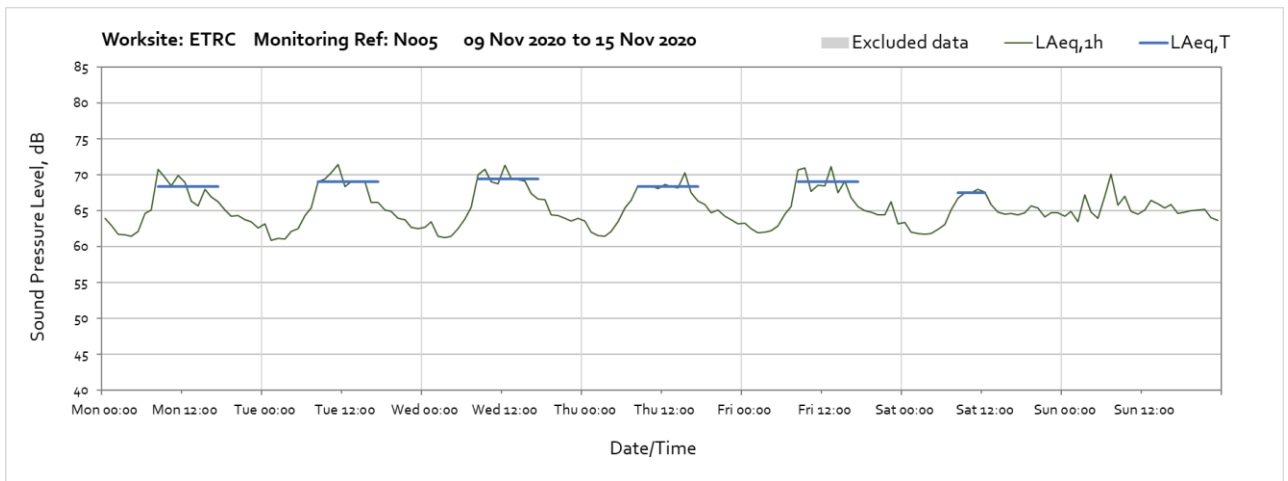
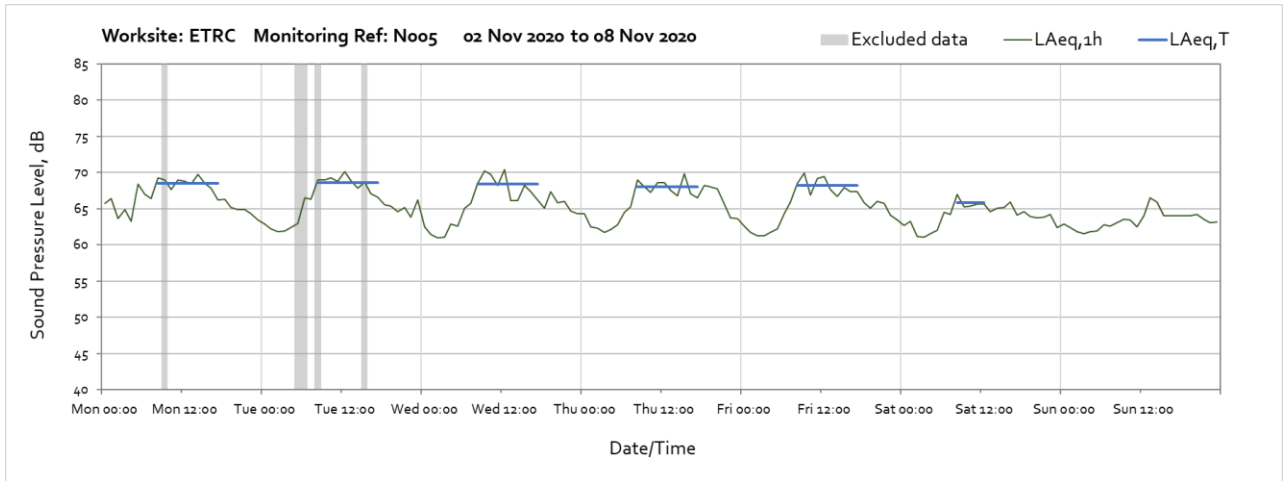




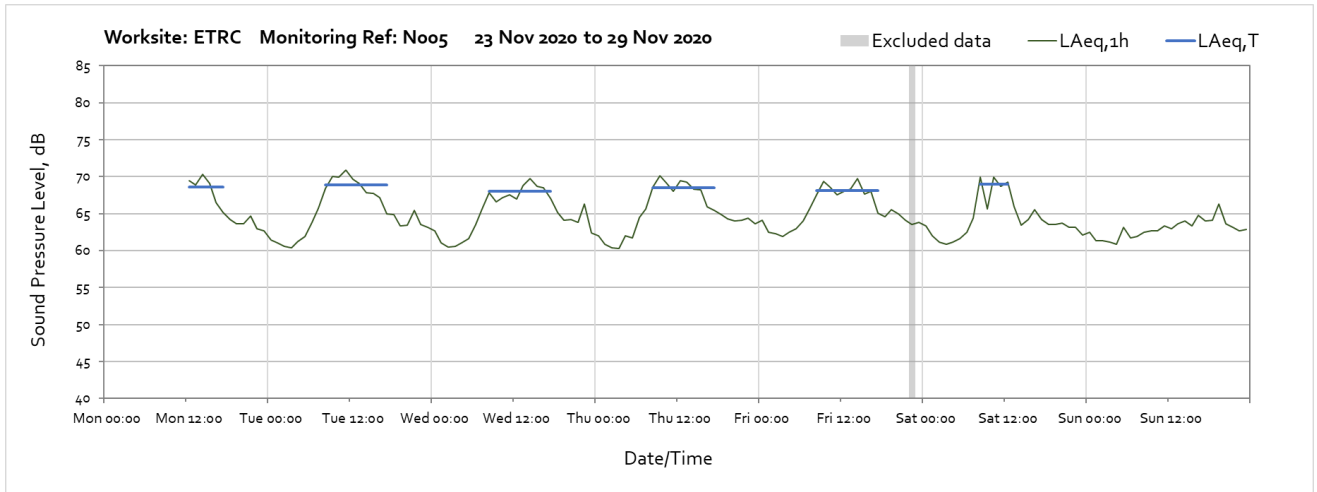


**Worksite: ETRC – Monitoring Ref: N005**

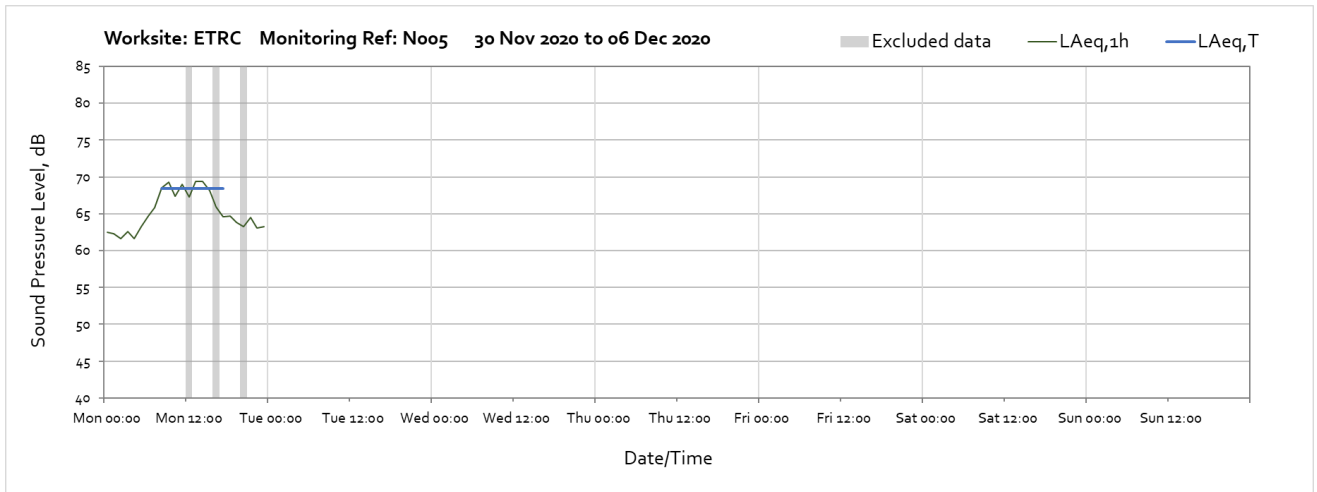




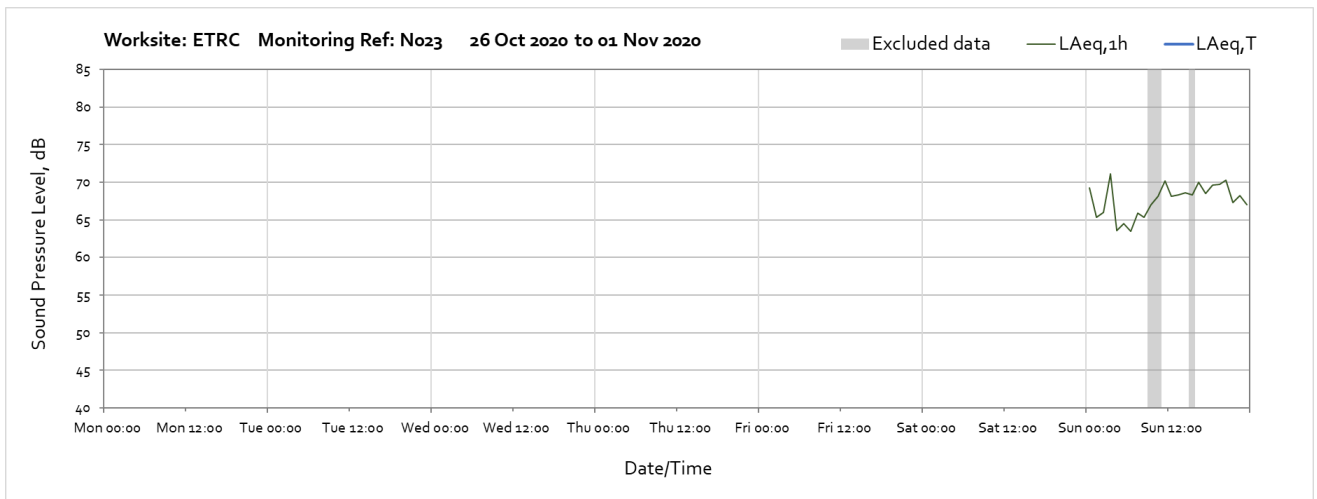
Note: Missing data from 01:00 on Sunday 22nd November until 12:00 on Monday 23rd November was due to a temporary loss of site power (including power to the monitoring station) which was subsequently restored.

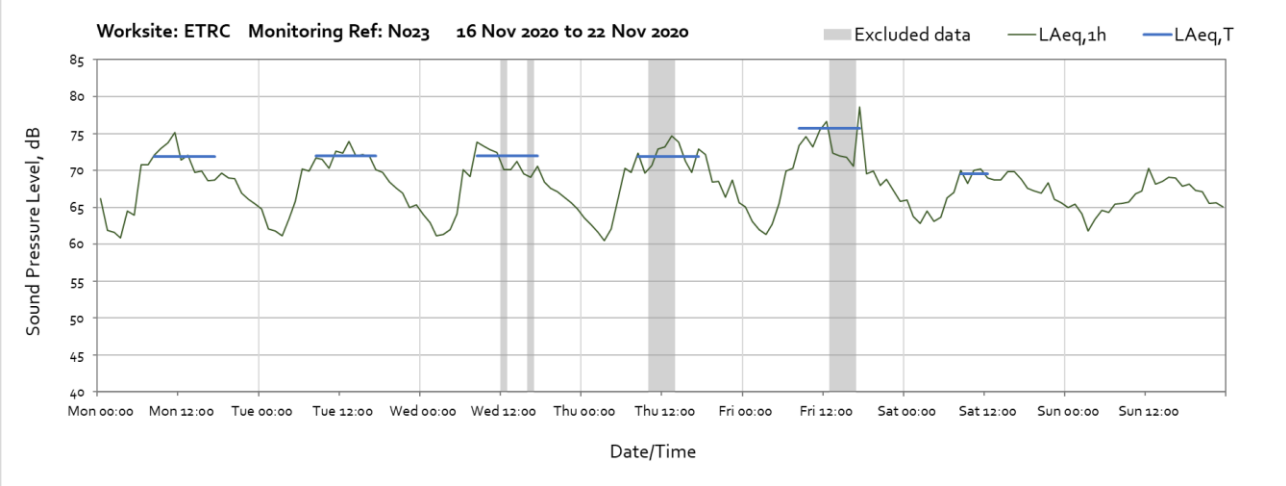
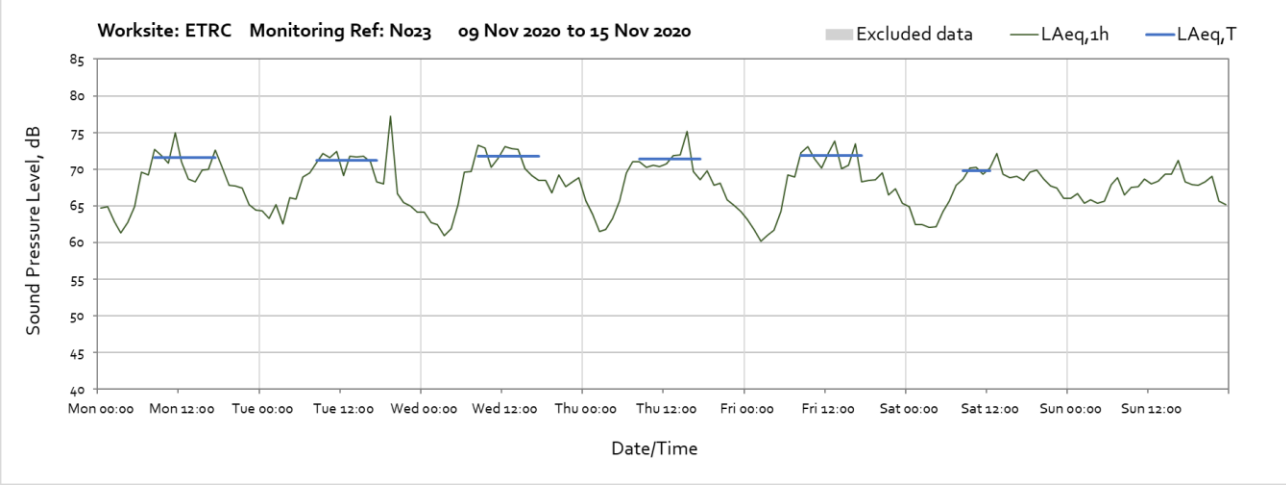
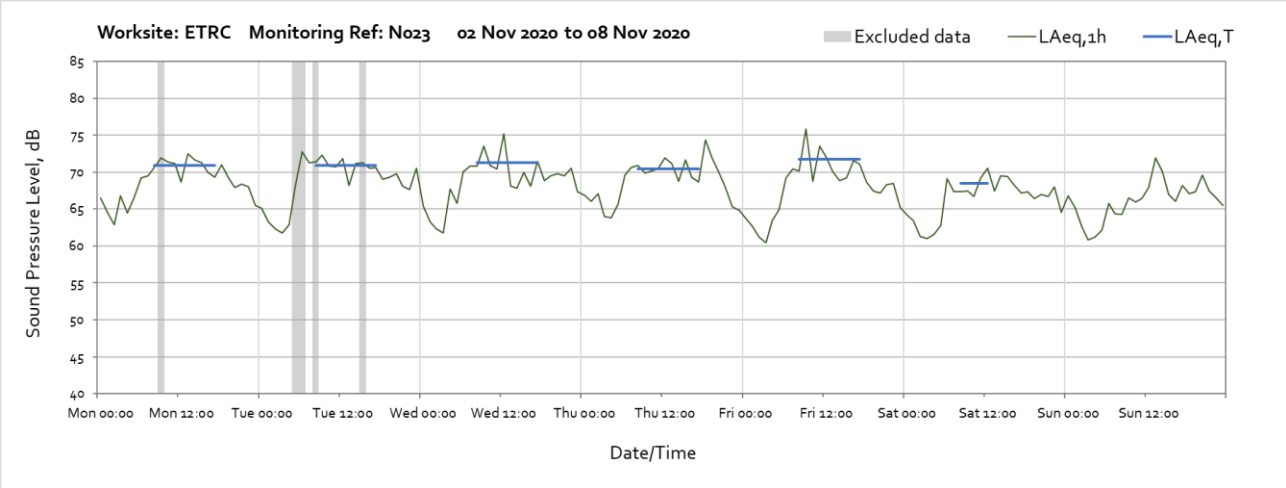


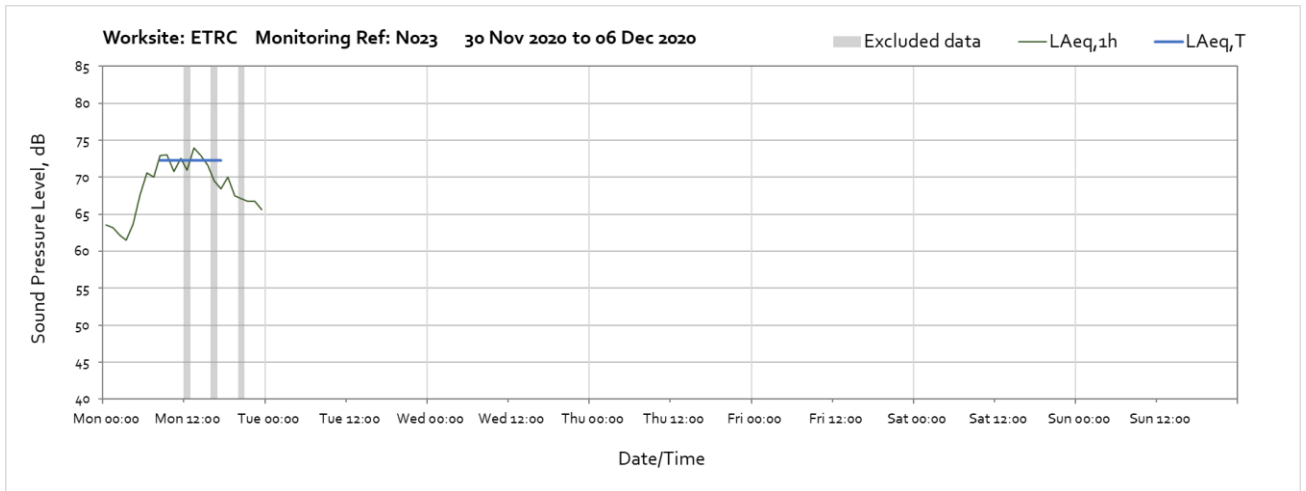
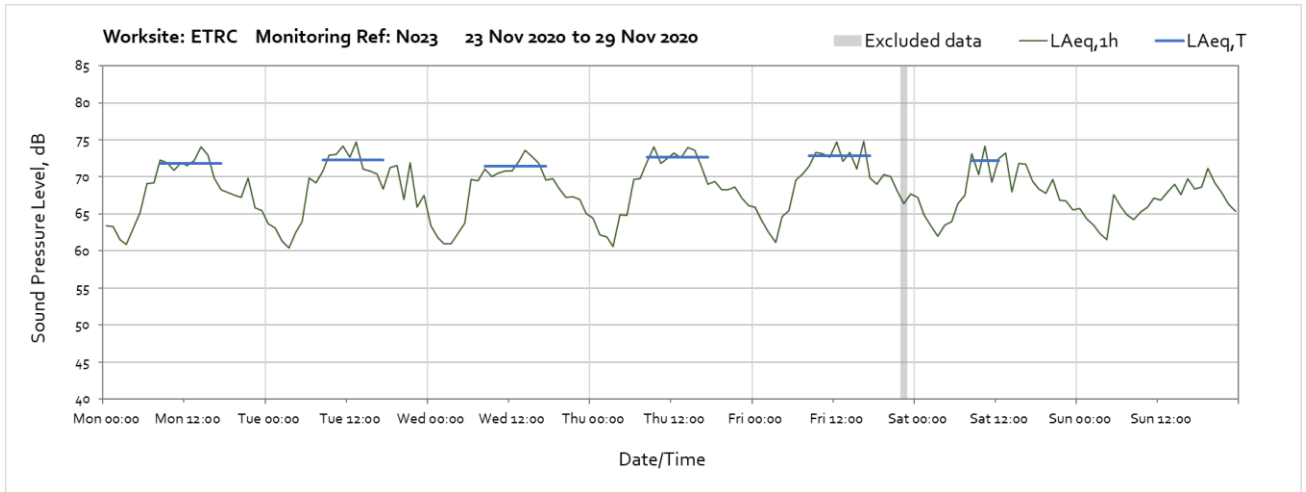
Note: Missing data from 01:00 on Sunday 22<sup>nd</sup> November until 12:00 on Monday 23<sup>rd</sup> November was due to a temporary loss of site power (including power to the monitoring station) which was subsequently restored.



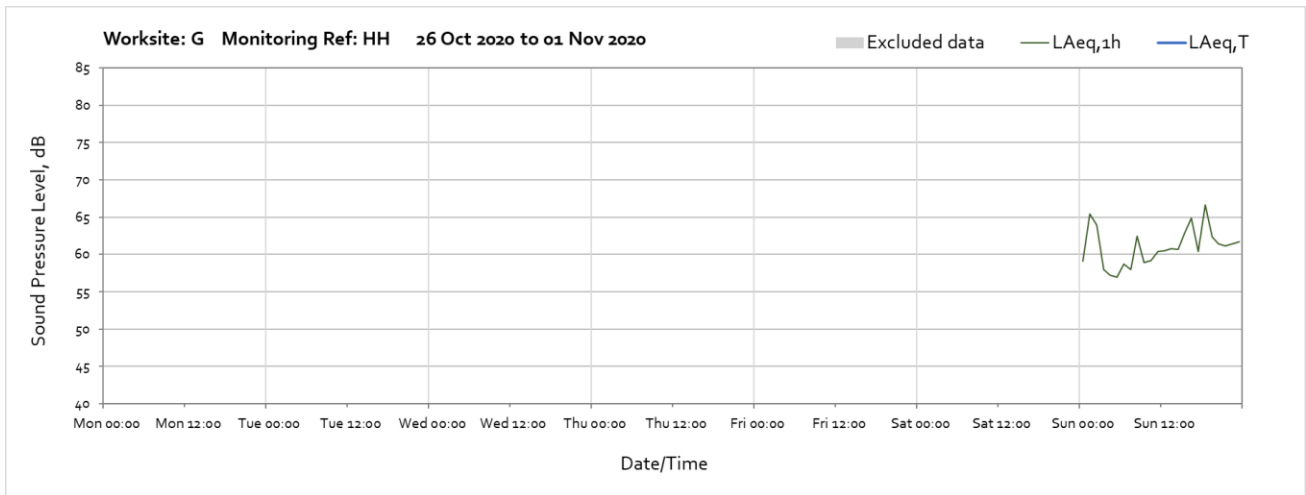
**Worksite: ETRC – Monitoring Ref: N023**



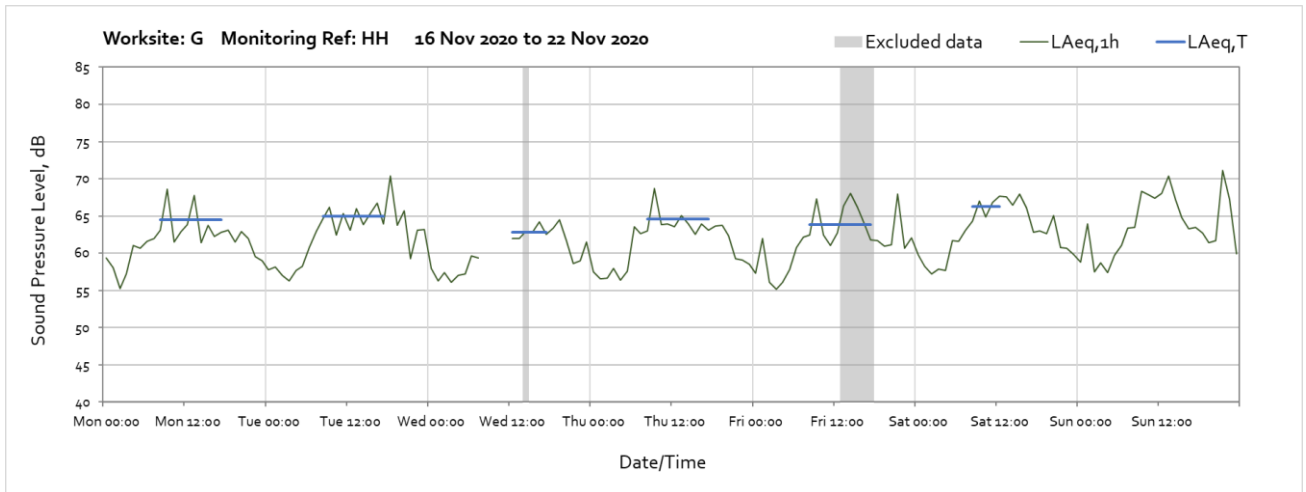
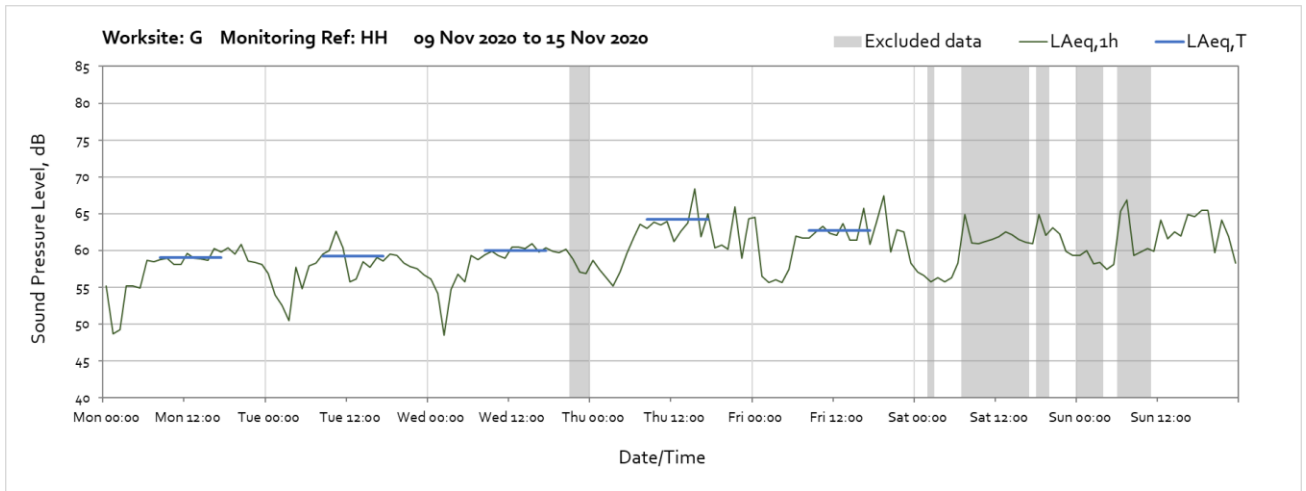
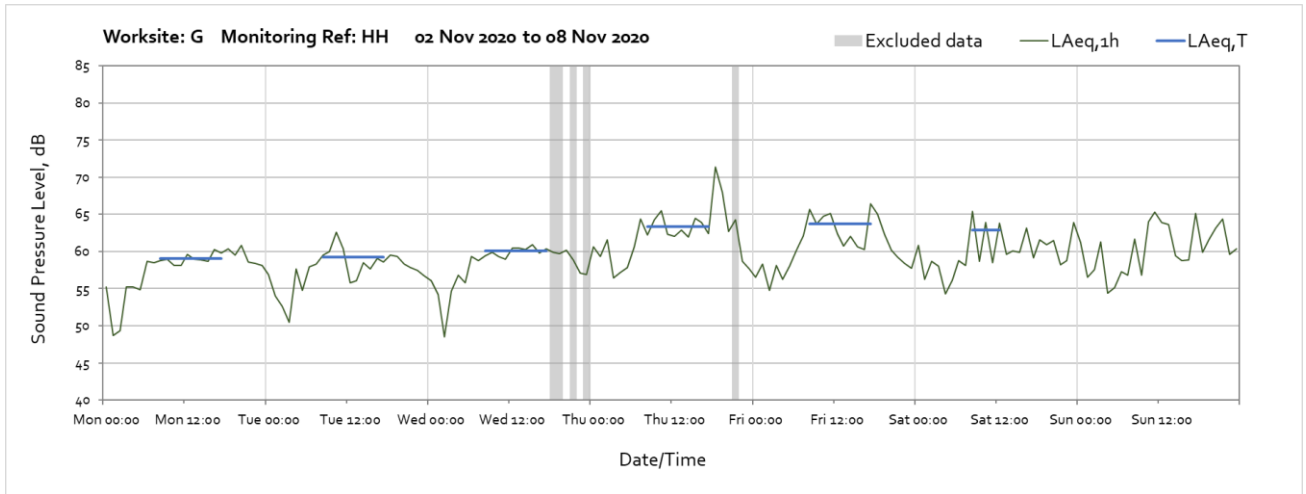




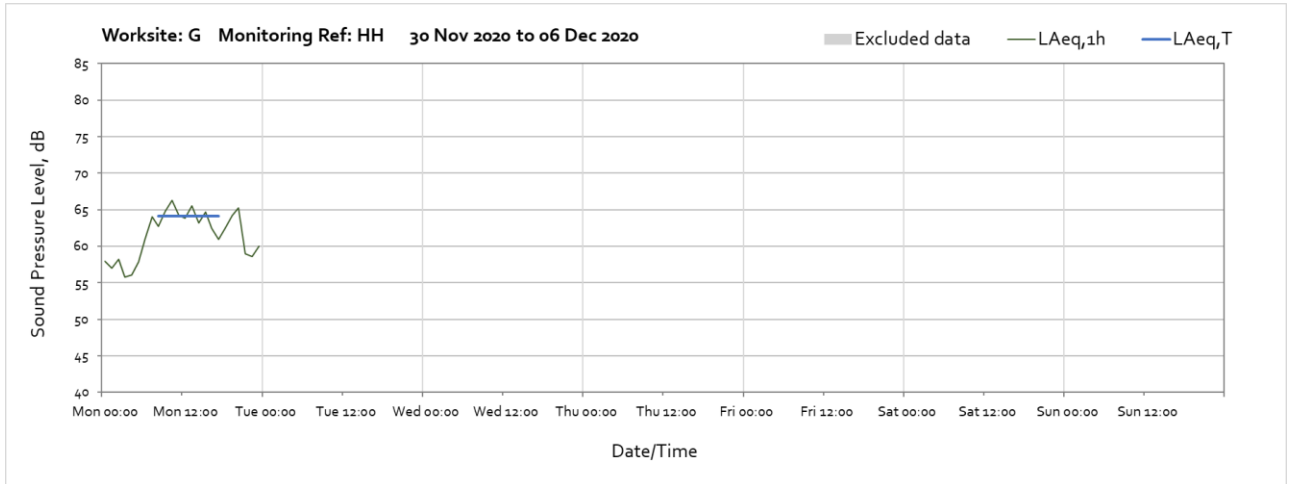
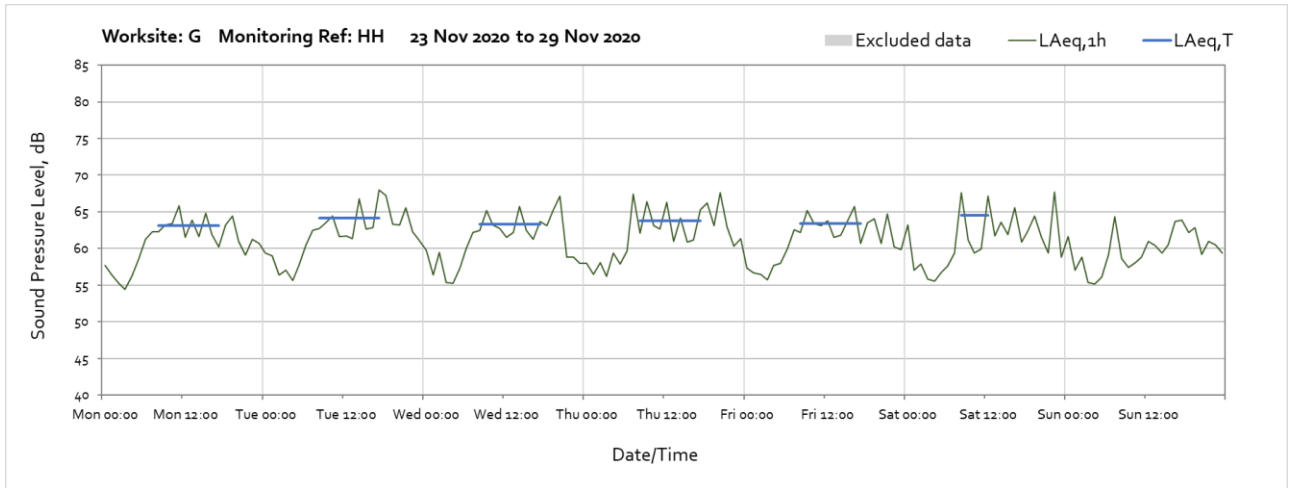
**Worksite: G – Monitoring Ref: HH**



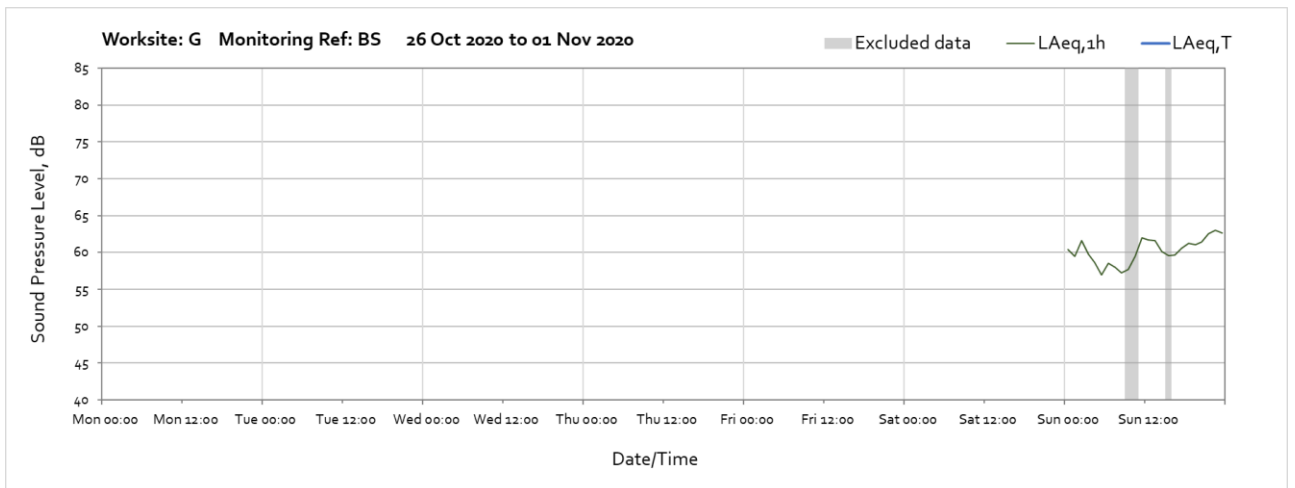


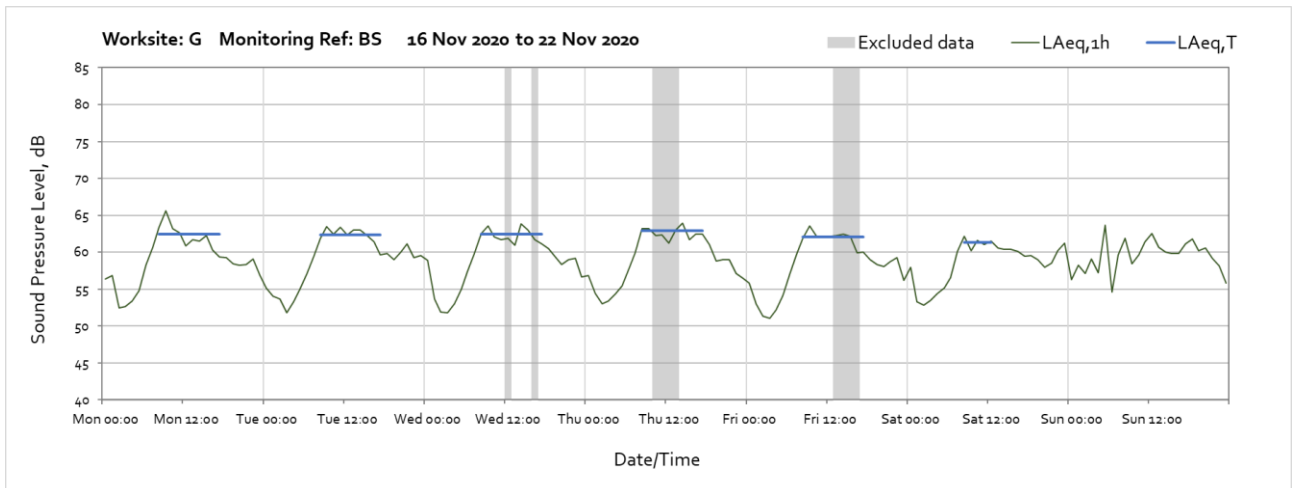
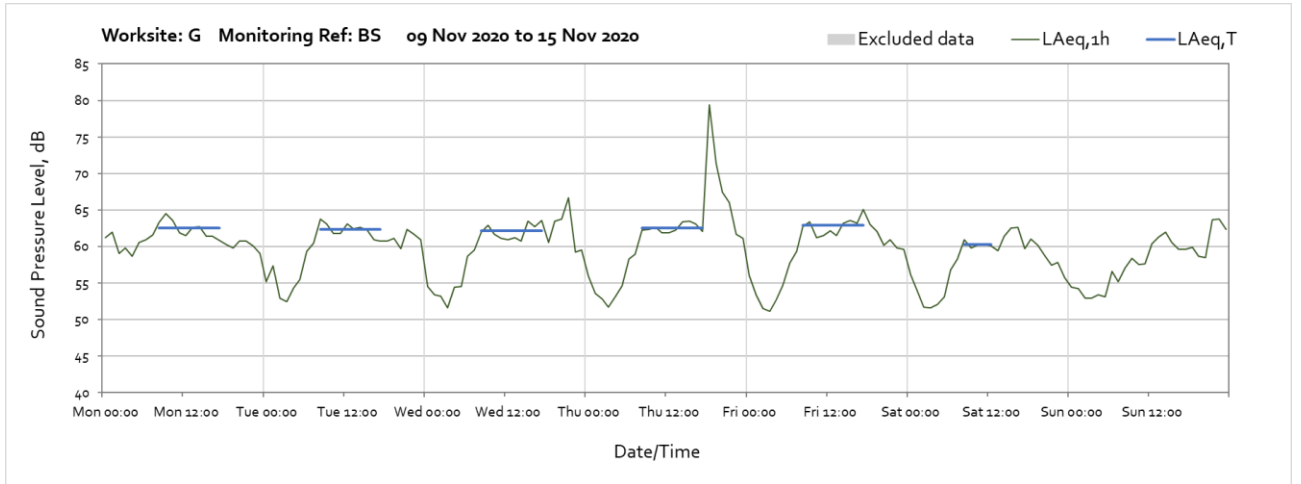
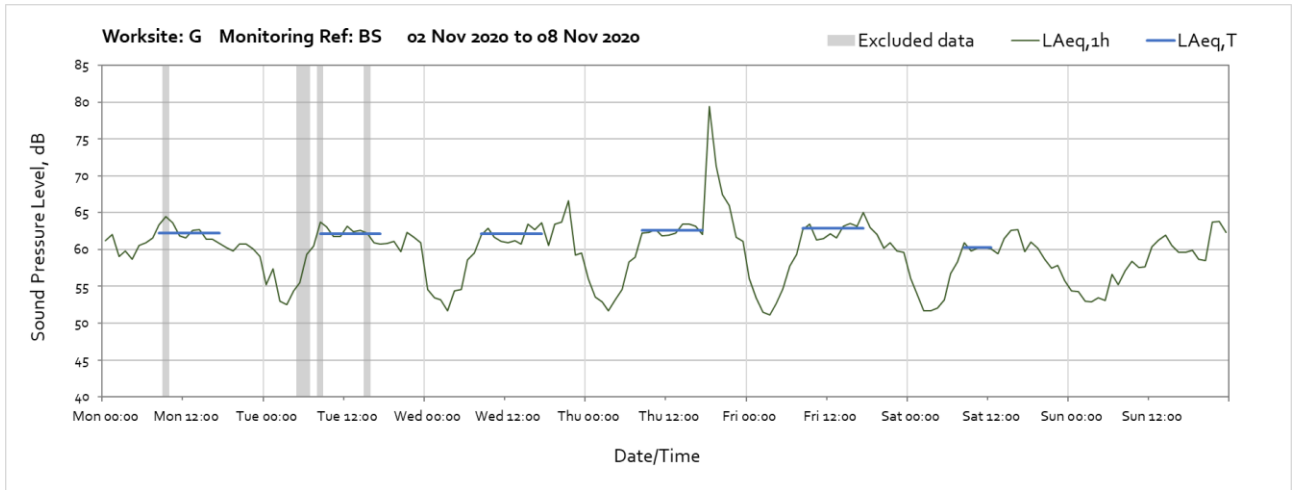


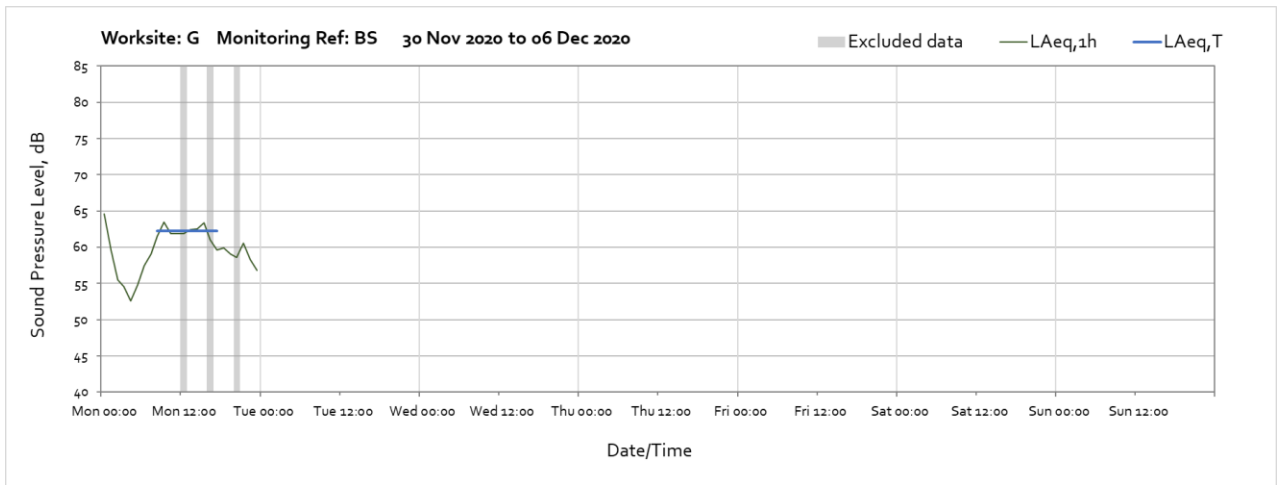
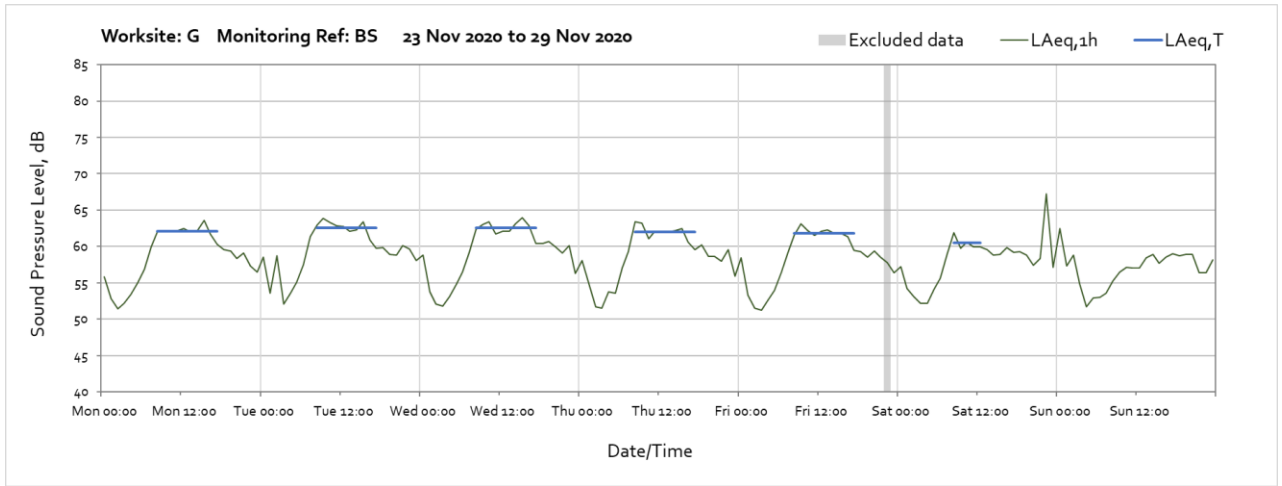
Note: Missing data between 08:00-12:00 on Wednesday 18<sup>th</sup> October was due the swapping of noise meters at the monitoring station.



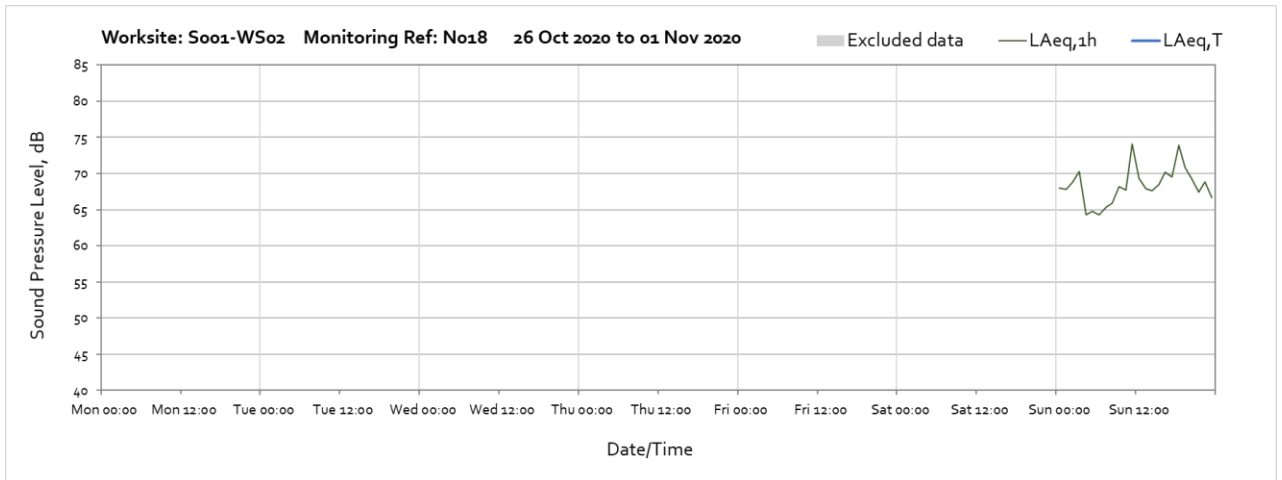
**Worksite: G – Monitoring Ref: BS**

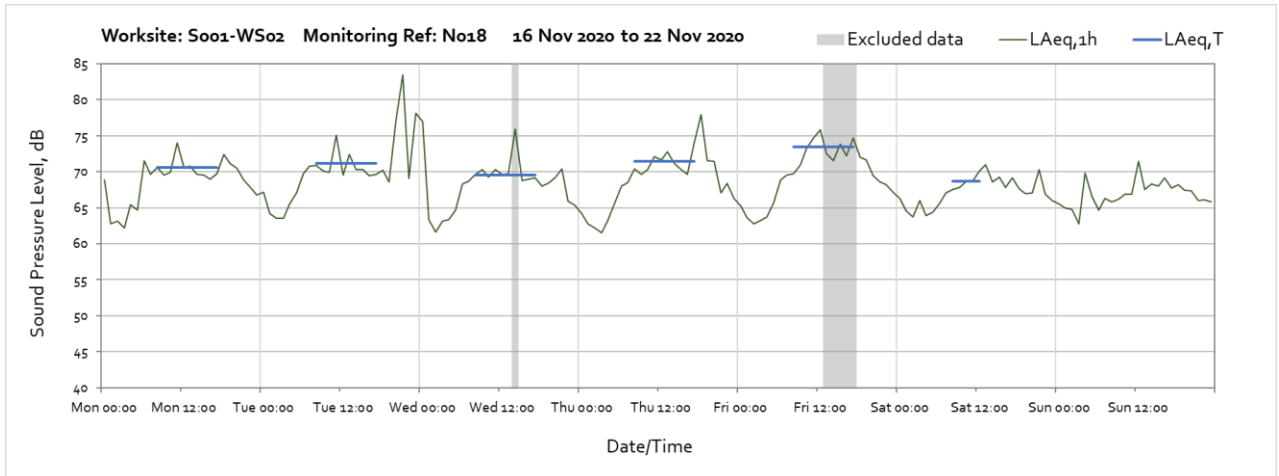
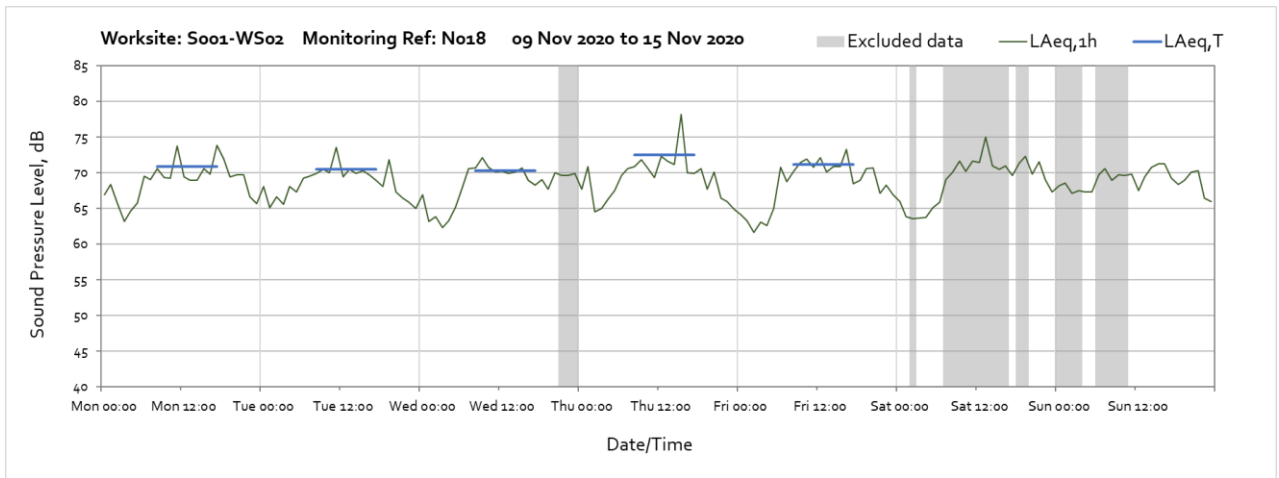
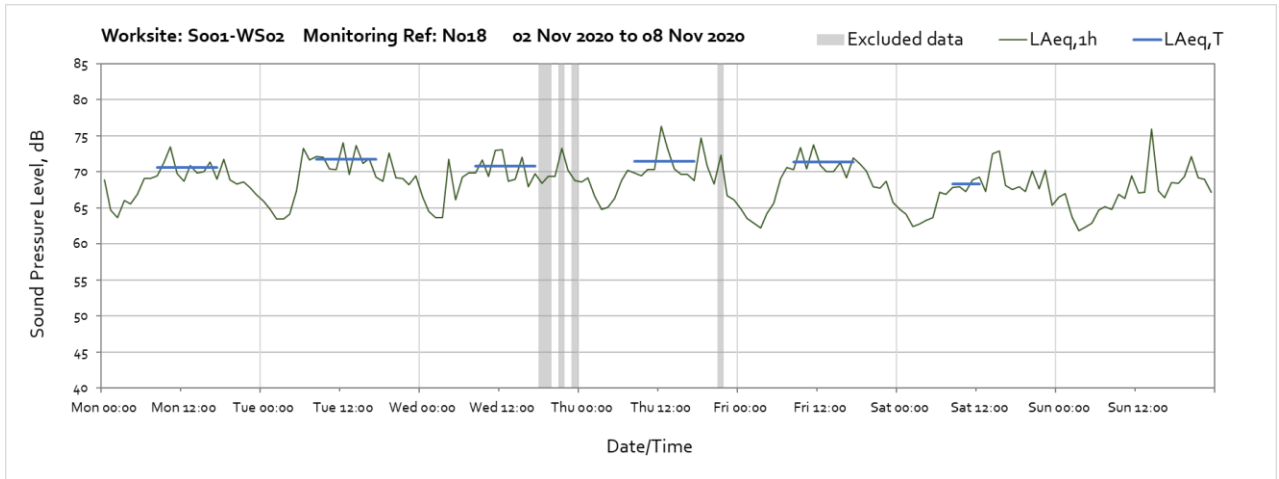


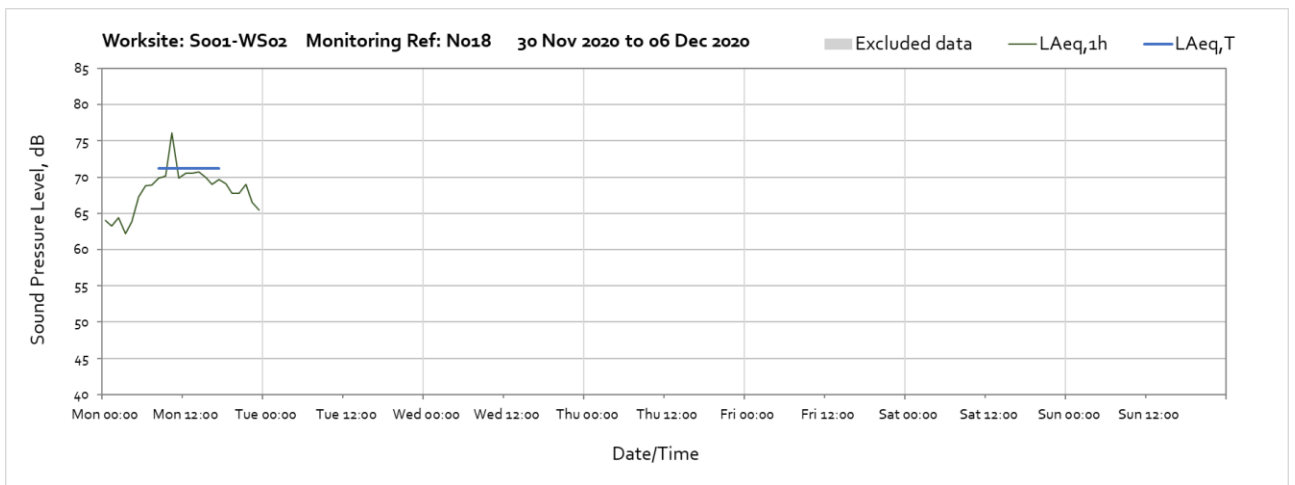
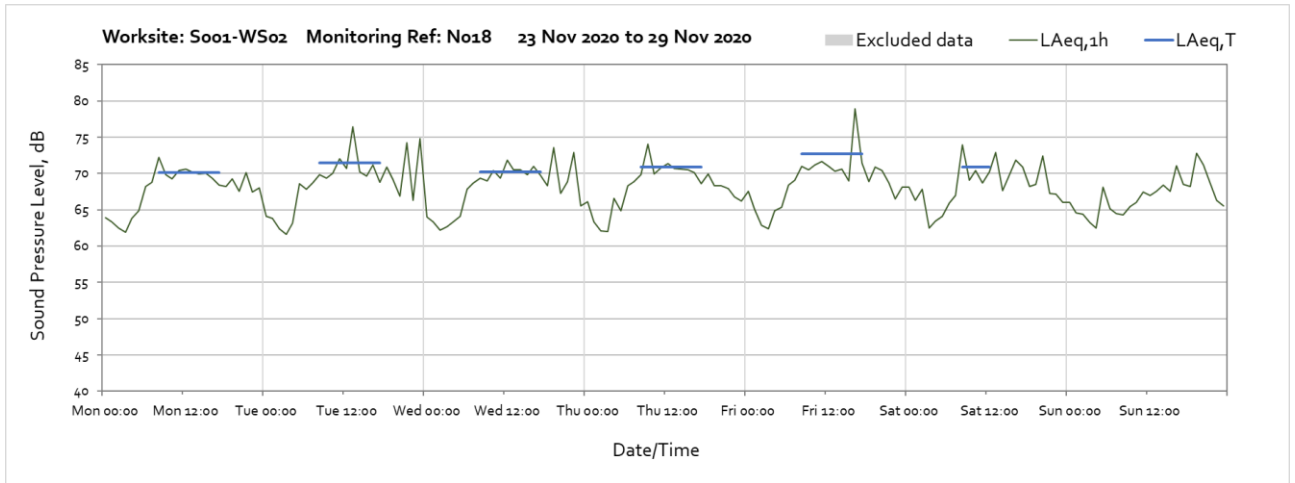




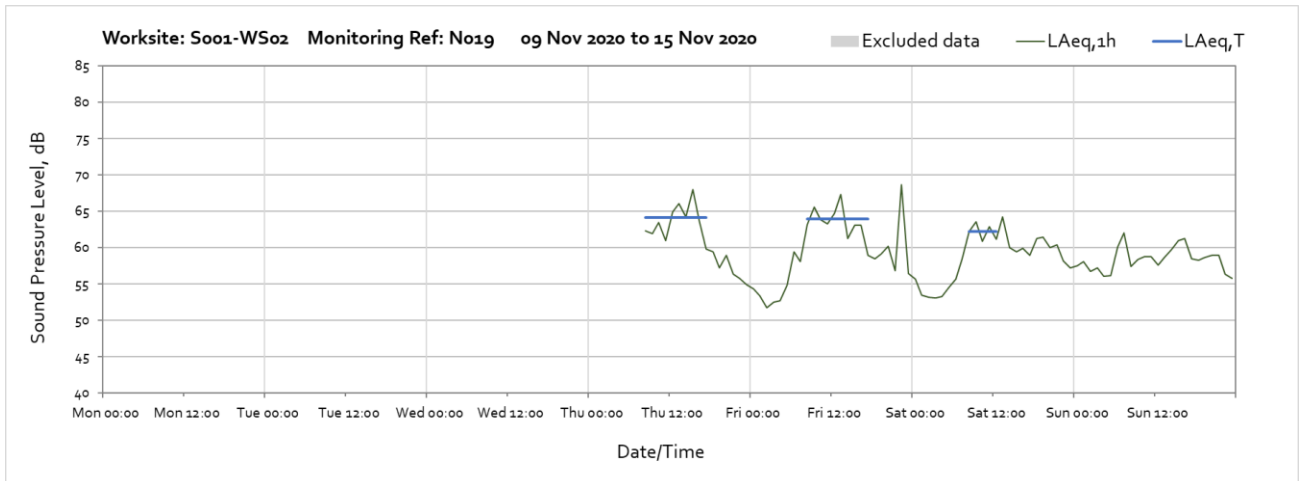
**Worksite: S001-WS02 – Monitoring Ref: N018**



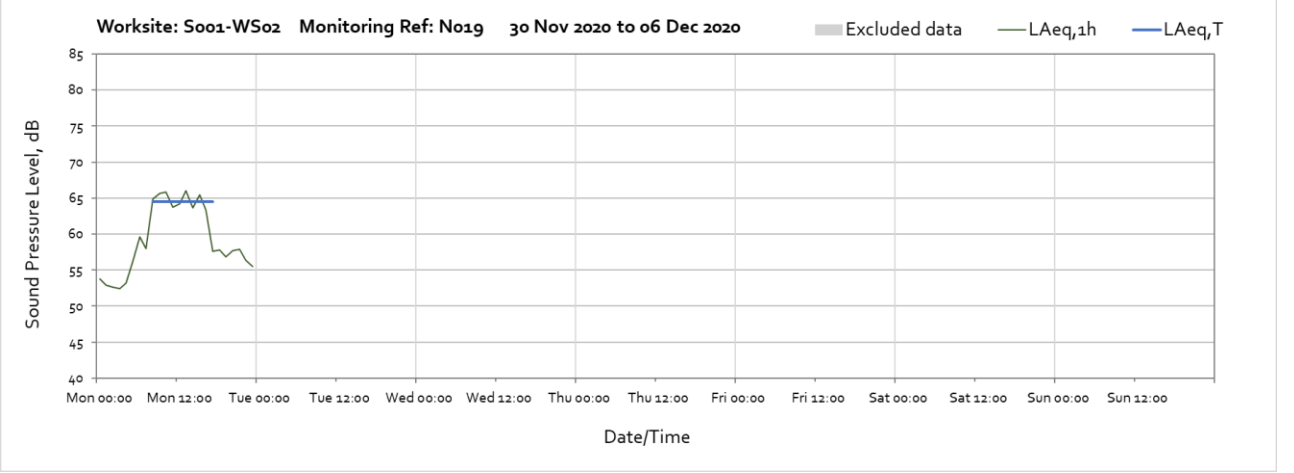
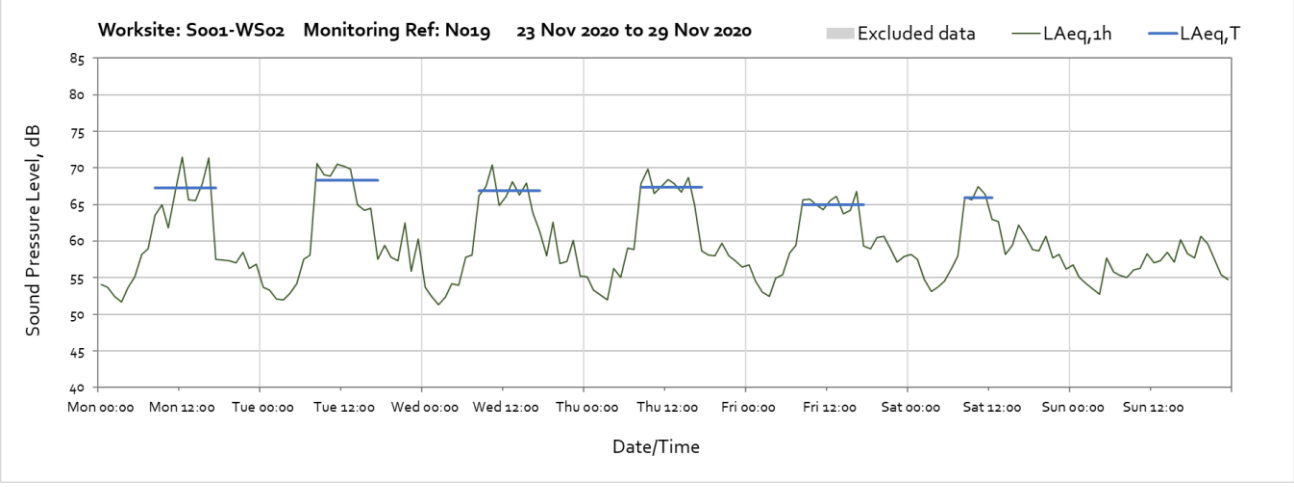
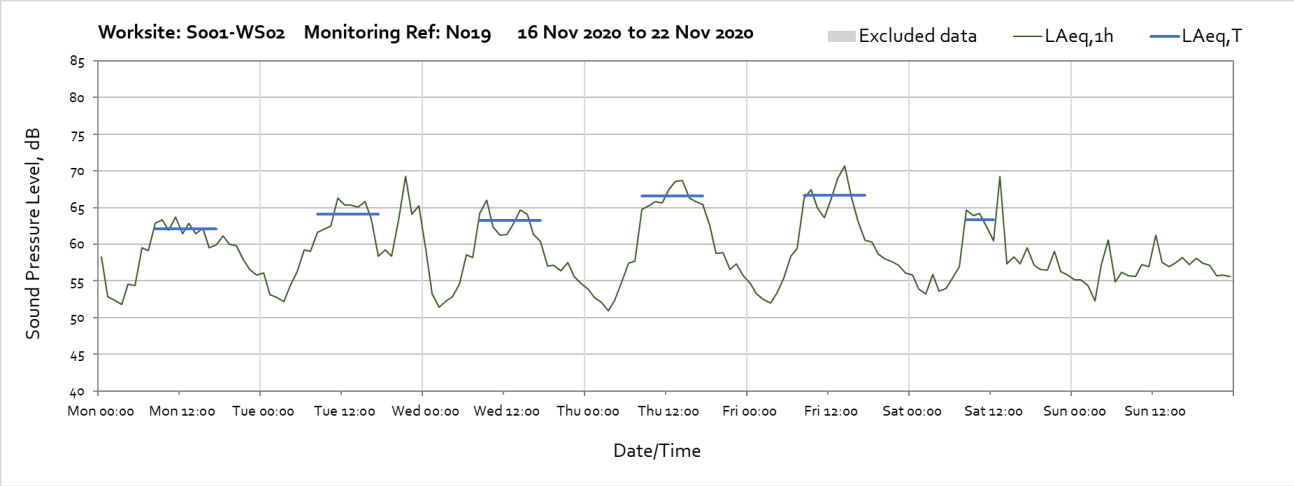




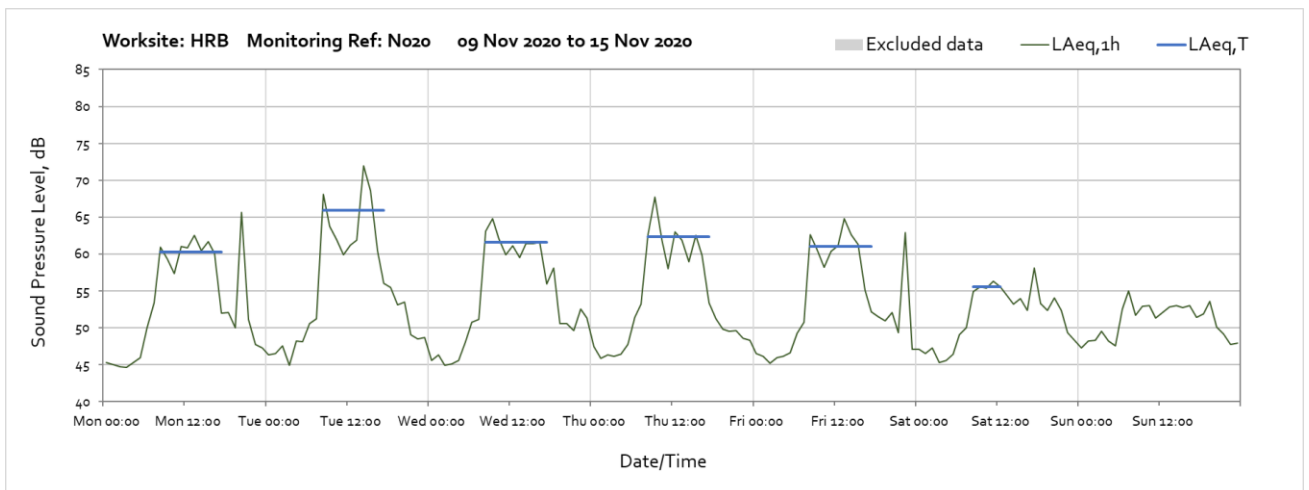
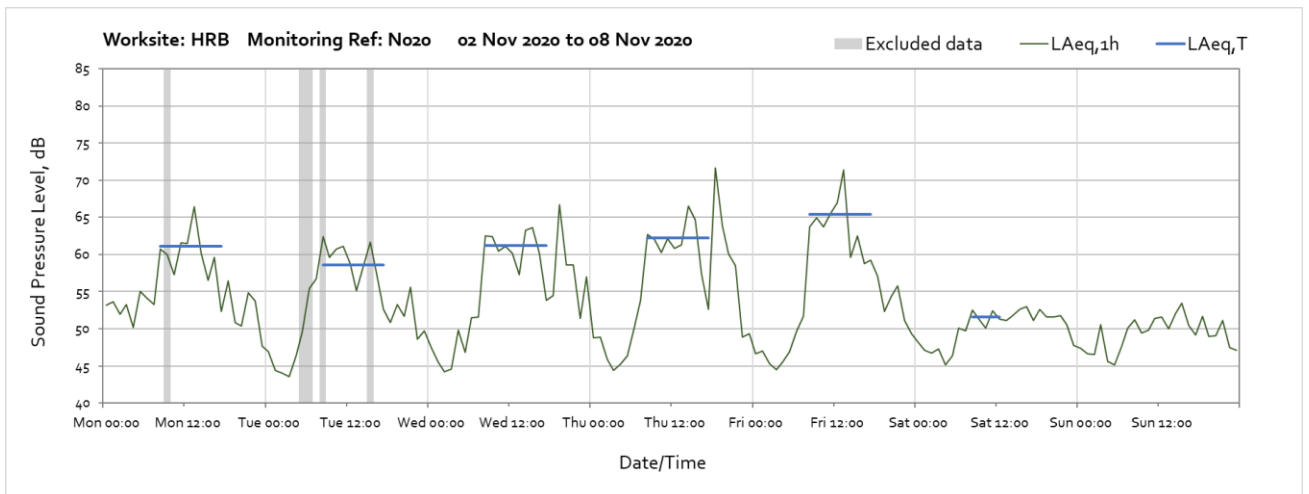
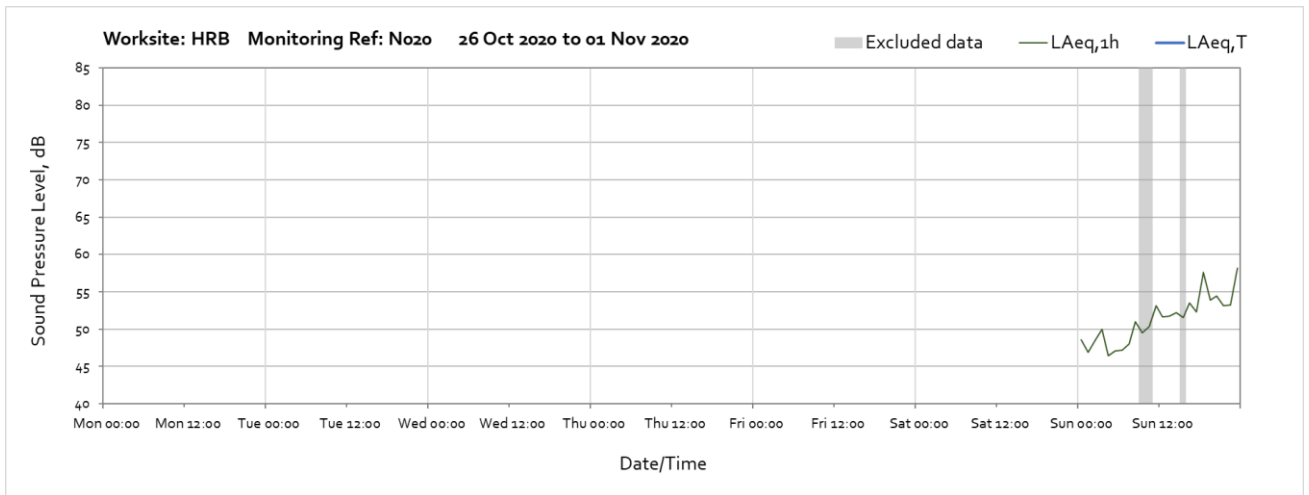
**Worksite: S001-WS02 – Monitoring Ref: N019**



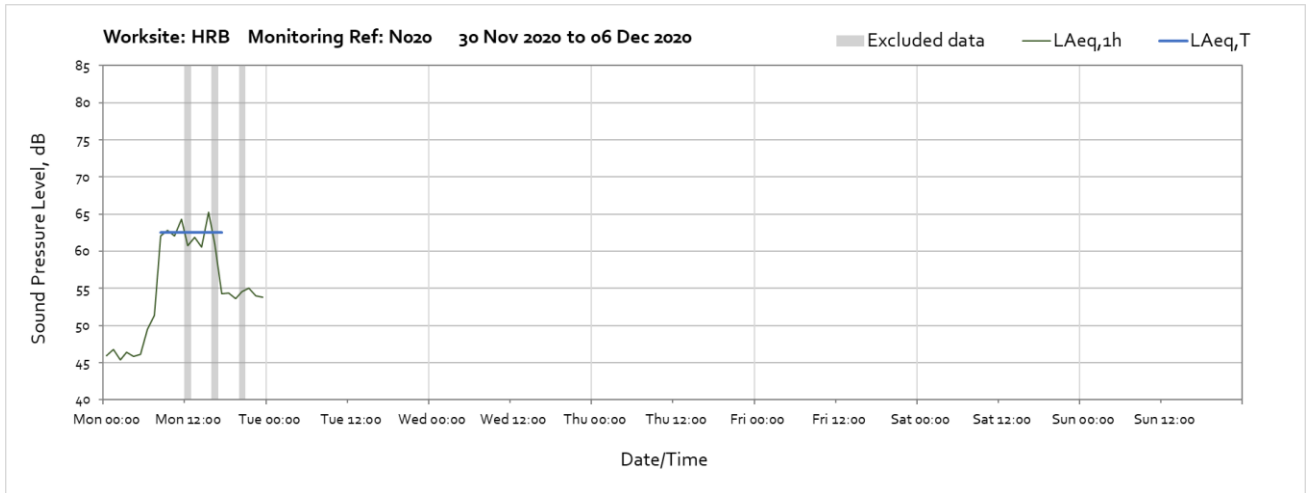
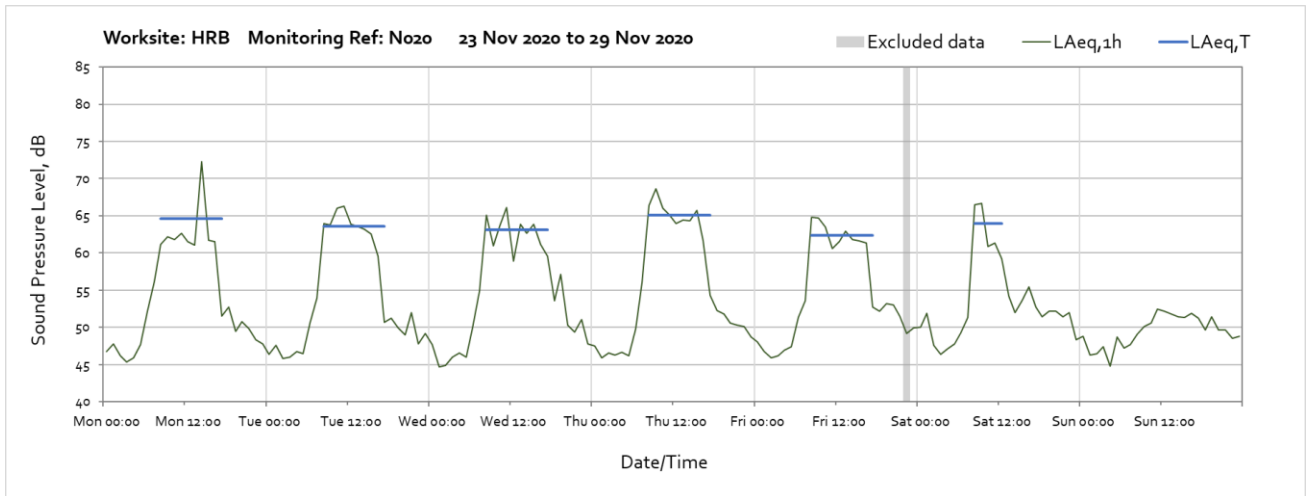
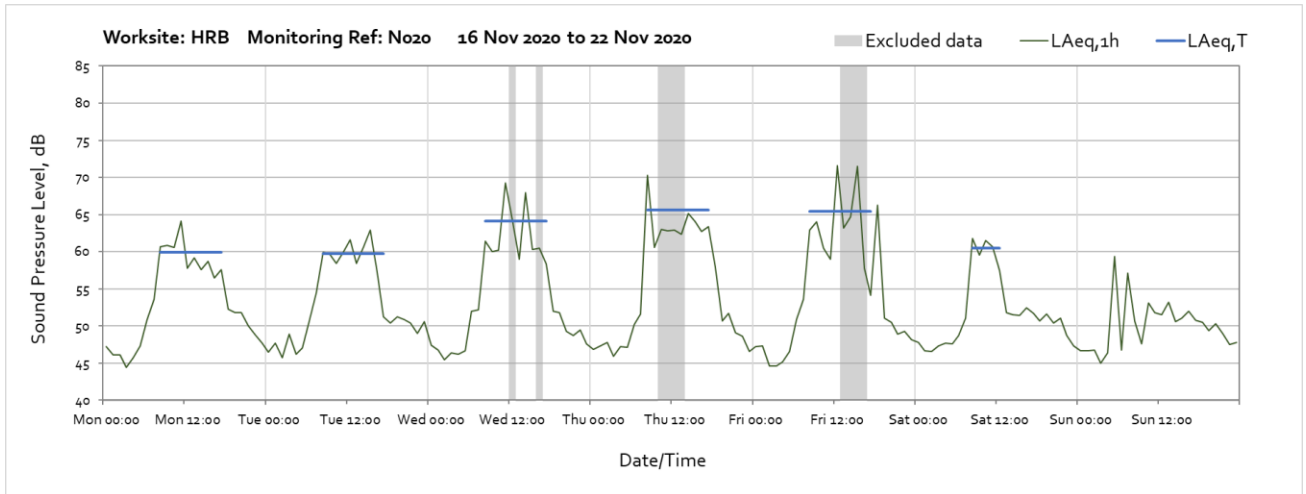
Note: Missing data from the start of the month until 08:00 on Tuesday 12<sup>th</sup> November was due to the handover of monitoring stations between contractors.



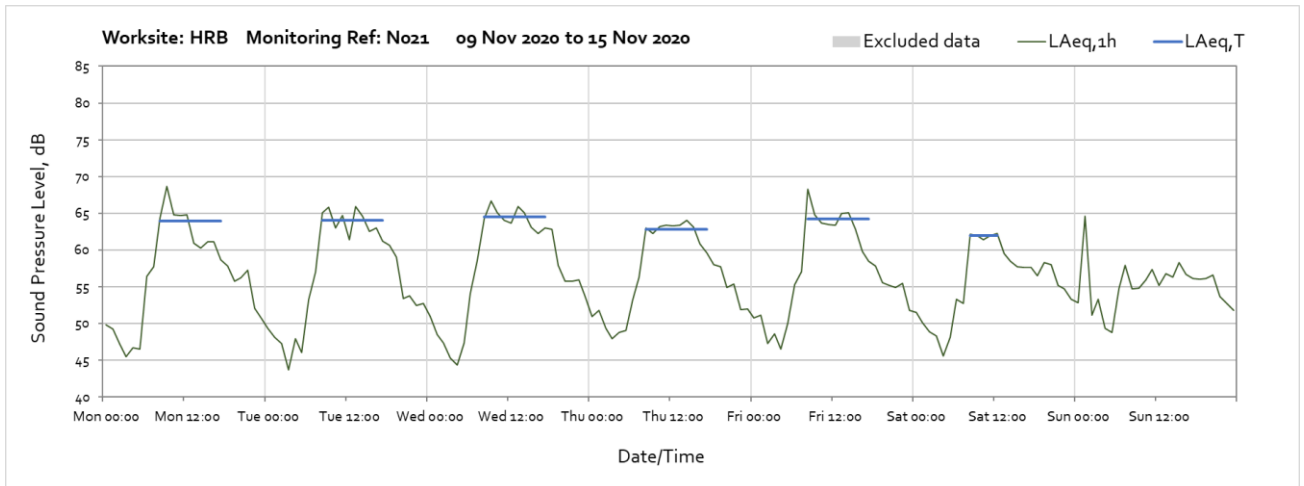
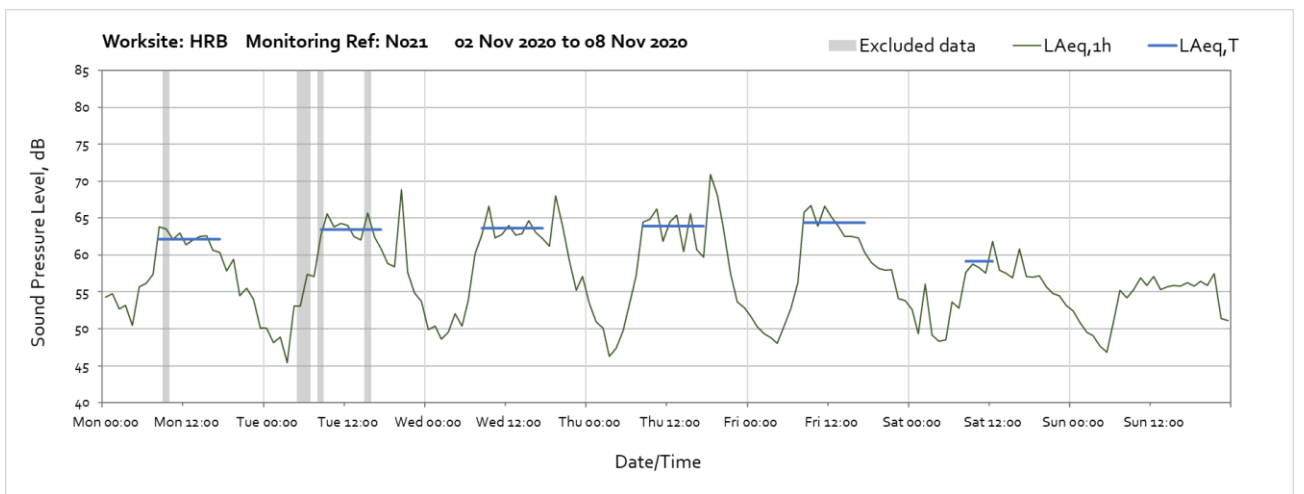
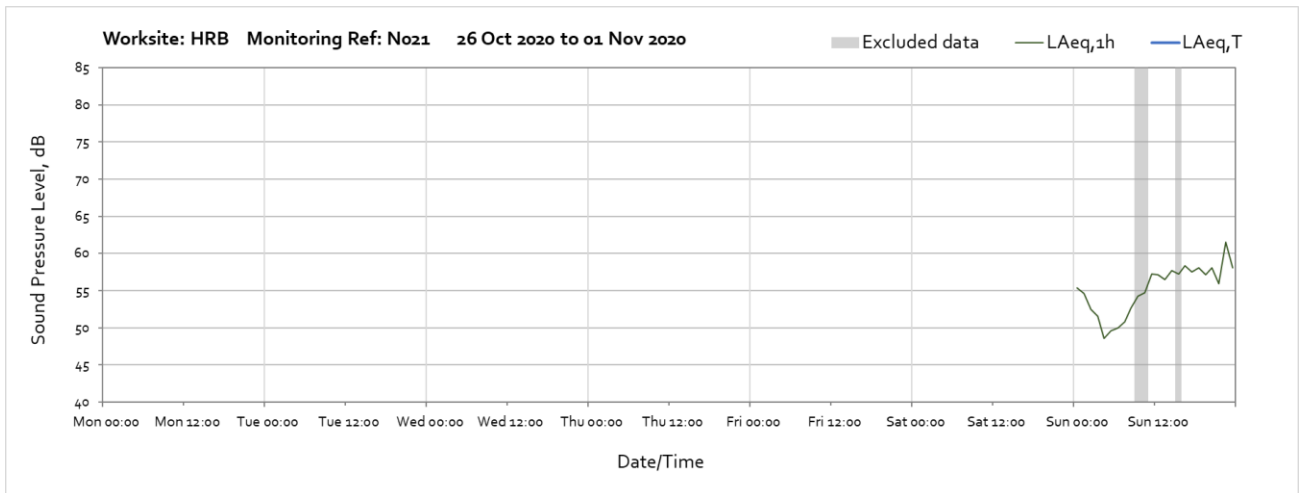
## Worksite: HRB – Monitoring Ref: N020

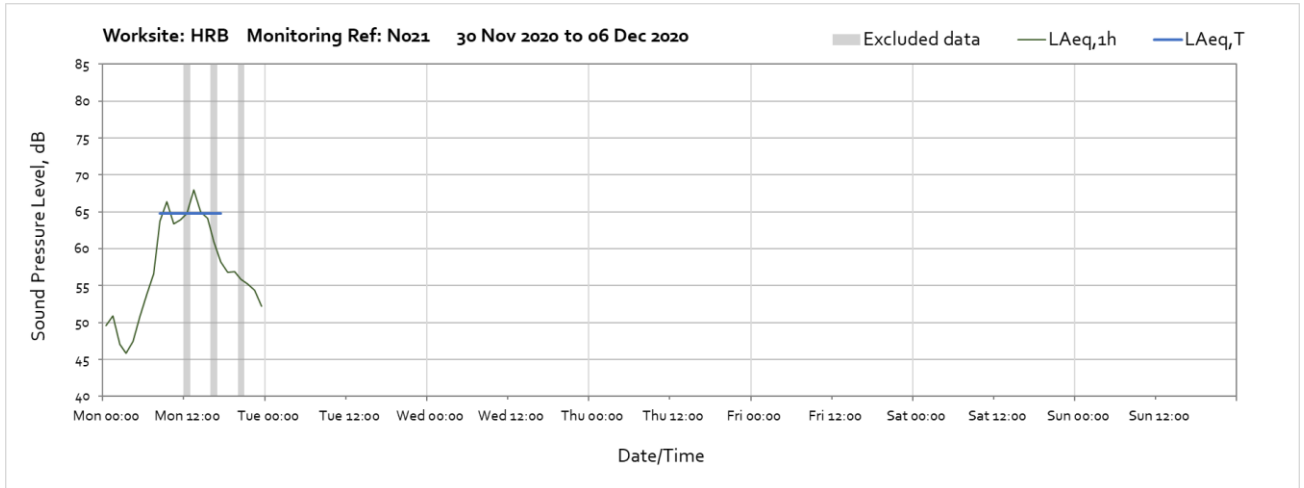
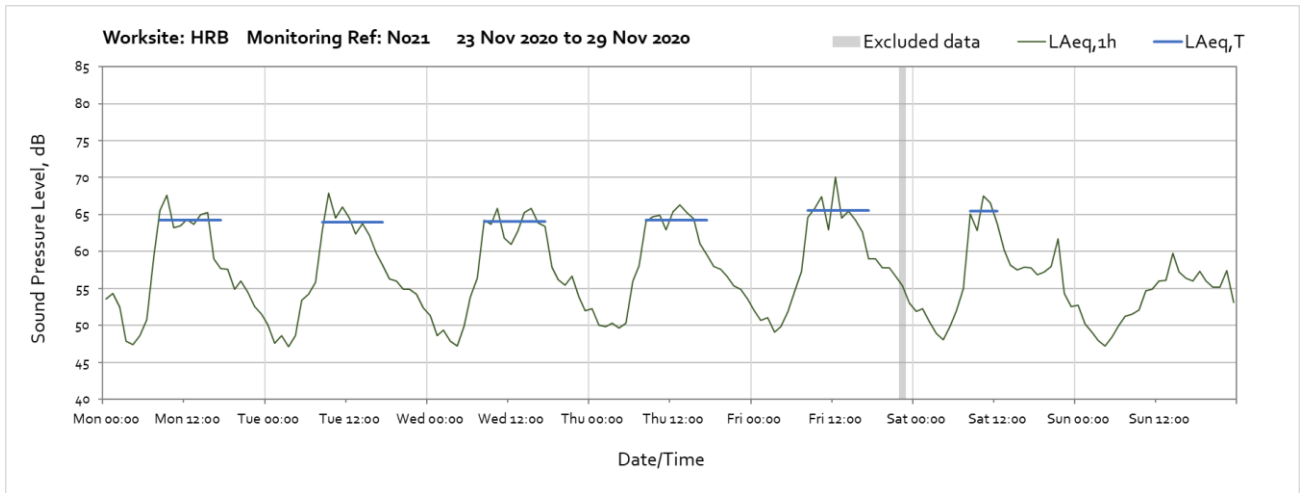
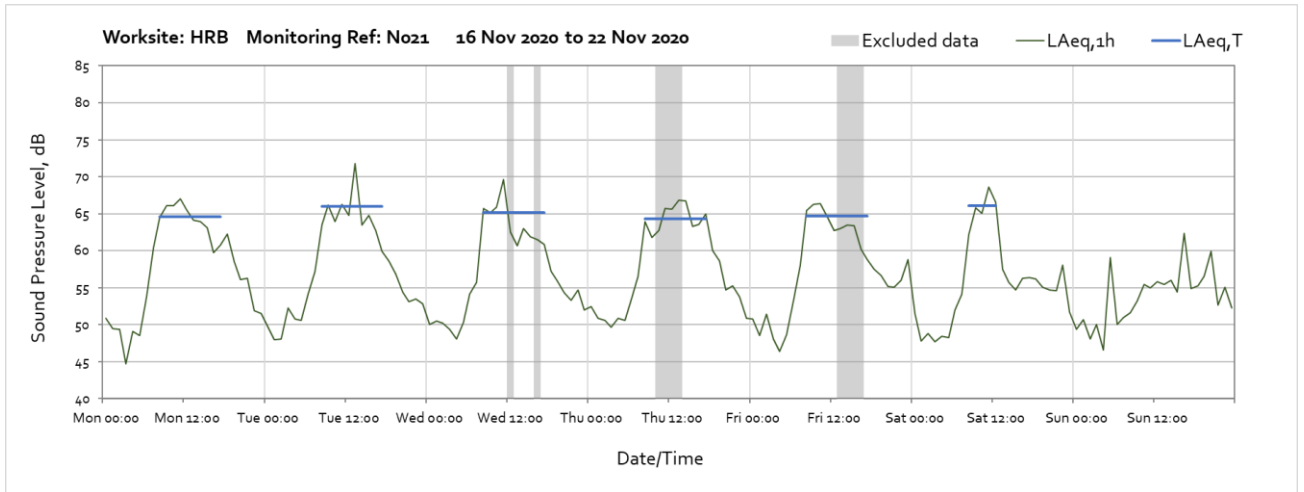




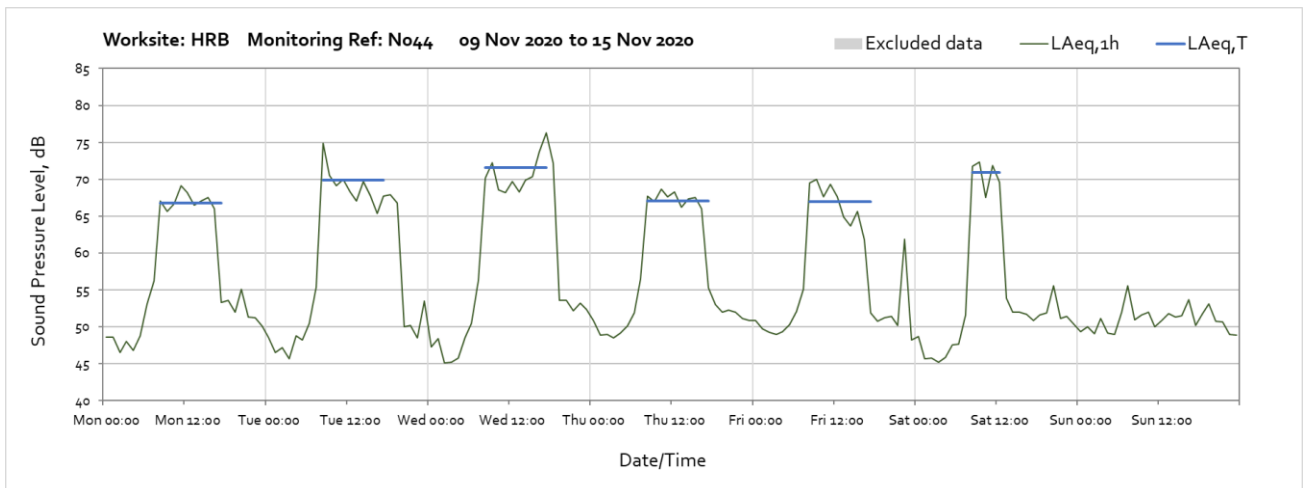
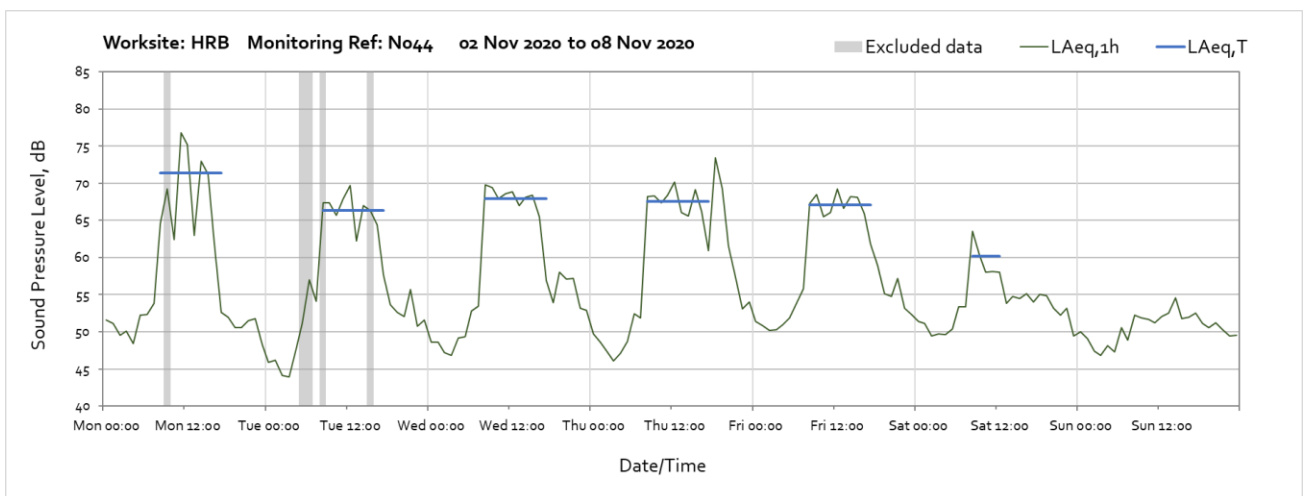
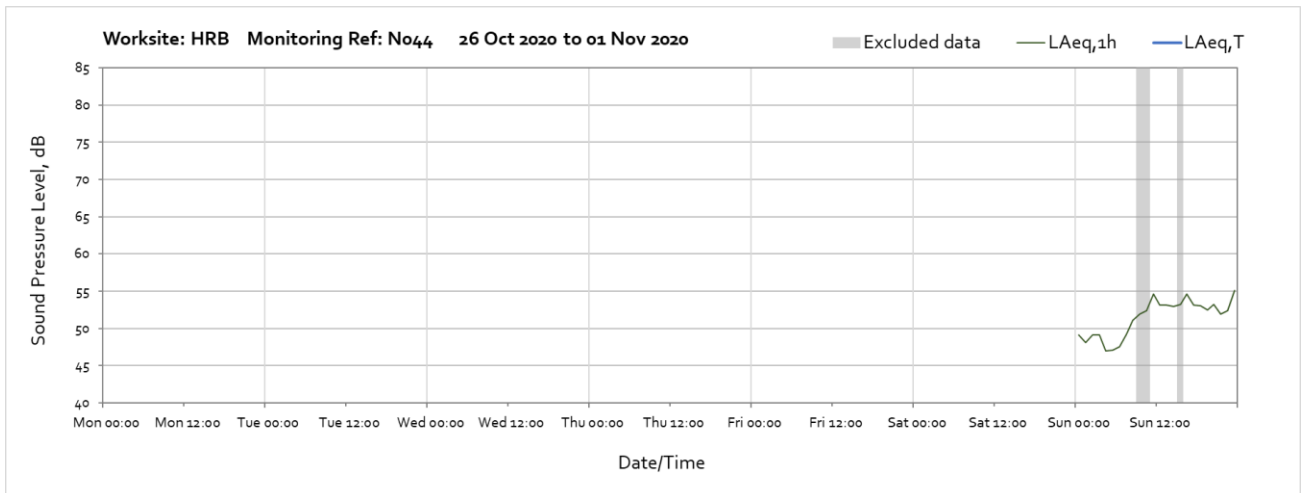


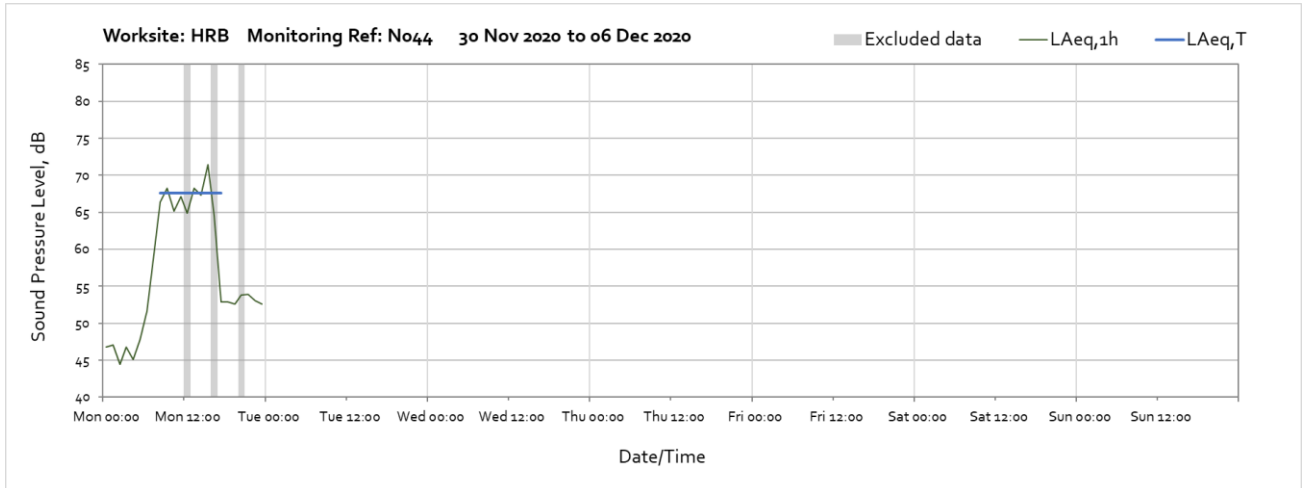
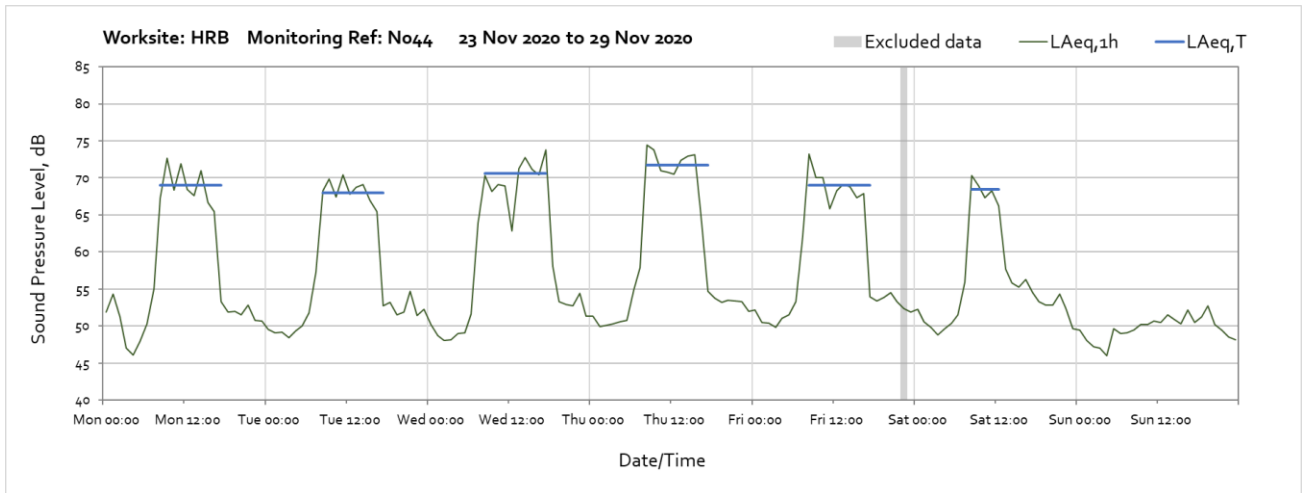
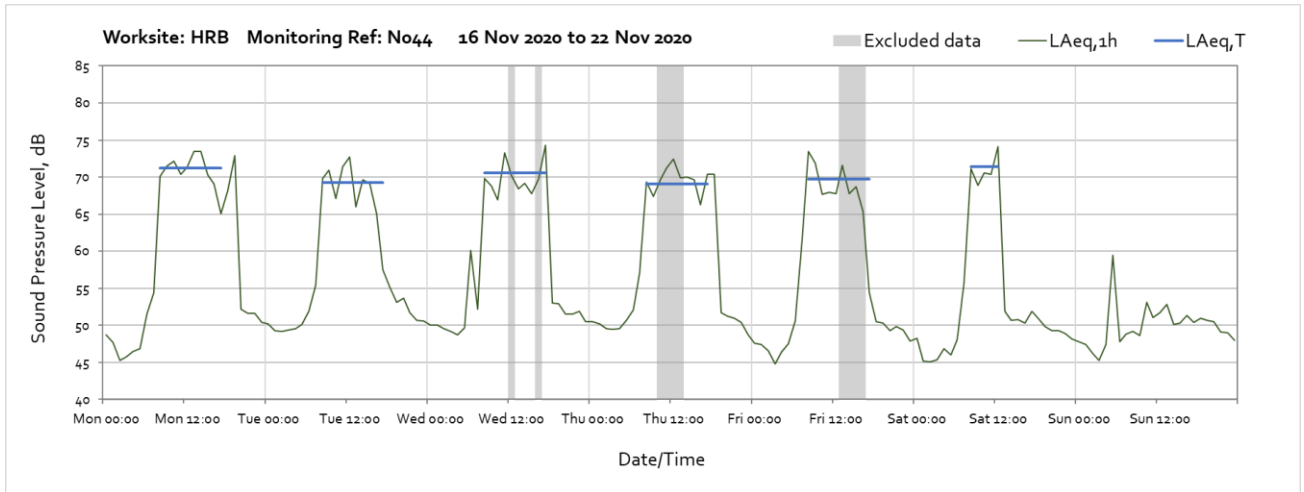
## Worksite: HRB – Monitoring Ref: N021



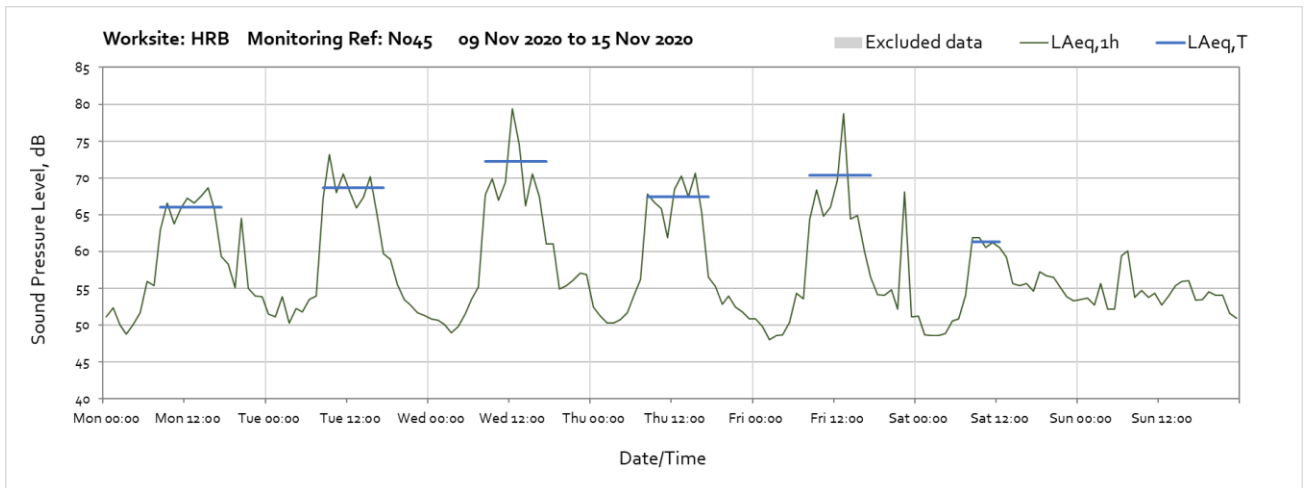
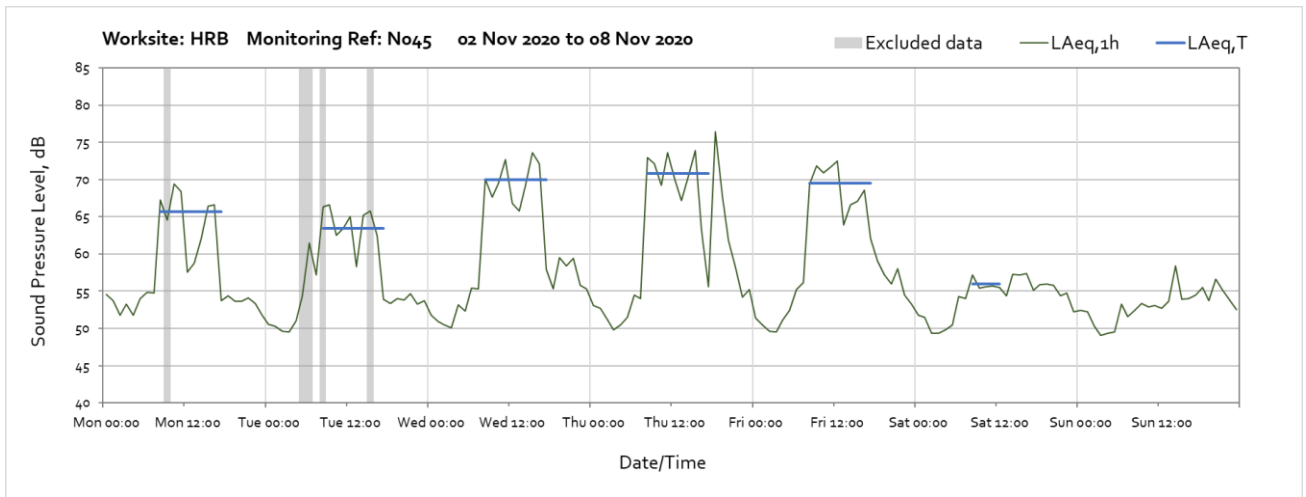
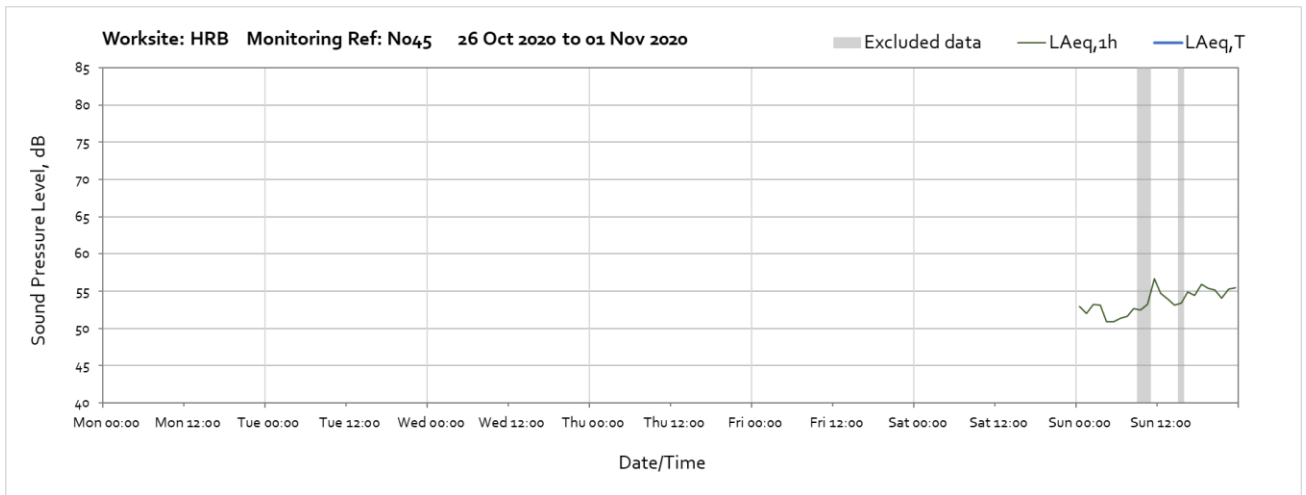


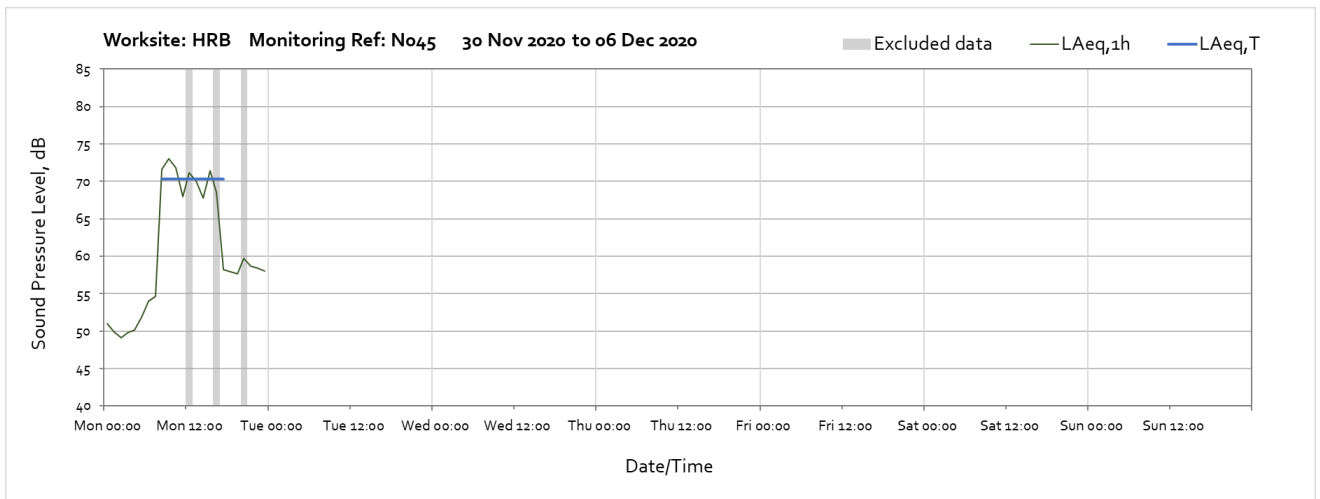
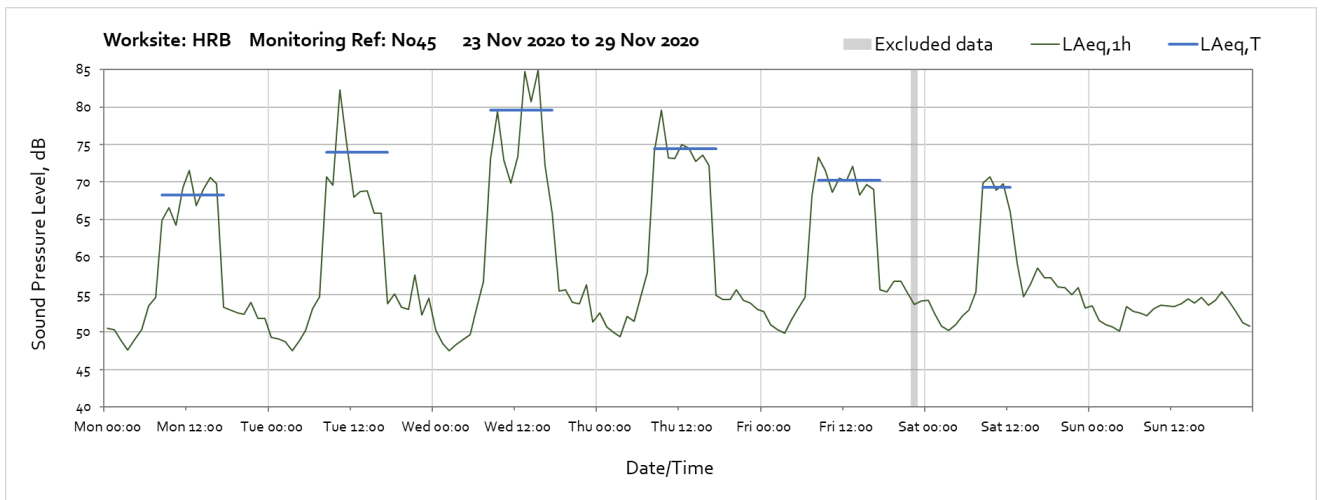
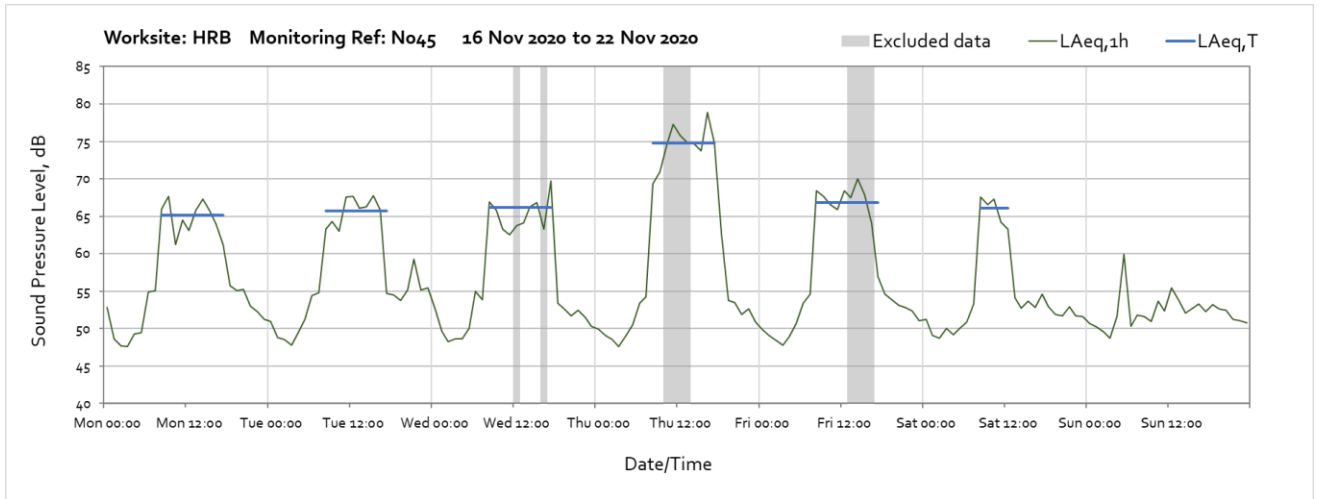
## Worksite: HRB – Monitoring Ref: N044



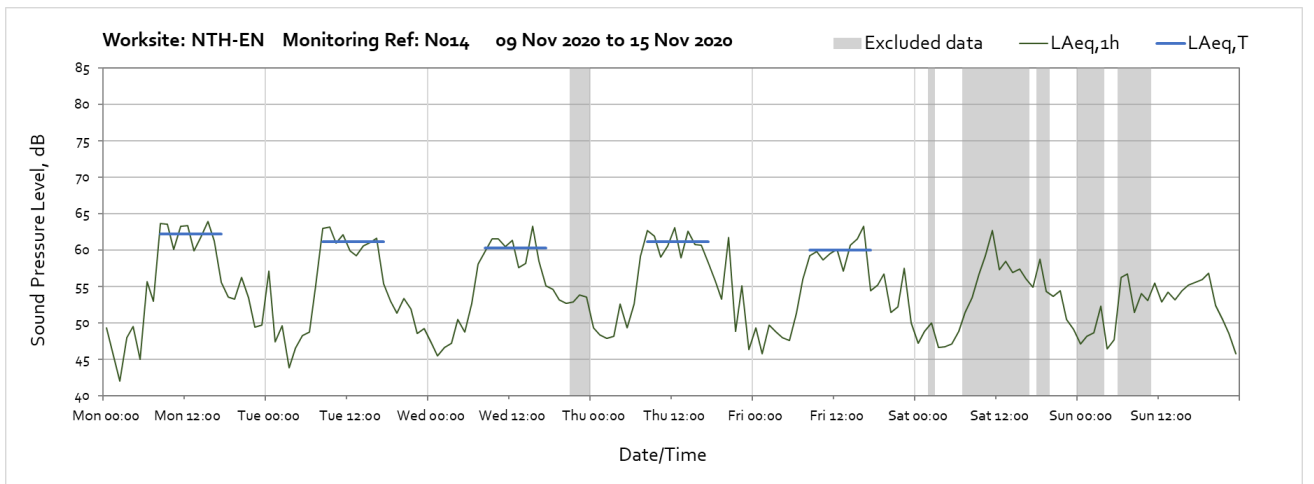
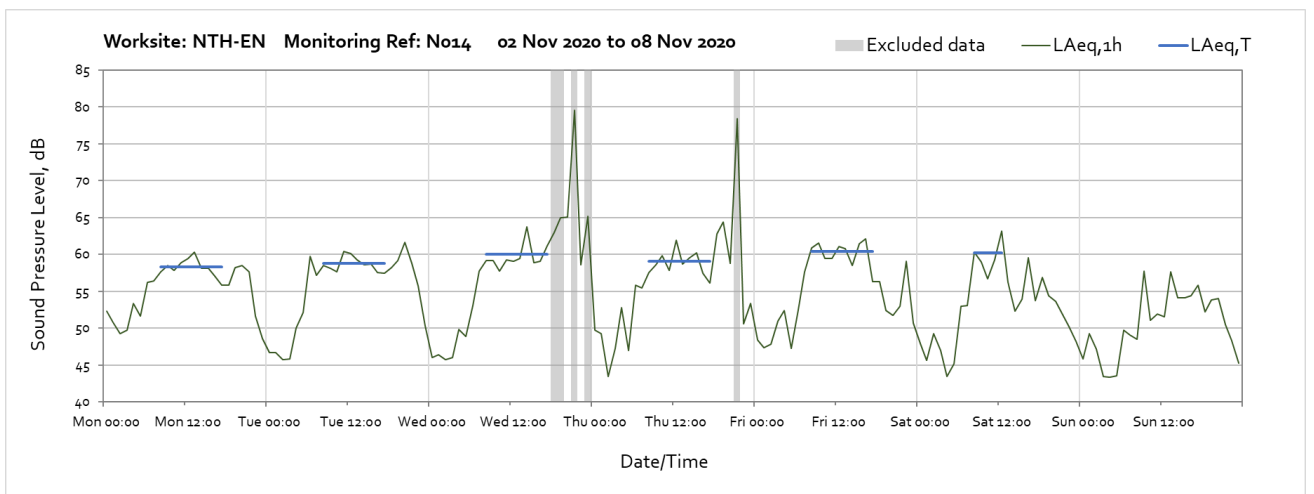
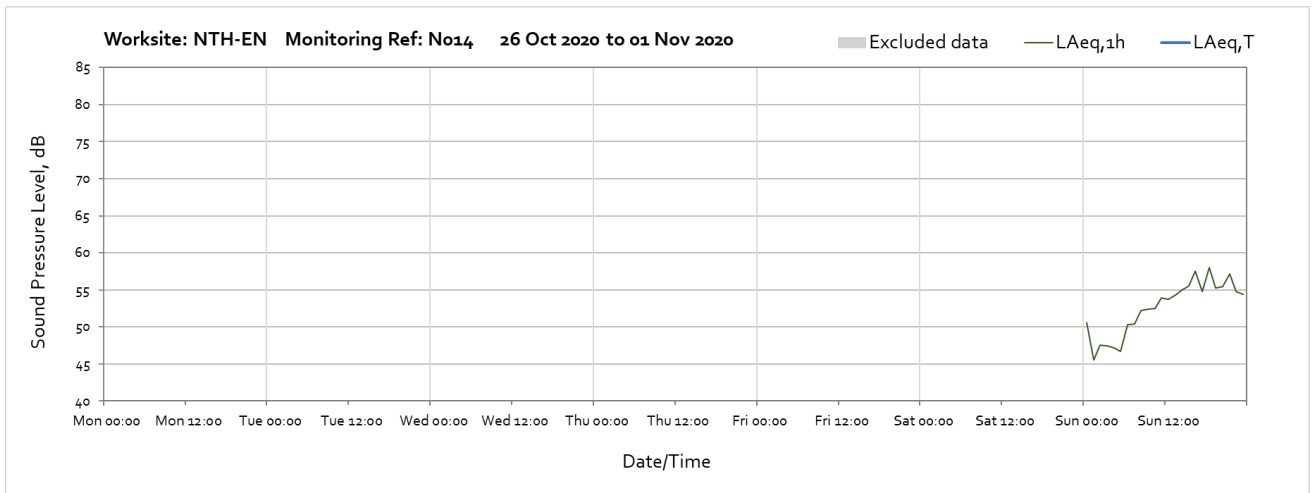


## Worksite: HRB – Monitoring Ref: N045

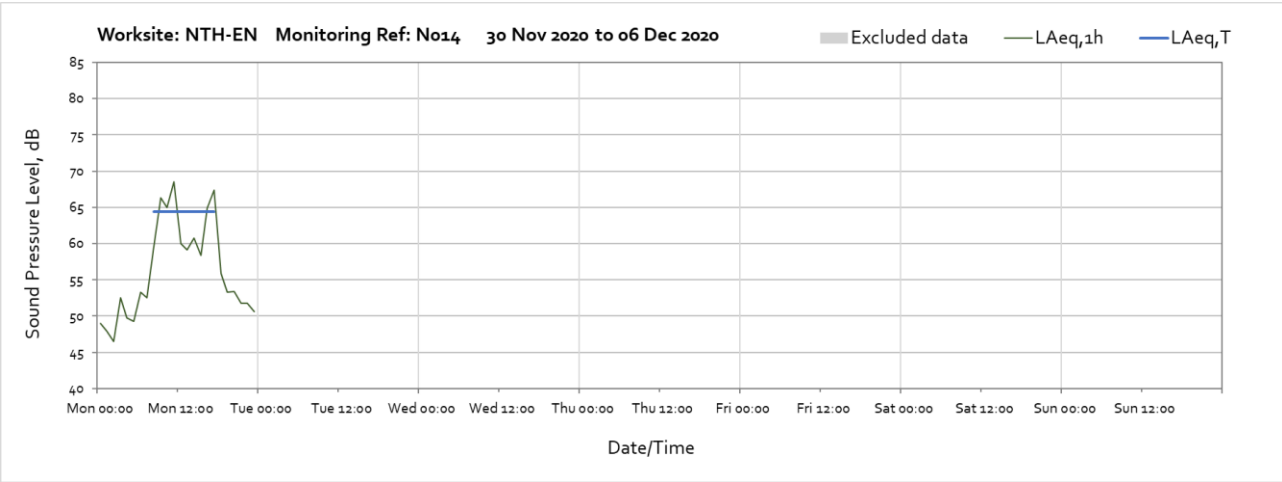
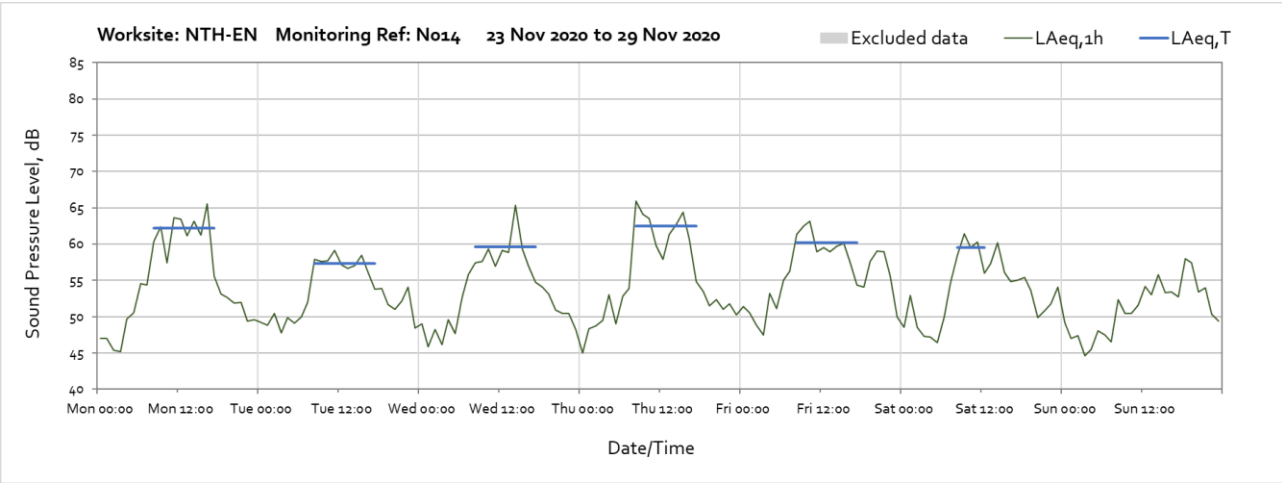




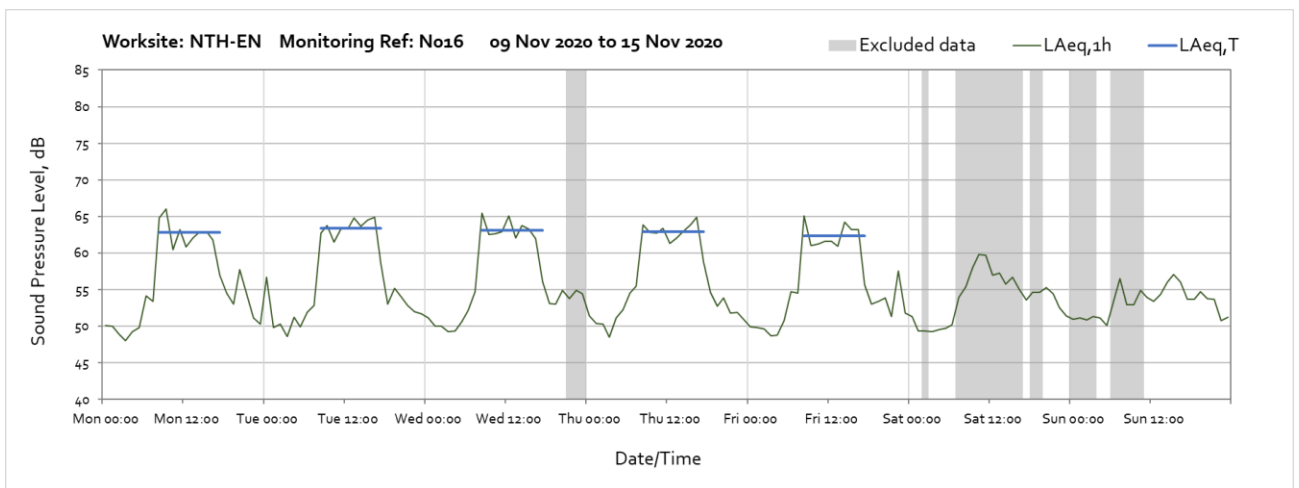
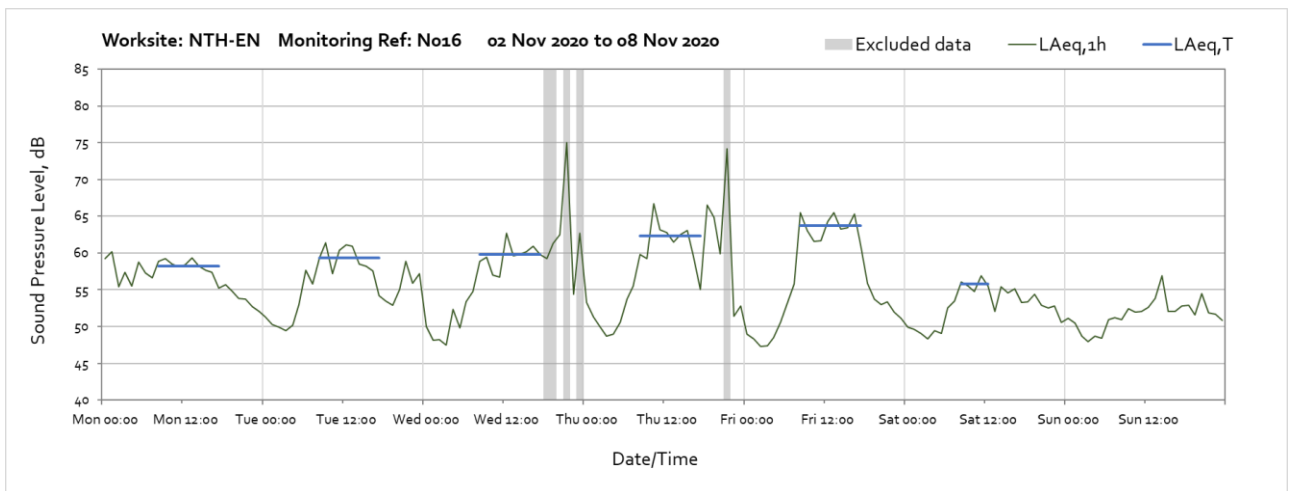
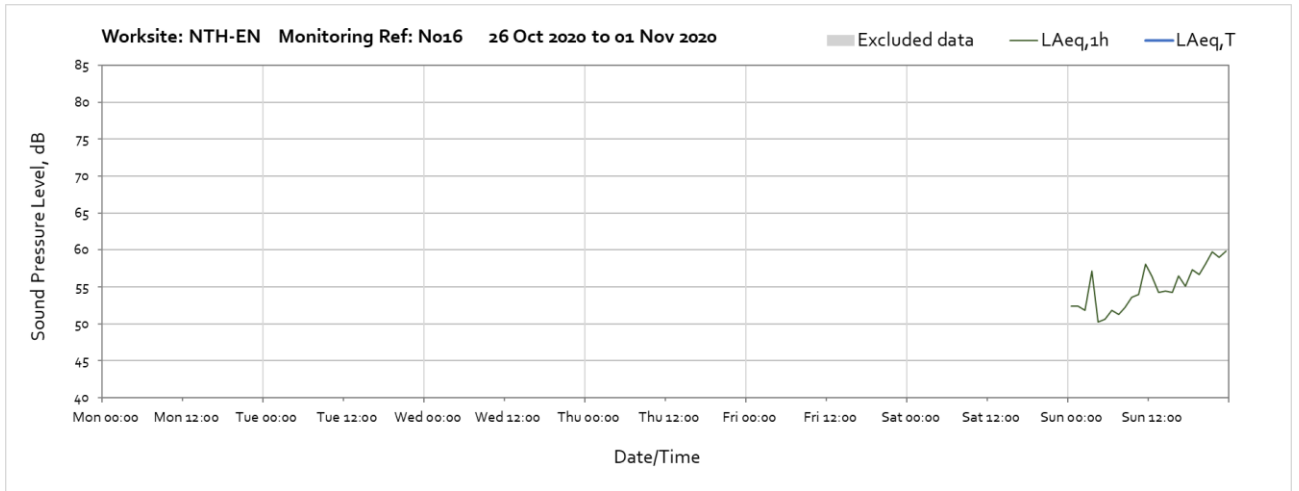
## Worksite: NTH-EN – Monitoring Ref: N014

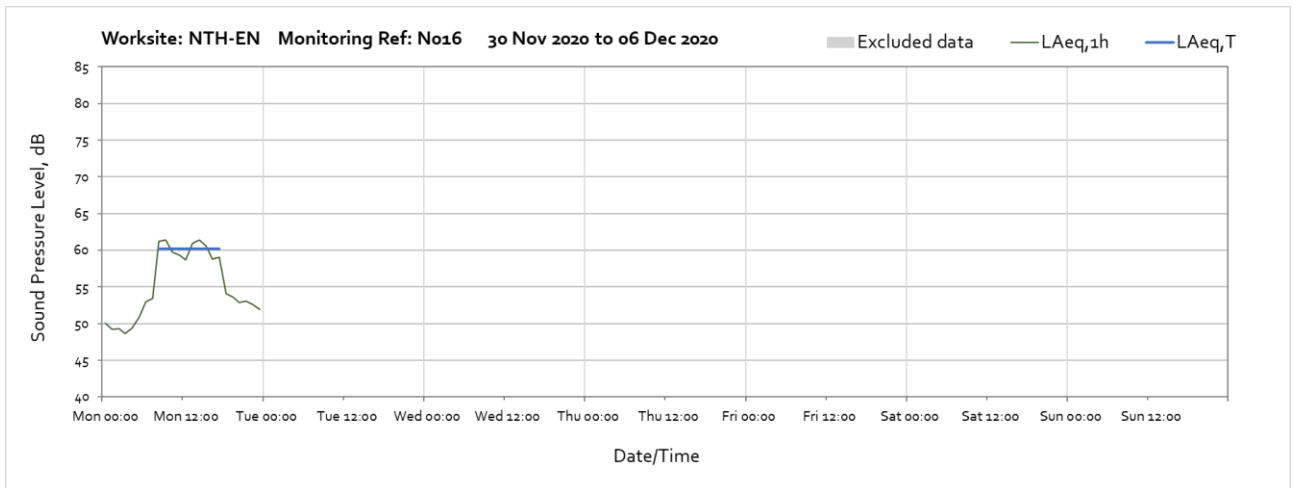
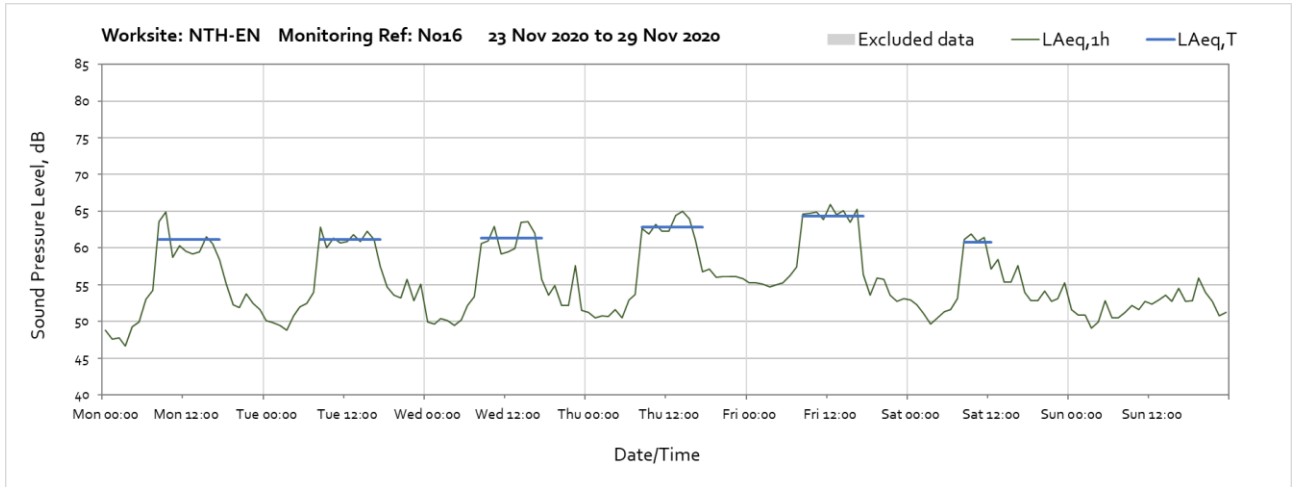
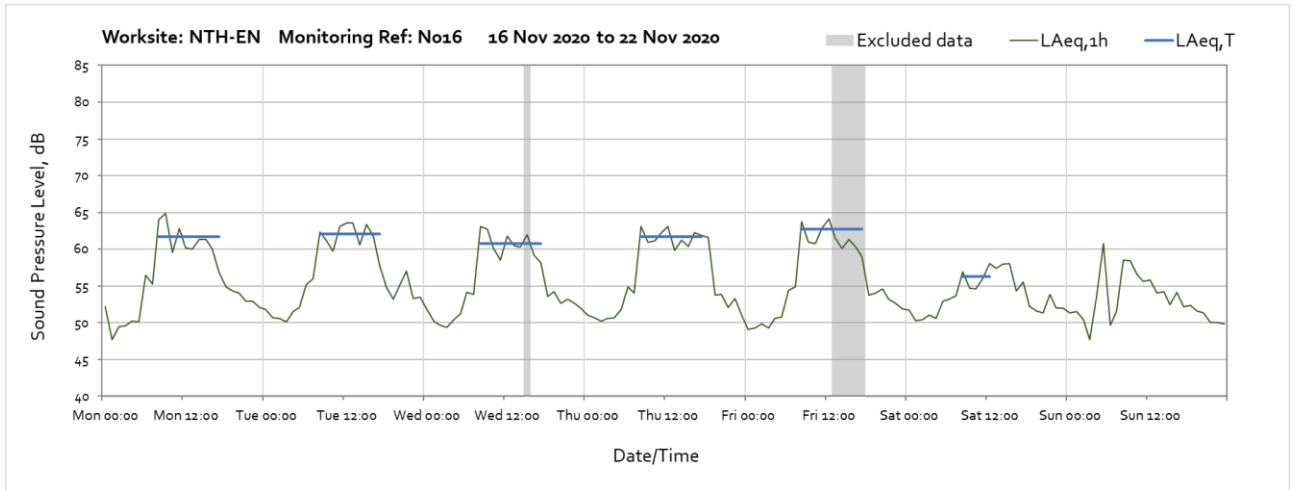




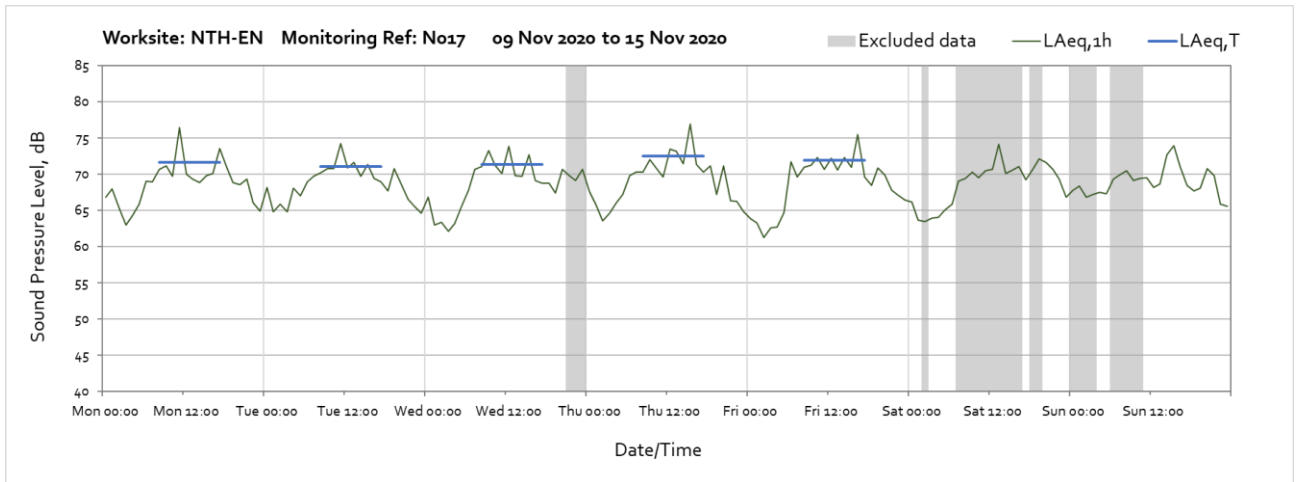
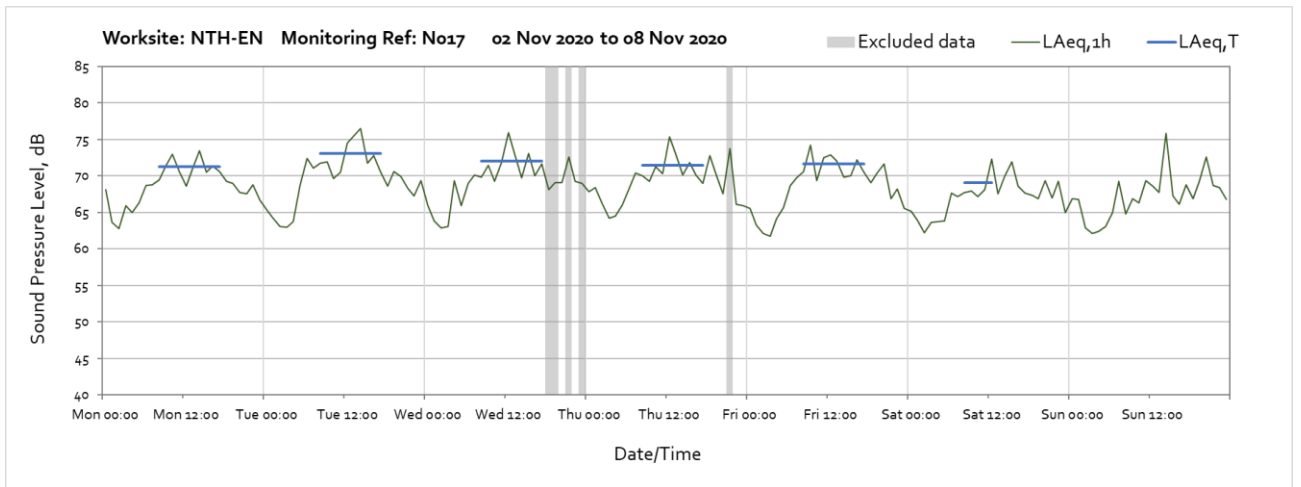
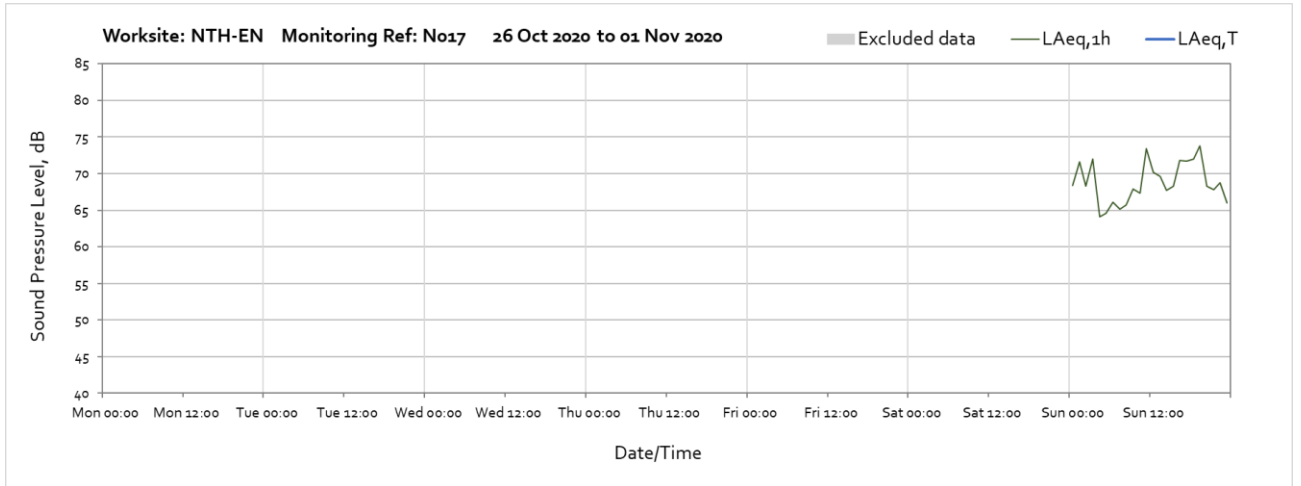


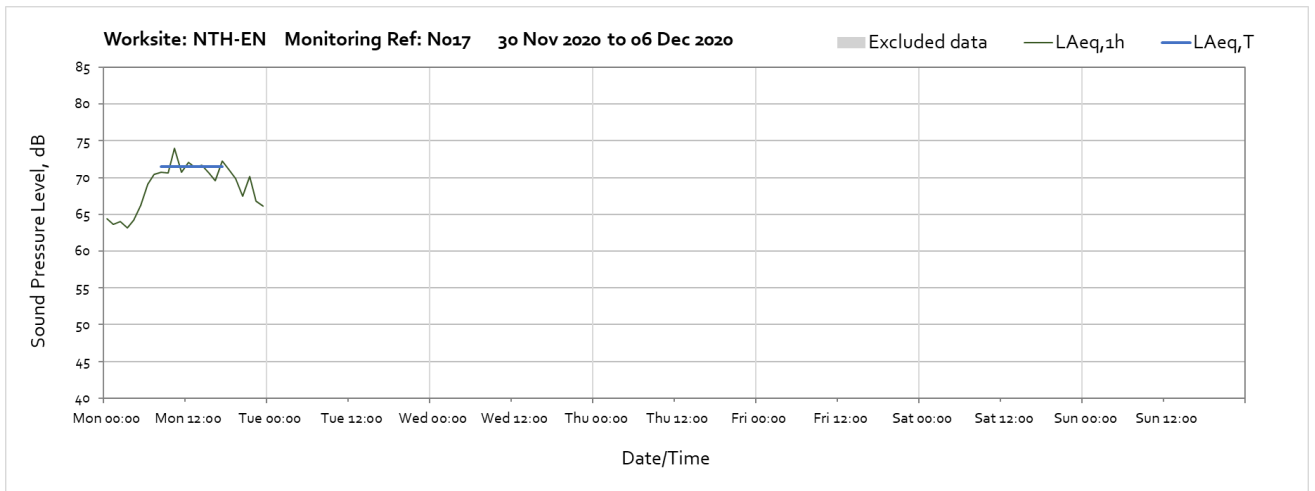
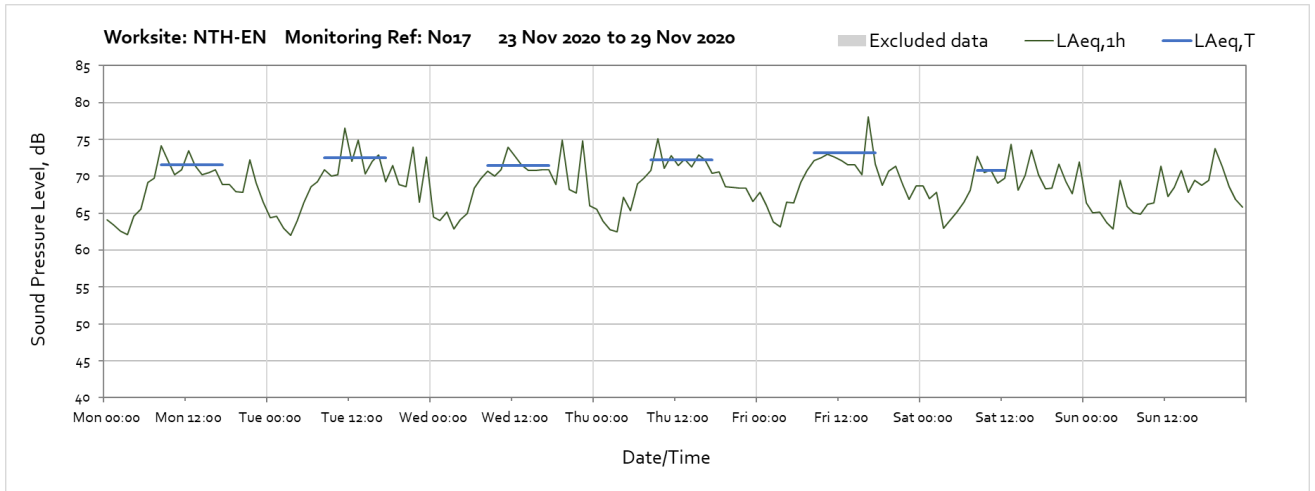
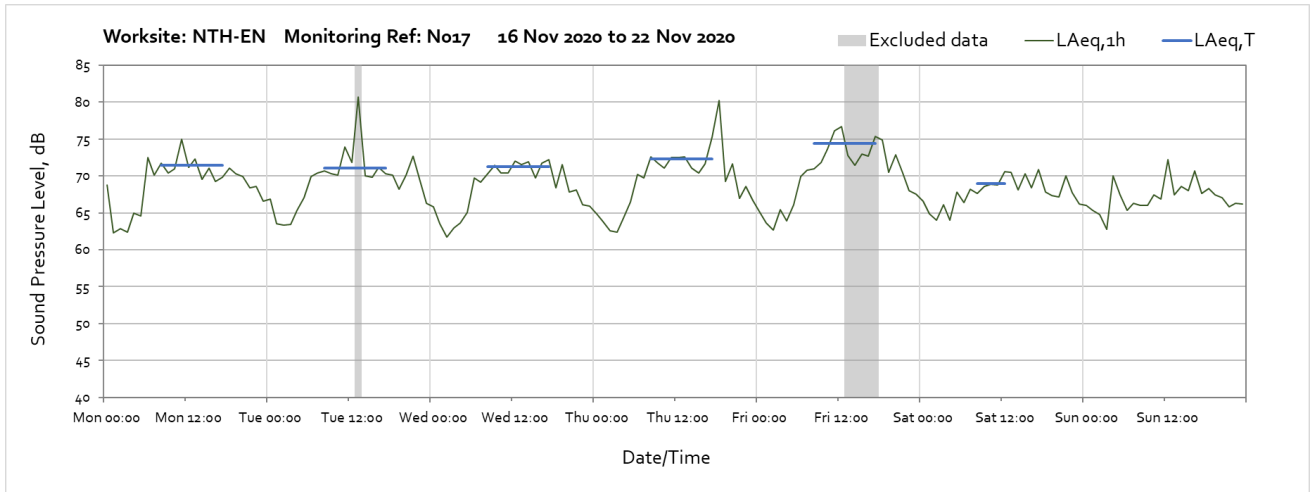
## Worksite: NTH-EN – Monitoring Ref: N016



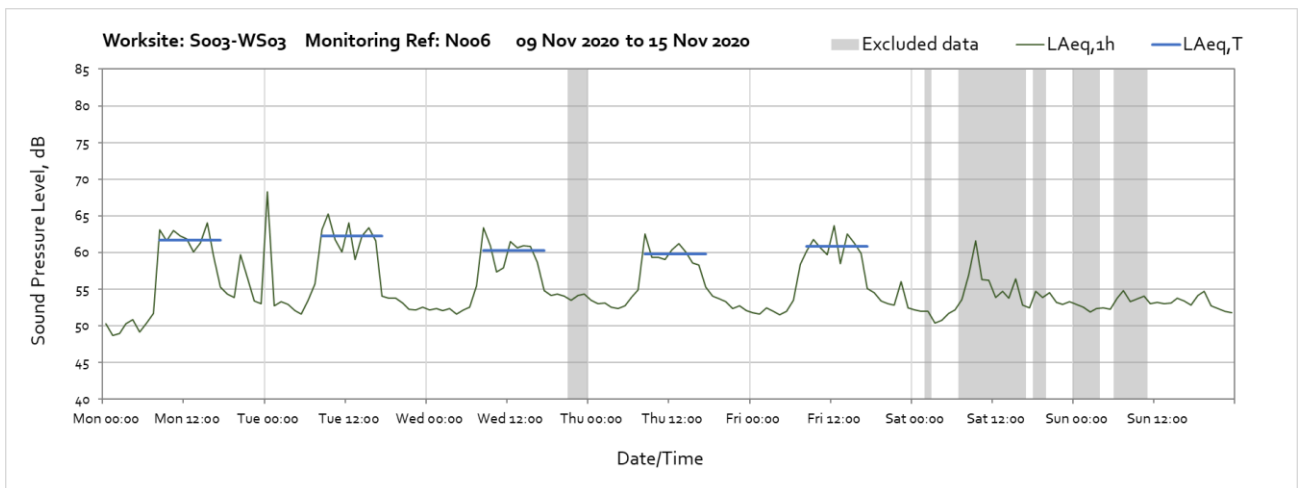
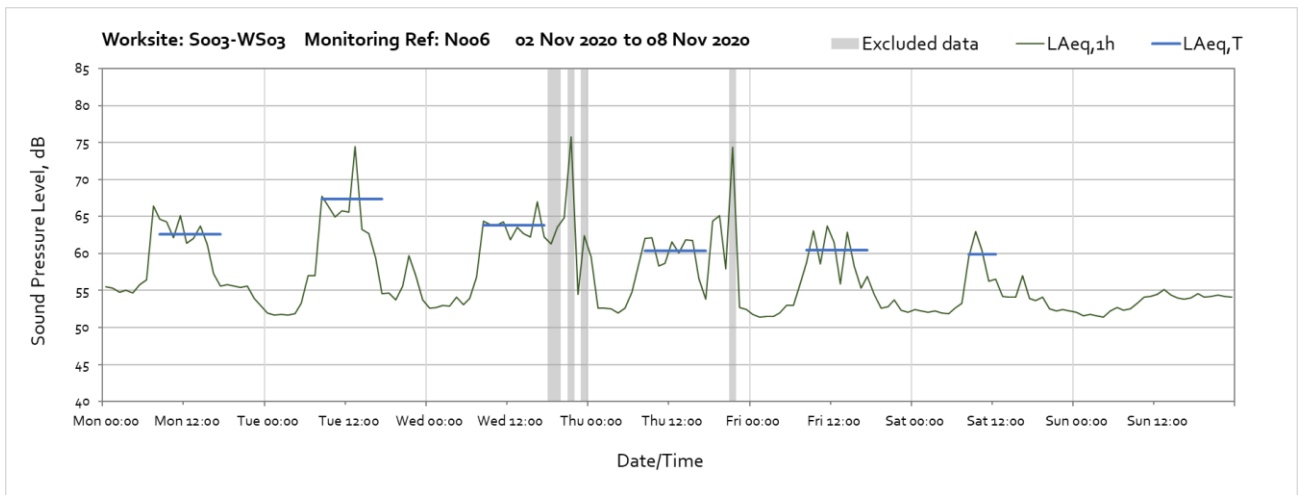
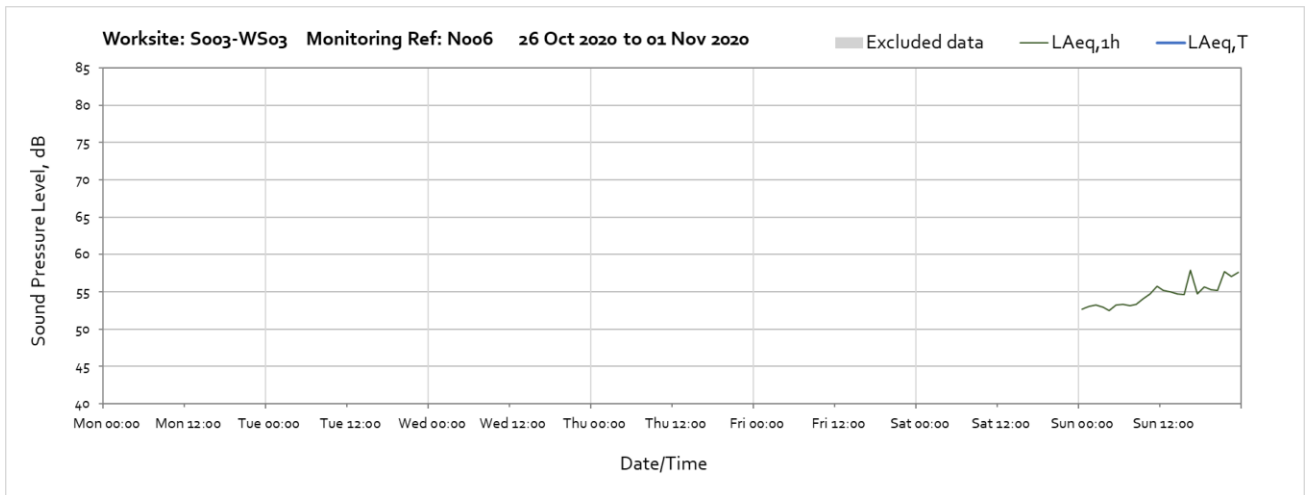


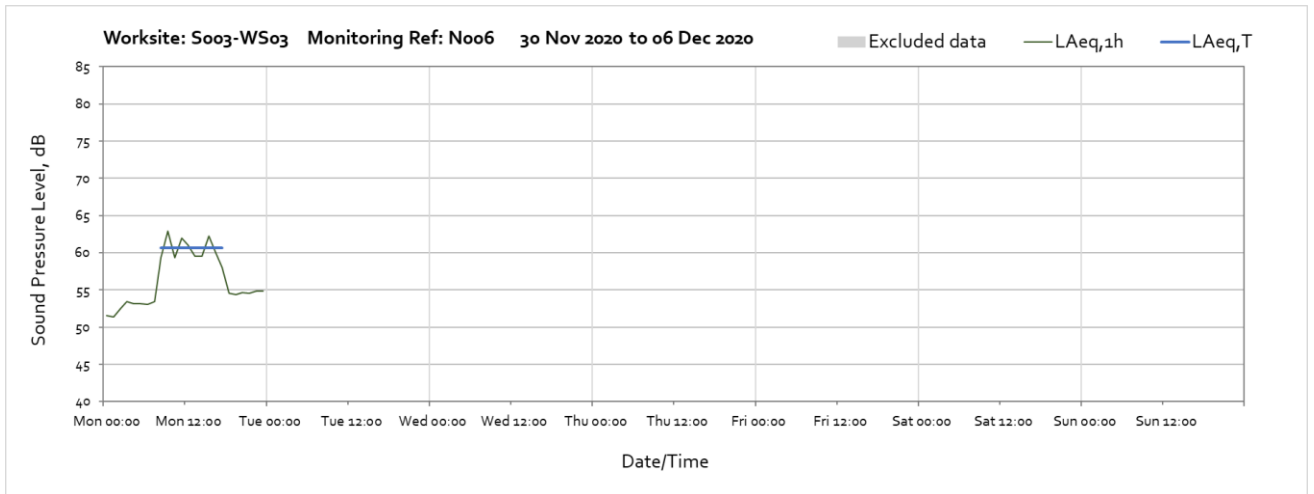
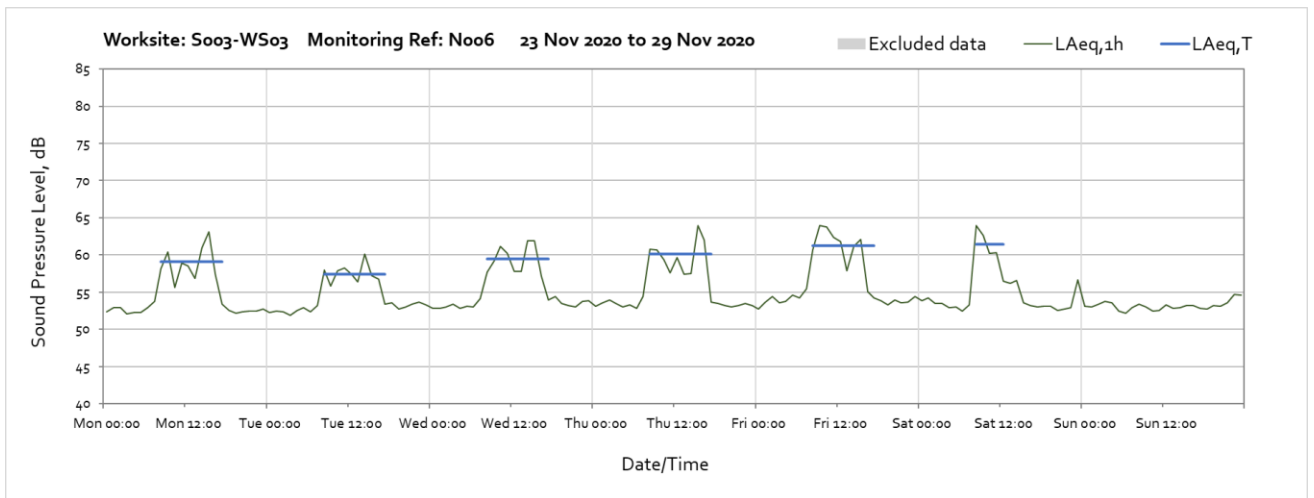
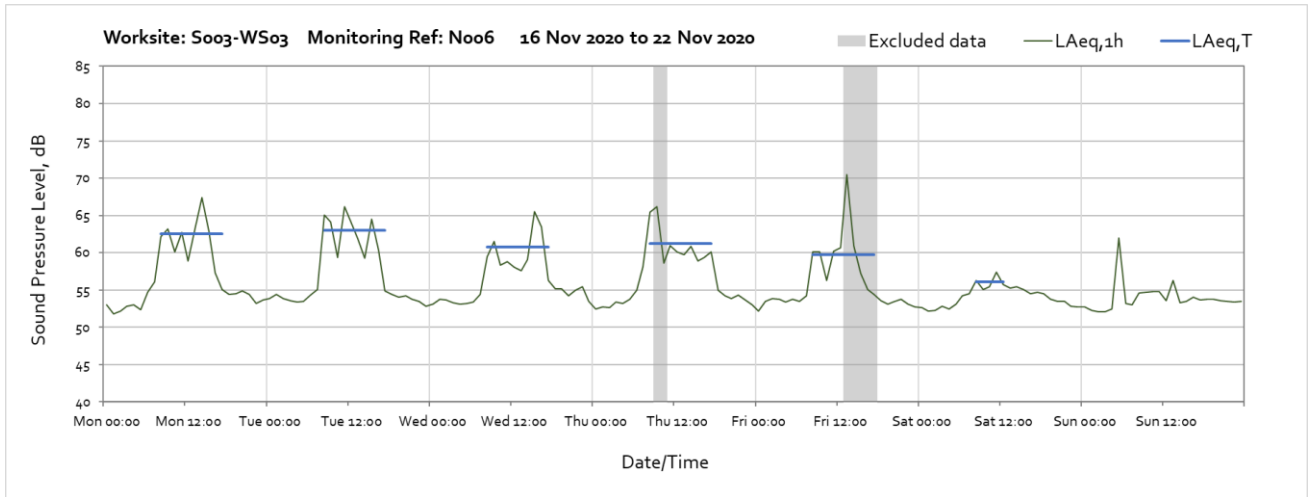
# Worksite: S003-WS06 – Monitoring Ref: N017



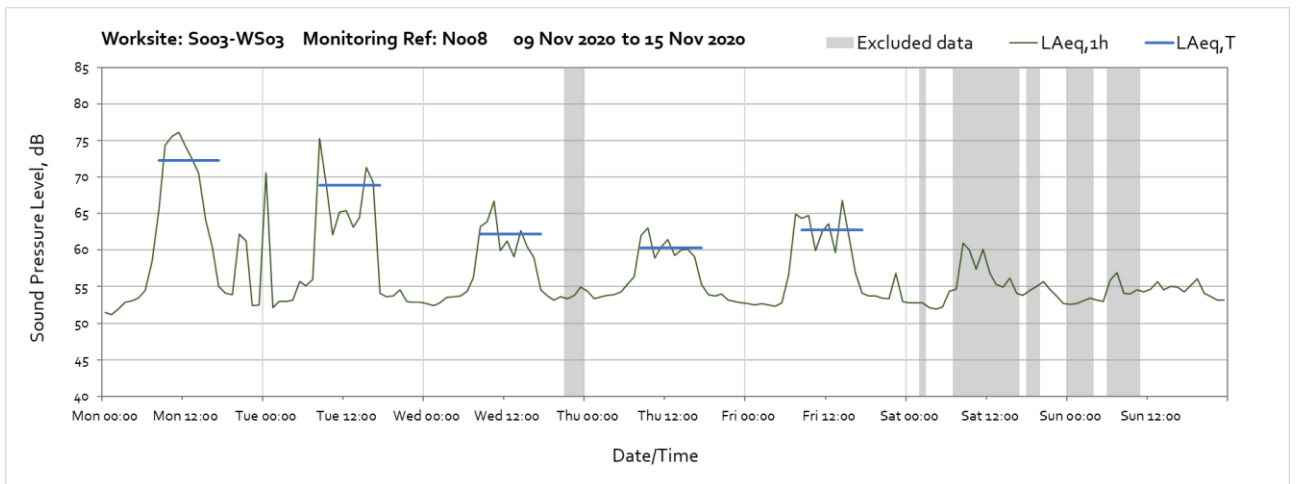
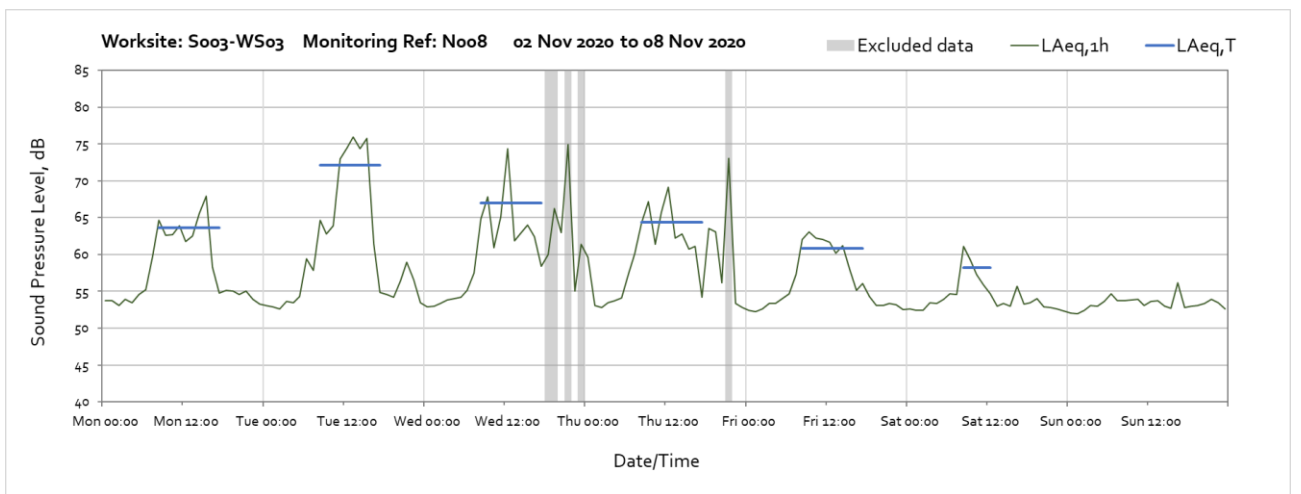
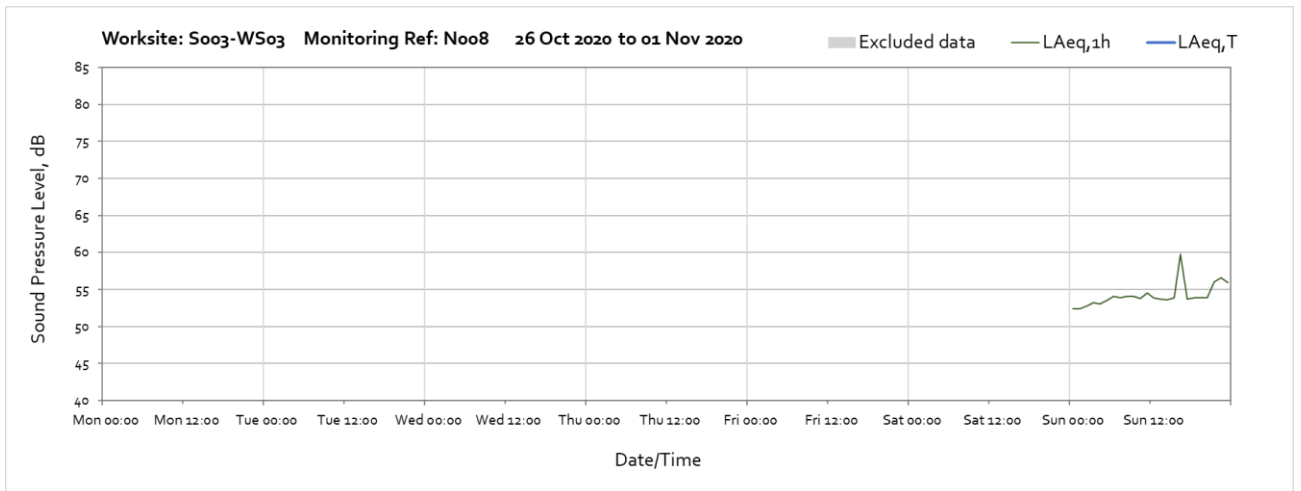


## Worksite: S003-WS03 – Monitoring Ref: N006



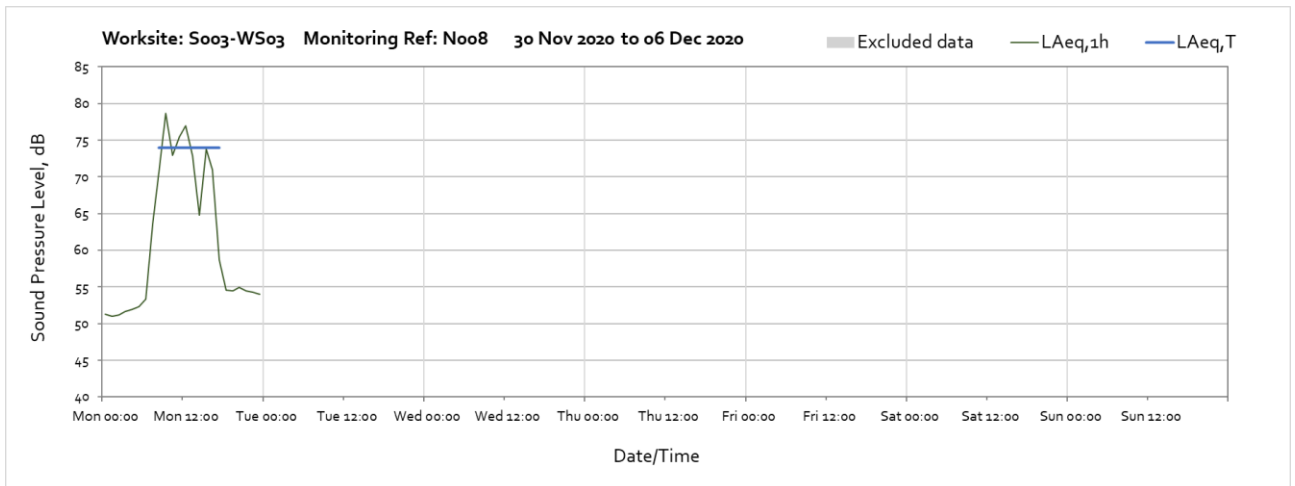
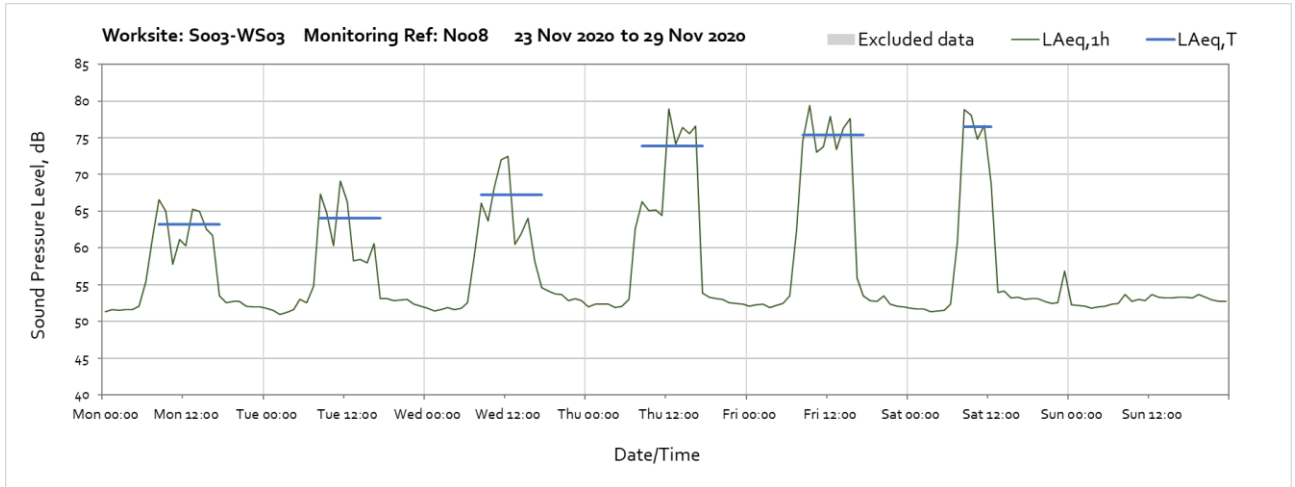
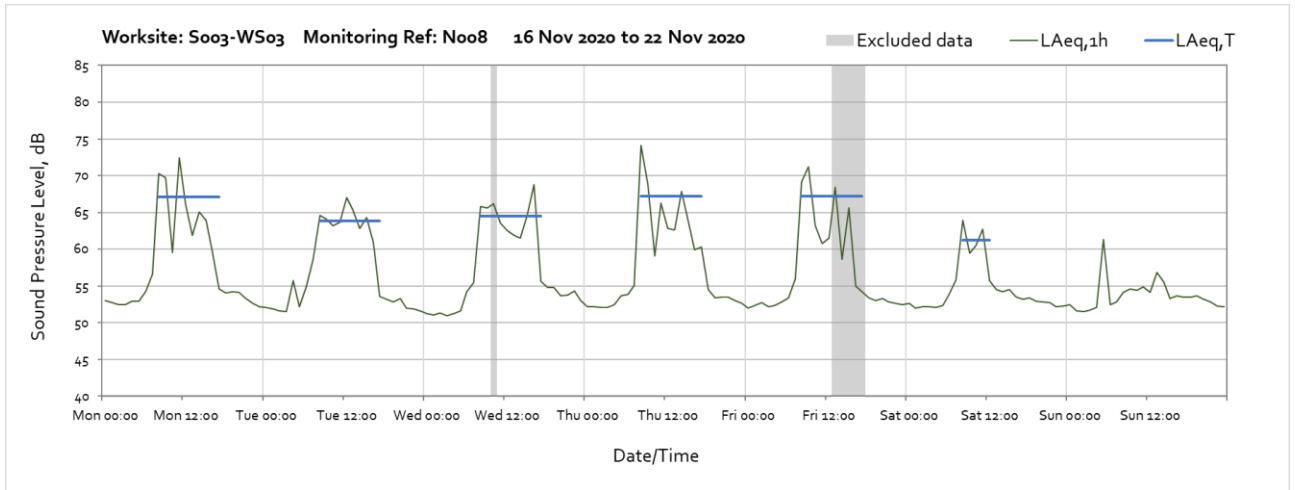


## Worksite: S003-WS03 – Monitoring Ref: N008

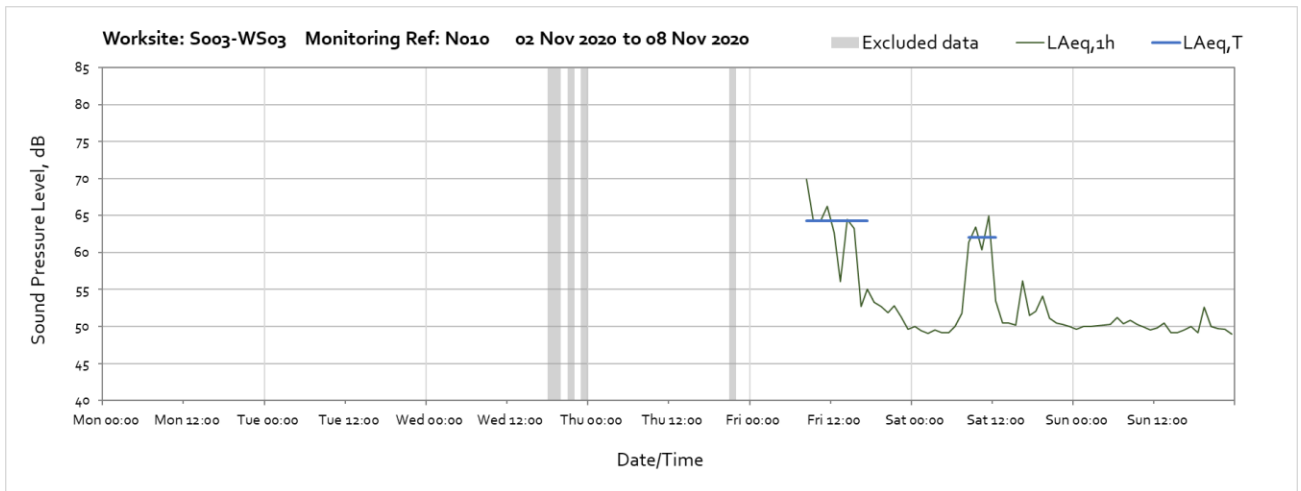


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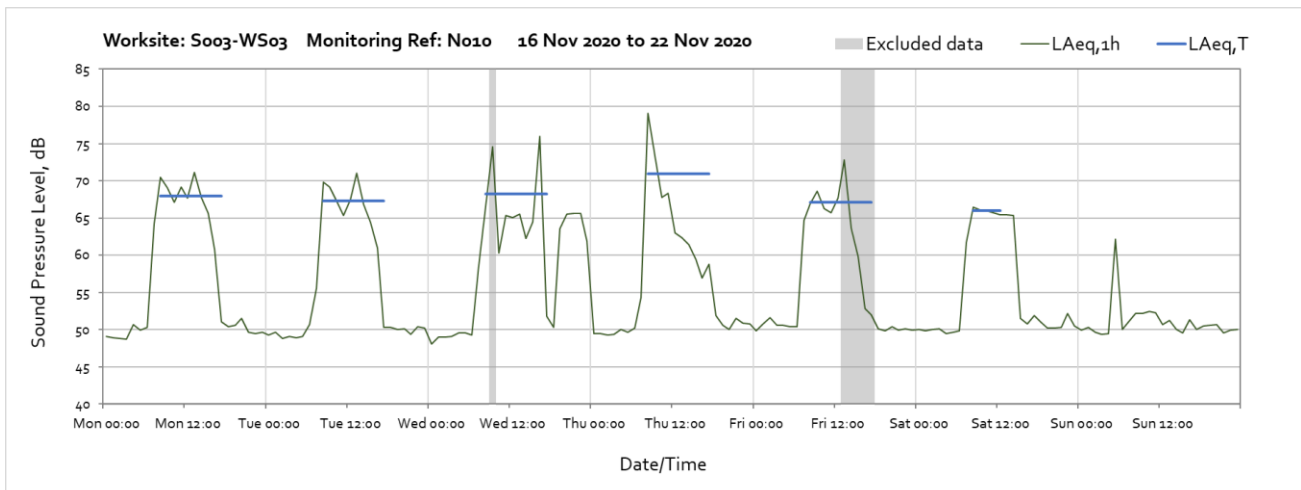
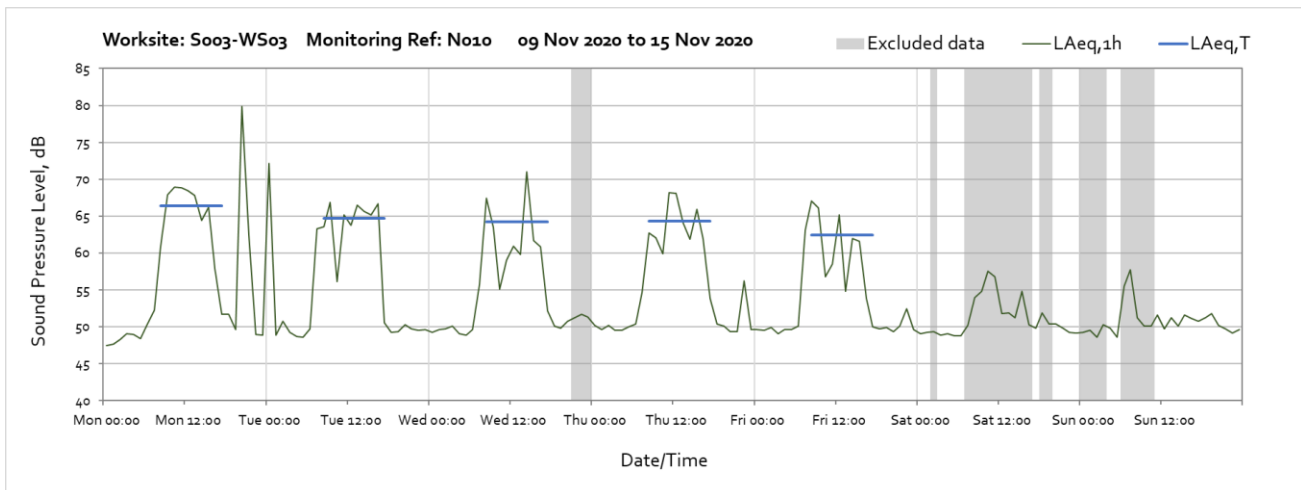


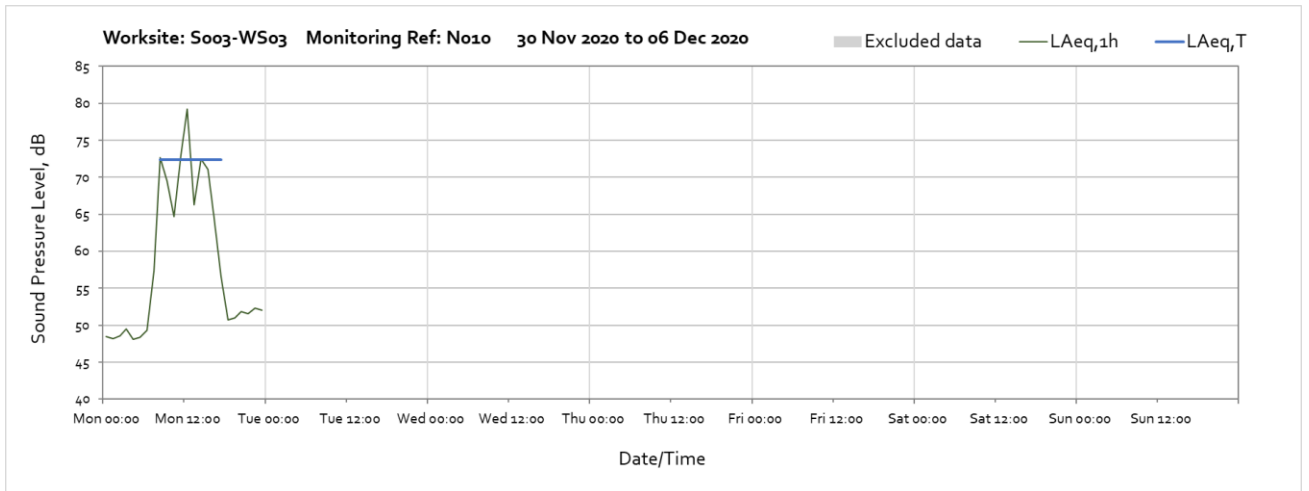
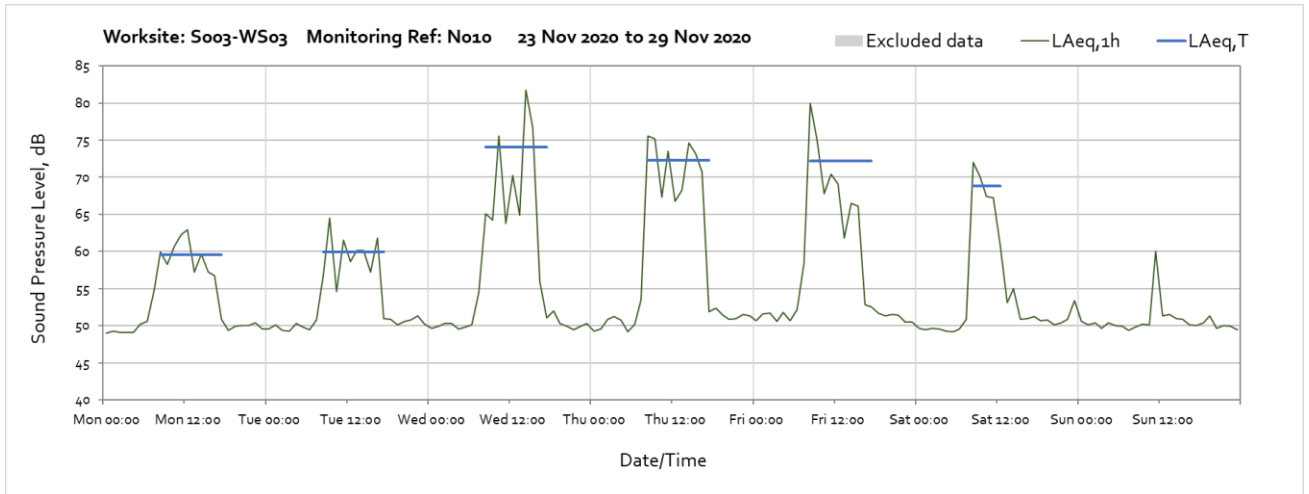


## Worksite: S003-WS03 – Monitoring Ref: N010

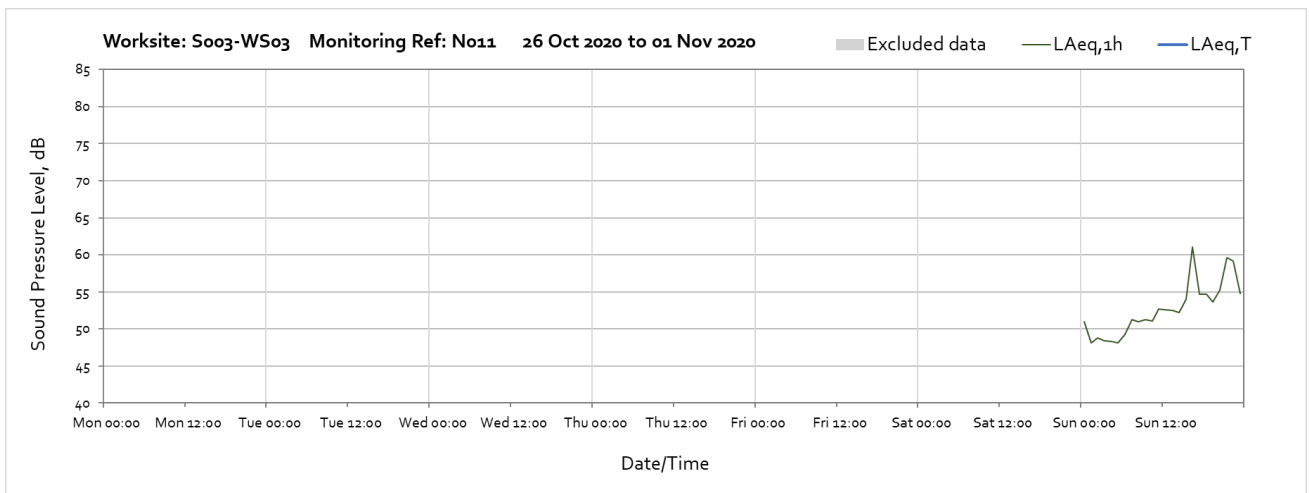


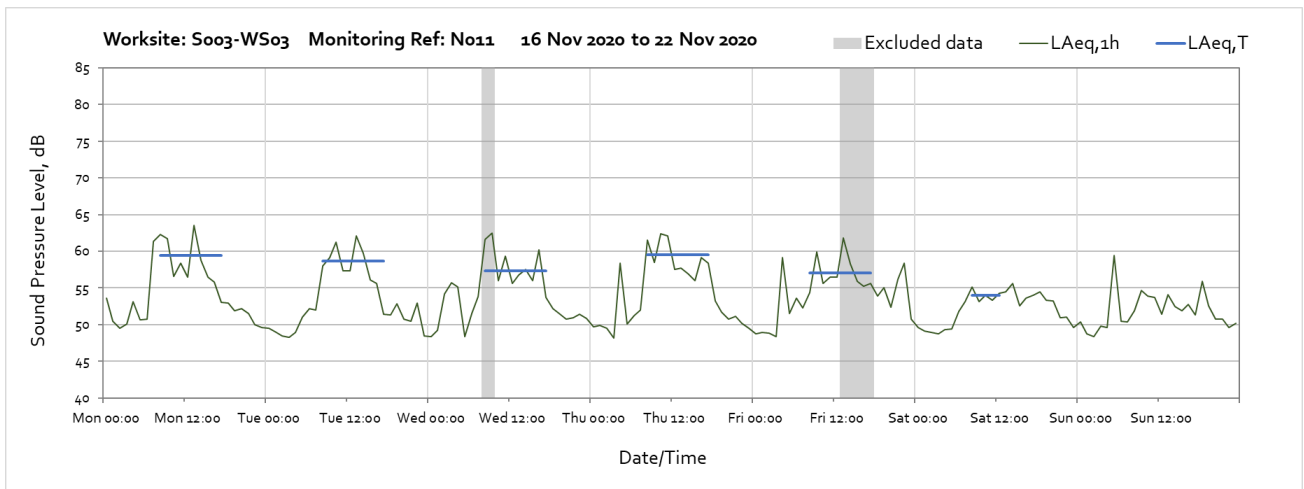
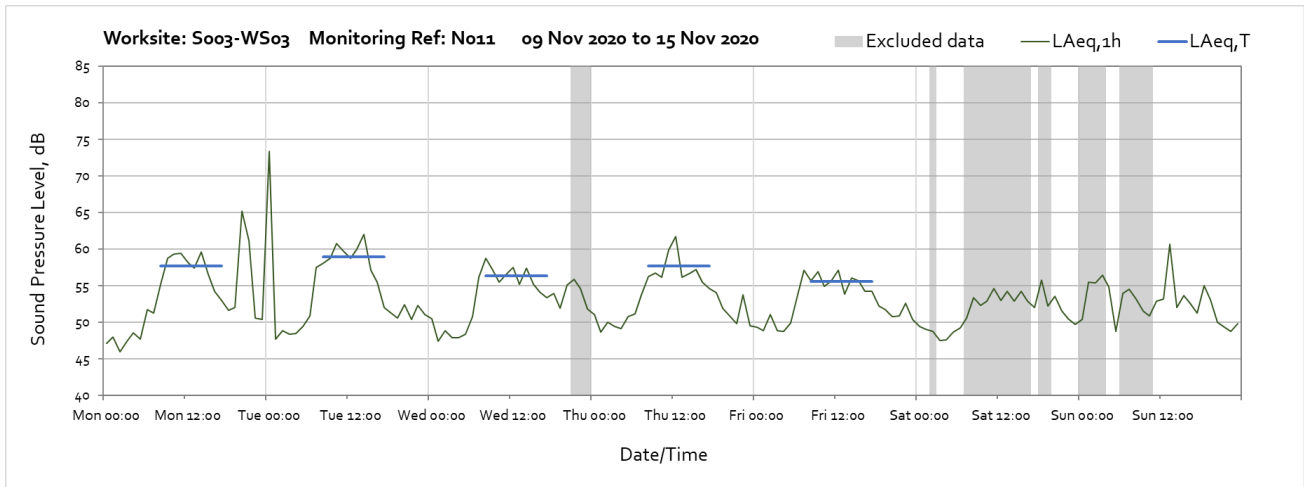
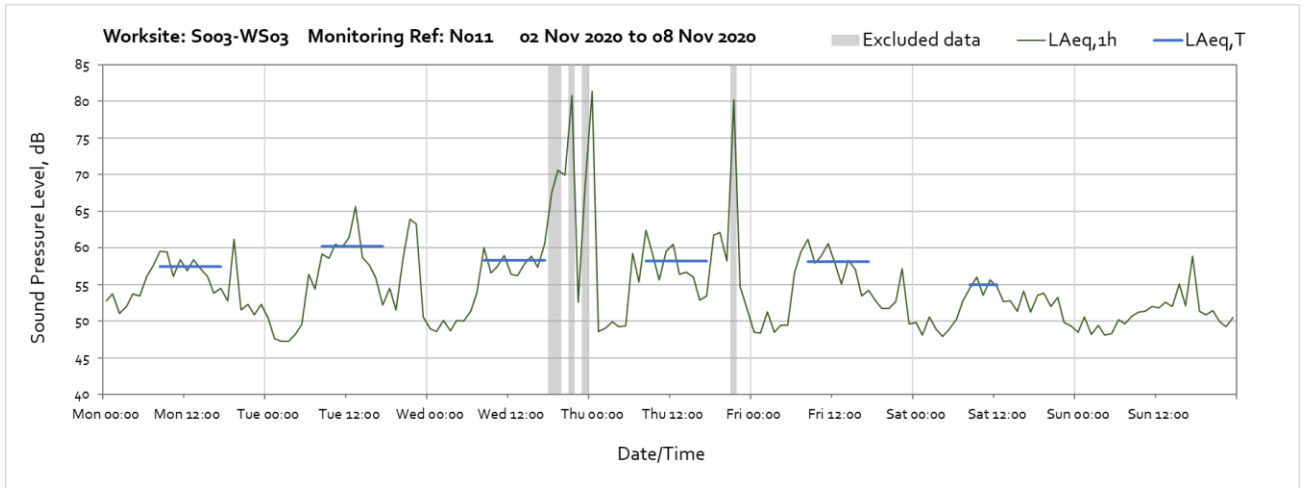
Note: Missing data from the start of the month until 08:00 on Friday 6<sup>th</sup> November was due to a fault with the monitoring station which resulted data not being recorded.

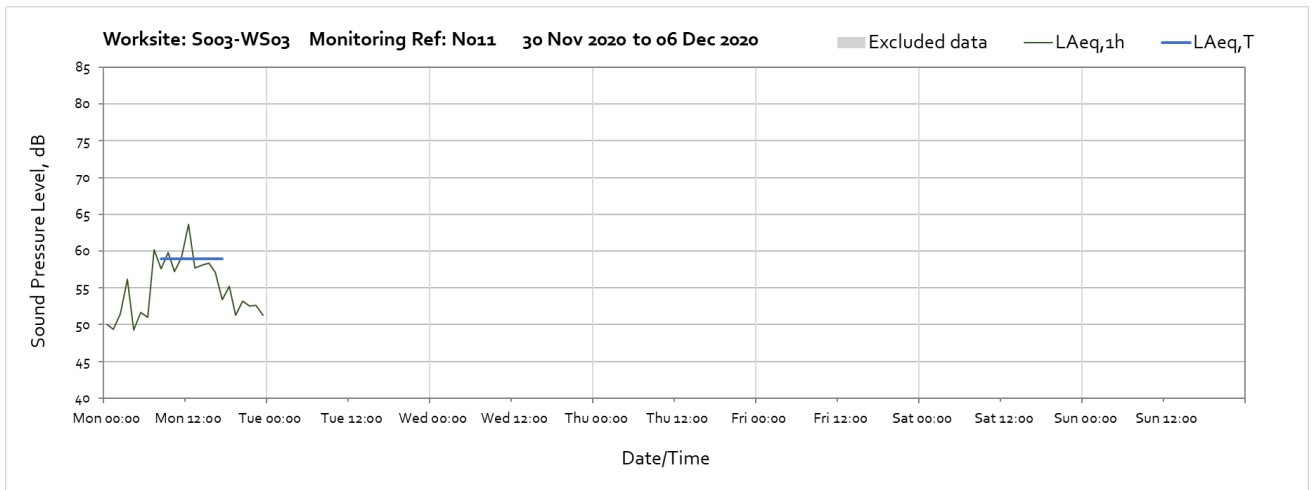
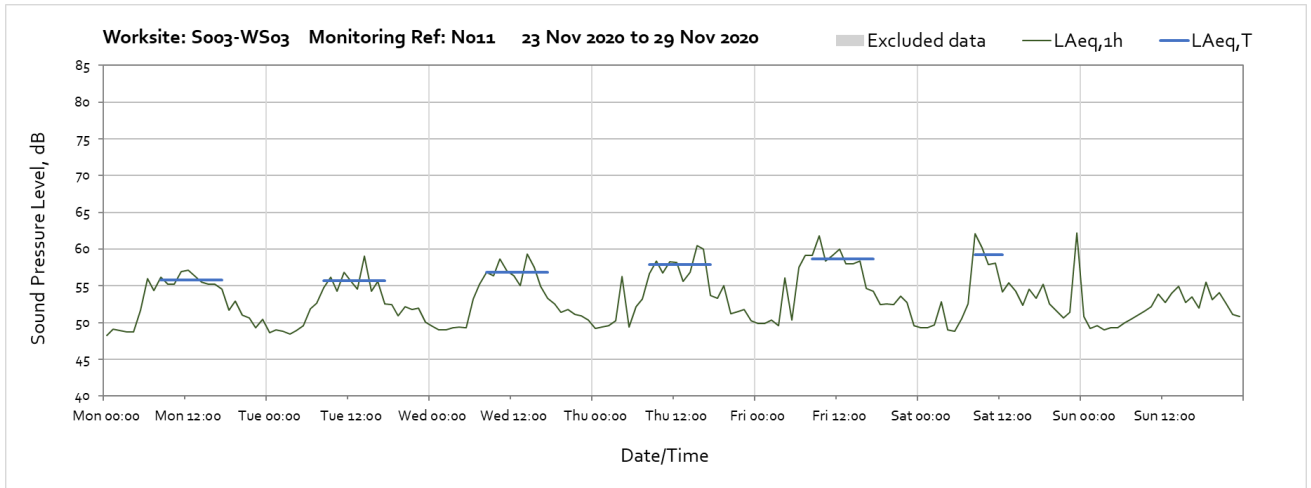




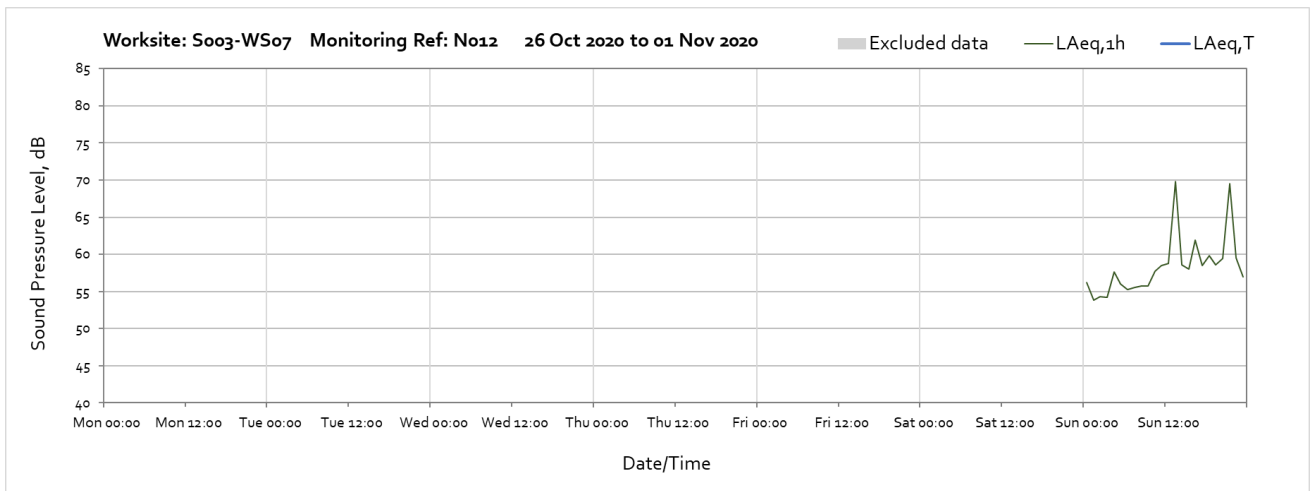
**Worksite: S003-WS03 – Monitoring Ref: N011**

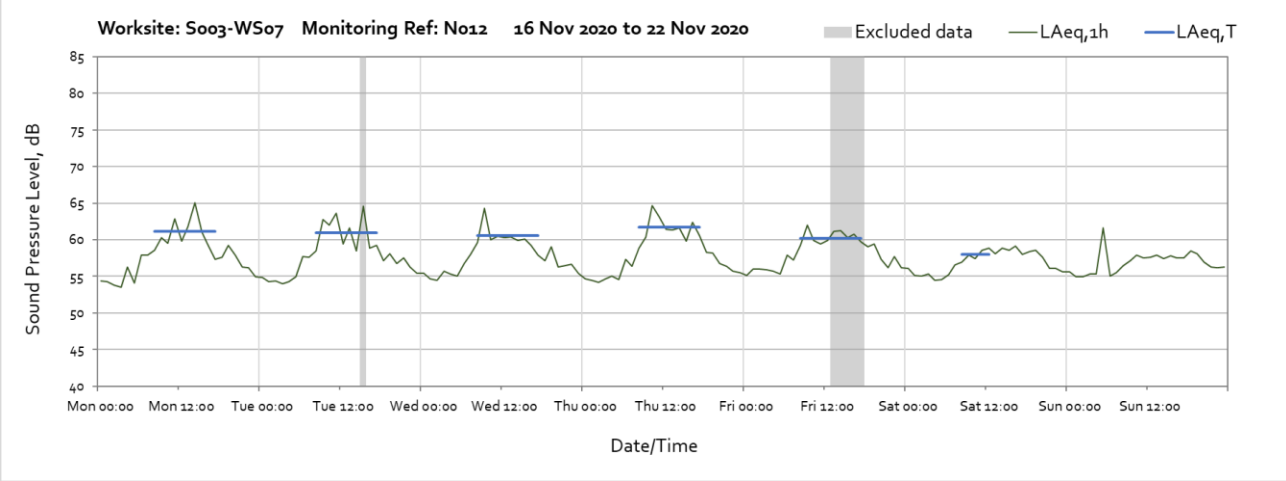
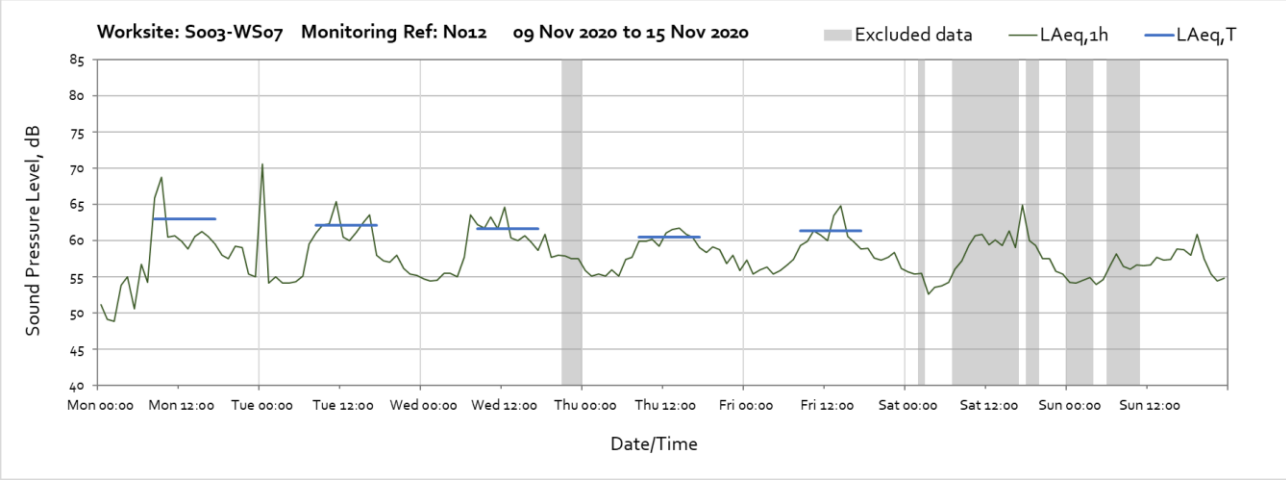
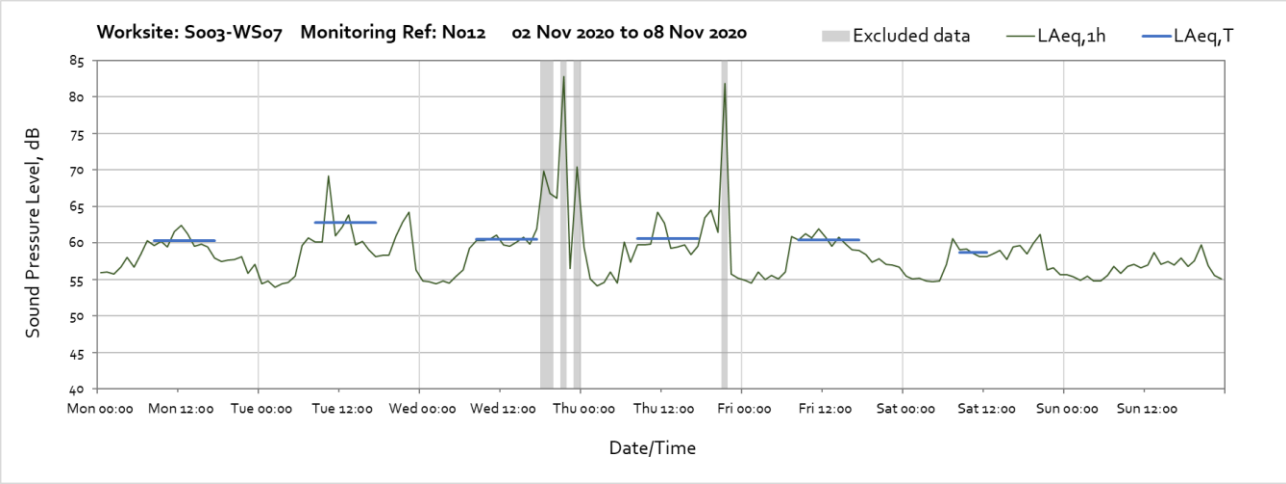


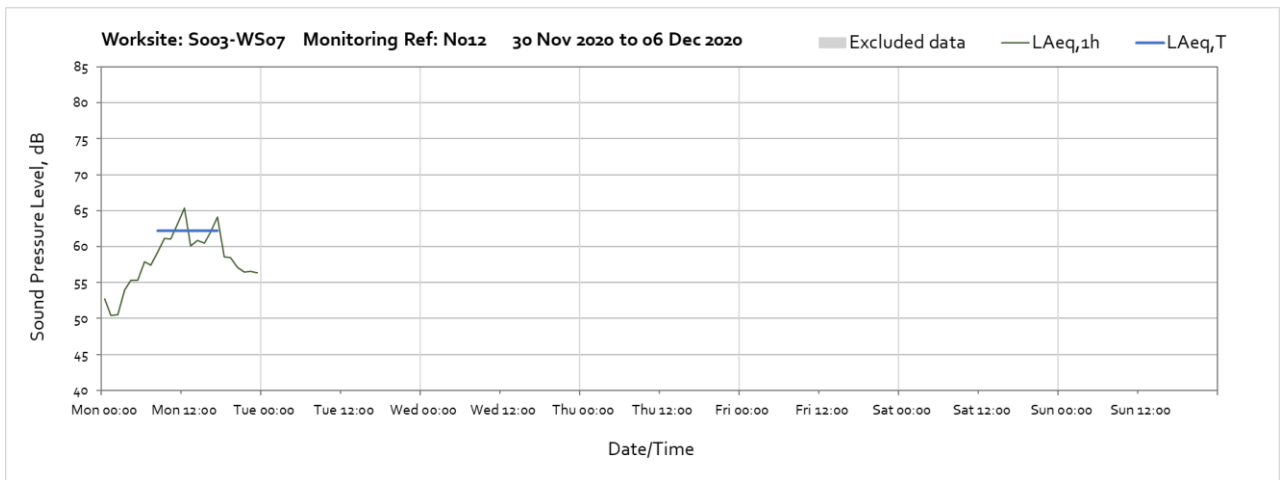
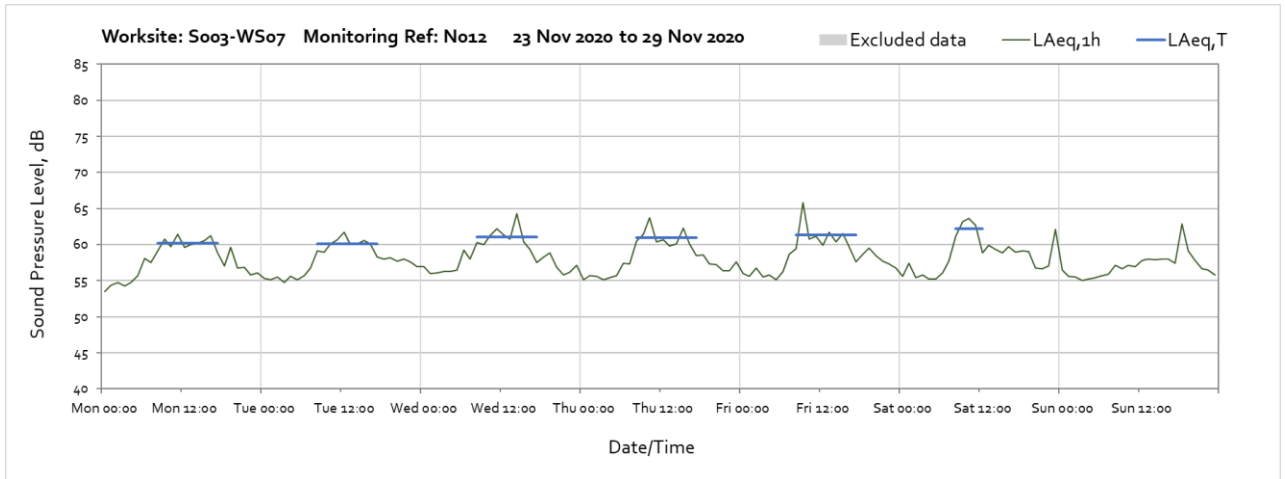




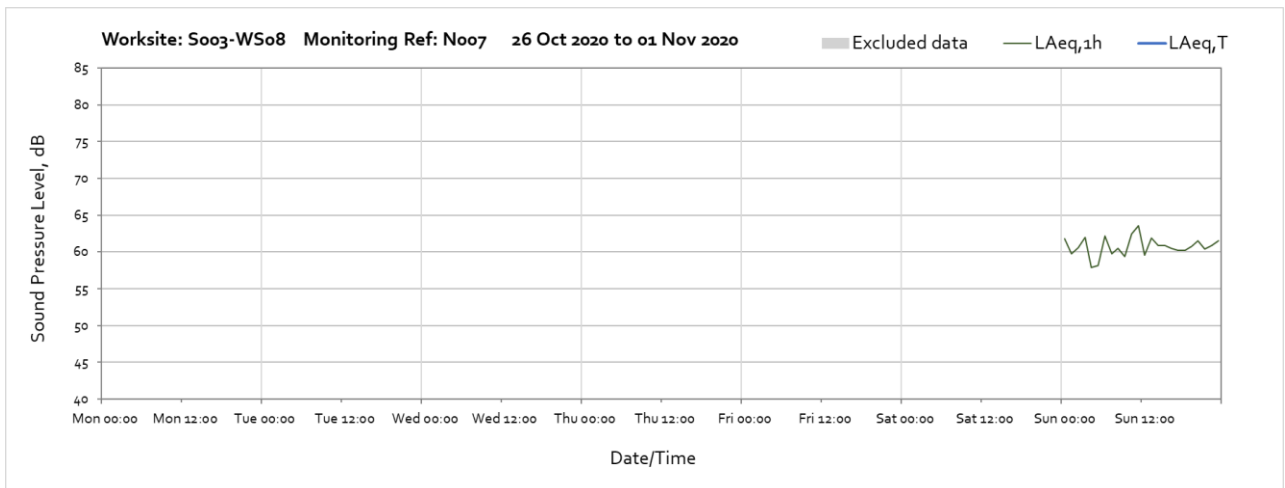
**Worksite: S003-WS07 – Monitoring Ref: N012**

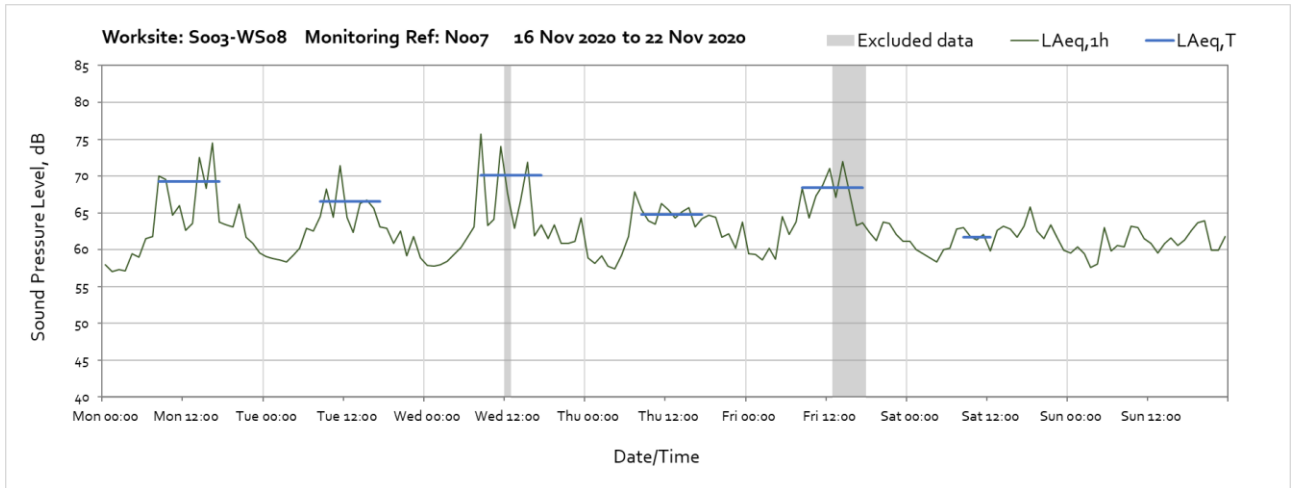
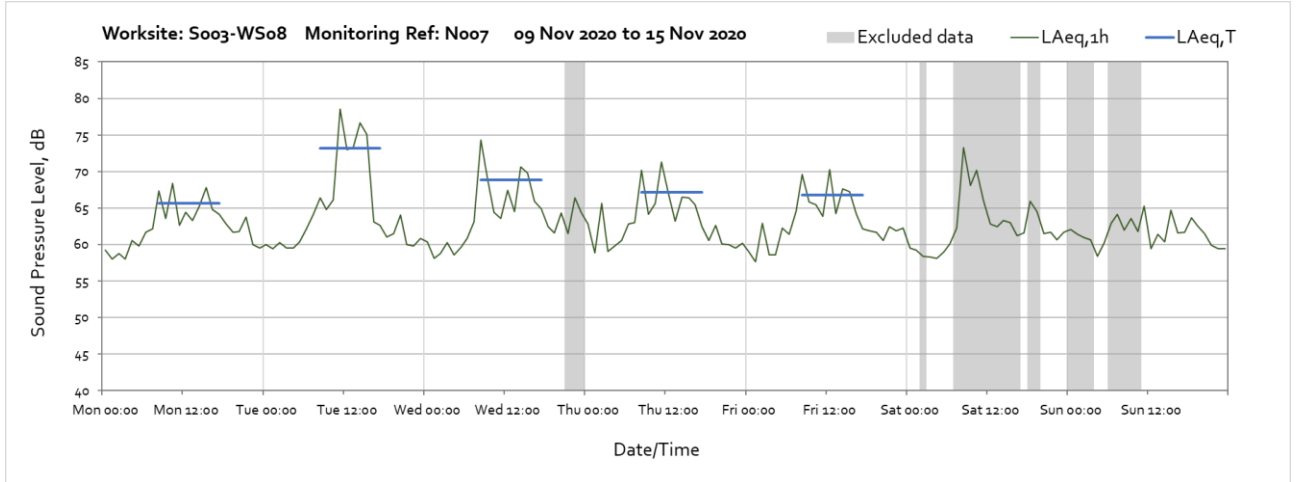
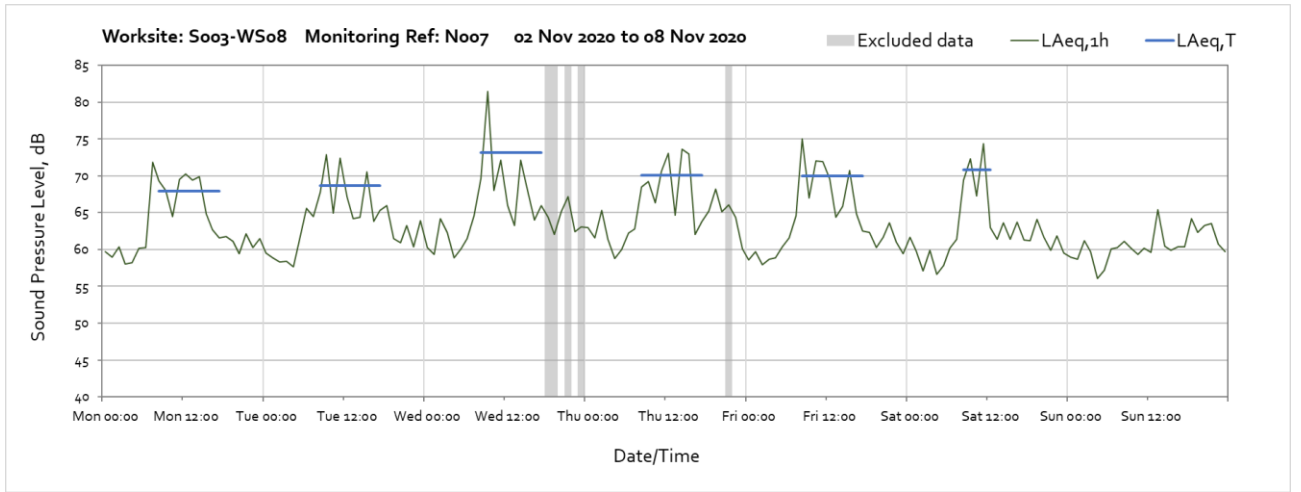




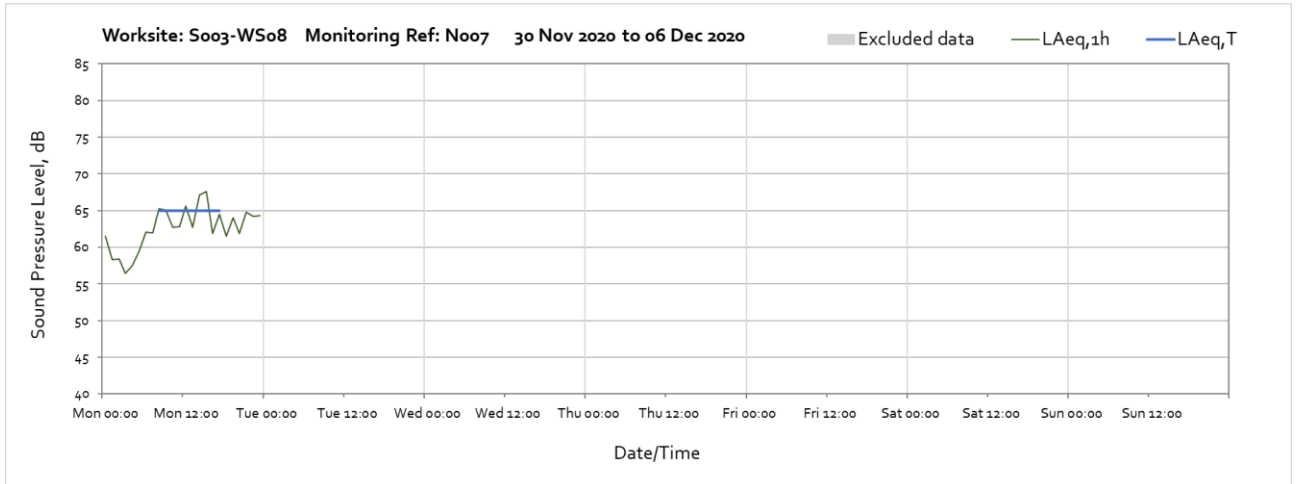
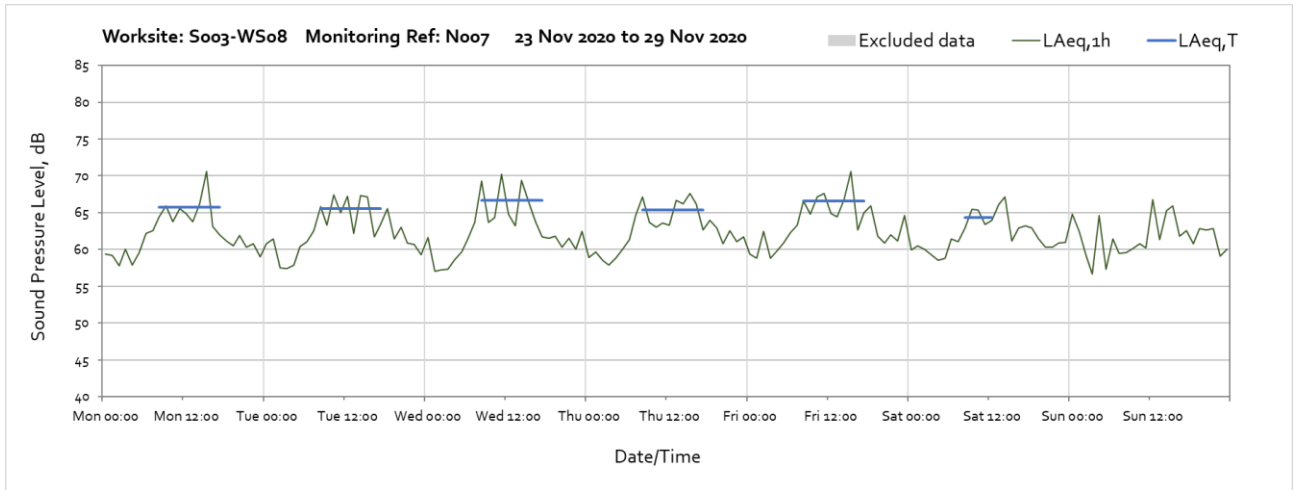


**Worksite: S003-WS08 – Monitoring Ref: N007**

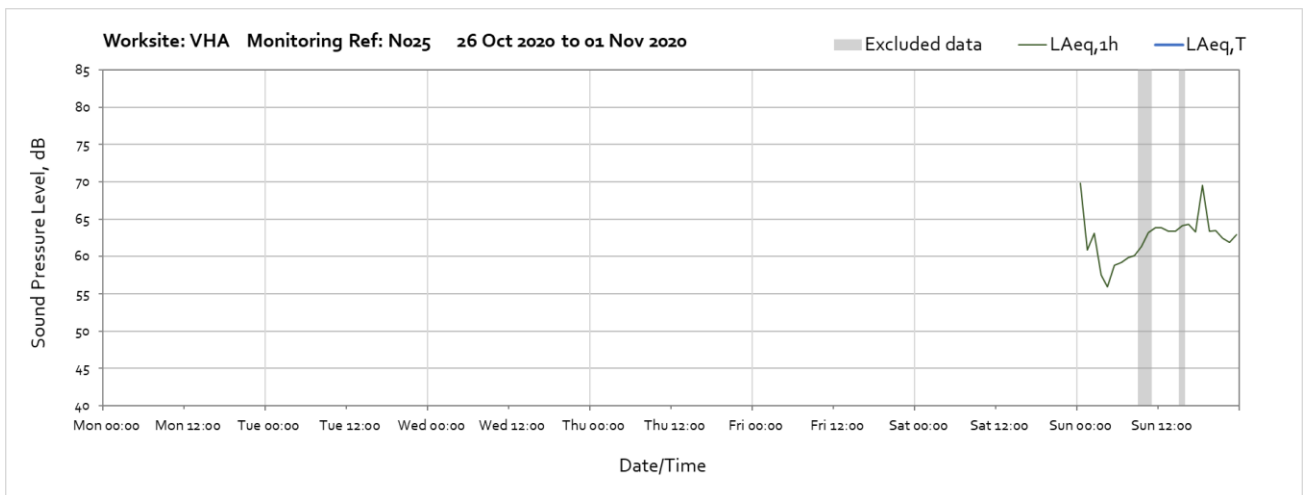


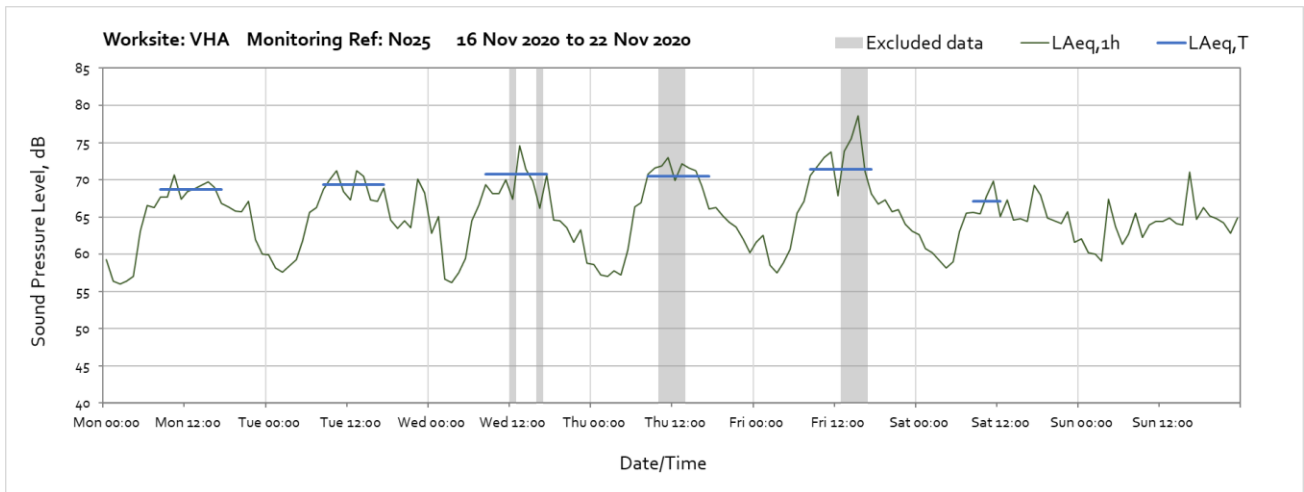
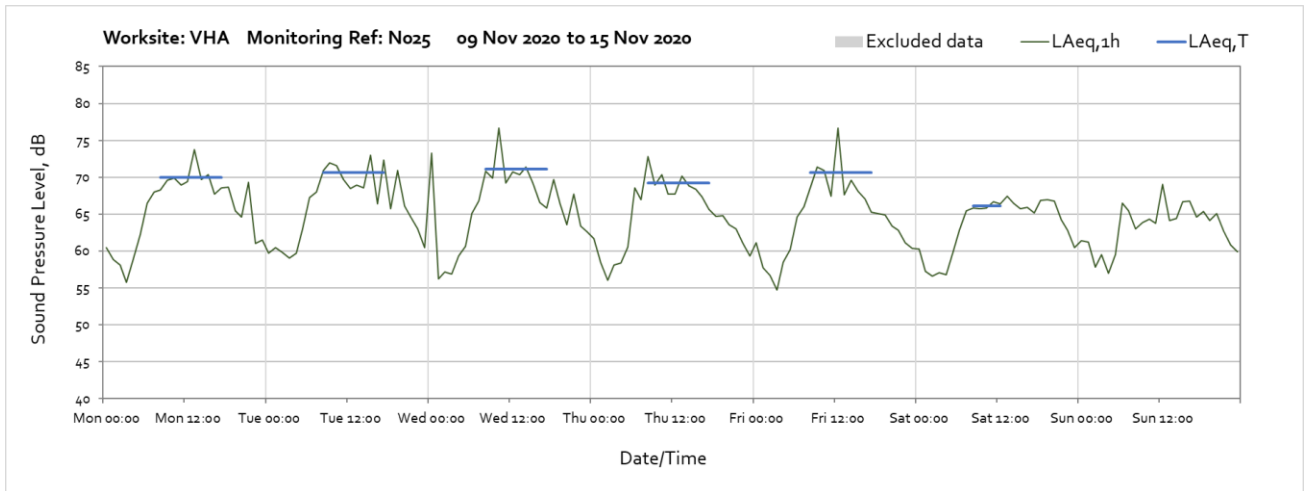
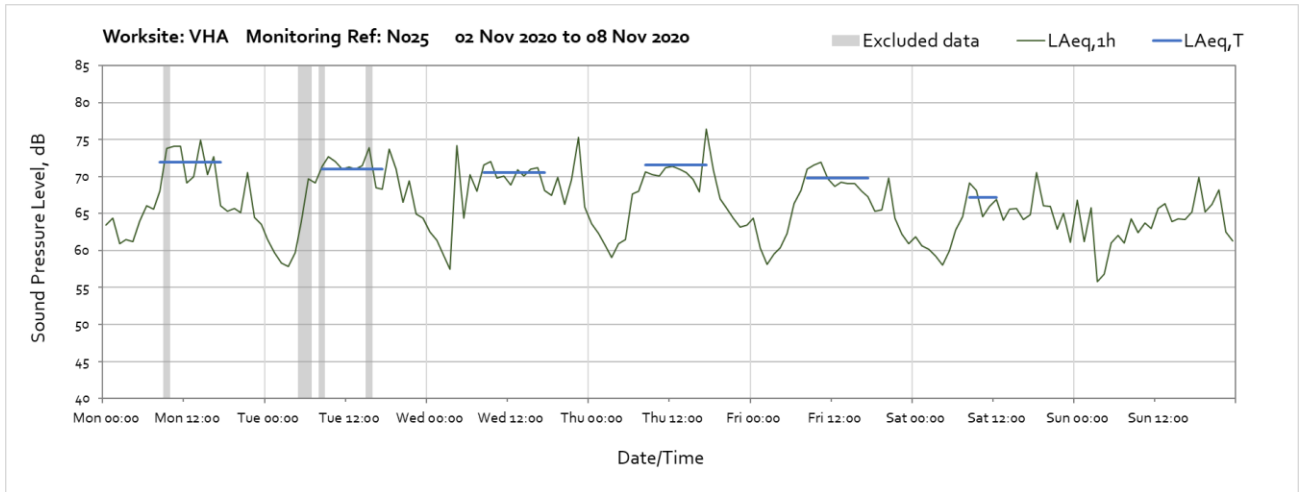


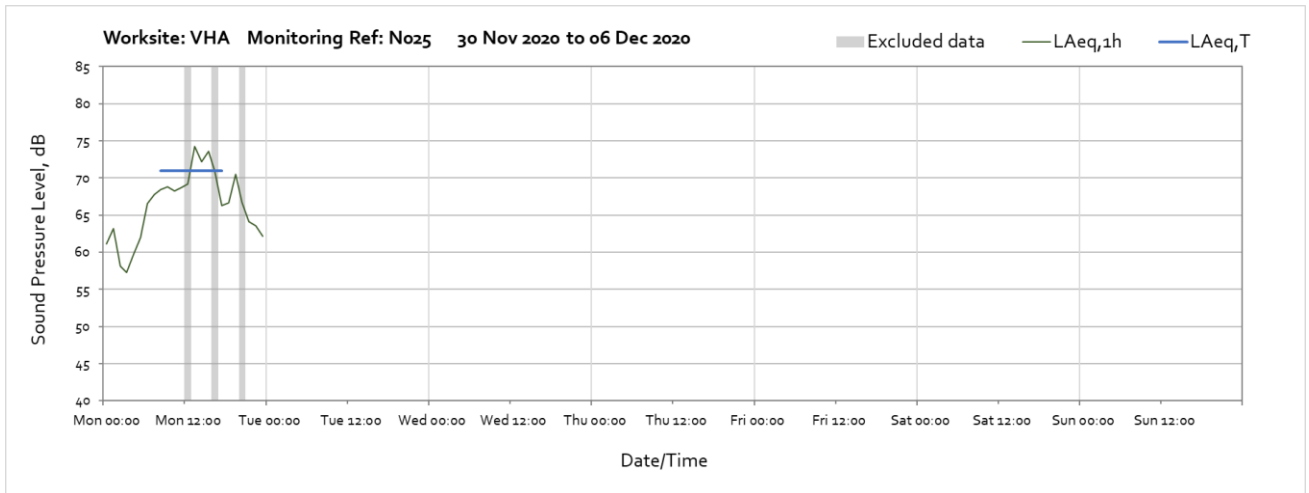
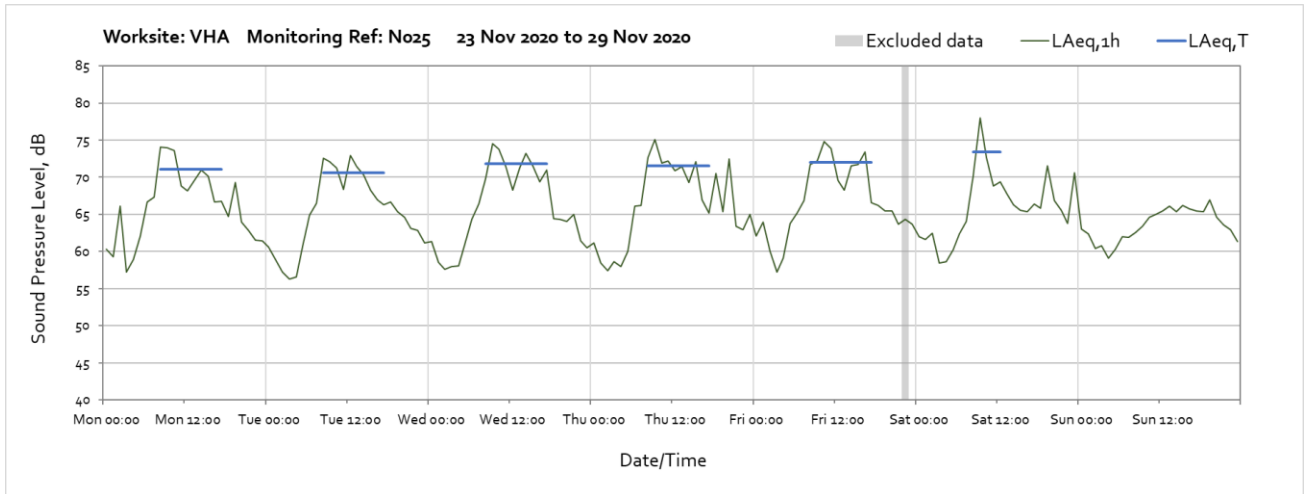




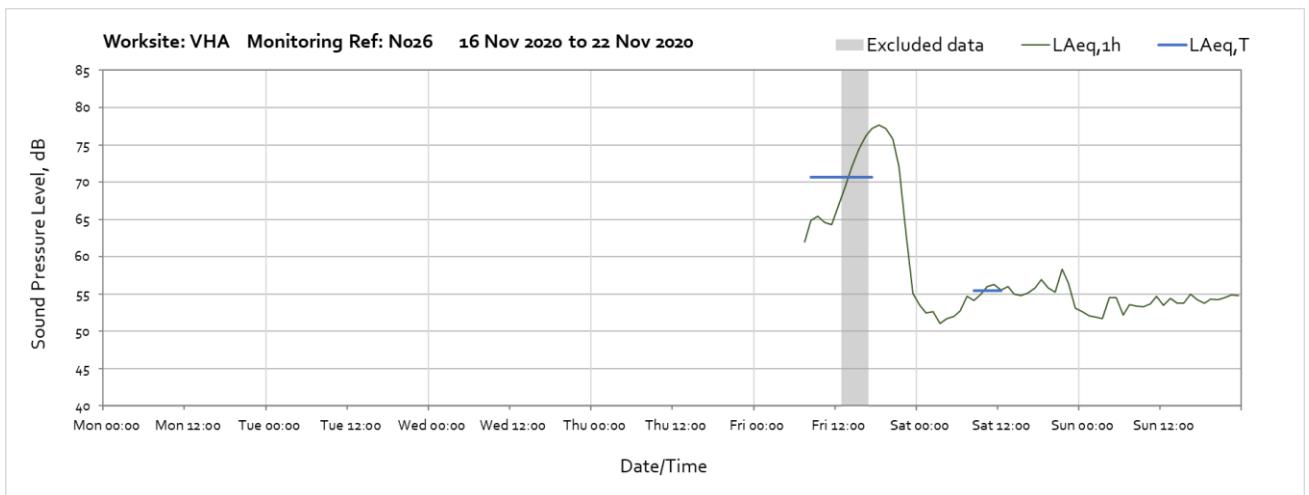
### Vehicle Holding Area (VHA) – Monitoring Ref: N025



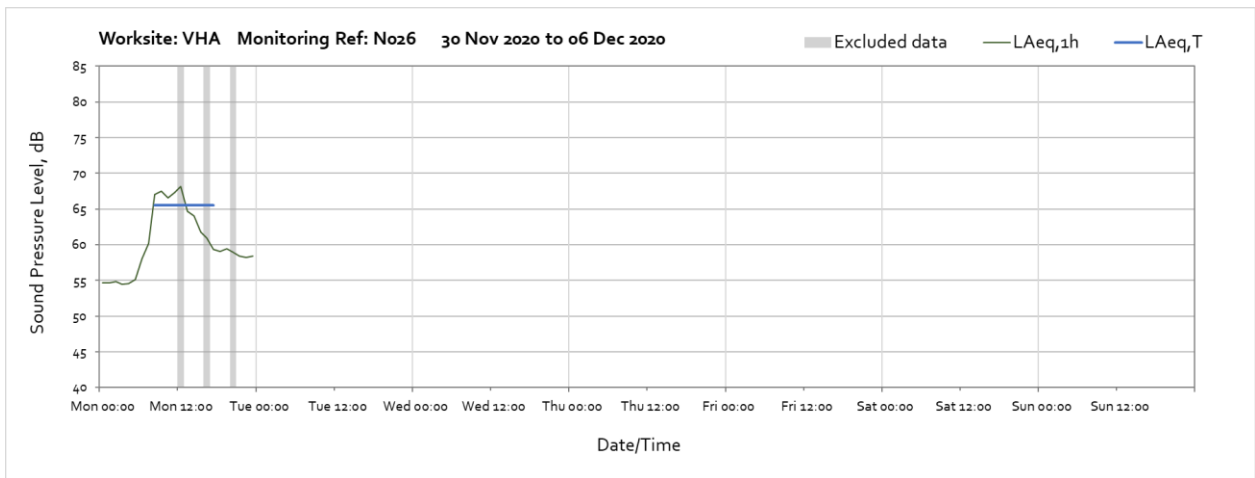
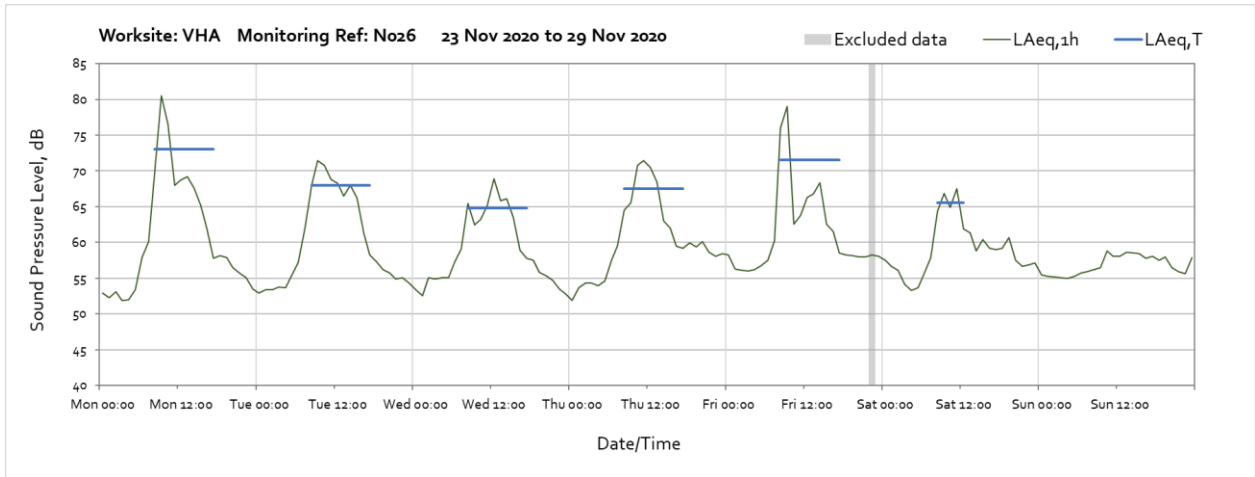




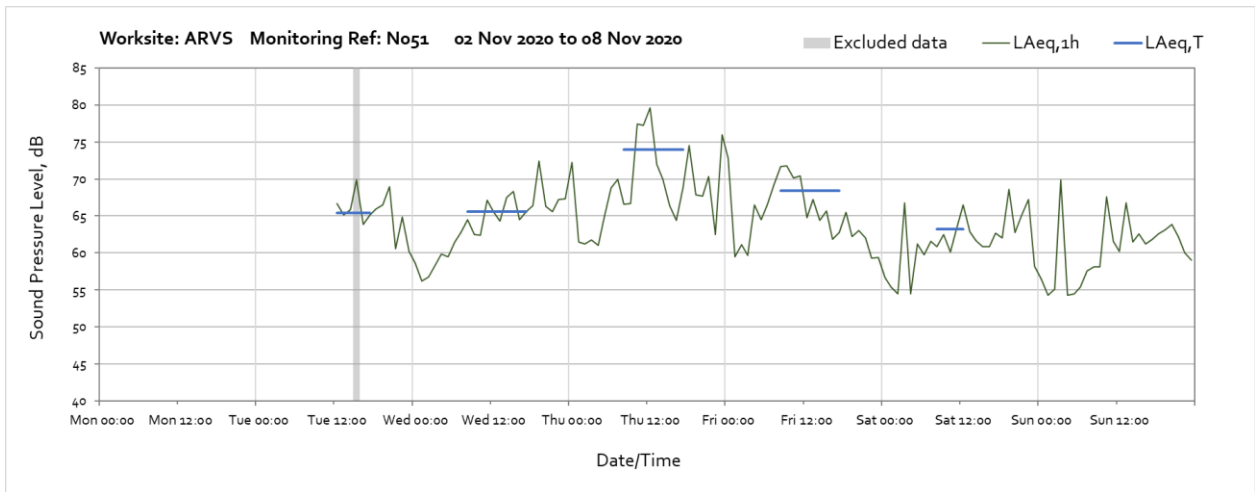
### Vehicle Holding Area (VHA) – Monitoring Ref: N026



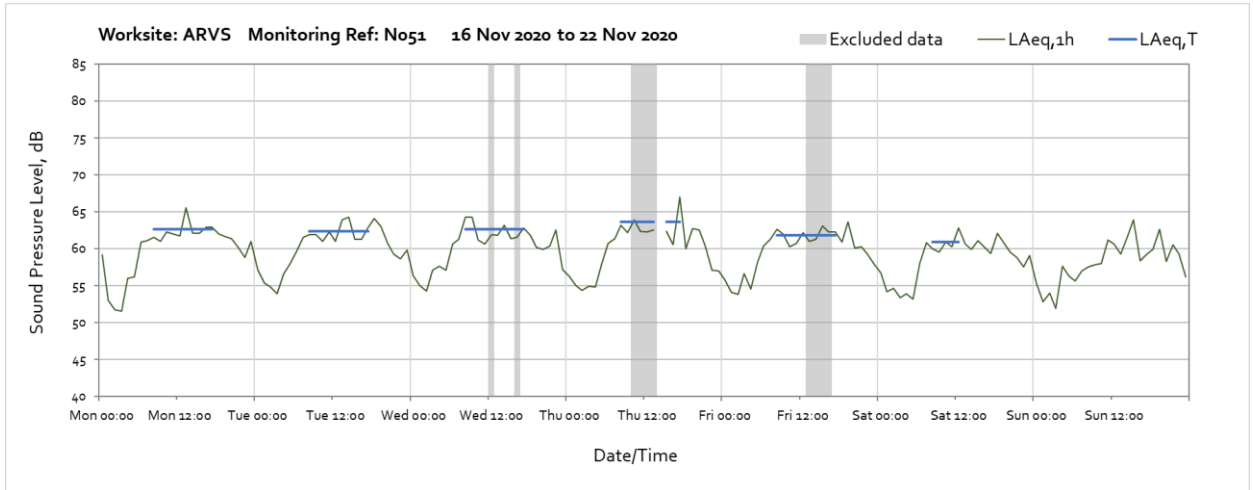
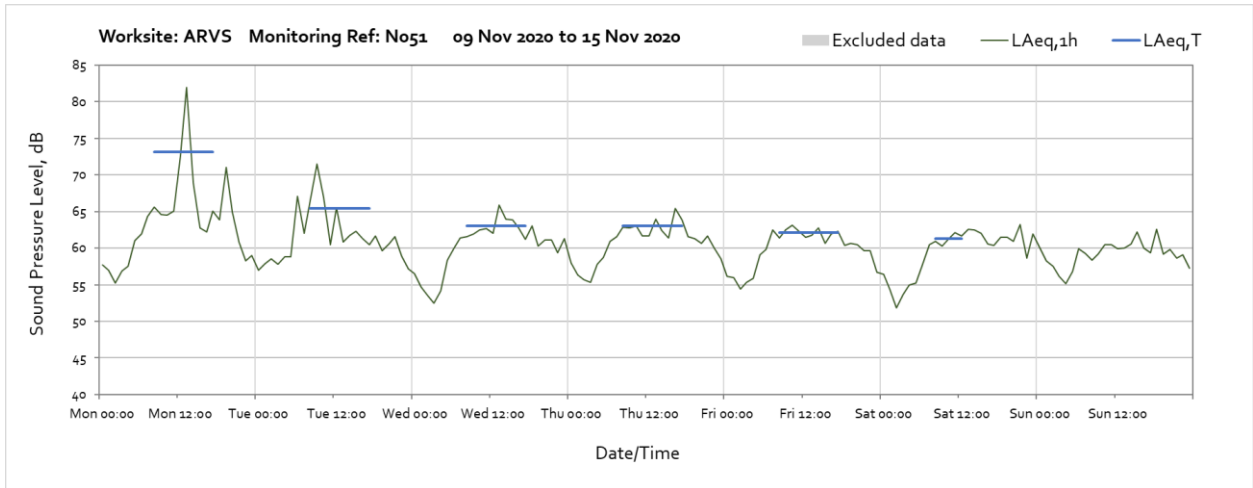
Note: Missing data from the start of the month until 07:00 on Friday 20<sup>th</sup> November was due to the handover of monitoring stations between contractors.



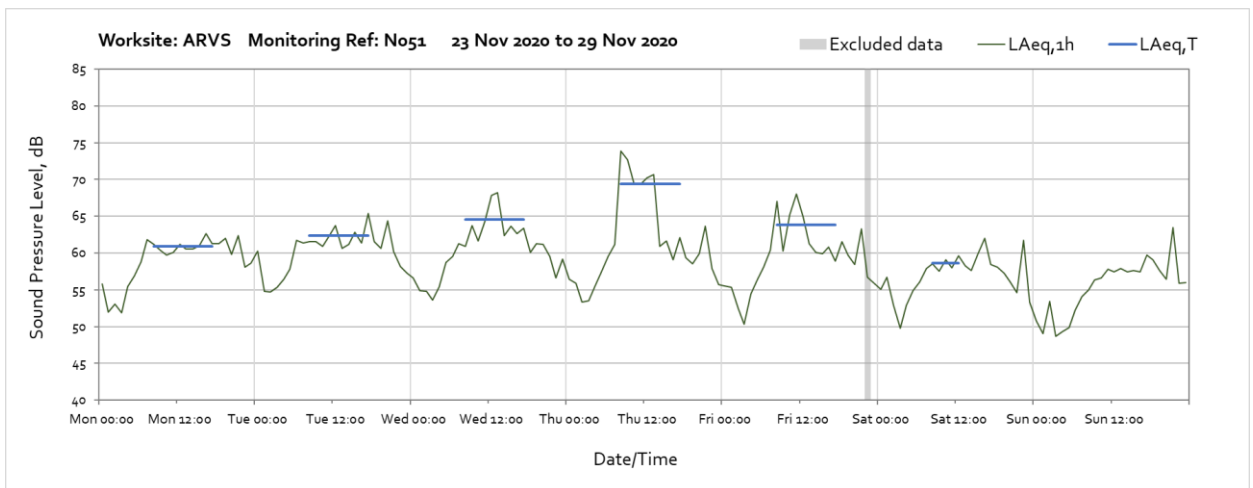
### Adelaide Road Ventilation Shaft (ARVS) – Monitoring Ref: N051

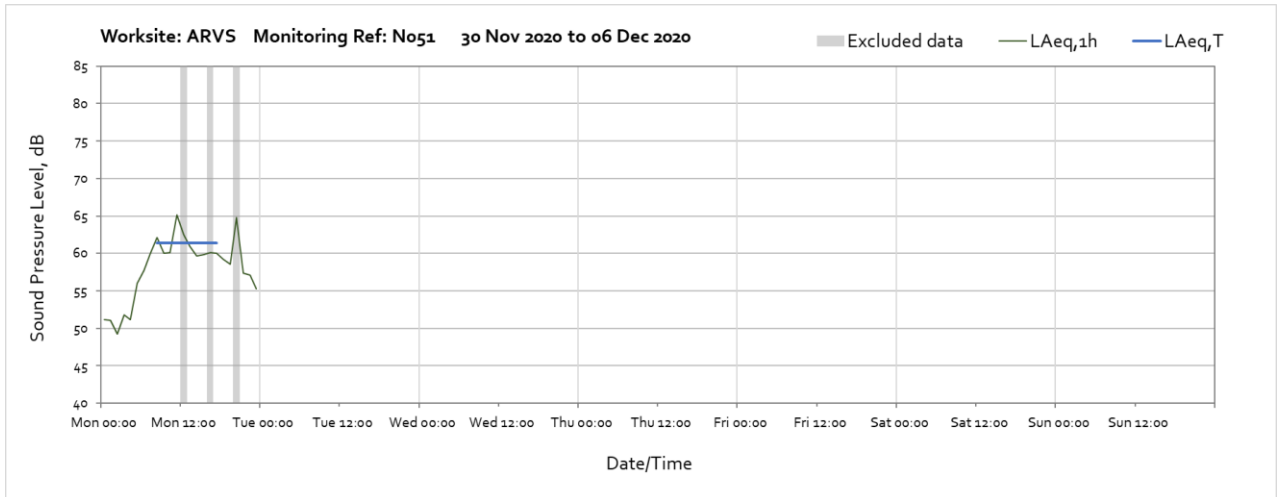


Note: Missing data from the start of the month until 12:00 on Tuesday 3<sup>rd</sup> November was due to a power connection issue associated with the new installation of the monitoring station.



Note: Missing data between 14:00 until 15:00 on Thursday 19<sup>th</sup> November was due to the swapping of equipment at the monitoring station.





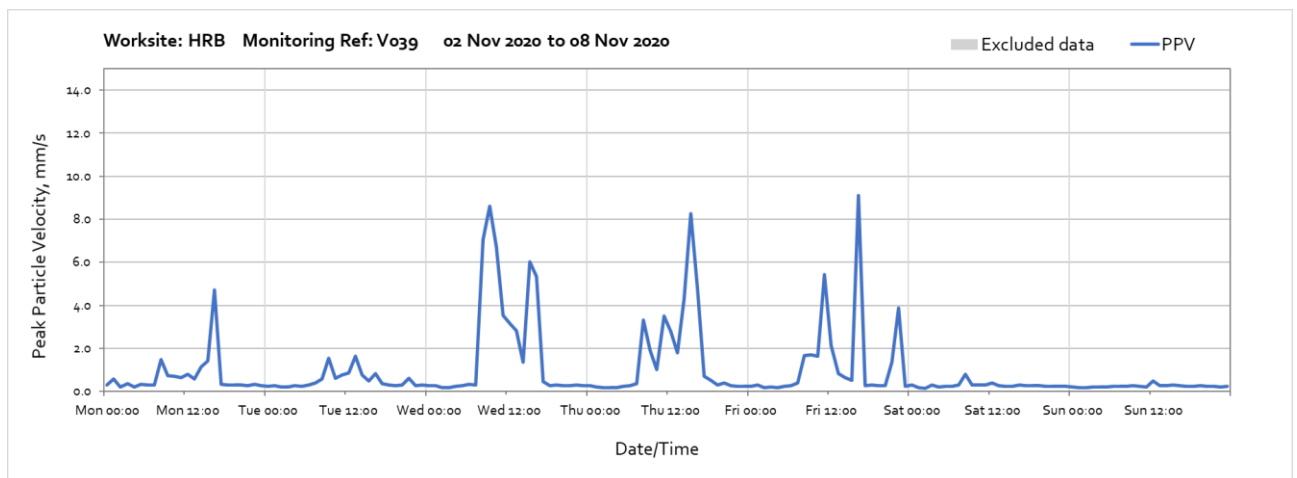
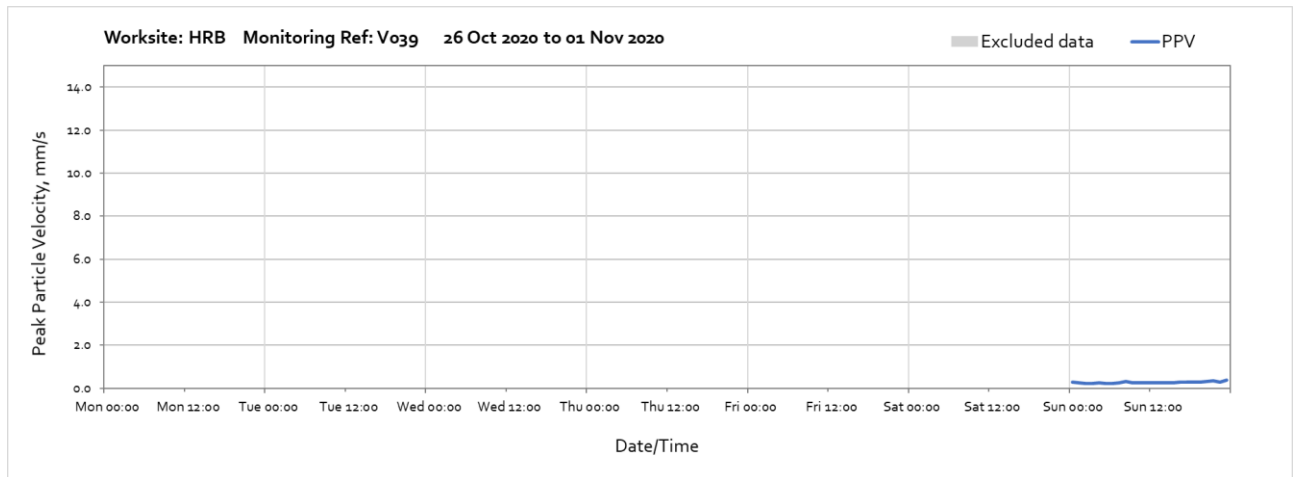
**Adelaide Road Ventilation Shaft (ARVS) – Monitoring Ref: N052**

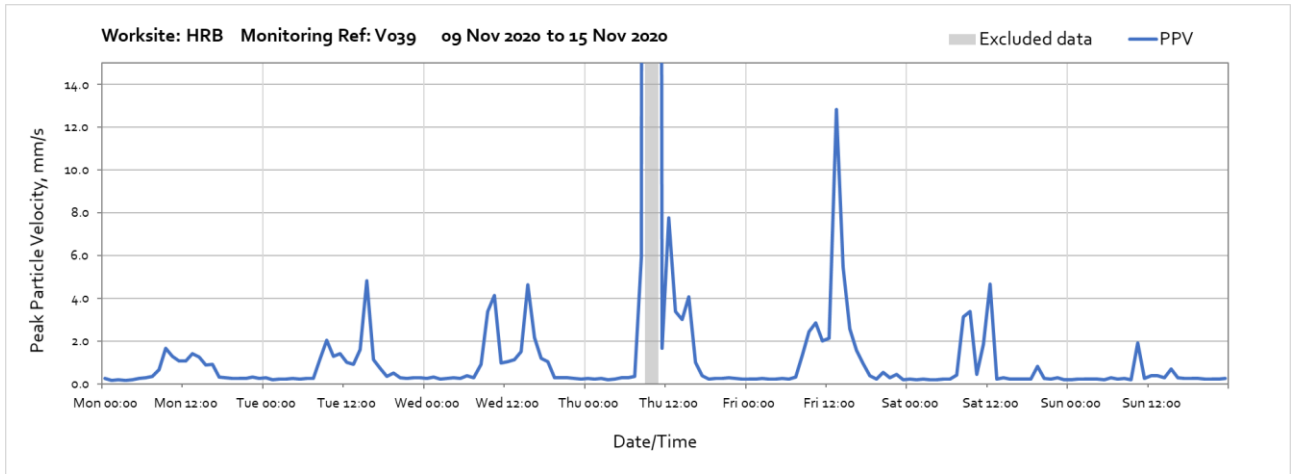
Note: No data measured due to corruption of SD card.

## Vibration

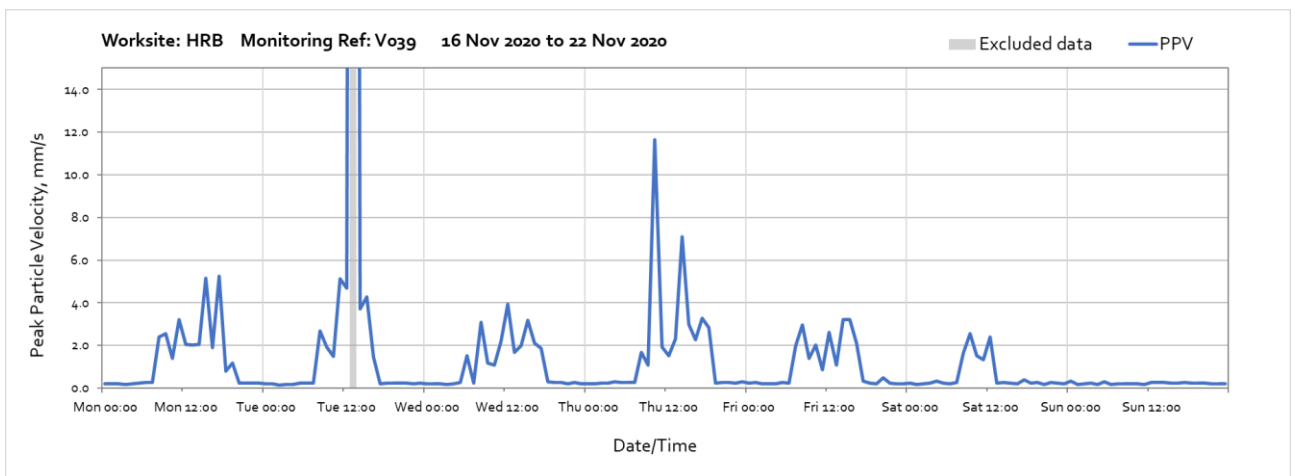
The following graphs show the hourly measured peak particle velocity PPV recorded during the monitoring period. The graphs show the resultant PPV due to vibration components on three orthogonal axis x, y and z. Where high values of PPV were caused by local interference with the vibration monitor, which are not representative of HS2 construction works, these values have been greyed out in the following charts and have been excluded to calculate values in Table 4 of the main report.

### Worksite: HRB – Monitoring Ref: V039

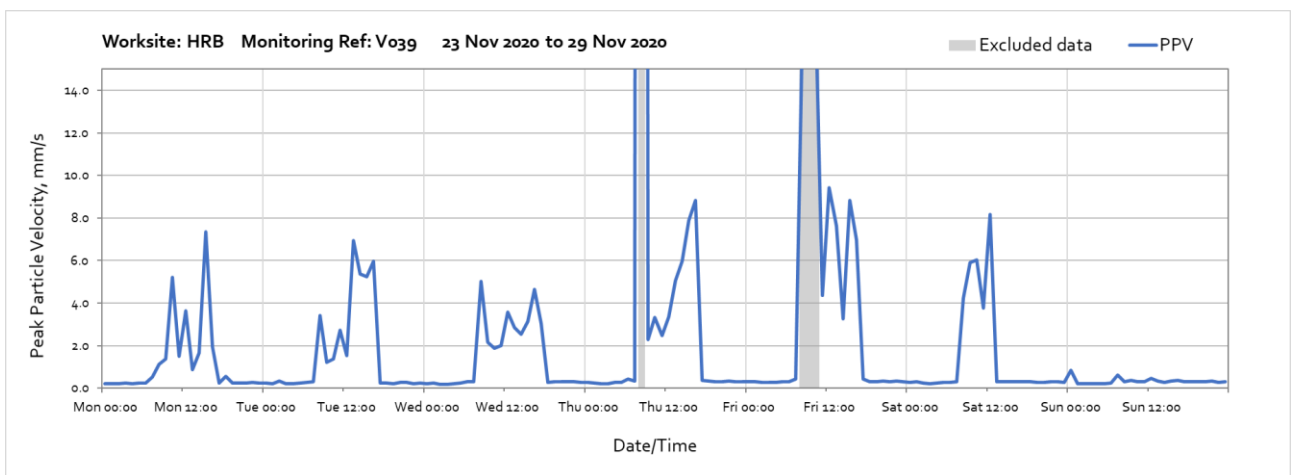




Note: High vibration levels measured between 09:00-11:00 on Thursday 12<sup>th</sup> November were due to local disturbance of the vibration monitor and are not representative of HS2 vibration levels.

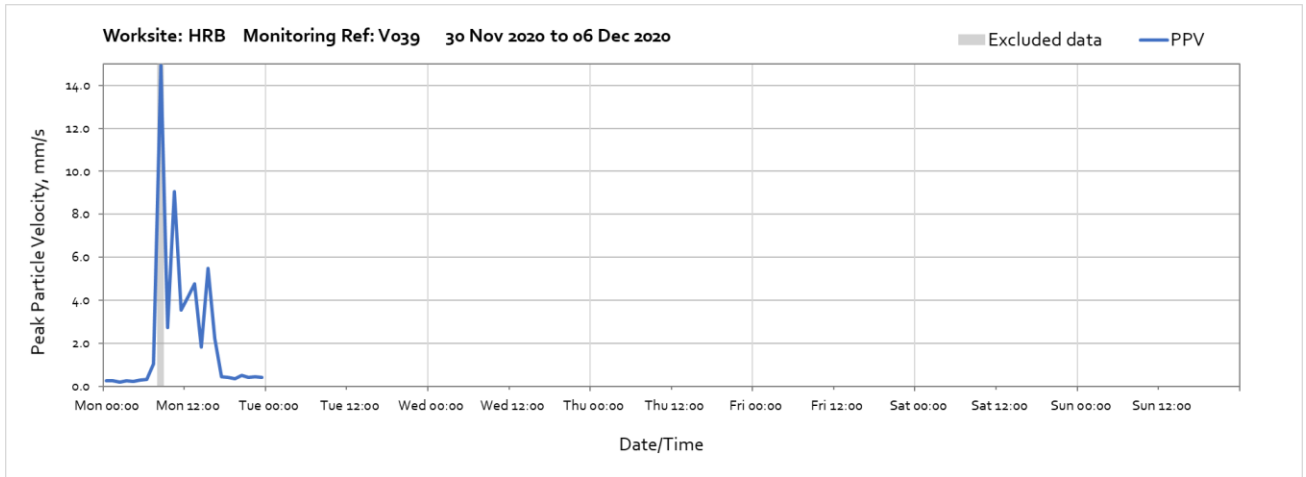


Note: High vibration levels measured at 13:00 on Tuesday 17<sup>th</sup> November were due to local disturbance of the vibration monitor and are not representative of HS2 vibration levels.



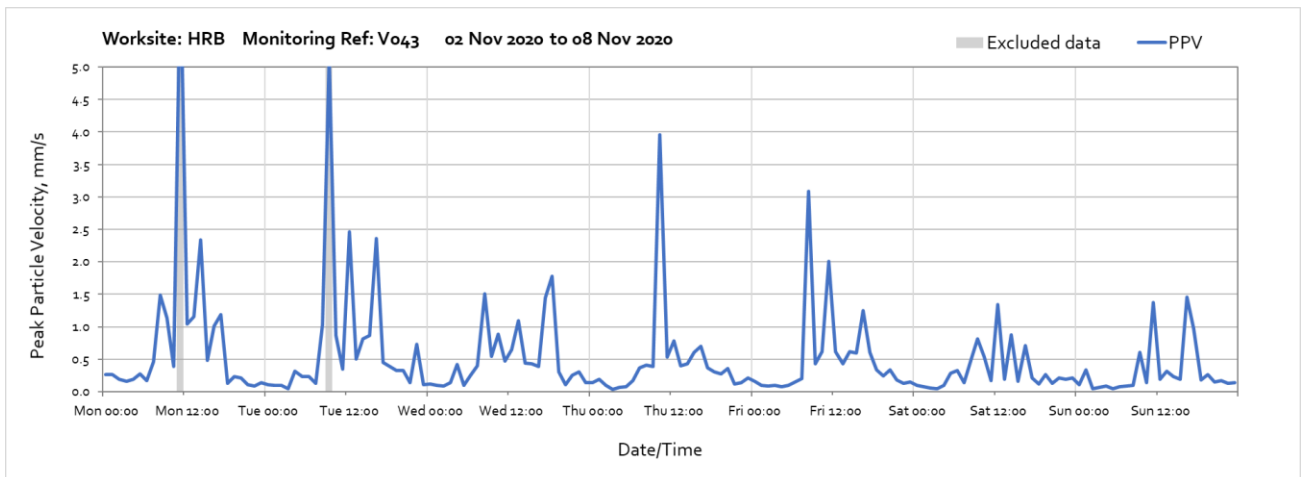
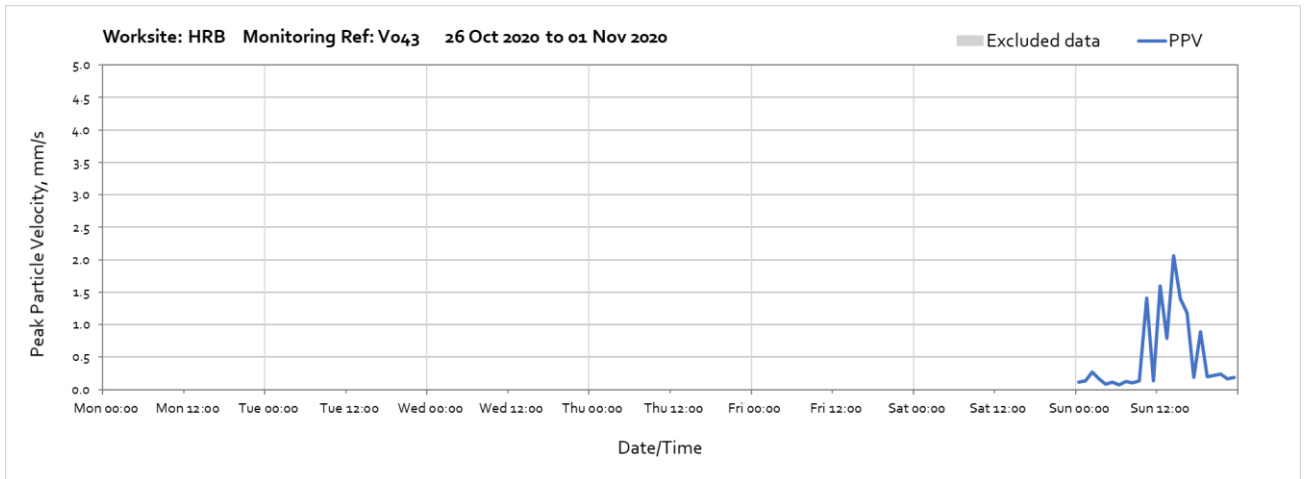
Note: High vibration levels measured throughout the week were due to local disturbance of the vibration monitor and are not representative of HS2 vibration levels.



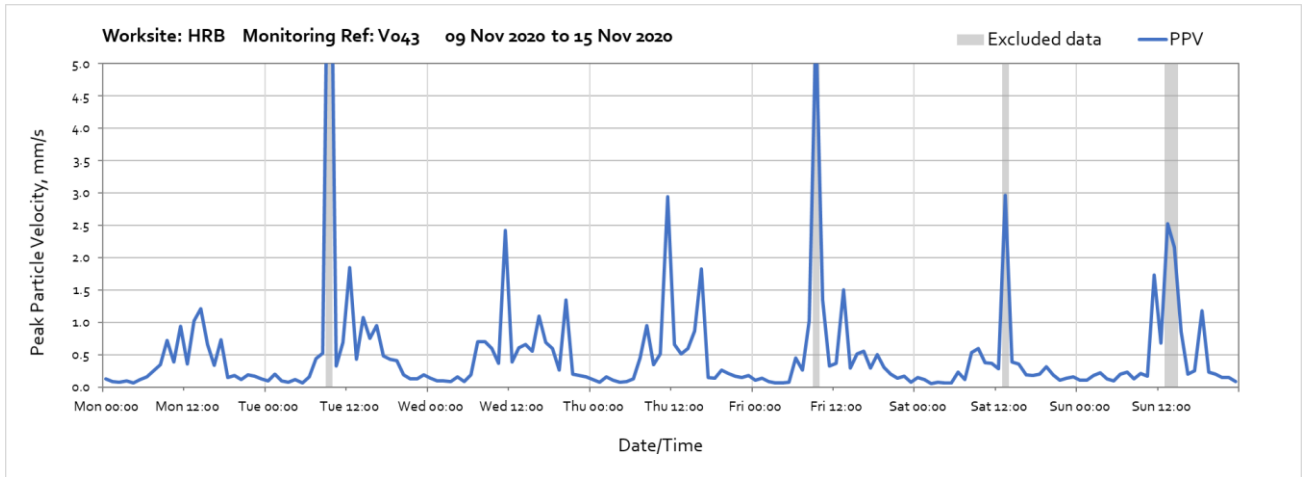


Note: High vibration levels measured at 08:00 on Monday 30<sup>th</sup> November were due to local disturbance of the vibration monitor and are not representative of HS2 vibration levels.

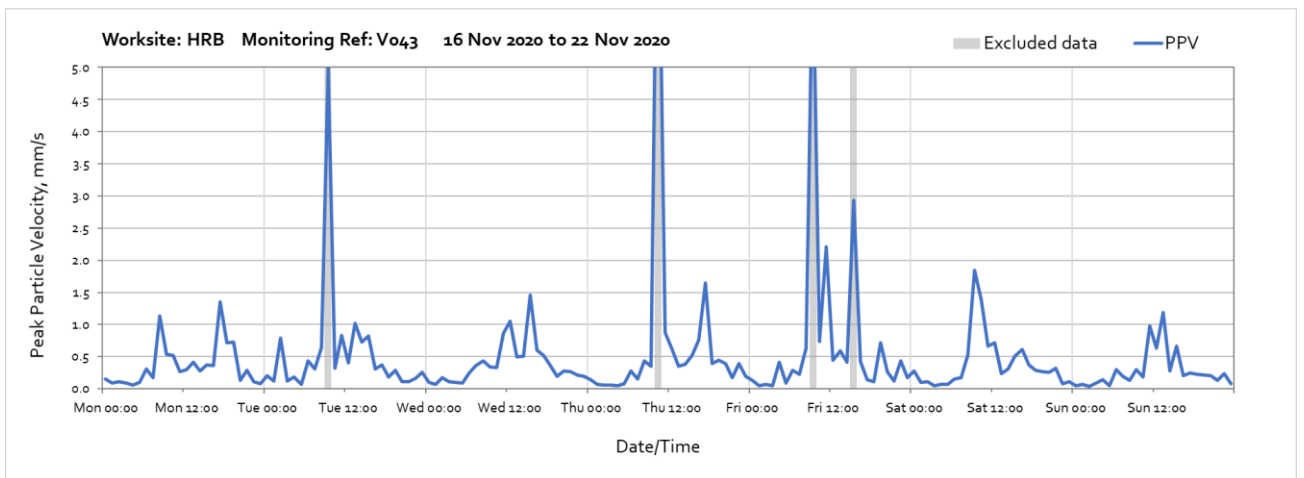
### Worksite: HRB – Monitoring Ref: V043



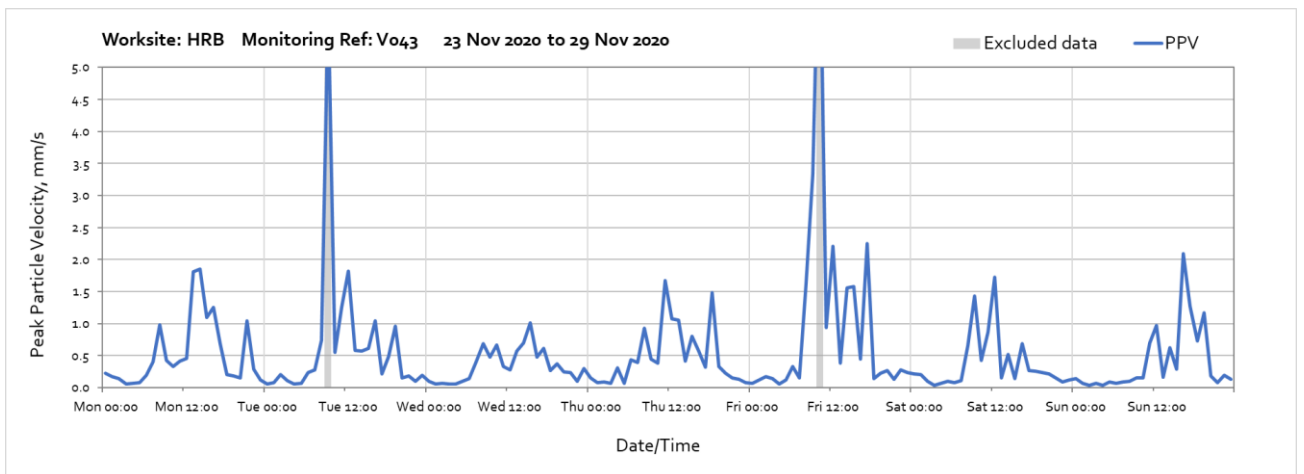
Note: High vibration levels measured throughout the week were due to the use of the nearby residential bin store and are not representative of HS2 vibration levels.



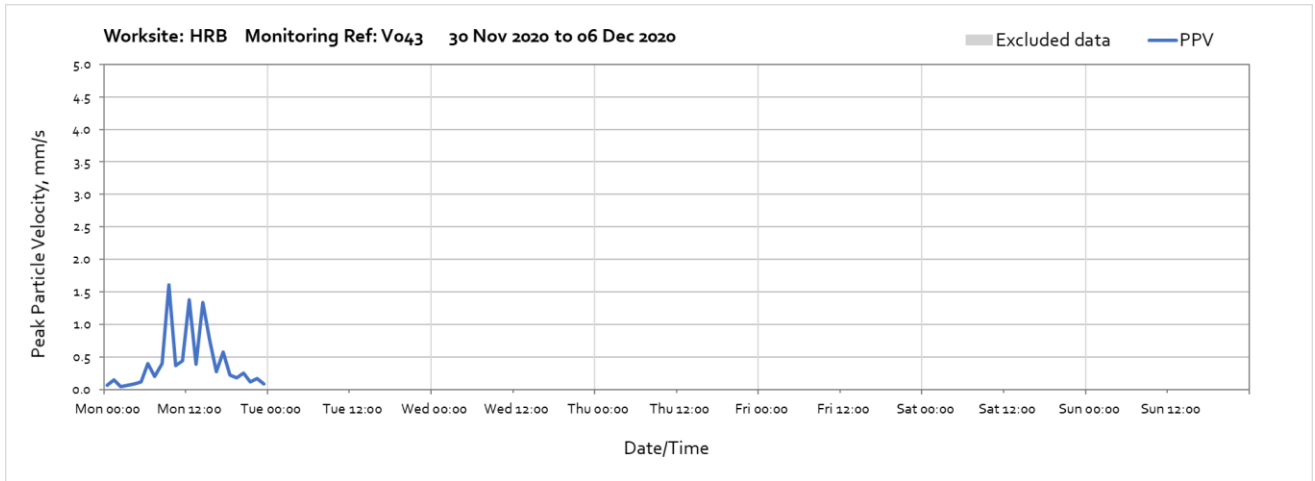
Note: High vibration levels measured throughout the week were due to the use of the neraby residential bin store and local interference of the monitor and are not representative of HS2 vibration levels.



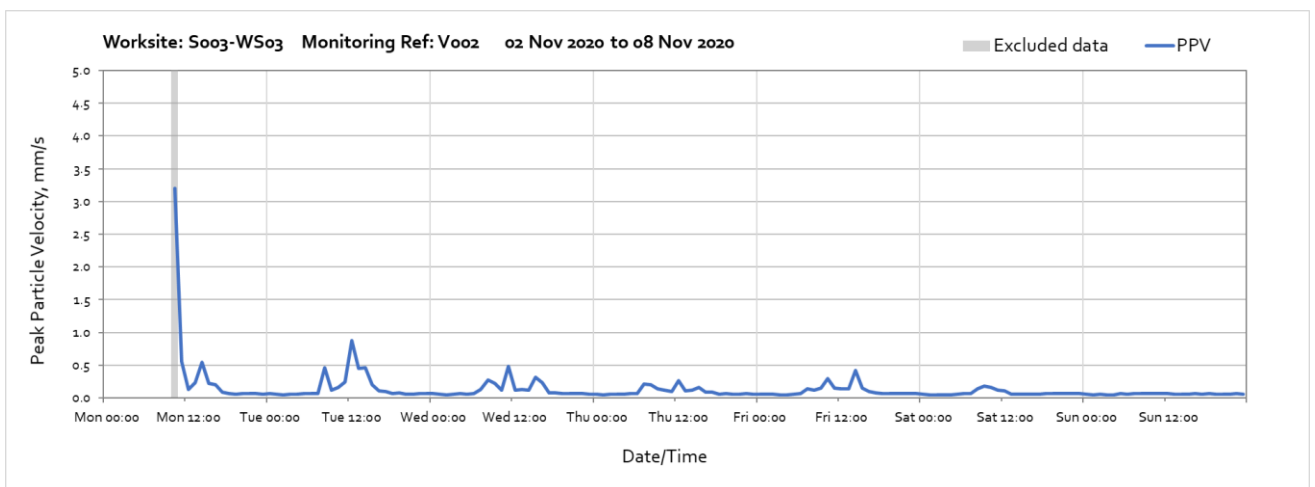
Note: High vibration levels measured throughout the week were due to the use of the neraby residential bin store and local interference of the monitor and are not representative of HS2 vibration levels.



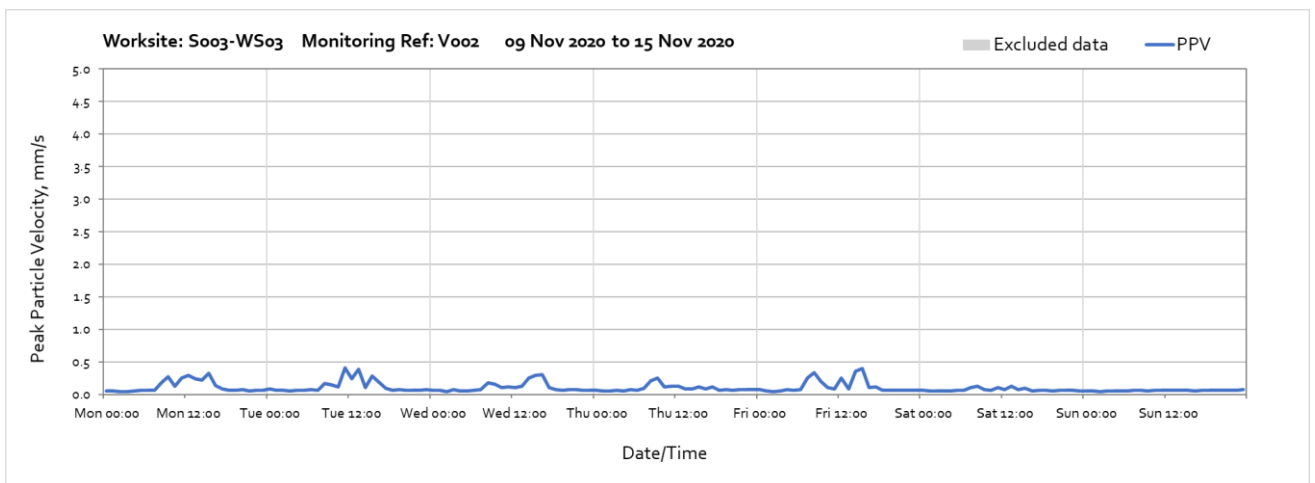
Note: High vibration levels measured throughout the week were due to the use of the neraby residential bin store and are not representative of HS2 vibration levels.

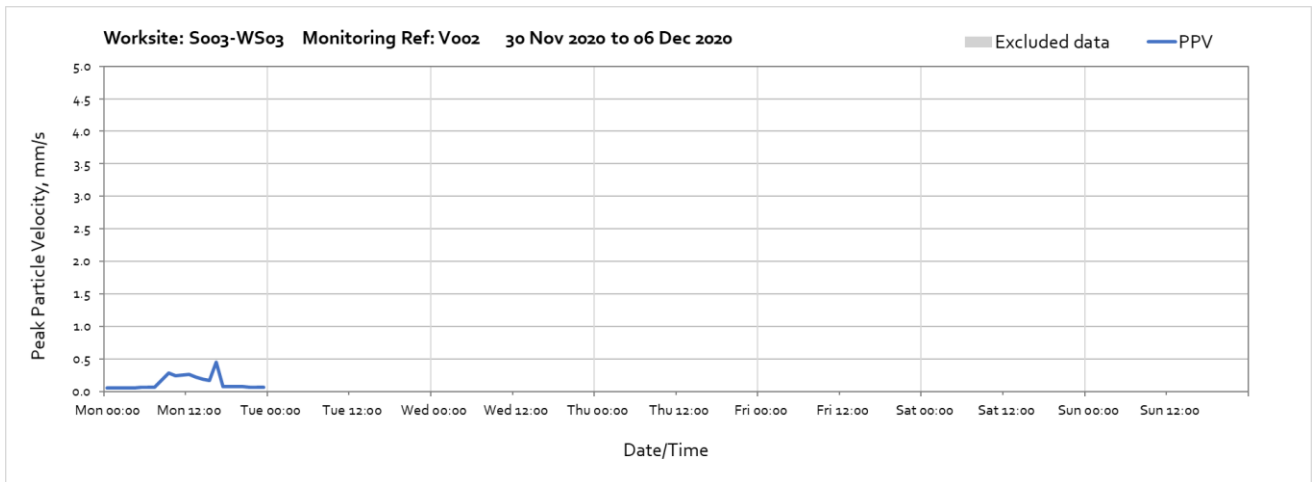
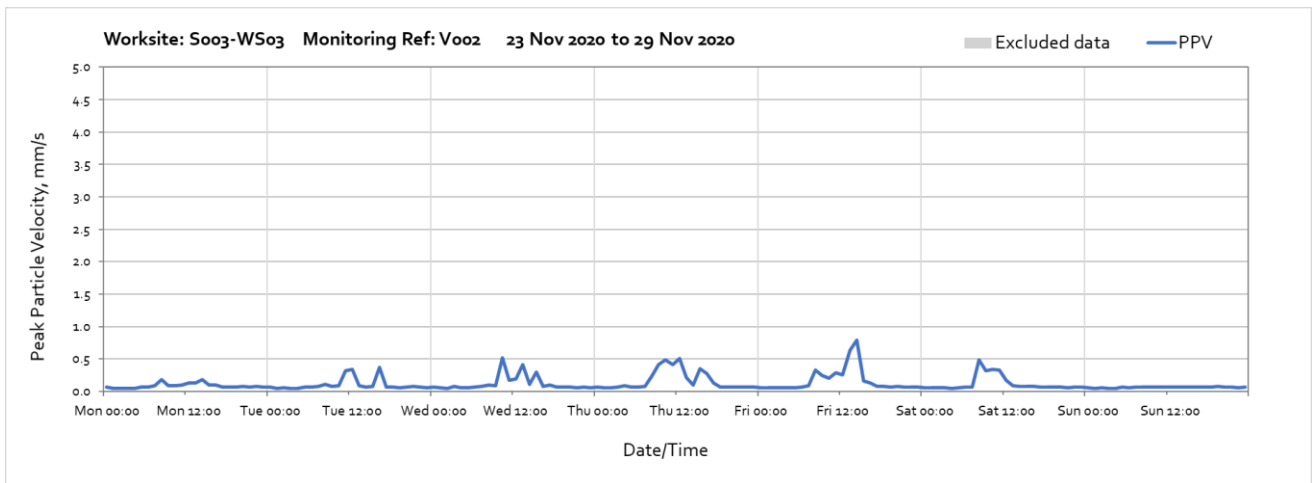
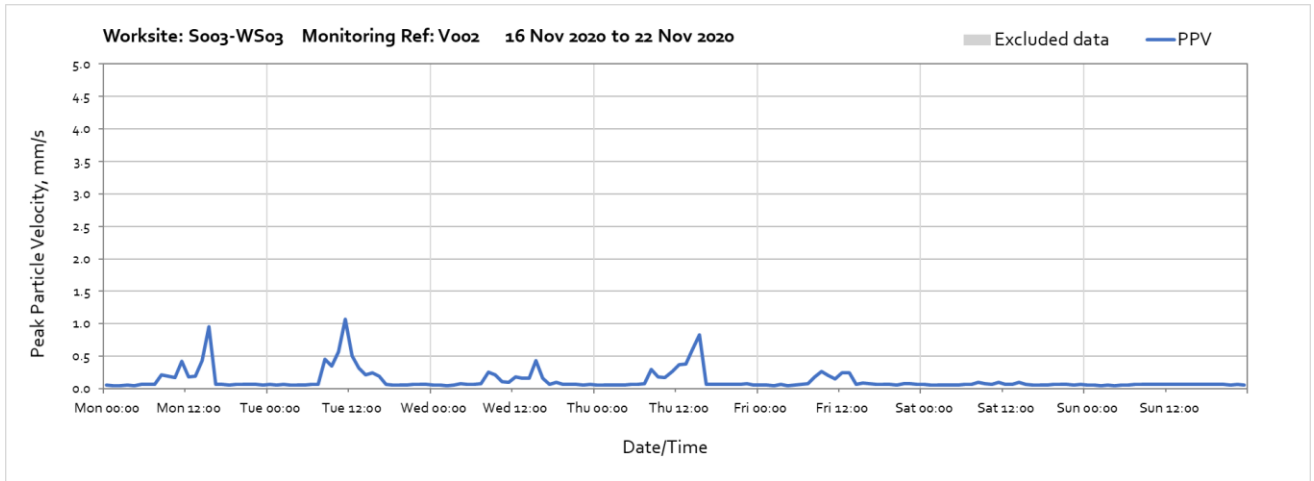


**Worksite: S003-WS03 – Monitoring Ref: V002**

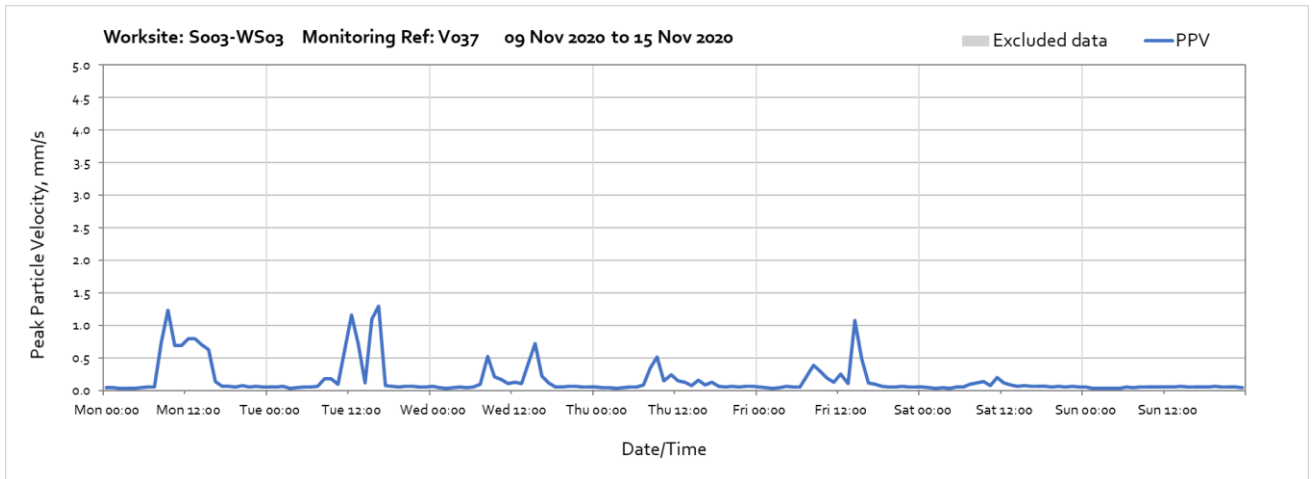
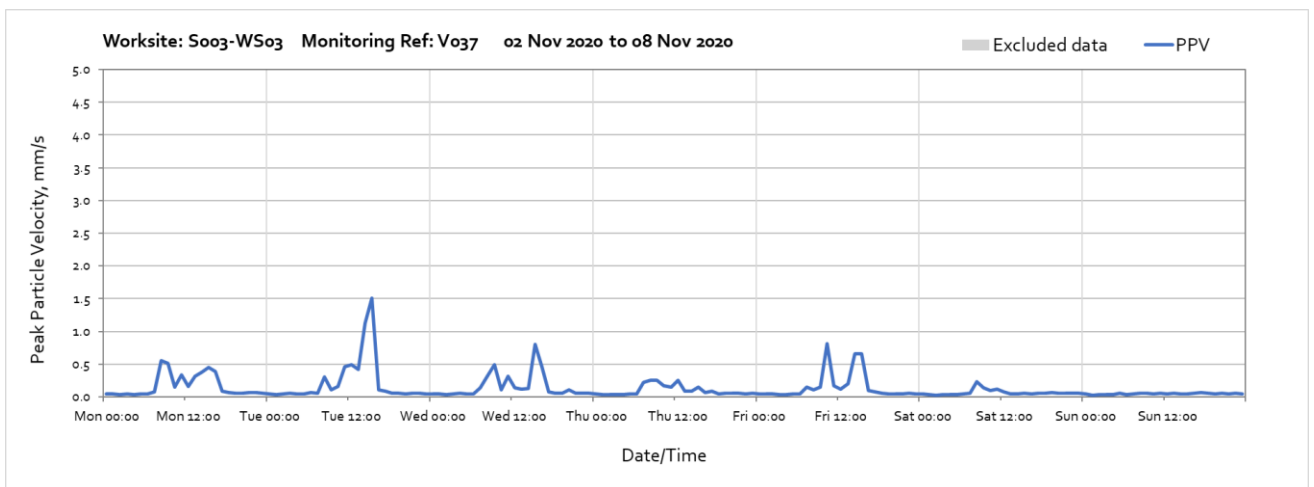
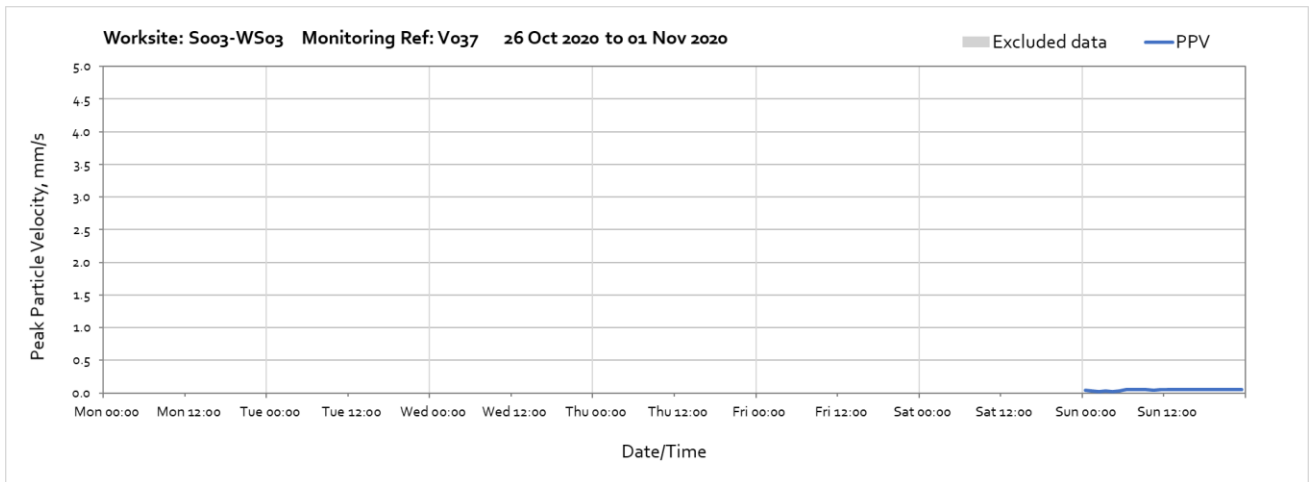


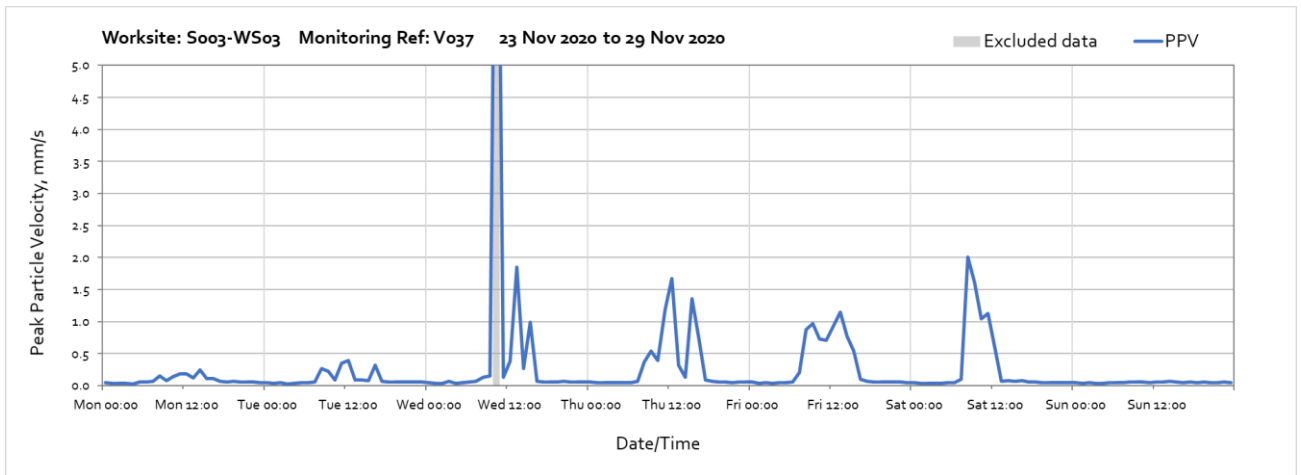
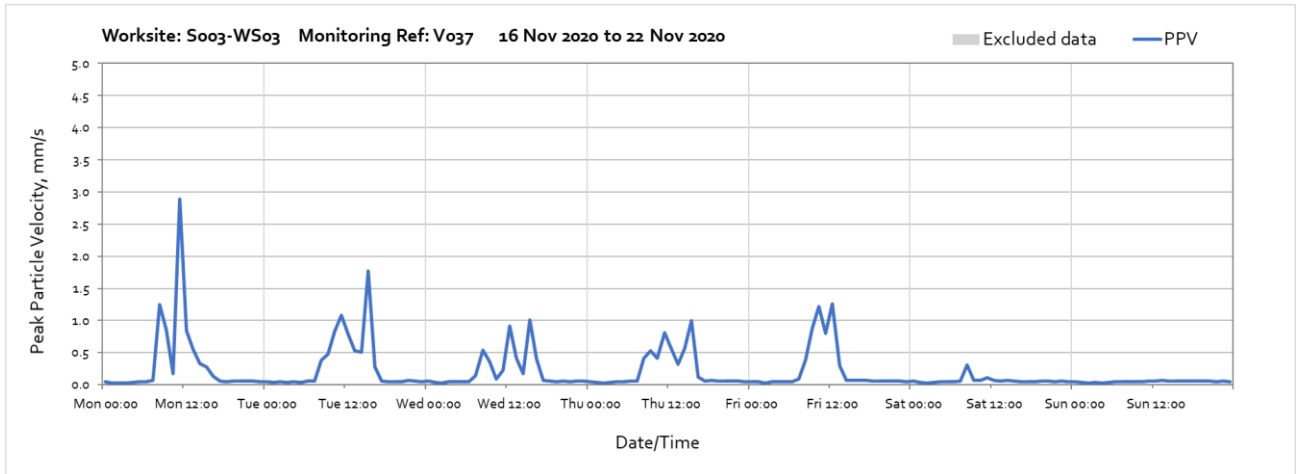
Note: Missing data from the start of the month until 10:00 on Monday 2<sup>nd</sup> November was due to the swapping of the vibration monitor between contractors. High vibration levels measured at 10:00 on Monday 2<sup>nd</sup> November was due to local disturbance of the vibration monitor during setup and are not representative of HS2 vibration levels.



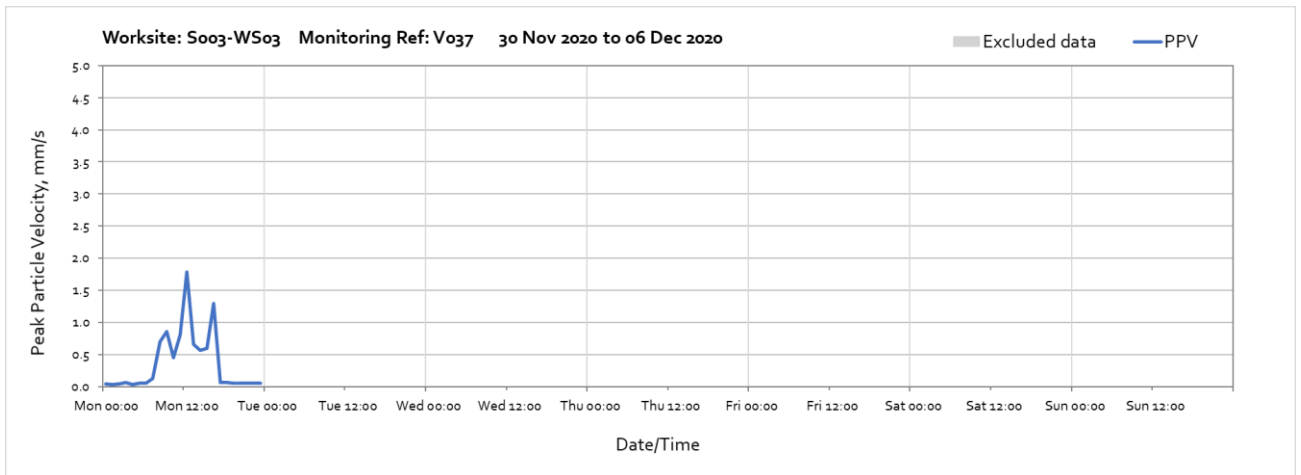


## Worksite: S003-WS03 – Monitoring Ref: V037

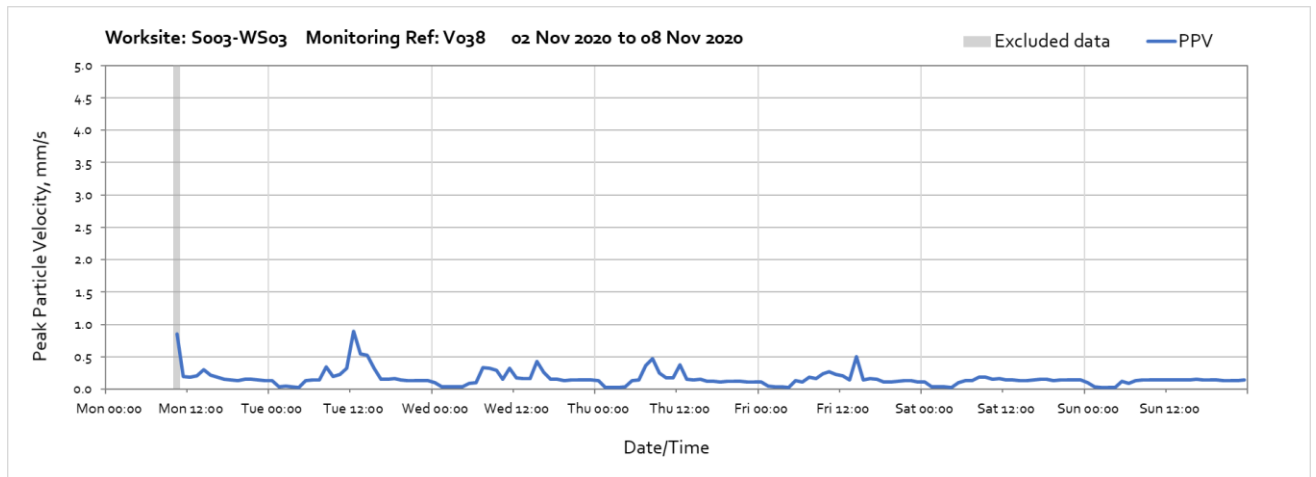




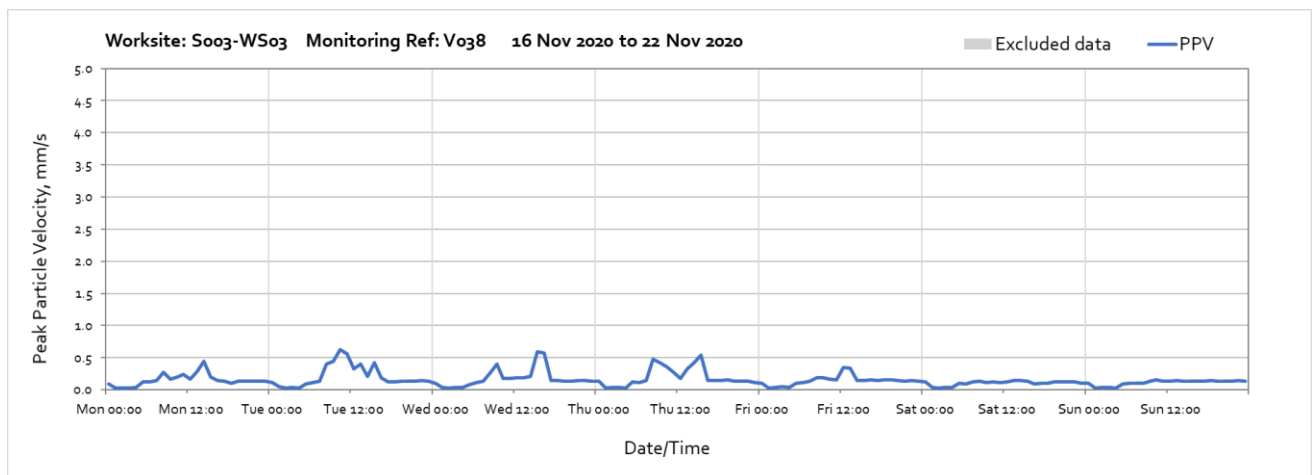
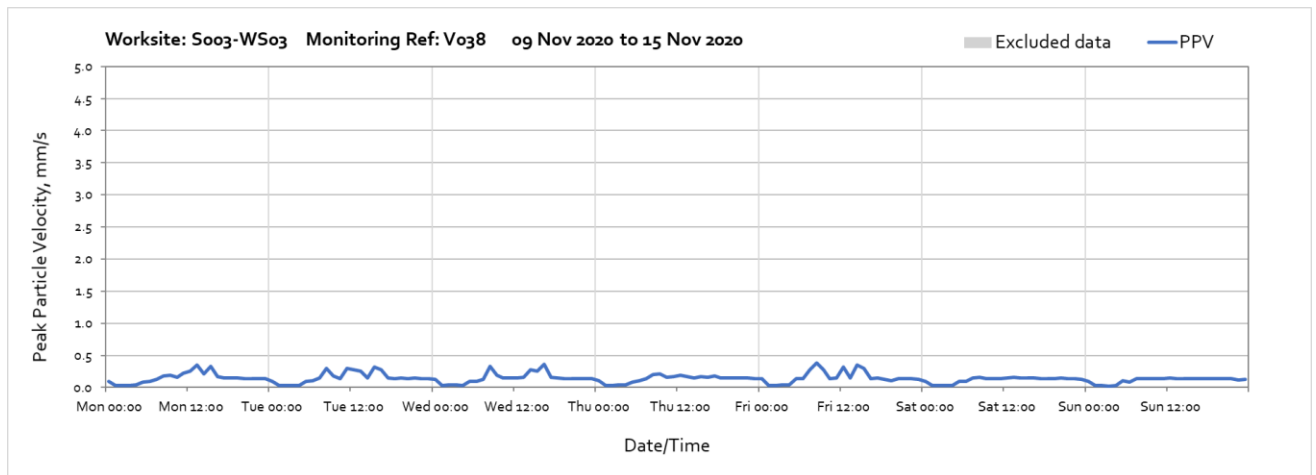
Note: High vibration levels measured at 10:00 on Wednesday 25<sup>th</sup> November was due to local disturbance of the vibration monitor and are not representative of HS2 vibration levels.

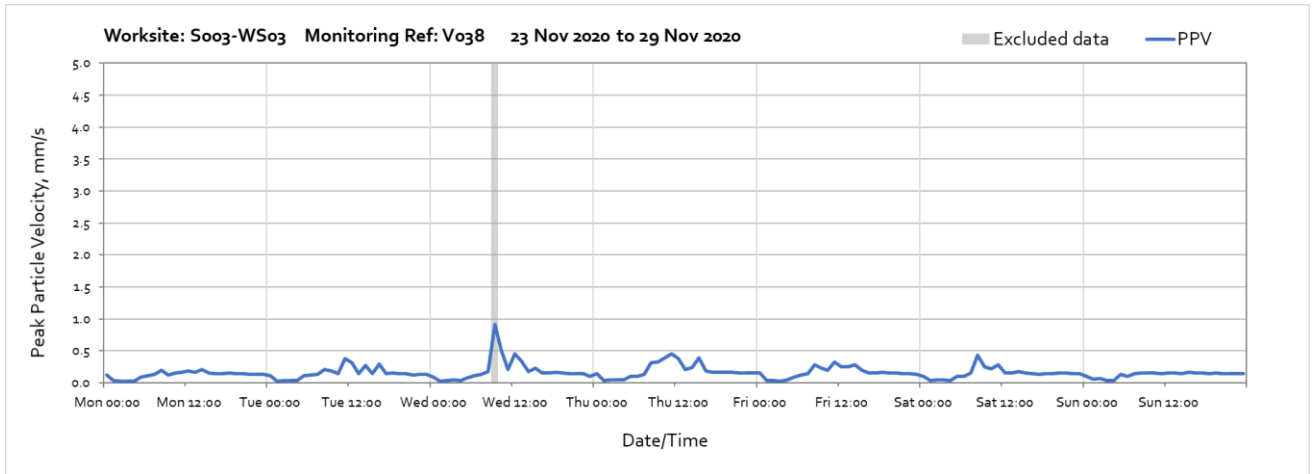


## Worksite: S003-WS03 – Monitoring Ref: V038

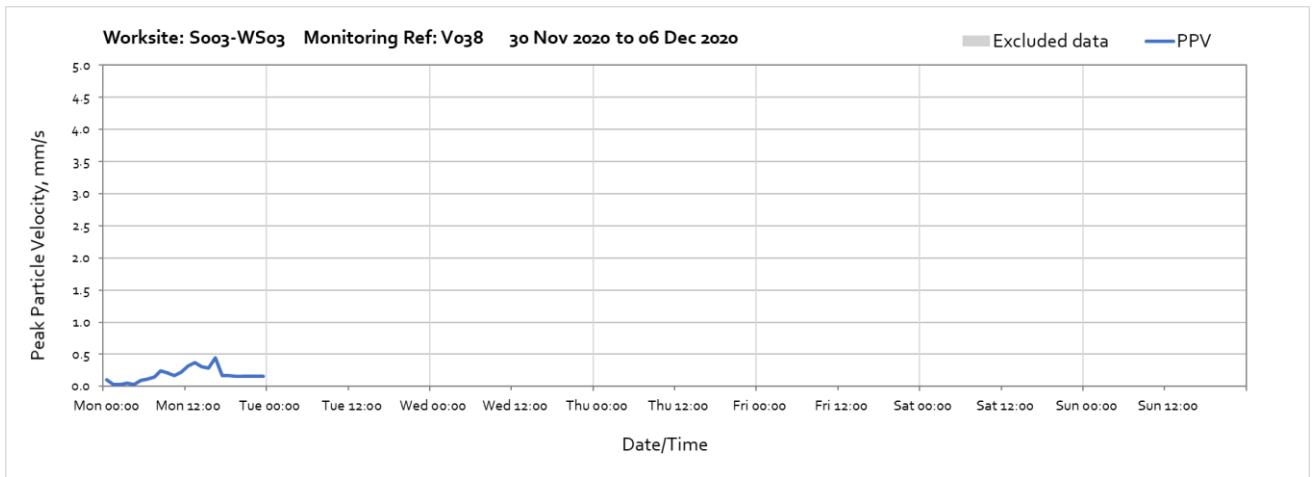


Note: Missing data from the start of the month until 10:00 on Monday 2nd November was due to the swapping of the vibration monitor between contractors.

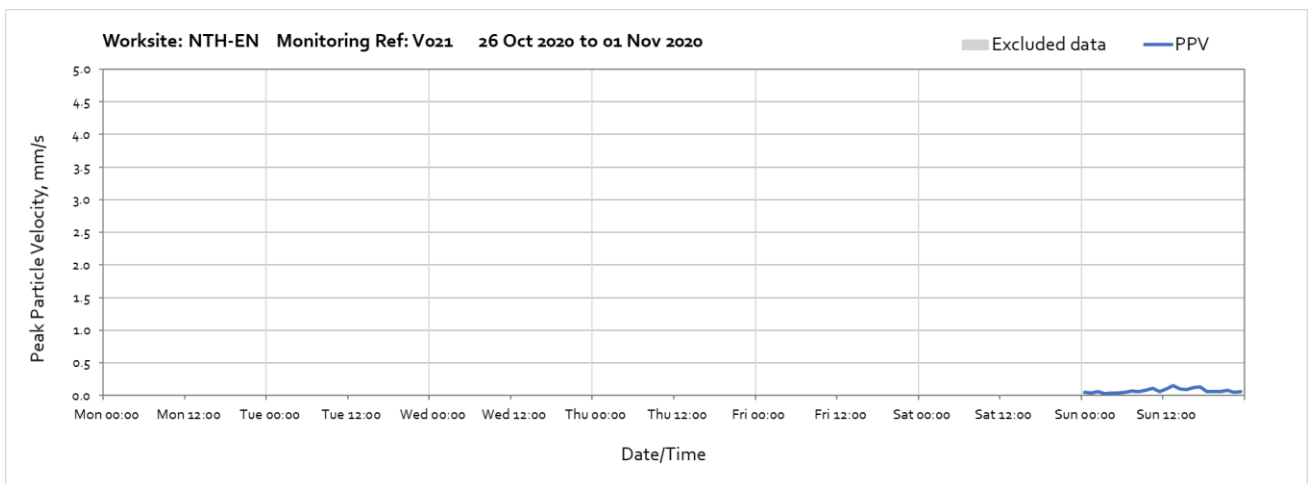




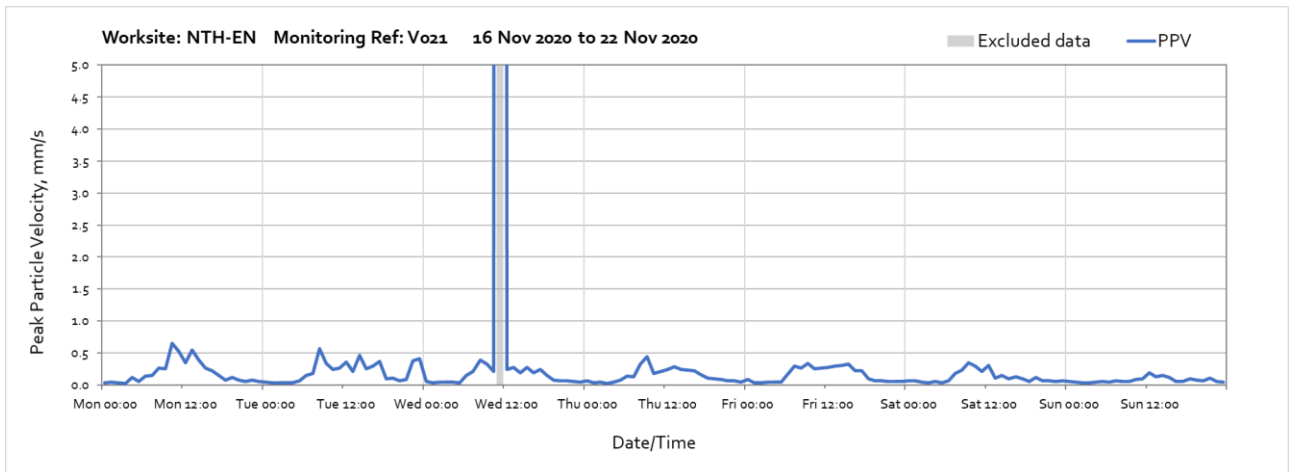
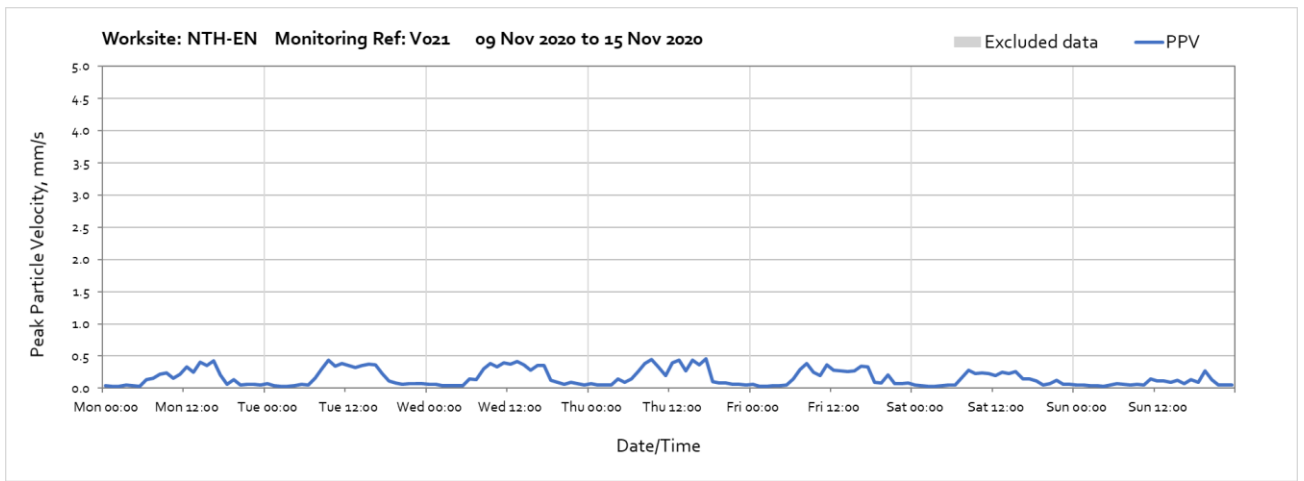
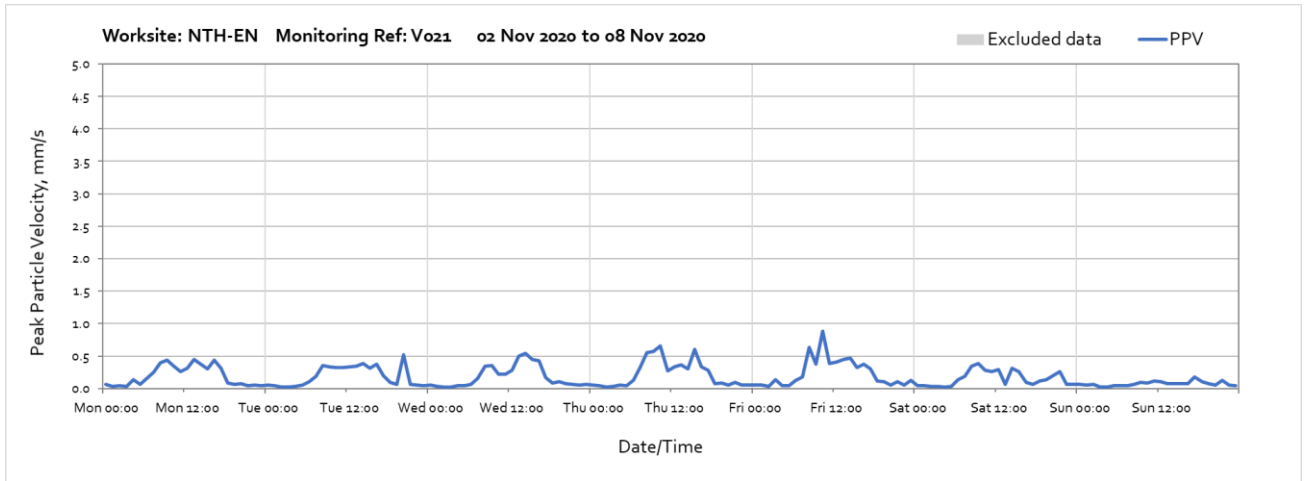
Note: High vibration levels measured at 09:00 on Wednesday 25<sup>th</sup> November was due to local disturbance of the vibration monitor during setup and are not representative of HS2 vibration levels.



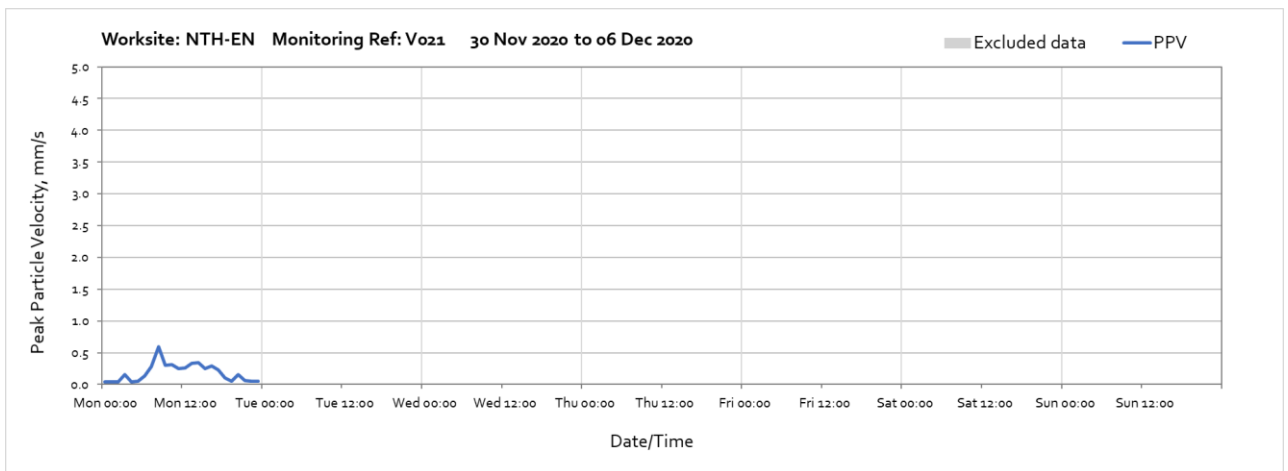
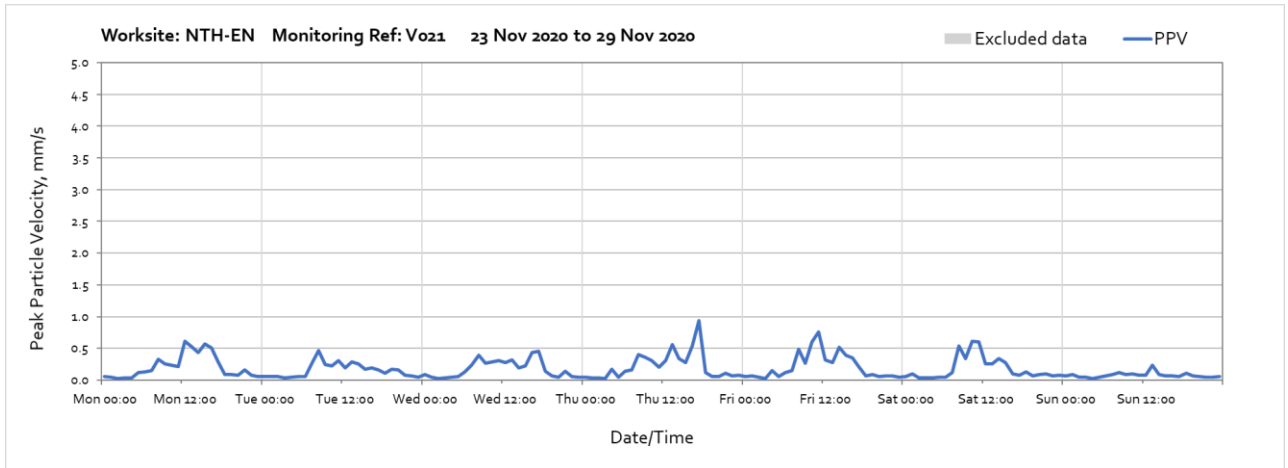
### Worksite: NTH-EN – Monitoring Ref: V021



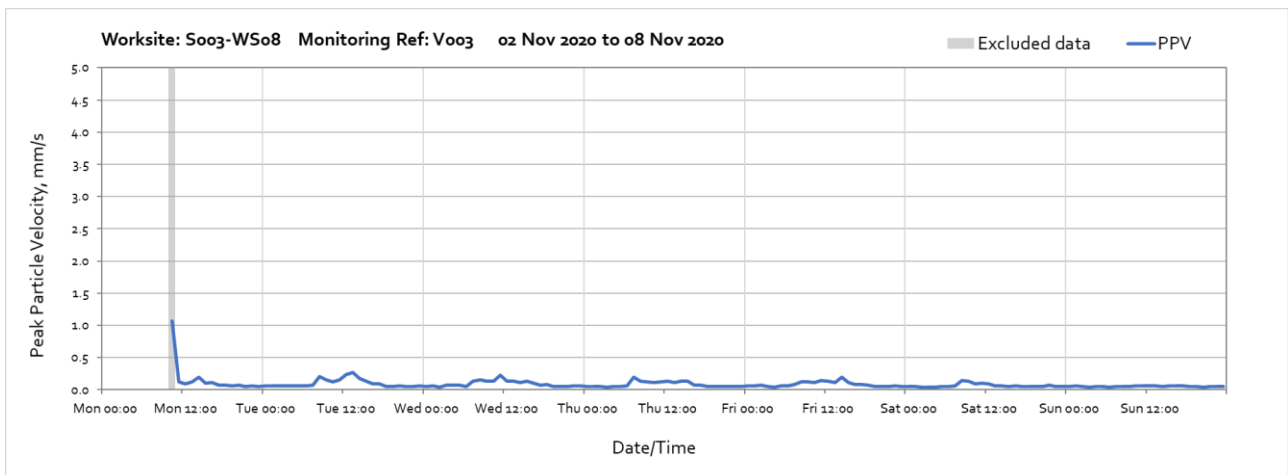




Note: High vibration levels measured at 11:00 on Wednesday 18<sup>th</sup> November was due to local disturbance of the vibration monitor during setup and are not representative of HS2 vibration levels.



**Worksite: S003-WS09 – Monitoring Ref: V003**



Note: Missing data from the start of the month until 10:00 on Monday 2nd November was due to the swapping of the vibration monitor between contractors.

