

Construction noise and vibration Monthly Report – May 2019

London Borough of Camden

Non-technical summary	1
Abbreviations and descriptions	3
1 Introduction	4
1.2 Measurement locations	6
2 Summary of results	7
2.1 Exceedances of SOAEL	7
2.2 Summary of measured noise and vibration levels	10
2.3 Exceedances of trigger level	14
2.4 Complaints	15
Appendix A Site Locations	19
Appendix B Monitoring Locations	24
Appendix C Data	31

List of tables

Table 1: Table of abbreviations	3
Table 2: Monitoring locations.	6
Table 3: Summary of exceedances of LOAEL and SOAEL.	8
Table 4: Summary of total exceedances of SOAEL.	10
Table 5: Summary of measured dB L_{Aeq} data over the monitoring period.	11
Table 6: Summary of measured PPV data over the monitoring period.	14
Table 7: Summary of exceedances of trigger levels.	15
Table 8: Summary of complaints.	15

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 (LBC) during the month of May 2019.

A number of worksites were active during the reporting month in the LBC area. Works at signal and telecommunication installations were underway at Network Rail worksite B. Works at Network Rail worksites C, D and E mainly included cabling, drainage, inspection for defects, removal of MEP assets and demobilisation works. Activities at Network Rail worksite F mainly included works at the substation building, cabling works and clearing of plant and materials. Excavations and concrete pouring were carried out at Network Rail worksite G. Ancillary activities were undertaken at the DB Cargo and former Addison Lee worksite (ref. S001-WS01) and at the former National Temperance Hospital, Insull Wing worksite (ref. S003-WS02). Demolition was underway at 132 and 140 Hampstead Road and Petrol Station, worksite (ref. S001-WS02) and at the Ibis Hotel, 3 Cardington Street & 1-3 Cobourg Street worksite (ref. S003-WS05). Archaeological excavations and construction of screening structures were underway at St James's Garden worksite (ref. S003-WS01). Removal of fixtures and fittings, demolition and scaffolding were carried out at Walkden House, 67-75 & 77-79 Euston Rd worksite (ref. S003-WS03) and removal of fixtures and fittings, asbestos removal, demolition and scaffolding at the Thistle Hotel worksite (ref. S003-WS04). Deliveries were carried out at the former National Temperance Hospital, 110-122 Hampstead Road worksite (ref. S003-WS06). Removal of fixtures and fittings and scaffolding were carried out at 93-103 Drummond Street, 11-15 Melton Street, 54-64 Euston Street, 69 Cobourg Street worksite (ref. S003-WS07) and at One Euston Square, 40 Melton Street, Grant Thornton House, 22 Melton Street worksite (ref. S003-WS09). Utilities diversions were also undertaken around Granby Terrace Bridge, along Stanhope Street, and Hampstead Road. Works to install main pipes were undertaken along Gloucester Gate, Albany Street, Redhill Street and Robert Street. Works for the construction of drive and reception shaft for tunnelling works were also undertaken at the London Zoo Car Park and at Park Village East. Works at the former National Temperance Hospital, Insull Wing worksite (ref. S003-WS02) were completed in May. Details of works undertaken at each worksite are presented in the report. Site setup for works at UK Power Network assets was undertaken near Regents Park Estate.

Noise monitoring was undertaken in the vicinity of Network Rail worksites B, C, D, E, F and G, the DB Cargo worksite (ref. S001-WS01), 132 and 140 Hampstead Road and Petrol Station worksite (ref. S001-WS02), St James's Gardens worksite (ref. S003-WS01), Walkden House, 67-75 & 77-79 Euston Rd worksite (ref. S003-WS03), the Ibis Hotel, 3 Cardington Street & 1-3 Cobourg Street worksite (ref. S003-WS05), former National Temperance Hospital, 110-122 Hampstead Road worksite (ref. S003-WS06), Drummond Street / Euston Street worksites (ref. S003-WS07), Ibis Hotel, Euston Square Gardens (west) worksite (ref. S003-WS08) and the Thistle Hotel (ref. S003-

WS04). Further noise monitoring was also undertaken at Regents Park Estate and in the vicinity of Regents Park Lorry Holding Area.

Vibration monitoring was undertaken in the vicinity of the at the former National Temperance Hospital, 110 Insull Wing worksite (ref. S003-WS02), the Walkden House, 67-75 & 77-79 Euston Road worksite (ref. S003-WS03), the Ibis Hotel, 3 Cardington Street & 1-3 Cobourg Street worksite (ref. S003-WS05) and the Ibis Hotel, Euston Square Gardens (west) worksite (ref. S003-WS08). Vibration monitor V009 was decommissioned on the 21st of May following completion of works at worksite S003-WS02.

Exceedances of the SOAELs were measured at some monitoring positions surrounding worksites B and C. Fifteen complaints were received during the monitoring period. Description of exceedance of trigger levels, complaints, results of investigations and any actions taken are detailed in the report.

Abbreviations and descriptions

The abbreviations, descriptions and project terminology used within this report can be found in the Project Dictionary (HS2-HS2-PM-GDE-000-000002).

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.
Equivalent continuous sound pressure level, or $L_{pAeq,T}$	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.
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.
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 The nominated undertaker 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 1st to 31st May 2019.

1.1.2 Active construction sites in the local authority area during this period include:

- Network Rail on-networks HS2 preparatory works: worksite ref. B (see plan 1 in Appendix A)
 - Works activities include bonding of signal and telecommunication installations, location of insulated block joints and movement of plant and vehicles.
- Network Rail on-networks HS2 preparatory works: worksite ref. C, D and E (see plan 2 in Appendix A)
 - Works activities include renewal of points, cable recovery, movements of plant and vehicles, inspection of structures and welds for defects, removal of earth cable, removal of MEP assets, drainage works, removal of haul road, site tidy and demobilisation works.
- Network Rail on-networks HS2 preparatory works: worksite ref. F (see plan 2 in Appendix A)
 - Works activities include alteration of hoarding to allow footpath reinstatement, works at the substation (including installation of door contact, handrail installation on roof and ground level, installation of cladding, installation of bird guard and installation of heaters, internal and external lighting works), works at high voltage and low voltage circuits (including cable works and

connections), coring, reinstatement of fence and clearing of plant and materials.

- Network Rail on-networks HS2 preparatory works: worksite ref. G (see plan 2 in Appendix A)
 - Works activities include excavation works and concrete pouring.
- DB Cargo shed and adjacent land on Granby Terrace, worksite ref. S001-WS01 (see plan 2 in Appendix A)
 - Works activities include ancillary activities at the former Addison Lee site.
- 132 and 140 Hampstead Road and Petrol Station, worksite ref. S001-WS02 (see plan 3 in Appendix A)
 - Works activities include demolition and processing.
- St James's Gardens, worksite ref. S003-WS01 (see plan 3 in Appendix A)
 - Works activities include archaeological excavations and construction of screening structures.
- Wolfson House, Walkden House, 67-75 & 77-79 Euston Rd, worksite ref. S003-WS03 (see plan 3 in Appendix A)
 - Works activities include removal of fixtures and fittings, scaffolding and demolition.
- Thistle Hotel, Cardington Street, worksite ref. S003-WS04 (see plan 3 in Appendix A)
 - Works activities include removal of fixtures and fittings, asbestos removal, scaffolding and demolition.
- Ibis Hotel, 3 Cardington Street & 1-3 Cobourg Street, worksite ref. S003-WS05 (see plan 3 in Appendix A)
 - Works activities include demolition.
- Former National Temperance Hospital, 110-122 Hampstead Road, worksite ref. S003-WS06 (see plan 3 in Appendix A)
 - Site activities include deliveries.
- 93-103 Drummond Street, 11-15 Melton Street, 54-64 Euston Street, 69 Cobourg Street, worksite ref. S003-WS07 (see plan 3 in Appendix A)
 - Works activities include removal of fixtures and fittings and scaffolding.
- One Euston Square, 40 Melton Street, Grant Thornton House, 22 Melton Street, worksite ref. S003-WS09 (see plan 3 in Appendix A)
 - Works activities include removal of fixtures and fittings and scaffolding.

- 1.1.3 Construction works at the former National Temperance Hospital, 110 Insull Wing worksite (ref. S003-WS02) were completed this month.
- 1.1.4 Further works were also undertaken as part of the Granby Terrace Bridge utilities diversion (GTB Utilities) on Stanhope Street and Hampstead Road. Works to install main pipes (including road breaking, pipe laying, backfilling and reinstatement) were undertaken along Gloucester Gate, Albany Street, Redhill Street and Robert Street. Works were undertaken within the London Zoo Car Park for the construction of a drive shaft to facilitate tunnelling works to Park Village East, where site set up was undertaken in the area of the reception shaft. Site setup for works at UK Power Network assets was undertaken near Regents Park Estate.

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. Noise and vibration reports prior to 2018 can be found at the following location www.gov.uk/government/publications/monitoring-noise-and-vibration-on-the-hs2-phase-one-route.

1.2 Measurement locations

- 1.2.1 Table 2 summarises the position of noise and vibration monitoring installations within the LBC area in May 2019.
- 1.2.2 Following completion of works at worksite S003-WS02 monitor ref. V009 was decommissioned on the 21st of May.
- 1.2.3 Maps showing the position of noise and vibration monitoring installations are presented in Appendix B.

Table 2: Monitoring locations.

Worksite Reference	Measurement Reference	Address
B	CC	Whittlebury Mews West
	JC	Juniper Crescent
C	MT2	Lamppost opposite to 49 Mornington Terrace
	N022	External to 34 Mornington Terrace
	N024	External to Park Village Studios, Park Village East
D	N004	Mornington Terrace, lamppost #7 (junction of Mornington Terrace, Mornington Place and Clarkson Row)
E	N005	5A Granby Terrace

Worksite Reference	Measurement Reference	Address
F	BS	Roof of Stockbeck House, Barnby Street
	N023	Lamppost #21 on Hampstead Road
G	HH	Euston Station Parcel Deck, Barnby Street
S001-WS01	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)
	N021	Stanhope Street, lamppost #2
S001-WS02	N018	Outside replacement housing, Hampstead Road
	N019	Outside Cartmel, Hampstead Road
S003-WS02	N016	Margaret Centre roof
	V009	Margaret Centre
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
S003-WS05	N014	Starcross Street lamppost (external to Exmouth Arms)
	V021	42-44 Cobourg Street
S003-WS06	N017	Hampstead Road, lamppost #48
S003-WS07	N012	Drummond Street, lamppost #14 (opposite to 92-94 Drummond Street)
S003-WS08	N007	Royal College of General Practitioners, Melton Street
	V003	Royal College of General Practitioners basement vaults under Melton St
Not near worksite	N020	Mackworth Street, lamppost #1
Not near worksite	N025	External to 3 Prince Albert Road
Not near worksite	N026	Thames Water Compound

2 Summary of results

2.1 Exceedances of SOAEL

2.1.1 The significant observed adverse effect levels (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."

2.1.2 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.

2.1.3 Table 3 presents a summary of recorded exceedances of the SOAEL due to HS2 related construction noise at each measurement location over the reporting period, including the number of exceedances during each time period.

Table 3: Summary of exceedances of LOAEL and SOAEL.

Worksite Reference	Measurement Reference	Site Address	Day (Weekday, Saturday, Sunday, Night)	Time period	Number of exceedances of SOAEL
B	CC	Whittlebury Mews West	All days	All periods	No exceedance
	JC	Juniper Crescent	Night	2200-0700	2*
C	MT2	Lamppost opposite to 49 Mornington Terrace	Night	2200-0700	5*
	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
D	N004	Mornington Terrace, lamppost #7	All days	All periods	No exceedance
E	N005	5A Granby Terrace	All days	All periods	No exceedance
F	BS	Barnby Street	All days	All periods	No exceedance
	N023	Amphill Estate, lamppost #21, Hampstead Road	All days	All periods	No exceedance
G	HH	Euston Station Parcel Deck, Barnby Street	All days	All periods	No exceedance
S001-WS01	N001	DB Cargo shed and adjacent land on Granby Terrace	All days	All periods	No exceedance
	N002	DB Cargo shed and adjacent land on Granby Terrace	All days	All periods	No exceedance
	N003	DB Cargo shed and adjacent land on Granby Terrace	All days	All periods	No exceedance
	N005	5A Granby Terrace	All days	All periods	No exceedance
	N021	Stanhope Street, lamppost #2	All days	All periods	No exceedance

Worksite Reference	Measurement Reference	Site Address	Day (Weekday, Saturday, Sunday, Night)	Time period	Number of exceedances of SOAEL
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-WS02	N016	Margarete Centre roof	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-WS05	N014	Ibis Hotel, 3 Cardington Street & 1-3 Cobourg Street	All days	All periods	No exceedance
S003-WS06	N017	Hampstead Road, lamppost #48	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
Not near worksite	N020	Mackworth Street, lamppost #1	All days	All periods	No exceedance
Not near worksite	N025	External to 3 Prince Albert Road	All days	All periods	No exceedance
Not near worksite	N026	Thames Water Compound	All days	All periods	No exceedance

* Exceedances have been identified as possibly due to HS2 works, investigations are ongoing and this number may be revised at a later date.

- 2.1.4 Over the reporting period the SOAEL was exceeded at measurement locations in the vicinity of worksite B and C. These were due to movements of plant and night time works at Juniper Crescent and Mornington Terrace.
- 2.1.5 Construction and demolition works taking place at worksites B, C, D, E, F, G, S001-WS02, S003-WS03, S003-WS04 and S003-WS05 along with utility diversion works for Granby Terrace were ongoing for the majority of the period and are likely to have given rise to noise which would have been audible beyond the site boundary and, at times, in excess of the LOAEL at sensitive receptors.
- 2.1.6 Activities taking place at other worksites were either intermittent or not considered to give rise to substantial levels of HS2 related construction noise during this period, with the measured noise levels largely dominated by the underlying ambient noise,

acknowledging that intermittent HS2 works may on occasion be taking place within the area.

2.1.7 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 4 and may be lower than the total sum of individual exceedances reported in Table 3 for each location.

Table 4: Summary of total exceedances of SOAEL.

Worksite Reference	Measurement Reference	Site Address	Total of SOAEL exceedances in the month
B	JC	Juniper Crescent	2*
C	MT2	Lamppost opposite to 49 Mornington Terrace	3*

* Exceedances have been identified as possibly due to HS2 works, investigations are ongoing and this number may be revised at a later date.

2.1.8 Monitoring of vibration peak particle velocity (PPV) was undertaken with the purpose of ensuring that construction generated vibration is not of such a magnitude to damage adjacent buildings, in accordance with Annex 1: Code of Construction Practice of the High Speed Rail (London-West Midlands) Environmental Minimum Requirements. There are no LOAEL and SOAEL criteria based on PPV applicable to HS2 construction vibration.

2.1.9 Transient vibration from demolition activities at S001-WS02 and S003-WS05 may have been perceptible on occasions within the closest residential premises in the area, although below levels representative of significant adverse effects.

2.2 Summary of measured noise and vibration levels

2.2.1 Table 5 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.

2.2.2 Noise monitoring in the vicinity of worksites B, C, D, E, F, G, S001-WS02, S003-WS03, S003-WS04 and S003-WS05 and around Granby Terrace Bridge is considered representative of HS2 Area South works during periods of construction works. Other worksites were not considered to be giving rise to substantial levels of HS2 related construction noise, with the measured noise levels largely dominated by the underlying ambient noise, acknowledging that intermittent HS2 works may on occasion be taking place within the area.

Table 5: Summary of measured dB L_{Aeq} data over the monitoring period.

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
B	CC	Whittlebury Mews West	Free-field	62.2 (65.3)	60.0 (64.2)	63.7 (65.6)	62.5 (66.1)	57.3 (65.1)	59.1 (62.4)	60.7 (64.1)	56.9 (57.5)	59.0 (65.7)	53.1 (61.5)	58.8 (65.1)	54.1 (62.7)
	JC	Juniper Crescent	Free-field	60.1 (62.6)	60.3 (67.7)	60.0 (63.1)	59.8 (64.1)	57.1 (62.2)	58.2 (59.5)	58.2 (59.0)	58.1 (58.8)	56.7 (59.8)	54.3 (57.5)	57.0 (59.9)	54.2 (58.2)
C	MT2	Lamppost opposite to 49 Mornington Terrace	Free field	62.7 (64.7)	63.8 (65.9)	63.6 (65.6)	62.2 (64.4)	58.6 (69.0)	60.6 (63.5)	63.1 (65.0)	63.6 (66.5)	61.3 (65.6)	56.8 (62.4)	60.0 (63.3)	56.0 (62.0)
	N022	External to 34 Mornington Terrace	Free-field	59.1 (62.2)	61.5 (67.5)	60.1 (62.5)	58.6 (60.7)	54.9 (62.4)	56.4 (58.3)	58.5 (59.4)	59.0 (59.9)	57.7 (60.1)	55.1 (67.4)	57.0 (63.2)	53.0 (59.1)
	N024	External to Park Village Studios, Park Village East	Free-field	56.4 (71.8)	60.1 (70.3)	56.6 (61.7)	56.3 (65.8)	52.4 (69.0)	52.6 (54.6)	55.6 (57.6)	54.9 (58.1)	56.6 (64.2)	51.9 (56.1)	53.1 (57.3)	51.1 (58.4)
D	N004	Mornington Terrace, lamppost #7	Free-field	63.7 (68.7)	64.8 (68.6)	65.0 (71.3)	64.7 (73.7)	60.7 (69.3)	63.9 (72.6)	64.0 (70.4)	64.7 (66.9)	63.8 (73.4)	59.8 (71.8)	63.1 (73.0)	58.3 (70.5)
E	N005	5A Granby Terrace	Free-field	66.0 (68.6)	66.8 (67.9)	66.9 (69.8)	65.9 (69.3)	63.7 (67.7)	63.8 (64.6)	67.4 (71.1)	64.5 (64.6)	65.8 (72.3)	64.1 (67.4)	65.3 (71.8)	63.4 (66.8)
F	BS	Roof of Stockbeck House, Barnby Street	Free-field	62.4 (66.1)	64.7 (68.8)	61.9 (64.7)	60.8 (63.6)	58.4 (65.5)	61.0 (64.5)	63.6 (65.2)	61.9 (62.1)	60.9 (64.9)	57.5 (61.8)	60.6 (64.4)	57.7 (62.0)
	N023	Ampthill Estate, Hampstead Road	Free-field	69.7 (71.3)	70.0 (71.8)	69.4 (71.9)	69.1 (71.8)	67.5 (73.3)	68.2 (68.4)	68.9 (69.1)	69.4 (70.3)	69.3 (72.6)	67.7 (71.9)	68.8 (73.3)	67.7 (73.2)
G	HH	Euston Station Parcel Deck, Barnby Street	Free-field	63.6 (67.2)	66.7 (68.4)	63.9 (65.9)	63.9 (71.6)	61.6 (68.6)	64.2 (64.2)	63.4 (63.4)	- ⁽¹⁾ - ⁽¹⁾	63.5 (65.9)	62.0 (65.5)	63.0 (66.0)	60.1 (61.8)

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
S001-WS01	N001	External to Cubitt Court, 100 Park Village East	Façade	56.2 (61.6)	64.2 (78.2)	57.7 (61.4)	56.9 (61.2)	52.4 (61.7)	54.2 (55.7)	67.5 (70.6)	65.7 (85.8)	56.7 (59.5)	54.4 (59.7)	55.5 (60.5)	51.6 (56.5)
	N002	Richmond Court, Park Village East	Free-field	58.1 (60.9)	60.6 (62.5)	60.4 (65.3)	59.9 (75.9)	54.2 (61.5)	56.6 (57.2)	59.6 (62.1)	61.7 (66.5)	59.8 (64.0)	55.2 (59.7)	59.0 (68.7)	53.5 (60.4)
	N003	Silsoe House, Park Village East	Free-field	58.1 (61.2)	60.4 (62.3)	60.4 (62.7)	59.7 (64.7)	55.0 (62.7)	56.2 (57.1)	59.3 (60.9)	58.0 (58.4)	59.8 (62.7)	55.6 (59.8)	58.4 (63.3)	54.5 (60.4)
	N021	Stanhope Street, lamppost #2	Free-field	53.2 (65.4)	66.4 (80.1)	53.3 (59.7)	52.5 (56.0)	49.9 (65.3)	51.3 (52.2)	71.0 (80.6)	60.8 (77.0)	52.4 (56.1)	49.6 (54.3)	51.6 (55.0)	48.4 (53.8)
S001-WS02	N018	Outside replacement housing, Hampstead Road	Free-field	71.2 (72.4)	74.6 (76.1)	72.9 (77.0)	72.3 (76.5)	70.6 (77.2)	70.2 (71.8)	74.3 (74.9)	70.9 (71.2)	72.7 (78.7)	71.2 (76.5)	71.5 (76.6)	70.2 (73.7)
	N019	Outside Cartmel, Hampstead Road	Free-field	69.9 (72.6)	72.5 (73.9)	71.3 (74.1)	71.0 (75.0)	69.3 (73.9)	69.0 (70.0)	72.2 (72.6)	69.7 (70.0)	71.0 (75.1)	70.2 (78.1)	70.2 (74.5)	69.3 (74.1)
S003-WS03	N006	RCGP Roof level	Free-field	51.7 (53.1)	66.3 (75.0)	51.5 (53.8)	51.8 (56.1)	50.8 (64.8)	52.5 (53.6)	62.3 (65.5)	51.1 (51.7)	51.8 (53.4)	51.3 (52.7)	51.8 (60.9)	49.7 (52.5)
	N008	RCGP Stephenson Way	Façade	63.9 (70.0)	65.9 (70.5)	56.3 (69.3)	56.9 (72.6)	58.7 (72.4)	56.9 (59.6)	63.4 (66.0)	55.4 (56.8)	55.2 (62.4)	53.4 (54.9)	54.4 (58.4)	61.9 (73.8)
	N010	Wesley Hotel	Façade	66.7 (67.7)	69.5 (72.4)	65.9 (66.8)	66.1 (67.4)	62.9 (67.5)	66.3 (66.8)	68.5 (72.2)	66.3 (66.5)	66.4 (70.7)	63.7 (67.4)	66.4 (67.5)	60.9 (67.8)
	N011	Outside 82 Euston Street	Free-field	58.3 (64.9)	62.3 (64.4)	57.4 (64.5)	56.9 (67.7)	55.4 (65.5)	54.7 (55.8)	60.5 (62.0)	56.3 (57.2)	56.4 (62.0)	52.8 (56.6)	55.7 (61.9)	52.9 (58.7)
S003-WS05	N014	Starcross Street	Free-field	55.0 (59.8)	61.5 (64.9)	60.3 (68.2)	59.7 (68.3)	53.9 (66.6)	51.2 (53.4)	59.0 (62.6)	59.6 (64.1)	56.8 (61.4)	53.0 (63.5)	54.8 (59.5)	51.6 (60.7)

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-WS06	N016	Margaret Centre roof	Free-field	54.9 (57.7)	61.3 (65.8)	55.5 (58.6)	55.6 (62.1)	58.4 (72.8)	54.1 (55.5)	60.9 (62.1)	56.1 (57.7)	56.9 (62.0)	61.8 (71.0)	55.2 (60.1)	60.8 (70.8)
	N017	Hampstead Road, lamppost #48	Free-field	70.5 (72.4)	71.8 (73.1)	71.6 (76.1)	71.1 (75.9)	69.2 (73.4)	69.2 (70.3)	70.9 (71.3)	69.5 (70.0)	71.3 (75.6)	70.0 (77.7)	70.3 (73.2)	69.0 (73.4)
S003-WS07	N012	Opposite 92-94 Drummond Street	Free-field	58.0 (60.3)	63.5 (67.3)	58.9 (61.1)	59.7 (66.5)	56.6 (66.0)	57.1 (58.0)	62.7 (65.4)	59.4 (60.1)	59.1 (60.7)	56.6 (59.8)	58.6 (64.1)	55.8 (63.4)
S003-WS08	N007	RCGP, Melton Street	Free-field	66.3 (67.8)	67.0 (69.4)	64.9 (67.6)	65.4 (69.4)	64.4 (74.7)	64.0 (64.6)	65.5 (66.2)	66.9 (67.4)	64.7 (67.5)	63.3 (66.3)	64.0 (66.0)	63.0 (66.8)
Not near worksite	N020	Mackworth Street	Free-field	52.8 (55.8)	60.9 (65.4)	55.4 (70.8)	52.3 (56.9)	50.4 (64.1)	52.1 (54.9)	59.7 (62.0)	50.6 (51.4)	53.0 (58.8)	50.3 (54.3)	52.1 (57.3)	50.4 (59.0)
Not near worksite	N025	External to 3 Prince Albert Road	Free-field	68.8 (72.3)	68.1 (69.5)	67.7 (69.4)	67.4 (74.4)	65.3 (73.2)	66.2 (66.6)	67.0 (67.6)	68.2 (69.7)	67.2 (70.9)	65.8 (68.8)	66.2 (71.6)	65.4 (71.6)
Not near worksite	N026	Thames Water Compound	Free-field	57.4 (59.9)	61.1 (68.7)	56.6 (60.8)	55.9 (60.4)	52.5 (59.3)	54.4 (55.6)	57.3 (59.0)	55.4 (57.3)	56.6 (61.8)	52.8 (56.5)	55.4 (63.3)	52.0 (56.7)

(1) Due to loss of power at the monitoring station insufficient data were recorded during this time period.

2.2.3 Table 6 presents a summary of the measured vibration levels at monitoring locations V002, V003, V009 and V021 over the reporting period. During the monitoring high values of PPV were measured at V021 which were due to local disturbance of the vibration monitors and are not representative of HS2 construction works. These have been greyed out in the charts alongside other periods of local disturbance of the monitor as shown in Appendix B, and have been excluded to calculate values in Table 6. The highest PPV measured during the monitoring along any axis is presented in the table.

Table 6: Summary of measured PPV data over the monitoring period.

Worksite Reference	Measurement Reference	Site Address	Highest PPV measured in any axis, mm/s
S003-WS02	V009	Margarete Centre	1.27 (Z-axis)
S003-WS03	V002	Royal College of General Practitioners basement boiler room by Stephenson Way	0.79 (Z-axis)
S003-WS05	V021	42-44 Cobourg Street	1.34 (Z-axis)
S003-WS08	V003	Royal College of General Practitioners basement vaults under Melton St	0.43 (Z-axis)

2.2.4 Appendix C presents graphs of noise and vibration monitoring data over the month for each of the measurement locations. Noise data presented consist 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>.

2.3 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 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
-	-	-	-	-	-

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

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.

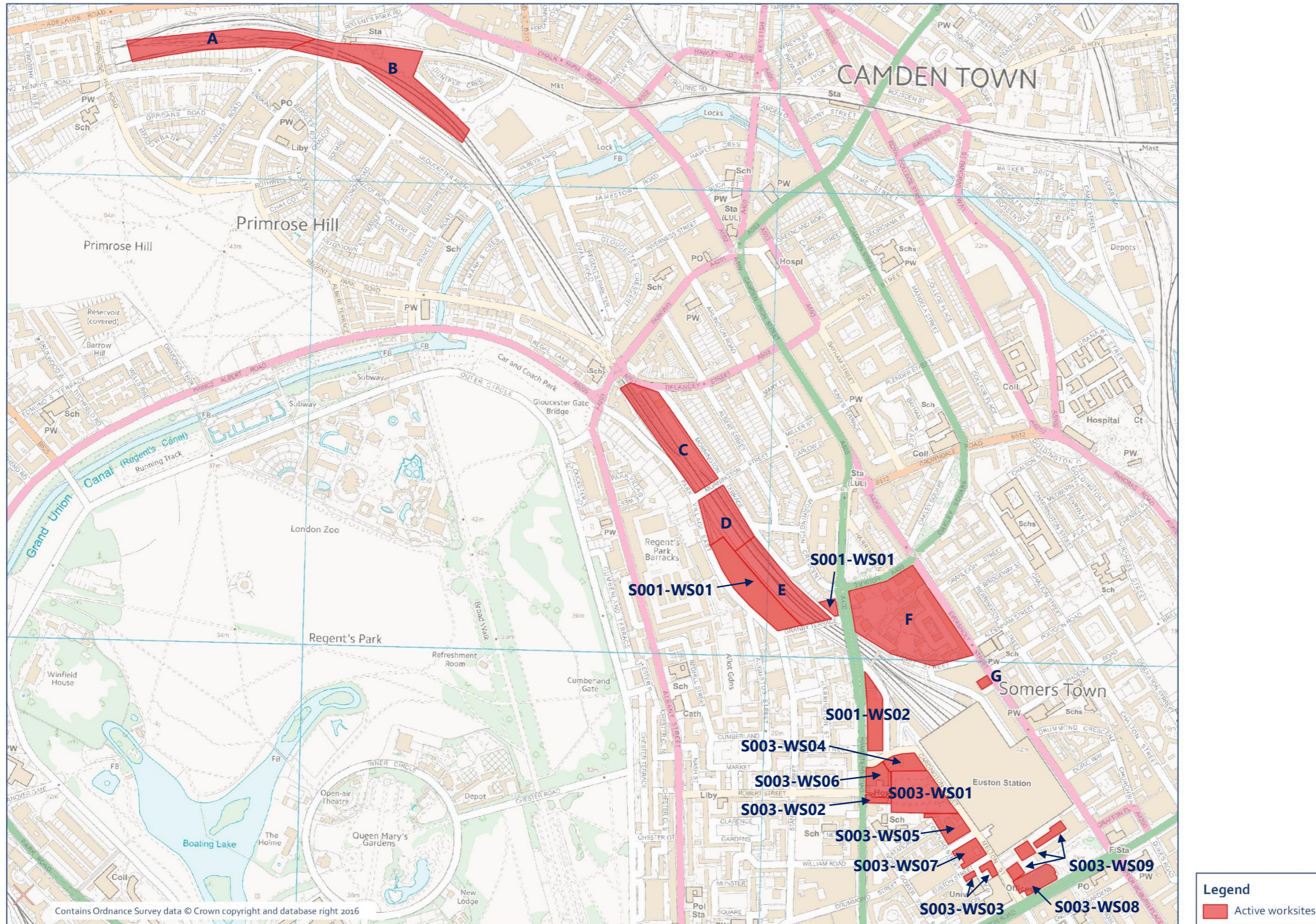
Complaint reference number	Worksite reference	Description of complaint	Results of investigation	Actions taken
HS2-19-02642-C	C	Complaint from resident on Delancey Street regarding noise during demolition works in the area and during night-time periods.	No HS2 construction activities were ongoing at the time of the complaint.	Resident was contacted and advised of the outcome of investigation.
HS2-19-02695-C	S001-WS02	Complaint from resident on Harrington Street regarding construction noise during daytime periods.	HS2 Community Engagement was contacted and agreed provision of noise insulation.	Installation of noise insulation is ongoing and the resident has been contacted to provide further information on planned works.
HS2-19-02717-C	S001-WS02	Complaint from resident of Cartmel on Hamsptead Road regarding construction noise during a weekend period.	Construction activity taking place at UCL. Investigations confirmed work methodology was according to S61 consent, noise and vibration levels were below trigger levels.	Resident was contacted and explanation provided along with confirmation that acoustic screening was in place.
HS2-19-02857-C	S003-WS03	Complaint from the Royal College of General Practitioners regarding perceptible vibration within the building.	The complainant has identified the source as drilling on partition wall of Walkden House building.	Work was stopped and reviewed, confirmed within methodology. Explanation provided.

Complaint reference number	Worksite reference	Description of complaint	Results of investigation	Actions taken
HS2-19-02977-C	E / S001-WS01	Complaint from resident of Cubitt Court about being continuously exposed to loud construction noise throughout day and night.	Construction activity taking place at worksites in the area. Investigations confirmed work methodology was according to S61 consent, noise and vibration levels were below trigger levels.	Resident was contacted and explanation provided along with confirmation that acoustic screening was in place.
HS2-19-02980-C	S001-WS02	Complaint from resident of Mardale on Hampstead Road about vibration and continuous construction noise.	Ongoing vibration monitoring in the area indicates that highest vibration levels are likely to have been perceptible within the premises, however were below levels that could potentially cause structural damage.	Resident was contacted and informed about vibration monitoring being undertaken and that current vibration levels are not of an extent to cause damage to the property.
HS2-19-03086-C	S003-WS05	Complaint from resident on Starcross Street working evenings and resting during the day, complaining about construction noise and vibration.	Breaking out of concrete slabs was ongoing at the Ibis Hotel. However work methodology was according to S61 consent, noise and vibration levels were below trigger levels and did not exceed the SOAEL.	Resident was contacted and advised of the outcome of investigation and provided with further information on planned works.
HS2-19-03457-C	S001-WS02	Complaint from resident of Cartmel on Hampsstead Road about vibration and seeking information on timescales.	Investigation identified that this was as a result of the breaking out of the basement concrete on the road side at UCL.	Resident reassured that there is no risk to the building and confirmed that this section of work would be completed within a week.
HS2-19-03497-C	S001-WS02	General complaint from resident of Newlands on Harrington Street working from home regarding construction noise and vibration.	Measured noise levels were below S61 trigger levels and did not exceed the SOAEL. Investigation of the vibration complaint is still ongoing.	Resident was contacted to advise regarding the noise insulation scheme. Investigation of the vibration complaint is still ongoing.

Complaint reference number	Worksite reference	Description of complaint	Results of investigation	Actions taken
HS2-19-03499-C	S003-WS03	Complaint from the Royal College of General Practitioners regarding perceptible vibration within the building for prolonged periods.	Works to remove a concrete basement at the former UCL building. Work methodology was according to S61 consent and ongoing vibration monitoring indicates that highest vibration levels are likely to have been perceptible within the premises, however were below levels that could potentially cause structural damage. Vibration generating works will be near to the property only for a short duration.	Resident was informed of results of investigation and programme of works.
HS2-19-03524-C	S001-WS02	Complaint from resident of Cartmel on Hampstead Road about strong vibration in the building.	Vibration generating works were ongoing at the Hampstead Road worksite. Work methodology was according to S61 consent and ongoing vibration monitoring indicates that highest vibration levels are likely to have been perceptible within the premises, however were below levels that could potentially cause structural damage.	Resident was informed of results of investigation and programme of works.
HS2-19-03629-C	S003-WS05	Complaint from non-residential premises on North Gower Street about strong vibration in the building causing objects to fall off desks.	There were no HS2 vibration generating works being undertaken at the Ibis Hotel worksite at the time of the complaint. Other non-HS2 building renovation projects are closer to the premises and may be the cause of vibration.	Resident was contacted by the contractor and informed of results of investigation.

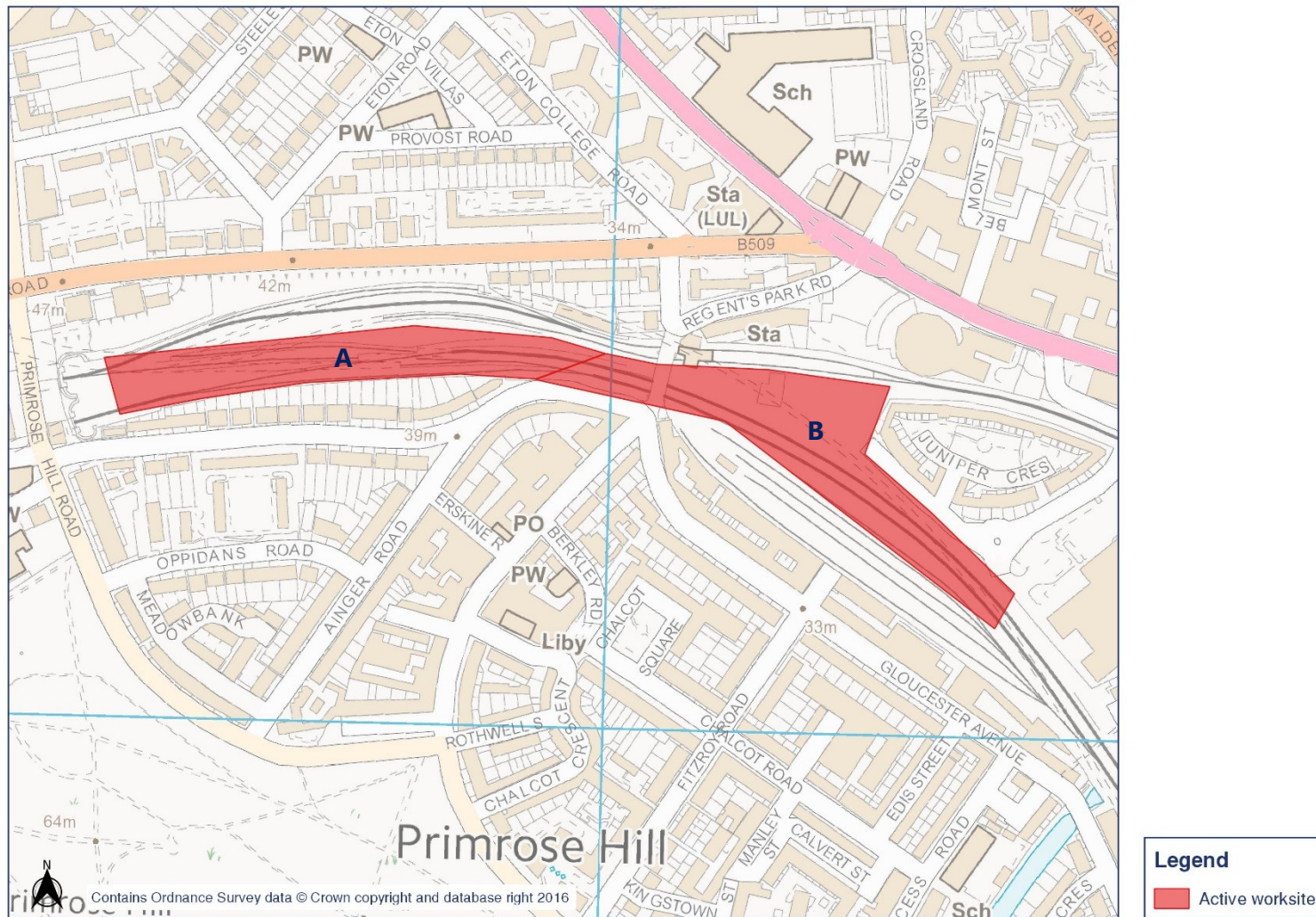
Complaint reference number	Worksite reference	Description of complaint	Results of investigation	Actions taken
HS2-19-03707-C	-	Complaint from resident of Regent's Park Estate regarding construction noise including bursts of knocking noise during daytime for a prolonged period.	Due to the location of the property being far from any HS2 construction sites the complaint is unlikely to be related to HS2 construction works.	Response provided to complainant.
HS2-19-03910-C	S003-WS05 / S003-WS07	Complaint from resident on Drummond Street about noise from works at night.	Scaffolding being erected during night-time working hours due to exclusion zone around the station concourse. Confirmed that modular system being used and no hammering taking place. Works being carried out in line with S61 requirements and noise did not exceed limits.	Explanation provided to the complainant .
-	Thames Water Compound	A complaint was received regarding noise from a Safety Alarm on a crane.	Alarmed crane within Thames Water Compound.	Alternative alarm systems are currently being considered.

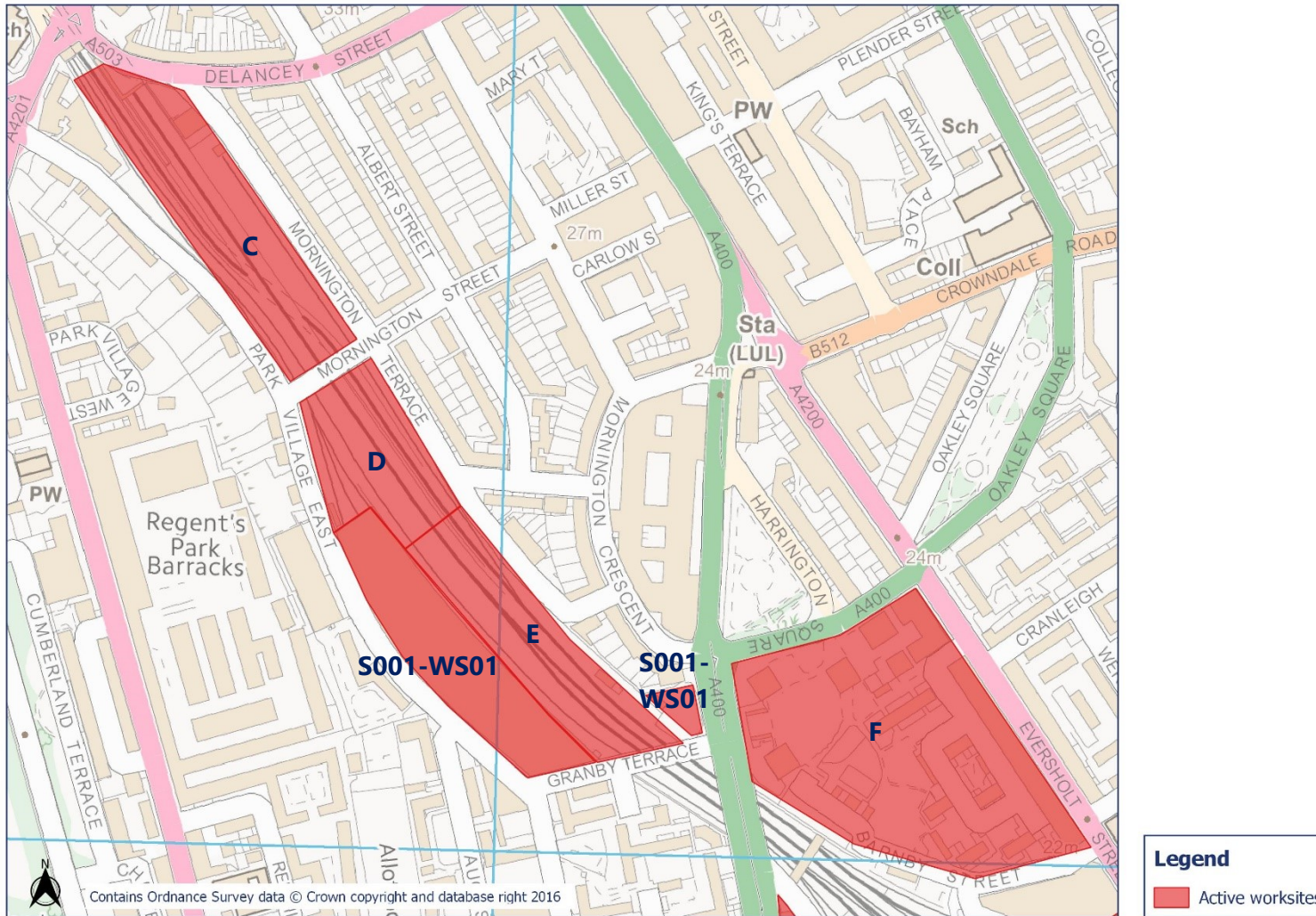
Appendix A Site Locations

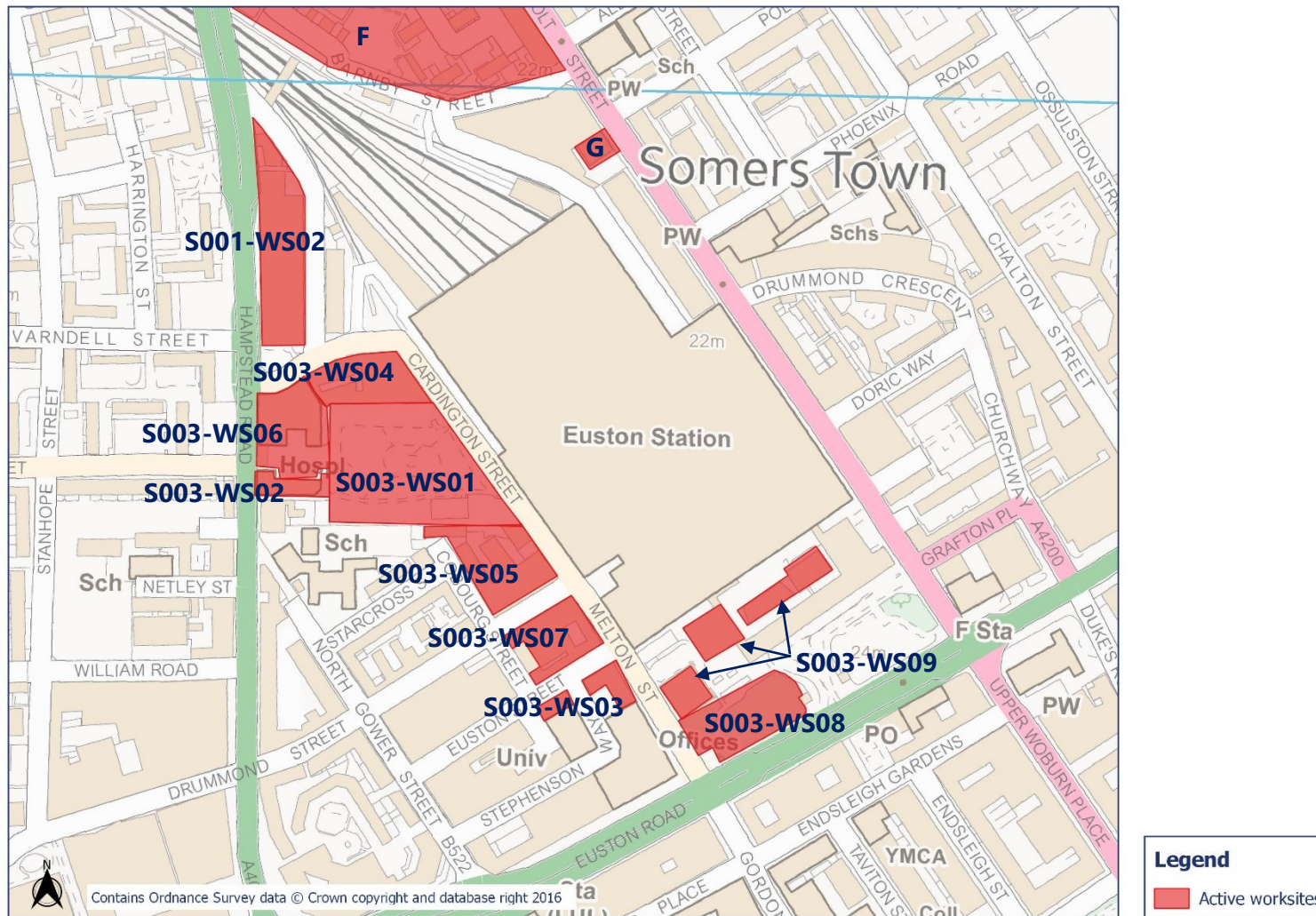


HS2

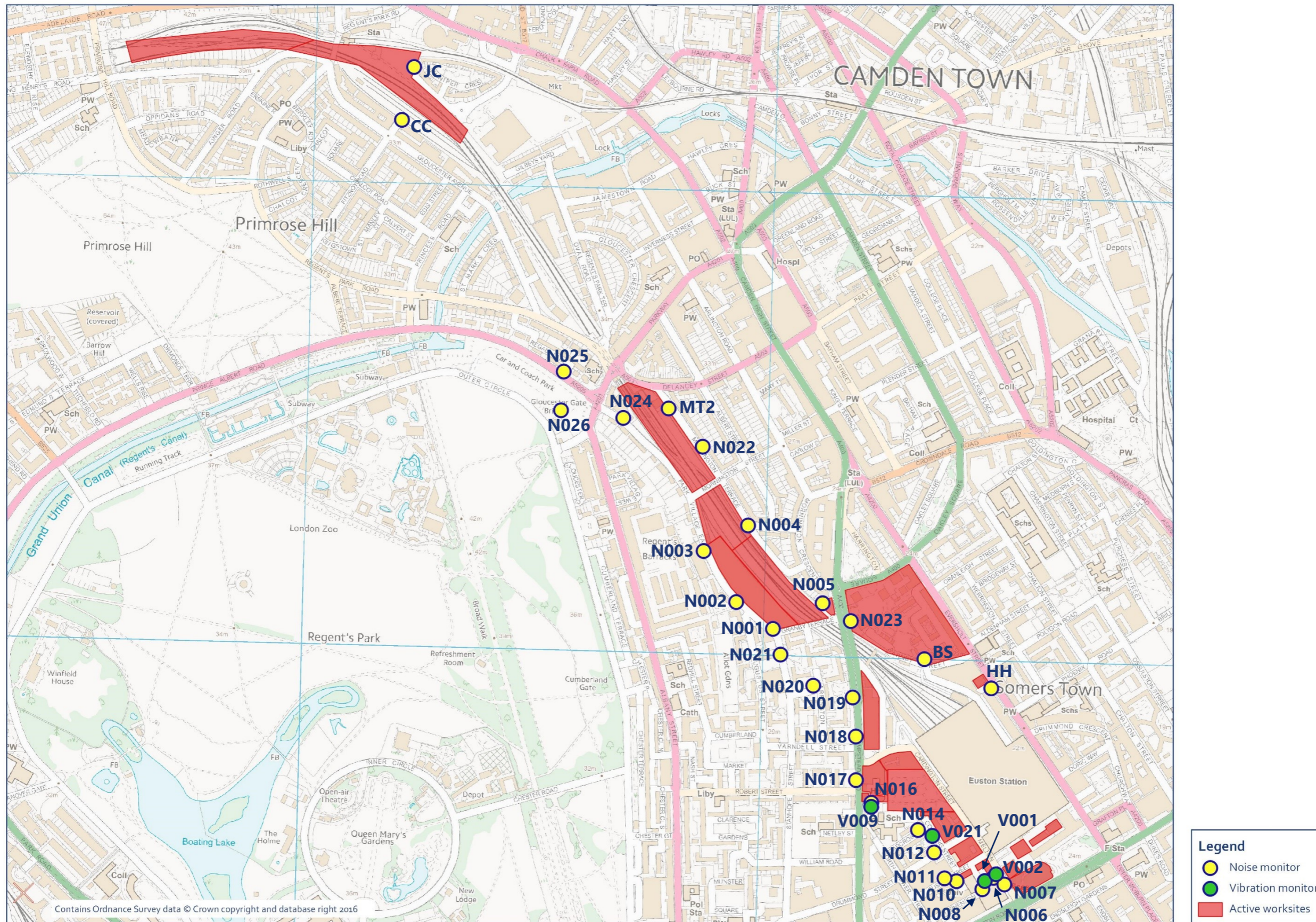
Worksite identification plan - 1

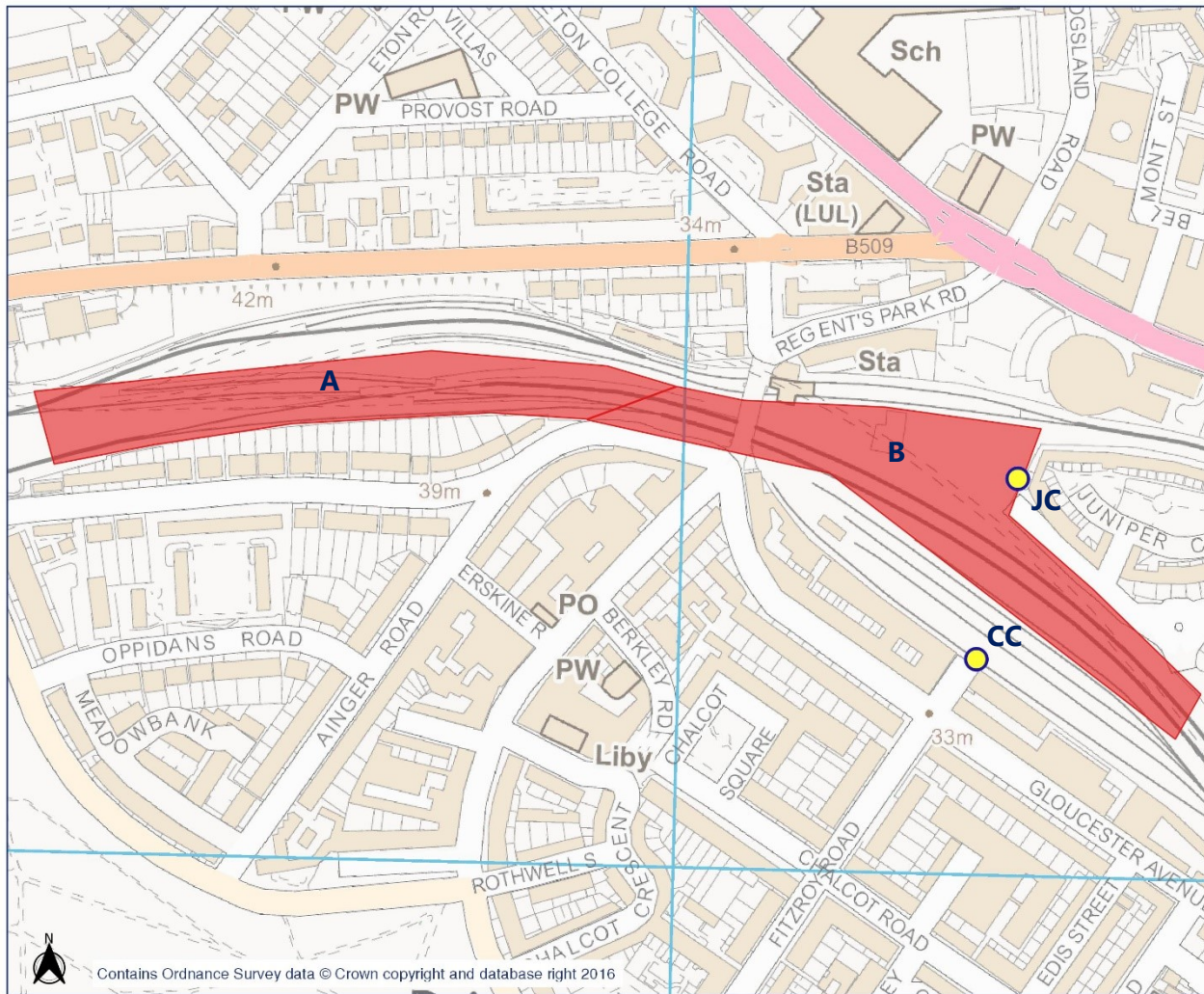


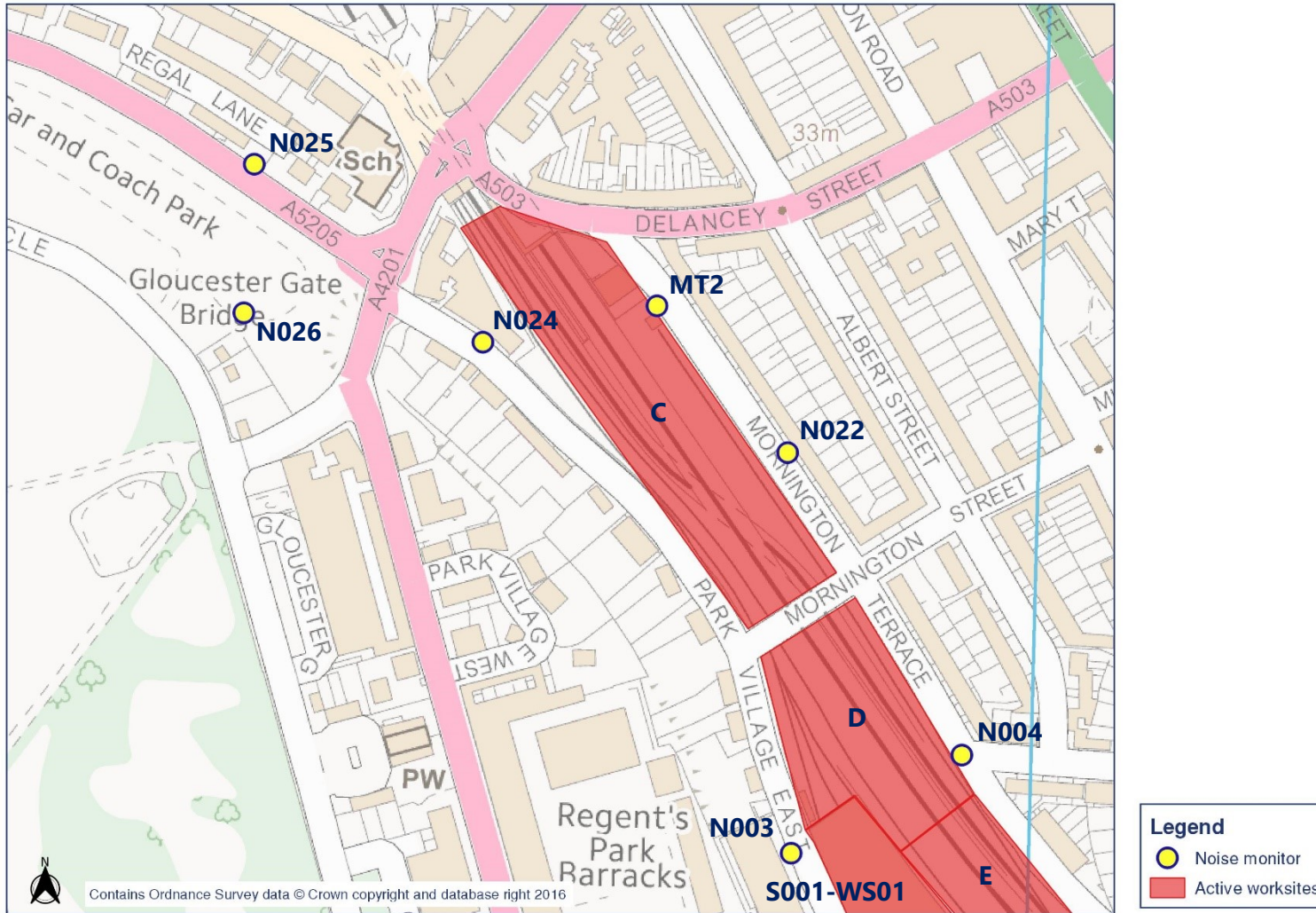


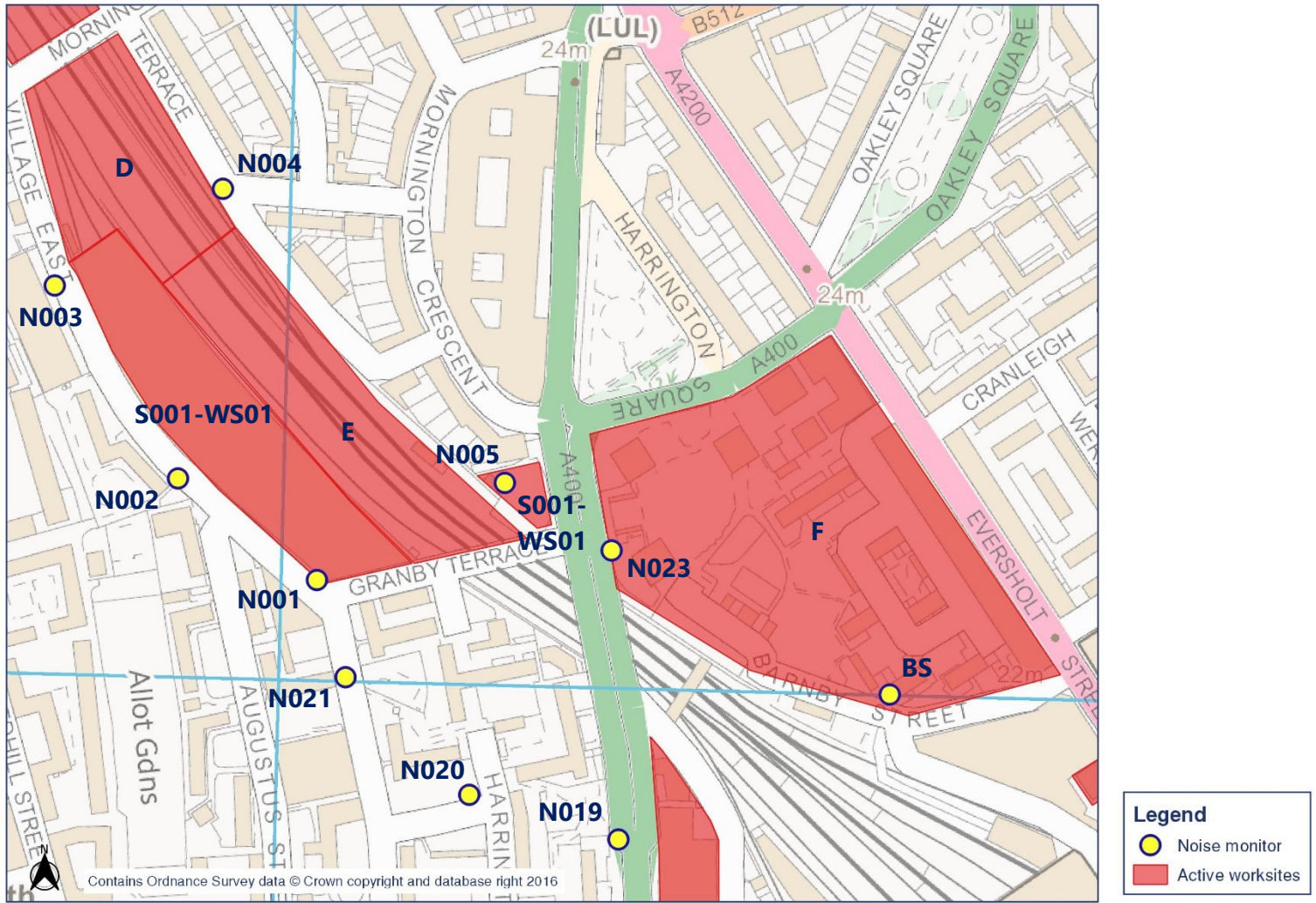


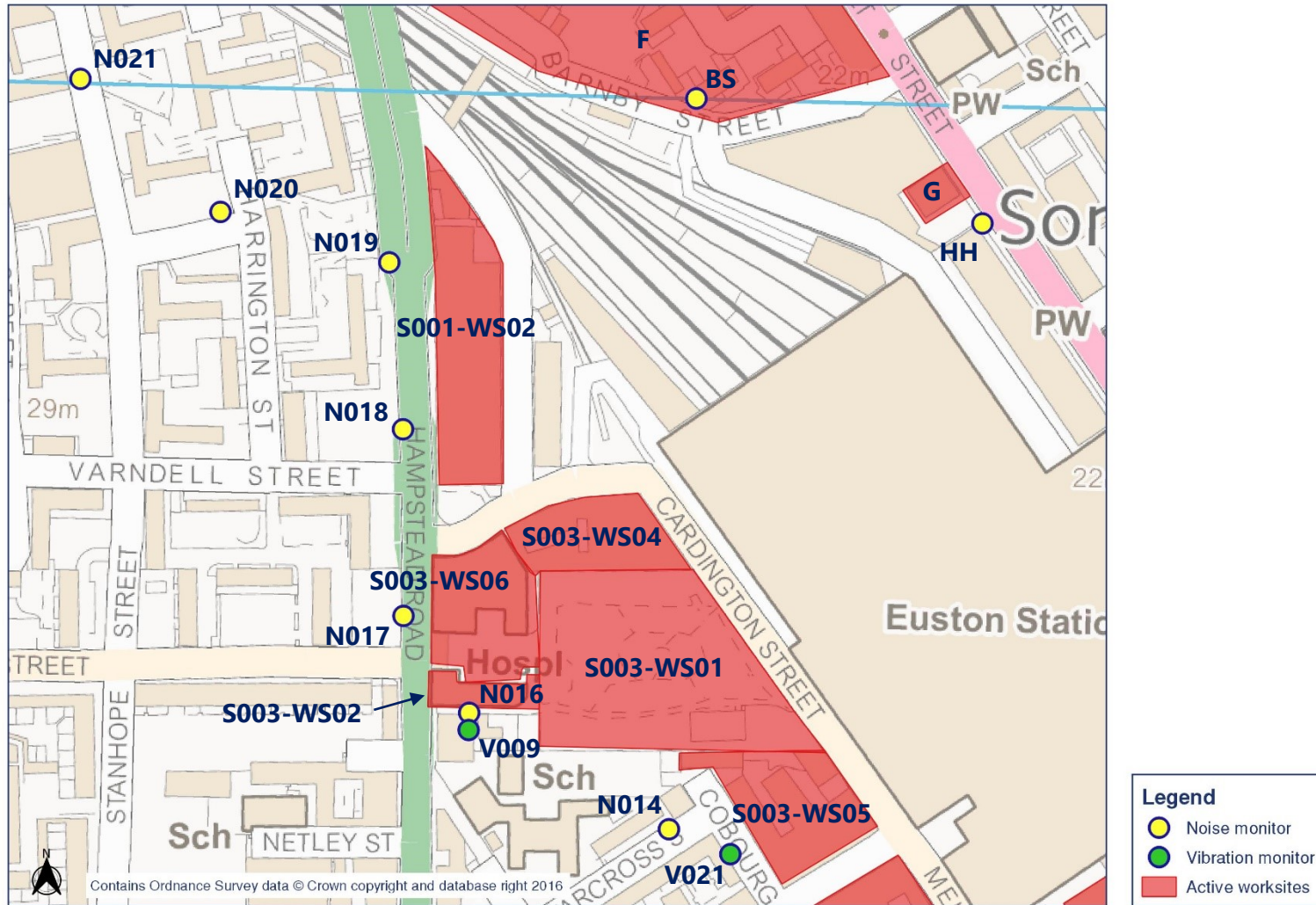
Appendix B Monitoring Locations

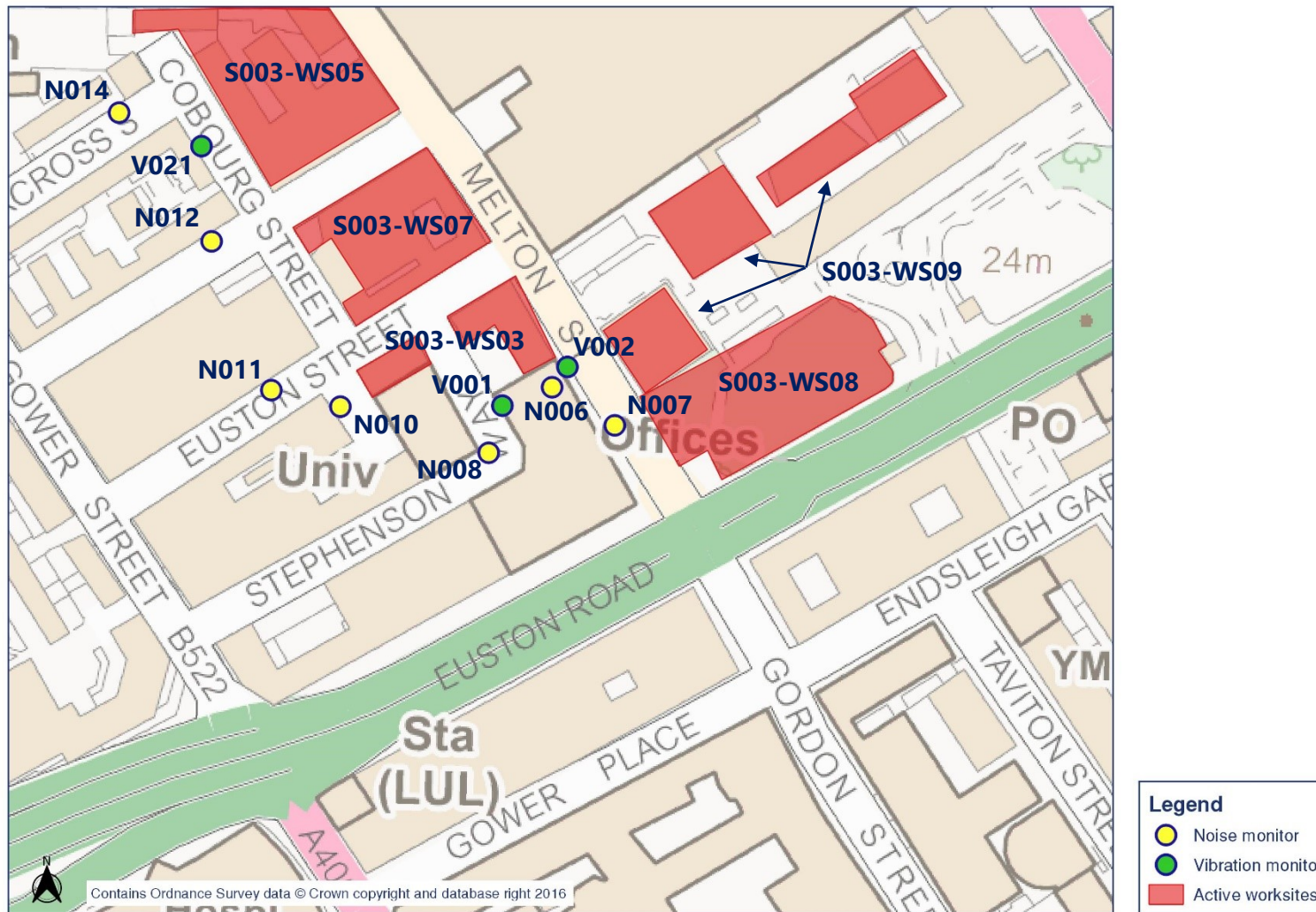










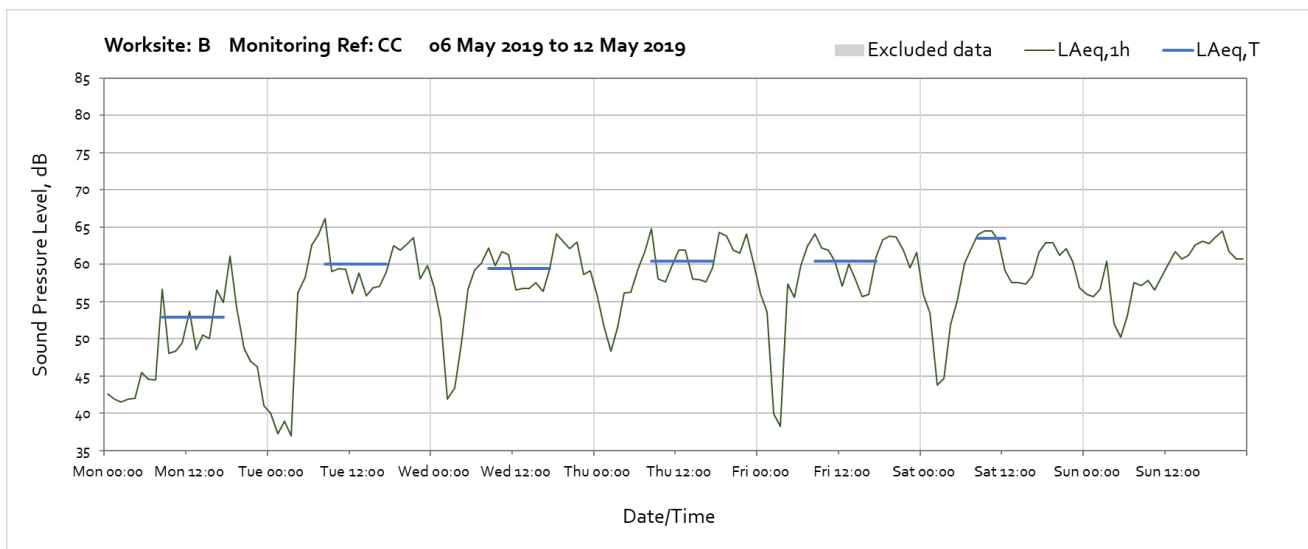
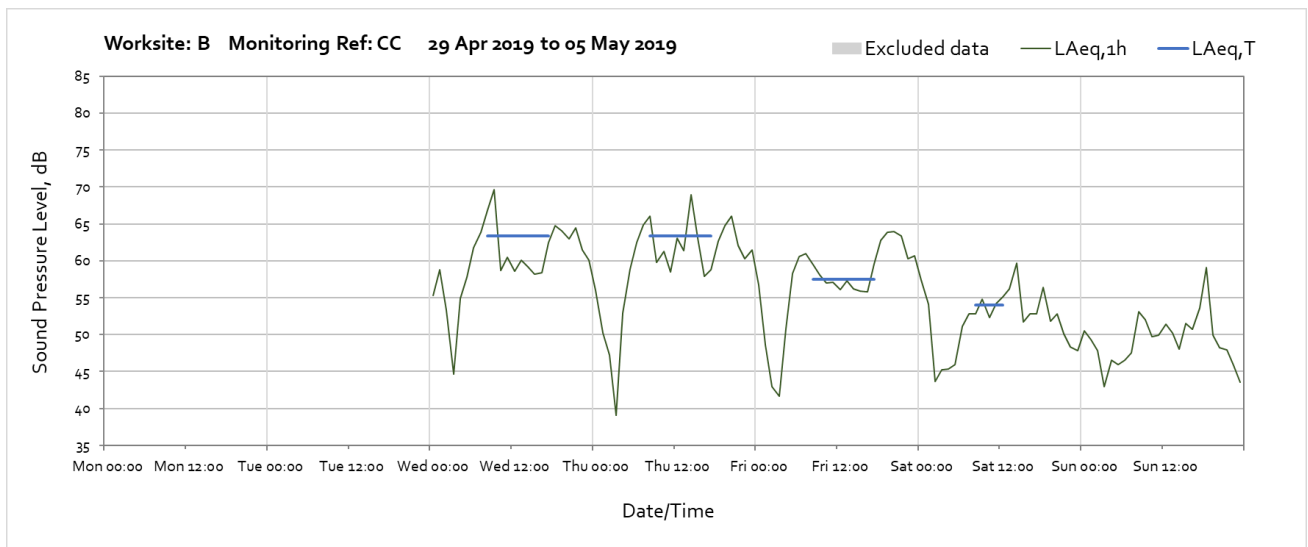


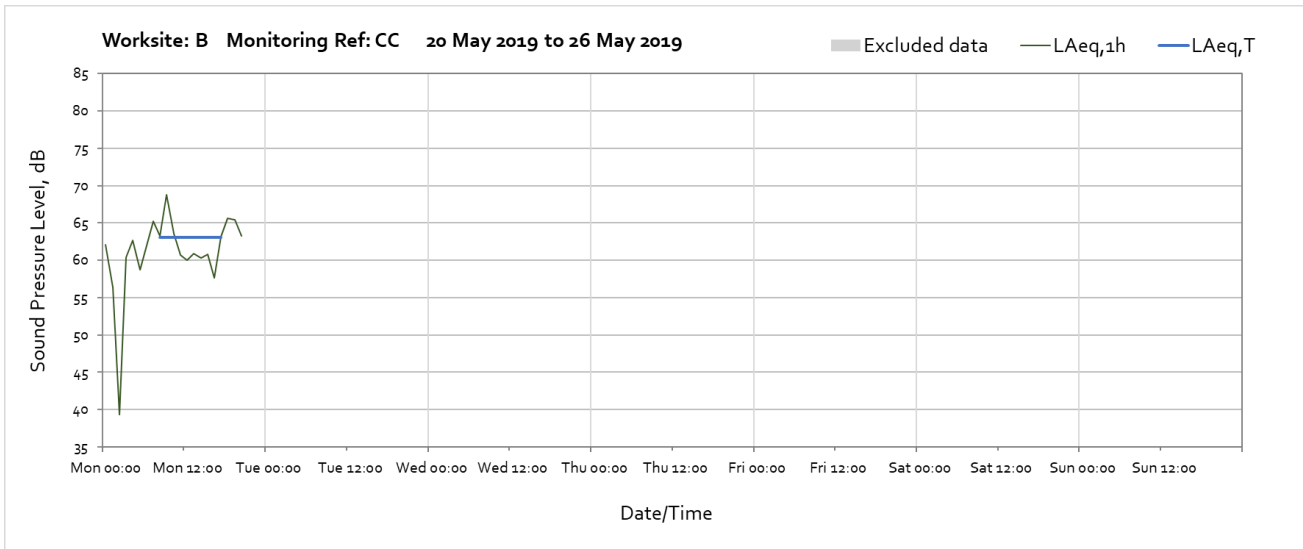
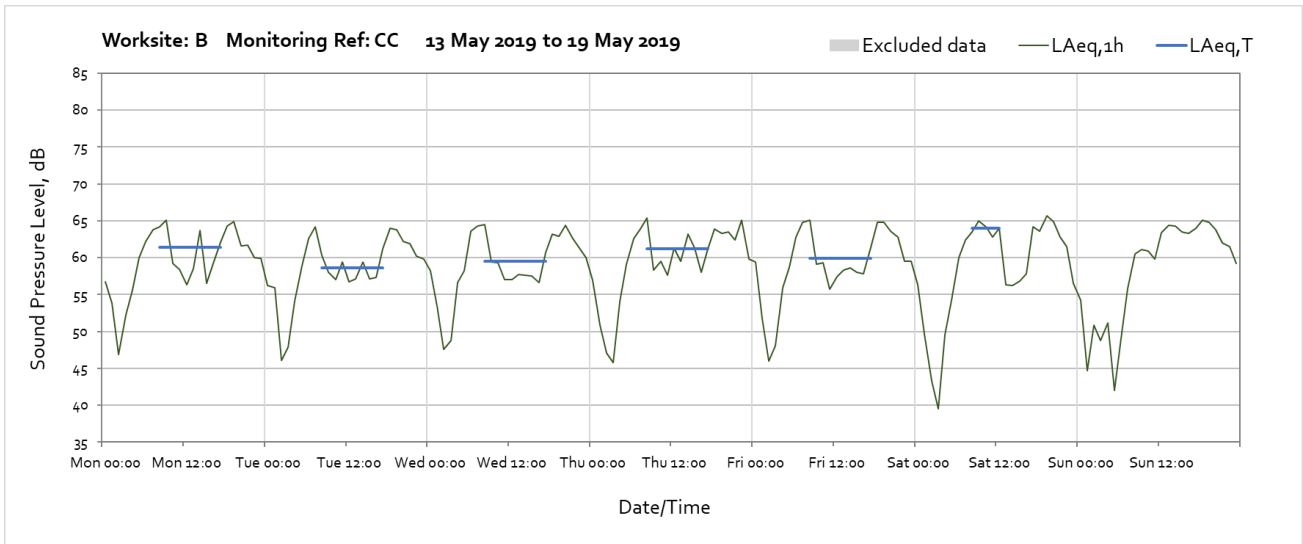
Appendix C Data

Noise

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 5.

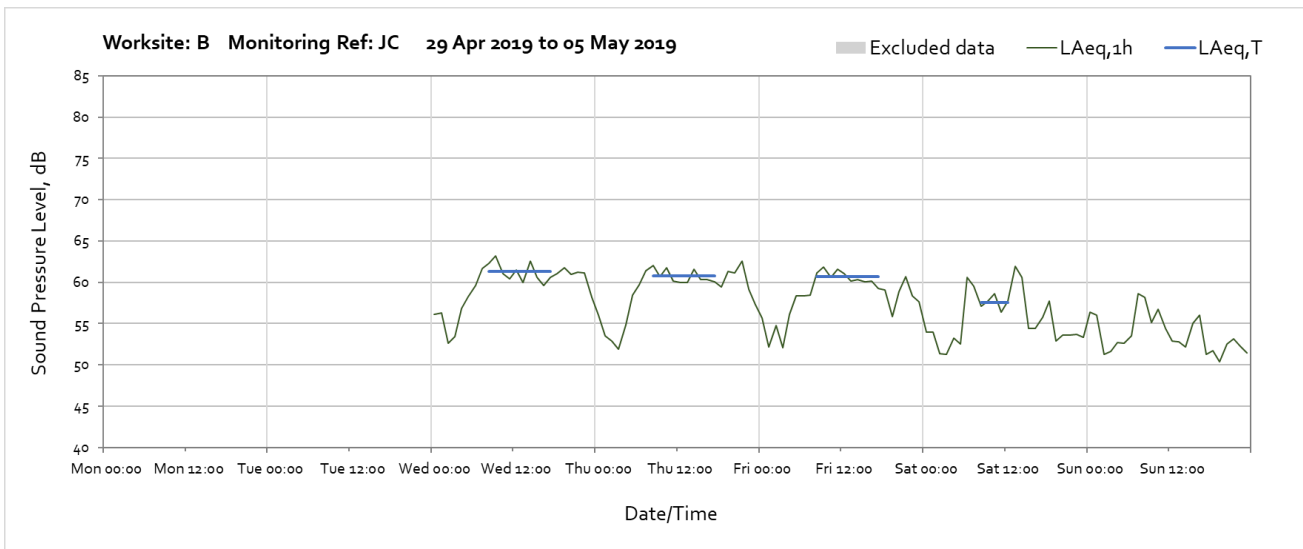
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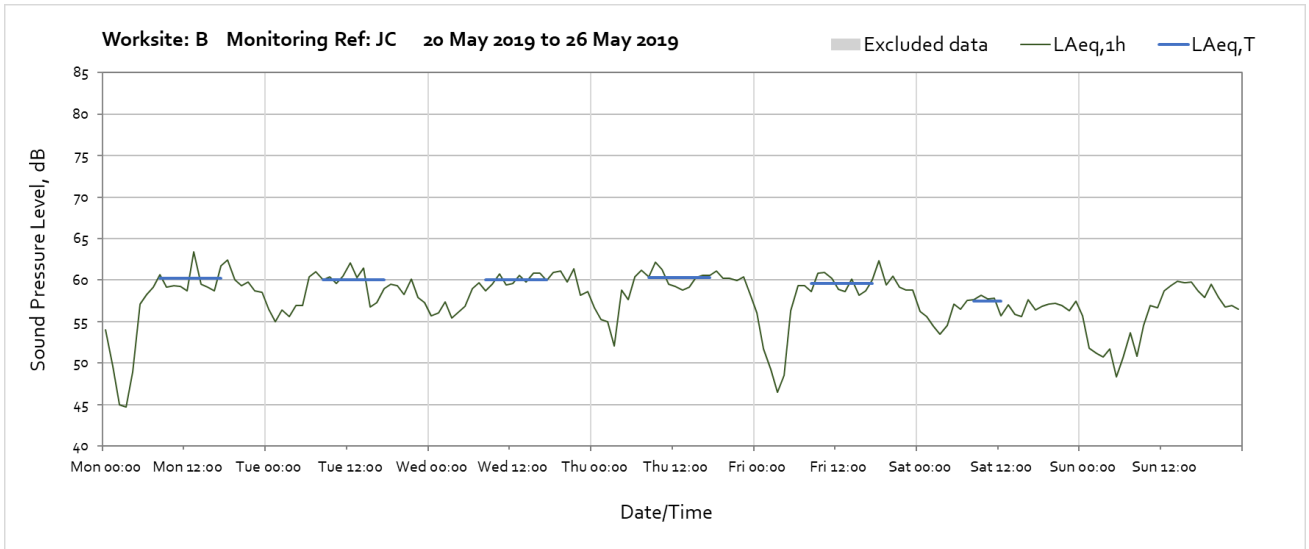
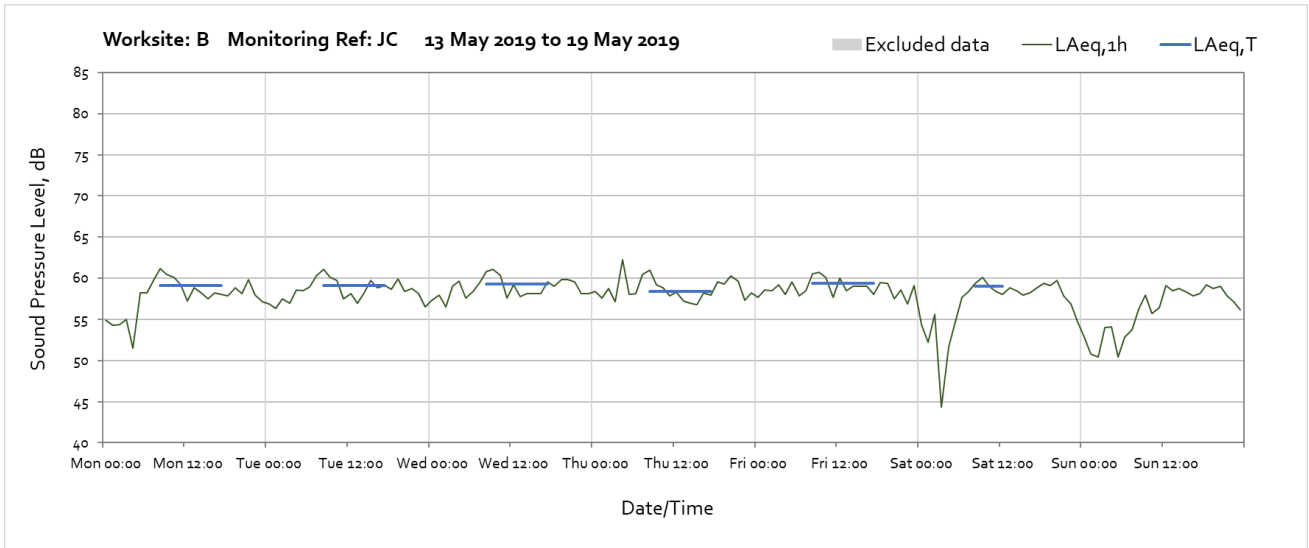
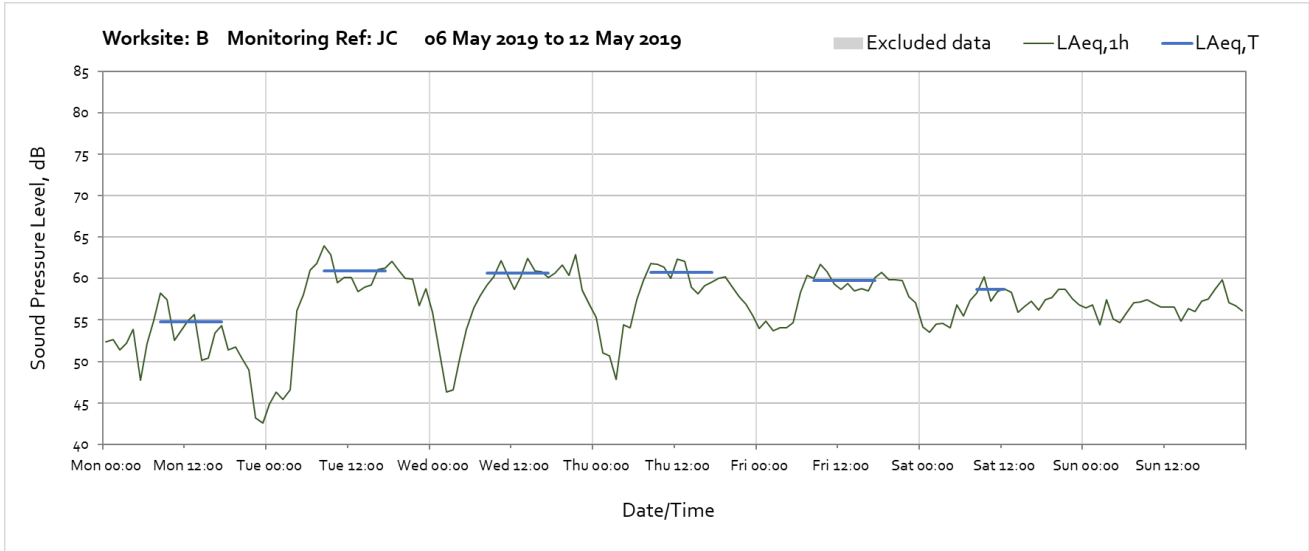


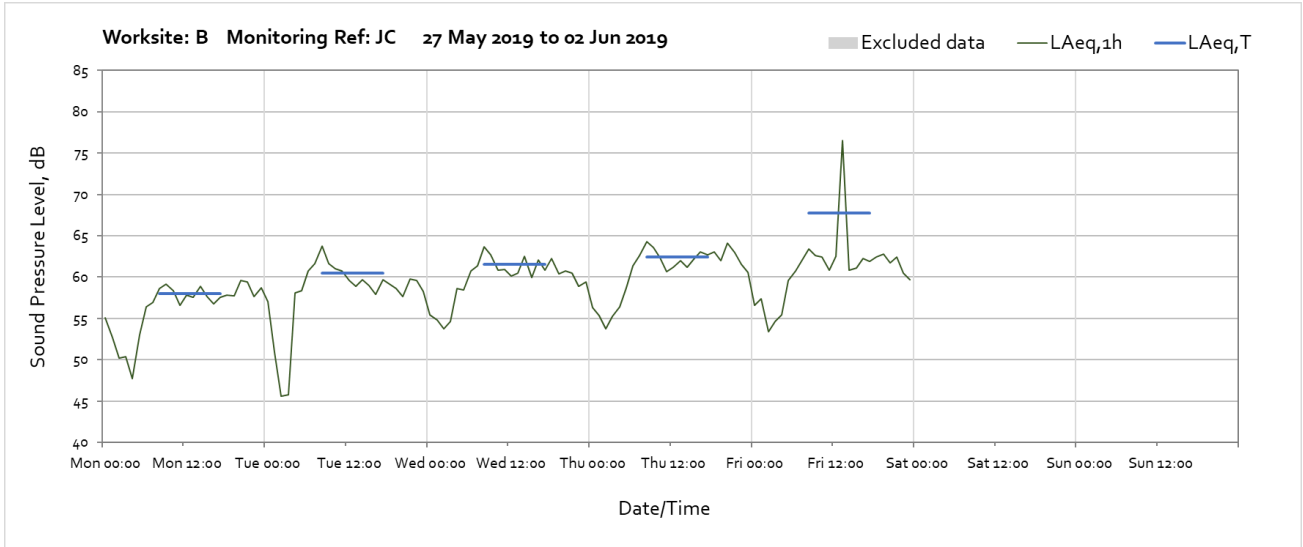


Note: Missing data from 20:00 on Monday 20th were due to a power cut affecting the site.

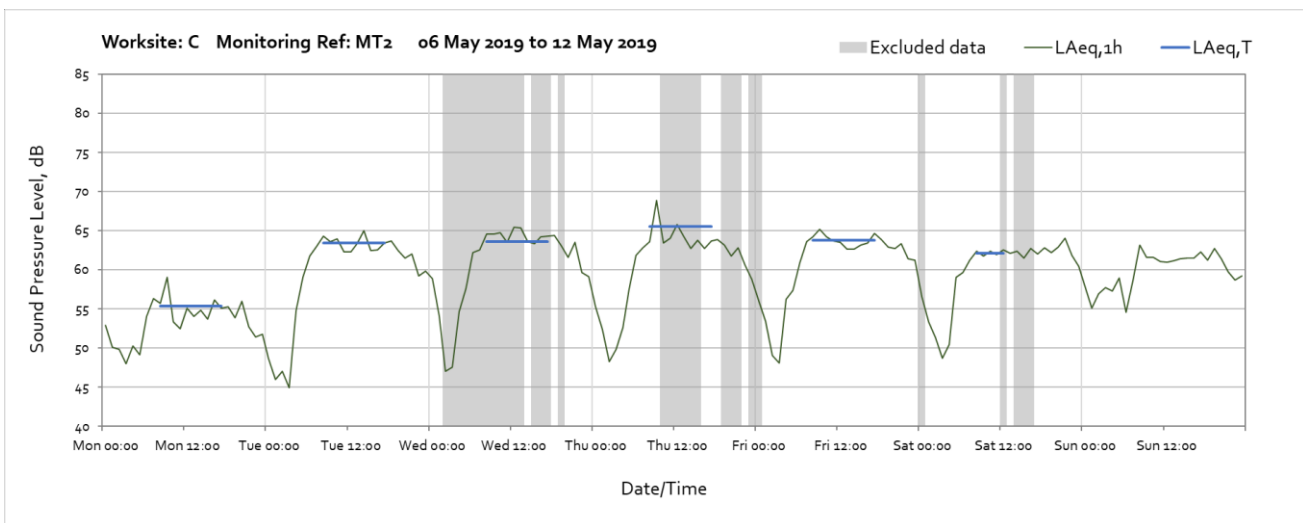
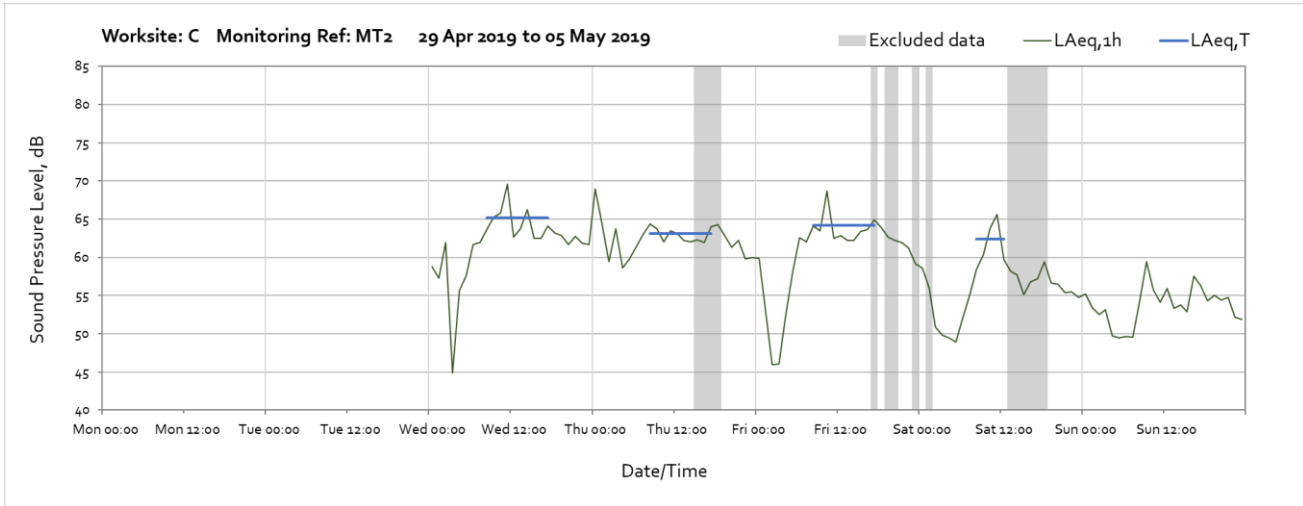
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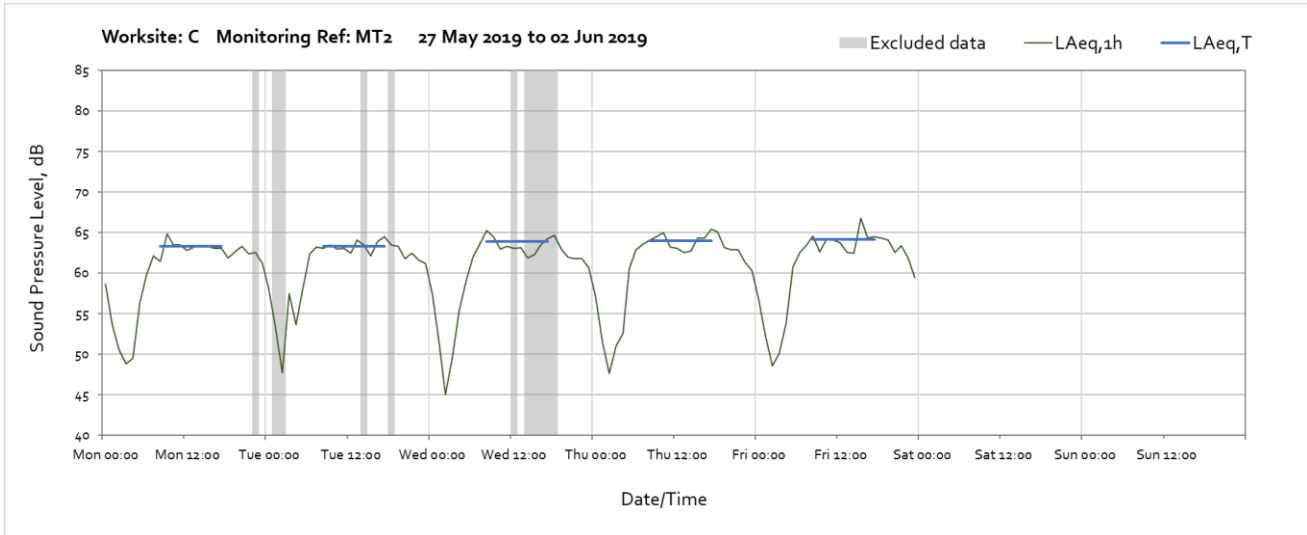
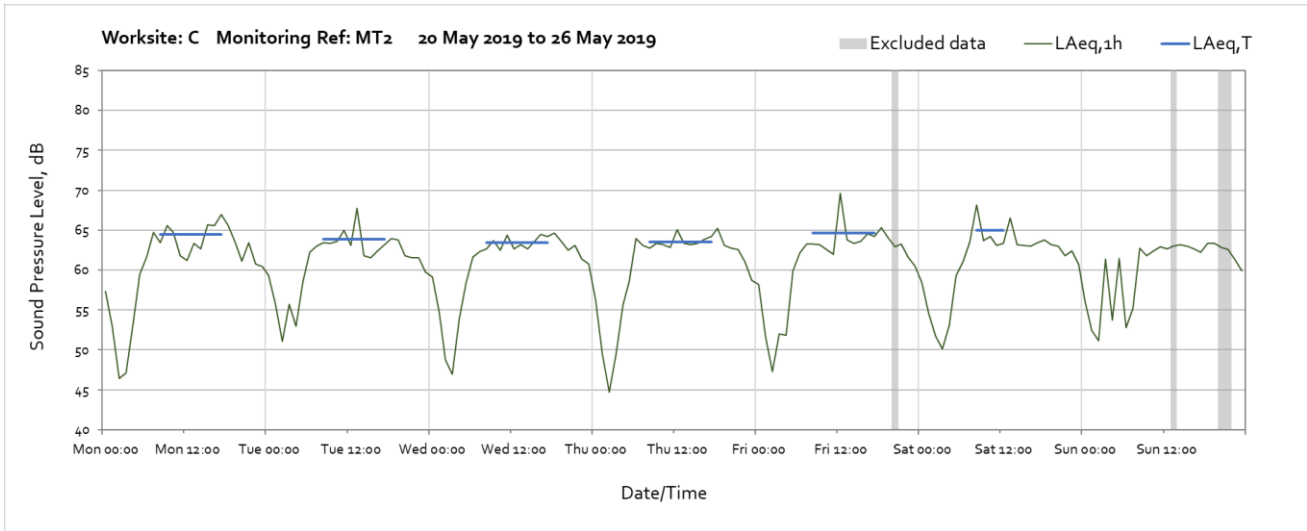
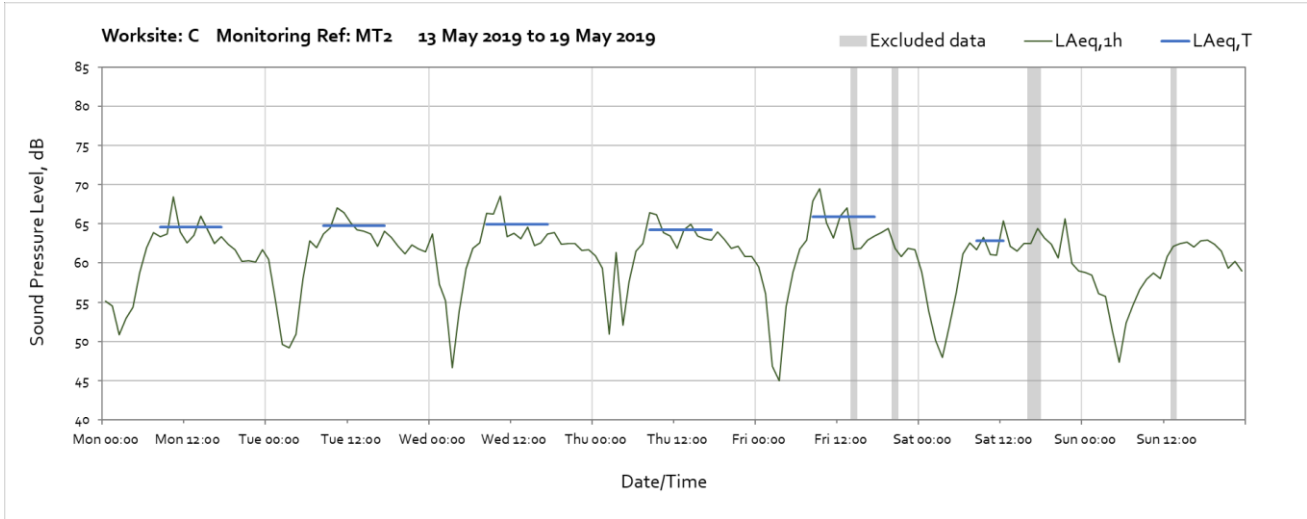




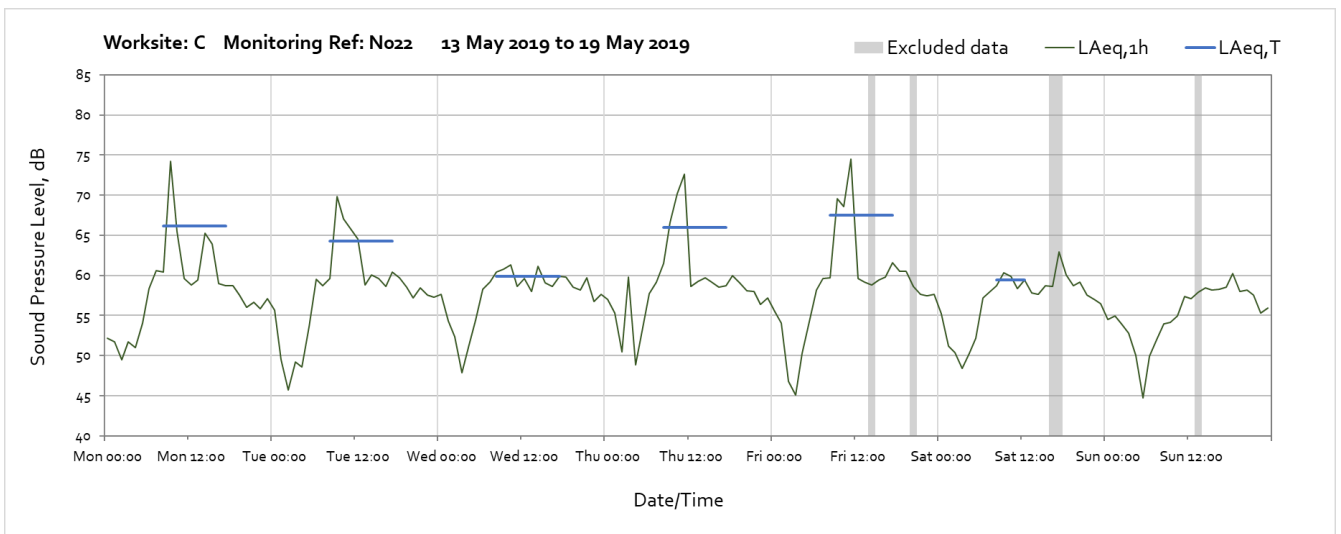
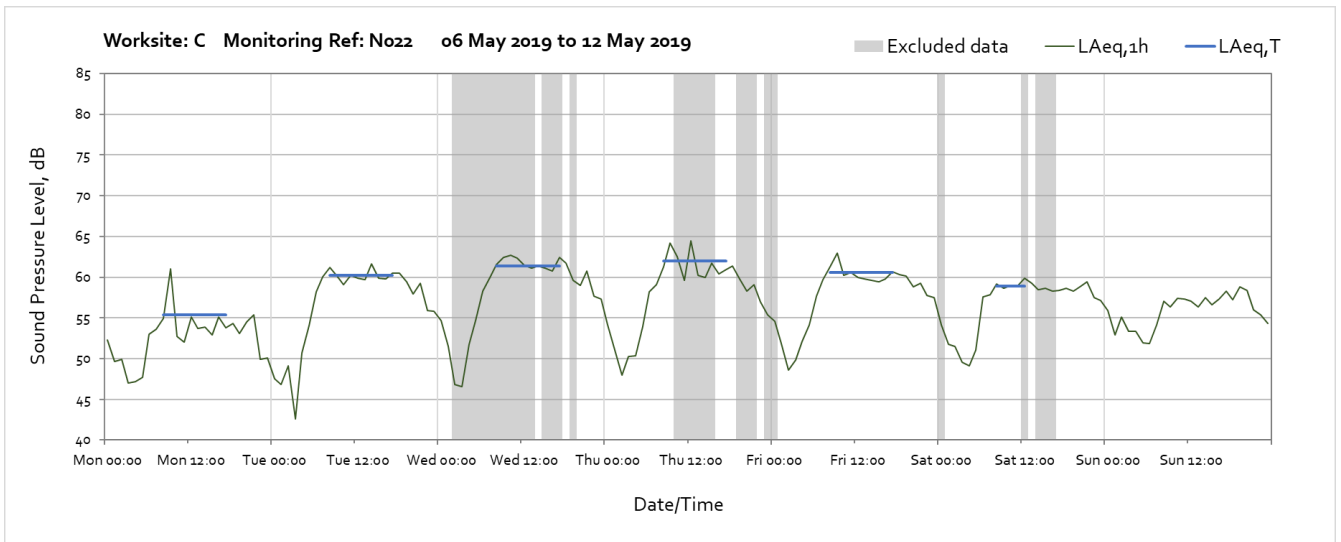
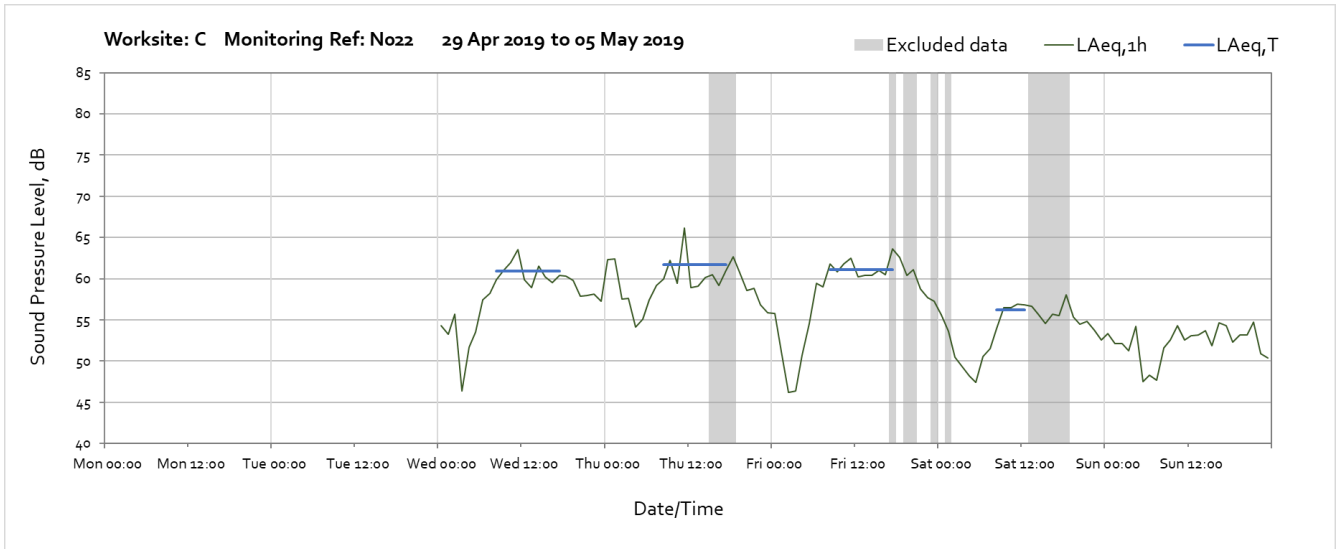


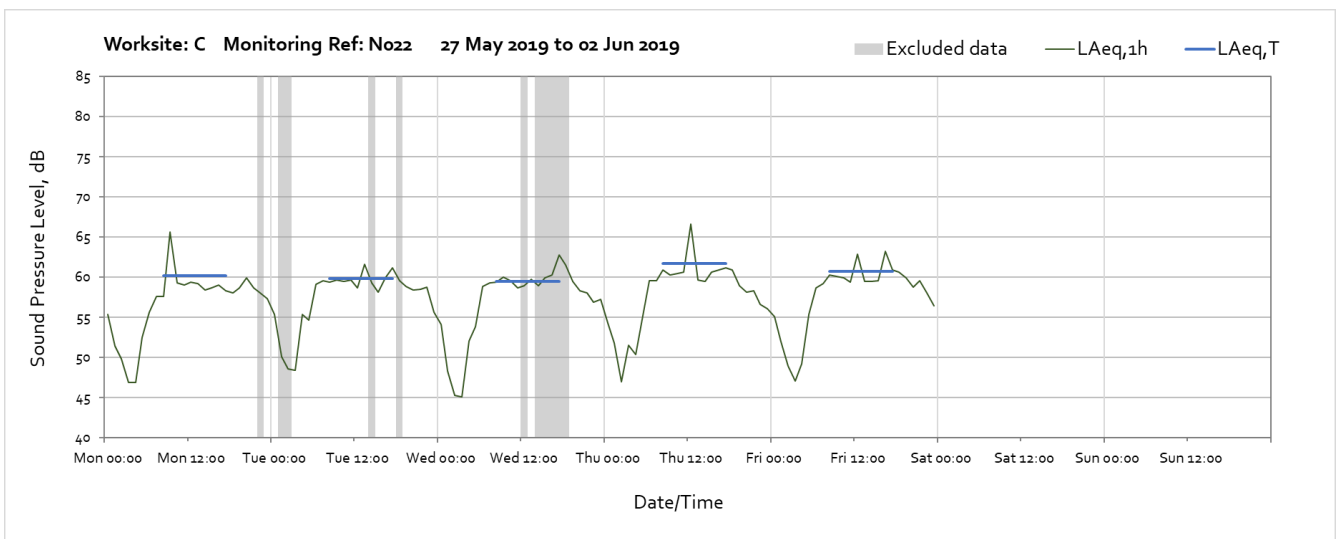
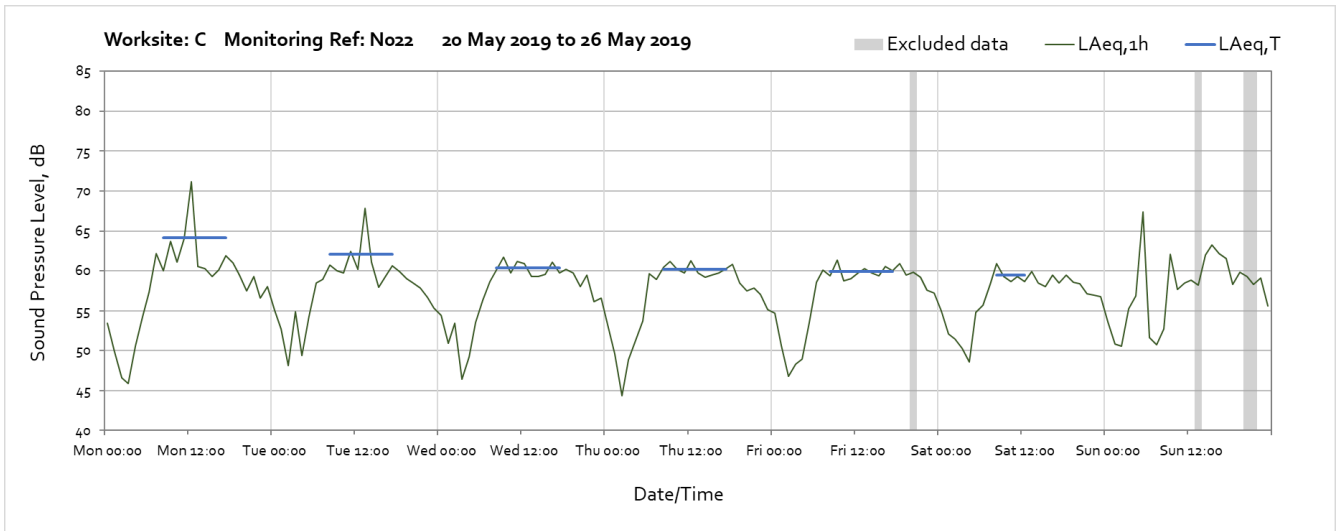
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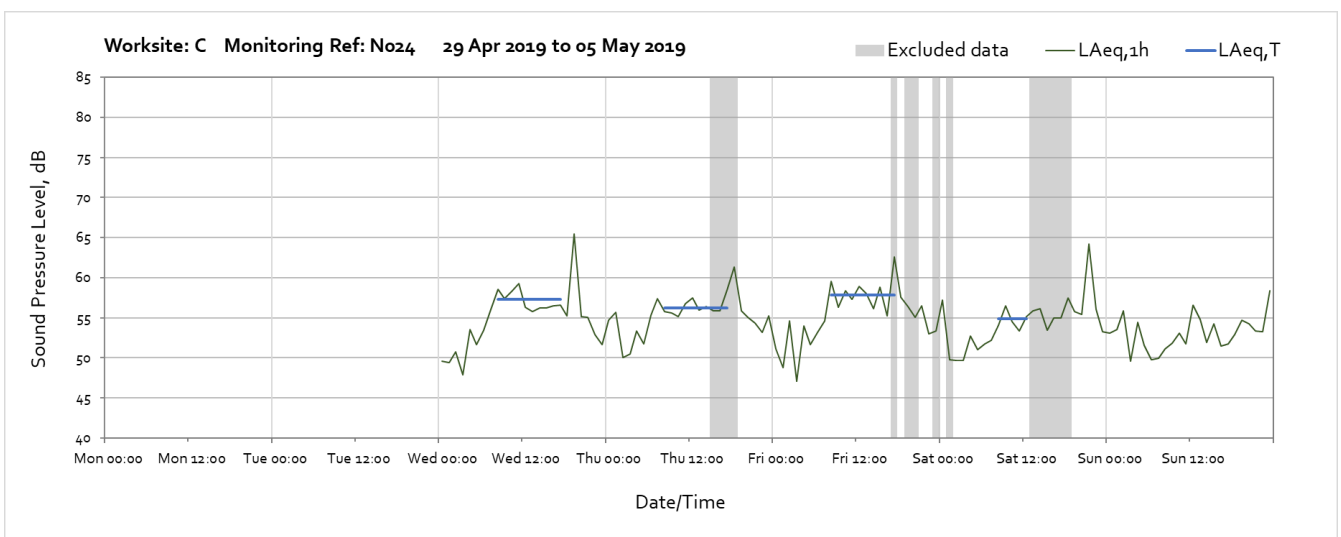


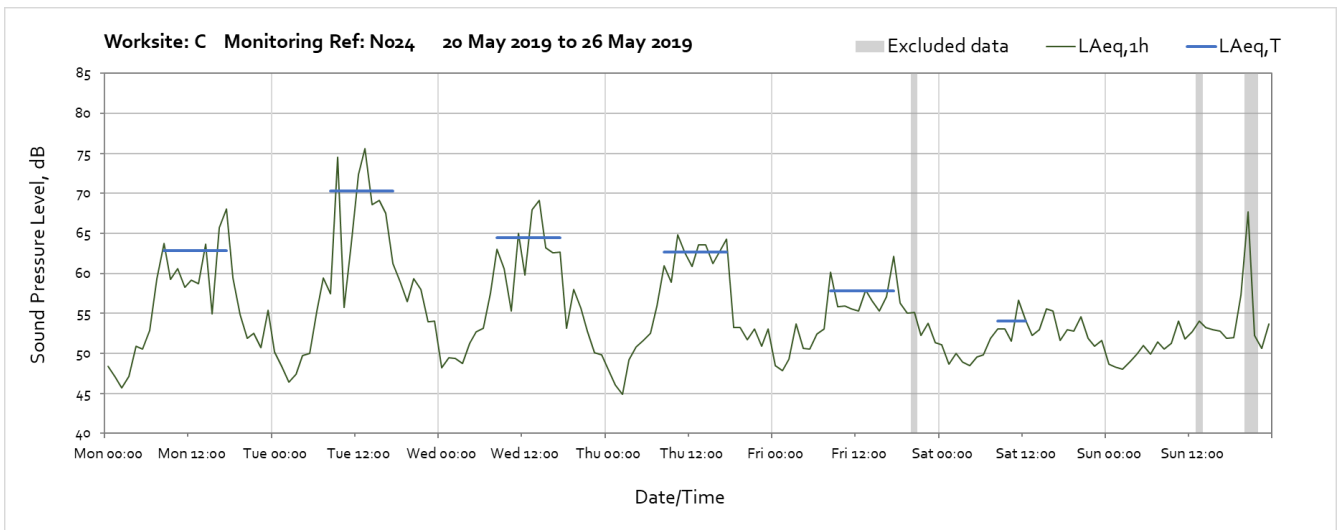
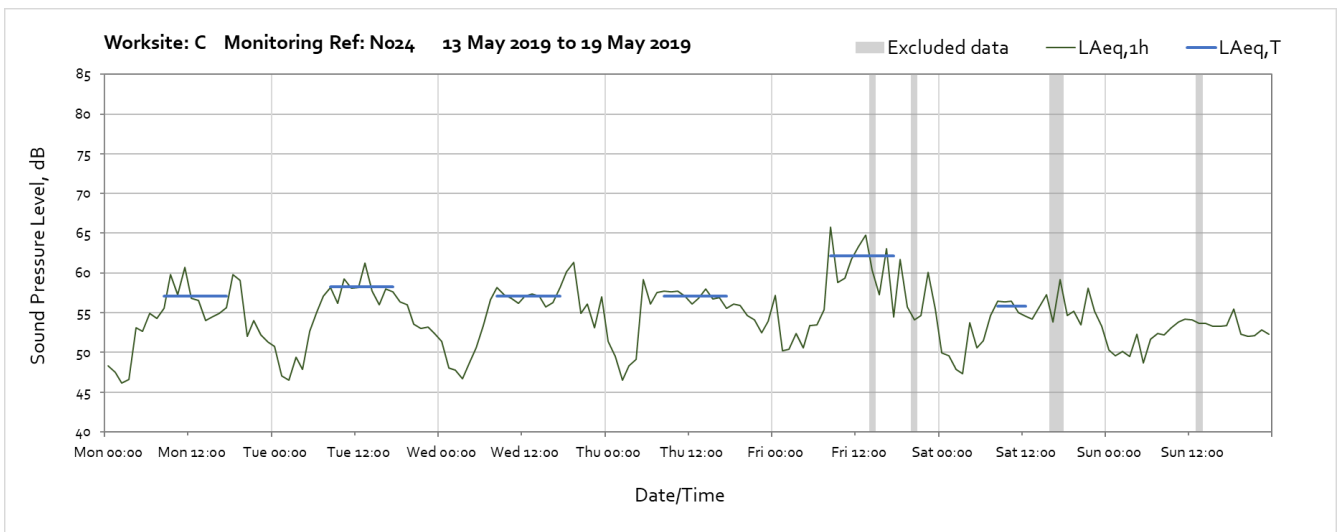
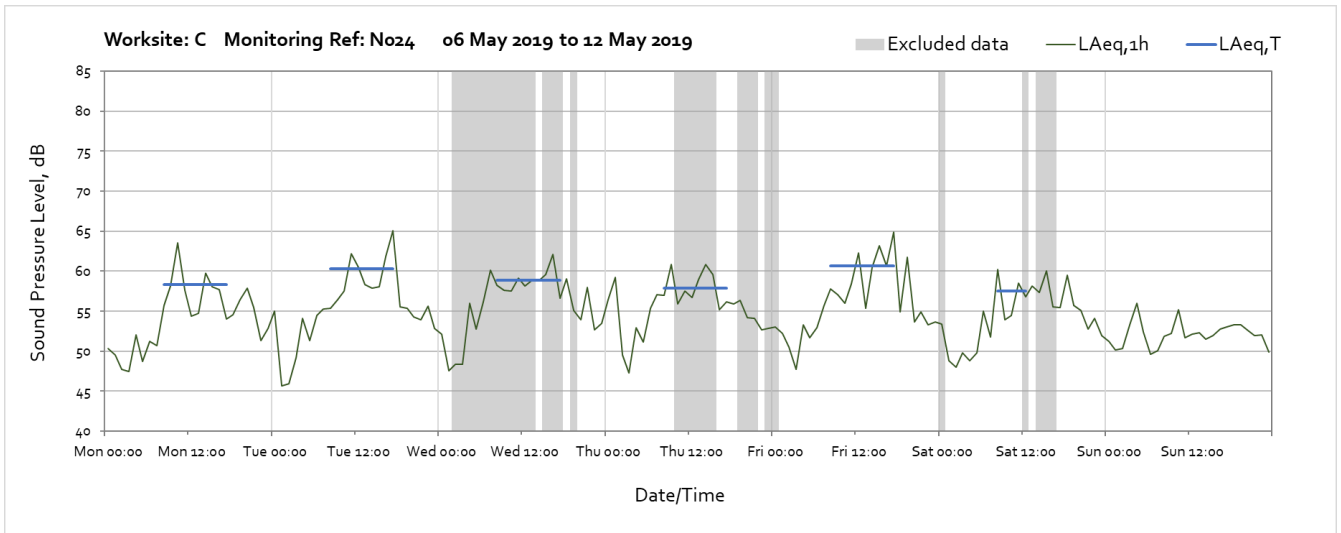
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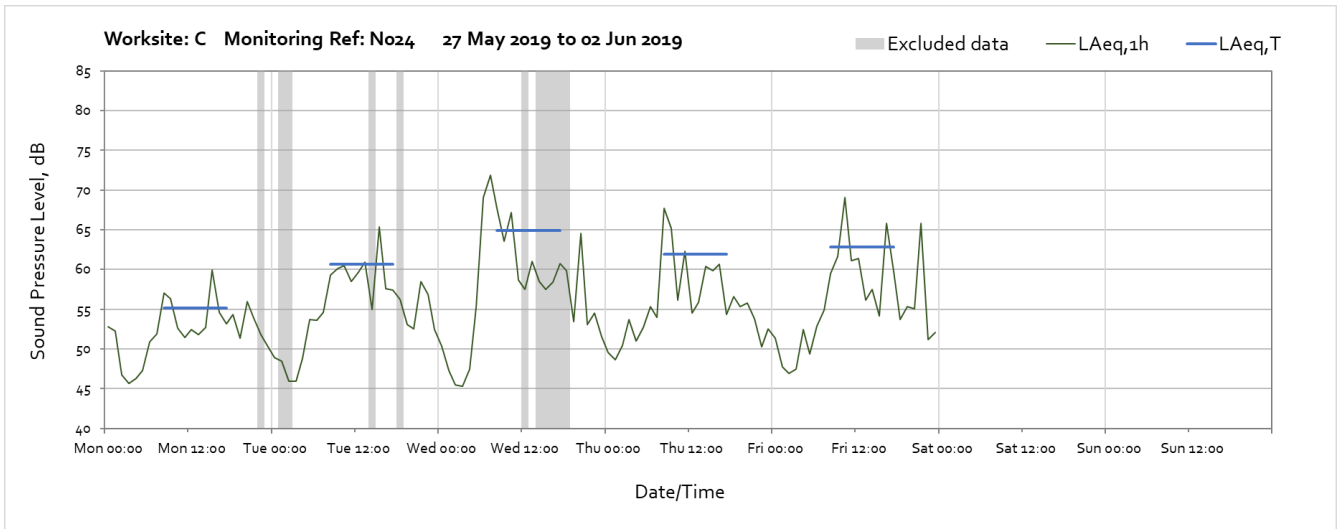




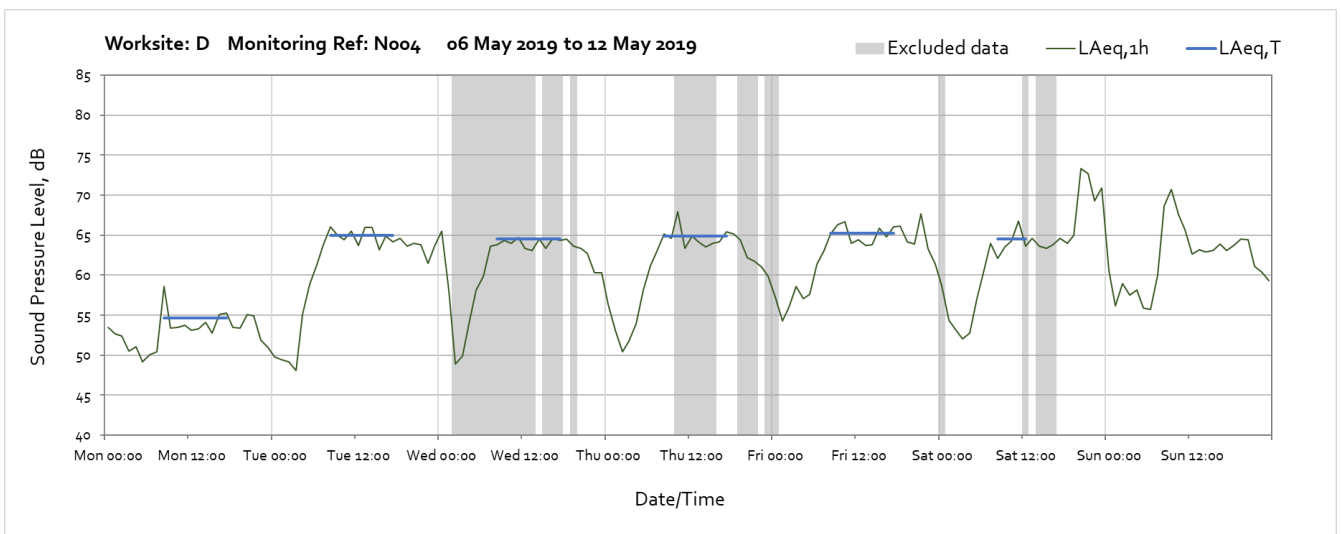
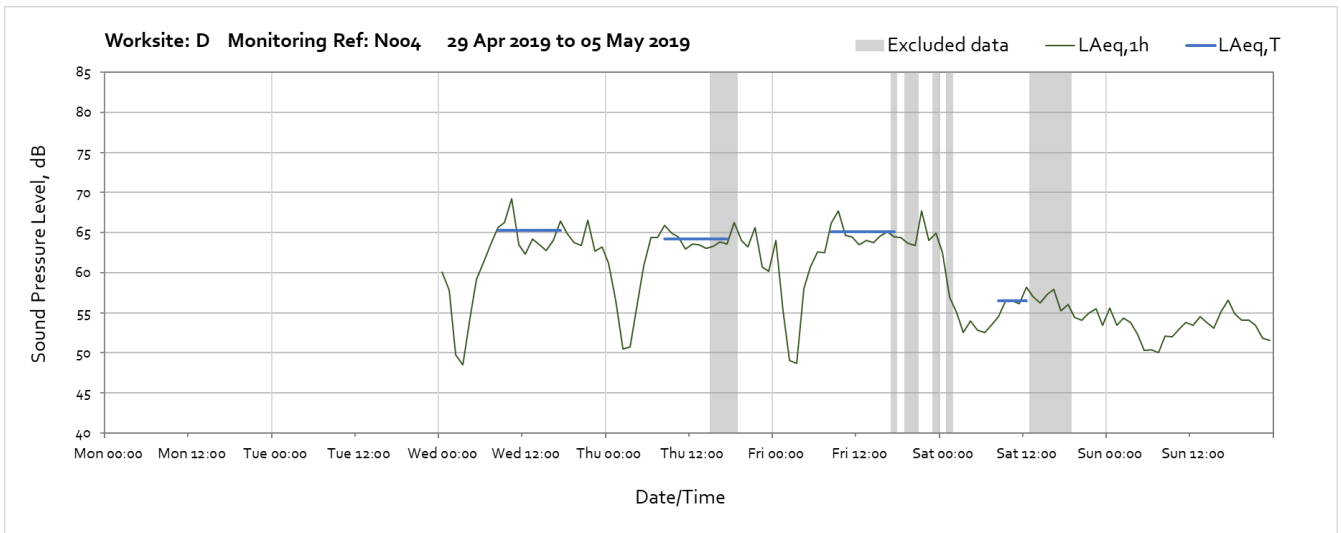
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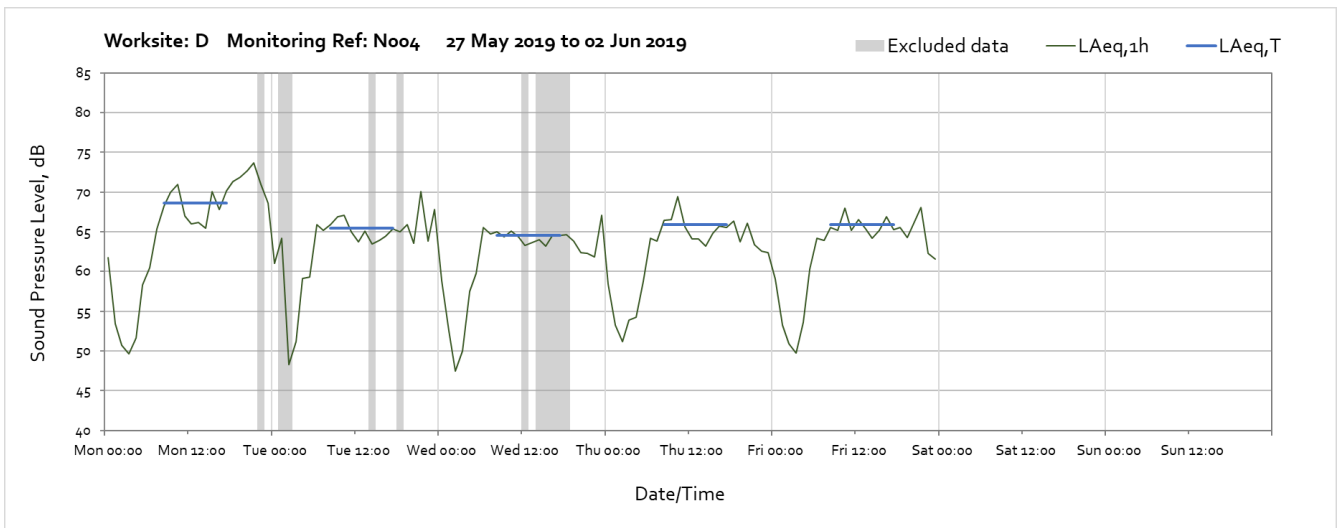
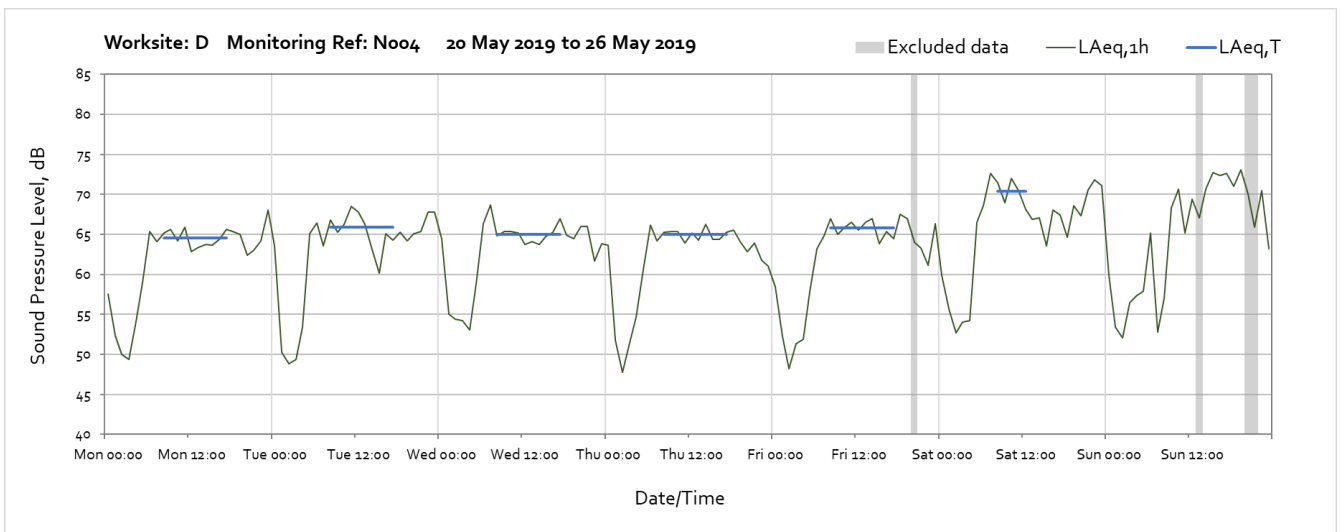
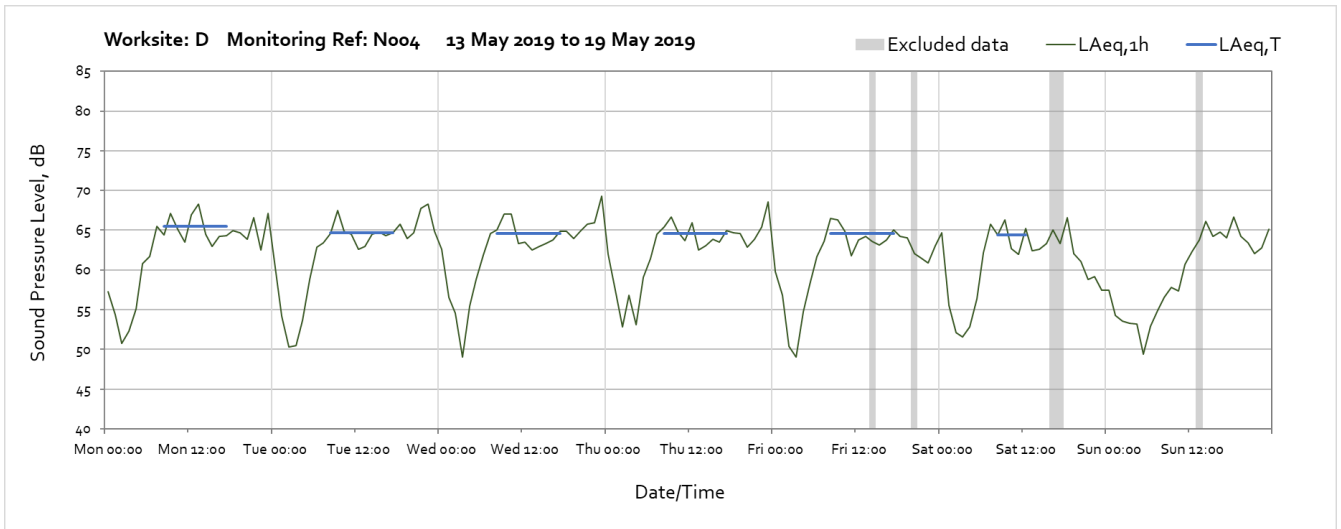




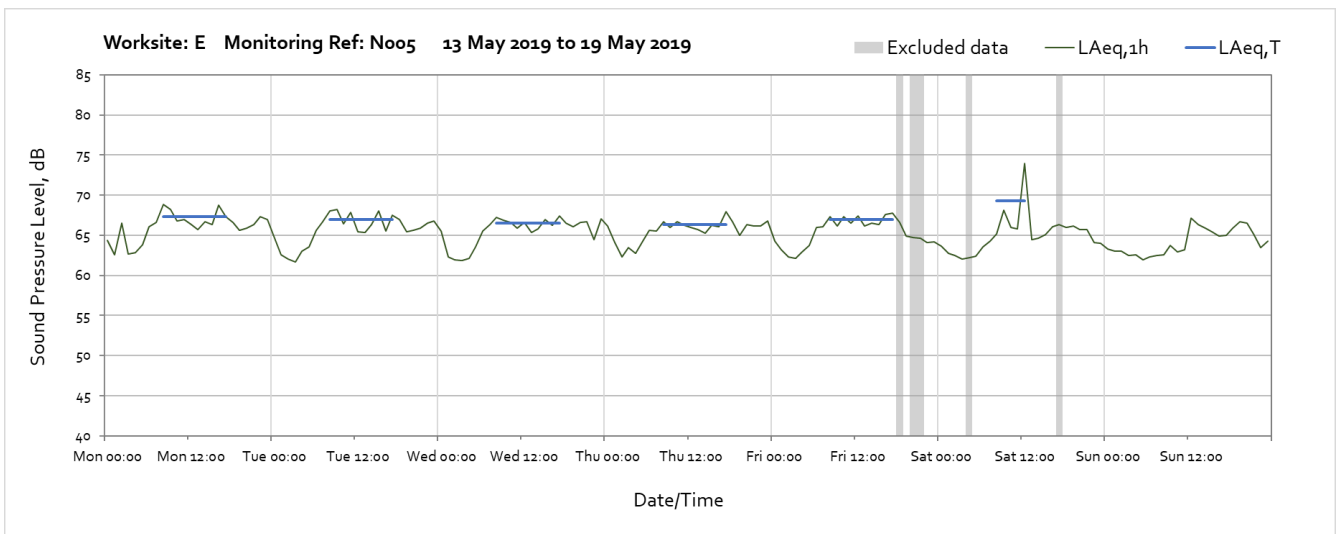
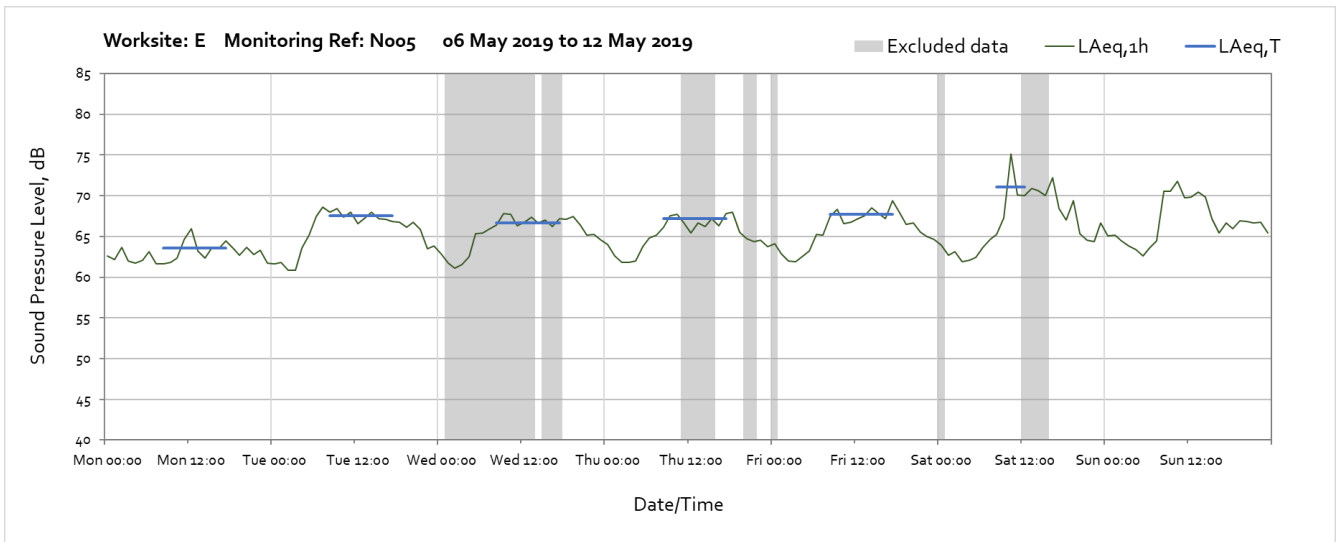
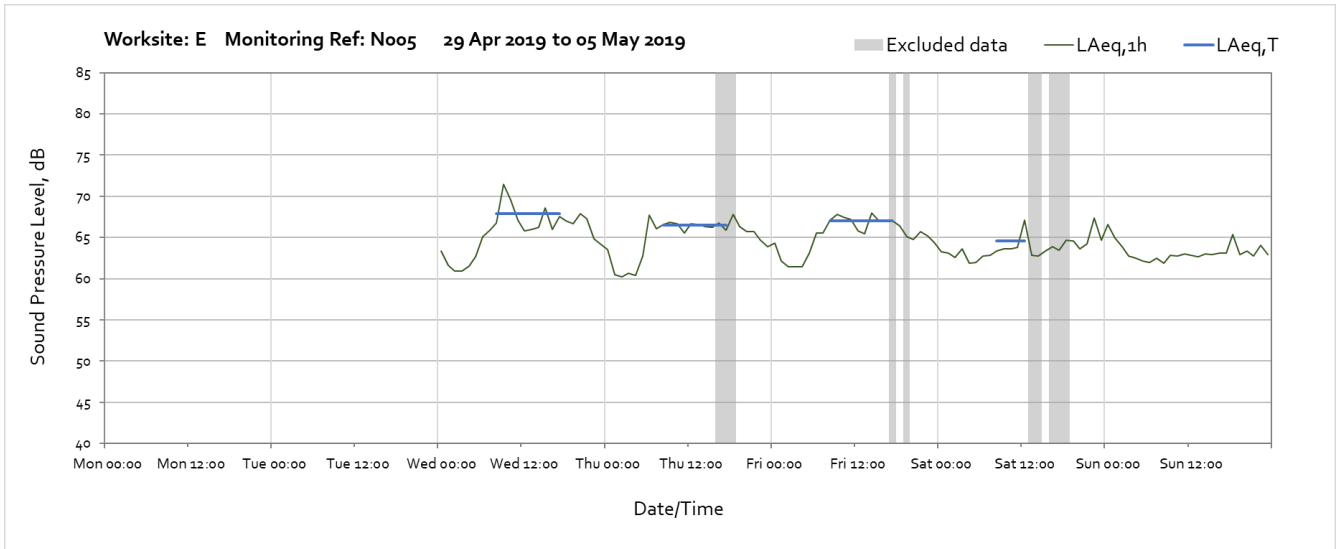


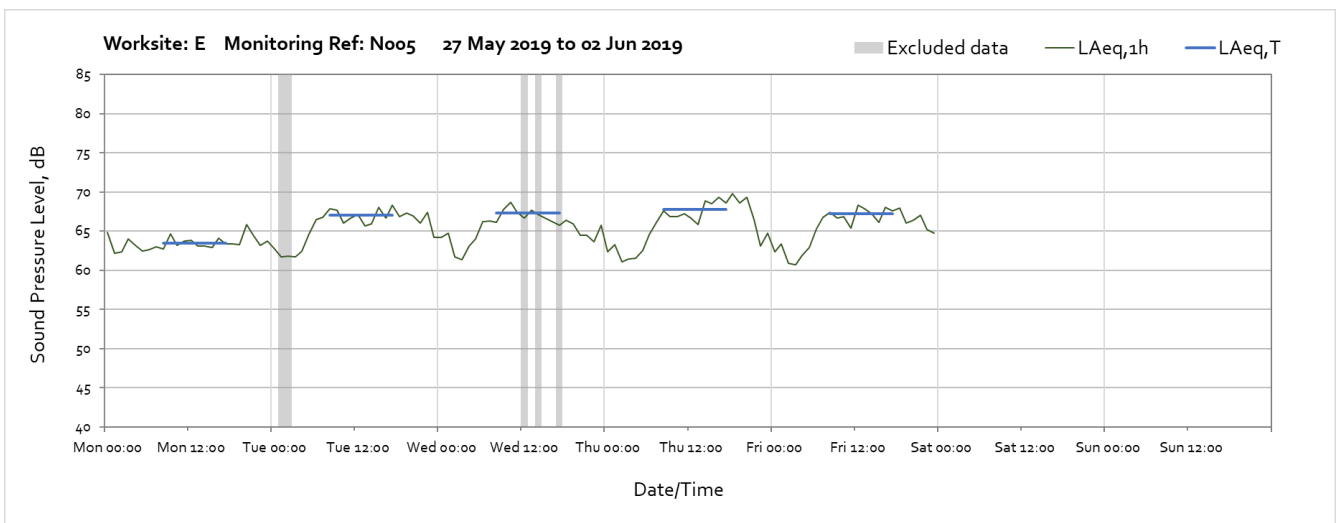
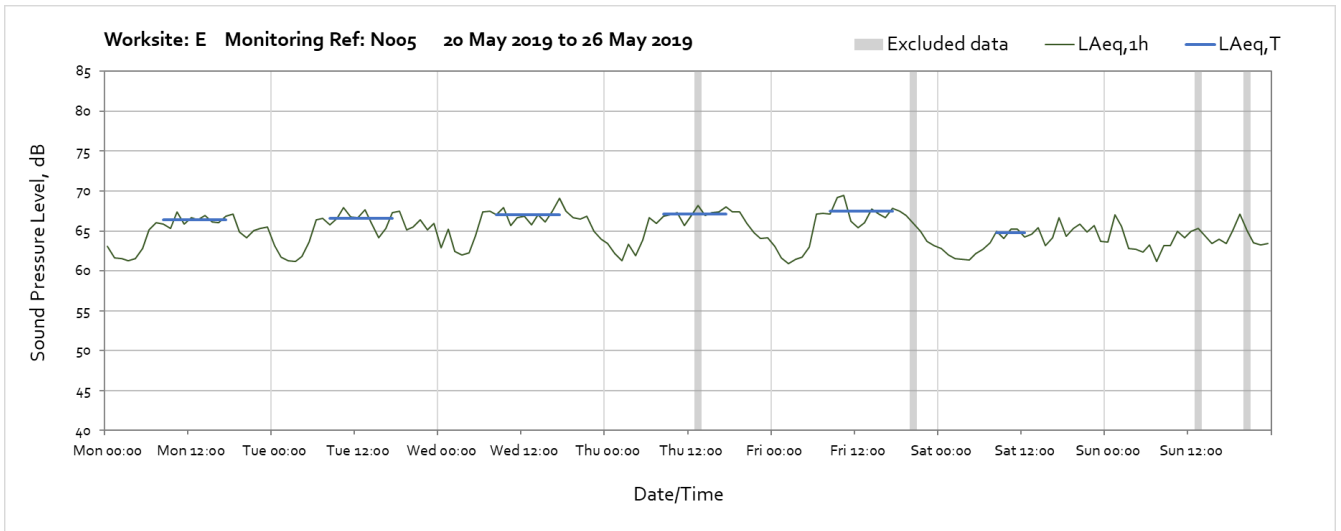
Worksite: D – Monitoring Ref: N004



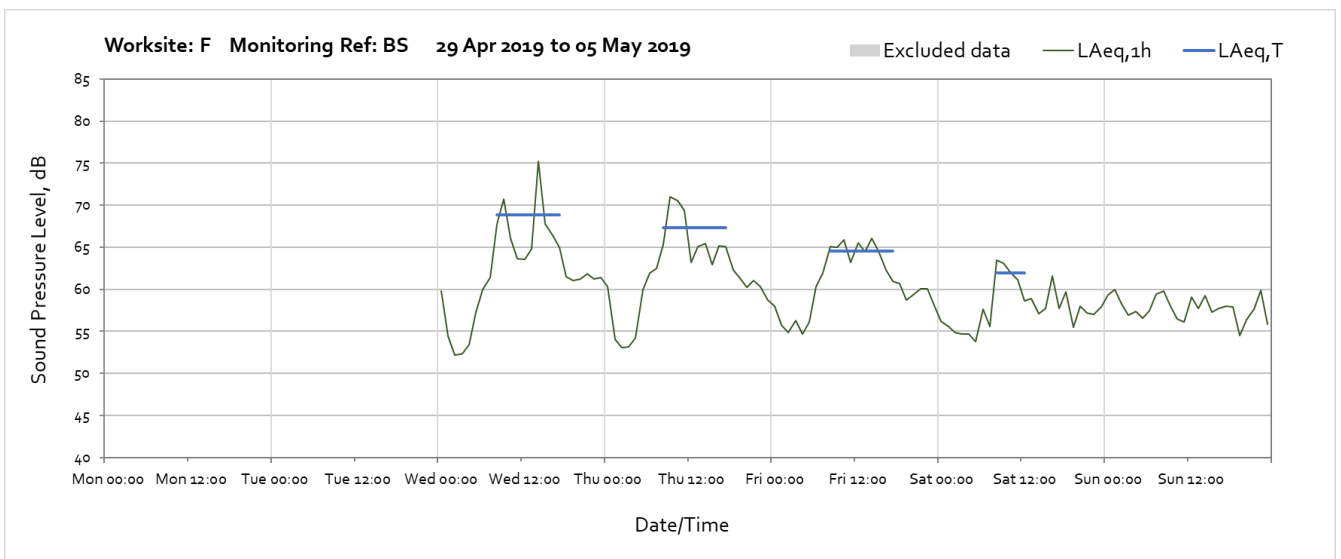


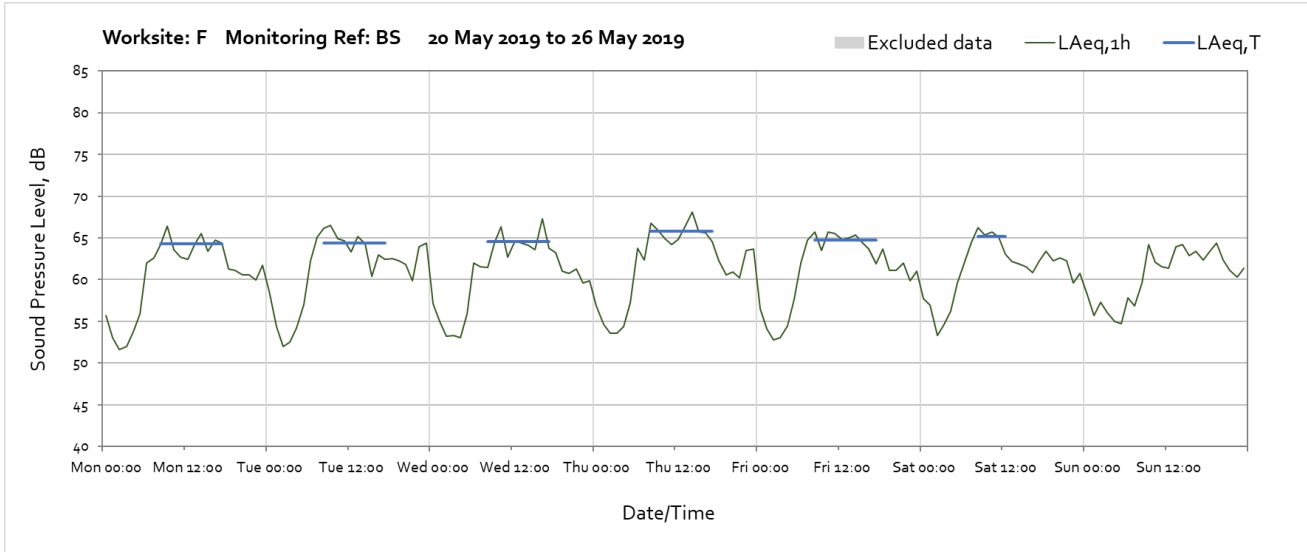
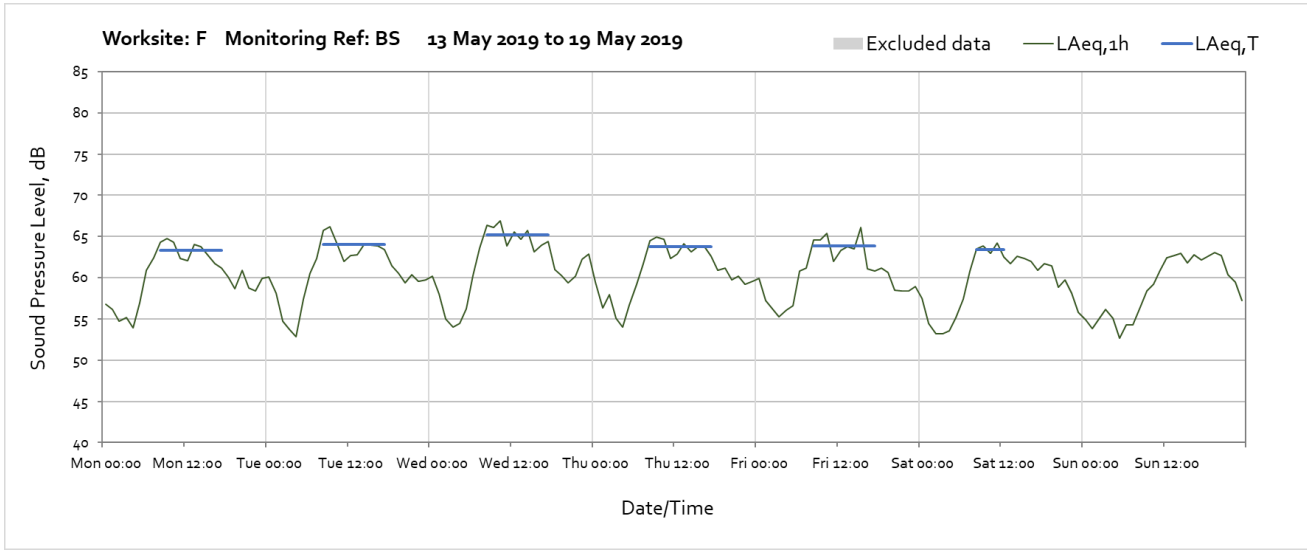
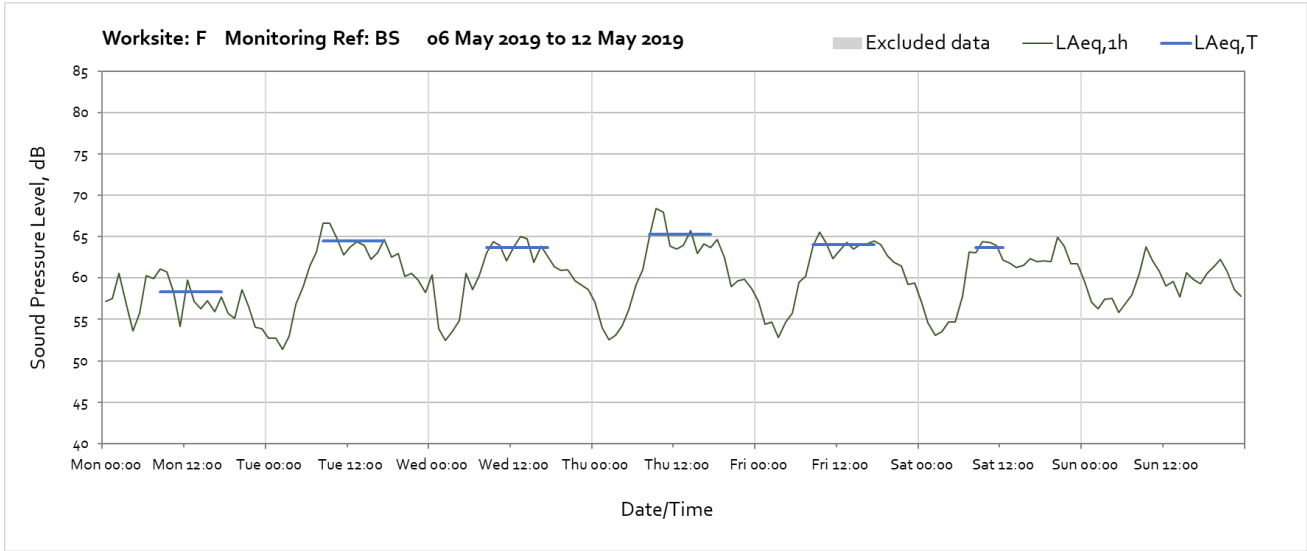
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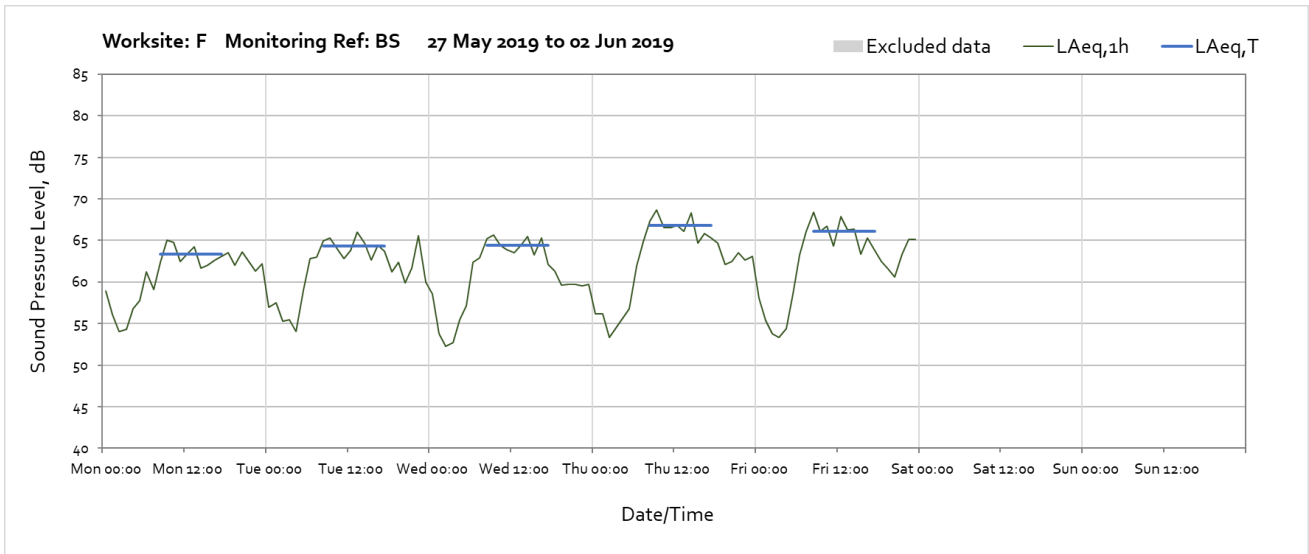




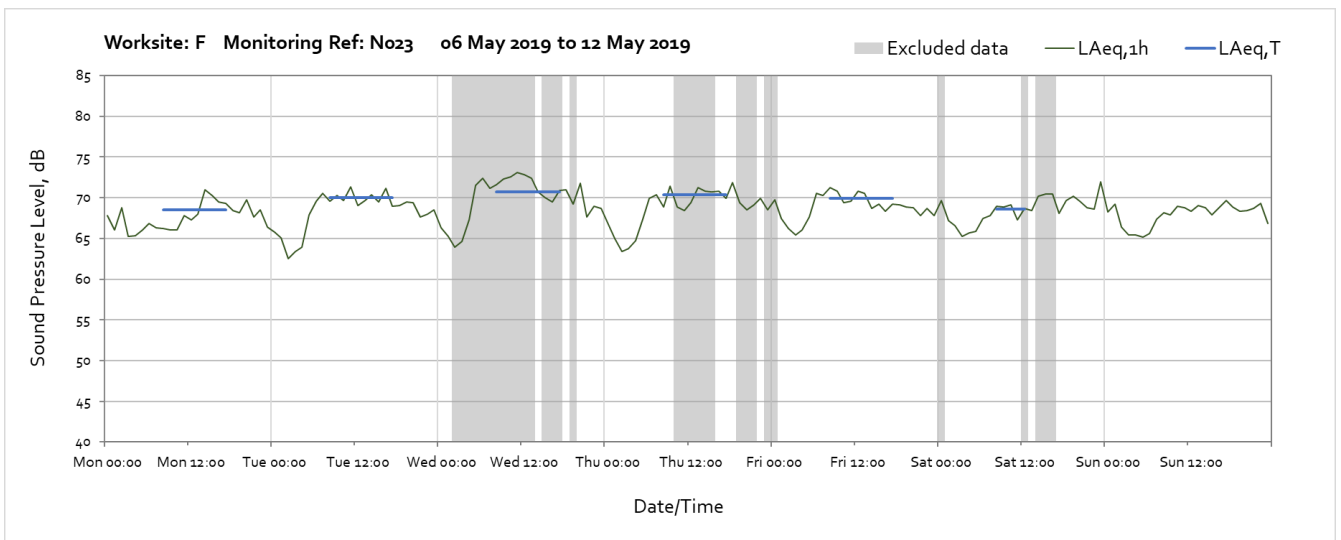
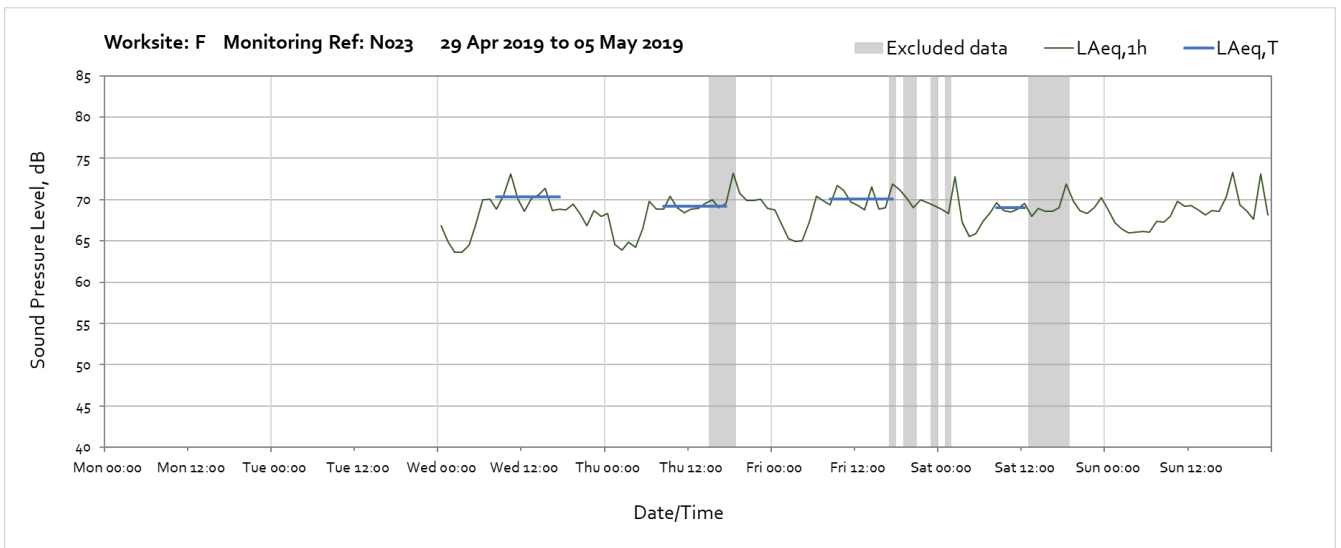
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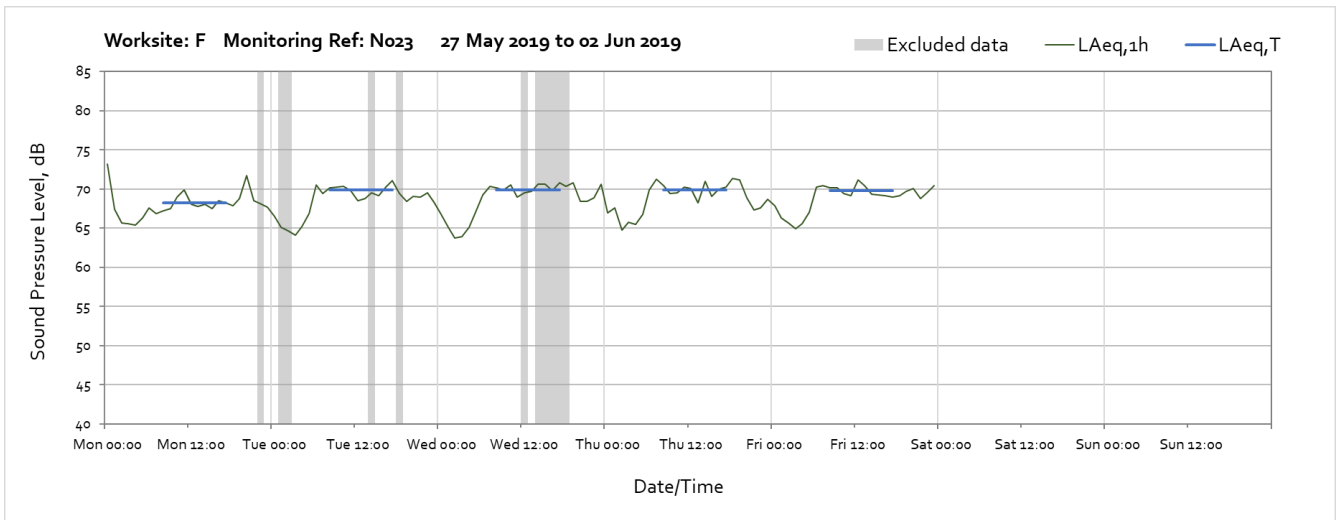
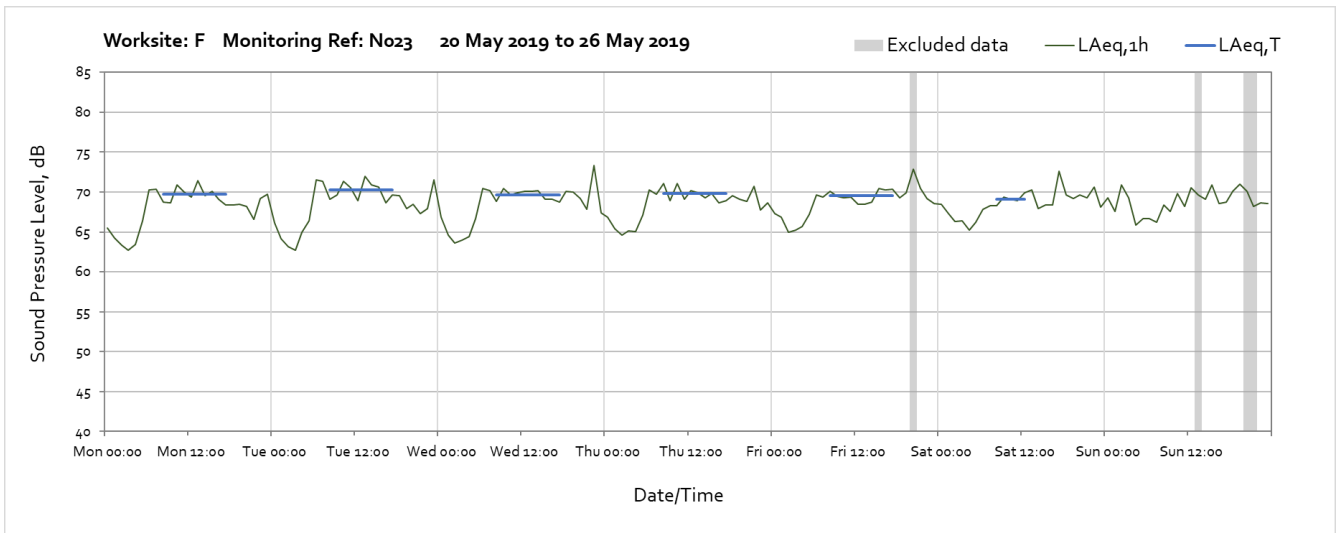
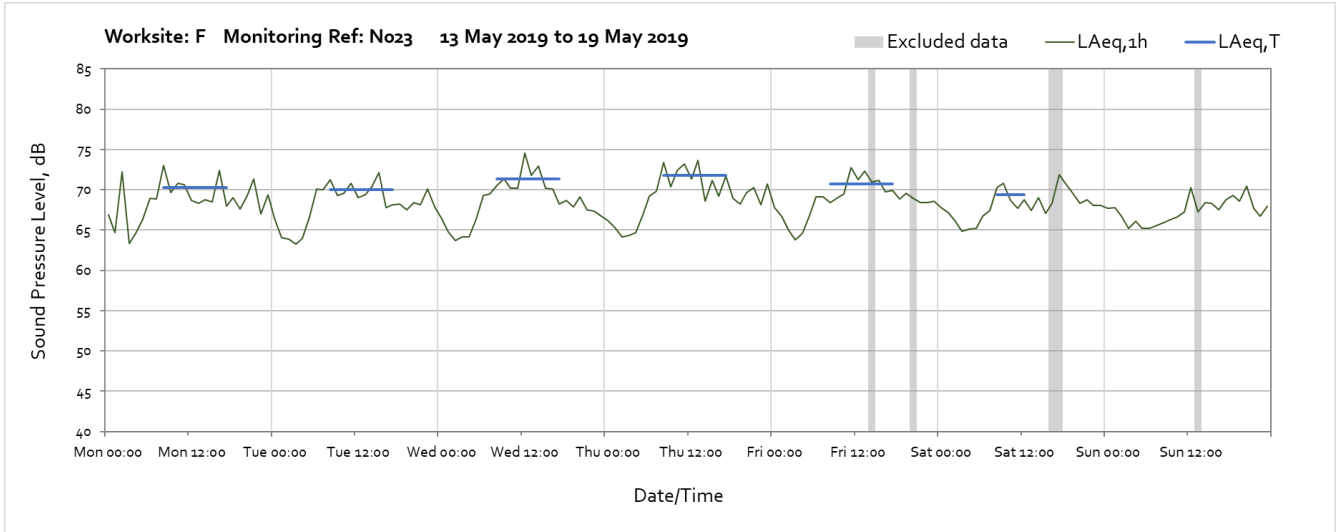




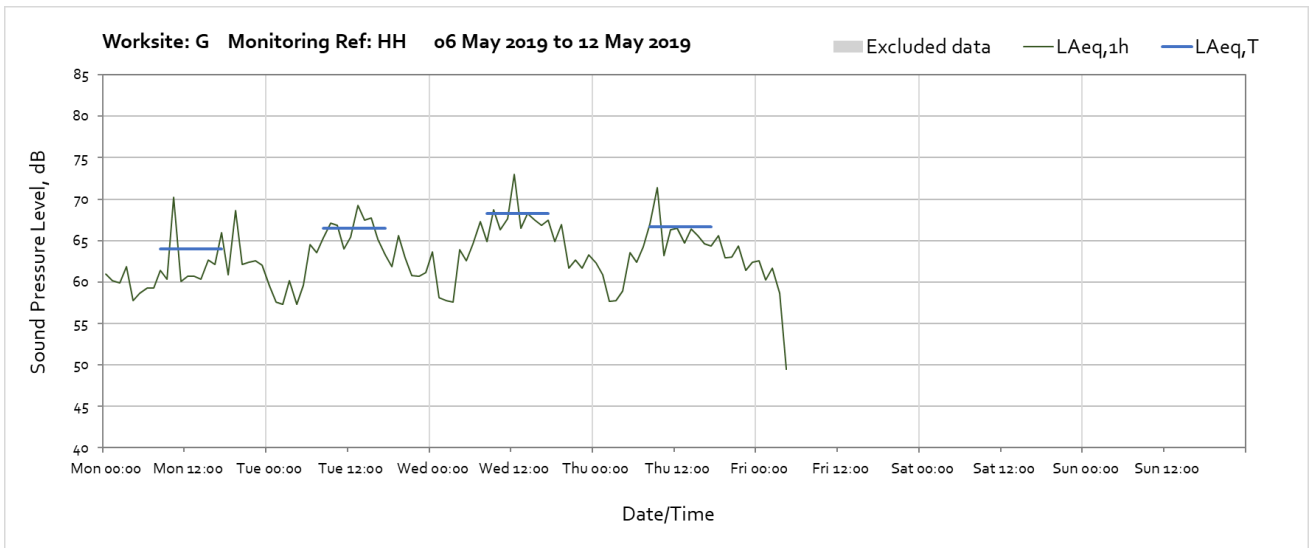
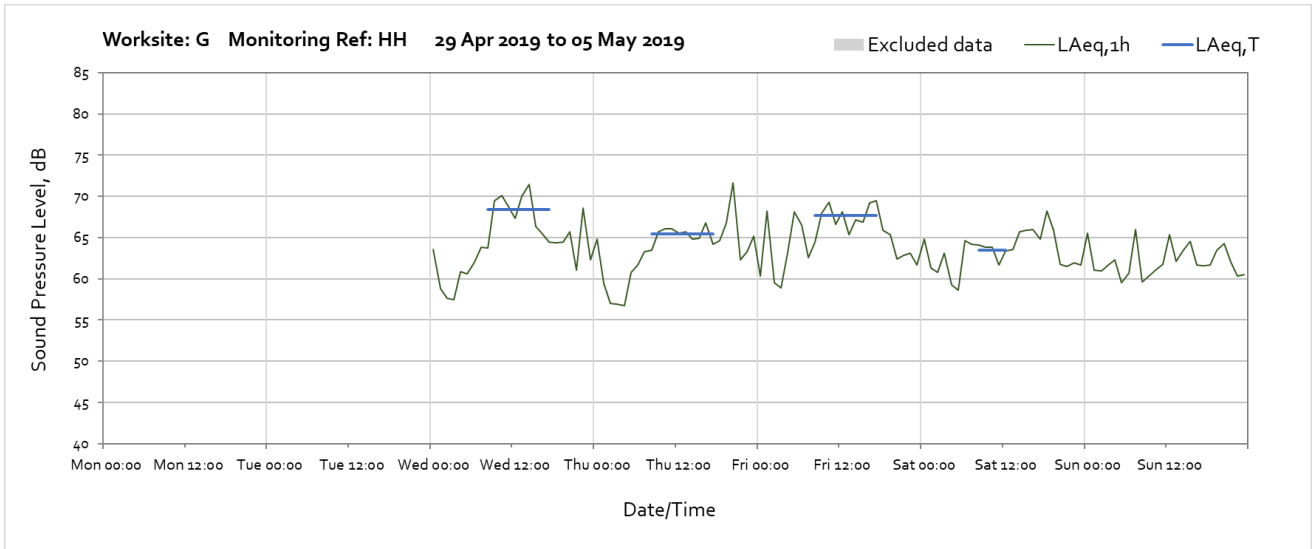


Worksite: F – Monitoring Ref: N023

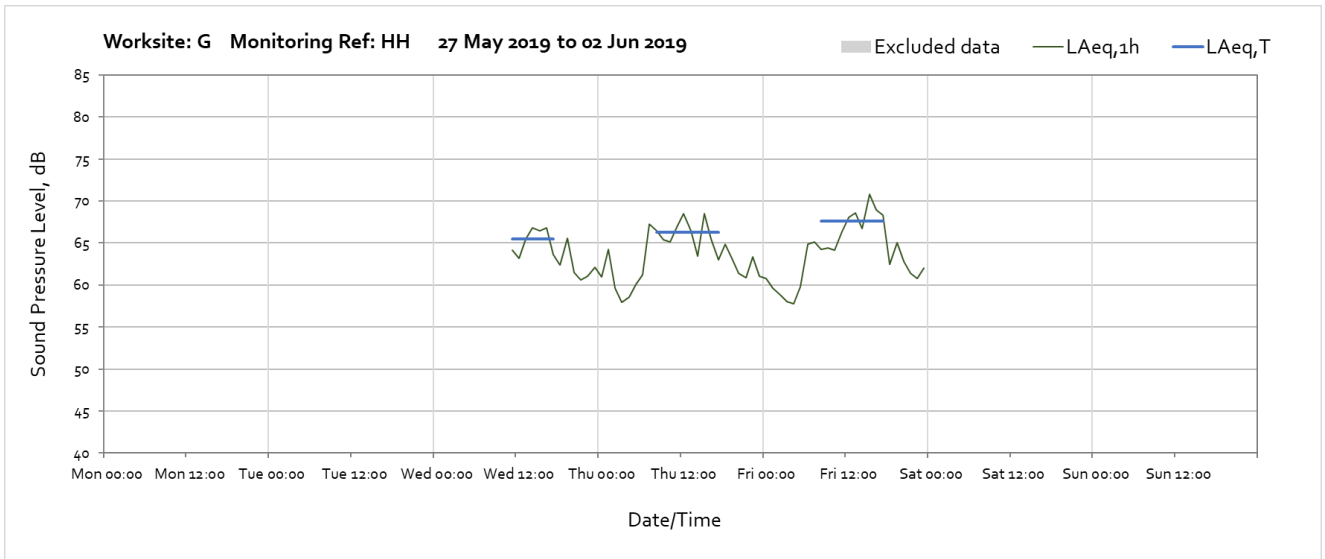




Worksite: G – Monitoring Ref: HH

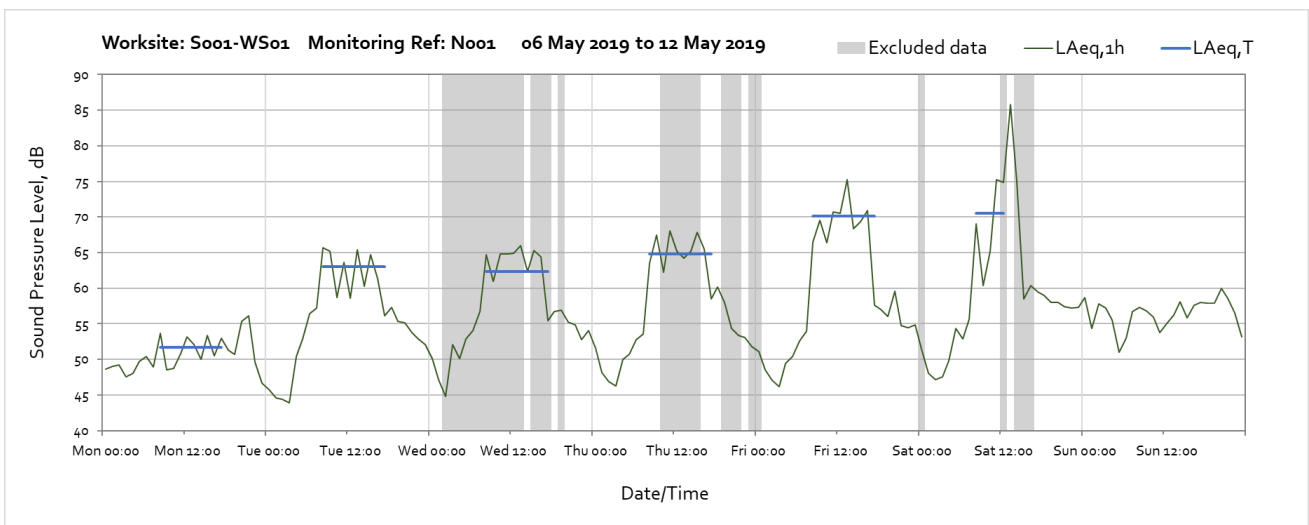
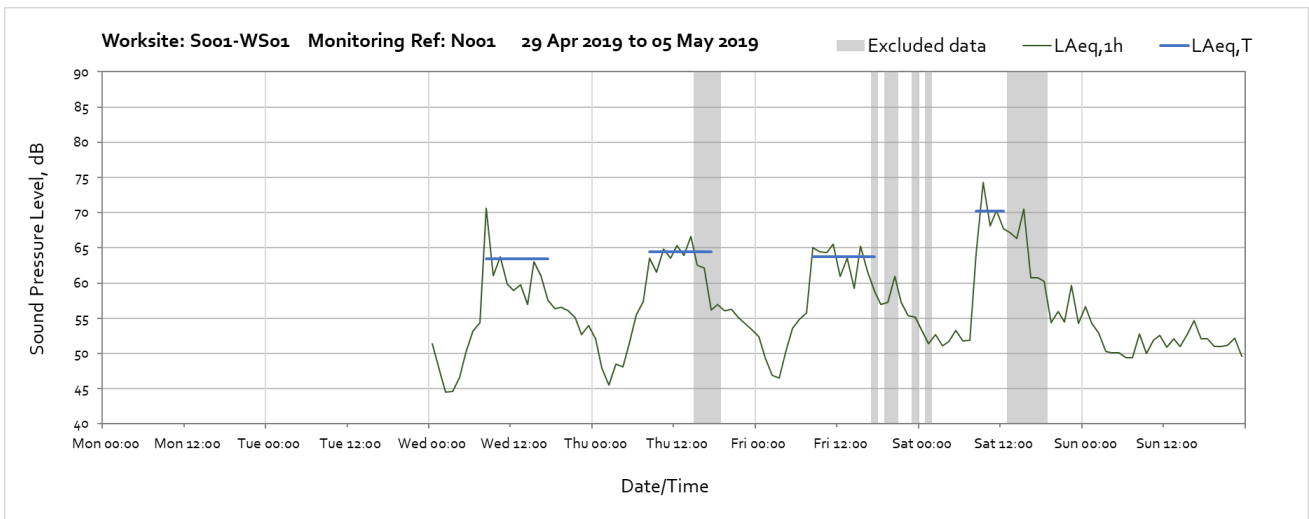


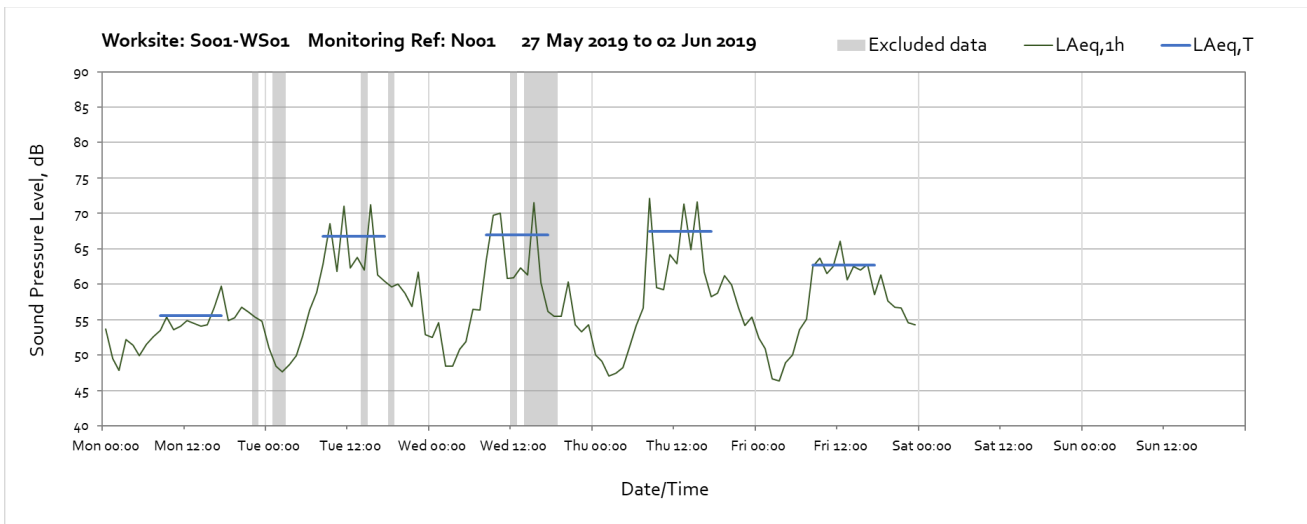
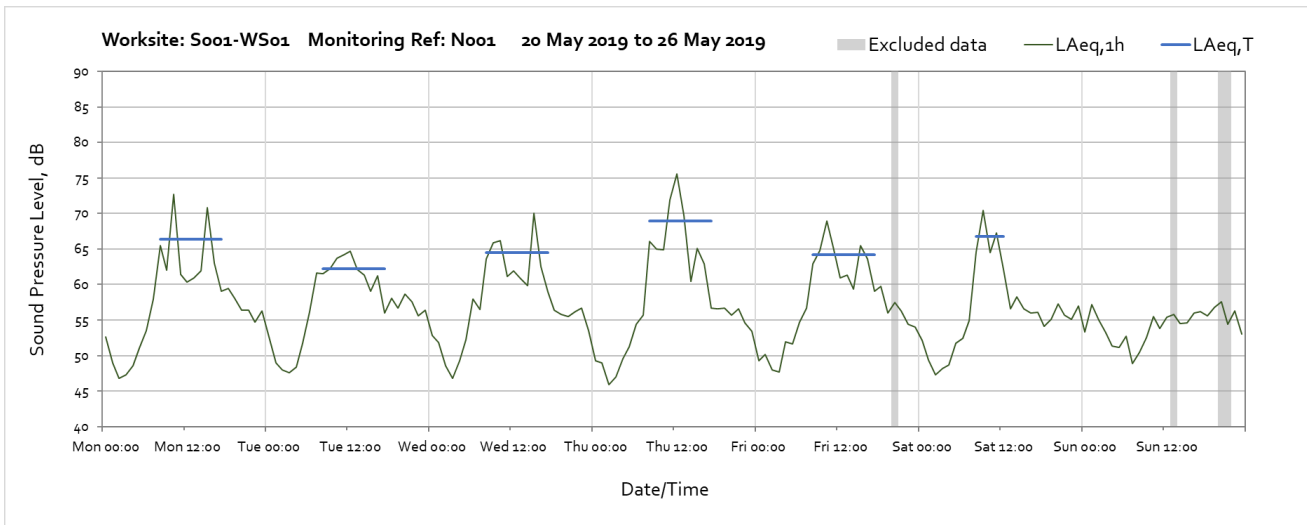
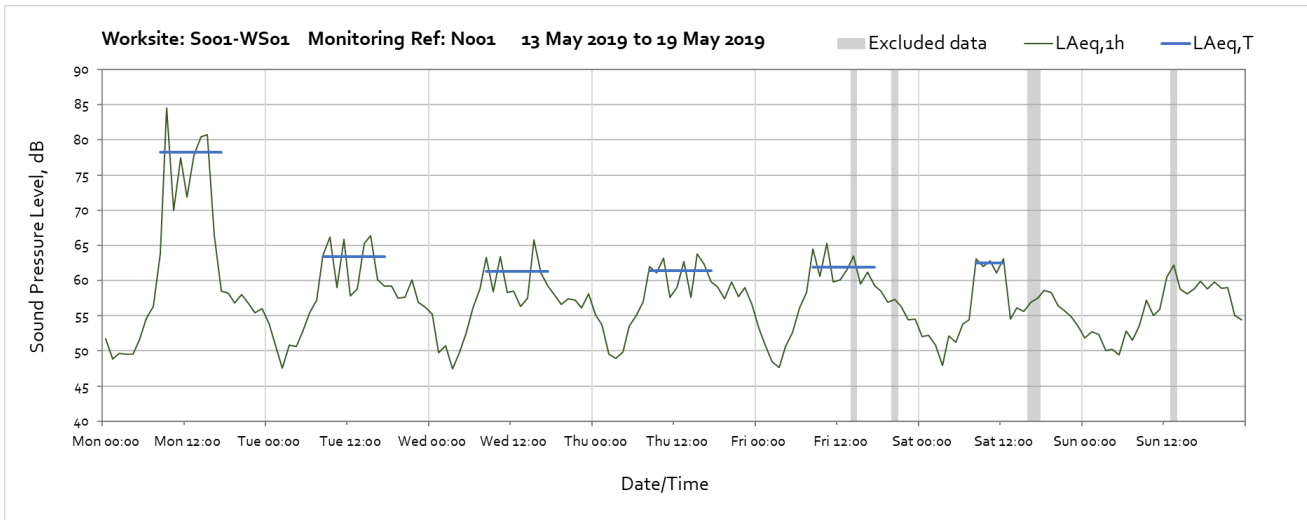
Note: Missing data between 04:00 on Friday 10th and 11:00 on Wednesday 29th were due to a power cut affecting the site.



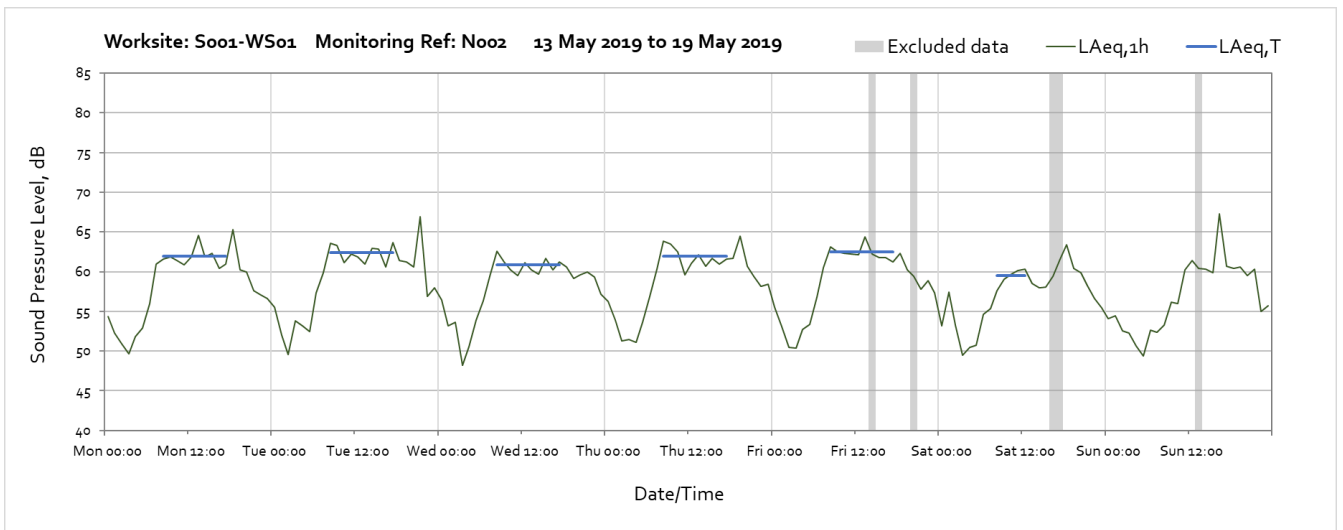
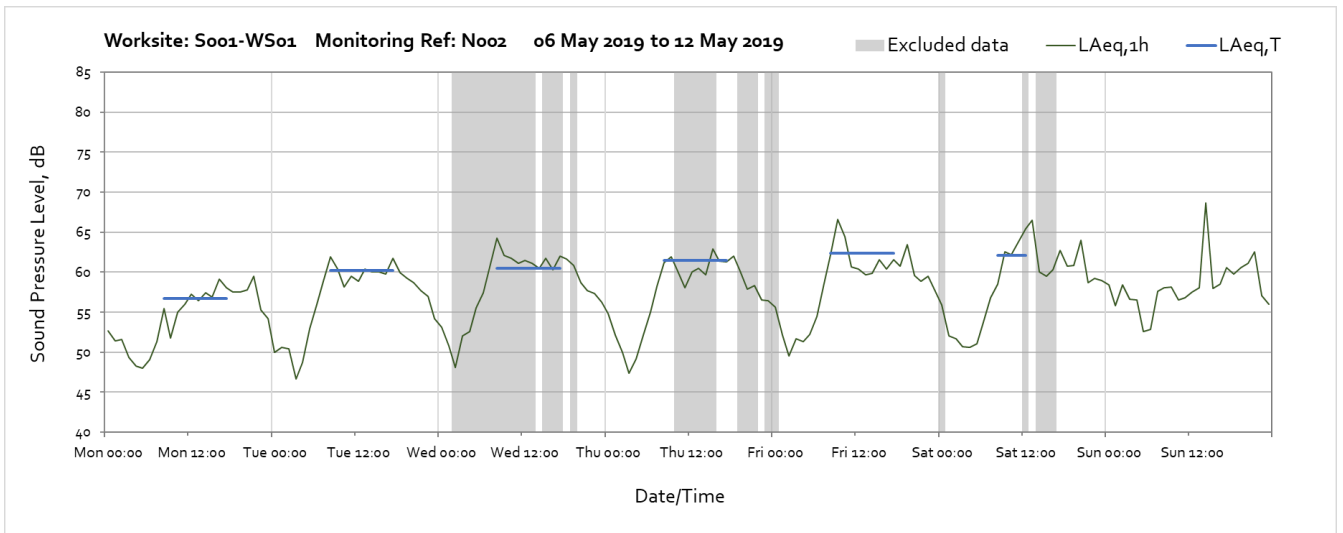
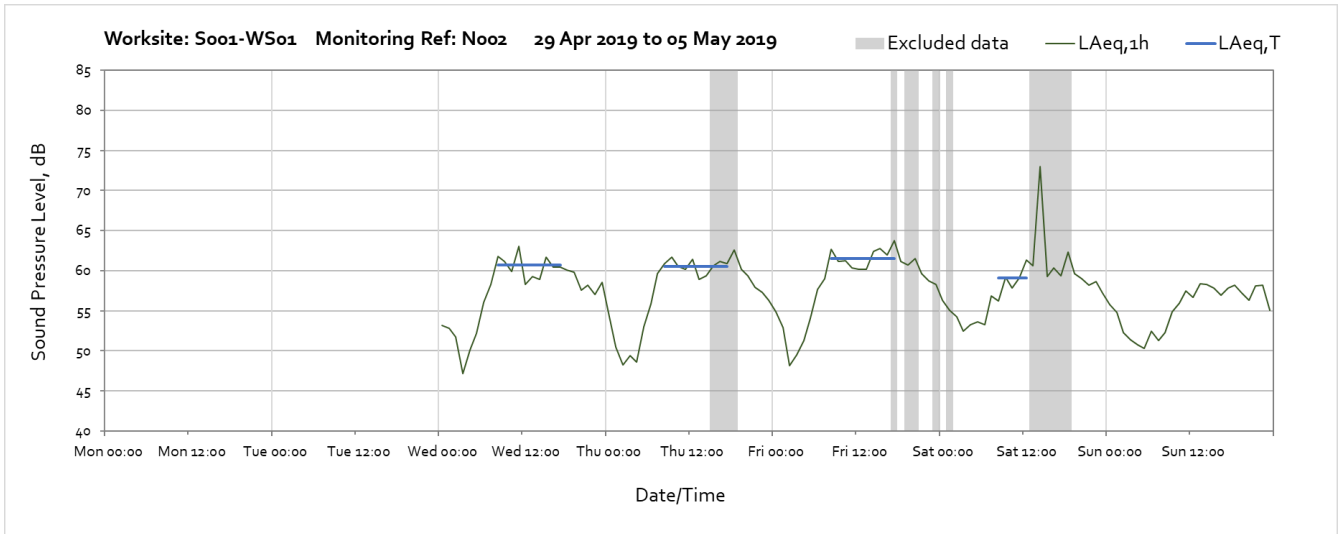
Note: Missing data between 04:00 on Friday 10th and 11:00 on Wednesday 29th were due to a power cut affecting the site.

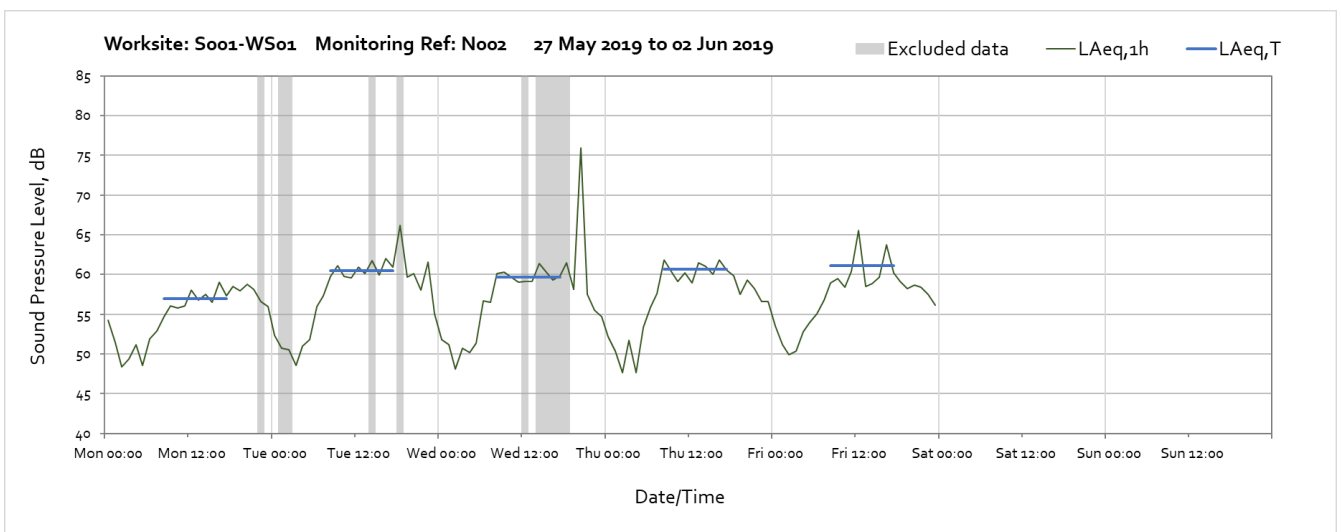
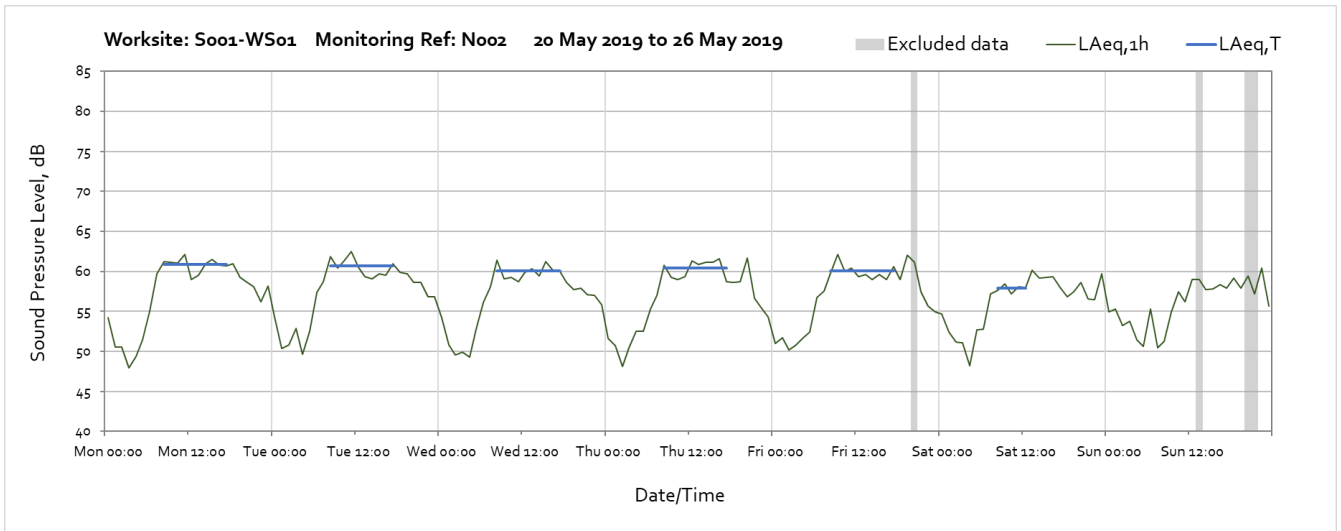
Worksite: S001-WS01 – Monitoring Ref: N001



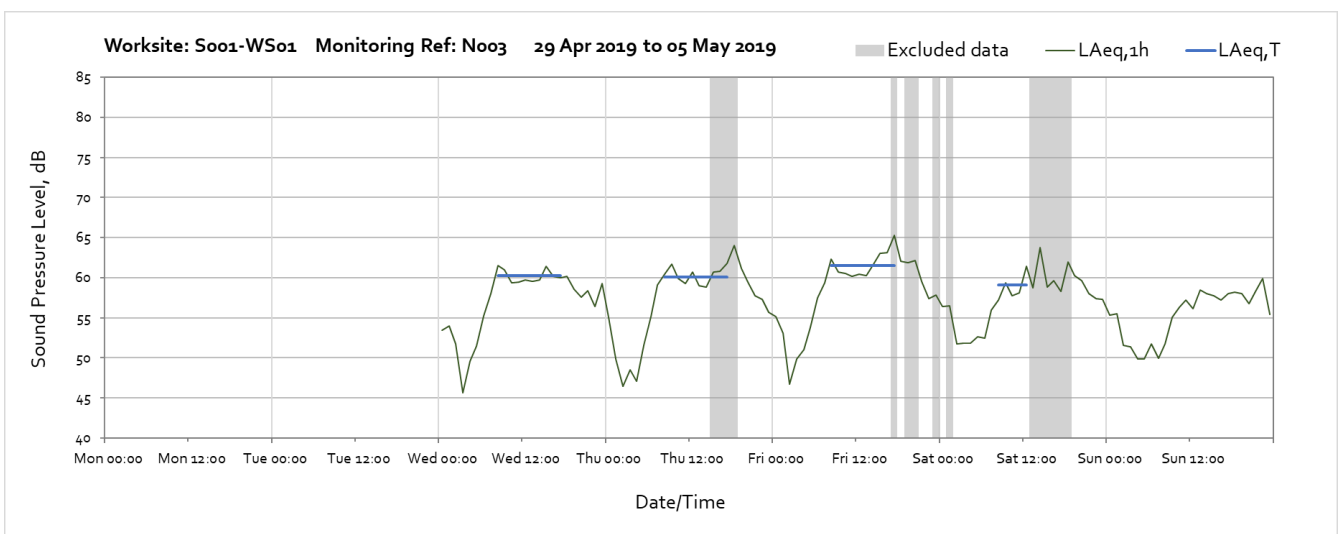


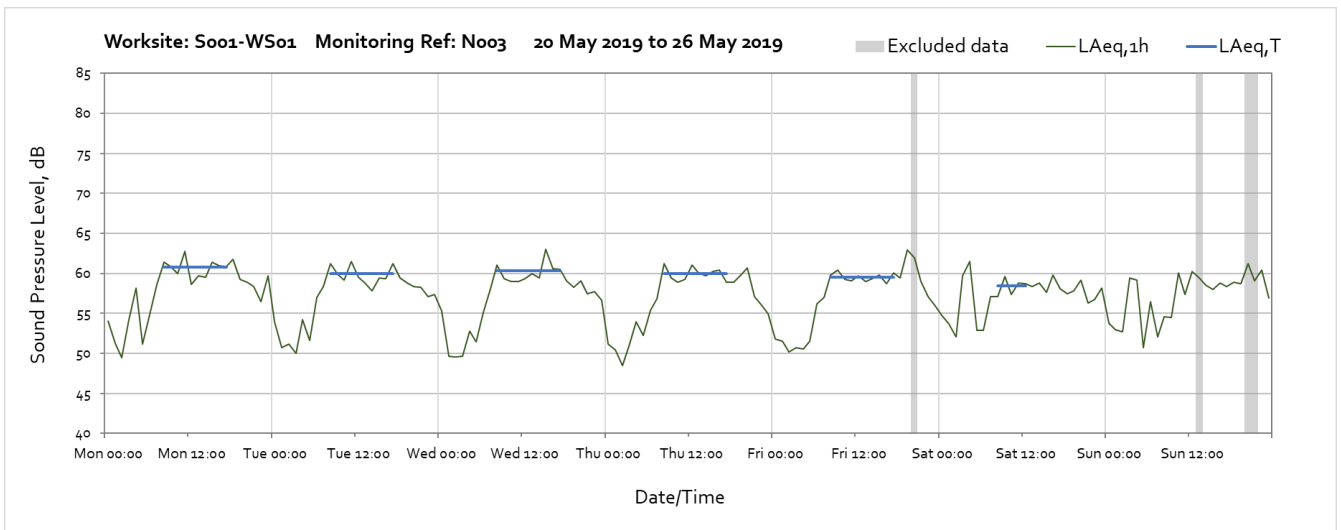
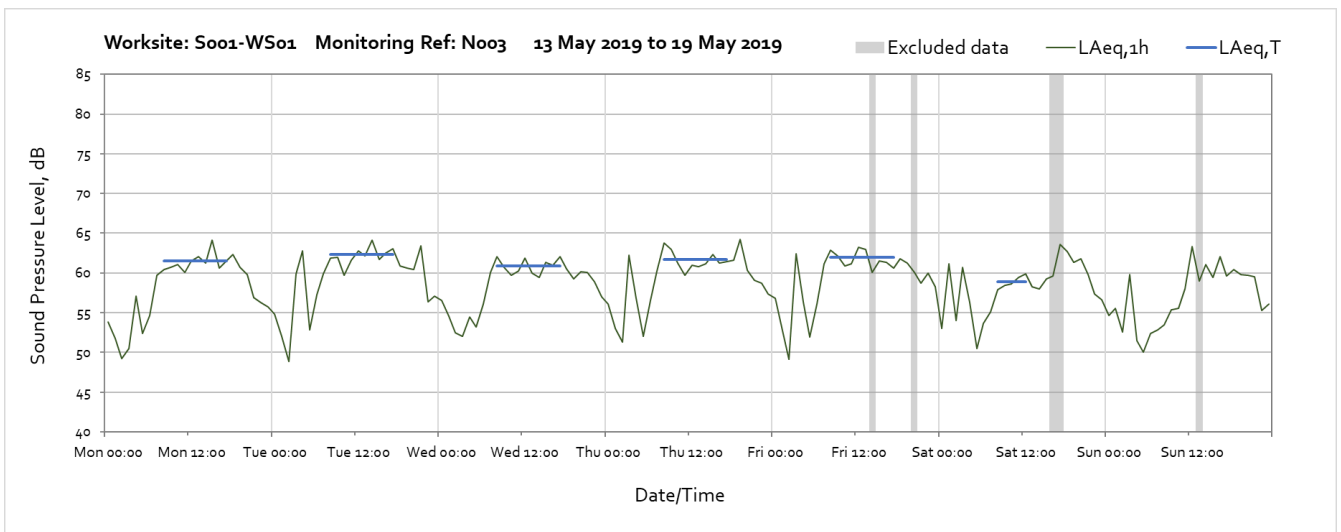
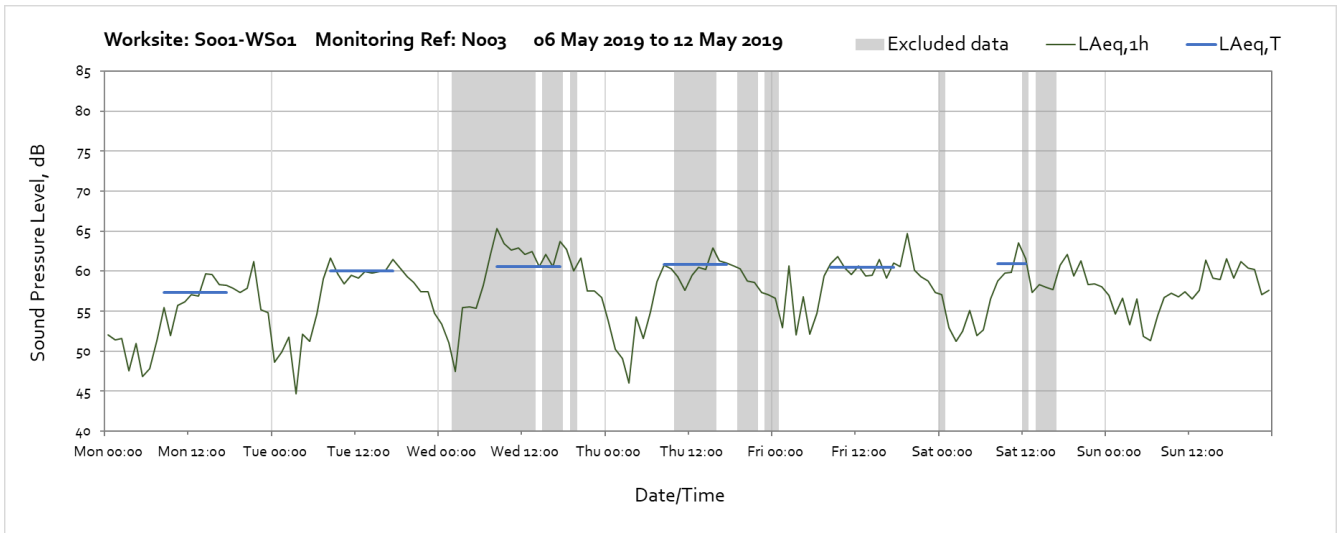
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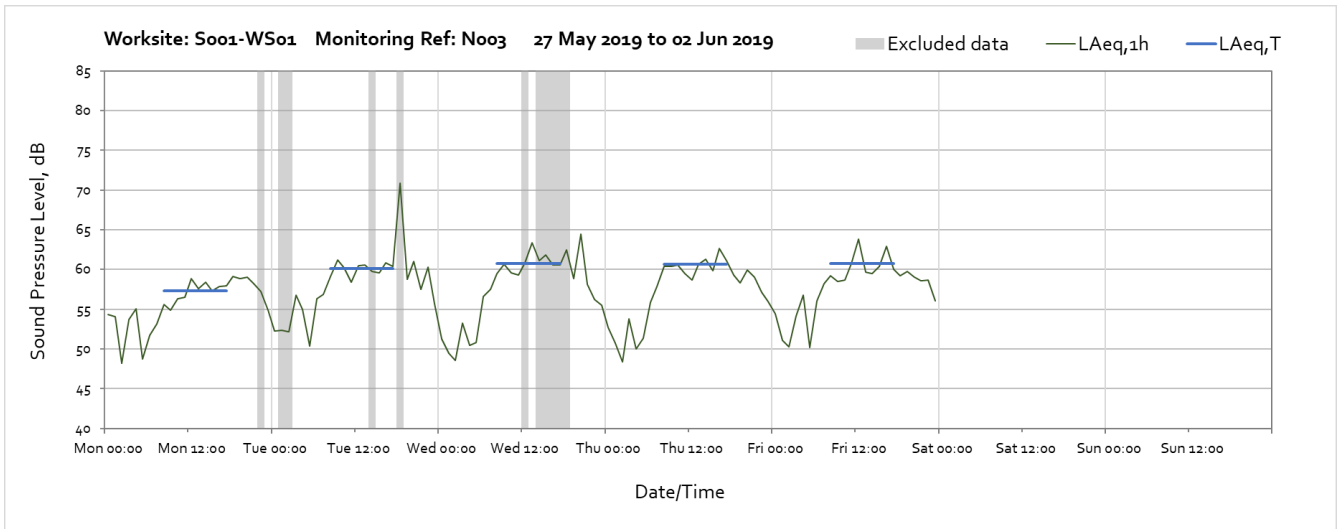




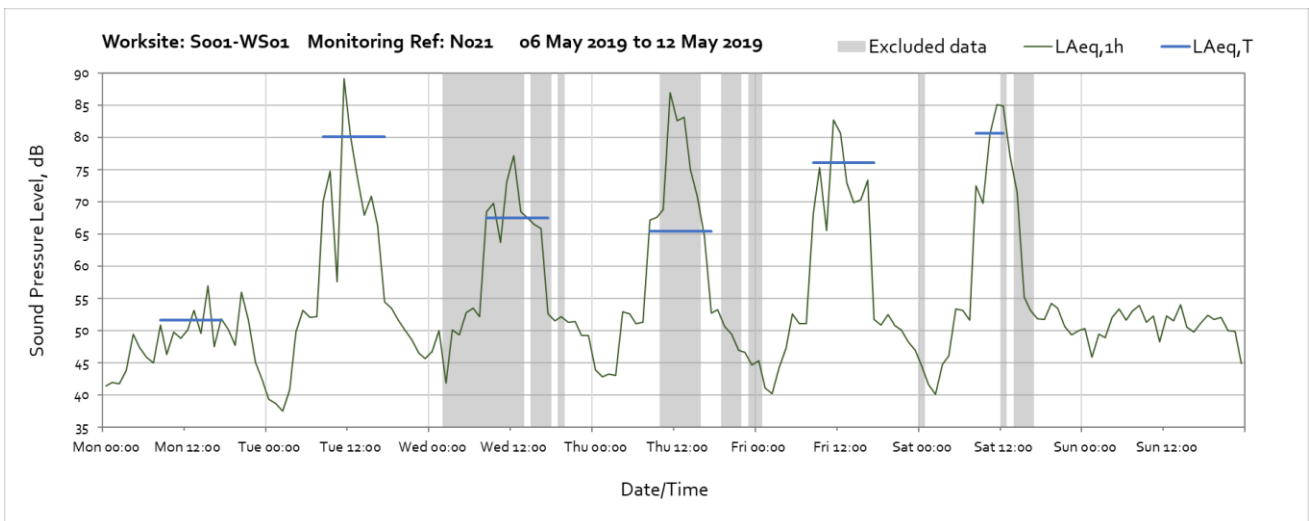
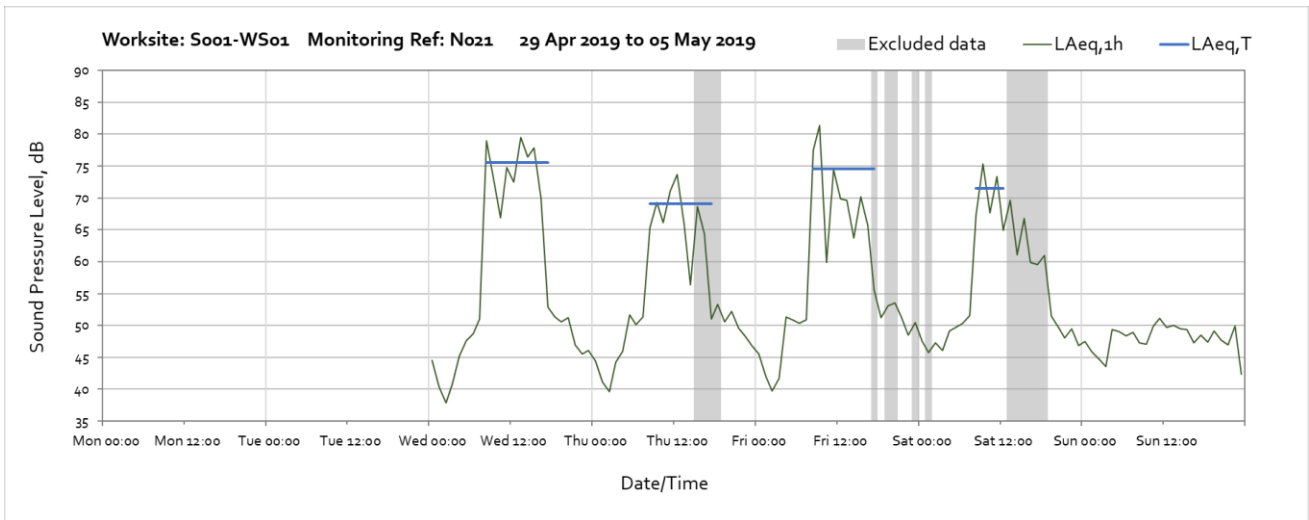
Worksite: S001-WS01 – Monitoring Ref: N003

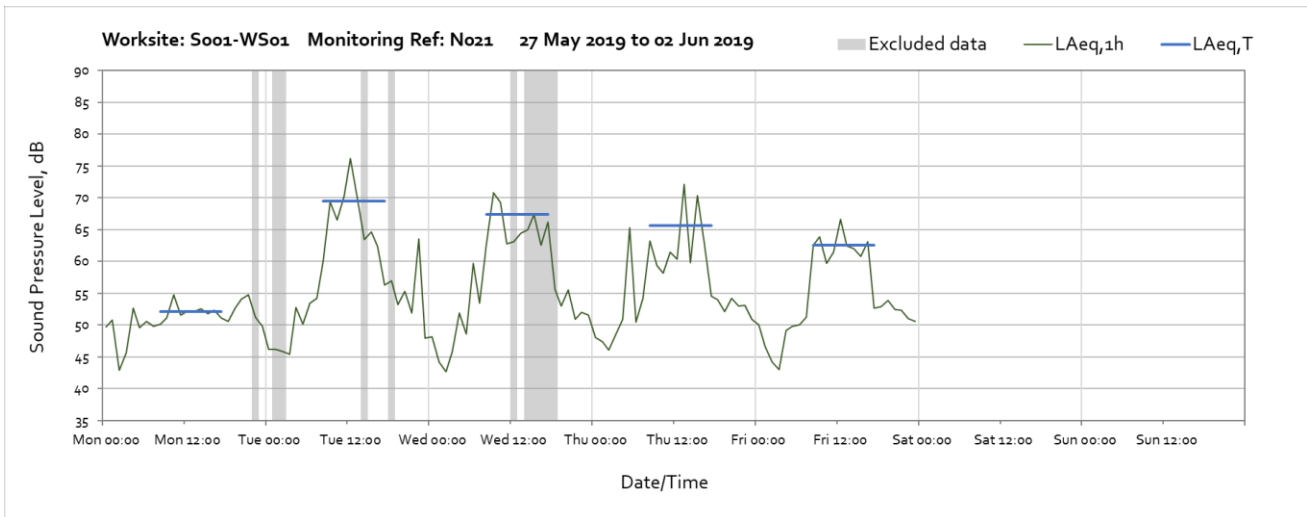
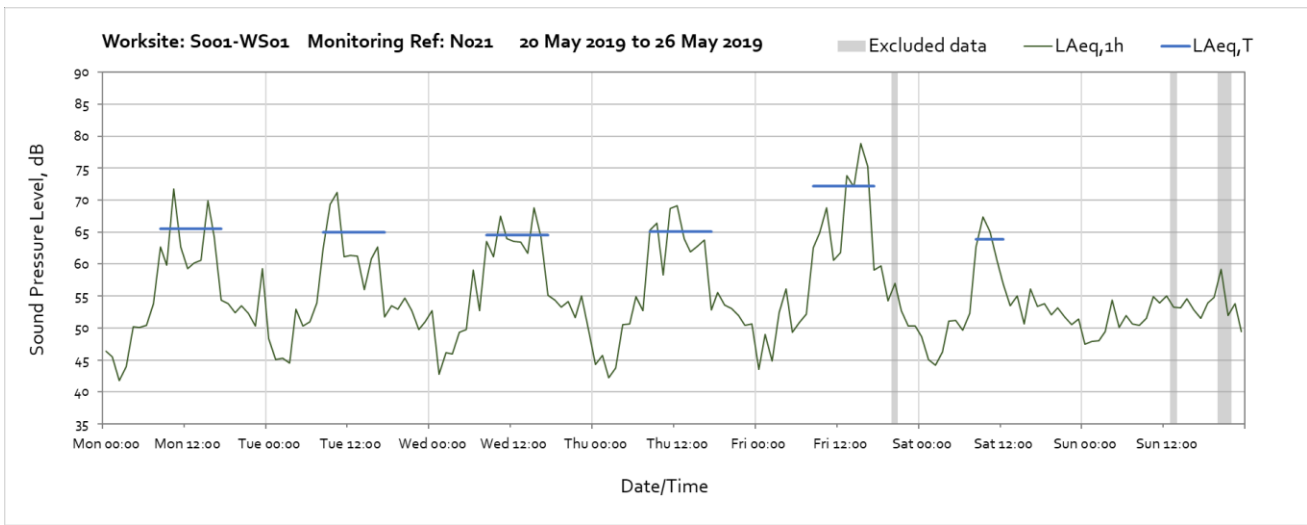
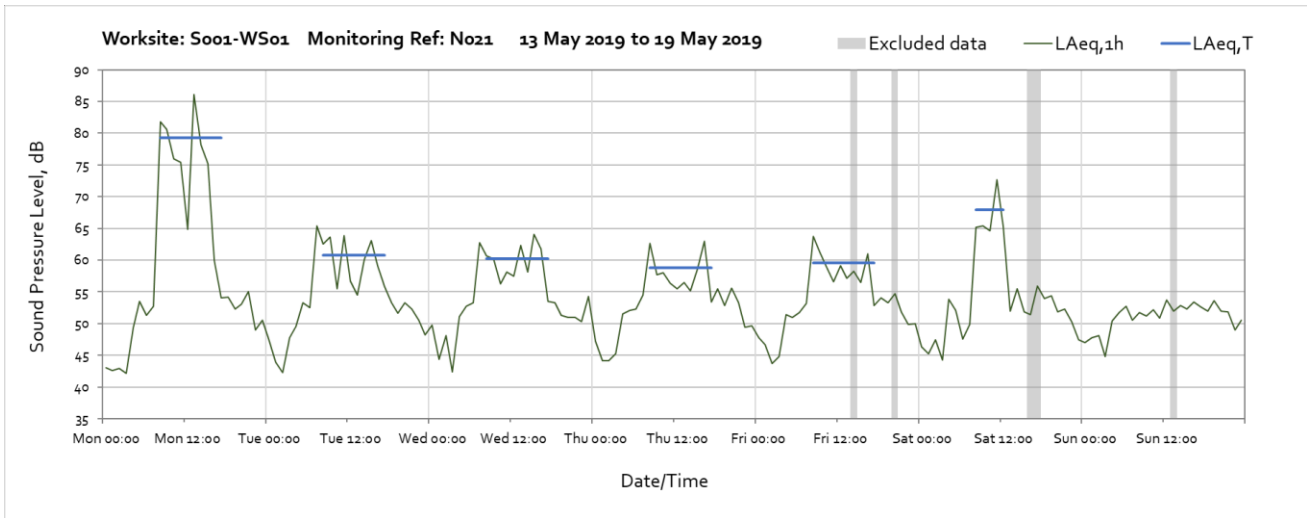




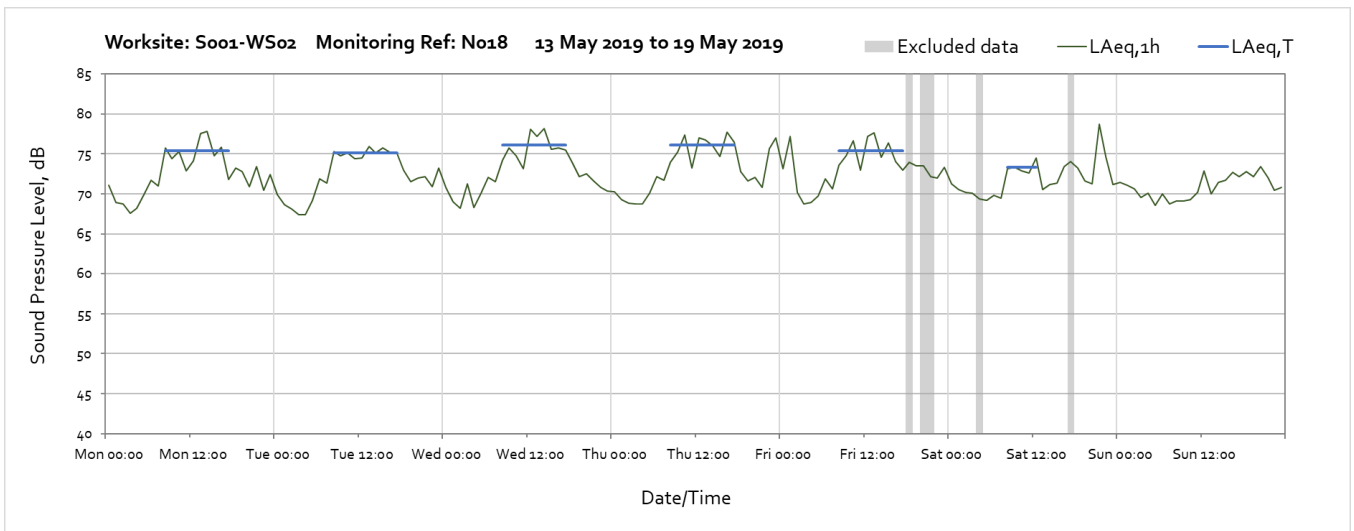
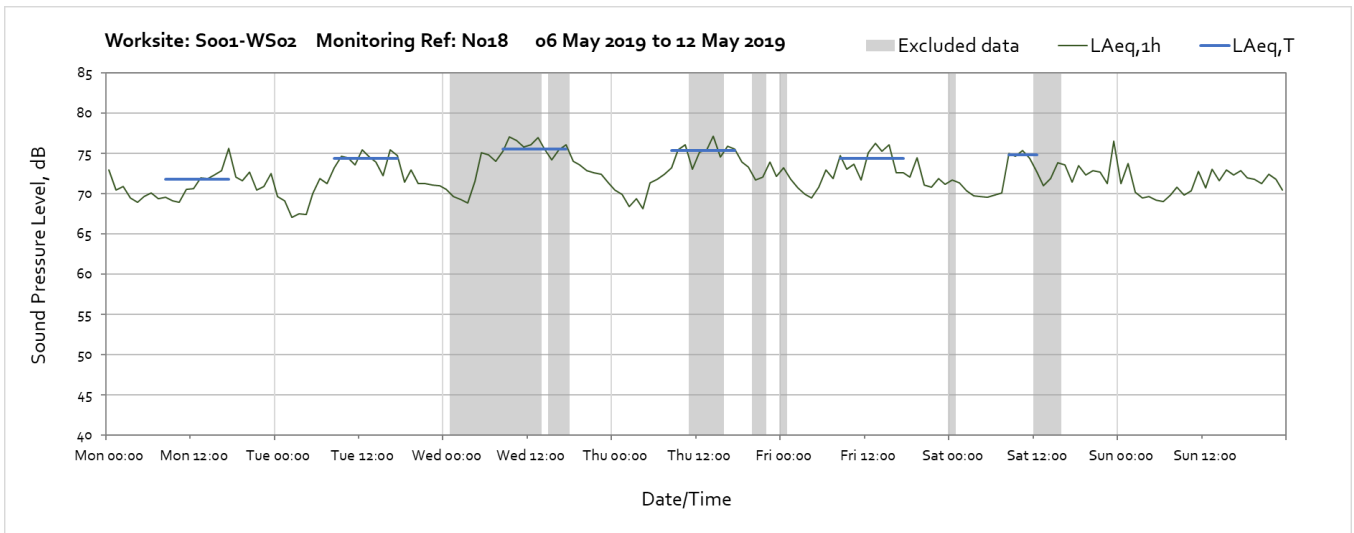
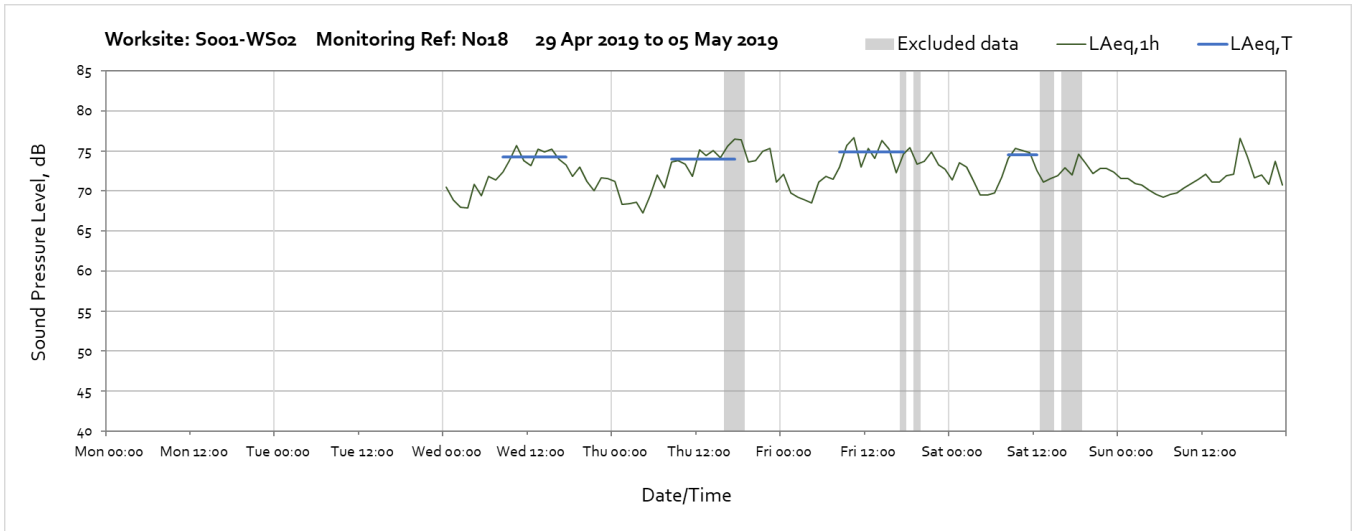


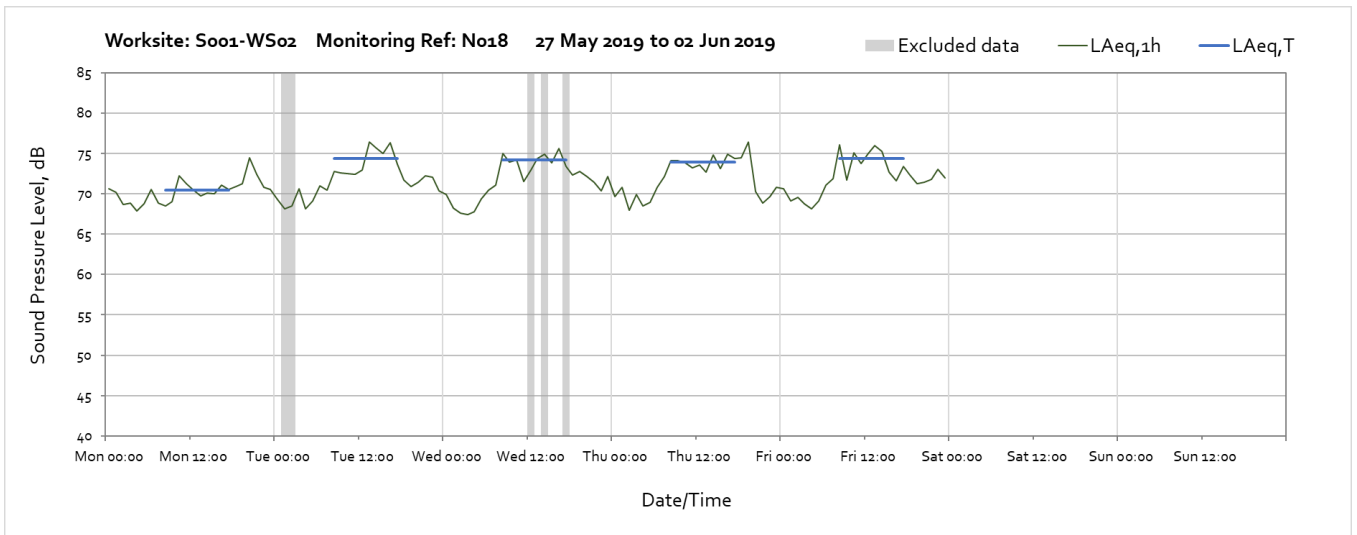
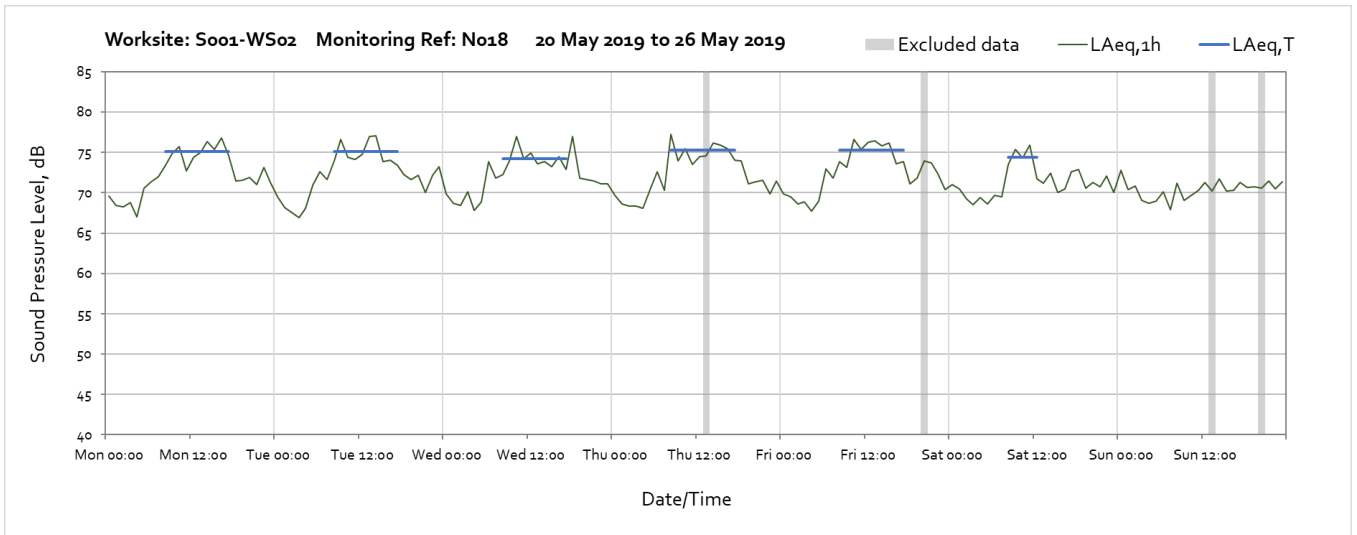
Worksite: S001-WS01 – Monitoring Ref: N021



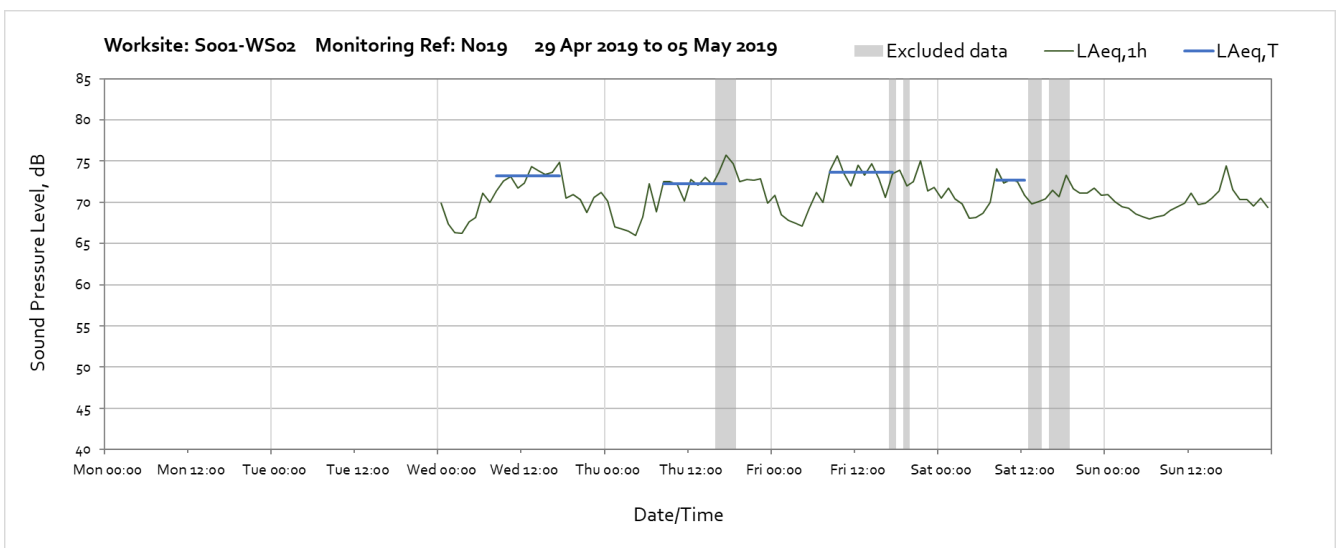


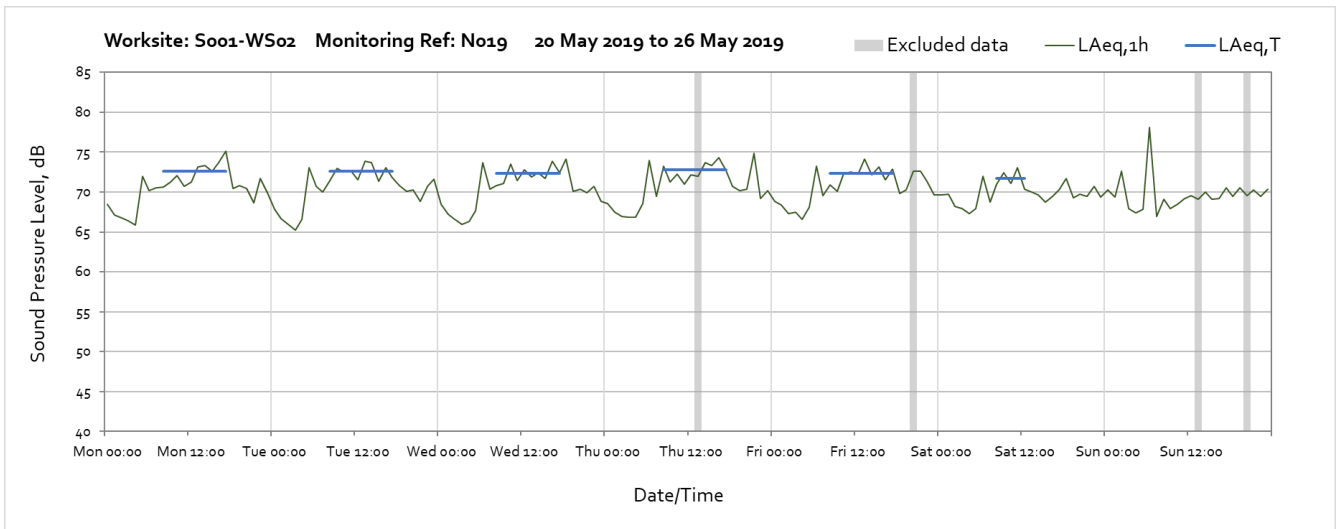
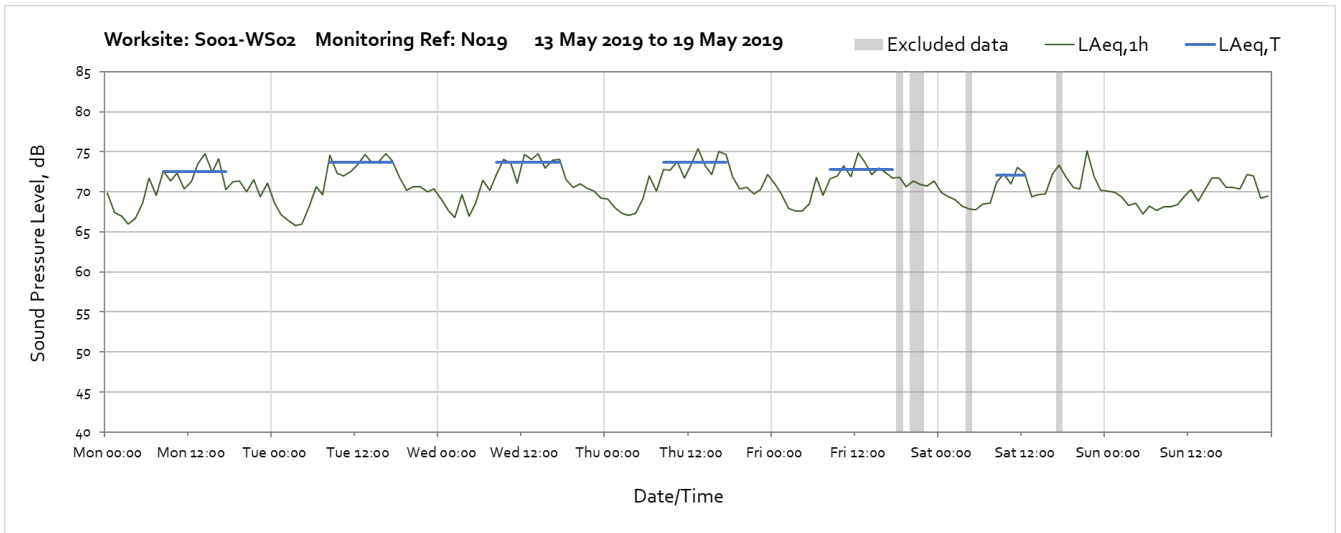
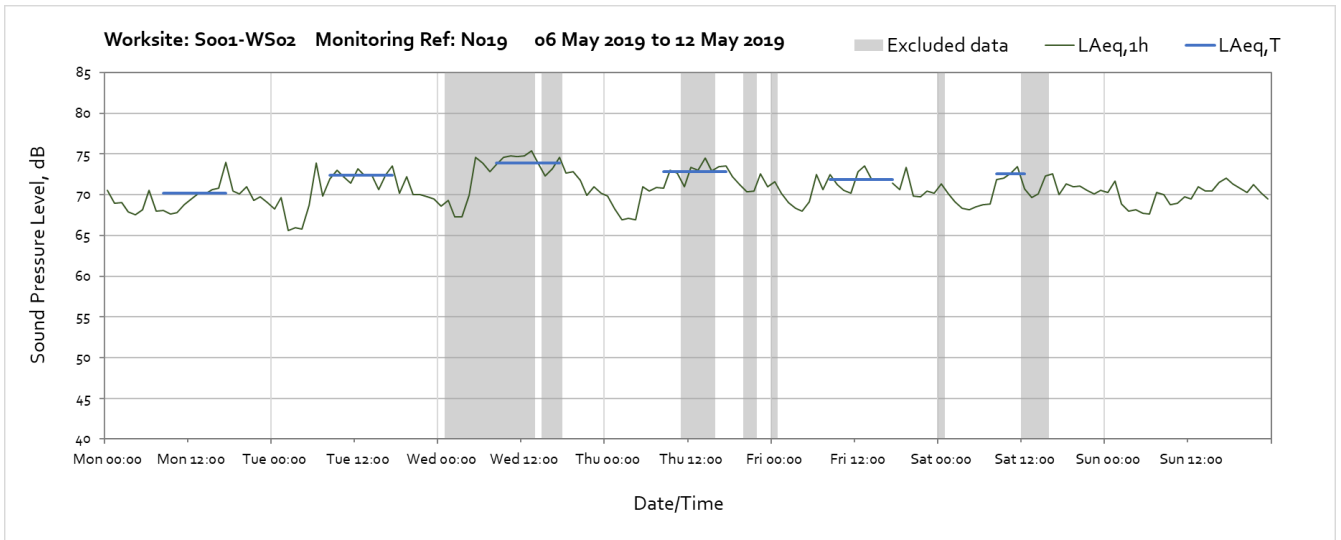
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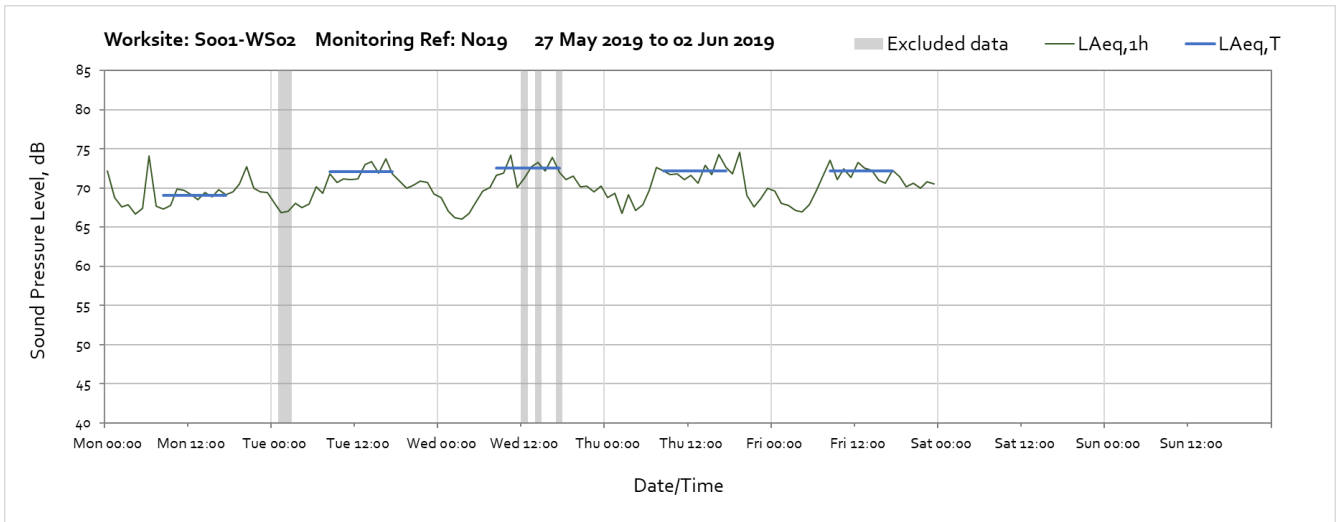




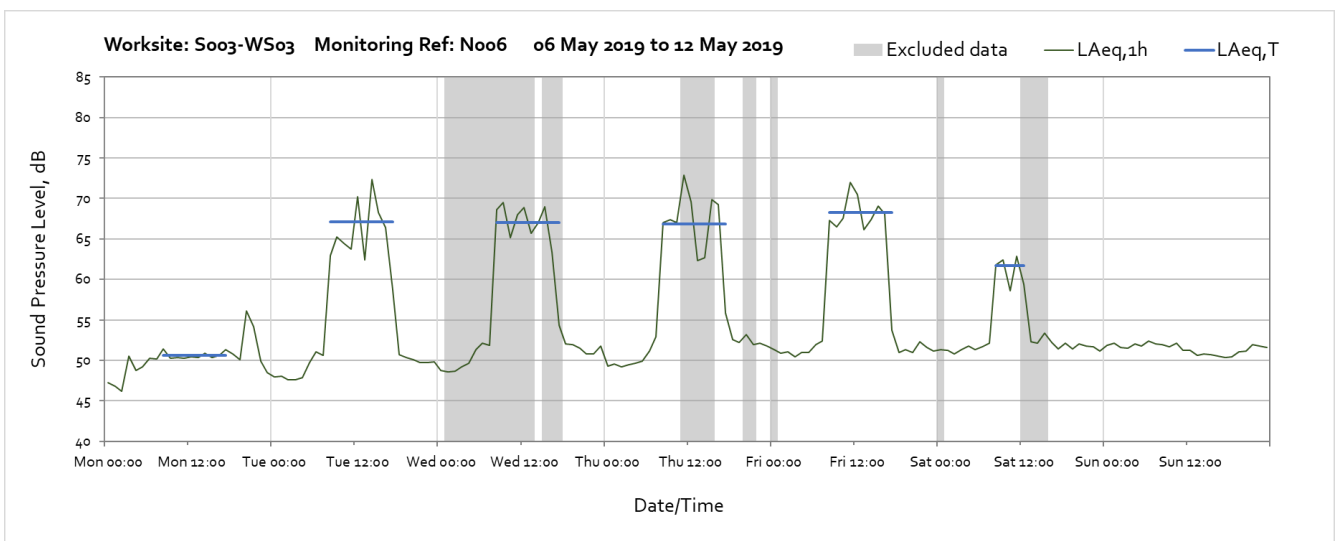
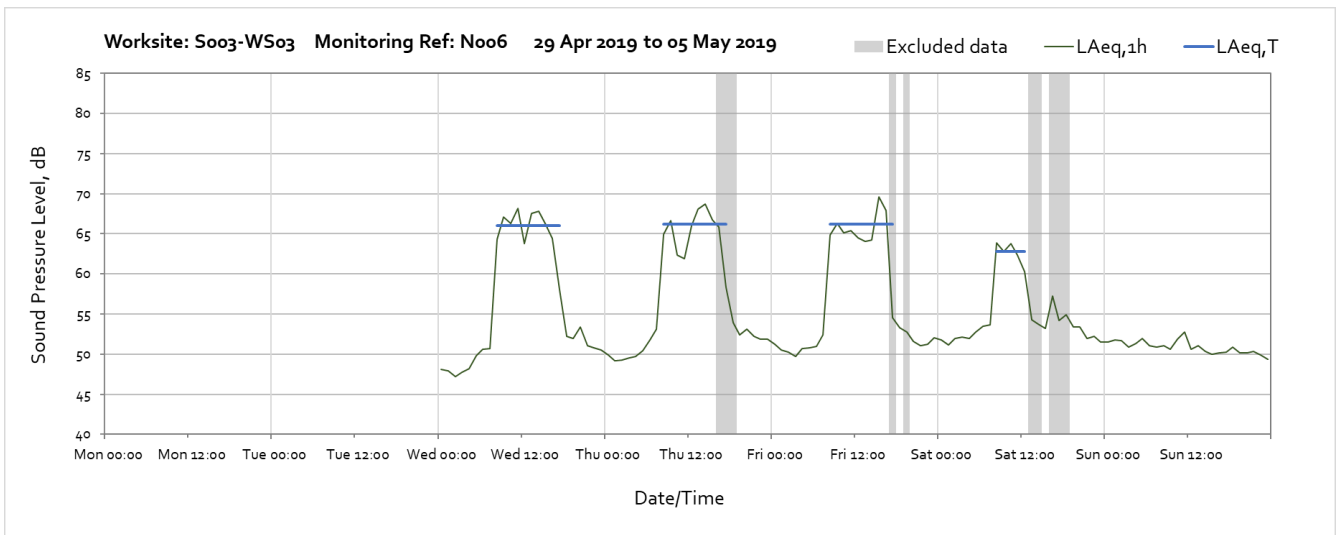
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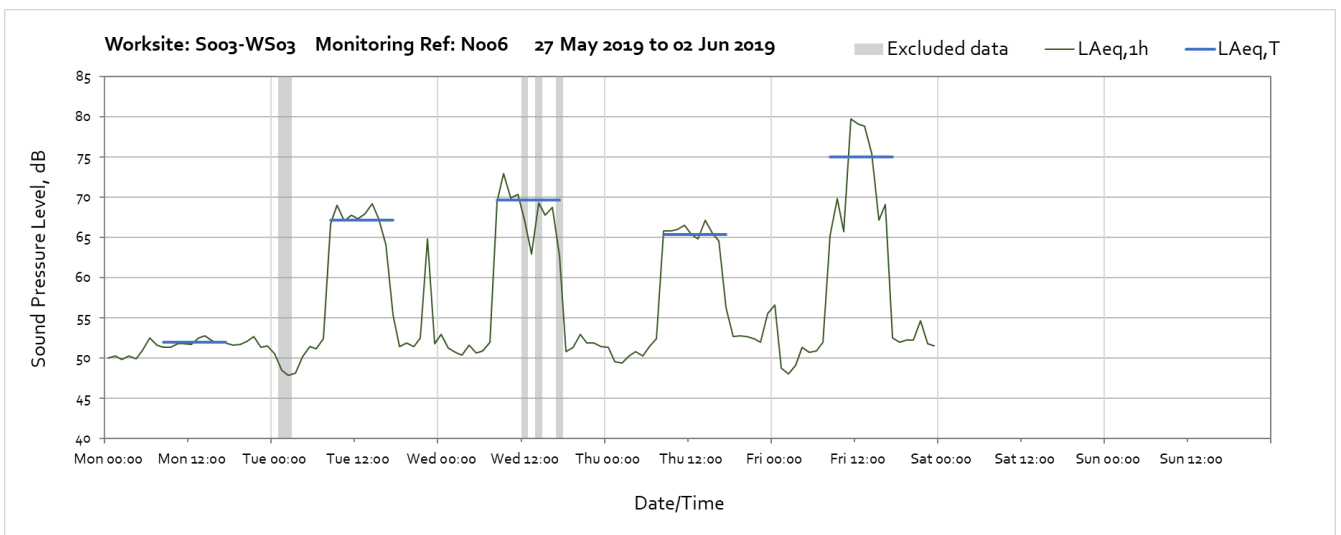
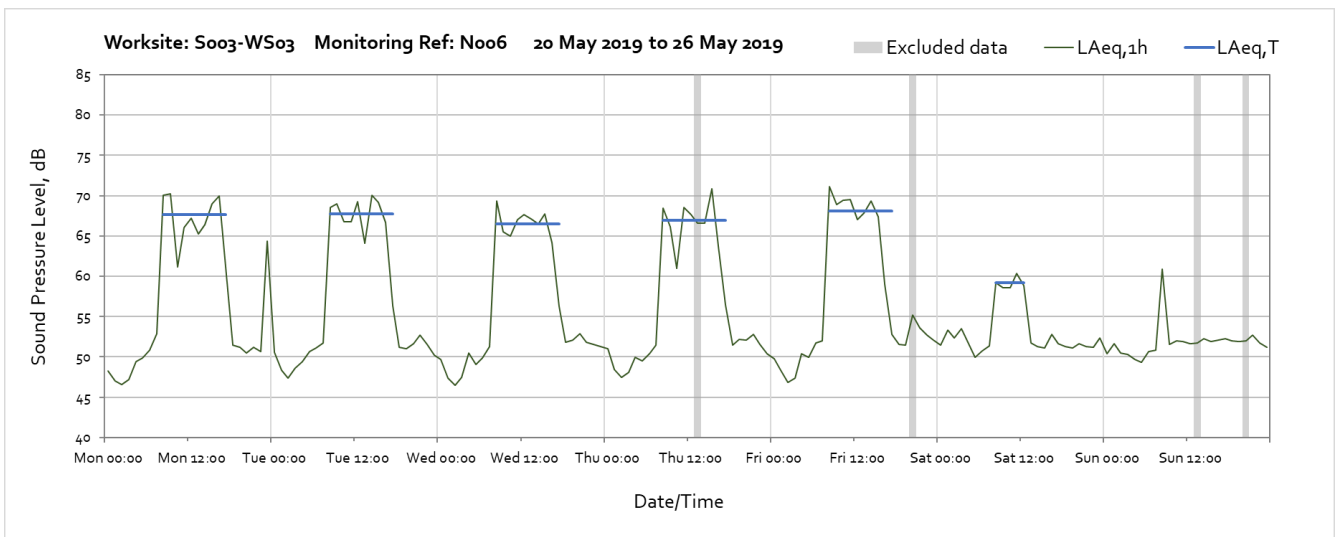
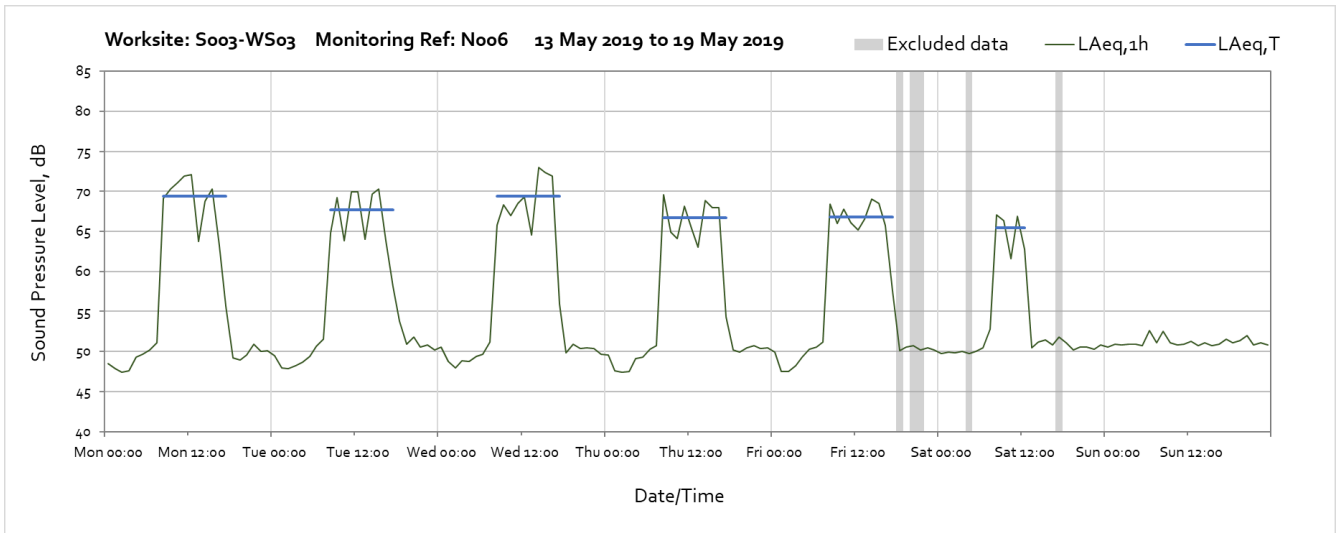




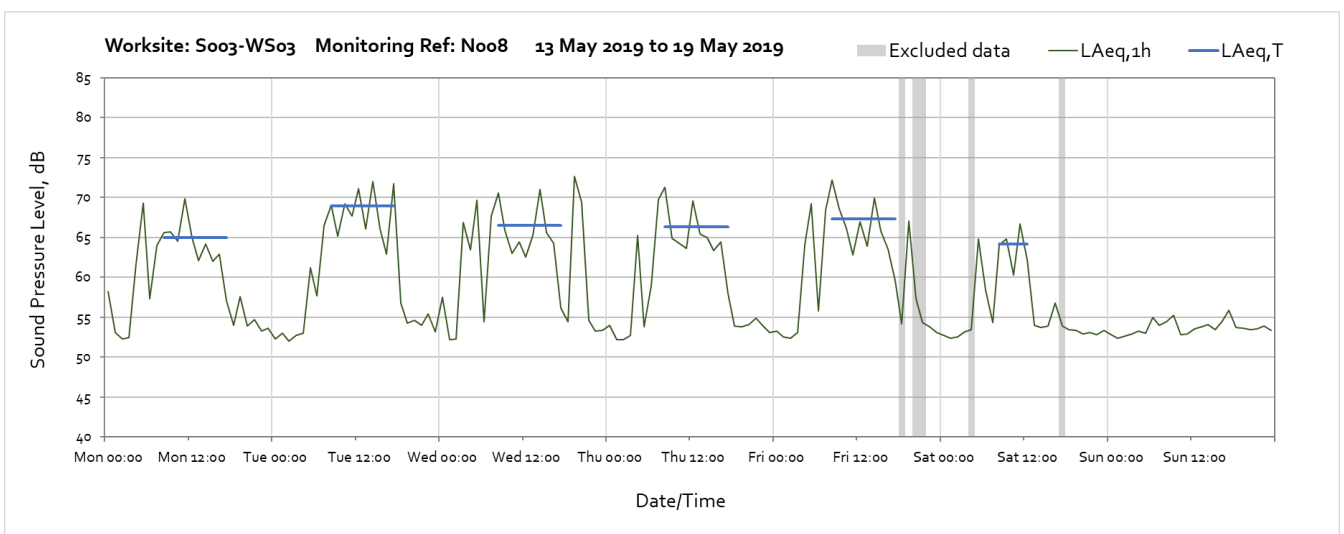
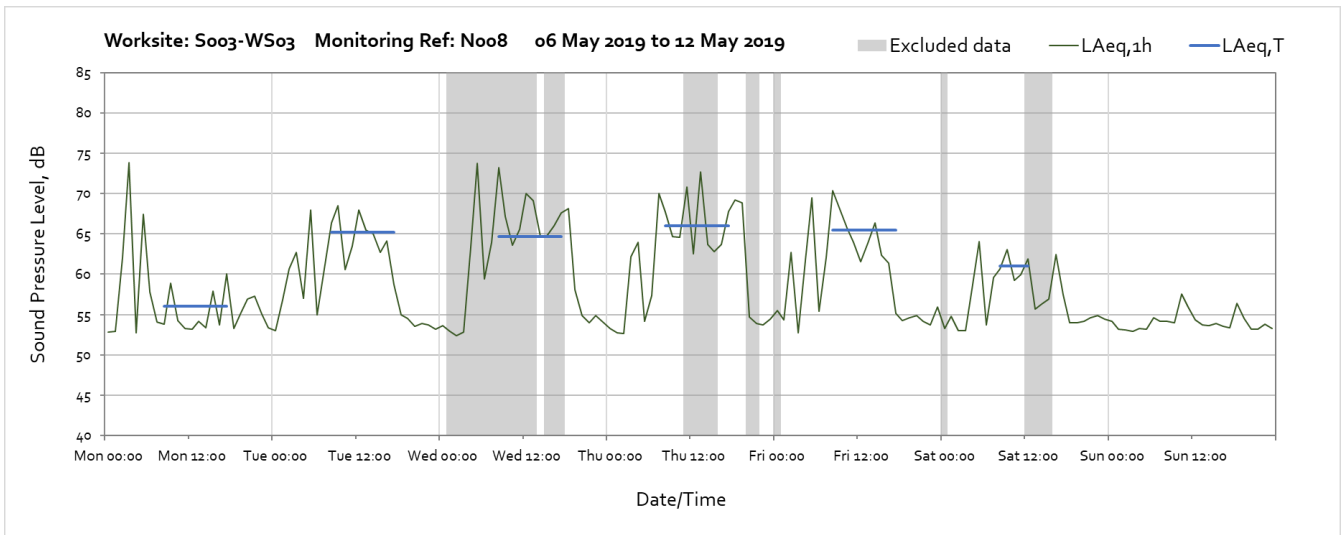
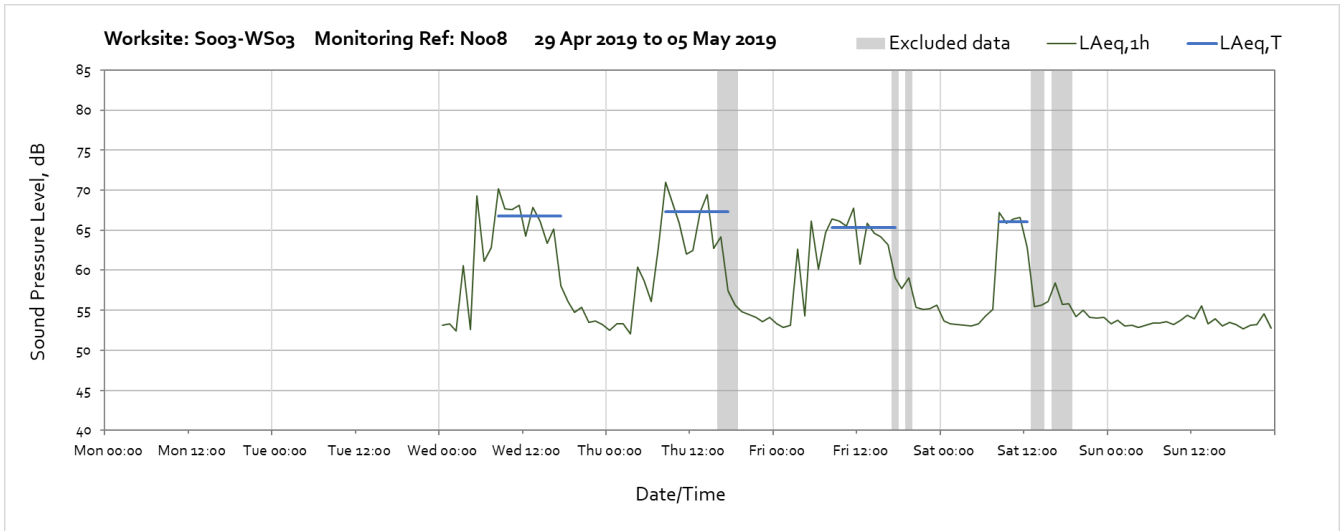


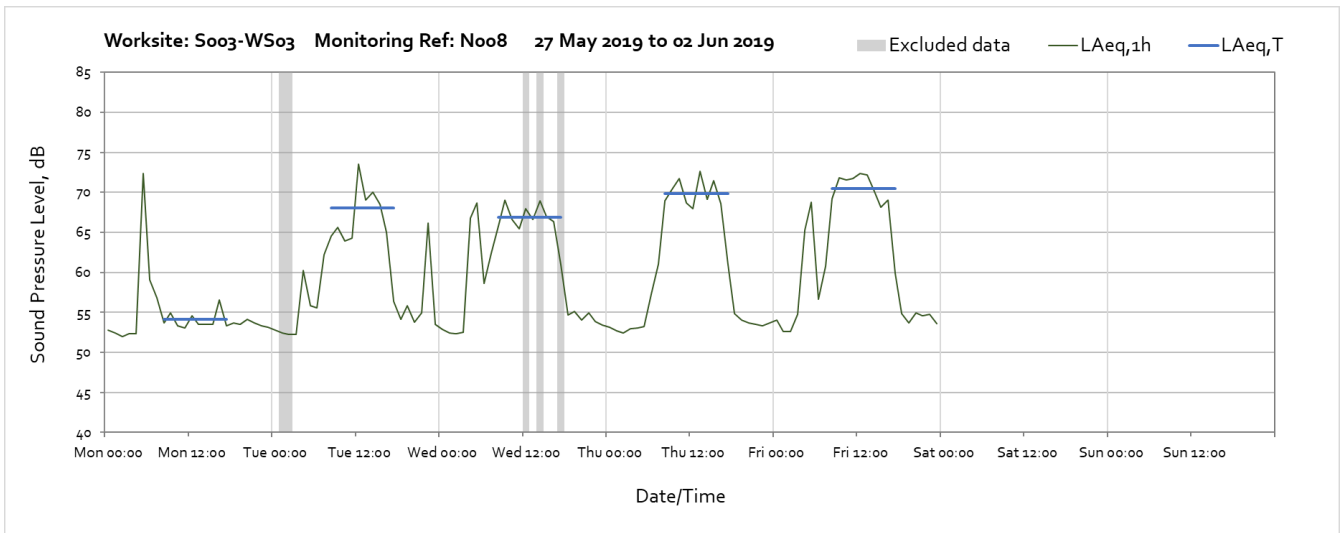
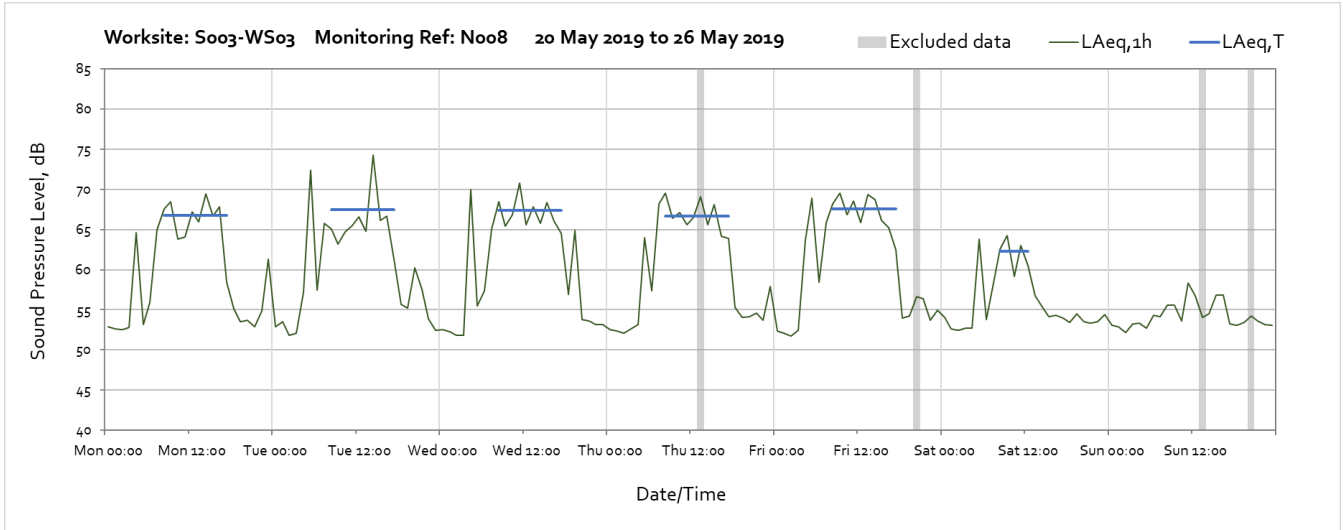
Worksite: S003-WS03 – Monitoring Ref: N006



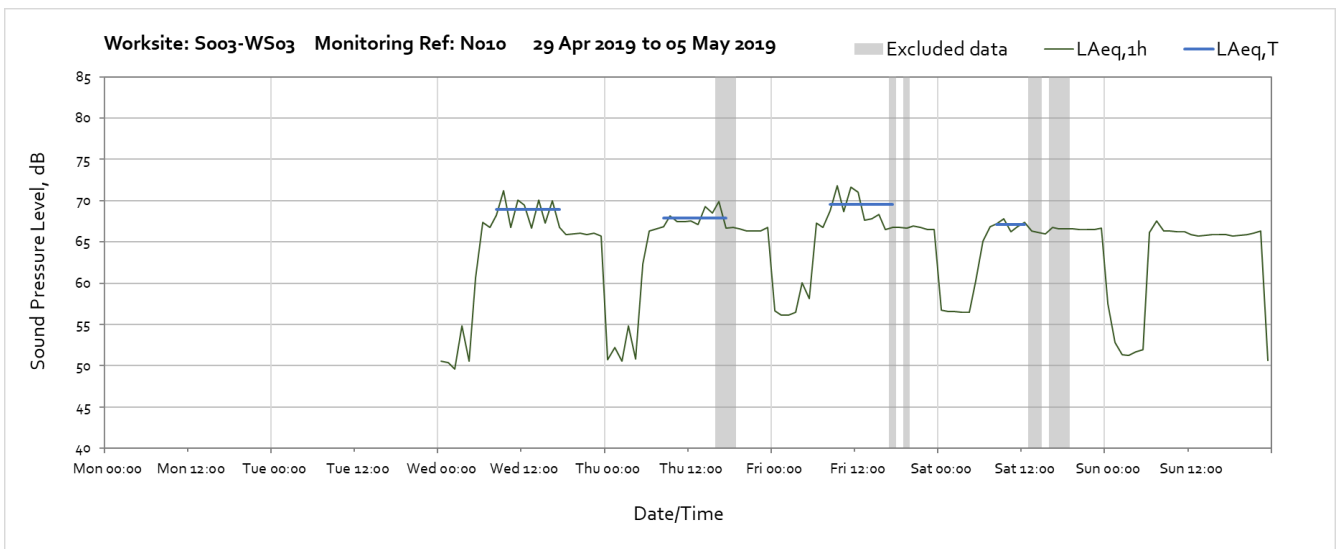


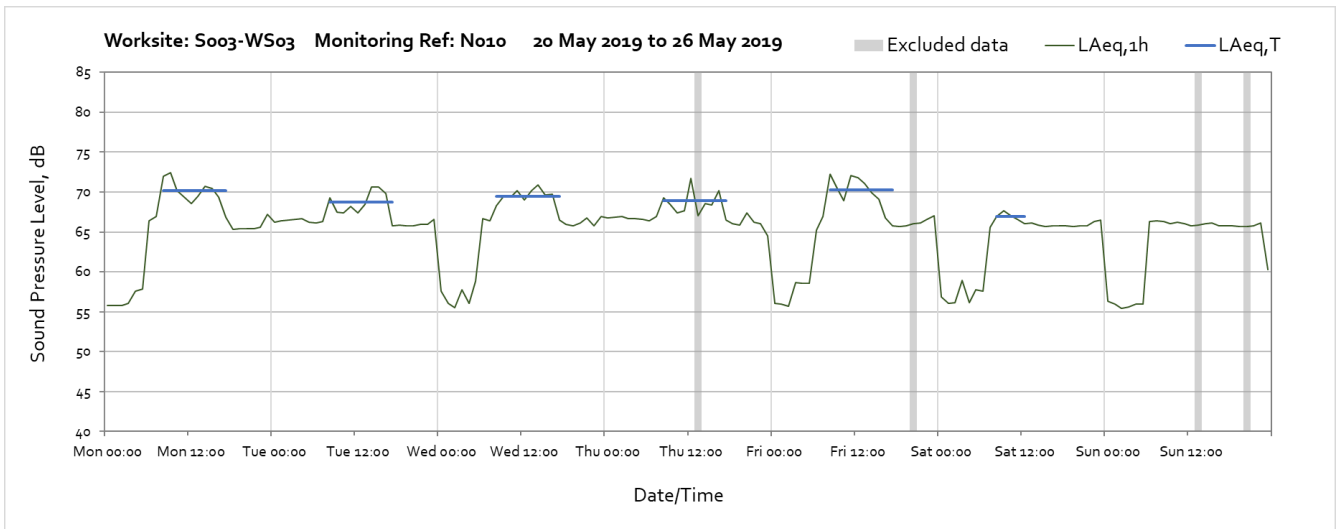
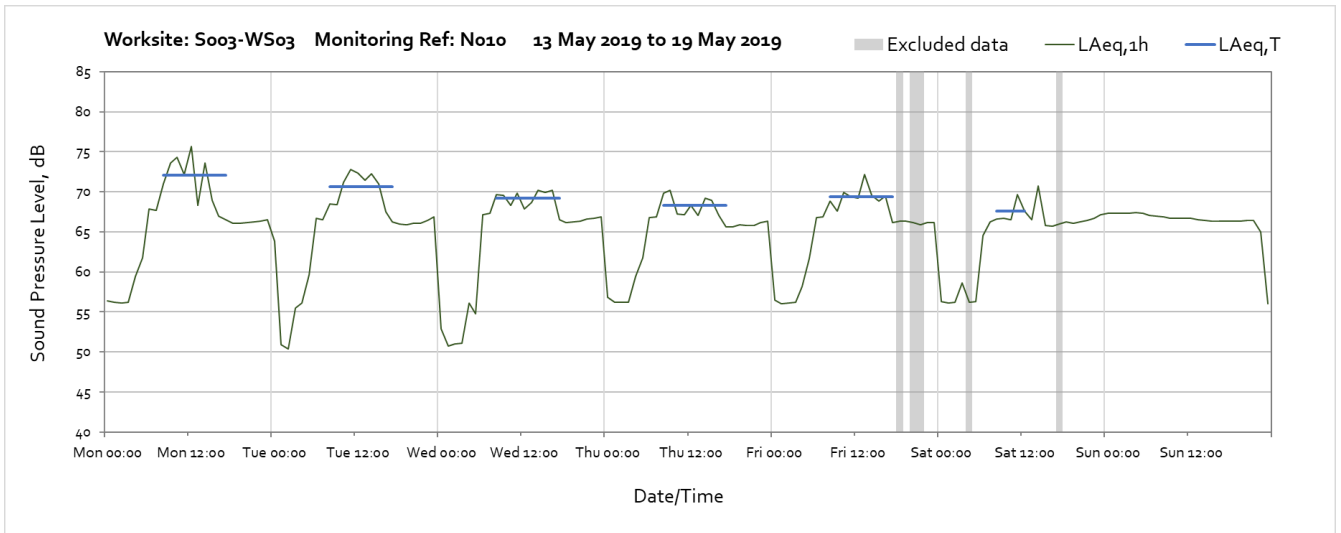
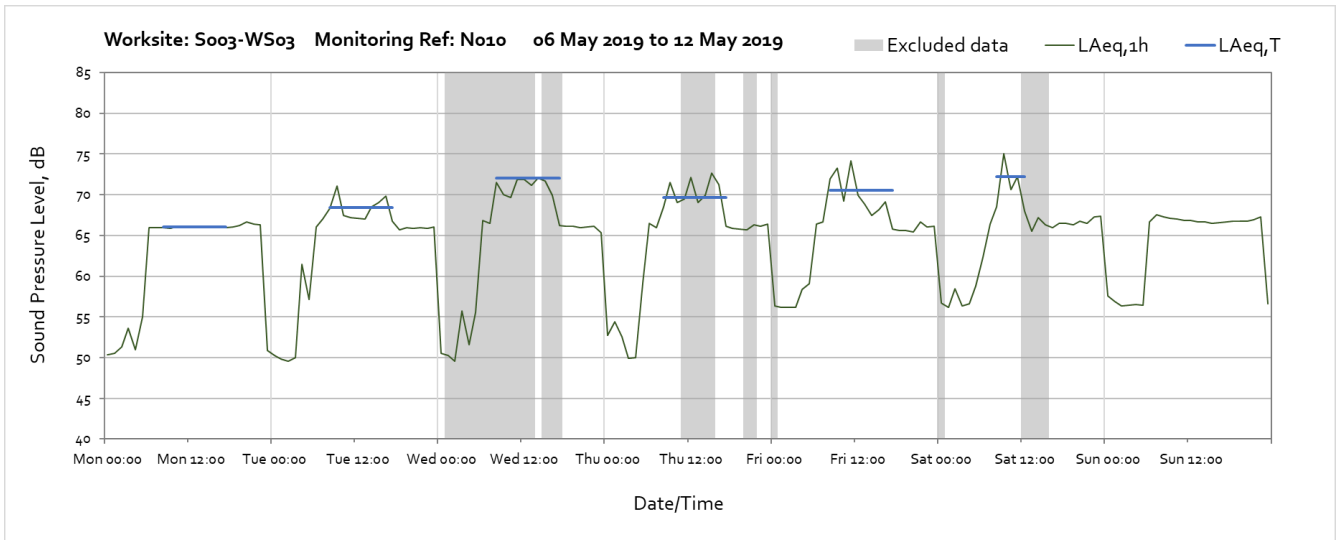
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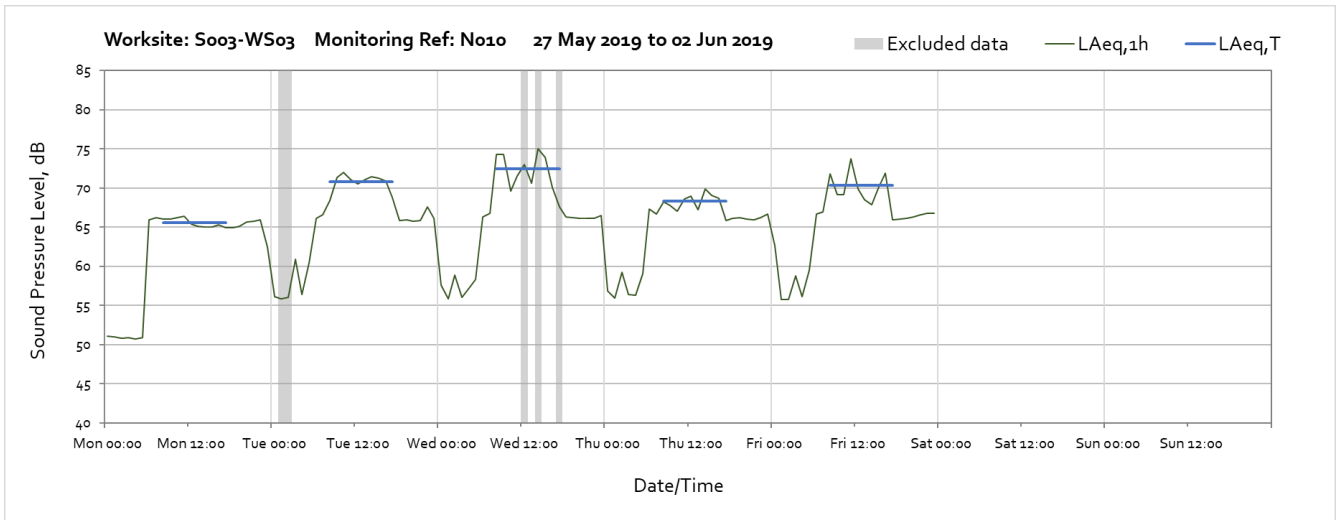




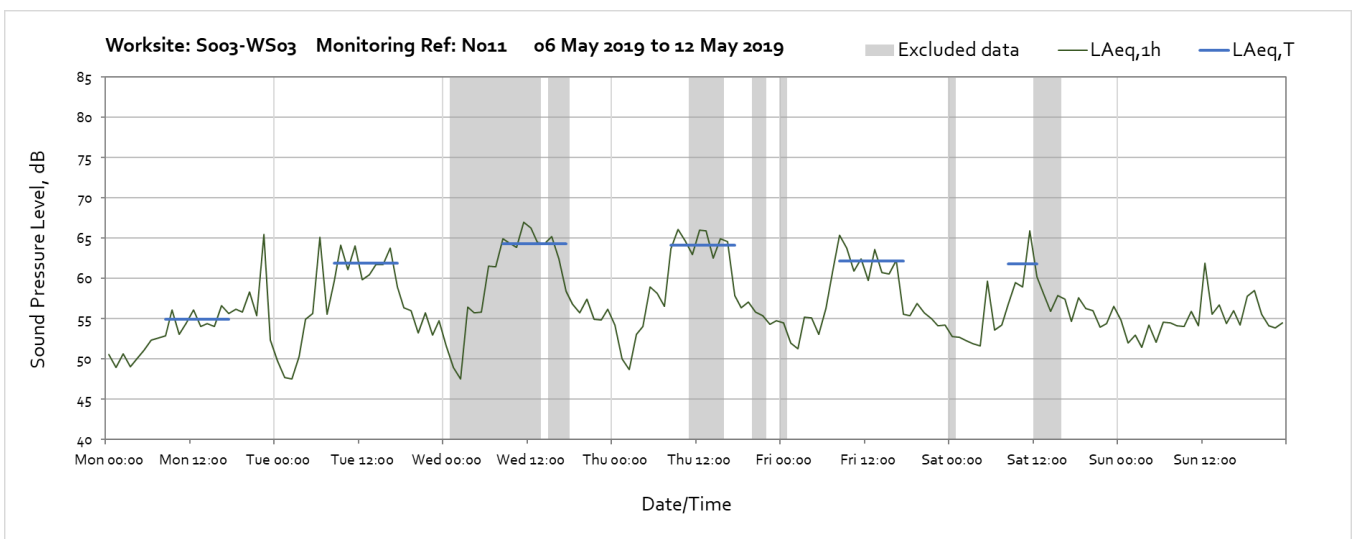
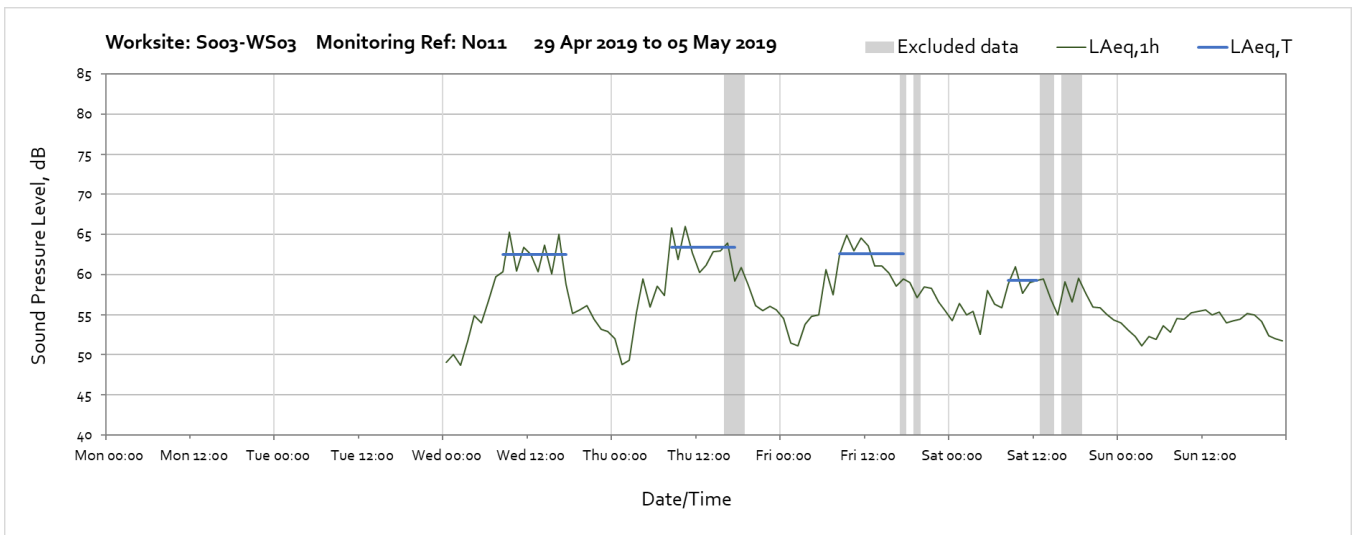
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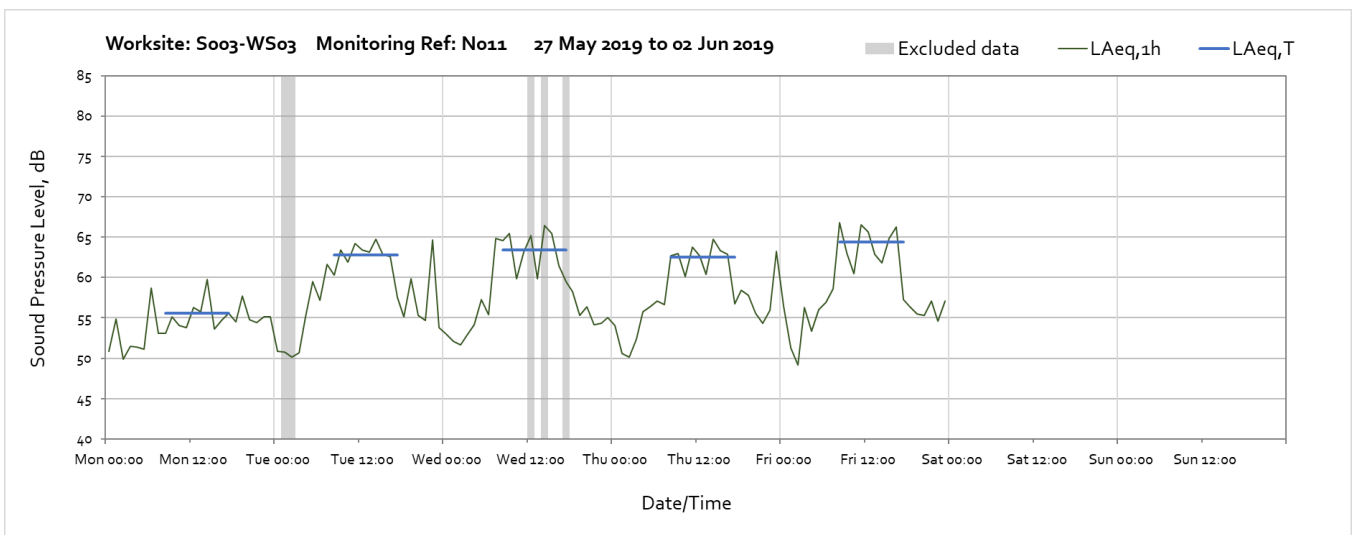
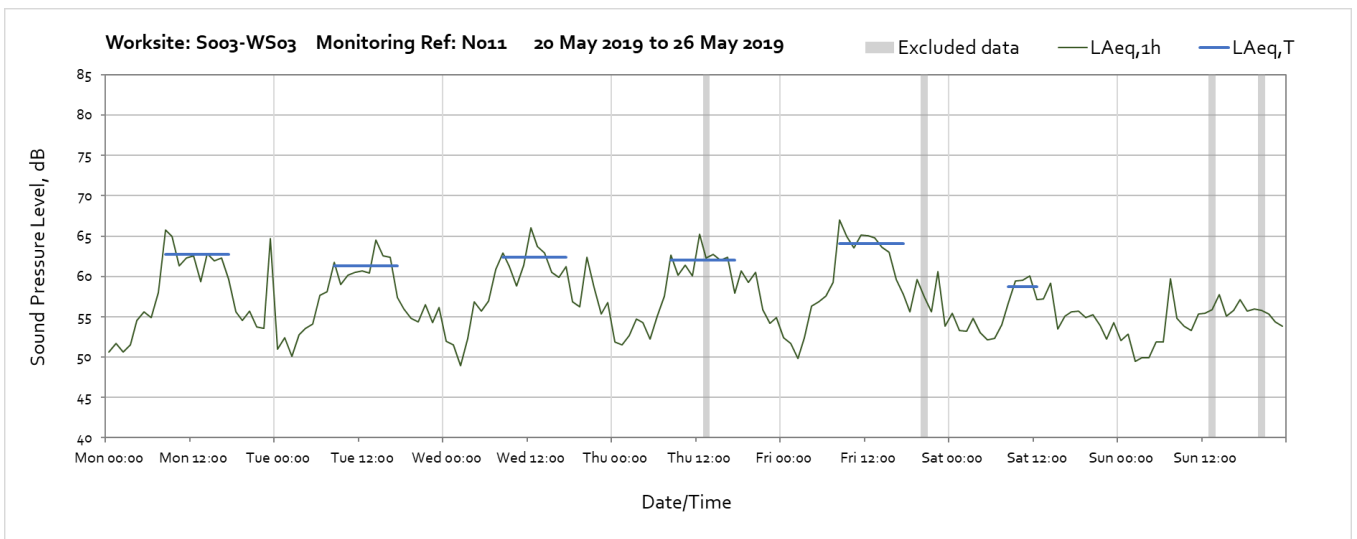
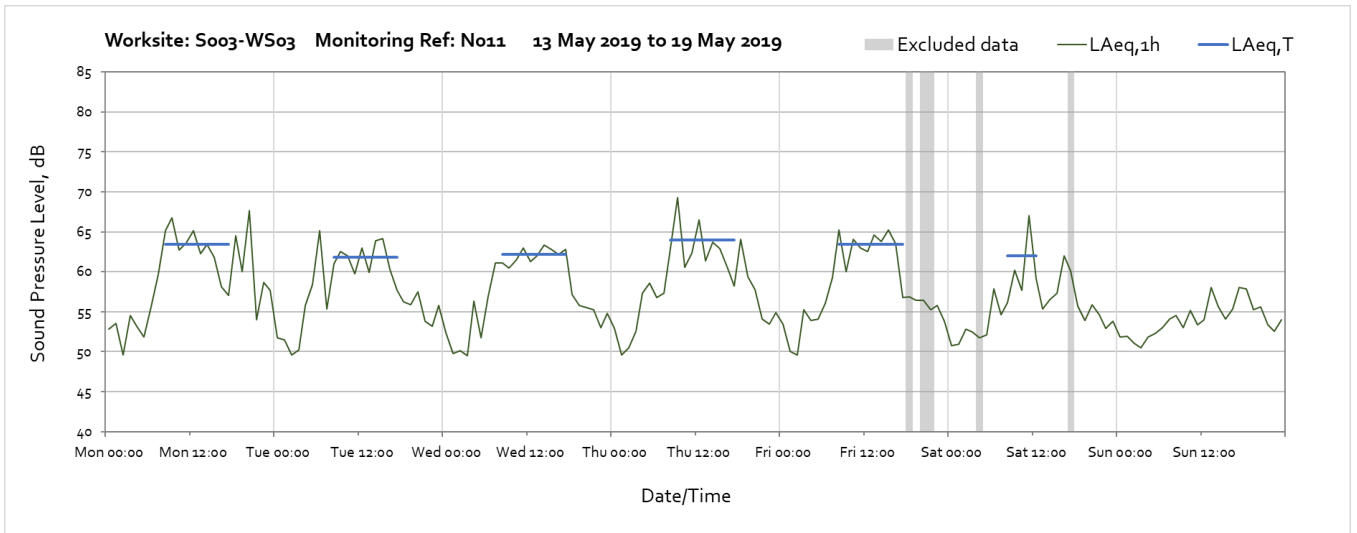




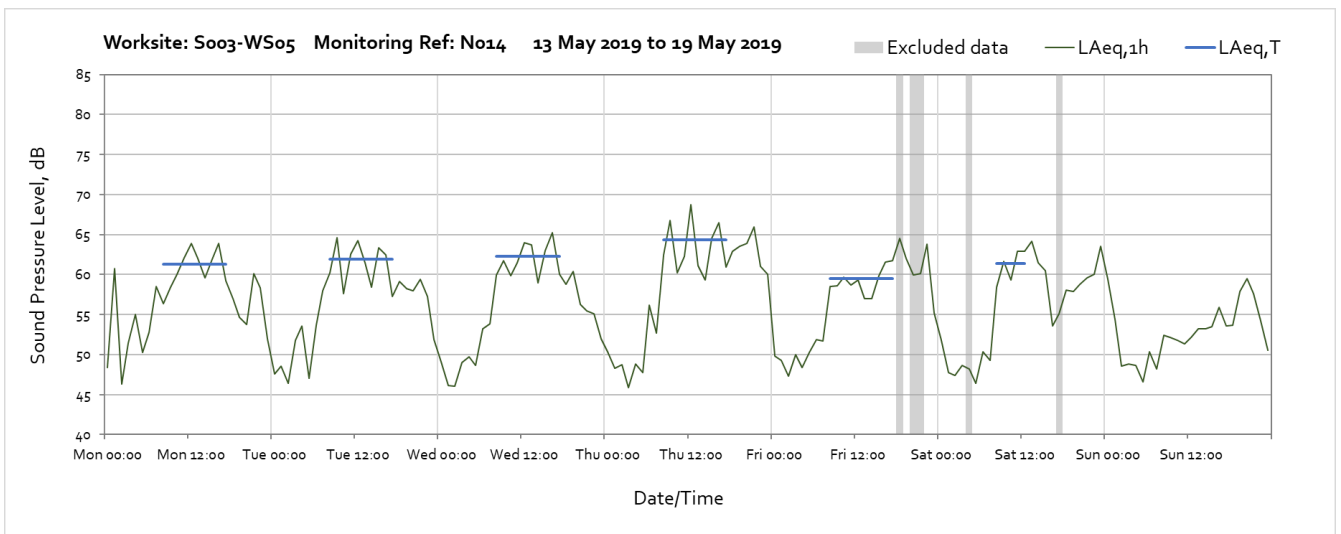
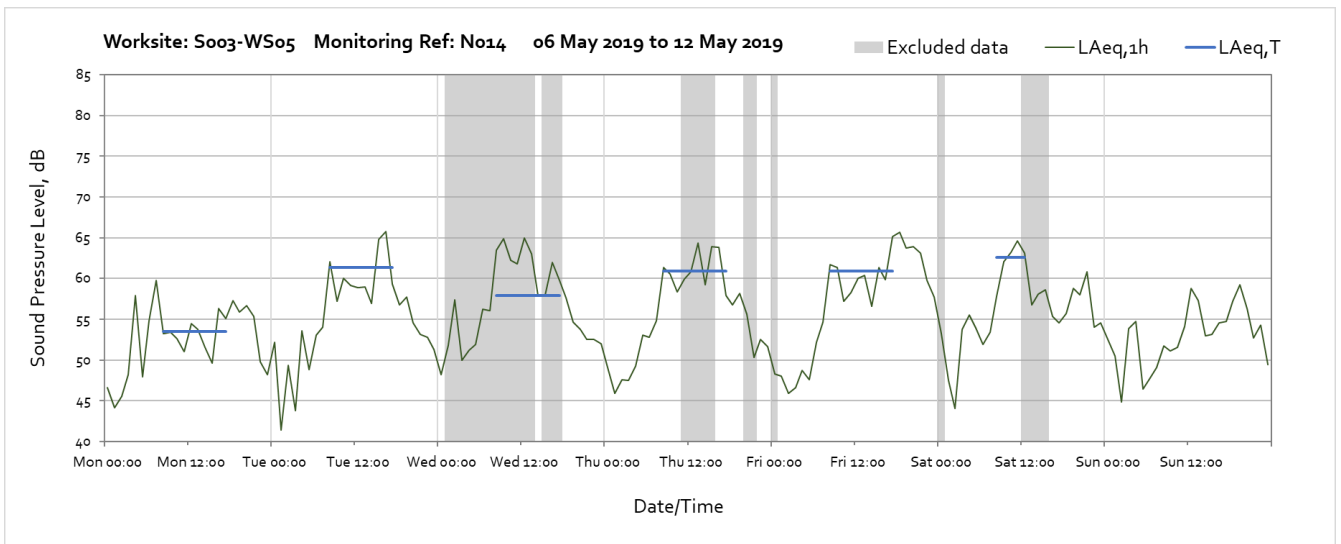
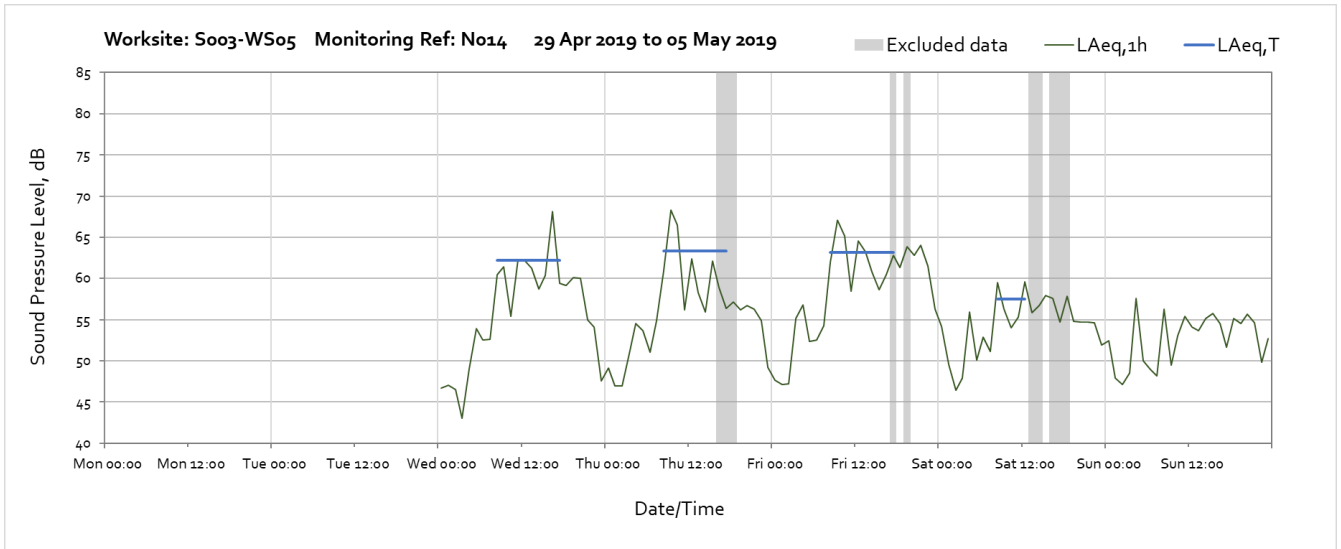


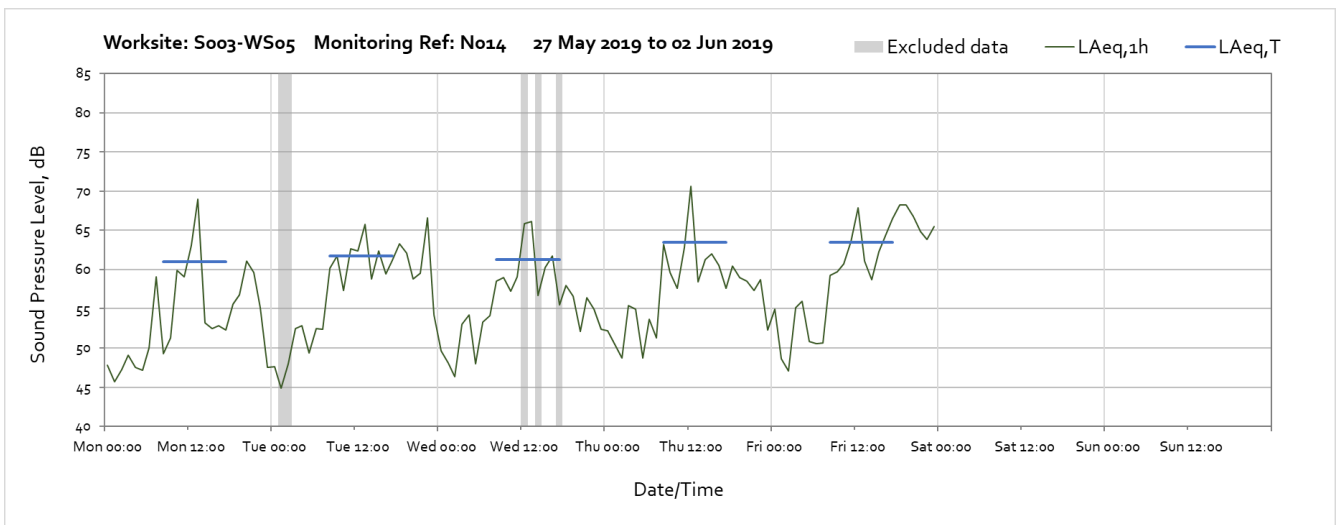
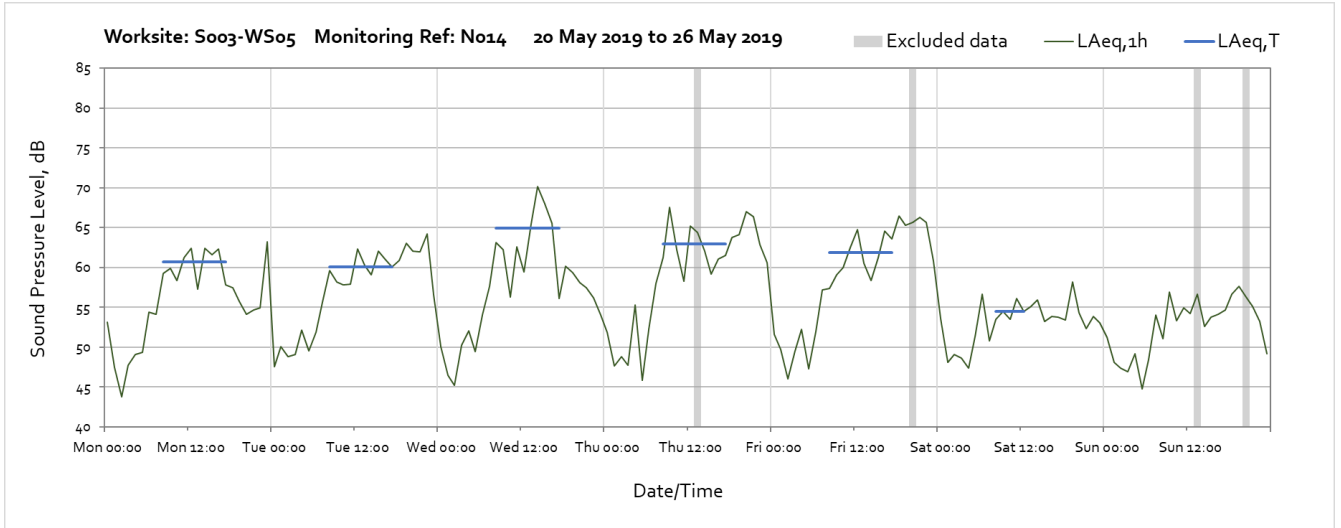
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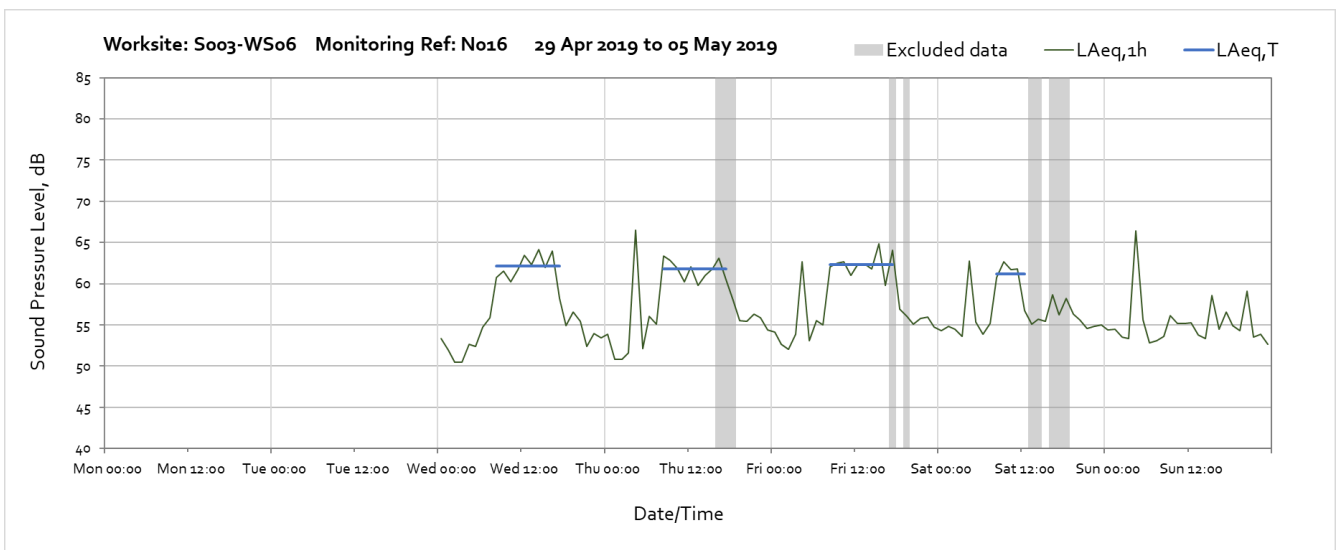


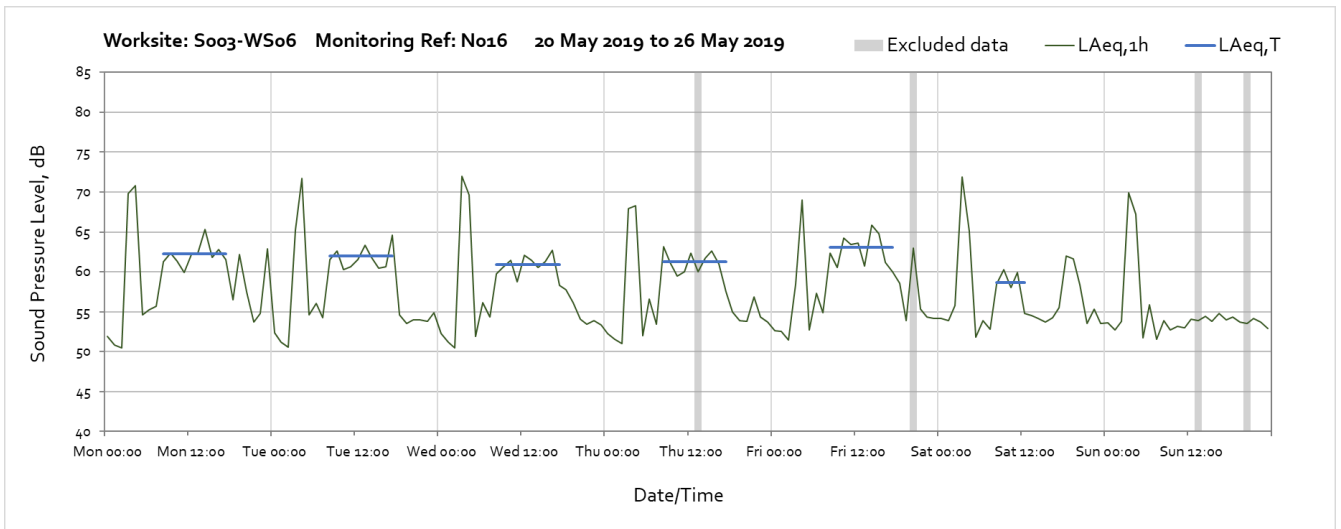
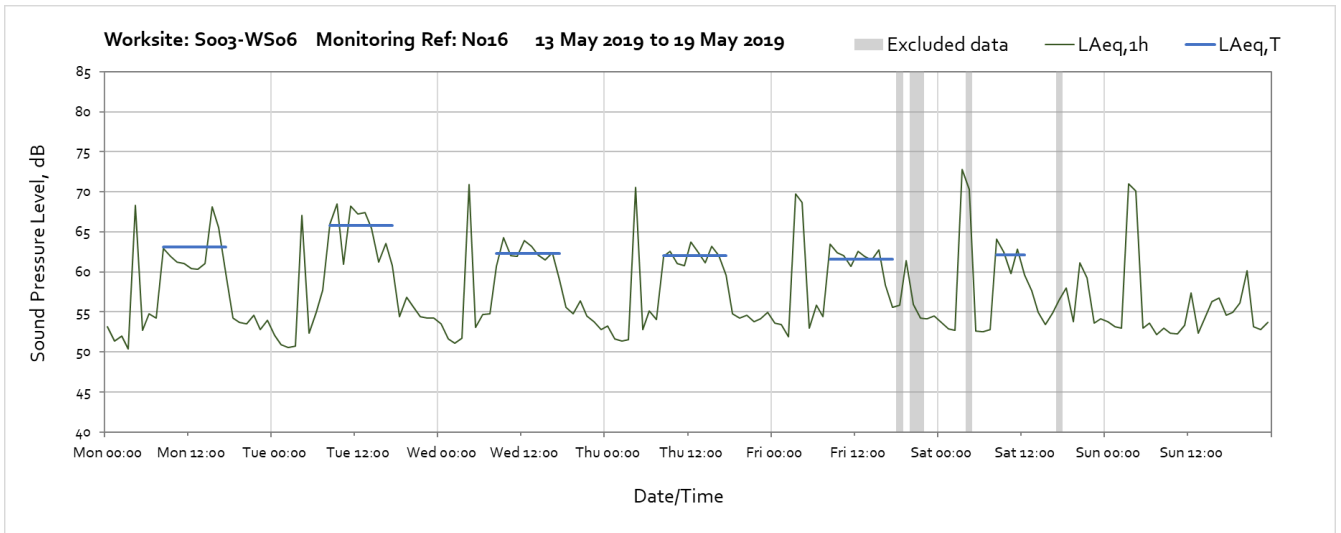
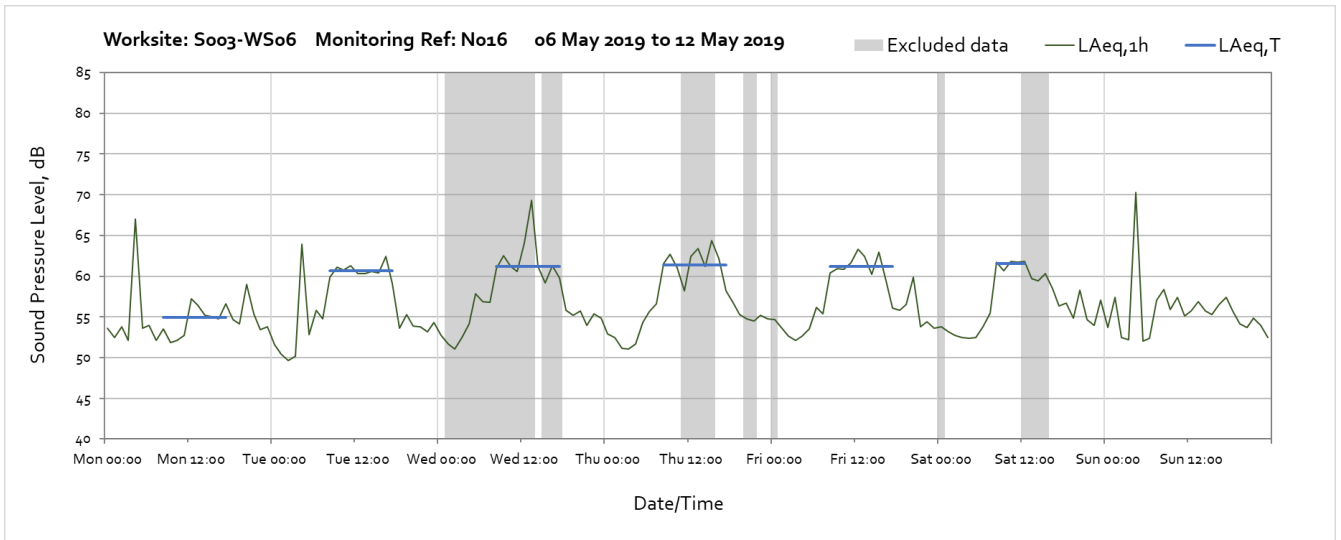
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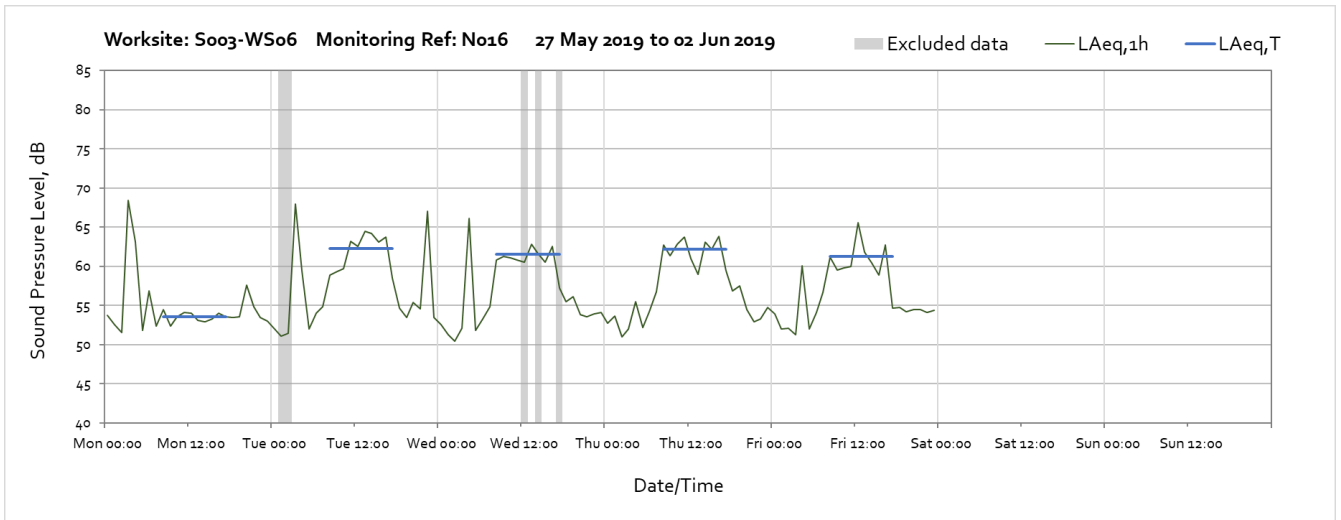




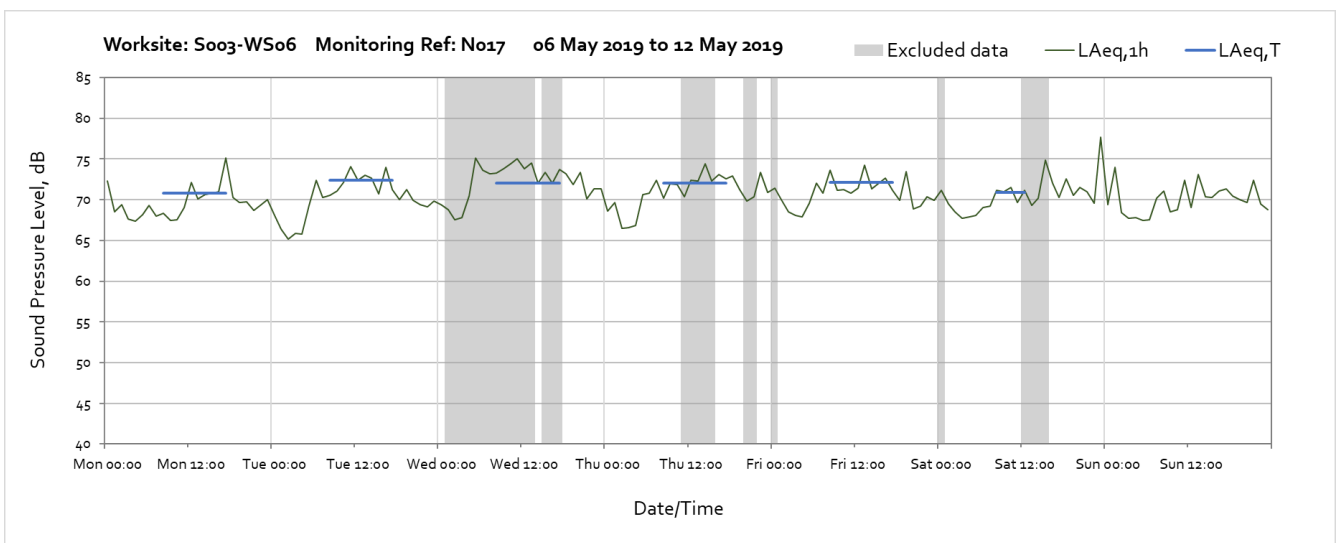
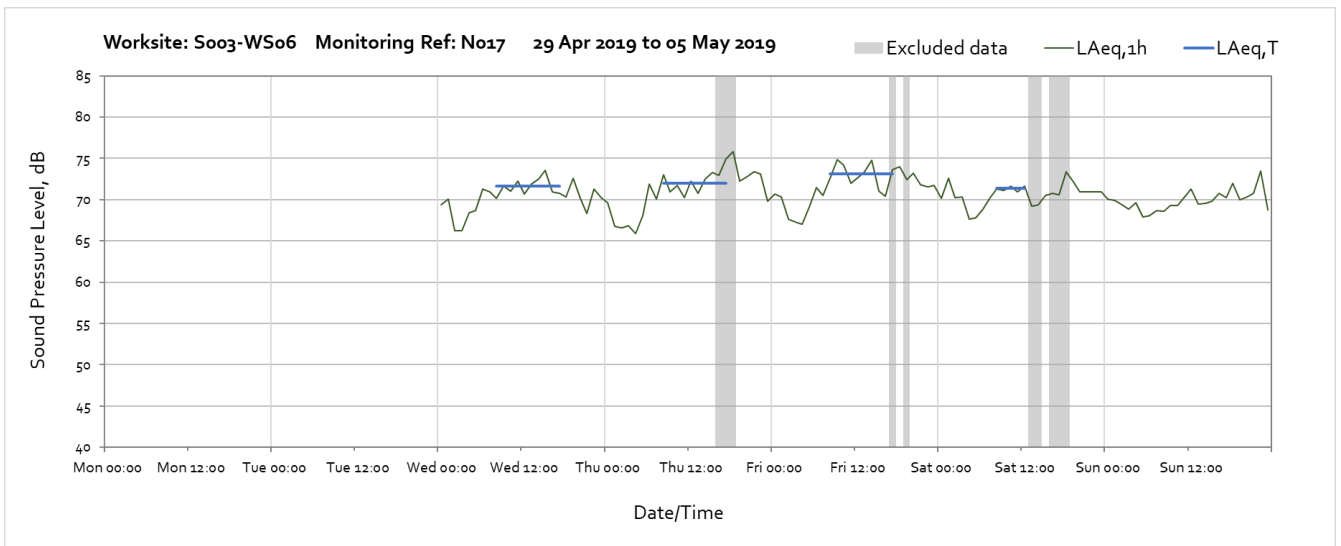
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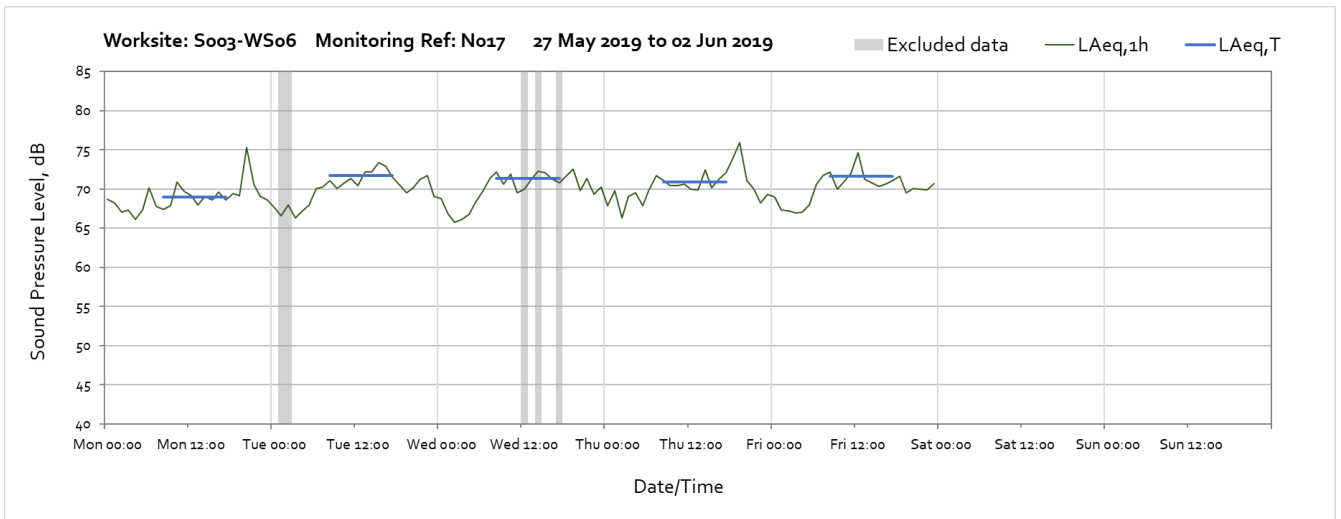
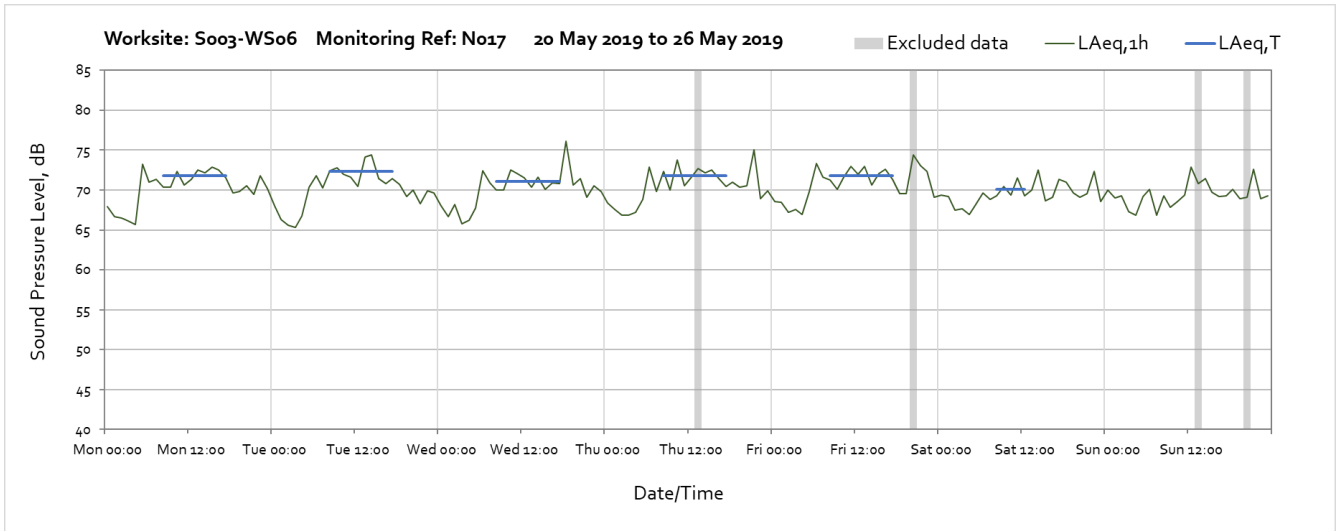
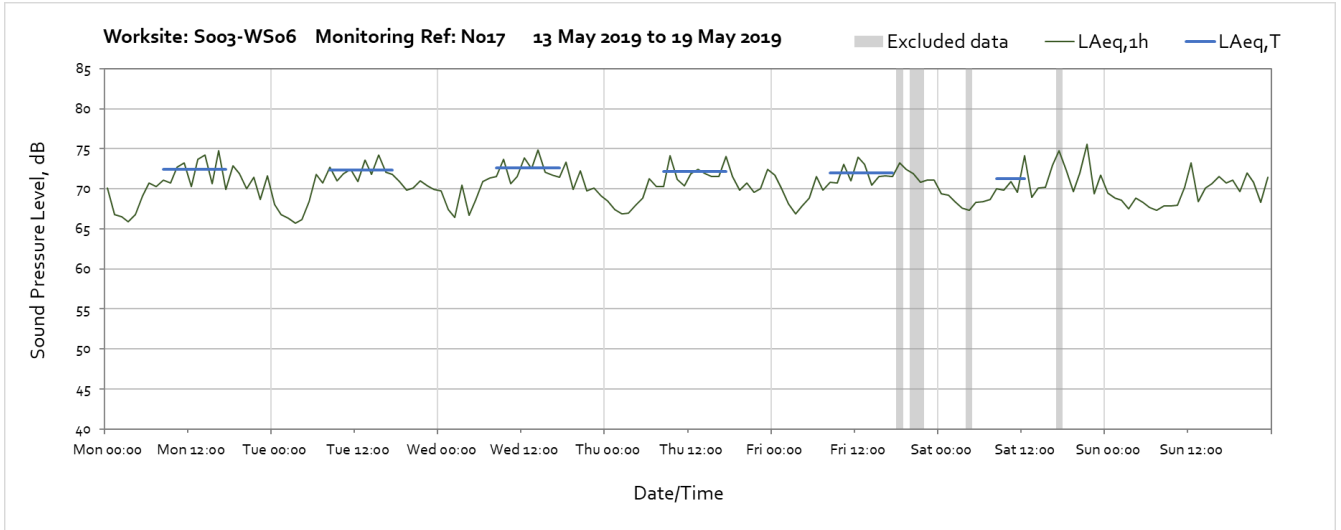




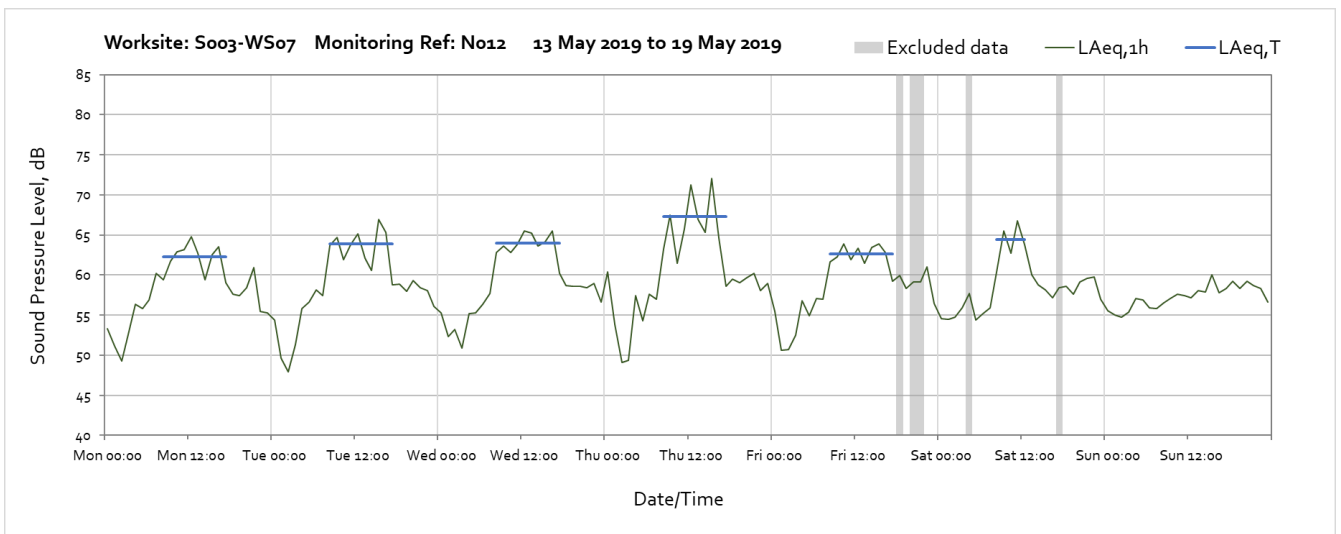
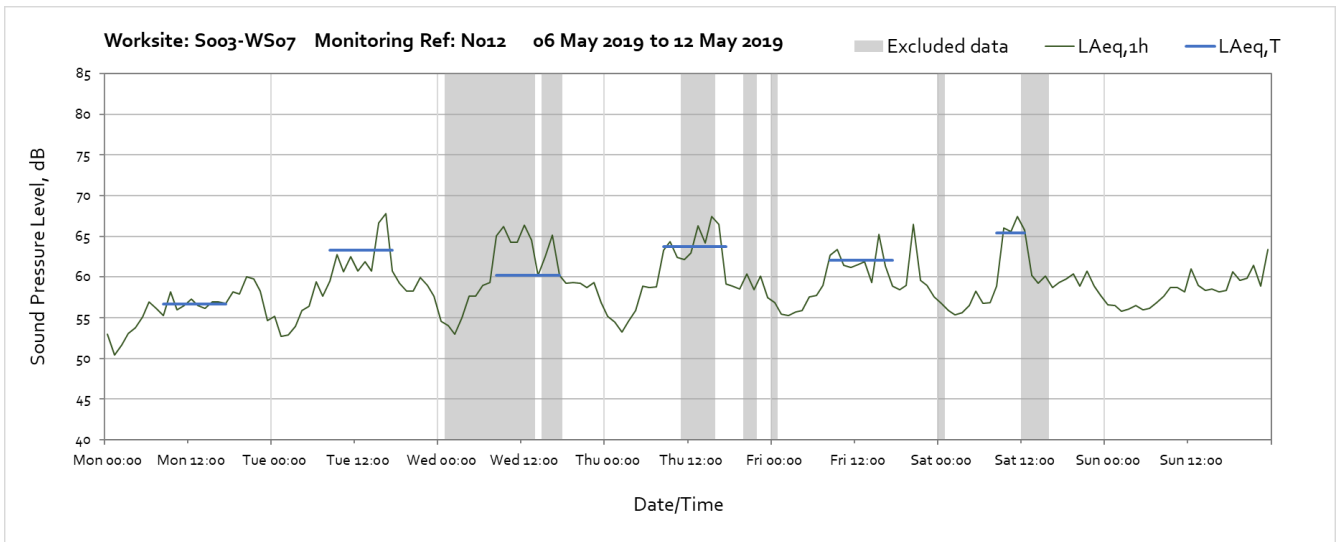
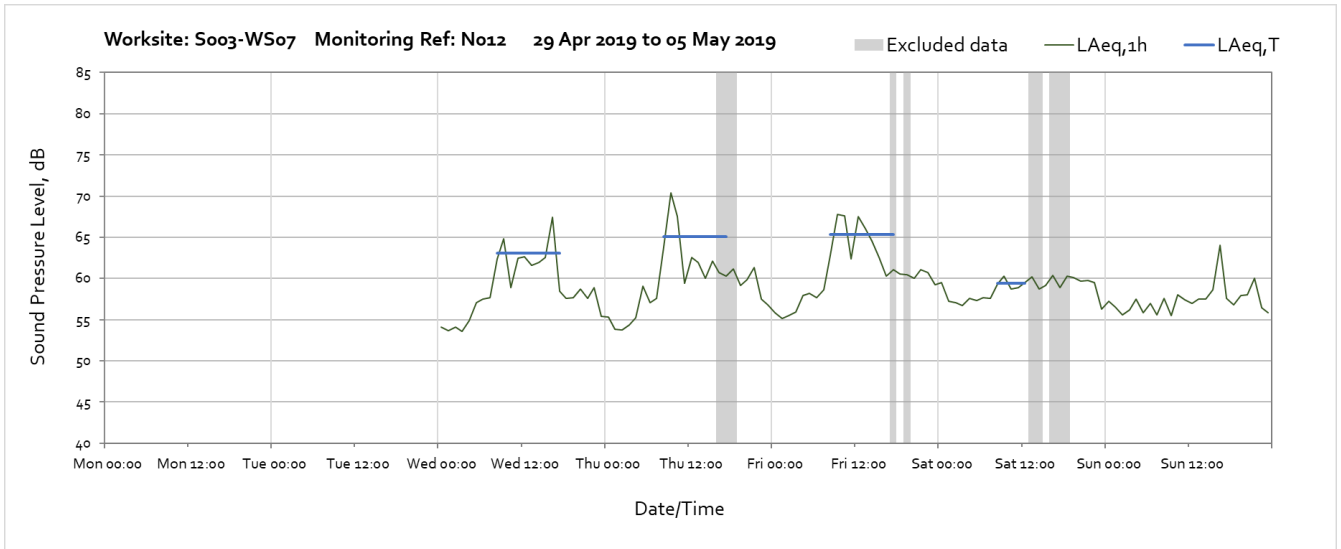


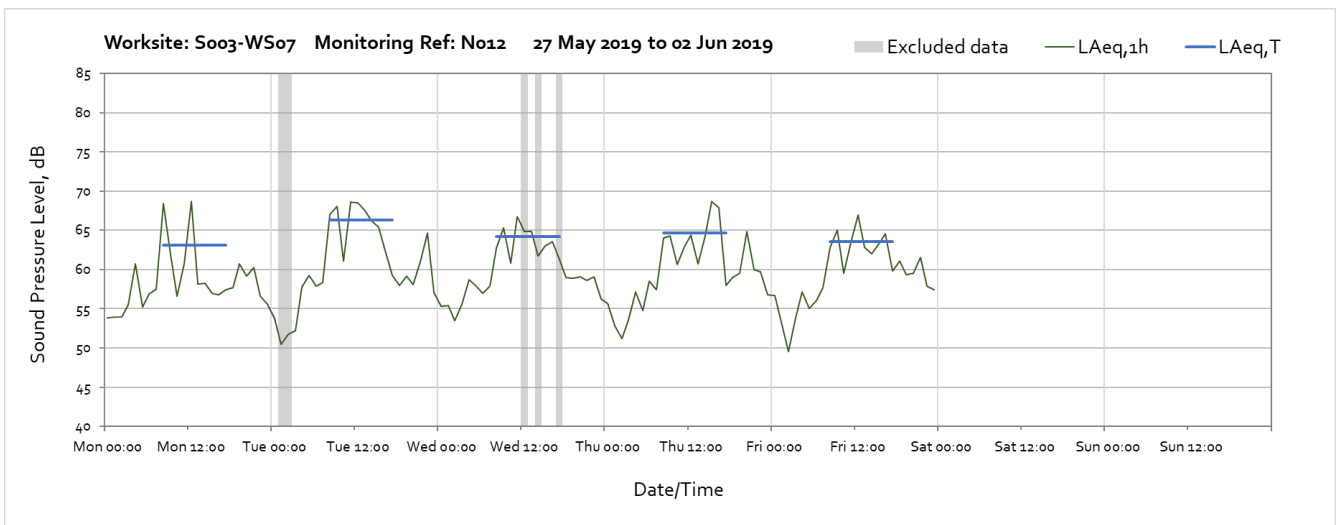
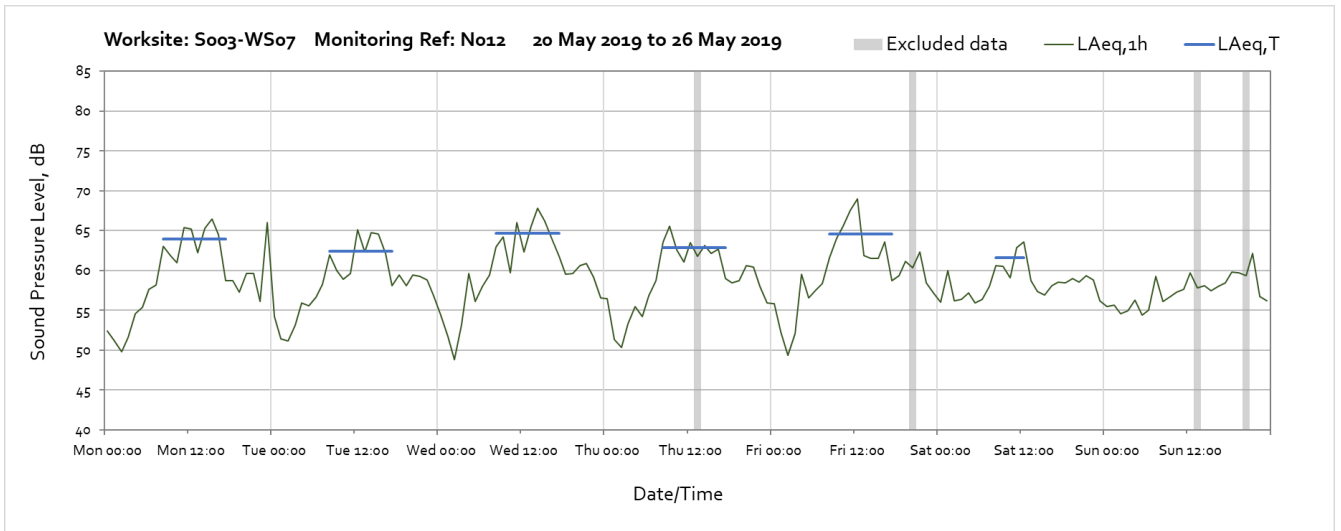
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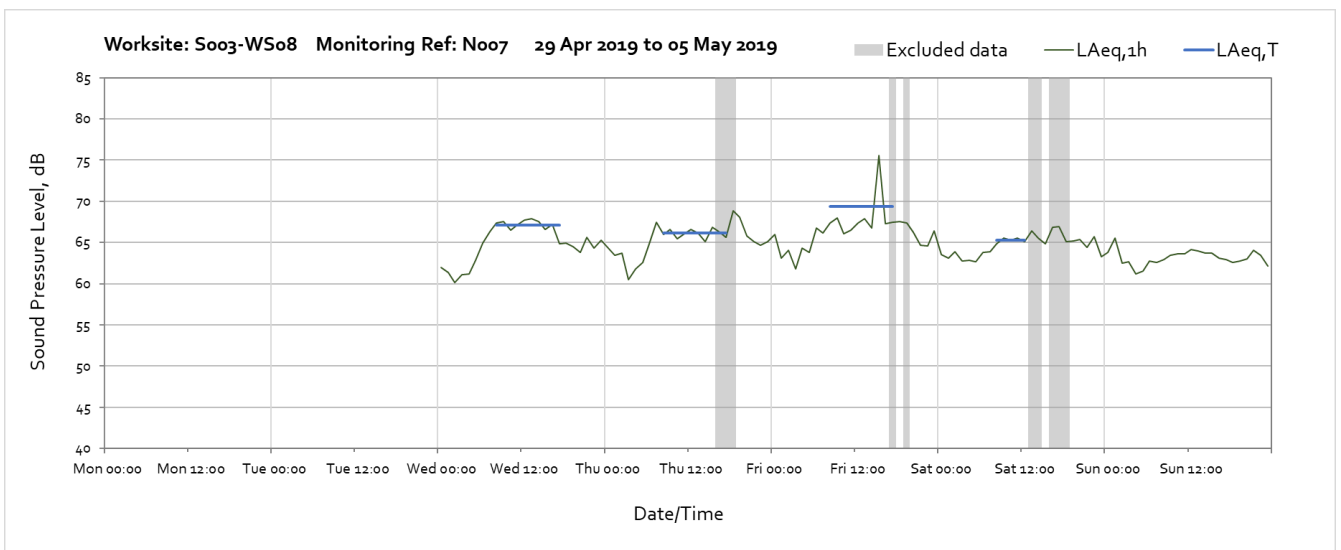


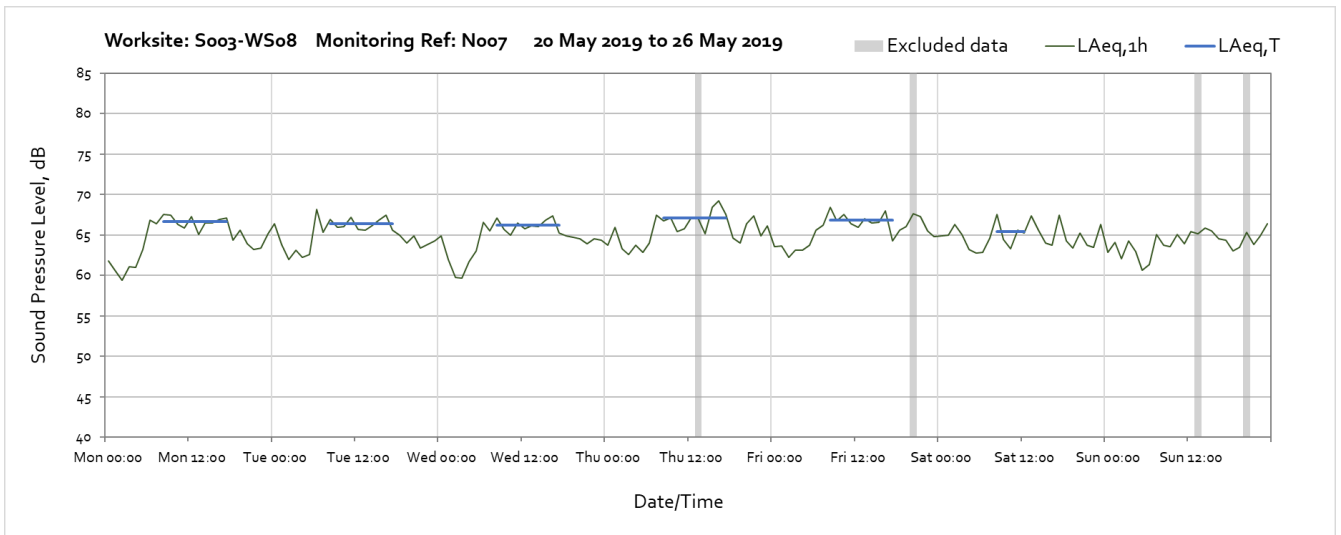
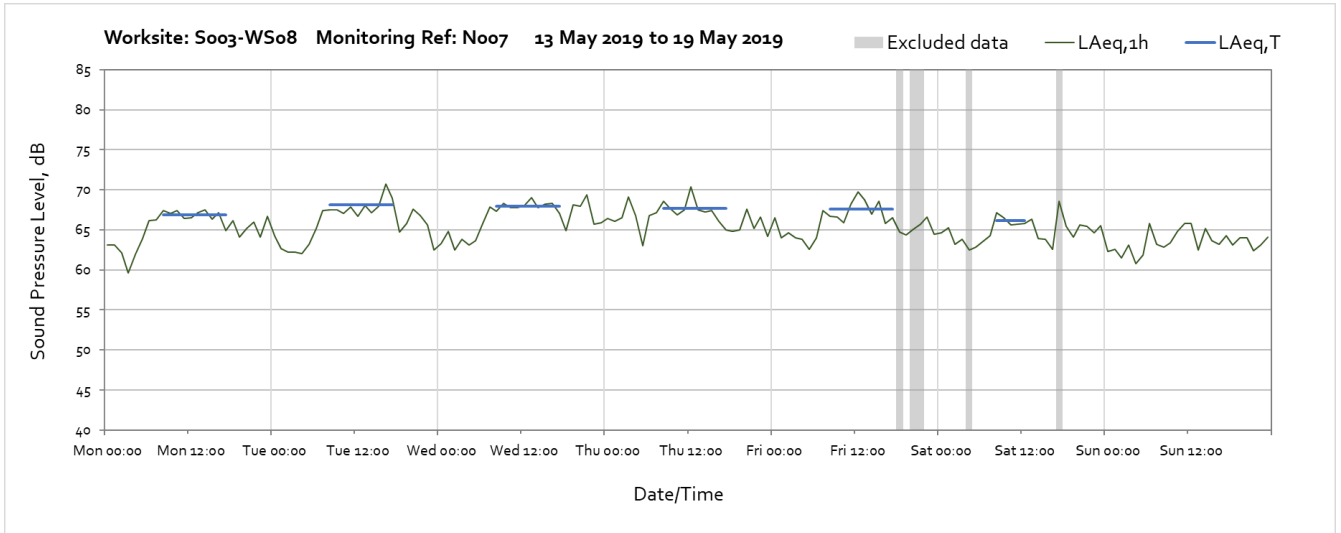
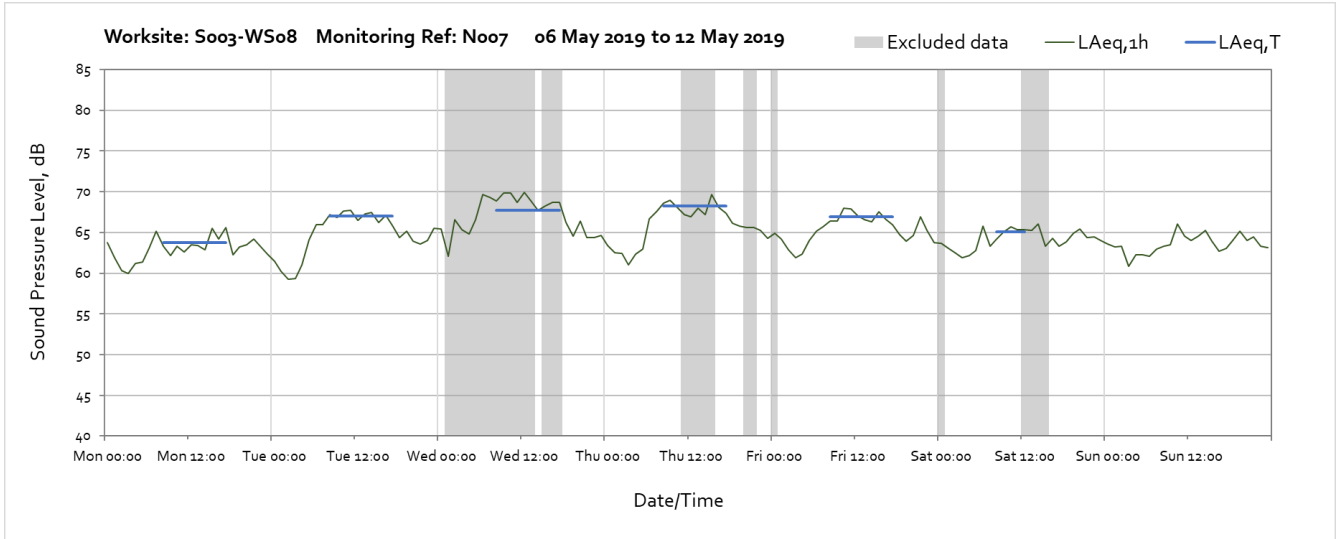
Worksite: S003-WS07 – Monitoring Ref: N012

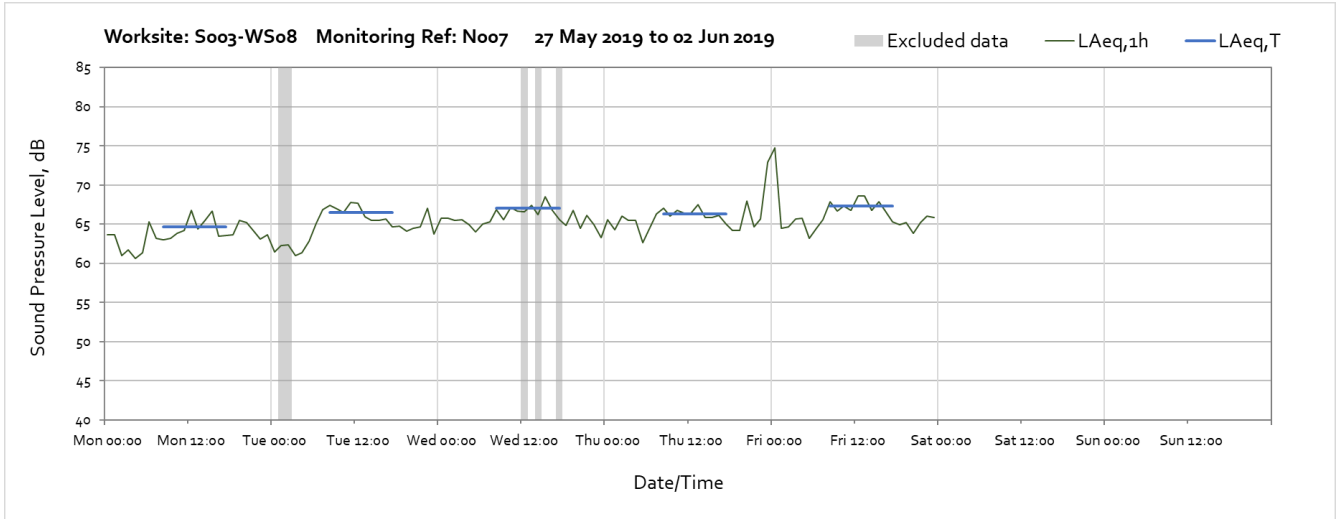




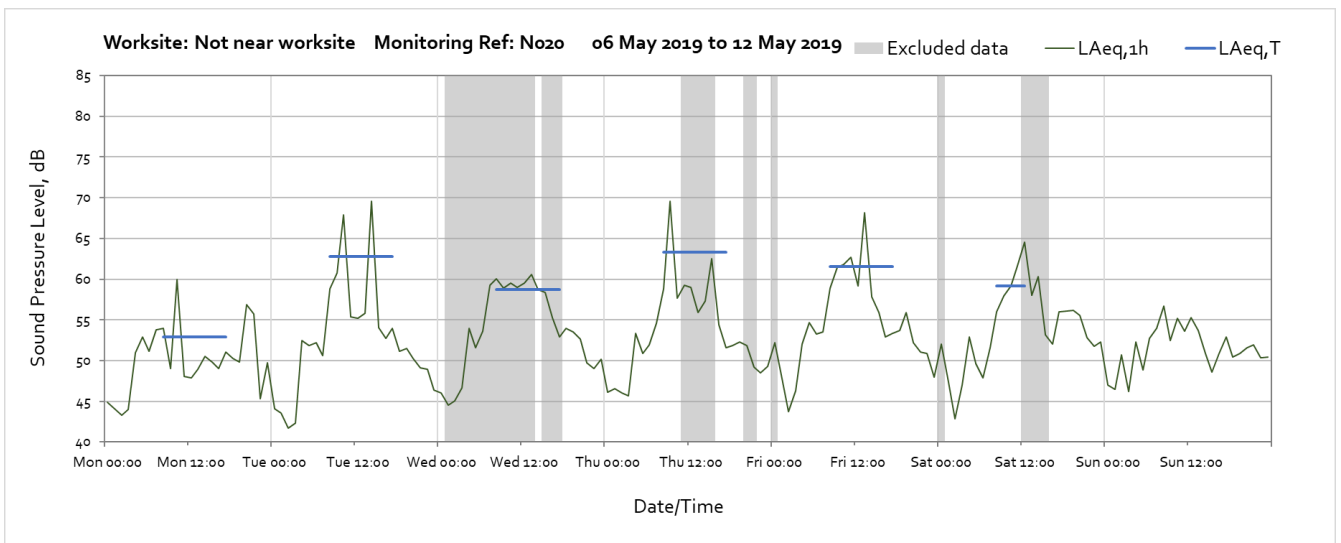
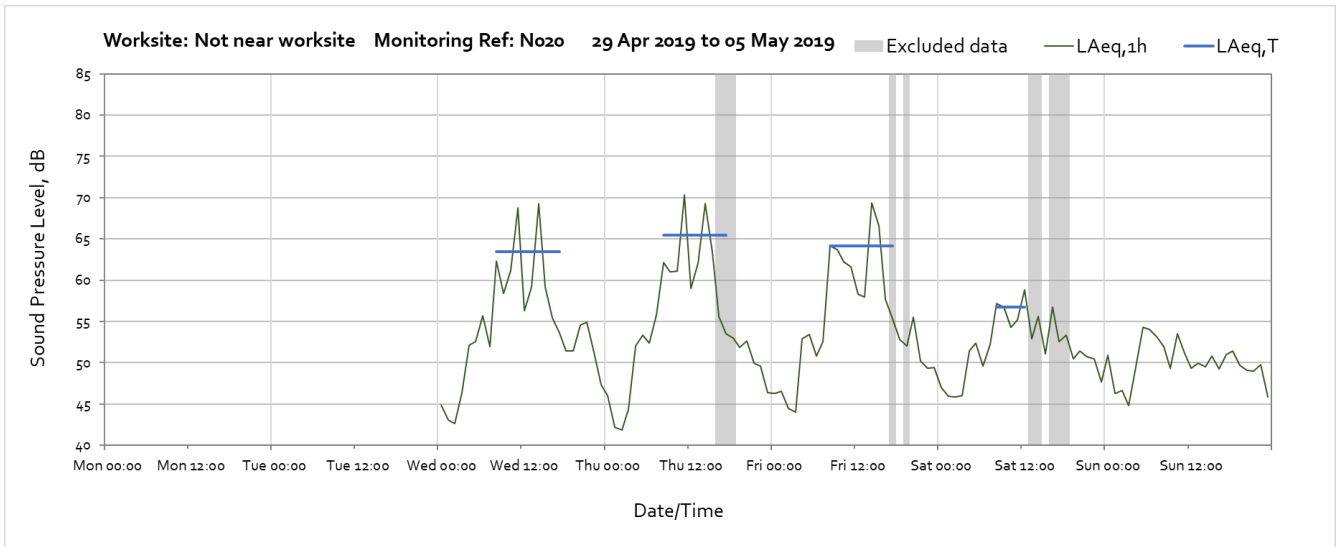
Worksite: S003-WS08 – Monitoring Ref: N007

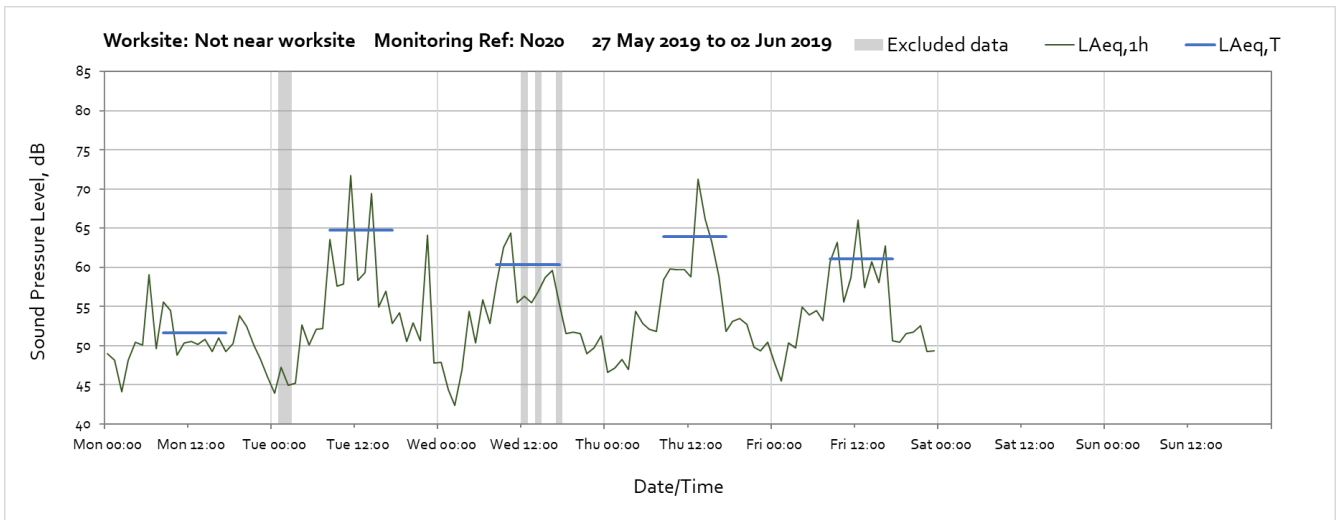
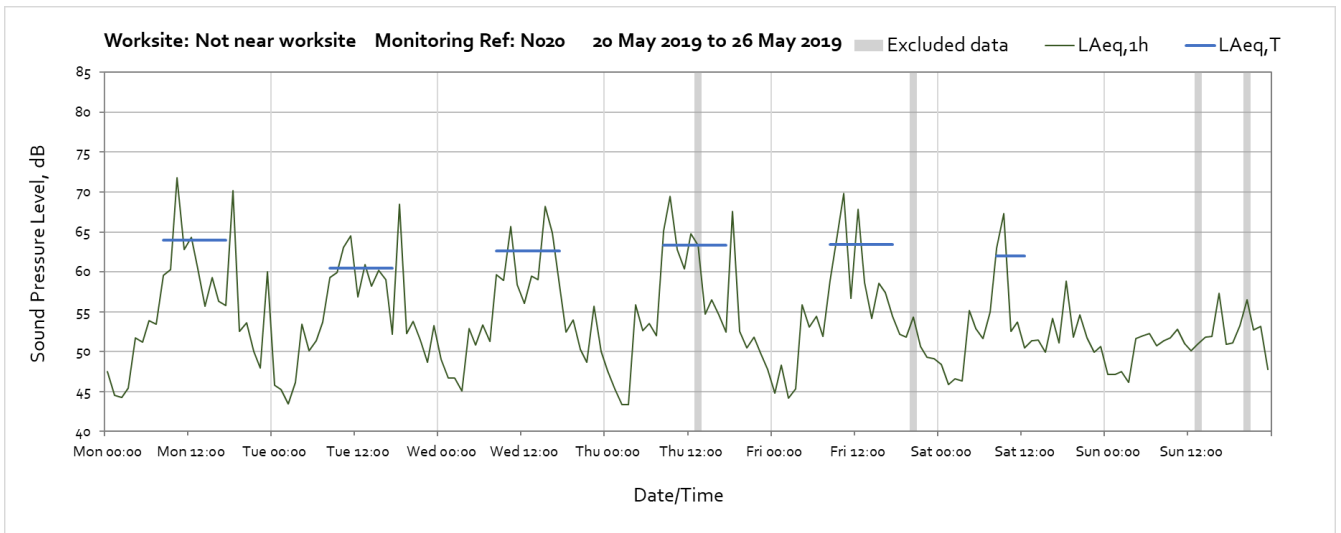
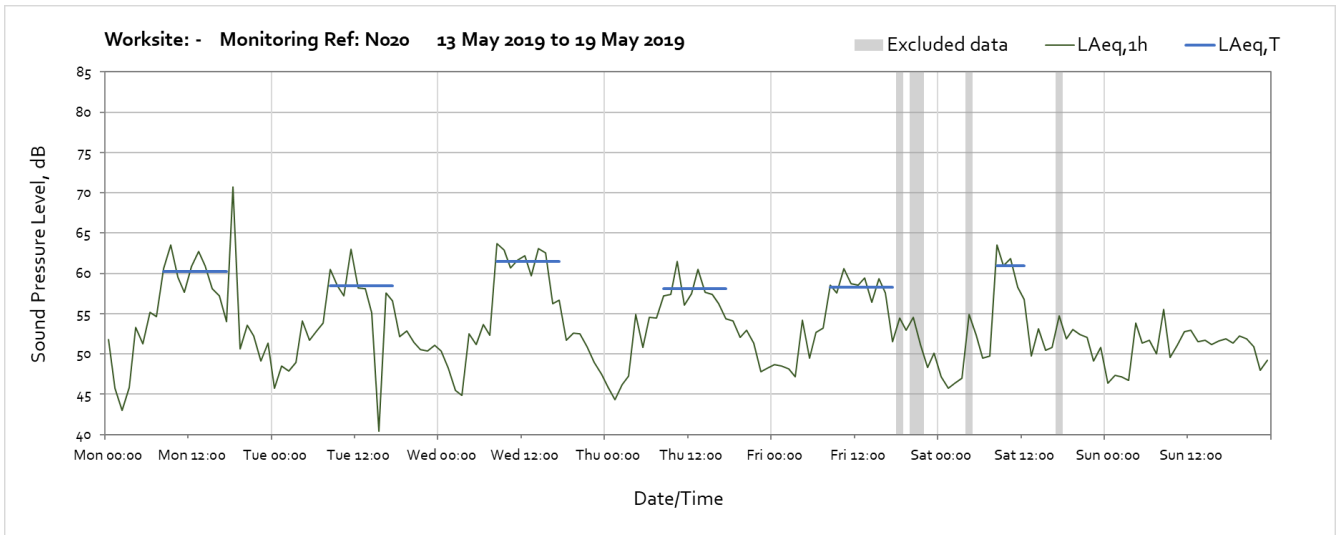




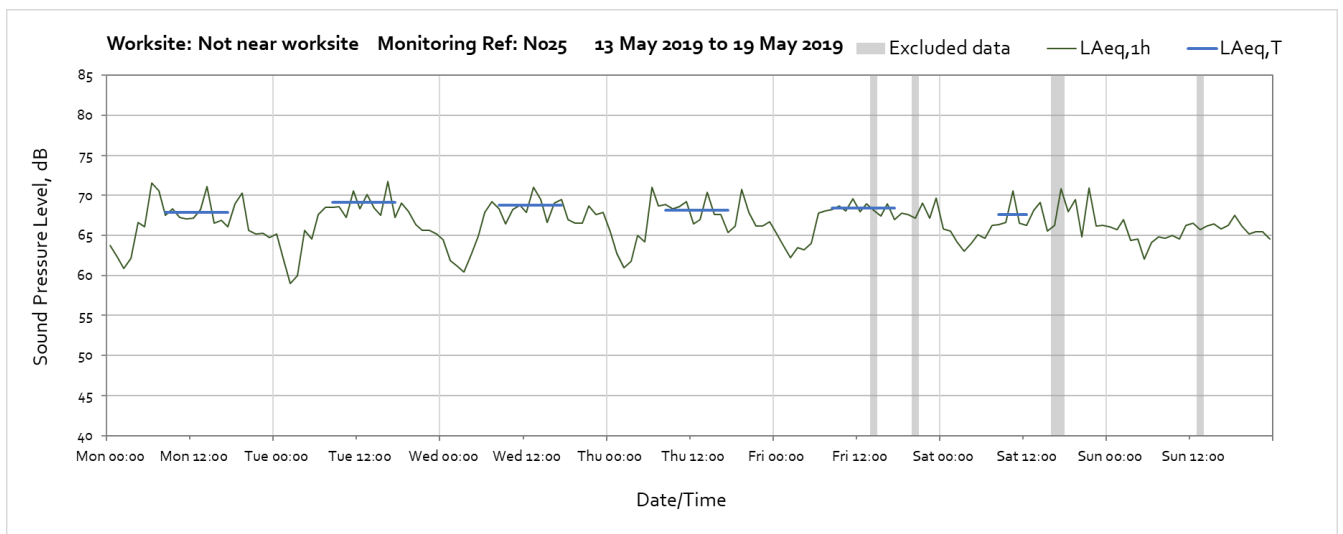
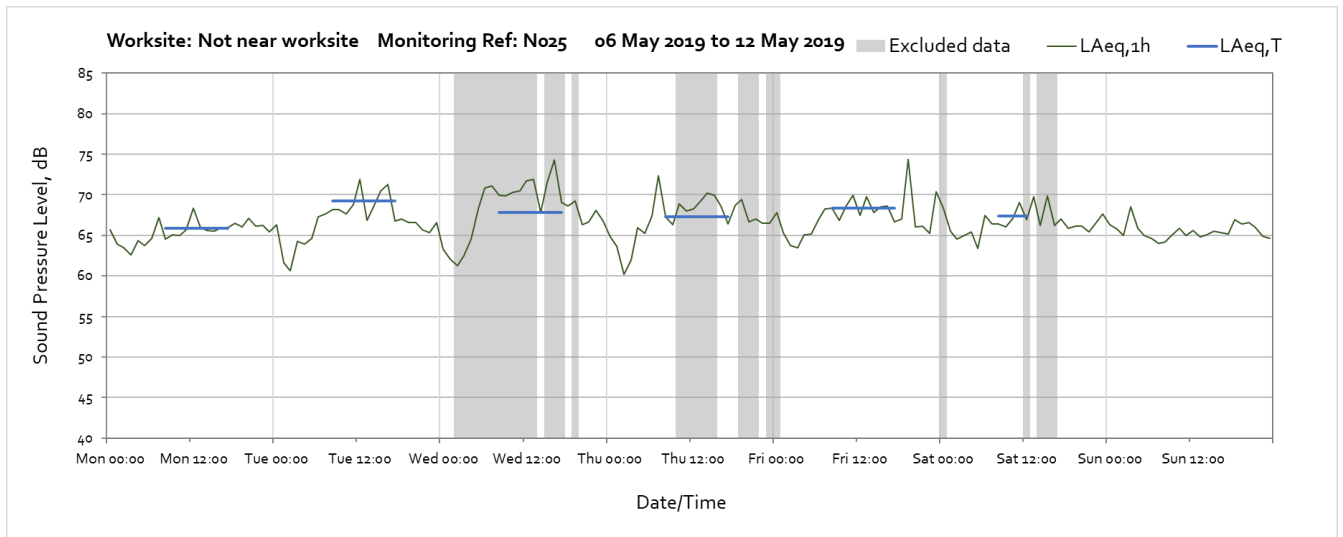
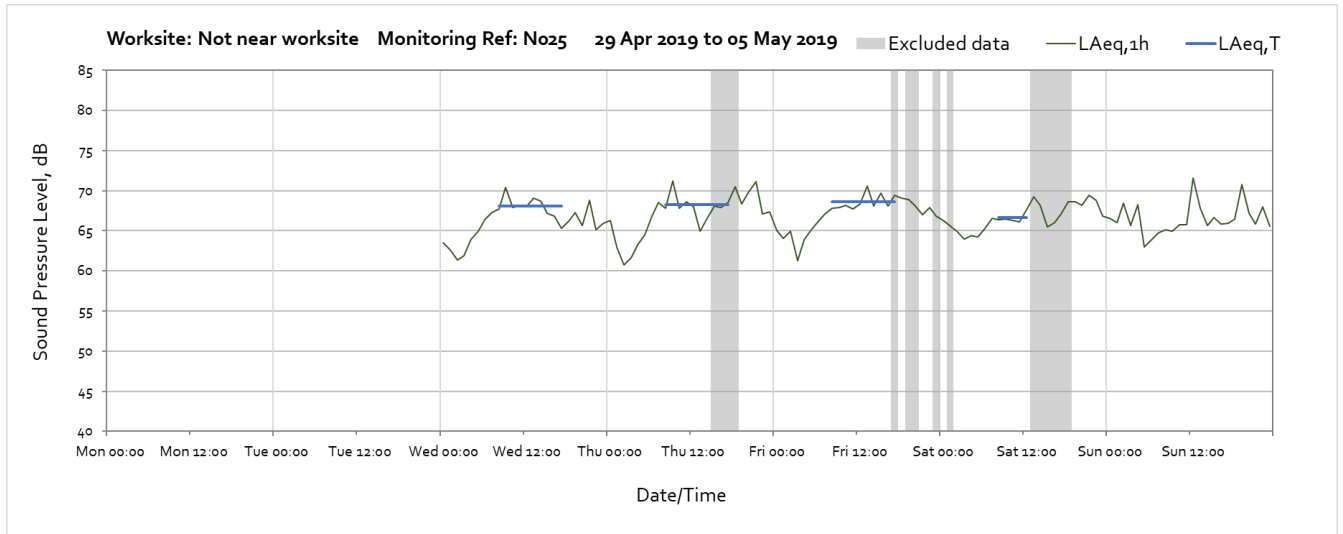


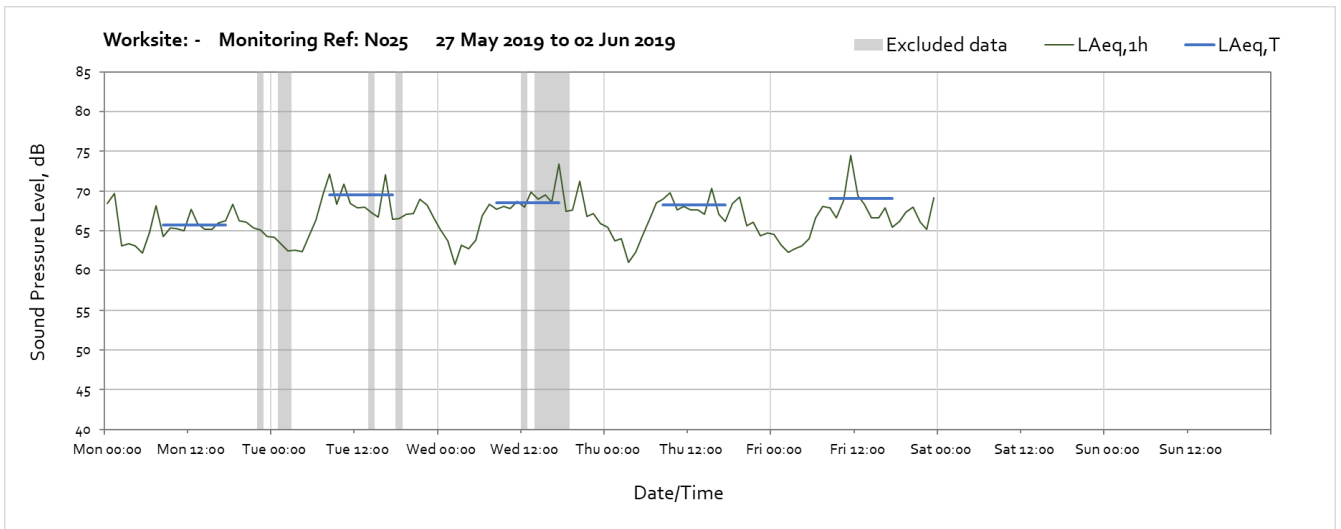
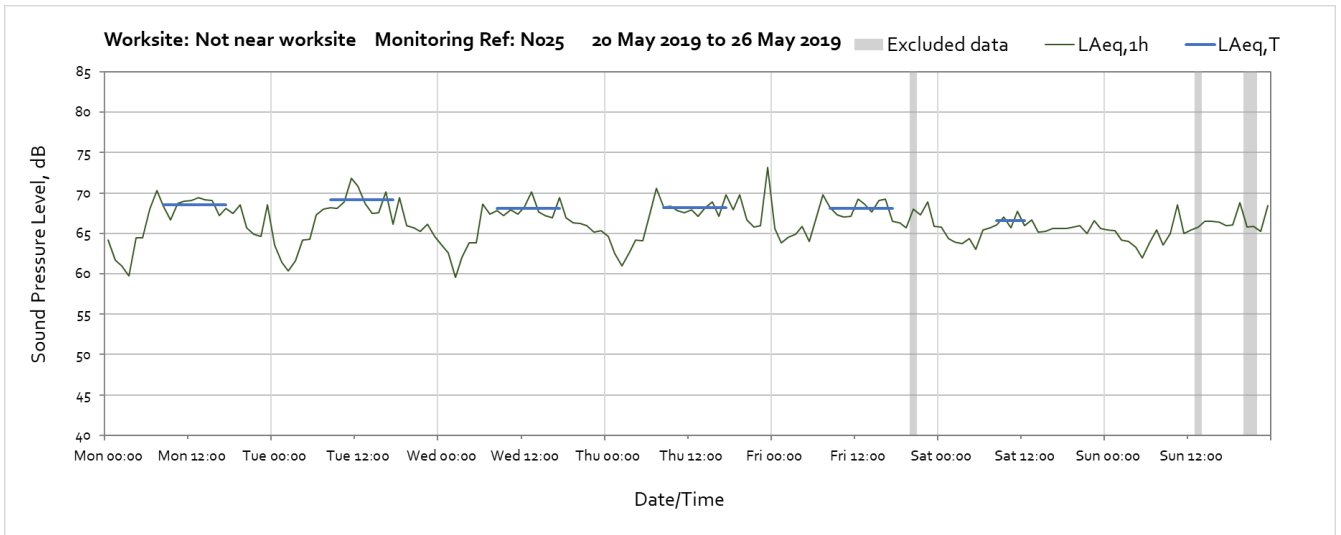
Monitoring Ref: N020



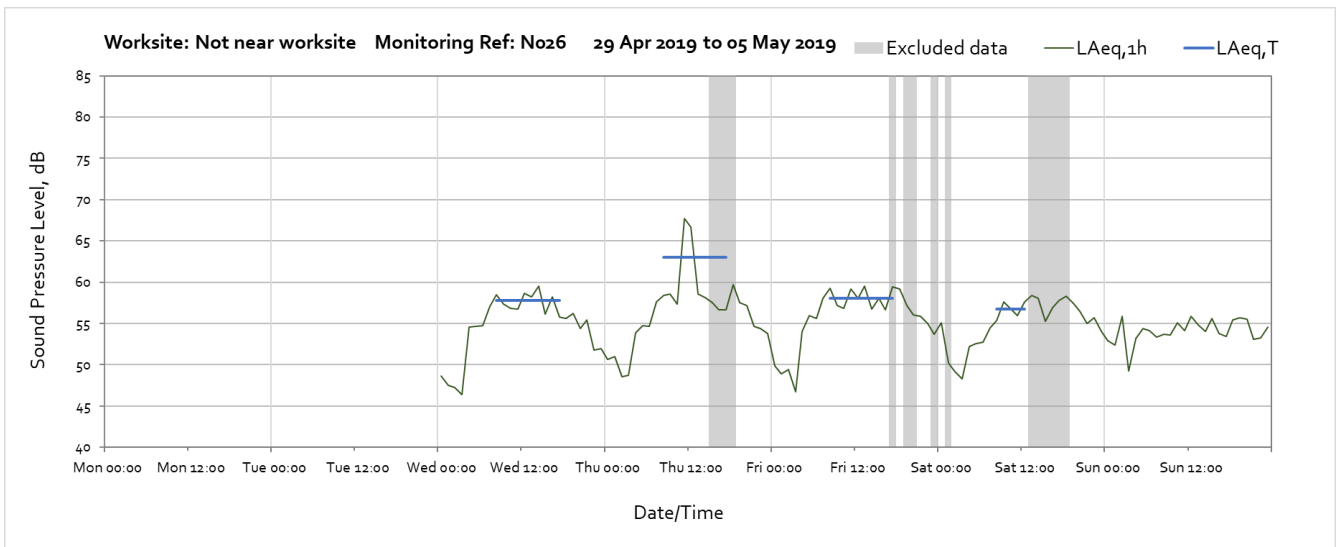


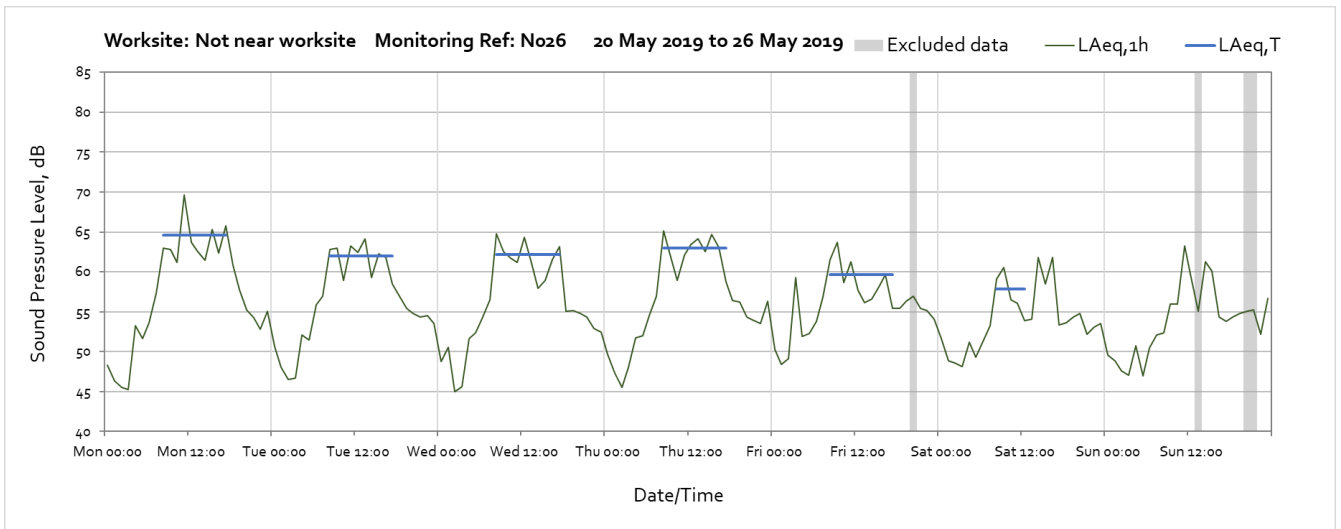
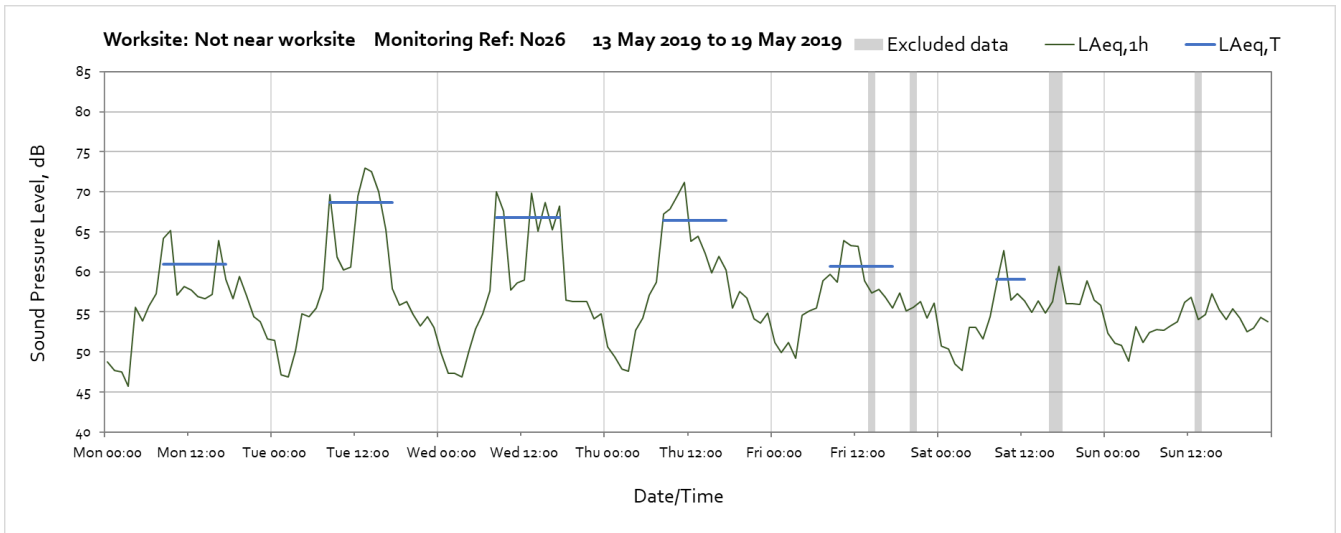
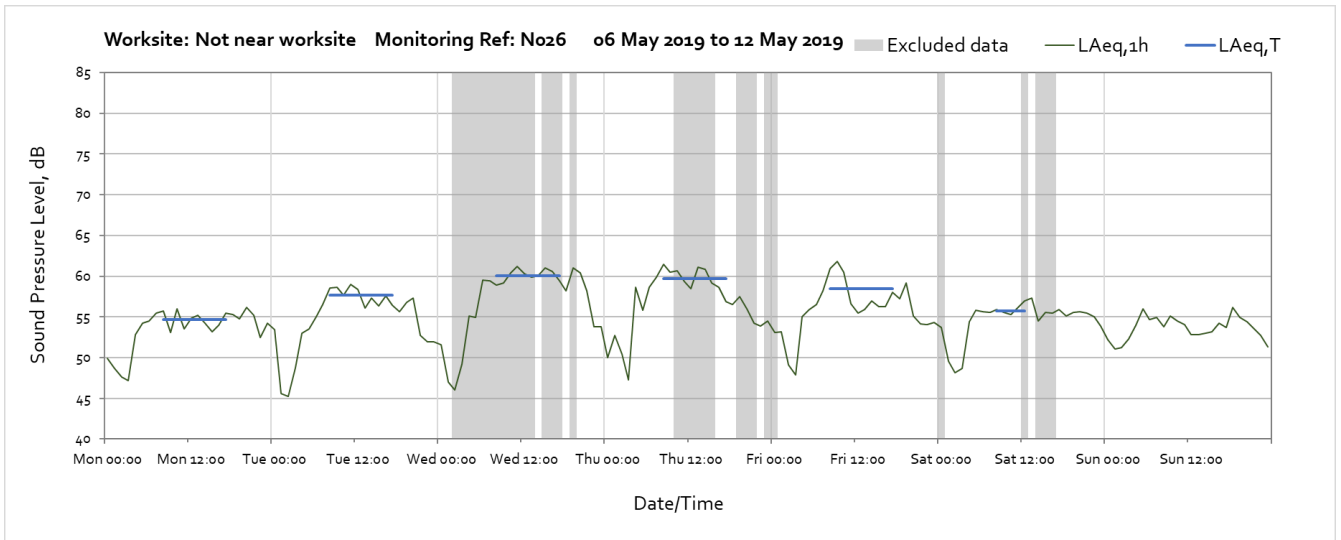
Monitoring Ref: N025

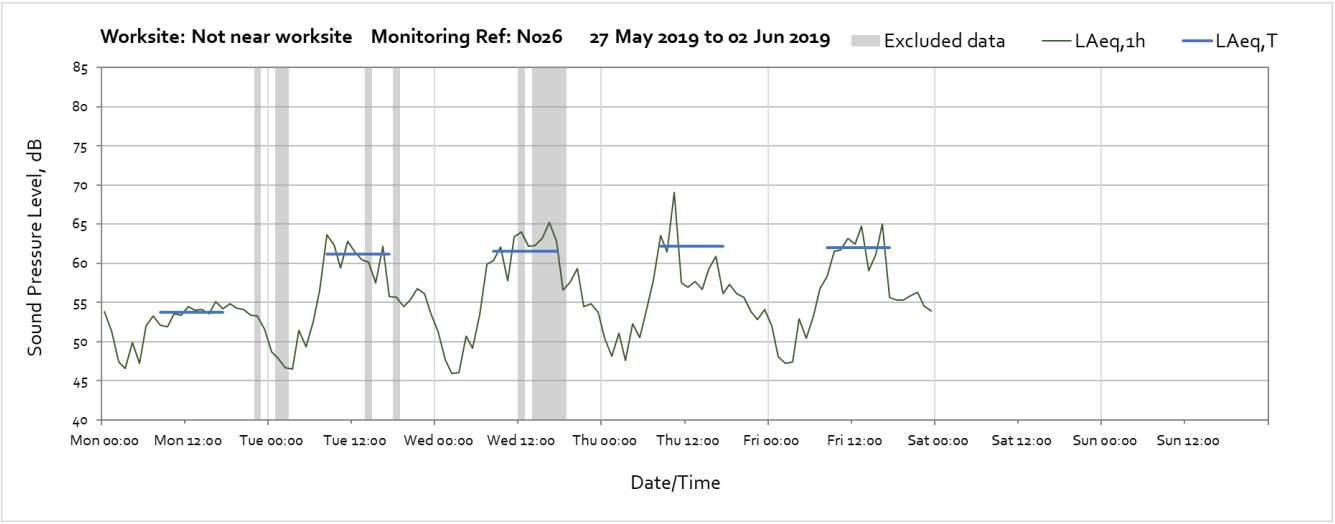




Monitoring Ref: N026



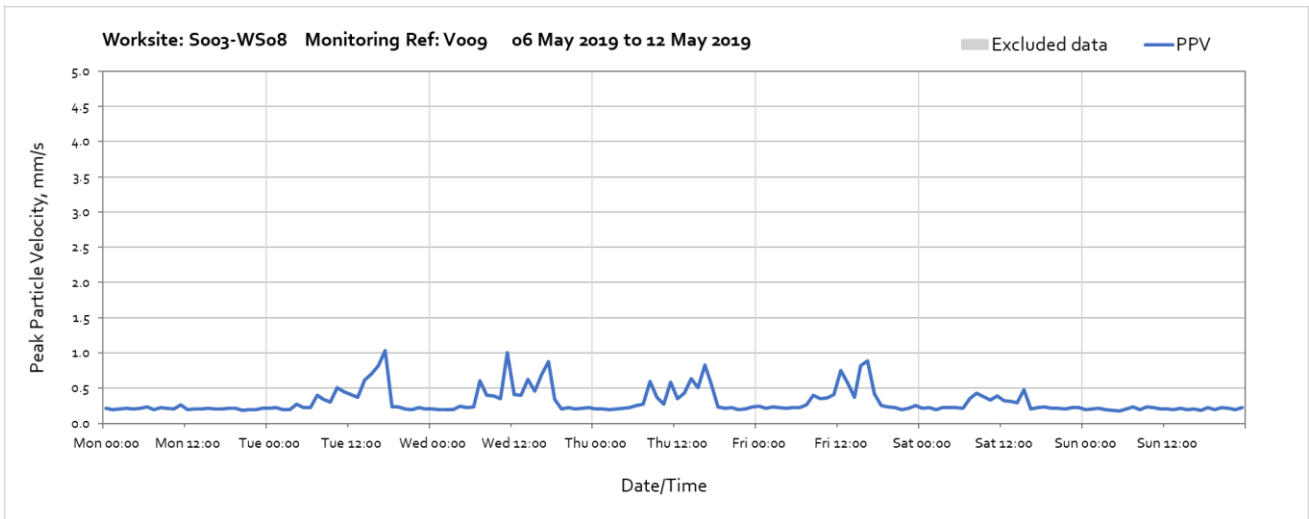
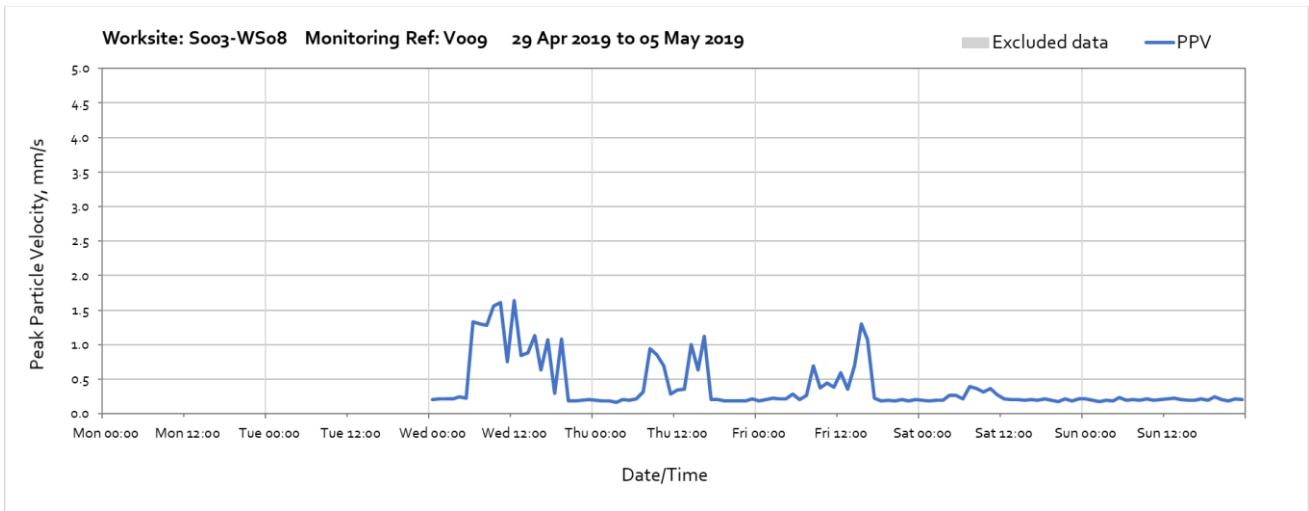


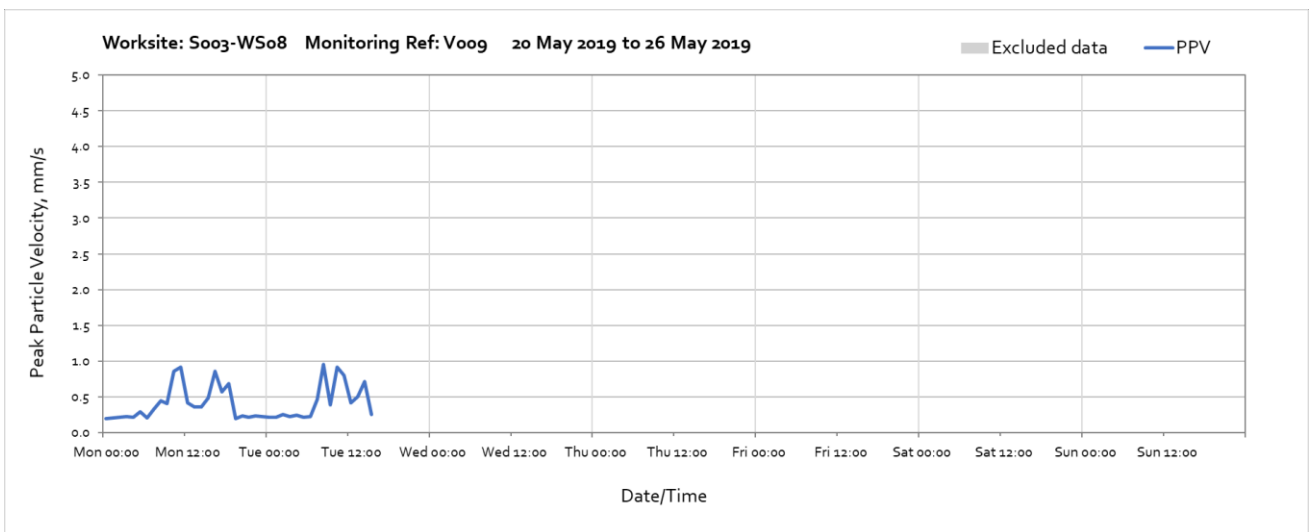
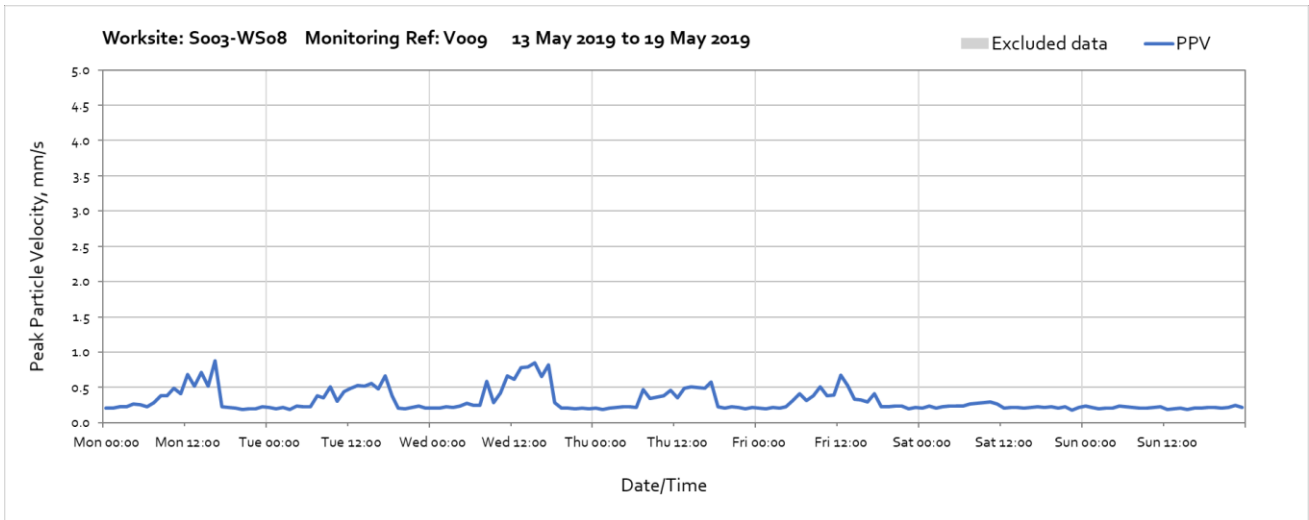


Vibration

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. High values of PPV were measured on occasions at V021. These were due to local interference with the vibration monitor and are not representative of HS2 construction works. These data entries have been greyed out in the following charts and have been excluded to calculate values in Table 6.

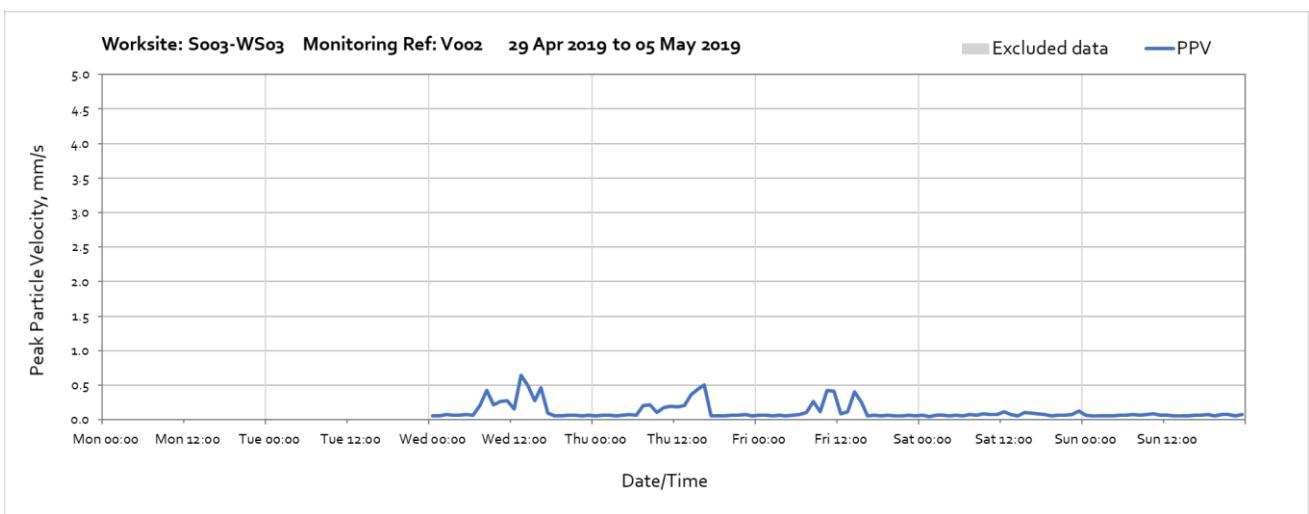
Worksite: S003-WS02 – Monitoring Ref: V009

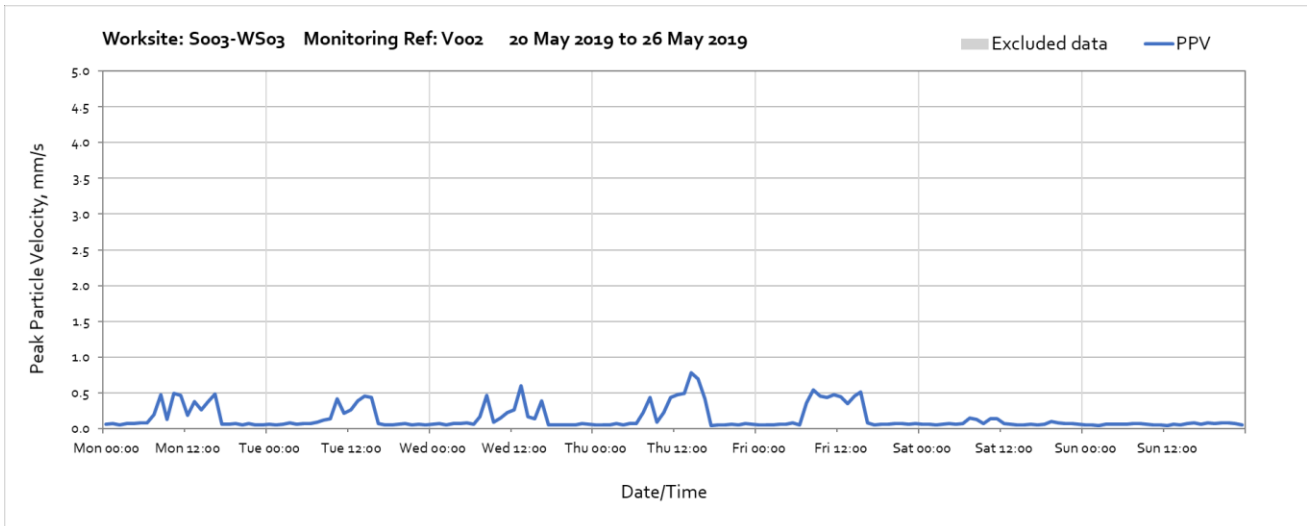
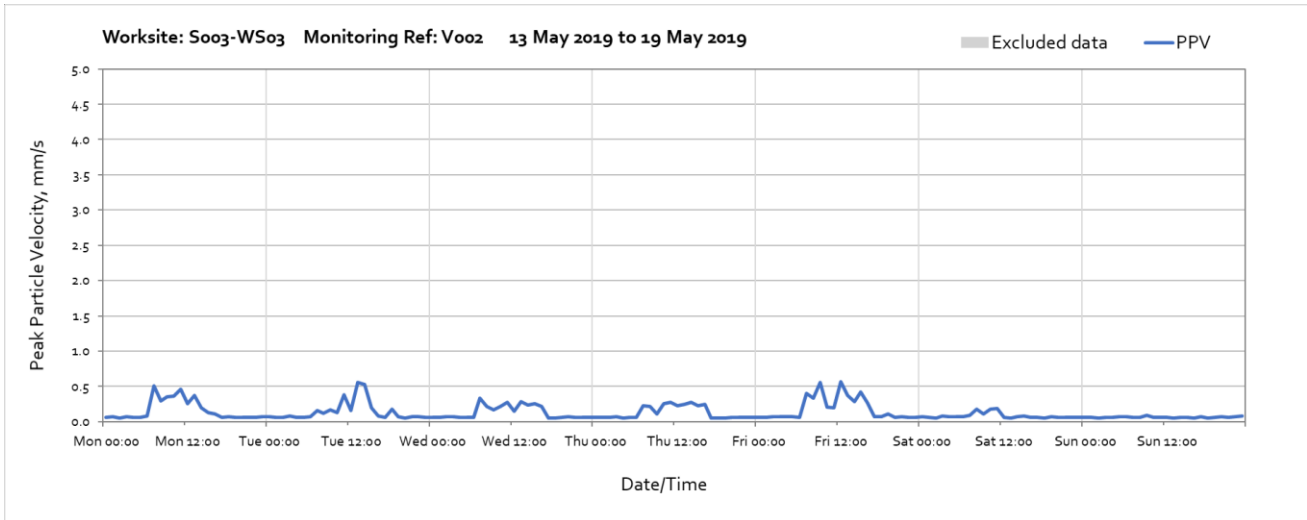
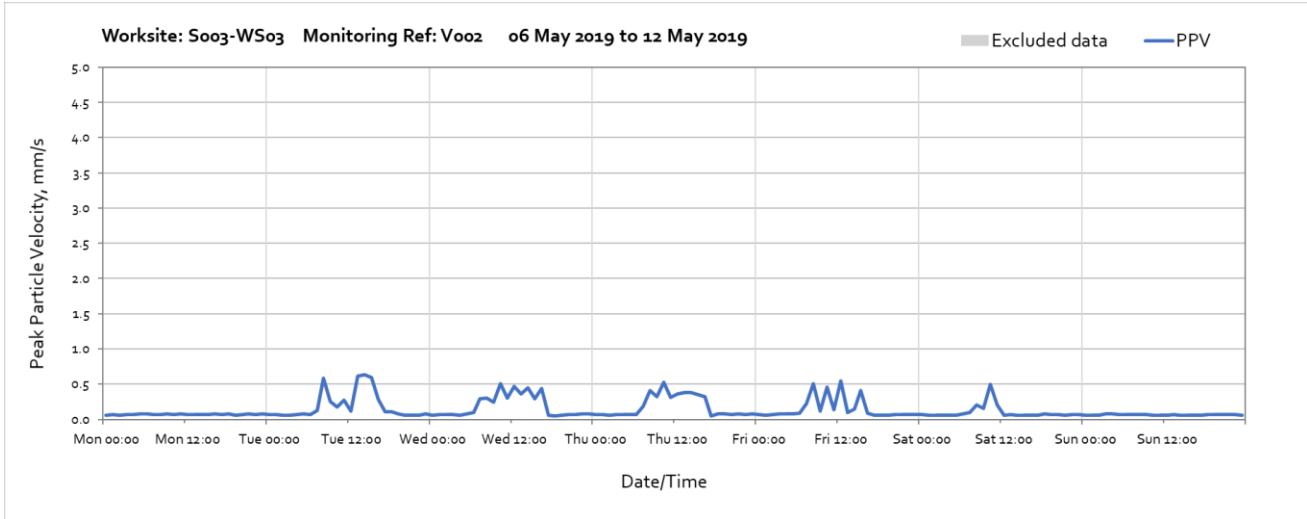


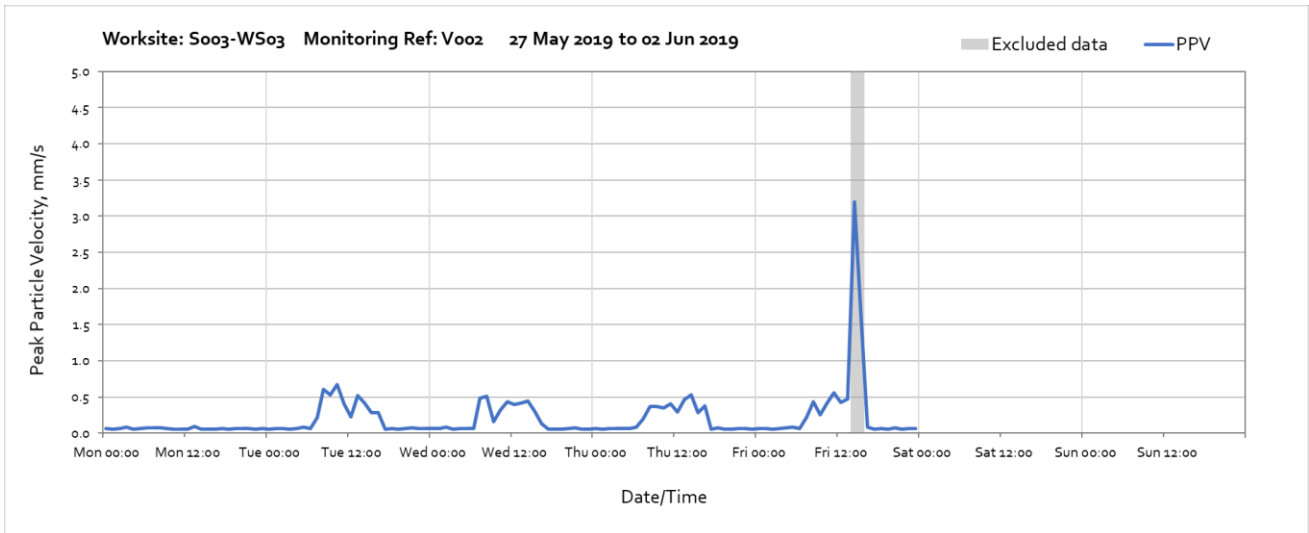


Note: Monitor was decommissioned on Tuesday the 21st following completion of works at S003-WS02.

Worksite: S003-WS03 – Monitoring Ref: V002

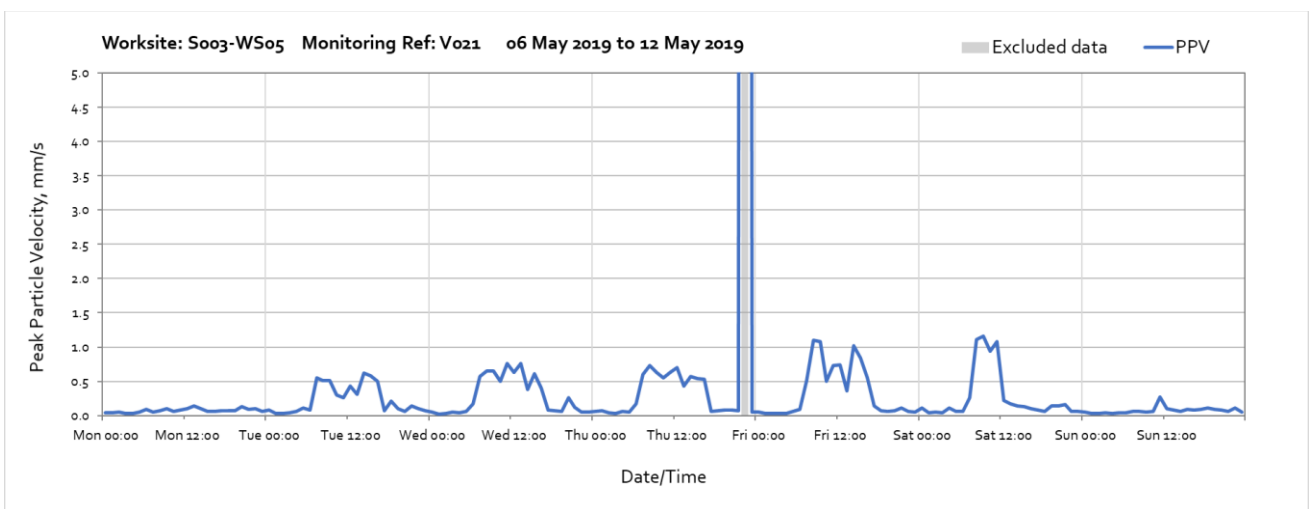
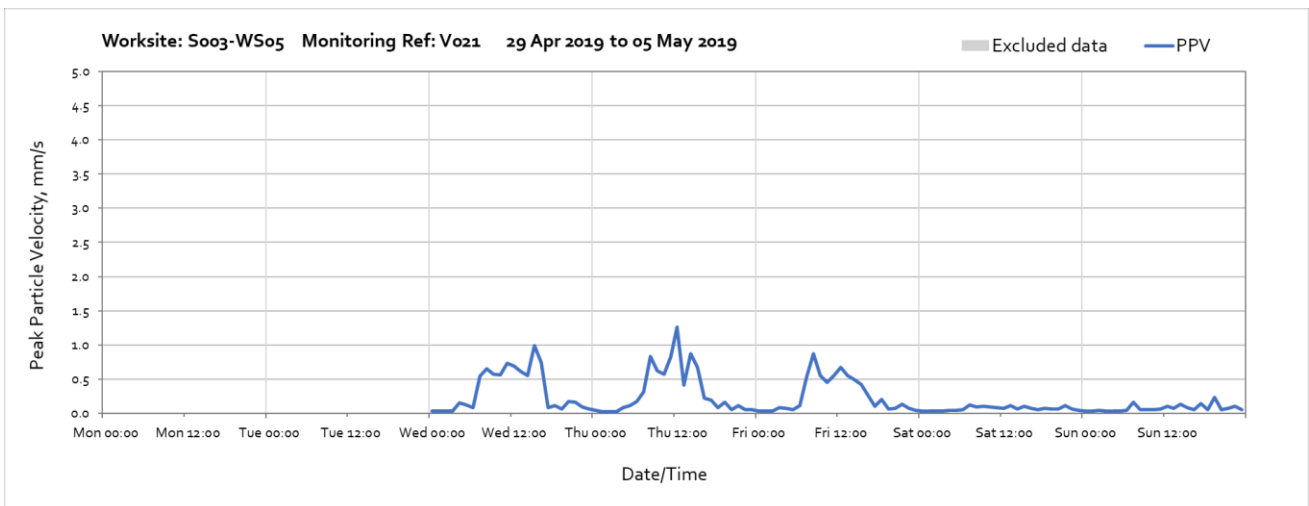




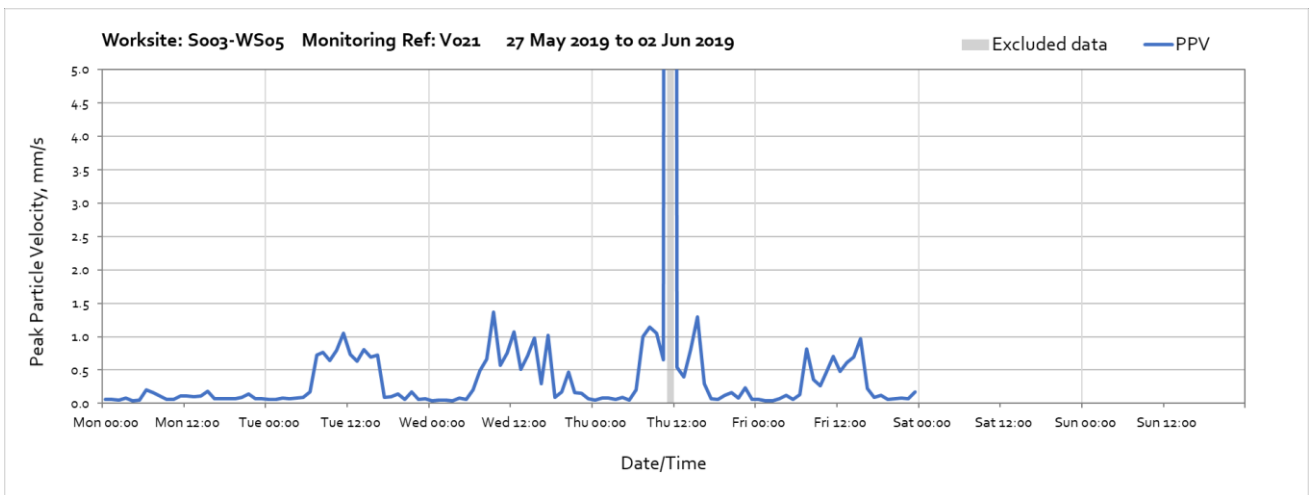
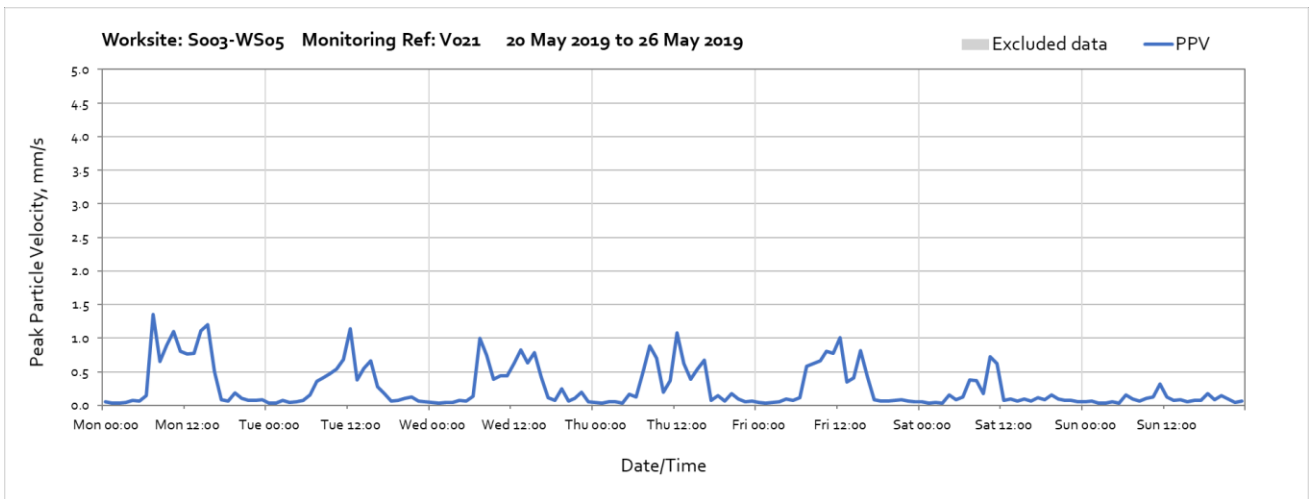
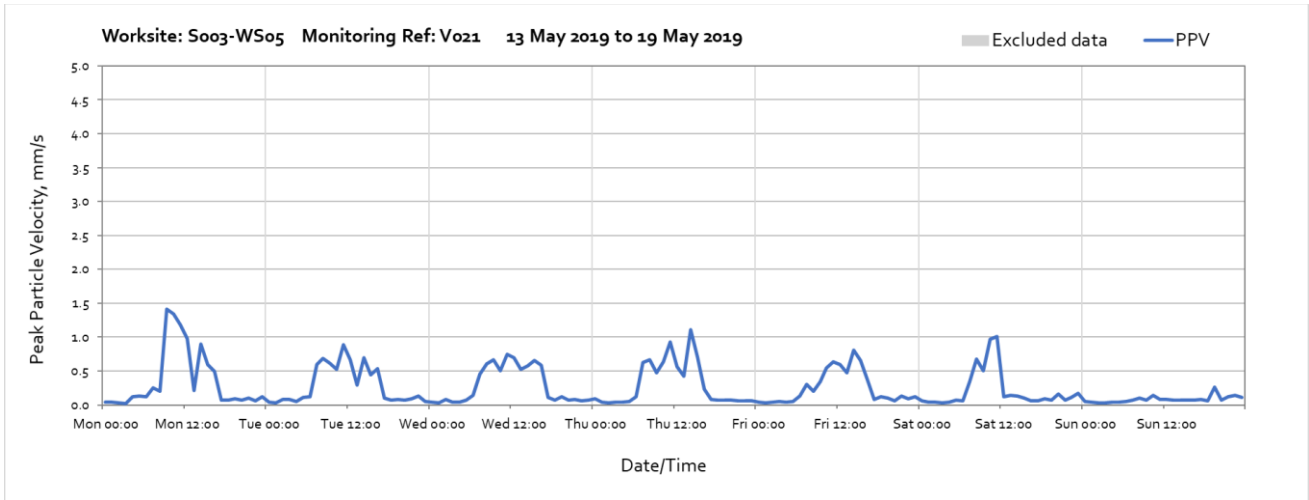


Note: The cause of high vibration levels at 14:00 and 15:00 on Friday 31st is unknown, but there were no HS2 construction activities ongoing at that time that are likely to have caused such levels of vibration. These are not considered representative of HS2 construction vibration levels at this location.

Worksite: S003-WS05 – Monitoring Ref: V021

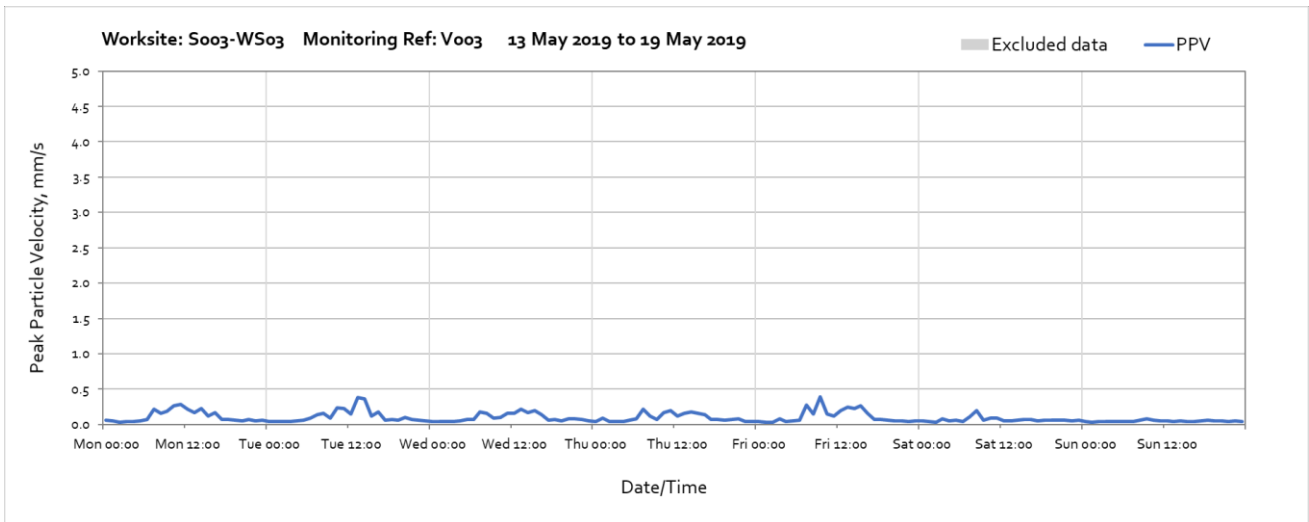
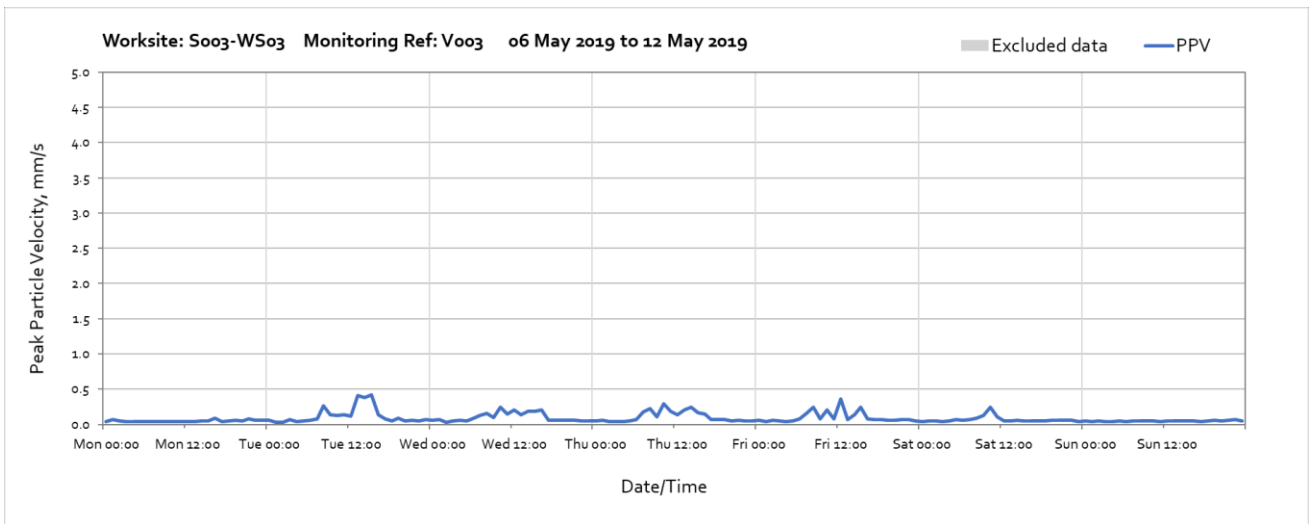
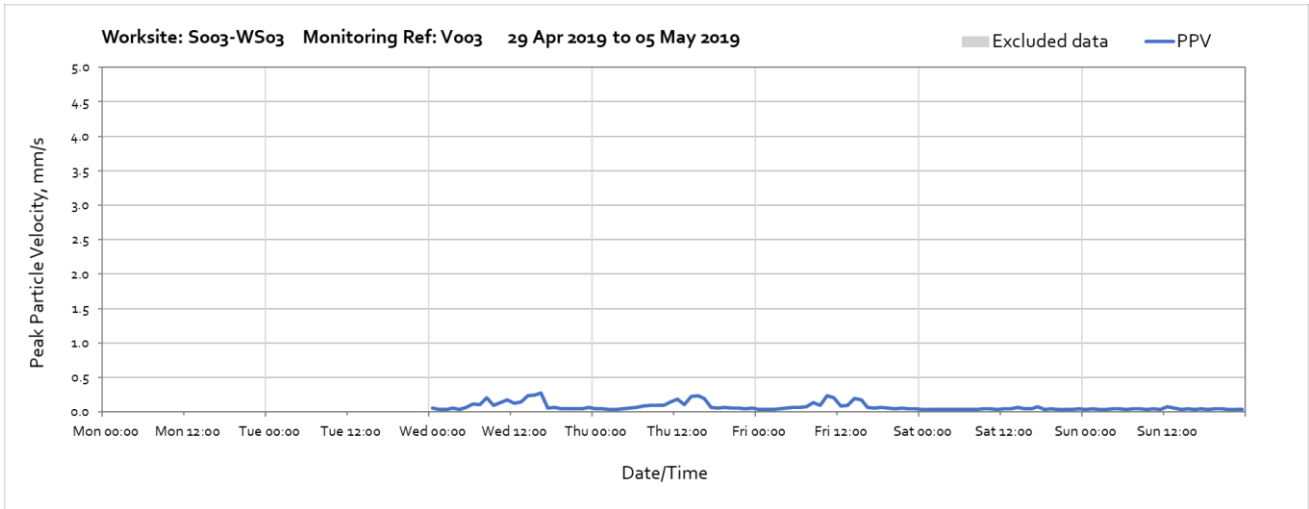


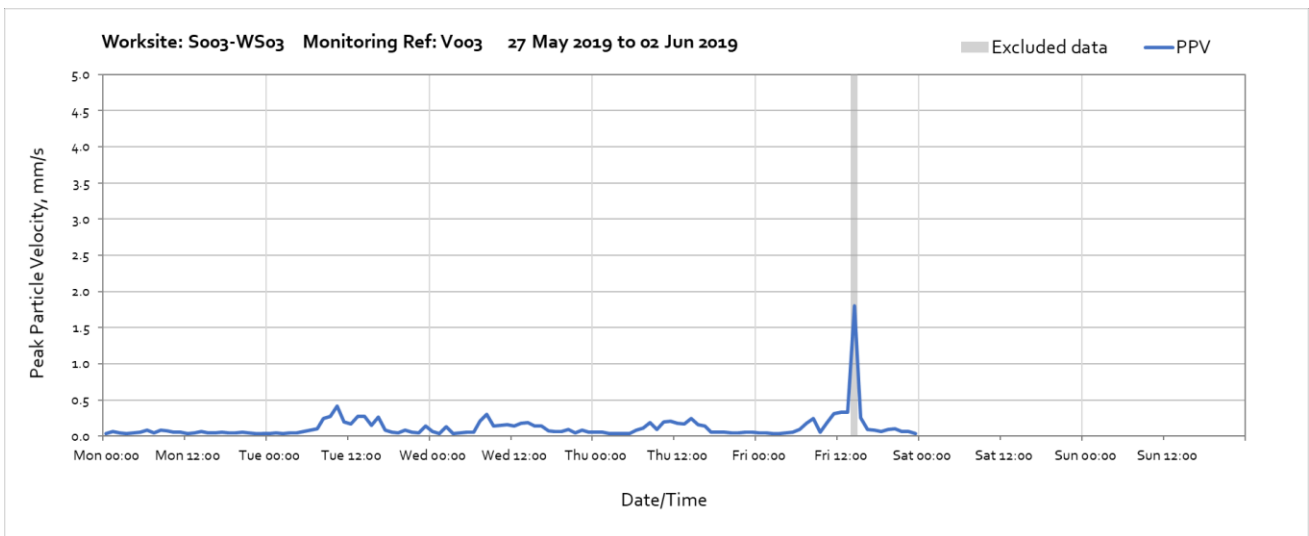
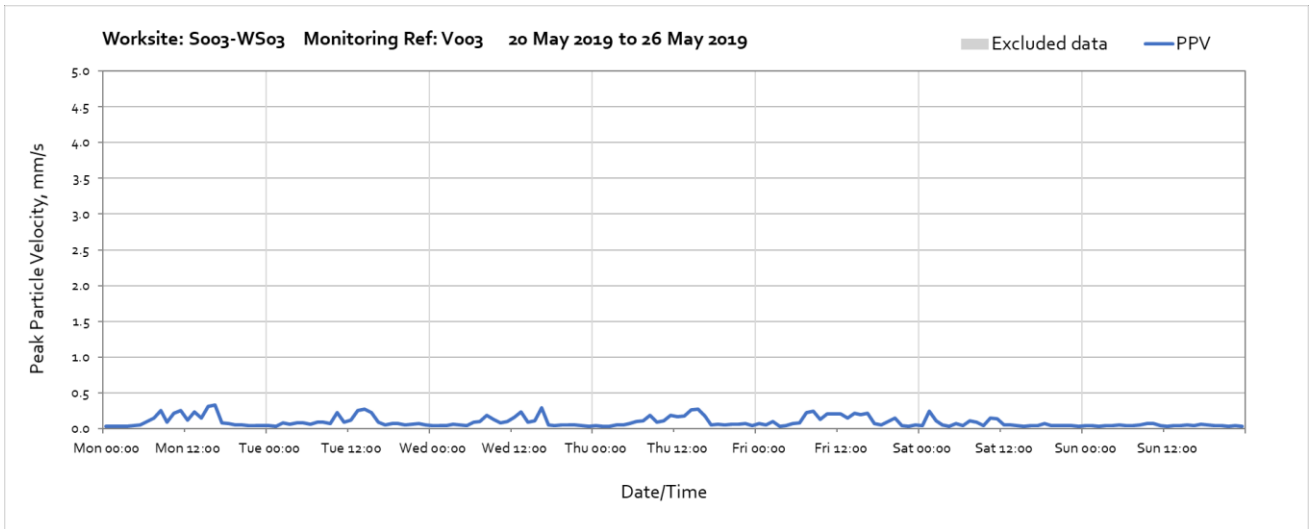
Note: High vibration levels at 22:00 on Thursday 9th were due to local disturbance of the vibration monitor and are not representative of HS2 construction vibration levels at this location.



Note: High vibration levels at 23:00 on Thursday 30th were due to local disturbance of the vibration monitor and are not representative of HS2 vibration levels.

Worksite: S003-WS08 – Monitoring Ref: V003





Note: The cause of high vibration levels at 14:00 on Friday 31st is unknown, but there were no HS2 construction activities ongoing at that time that are likely to have caused such levels of vibration. These are not considered representative of HS2 construction vibration levels at this location.