HS2

December 2023

Construction Noise and Vibration Monthly Report – October 2023

London Borough of Ealing

gov.uk/hs2

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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 Ealing (LBE) (including one monitoring location on the boundary with the London Borough of Hammersmith and Fulham) during the month of October 2023.

Within this period monitoring was undertaken at the following worksites:

- Noise monitoring was undertaken in proximity of the Mandeville Road Ventilation Shaft worksite (ref.: MRVS), where site maintenance, water management, utility works, concrete pours, excavations and sheet piling were underway.
- Noise and vibration monitoring were undertaken in proximity of the Green Park Way Ventilation Shaft worksite (ref.: GPWVS), where general site operations, road sweeping, electrical works, shaft construction, waterproofing, construction of cross passage and blinding break out were underway.
- Noise monitoring was undertaken in proximity of the Westgate Ventilation Shaft (ref.: WVS), where dismantling and lifting operations, installation of staircase, sprayed concrete lining works, excavations, steel fixing, concrete pours and piling works were underway.
- Noise monitoring was undertaken in the vicinity of the Atlas Road worksite (ref.: AR) where excavation, concrete works, installation of blinding and concrete retaining wall, backfilling, barrier installation and maintenance, extension of walkways and services, workshop fit-out, back grouting, installation of conveyor sections, maintenance works, material deliveries, scaffolding works, electrical works, vegetation management and tunnelling works were underway.
- Noise and vibration monitoring were undertaken in the vicinity of the Willesden EuroTerminal worksite (ref.: WET), where utility works, installation of decking, modular units, cabins and lighting columns, internal fit-out, refurbishment works, deliveries and material loading were underway.
- Noise monitoring was undertaken in the vicinity of the Victoria Road Crossover Box worksite (worksite ref.: VRCB), where excavation, diaphragm wall hydro-demolition , steel fixing, shuttering, installation of props and grouts, concrete works, preparation for jet grouting, grainage works, installation of pipes, sleeves and bars, coring works, sprayed concrete lining break out, backfilling, installation of manholes boxes, break out works, waterproofing, installation of edge protection and access, Tunnel boring machine assembly, removing of items, concrete casting and cleaning of tunnel inverts were underway.

- Noise monitoring was undertaken in the vicinity of the Flat Iron compound (worksite ref.: FIC), where conveyor installation, cabling works, tunnel boring machine assembly, installation of barriers and bollards were underway.
- Noise and vibration monitoring were undertaken in proximity of the Old Oak Common depot worksite (ref.: OOC), where concrete works, drainage, kerb installation, diaphragm wall breakdown, steel fixing, excavation, piling platform construction, road sweeping, pile mat construction, piling and slit trench excavation, pile operation and cropping were underway.

Further works, where monitoring did not take place, were undertaken at Atlas Road Sub-Station where excavations, ducting, backfilling, cabling, sinking of shafts and tunnelling were underway.

The HS2 threshold levels for significant noise impacts, which are defined in Information Paper E23 (https://www.gov.uk/government/publications/hs2-information-papers-environment), were not exceeded during the reporting period.

There were no exceedances of trigger levels, as defined in Section 61 consents during the reporting period.

Eight (8) complaints were received during the monitoring period. A description of complaints, the results of investigation and any actions taken are detailed in Table 7 of this report.

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 +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.

1.1.2 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 Ealing (LBE) (including one monitoring location on the boundary with the London Borough of Hammersmith and Fulham) during the month for the period 1st to 31st October 2023.

1.1.3 Active construction sites in the local authority area, where noise and vibration monitoring were conducted during this period, include:

- Mandeville Road Ventilation Shaft worksite, reference MRVS (see plan 1 in Appendix A), where work activities included:
  - Site maintenance.
  - Water management, including lifting operations.
  - Utility works.
  - Concrete pours.
  - Excavations.
  - Sheet piling, including possession works.
- Green Park Way Ventilation Shaft worksite, reference GPWVS (see plan 2 in Appendix A), where work activities included:
  - General site operations, including housekeeping works.

- Road sweeping.
- Electrical works.
- Waterproofing.
- Cross passage construction works, including excavations and installation of sprayed concrete lining.
- Blinding break out.
- Shaft construction works, including excavations and installation of sprayed concrete lining.

- Westgate Ventilation Shaft worksite, reference WVS (see plan 3 in Appendix A), where work activities included:
  - Dismantling and lifting operations.
  - Installation of staircase.
  - Sprayed concrete lining works, including waterproofing and construction of concrete slabs.
  - Excavations.
  - Steel fixing.
  - Concrete pours.
  - Piling works, including breaking, excavation and cropping of piles.
- Atlas Road worksite, ref. AR (see plan 4 in Appendix A), where work activities included:
  - Excavation.
  - Concrete works.
  - Installation of blinding.
  - Installation of concrete retaining wall.
  - Backfilling.
  - Barrier installation and maintenance.
  - Extension of walkways and services.
  - Workshop fit-out.
  - Back grouting.
  - Installation of conveyor sections.

- Maintenance works including existing conveyers, substations and gantry cranes.
- Material deliveries.
- Scaffolding works.
- Electrical testing and commissioning works.
- Vegetation management.
- Tunnelling works, including pre-cast tunnel segment installation.

- Willesden EuroTerminal worksite, ref. WET (see plan 4 in Appendix A), where work activities included:
  - Utility works, including installation of site lighting and cabling works.
  - Installation of modular units and internal fit-out works.
  - Installation of decking.
  - Installation of lighting columns.
  - Refurbishment works.
  - Installation of cabins.
  - Deliveries and material loading.
- Victoria Road Crossover Box worksite, ref. VRCB (see plan 4 in Appendix A), where work activities included:
  - Excavation.
  - Diaphragm wall hydro-demolition.
  - Steel fixing.
  - Shuttering
  - Installation of props and grouting.
  - Concrete works, including pours.
  - Preparation for jet grouting.
  - Drainage works.
  - Installation of pipes, sleeves and bars.
  - Coring works.
  - Sprayed concrete lining break out.
  - Backfilling.

    - Installation of manhole boxes.
    - Break out of the tunnel eye.
    - Waterproofing.
    - Installation of edge protection and access.
    - Tunnel boring machine assembly, including welding.
    - Removing of items from tunnel pit bottoms.
    - Concrete casting within tunnels.
    - Cleaning of tunnel inverts.
- Flat Iron compound, worksite ref. FIC (see plan 4 in Appendix A), where work activities included:
    - Conveyor installation.
    - Cabling works.
    - Tunnel boring machine assembly.
    - Installation of barriers and bollards.
- Old Oak Common depot worksite, located in the London Borough of Hammersmith and Fulham (LBHF), ref. OOC (see plan 4 in Appendix A), where work activities included:
    - Concrete works.
    - Drainage.
    - Kerb installation.
    - Diaphragm wall breakdown.
    - Steel fixing.
    - Excavation.
    - Piling platform construction.
    - Piling operations.
    - Road sweeping.
    - Pile mat construction.
    - Piling and slit trench excavation.
    - Pile cropping.

1.1.4 Further works, where monitoring did not take place, were undertaken at Atlas Road Sub-Station where excavations, ducting, backfilling, cabling, sinking of shafts and tunnelling were underway.

1.1.5 The applicable standards, guidance, and monitoring methodology are 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 Twenty-one (21) noise and eight (8) vibration monitoring installations were active in October in the LBE area. Table 2 summarises the position of noise and vibration monitoring installations within the LBE area in October 2023.

1.2.2 The noise monitor at measurement location ref.: WT-N01, worksite ref.: S6, was removed on the 1st of October as works at the worksite have ceased.

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
MRVS	N040	Badminton Close
	N058	Mandeville Road North hoarding, Northeast Part of Site
	N063	Mandeville Road, North Hoarding, Northwest part of Site
	BLV-N001	45 Belvue Road
	V055	Mandeville Road North hoarding, Northeast Part of Site
	V056	Mandeville Road, North Hoarding, Northwest part of Site
GPWVS	N059	Greenpark Way East boundary on hoarding
	N064	Greenpark Way outside Tetris building
	V053	Greenpark Way Eastern boundary
	V054	Greenpark Way outside Tetris building (West of Site)
WVS	N062	Westgate Ventilation Shaft, on site hoarding in Northeast corner of site.
AR	N032	Shaftesbury Gardens
	N033	Outside The Collective, Atlas Road / Victoria Road
	N060	Atlas Road next to Bashey Road

Worksite Reference	Measurement Reference	Address
WET	N034	Stephenson Street (north)
	N035	Stephenson Street (south)
	N041	Junction of Stephenson Street / Goodhall Street
	V057	37, Stephenson Street
	V052	63, Stephenson Street
VRCB	N031	School Road, outside Acton Business Centre
	N050	Acton Square, outside North Acton Station
FIC	N029	Braitrim House, Victoria Road
	N042	Boden House Car Park
	N049	Flat Iron compound railway fence, Victoria Rd North Acton
OOC	OOC-N01	Adjacent to 205 Old Oak Common Lane
	OOC-N02	Old Oak Common Lane, Hilltop Works
	OOC-N03	Wycombe Triangle at the rear of 63 Wells House Road
	OOC-V02	Kildun Court, Old Oak Common Lane
	OOC-V03	Wells House Road Alleyway

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.

Table 3: Summary of Measured dB L_{Aeq} Data over the Monitoring Period

Worksite Reference	Measurement Reference	Site Address	Free-field or Façade measurement	Weekday 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**
MRVS	N040	Badminton Close	Free field	53.7 (58.7)	54.5 (58.2)	53.2 (58.0)	53.7 (58.3)	51.5 (60.1)	54.4 (55.5)	53.8 (54.6)	52.9 (54.2)	54.0 (56.7)	51.8 (57.3)	53.5 (56.9)	51.5 (56.8)
	N058	Mandeville Road	Free field	58.0 (72.4)	61.9 (70.2)	58.4 (68.4)	59.8 (77.4)	59.5 (84.9)	57.8 (59.2)	59.7 (63.3)	61.5 (63.3)	60.1 (64.1)	58.6 (65.9)	60.3 (67.0)	56.8 (61.8)
	N063	Mandeville Road	Free field	57.8 (60.0)	63.5 (68.9)	57.2 (59.6)	58.2 (65.4)	55.3 (61.1)	58.1 (58.6)	57.5 (58.7)	56.5 (57.2)	57.5 (60.6)	55.8 (59.6)	57.6 (60.3)	54.9 (60.5)
	BLV-N001	45 Belvue Road	Free field	57.1 (58.2)	57.7 (60.4)	56.1 (57.4)	56.6 (58.6)	54.0 (58.2)	56.9 (57.6)	56.4 (57.4)	55.8 (56.8)	57.6 (61.8)	56.1 (61.5)	57.5 (60.7)	53.6 (57.9)
GPWVS	N059	Green Park Way Ventilation Shaf	Free field	58.9 (62.0)	63.8 (66.9)	56.8 (59.8)	58.1 (67.2)	56.1 (67.1)	57.9 (62.6)	59.8 (62.6)	58.6 (62.7)	58.5 (62.9)	55.7 (60.7)	57.6 (68.4)	56.3 (60.5)
	N064	Green Park Way Ventilation Shaft	Façade	57.0 (61.3)	60.9 (65.7)	57.7 (61.2)	56.6 (58.6)	54.8 (69.8)	56.2 (57.0)	57.0 (58.6)	57.4 (59.1)	56.7 (59.8)	53.7 (58.2)	56.2 (63.6)	54.0 (59.1)
WVS	N062	Westgate Ventilation Shaft	Free field	65.7 (73.1)	68.9 (71.8)	61.9 (65.7)	63.5 (67.0)	62.6 (70.9)	65.0 (68.4)	69.6 (73.2)	63.0 (66.9)	61.4 (69.4)	59.5 (67.7)	60.8 (68.5)	57.4 (60.4)
AR	N032	Shaftesbury Gardens	Free field	63.3 (65.8)	65.8 (71.8)	63.1 (67.6)	61.3 (67.9)	58.7 (63.5)	60.5 (61.5)	62.6 (63.8)	62.5 (63.1)	61.8 (64.1)	57.0 (60.7)	61.1 (64.5)	58.4 (64.0)

Worksite Reference	Measurement Reference	Site Address	Free-field or Façade measurement	Weekday 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**
	N033	Outside The Collective, Atlas Road/Victoria Road	Free field	67.9 (68.9)	67.8 (68.9)	64.7 (66.4)	63.9 (67.3)	61.5 (69.1)	63.4 (64.5)	64.9 (65.8)	64.0 (64.7)	64.5 (69.9)	59.7 (63.6)	63.2 (67.0)	60.7 (66.2)
	N060	Atlas Road next to Bashey Road	Free field	60.7 (68.0)	66.2 (69.6)	55.9 (62.7)	62.7 (69.0)	63.7 (68.9)	61.7 (68.3)	65.1 (67.8)	64.1 (66.2)	61.4 (66.6)	60.6 (68.6)	61.7 (69.2)	58.7 (68.2)
WET	N034	Stephenson Street (north)	Free field	54.2 (58.9)	56.8 (64.4)	55.5 (61.3)	54.1 (57.8)	50.7 (57.8)	51.6 (53.7)	54.0 (55.4)	52.0 (52.1)	54.3 (64.8)	48.2 (52.2)	53.4 (59.9)	47.7 (54.3)
	N035	Stephenson Street (south)	Free field	56.1 (62.9)	57.8 (63.0)	53.3 (58.8)	51.8 (60.6)	50.0 (57.5)	52.0 (53.4)	54.5 (55.9)	51.1 (52.3)	52.3 (59.1)	48.4 (51.4)	51.4 (59.7)	47.8 (56.3)
	N041	Junction of Stephenson Street/Goodhall Street	Free field	55.0 (58.9)	56.9 (62.5)	55.4 (58.5)	54.4 (61.7)	50.7 (56.1)	51.6 (52.4)	54.3 (55.3)	53.3 (53.9)	54.1 (58.4)	48.7 (54.6)	52.9 (60.1)	48.7 (54.2)
VRCB	N031	School Road, outside Acton Business Centre	Free field	60.9 (62.8)	64.7 (72.3)	60.2 (62.0)	58.7 (61.8)	56.1 (61.8)	58.3 (61.3)	64.0 (66.2)	63.9 (65.8)	60.3 (67.1)	53.8 (58.5)	60.5 (73.5)	55.5 (59.7)
	N050	Acton Square, outside North Acton Station	Free field	64.2 (68.5)	65.3 (71.6)	63.4 (64.9)	62.9 (67.4)	59.5 (68.4)	62.5 (64.5)	64.9 (66.9)	63.6 (64.6)	62.9 (65.0)	58.9 (64.7)	62.4 (66.5)	58.5 (63.6)
FIC	N029	Braitrim House, Victoria Road	Free field	58.5 (64.4)	66.2 (78.5)	54.2 (63.6)	54.9 (64.1)	55.3 (64.9)	55.2 (57.0)	57.8 (59.4)	55.0 (58.6)	52.7 (60.3)	47.9 (55.8)	51.5 (60.4)	52.9 (61.3)
	N042	Bodens car park	Free field	59.0 (60.2)	61.4 (63.4)	57.1 (59.7)	56.1 (60.2)	55.2 (59.8)	57.6 (58.2)	60.9 (62.8)	62.3 (65.3)	57.1 (60.7)	54.3 (56.8)	57.2 (65.6)	54.8 (57.6)

Worksite Reference	Measurement Reference	Site Address	Free-field or Façade measurement	Weekday 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**
	N049	Flat Iron compound	Free field	60.6 (66.6)	74.3 (76.7)	57.9 (61.5)	57.7 (65.7)	58.1 (64.0)	53.6 (54.8)	59.1 (60.9)	55.9 (58.0)	55.2 (58.7)	52.8 (63.5)	54.9 (59.9)	57.3 (64.8)
OOC	OOC-N01	Adjacent to 205 Old Oak Common Lane	Free-field	57.9 (60.8)	62.9 (66.2)	57.6 (59.3)	57.2 (58.8)	53.7 (59.5)	56.5 (57.1)	59.0 (60.7)	57.5 (59.1)	57.1 (59.6)	53.2 (59.5)	56.6 (61.5)	53.5 (59.6)
	OOC-N02	Old Oak Common Lane, Hilltop Works	Free-field	66.6 (69.2)	71.0 (73.8)	66.4 (68.6)	65.0 (69.2)	61.2 (66.8)	62.3 (63.4)	66.7 (68.6)	66.6 (67.5)	66.8 (71.7)	60.8 (66.6)	64.8 (74.7)	60.3 (65.6)
	OOC-N03	Old Oak Lane Halt, Wells House Road	Free-field	57.9 (60.8)	62.9 (66.2)	57.6 (59.3)	57.2 (58.8)	53.7 (59.5)	56.5 (57.1)	59.0 (60.7)	57.5 (59.1)	57.1 (59.6)	53.2 (59.5)	56.6 (61.5)	53.5 (59.6)

2.1.2 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
GPWVS	V053	Green Park Way, Greenford	1.47 (Z-axis)
	V054	Green Park Way Ventilation Shaft	1.09 (Z-axis)
MRVS	V055	Mandeville Road	1.33 (Z-axis)
	V056	Mandeville Road	1.03 (Z-axis)
WET	V052	63, Stephenson Street	2.99 (Y-axis)
	V057	37, Stephenson Street	0.80 (Z-axis)
OOC	OOC-V02	Kildun Court, Old Oak Common Lane	2.23 (Z-axis)
	OOC-V03	Wells House Road Alleyway	0.90 (Y-axis)

2.1.3 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 reported construction noise levels exceed the SOAEL, relevant periods will be identified. Summary statistics to evaluate ongoing qualification for noise insulation and temporary rehousing are also presented where relevant.

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
MRVS	N040	Badminton Close	All days	All periods	No exceedance
	N058	Mandeville Road	All days	All periods	No exceedance
	N063	Mandeville Road	All days	All periods	No exceedance
	BLV-N001	45 Belvue Road	All days	All periods	No exceedance
GPWVS	N059	Green Park Way Ventilation Shaft	All days	All periods	Not applicable*
	N064	Green Park Way Ventilation Shaft	All days	All periods	Not applicable*
WVS	N062	Westgate Ventilation Shaft	All days	All periods	Not applicable*
AR	N032	Shaftesbury Gardens	All days	All periods	No exceedance
	N033	Outside The Collective, Atlas Road / Victoria Road	All days	All periods	No exceedance
	N060	Atlas Road next to Bashey Road	All days	All periods	No exceedance
WET	N034	Stephenson Street (north)	All days	All periods	No exceedance
	N035	Stephenson Street (south)	All days	All periods	No exceedance
	N041	Junction of Stephenson Street / Goodhall Street	All days	All periods	No exceedance
VRCB	N031	School Road, outside Acton Business Centre	All days	All periods	Not applicable*
	N050	Acton Square, outside North Acton Station	All days	All periods	No exceedance

Worksite Reference	Measurement Reference	Site Address	Day (Weekday, Saturday, Sunday, Night)	Time period	Number of exceedances of SOAEL
FIC	N029	Braitrim House, Victoria Road	All days	All periods	No exceedance
	N042	Bodens Car Park	All days	All periods	No exceedance
	N049	Flat Iron compound	All days	All periods	No exceedance
OOC	OOC-N01	Adjacent to 205 Old Oak Common Lane	All days	All periods	No exceedance
	OOC-N02	Old Oak Common Lane, Hilltop Works	All days	All periods	No exceedance
	OOC-N03	Old Oak Lane Halt, Wells House Road	All days	All periods	No exceedance

* The defined SOAEL criteria are not applicable to non-residential properties

2.2.5 No SOAEL exceedances were recorded due to HS2 construction works during October 2023.

2.3 Exceedances of Trigger Level

2.3.1 Table 6 provides a summary of exceedances of the Section 61 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 6: 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

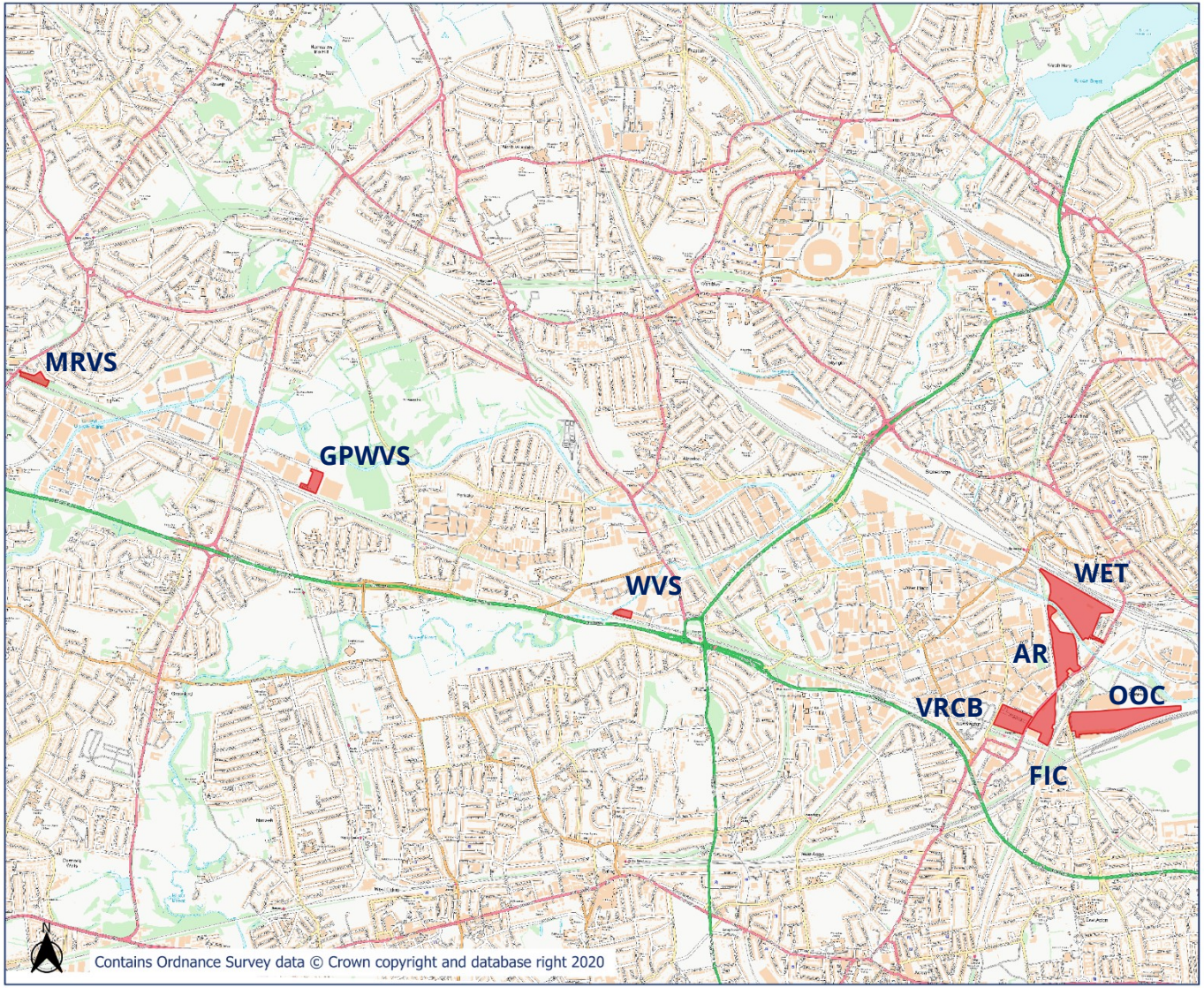
2.4.1 Table 7 provides a summary of complaint information related to noise and vibration received during the reporting period, along with the findings of any investigation.

Table 7: Summary of Complaints

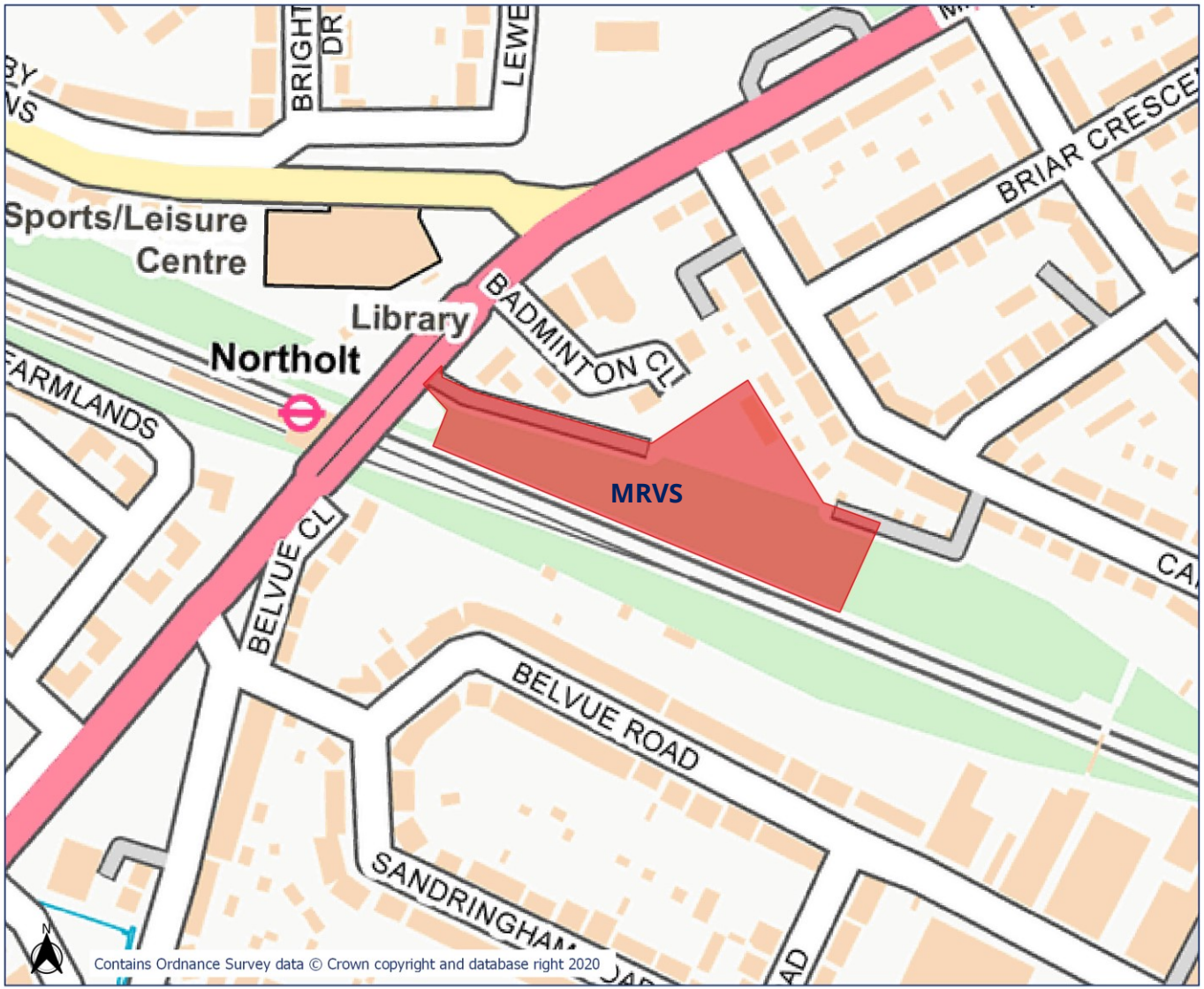
Complaint Reference Number	Worksite Reference	Description of Complaint	Results of Investigation	Actions Taken
HS2-23-101364-E-C	MRVS	Complaint regarding noise at night due to mechanical machinery noise.	The noise is not related to HS2 construction works. The noise levels measured at fixed monitors were checked and no noise exceedances were reported.	Findings were reported to the resident.
HS2-23-44981-C	OOC	Complaint about workers shouting early in the morning.	Feedback has been given to site team and they have been briefed. Also, SHUSH campaign has been relaunched for all staff.	Resident requested no contact; therefore, case was closed.
HS2-23-101458-E-C	GPWVS	Complaint due to drilling and banging noise at night.	The noise is not related to HS2 construction works.	Response provided to complainant.
HS2-23-101787-E-C HS2-23-101788-E-C	WET	Complaint regarding beeping and machinery noise at night, coming from nearby site.	The noise is not related to HS2 construction works.	Response provided to complainant.
HS2-23-102051-E-C	Utility works	Complaint about loud generator noise.	The mitigation measures on site were reviewed.	Mitigation now in place to reduce noise, the resident was updated.
HS2-23-45011-C	VRCB	Beeping tone of reversing vehicles reported.	The vehicles on site were not fitted with white tone reversing alarms.	White tone reversing sound to be installed on vehicles to reduce noise.
HS2-23-102224-E-C	OOC	Abusive email received regarding noise.	No investigation was undertaken.	No official response provided other than the HS2 respect policy.

Appendix A Site Locations

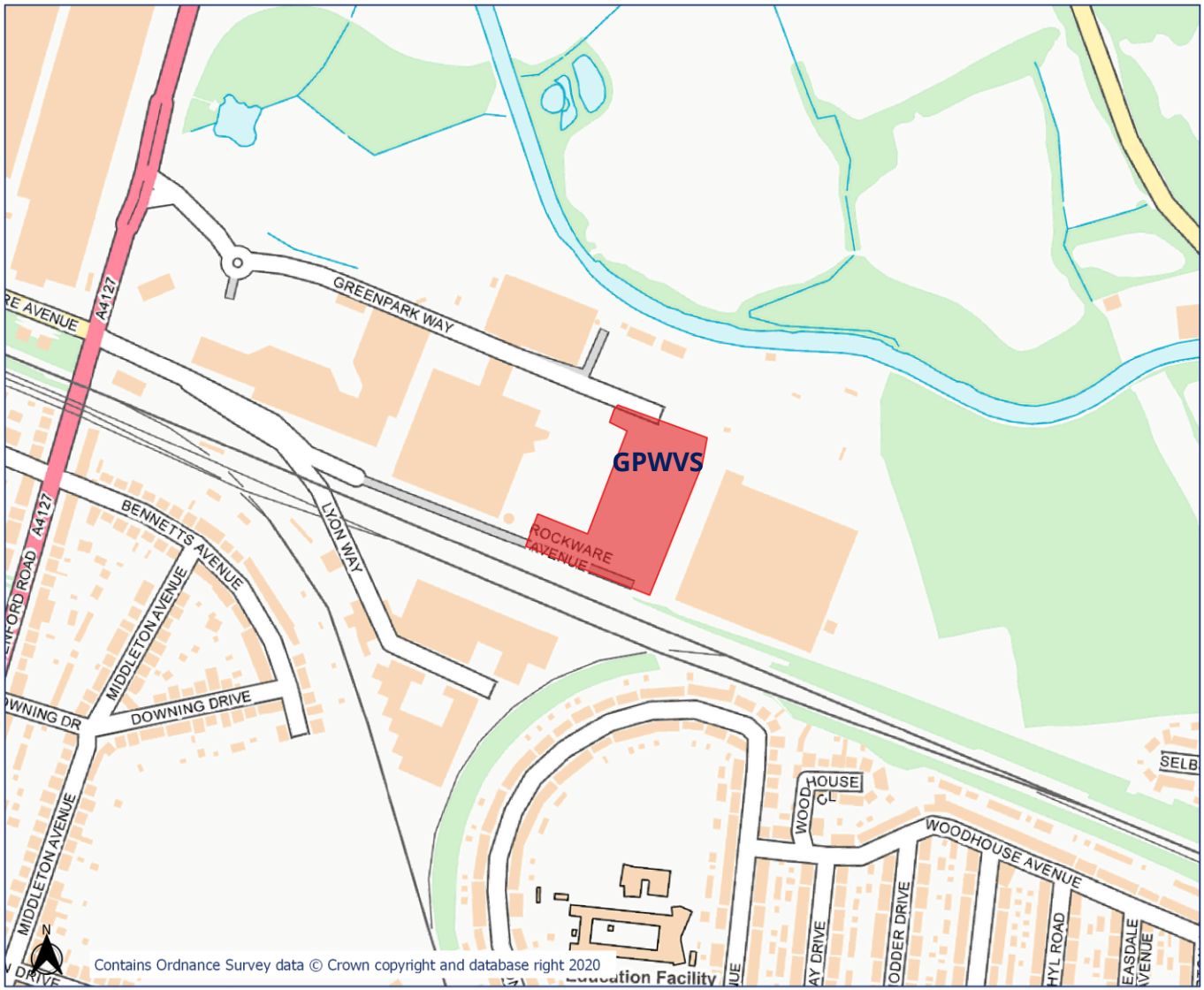
Worksite Identification Plan - Overview



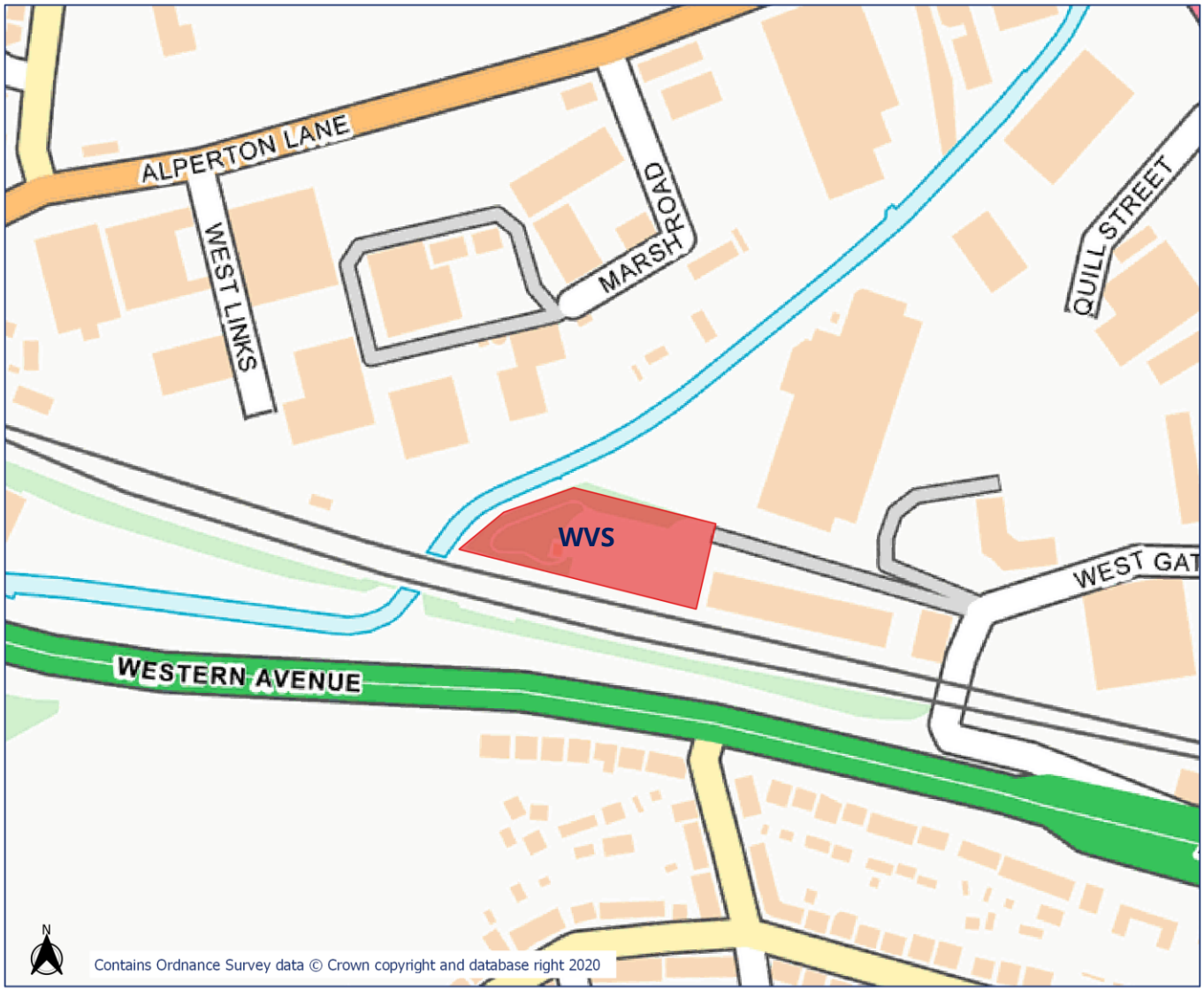
Worksite Identification Plan - 1



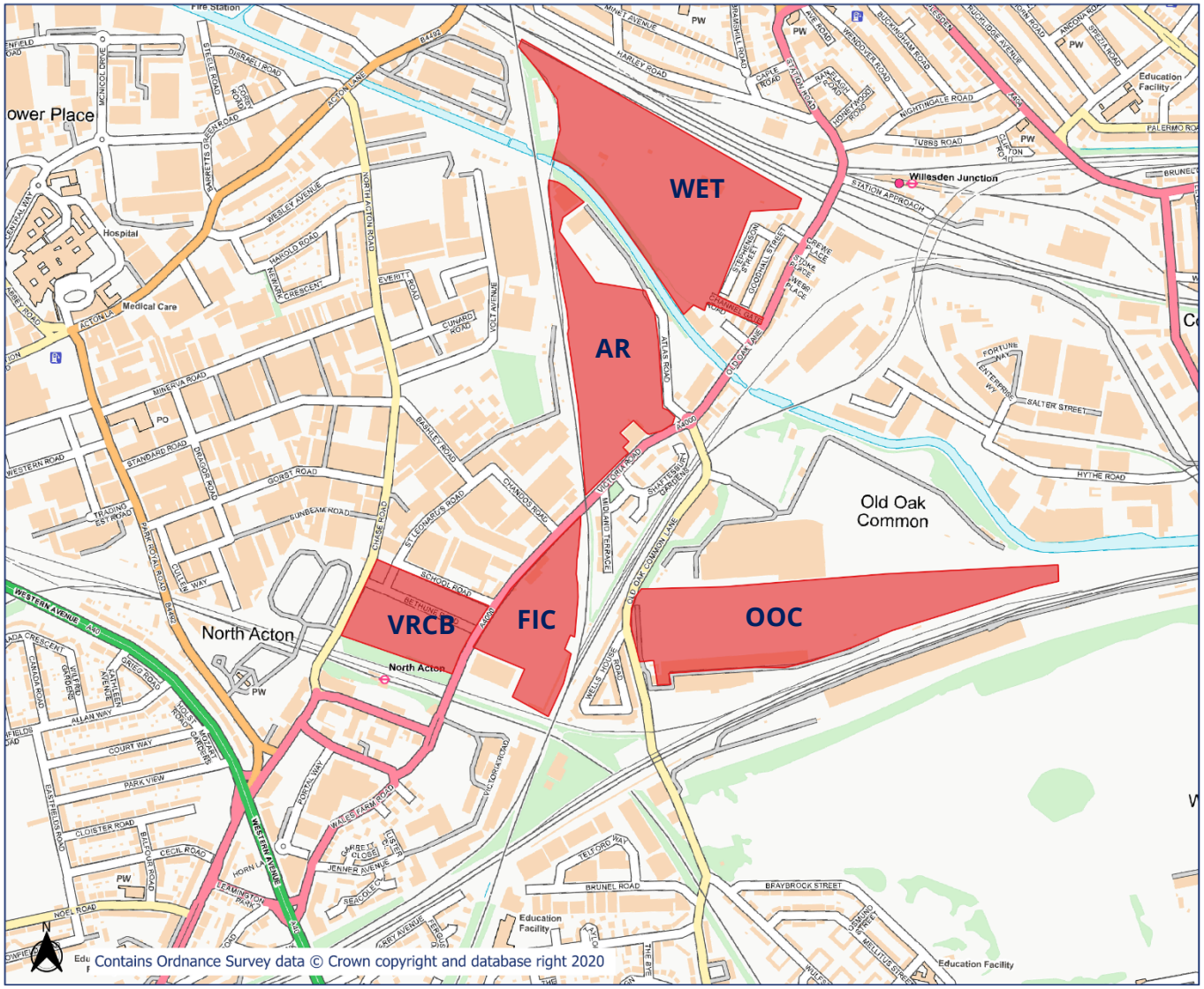
Worksite Identification Plan - 2



Worksite Identification Plan - 3

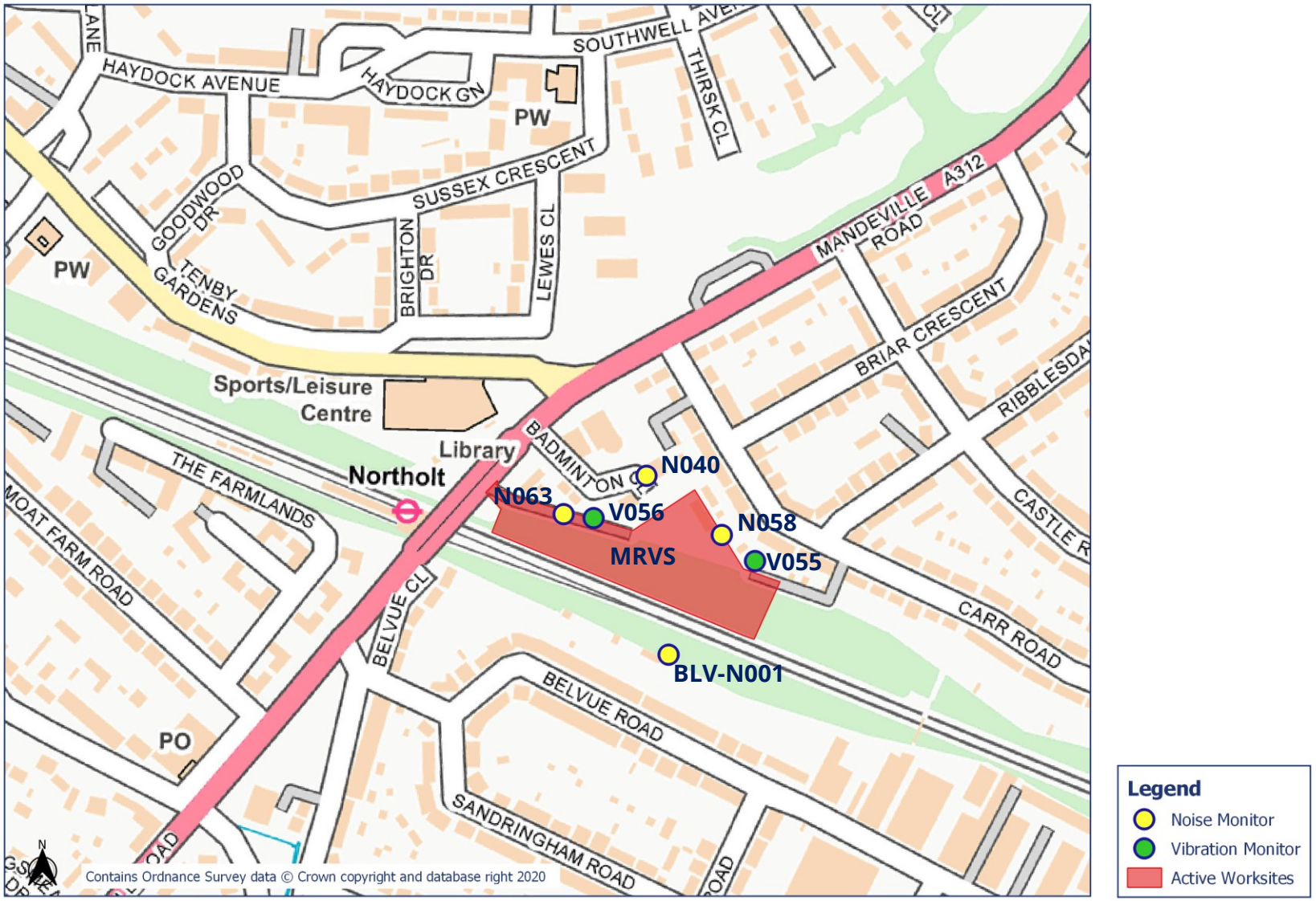


Worksite Identification Plan - 4

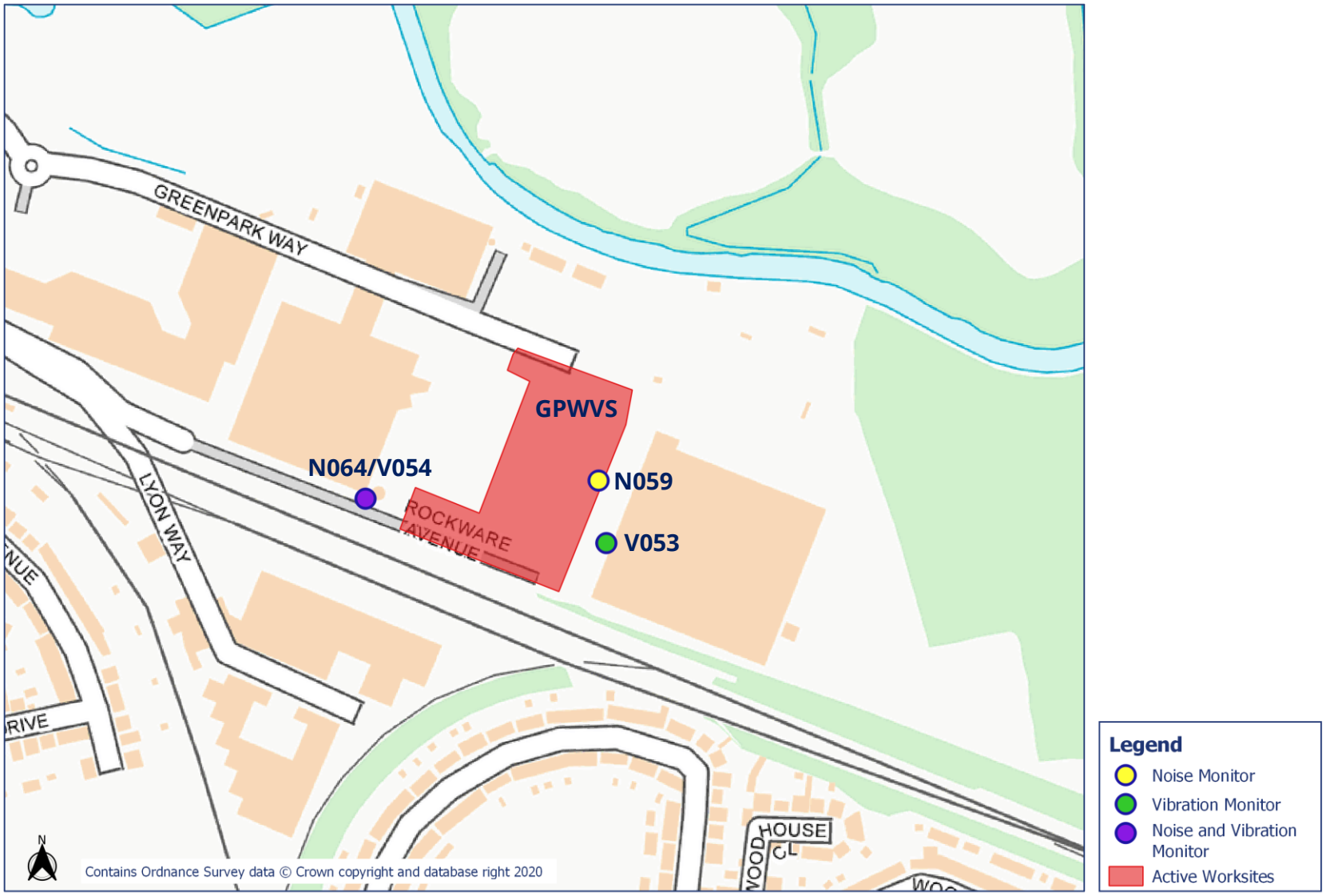


Appendix B Monitoring Locations

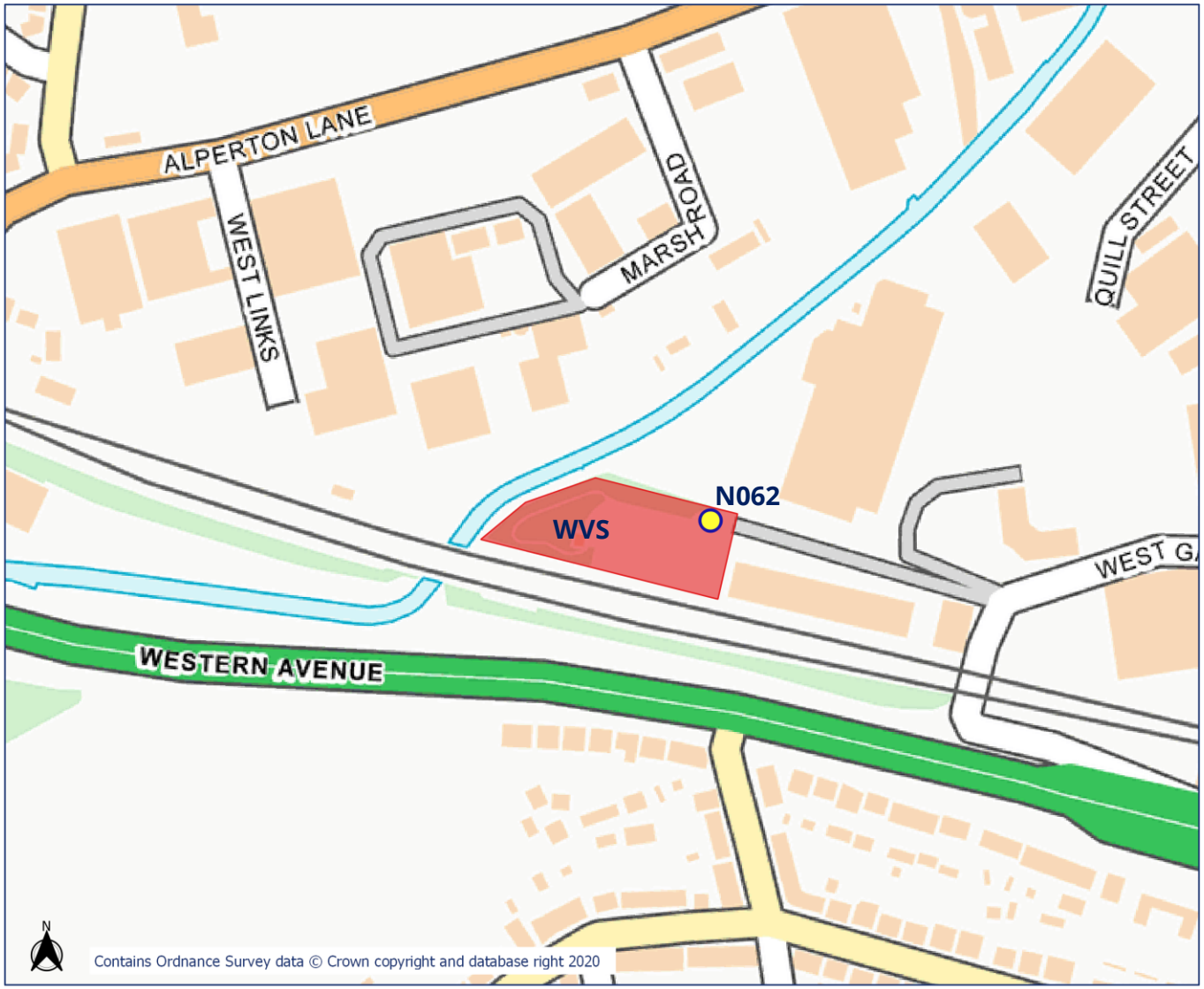
HS2 Noise and Vibration Monitoring Plan - 1



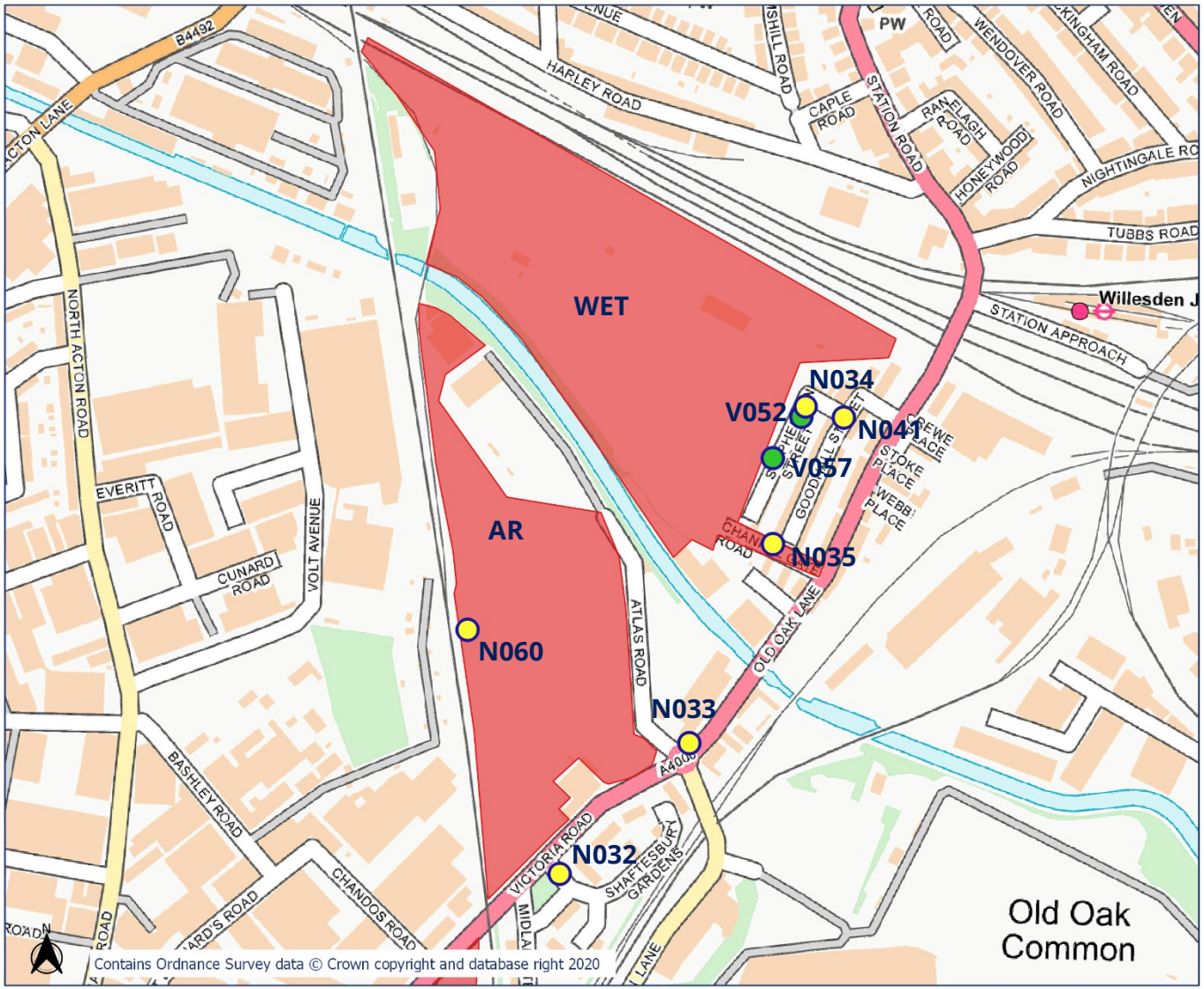
Noise and Vibration Monitoring Plan - 2



Noise and Vibration Monitoring Plan - 3



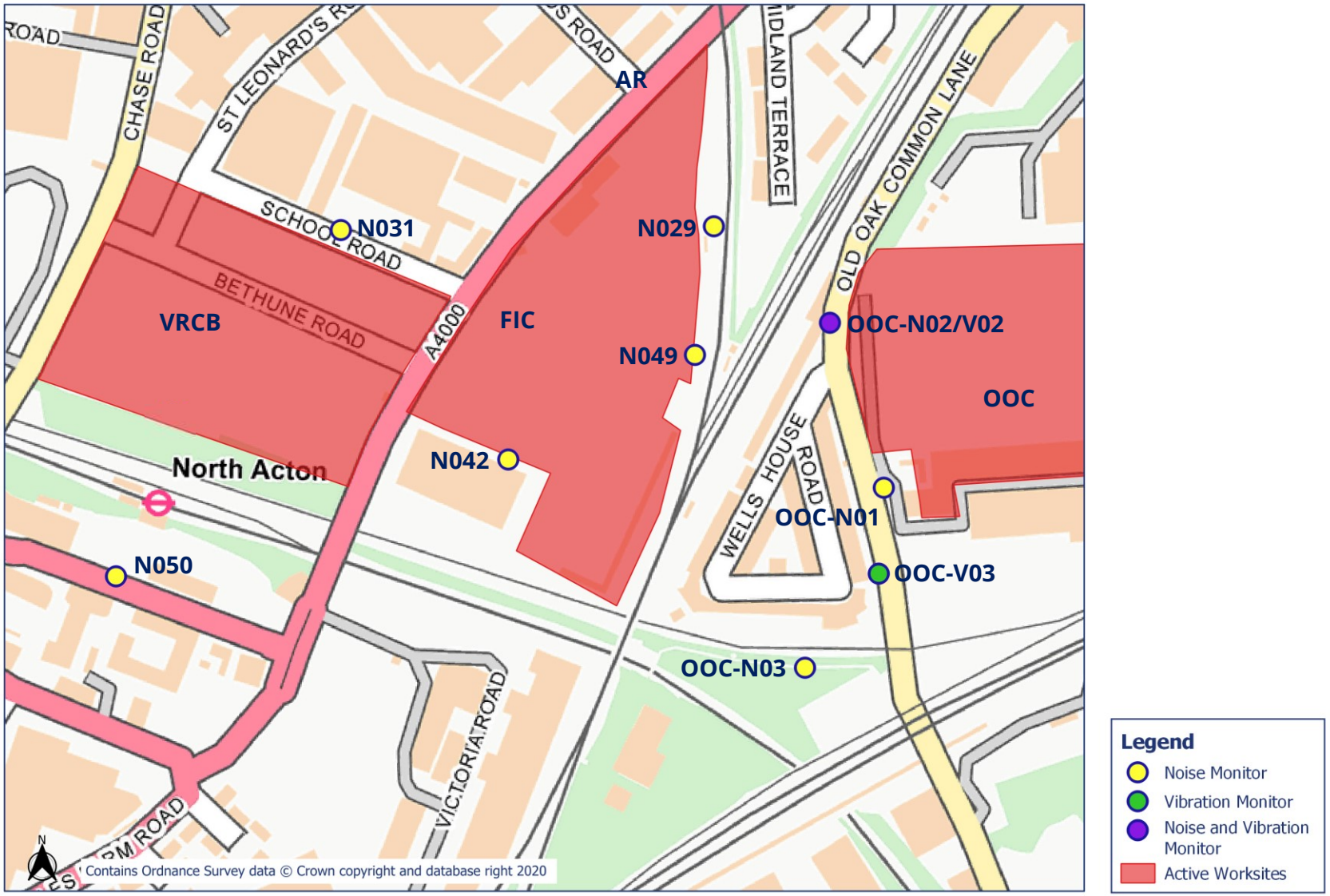
HS2 Noise and Vibration Monitoring Plan - 4



Legend

- Noise Monitor
- Vibration Monitor
- Active Worksites

Noise and Vibration Monitoring Plan - 5

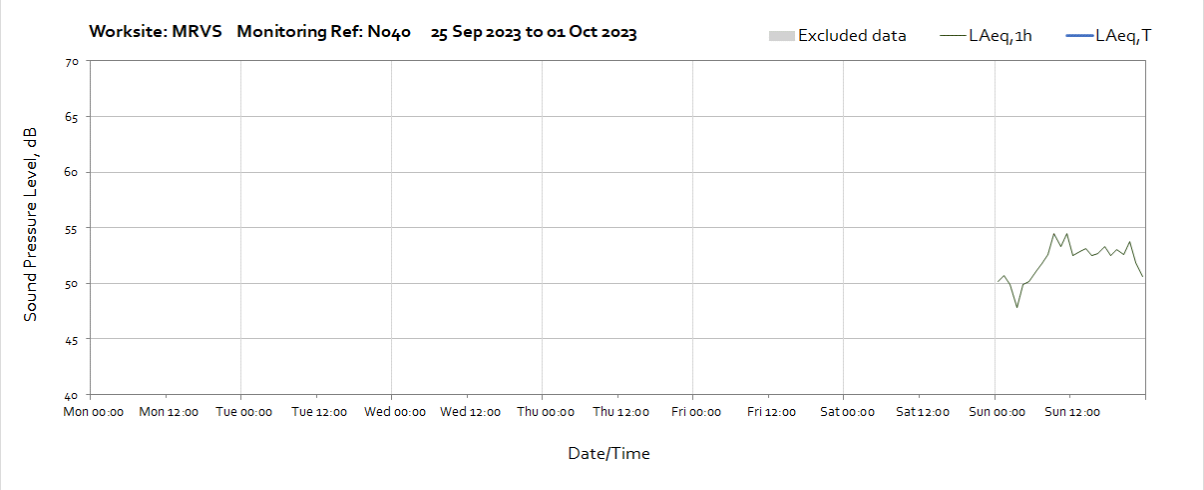


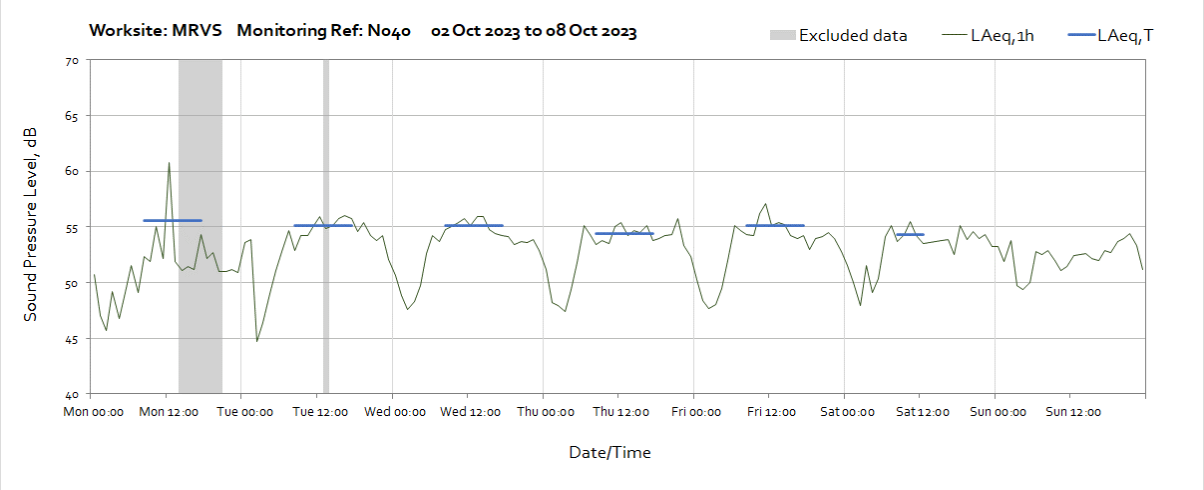
Appendix C Data

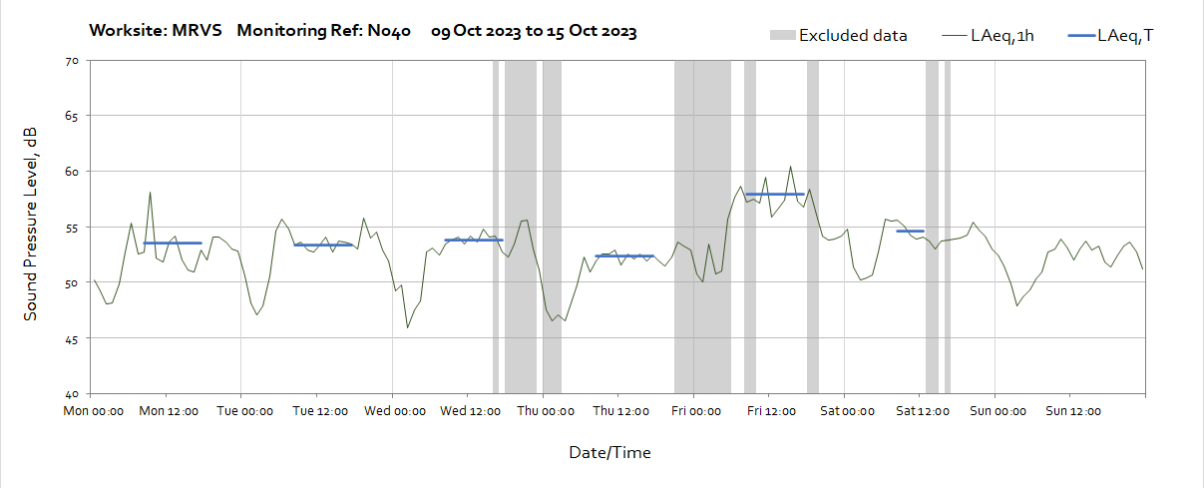
Noise

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 where noise levels are adversely affected by weather or only measured for part of the period, which are not representative of HS2 construction works, have been greyed out and excluded from the calculation of the $L_{Aeq,T}$ values in Table 3 of the main report.

Worksite: MRVS – Monitoring Ref: N040



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60
55
50
45
40
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
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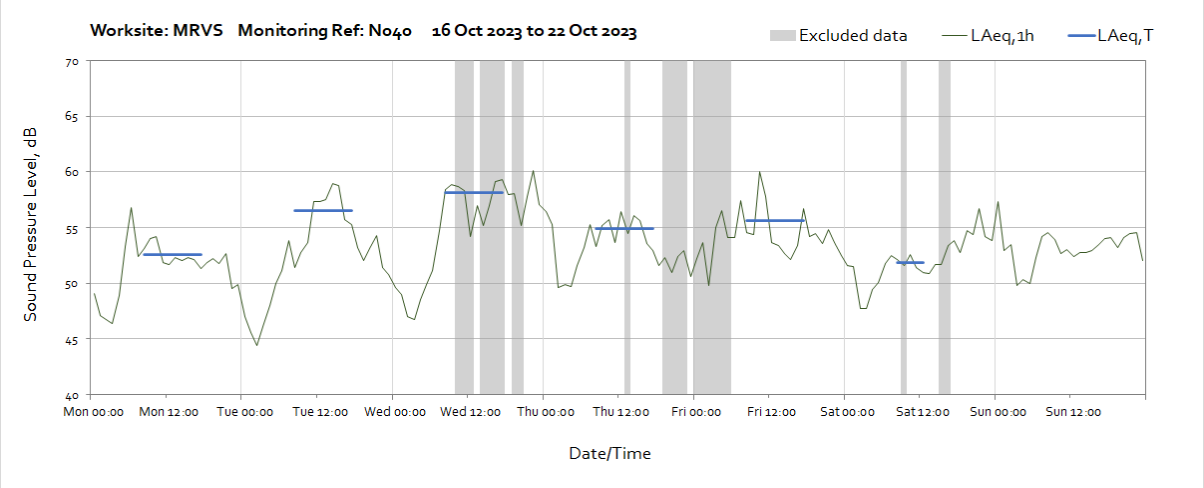
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time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Excluded data
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Sound Pressure Level, dB
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60
55
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Tue 00:00
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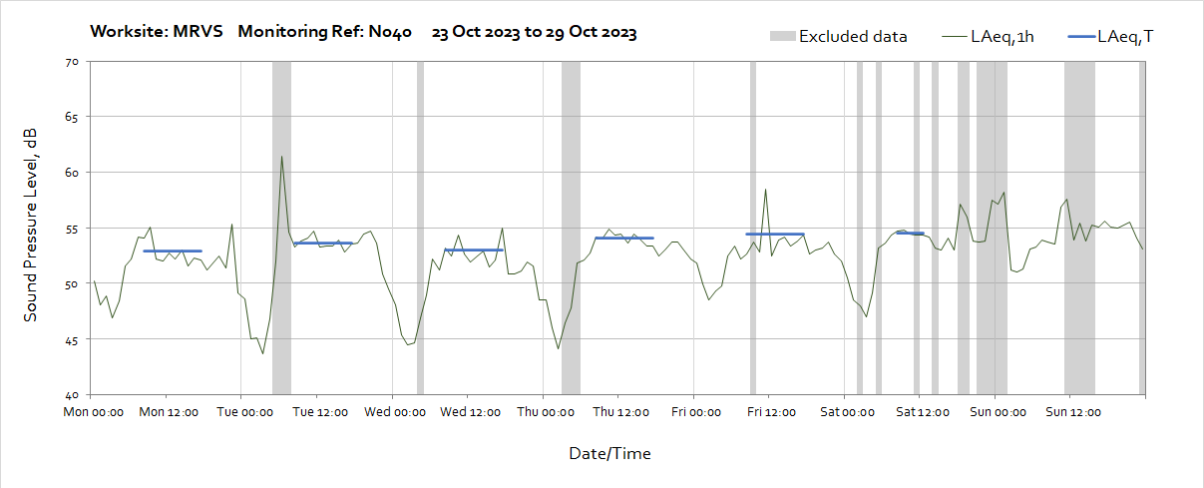
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LAeq,T
Sound Pressure Level, dB
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60
55
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Tue 12:00
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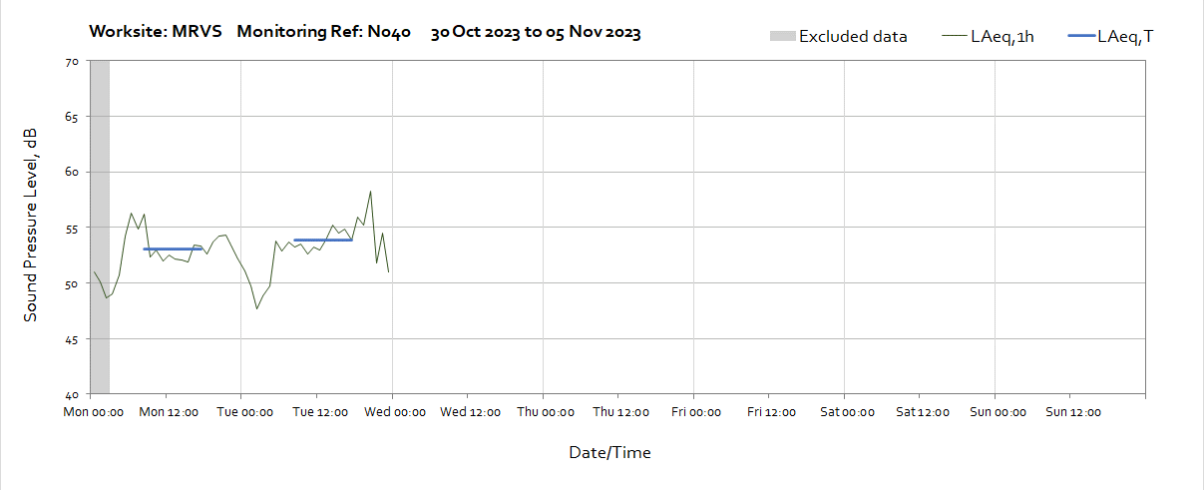
Date/Time



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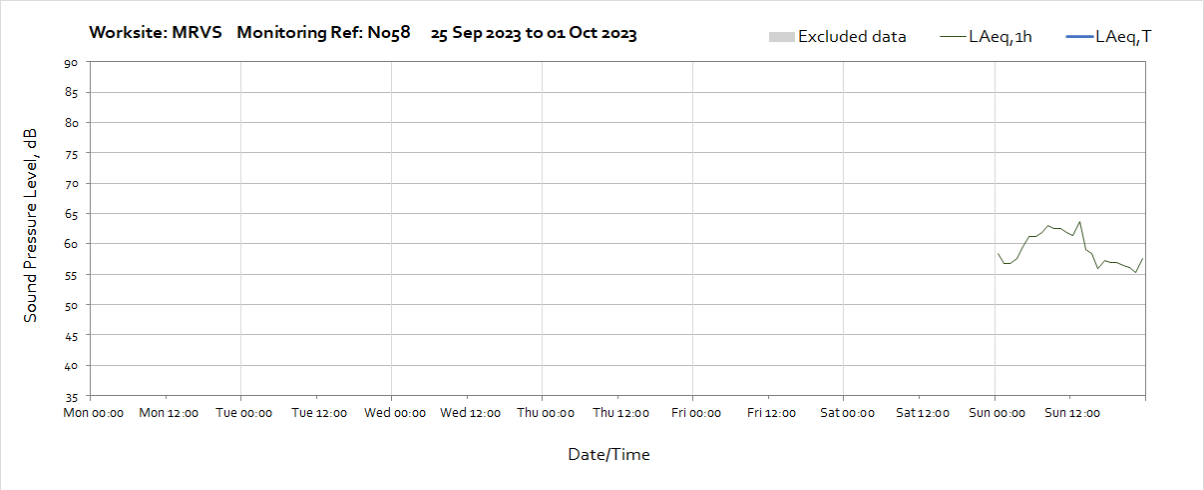
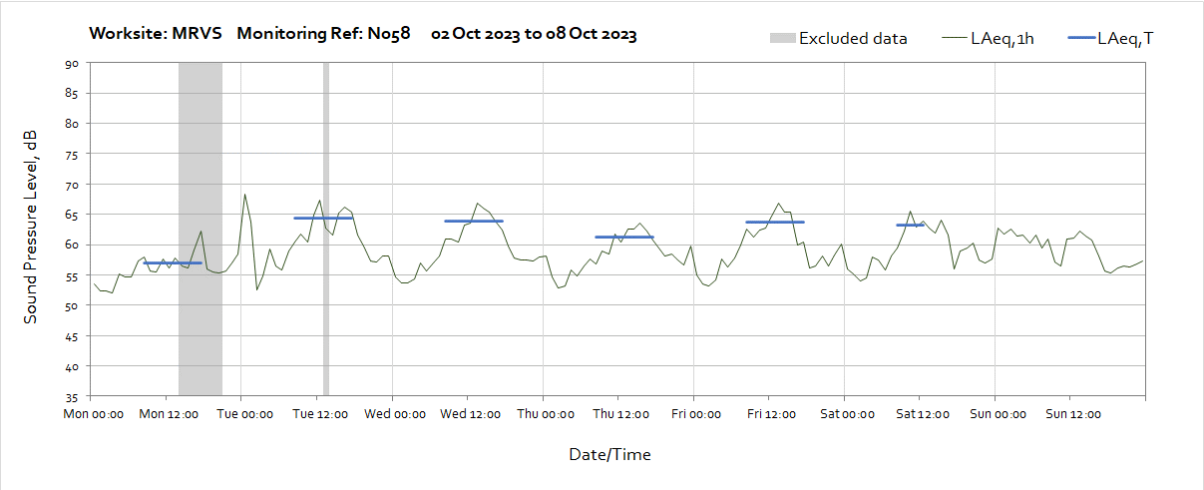
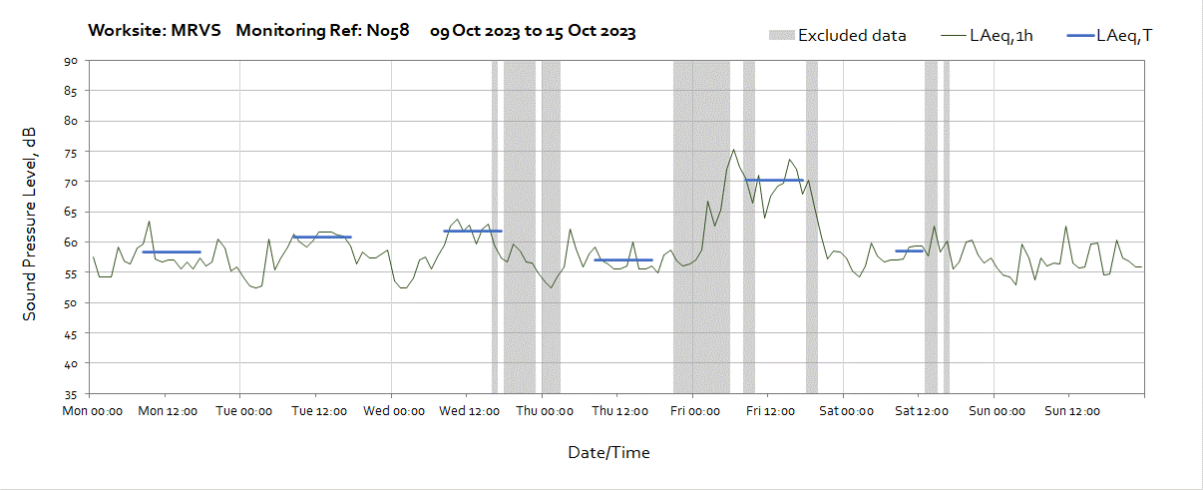
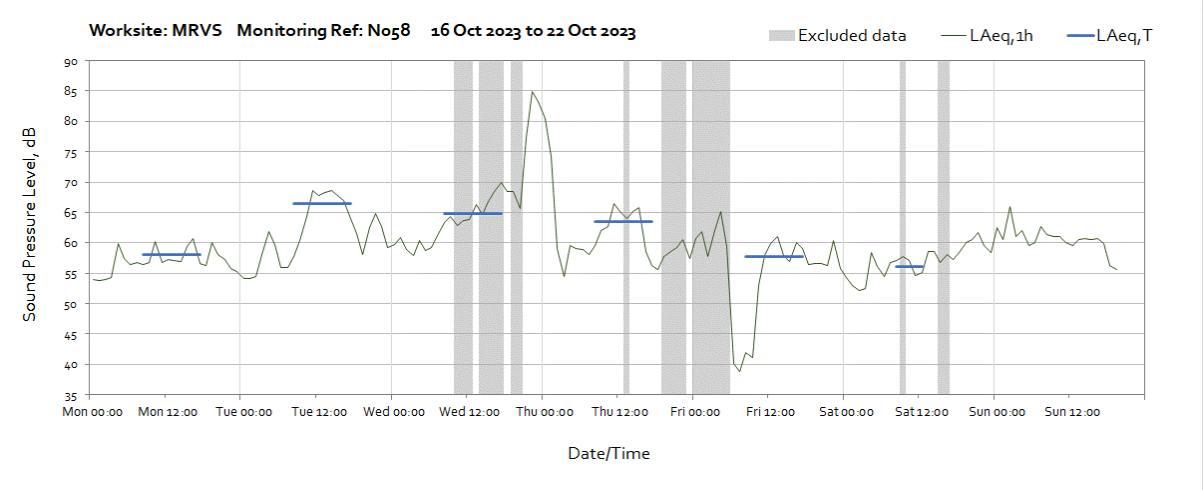
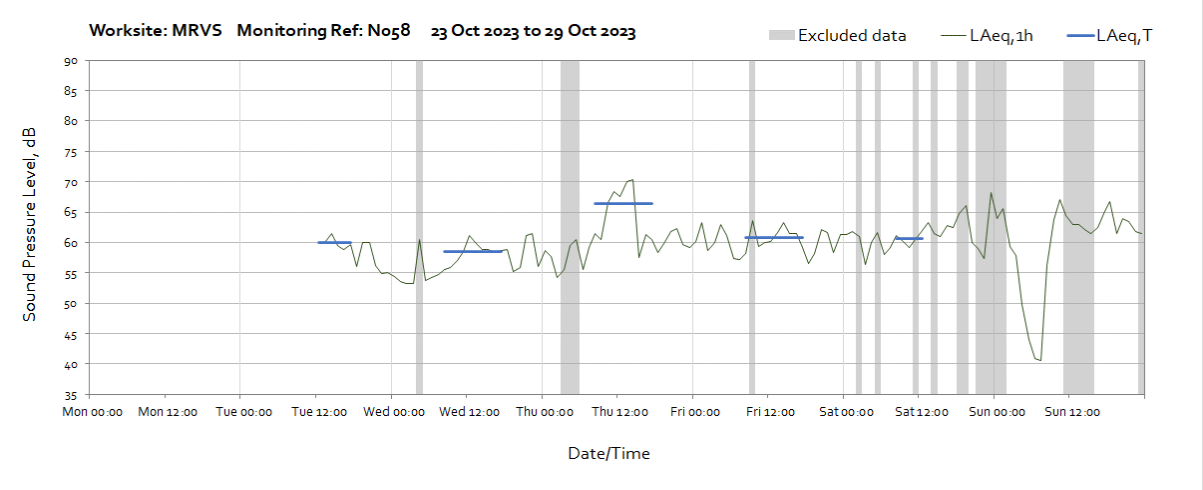




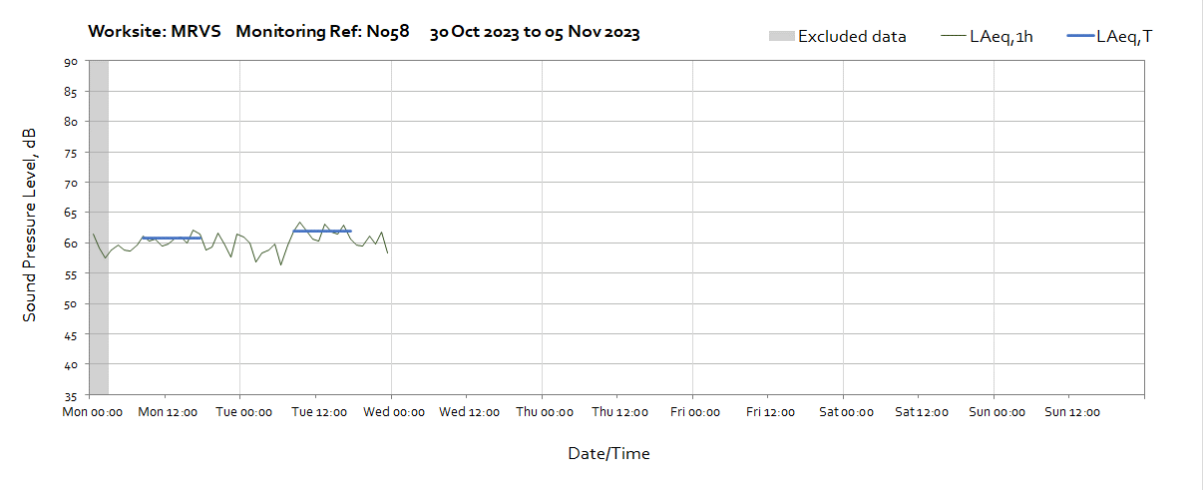




Note: Missing data between 20:00 on Sunday 22nd October and 12:00 on Tuesday 24th October were due to a memory card error.



Note: Missing data between 20:00 on Sunday 22nd October and 12:00 on Tuesday 24th October were due to a memory card error.



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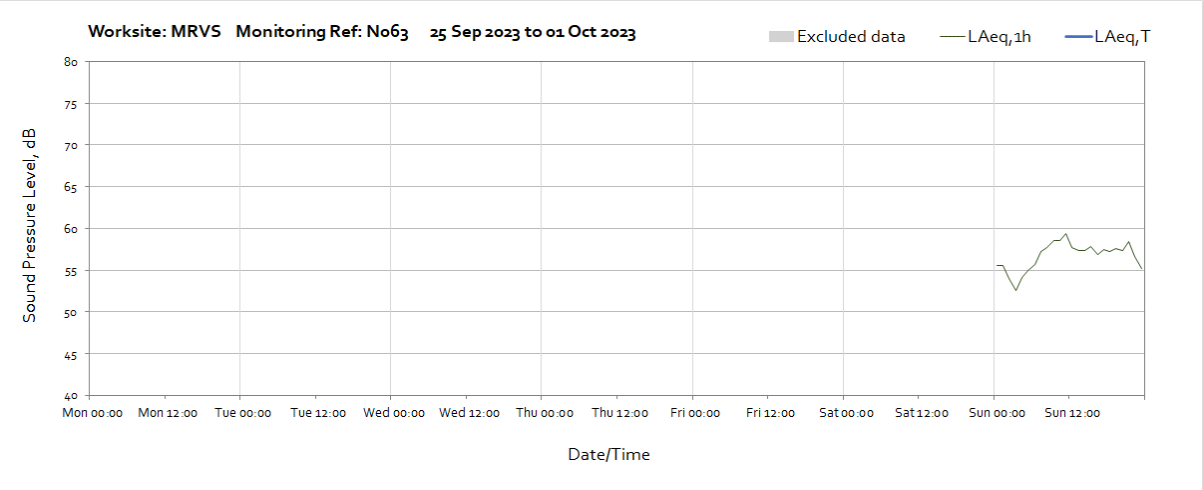

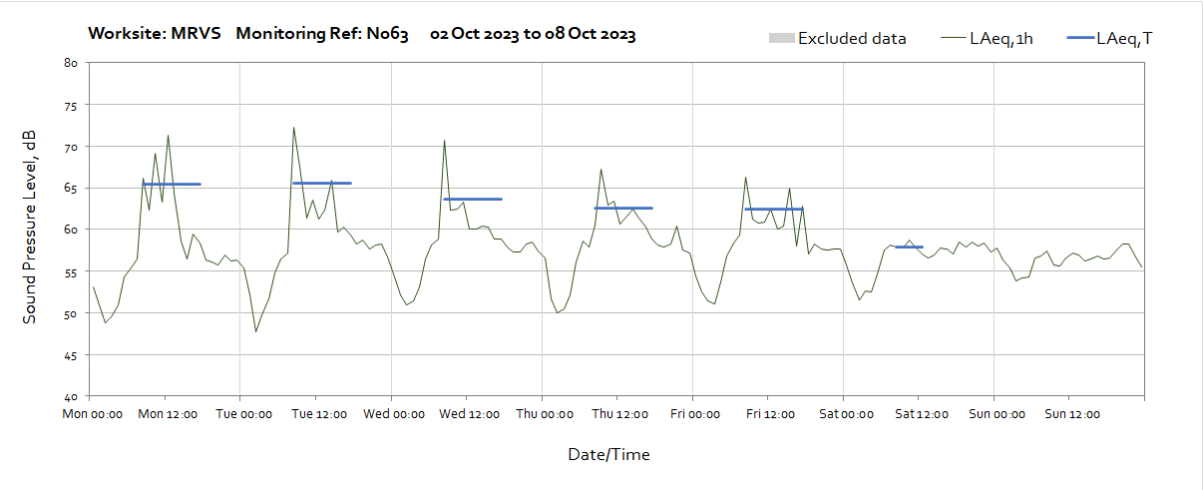

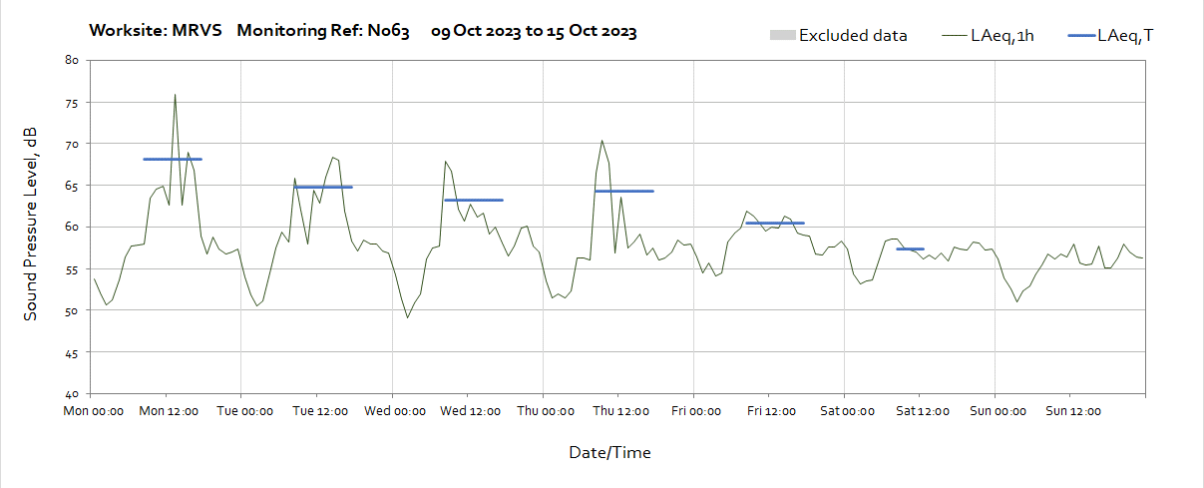
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Sound Pressure Level, dB
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70
65
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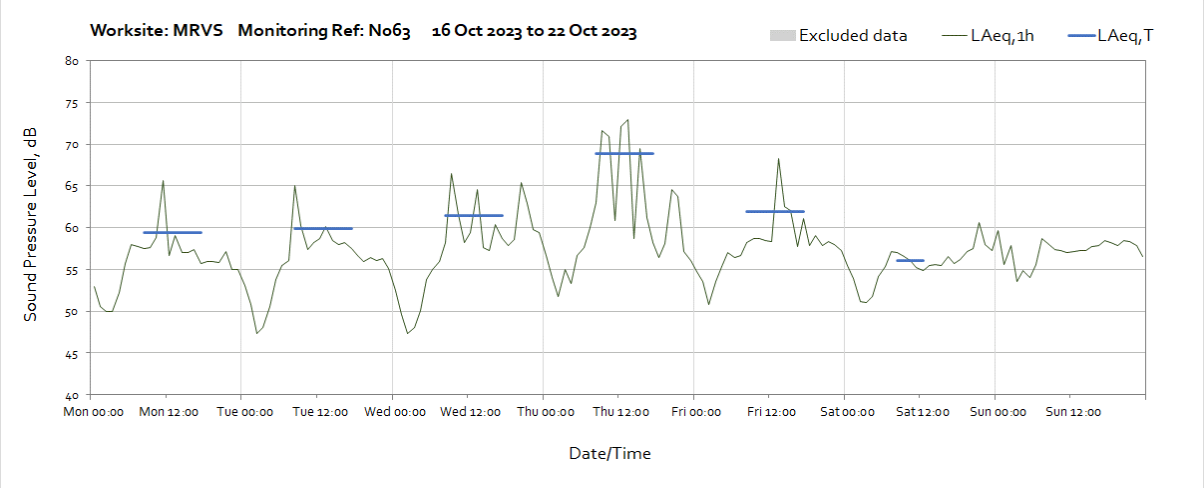
Sun 00:00
Sun 12:00
Date/Time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Excluded data
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LAeq,T
Sound Pressure Level, dB
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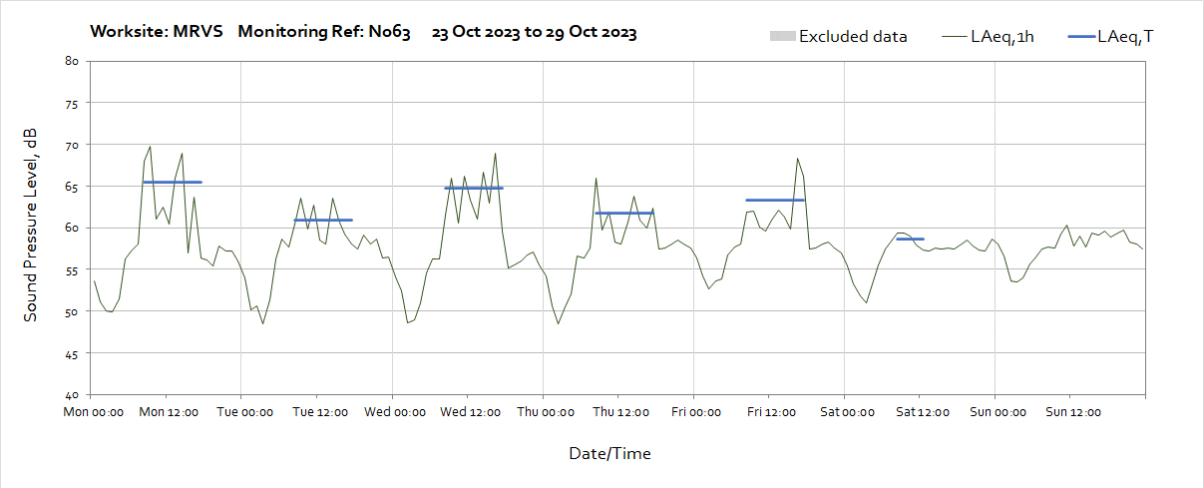
Date/Time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LAeq,T
Sound Pressure Level, dB
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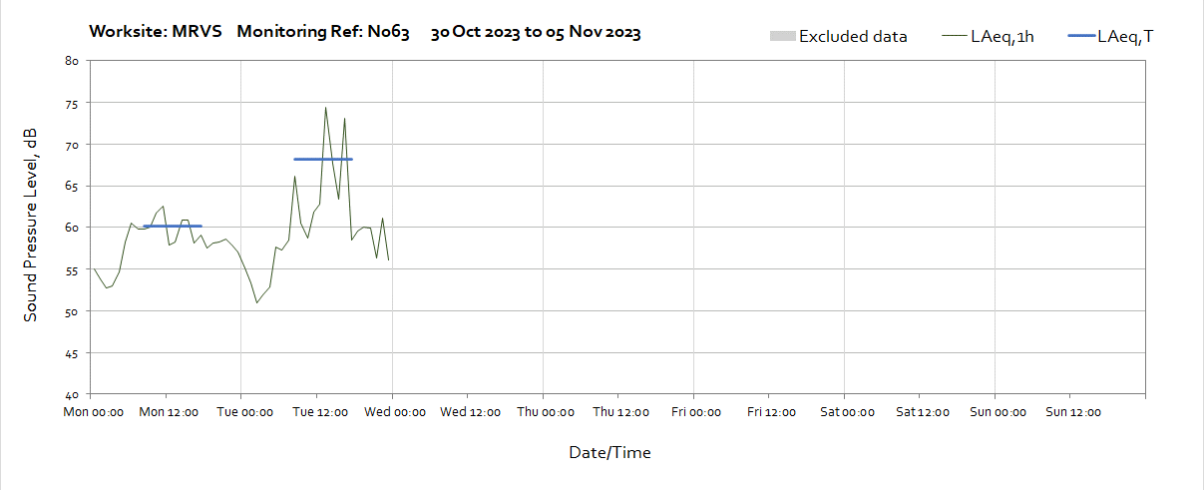

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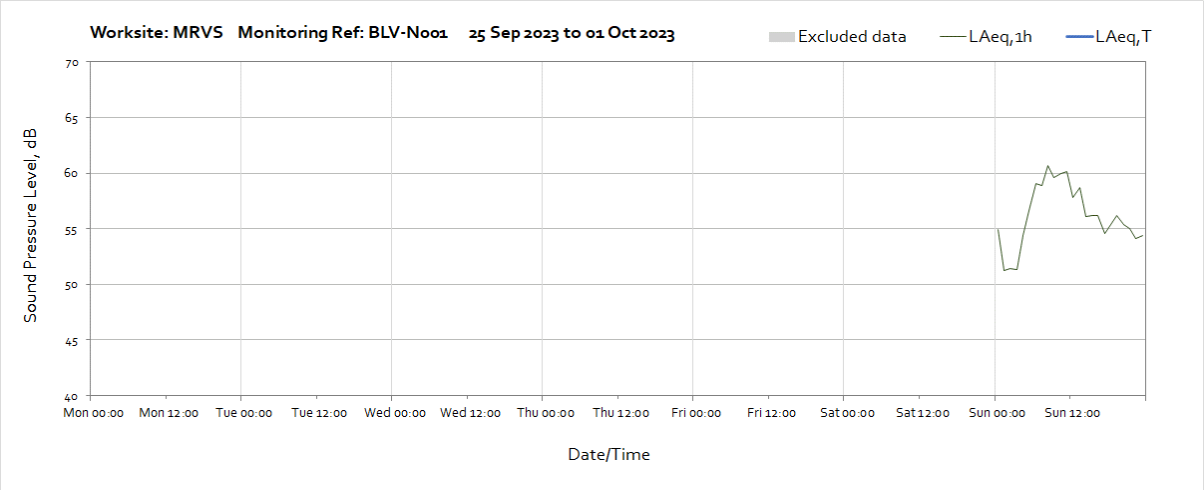

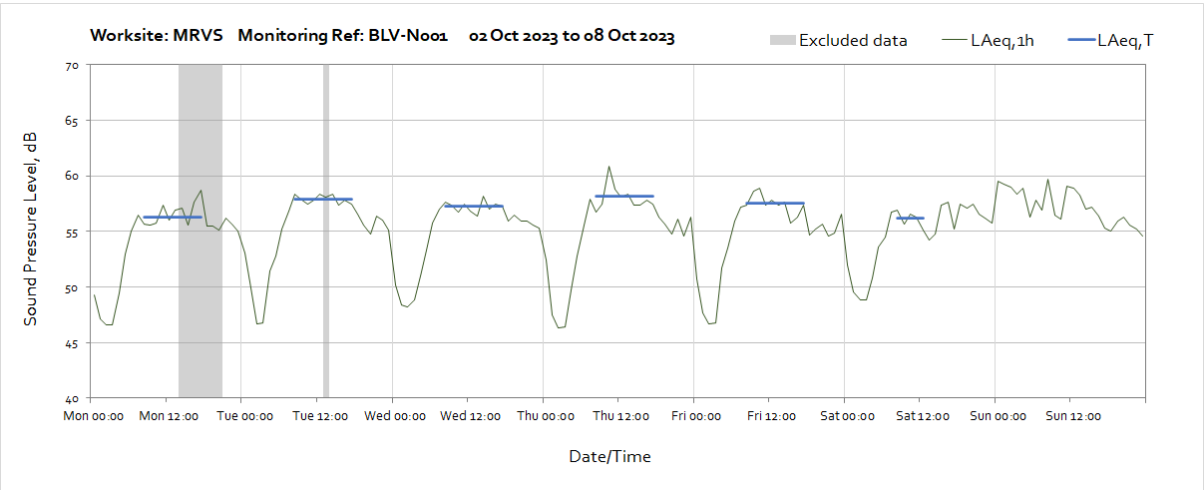

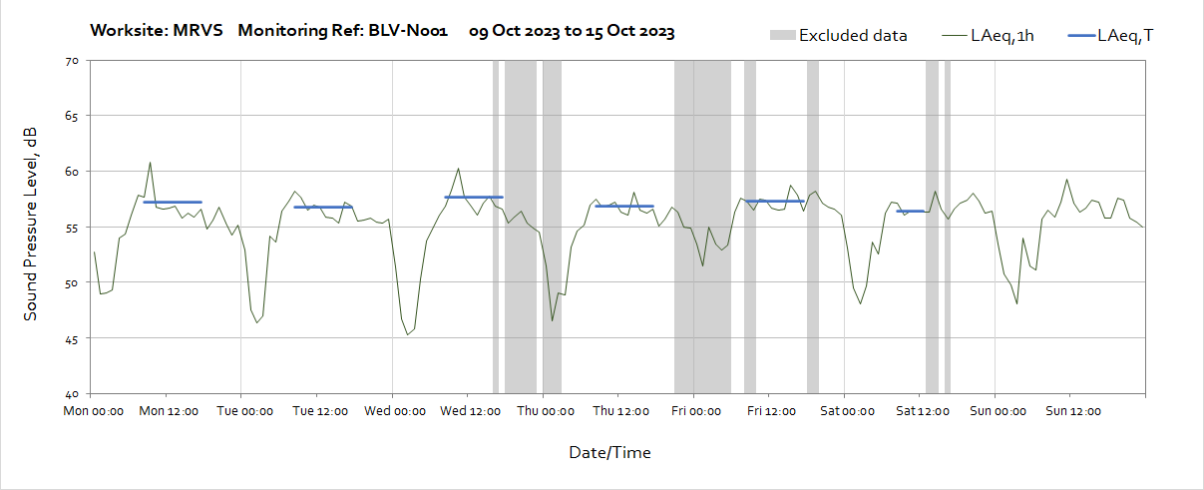
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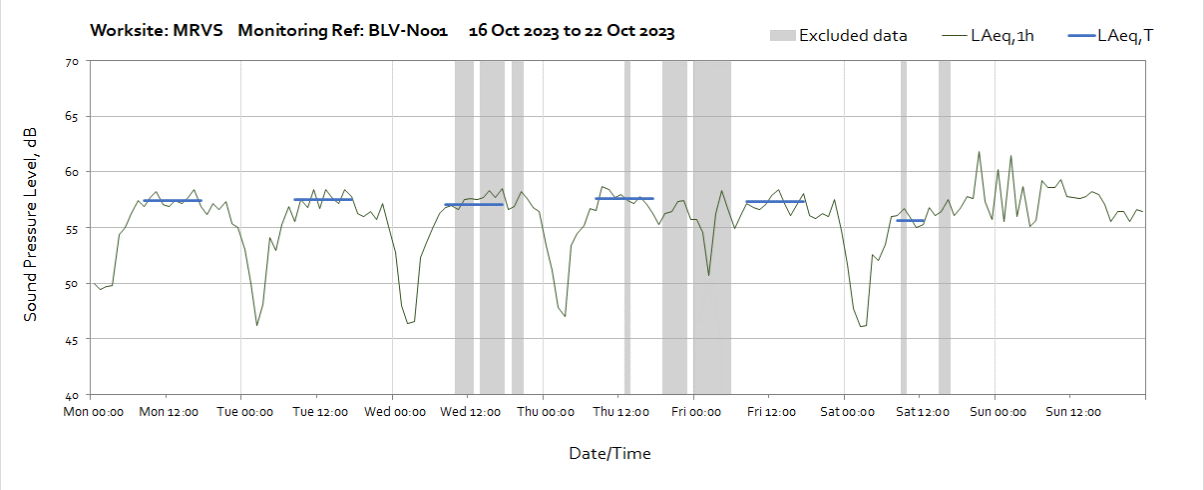
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Excluded data
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Sound Pressure Level, dB
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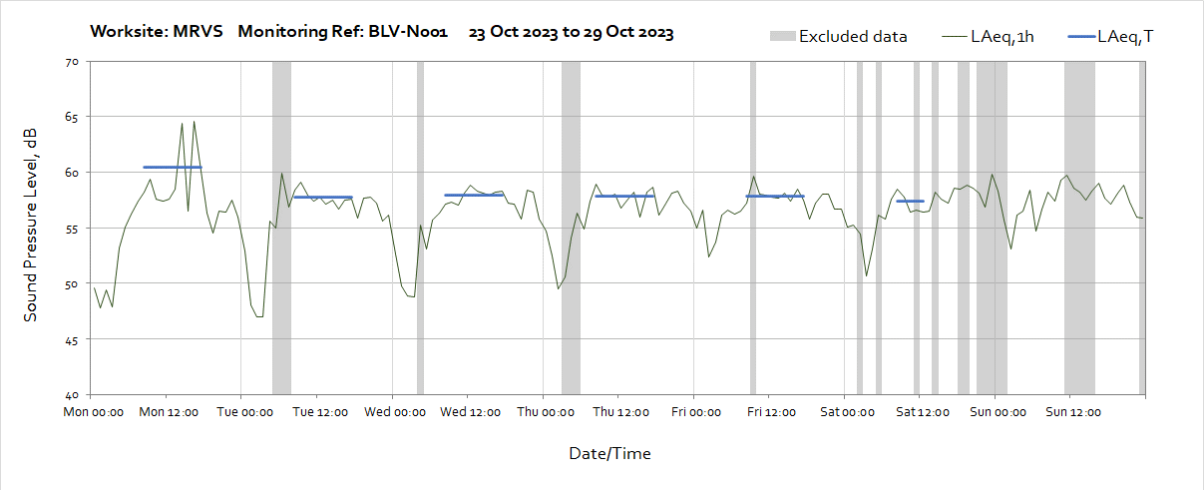
Date/Time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Excluded data
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LAeq,T
Sound Pressure Level, dB
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60
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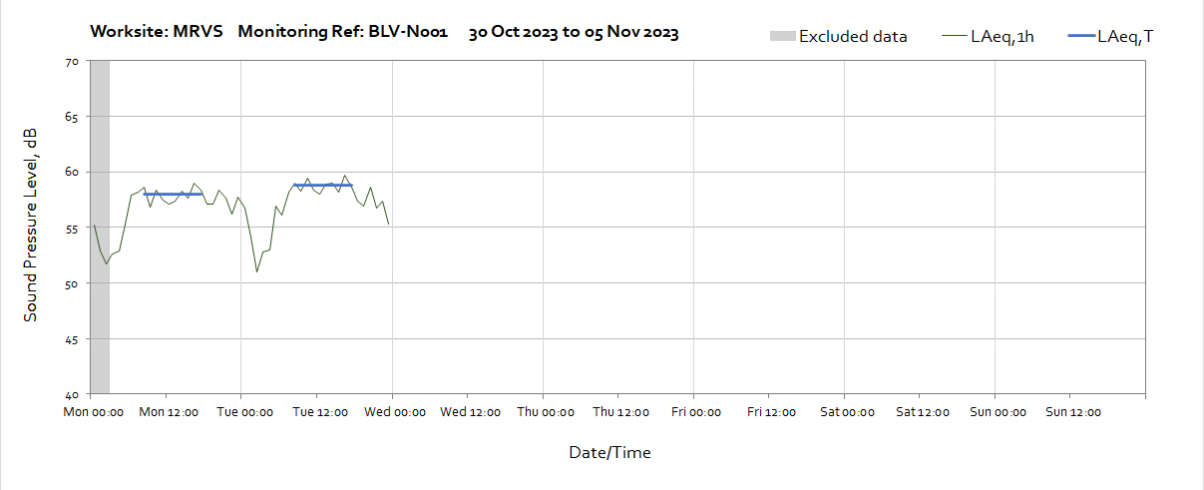
Date/Time



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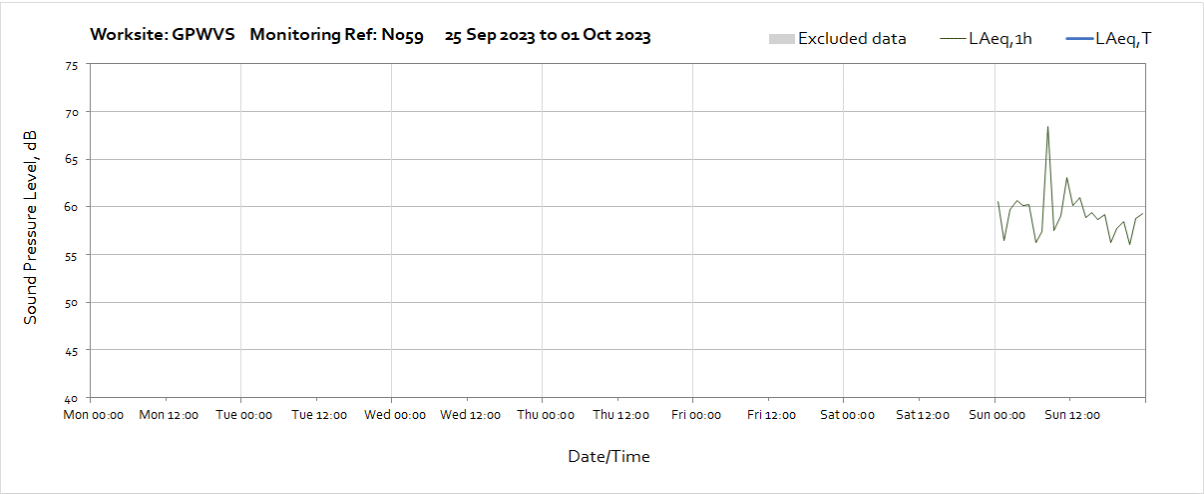

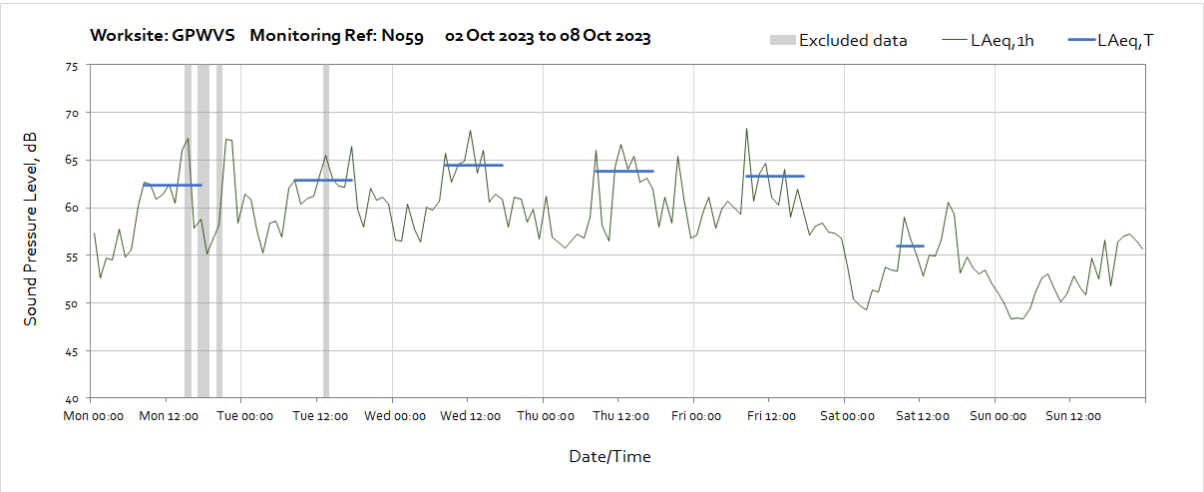

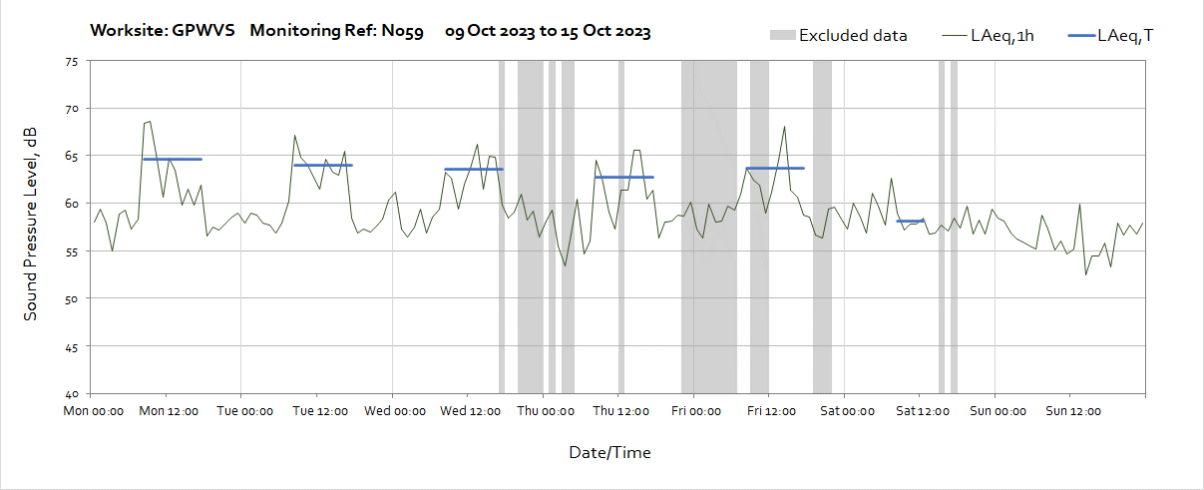
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LAeq,T
Sound Pressure Level, dB
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65
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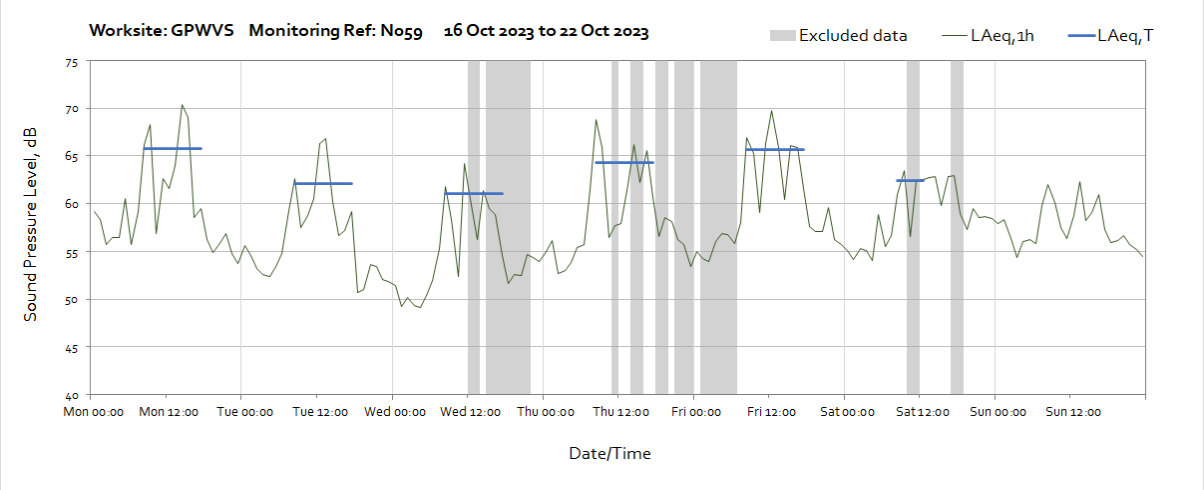
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time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LAeq,T
Sound Pressure Level, dB
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65
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Wed 00:00
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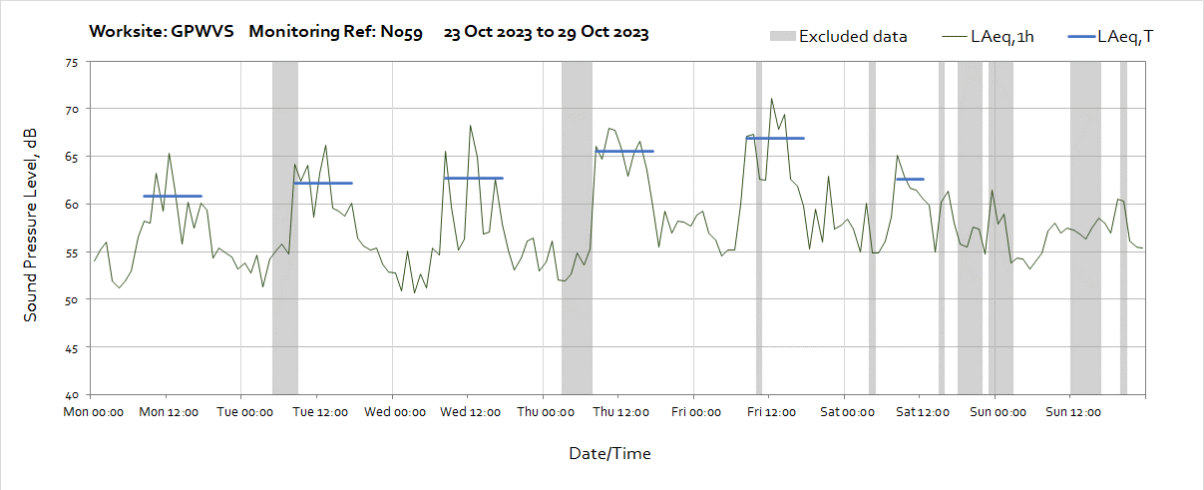
Date/Time


Worksite: GPWVS Monitoring Ref: No59 23 Oct 2023 to 29 Oct 2023
Excluded data
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LAeq,T
Sound Pressure Level, dB
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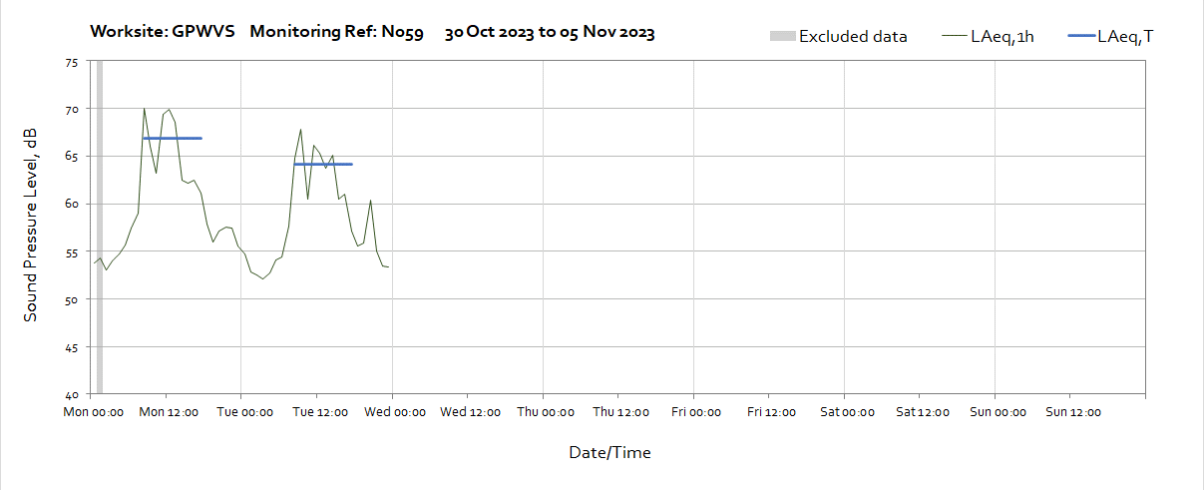
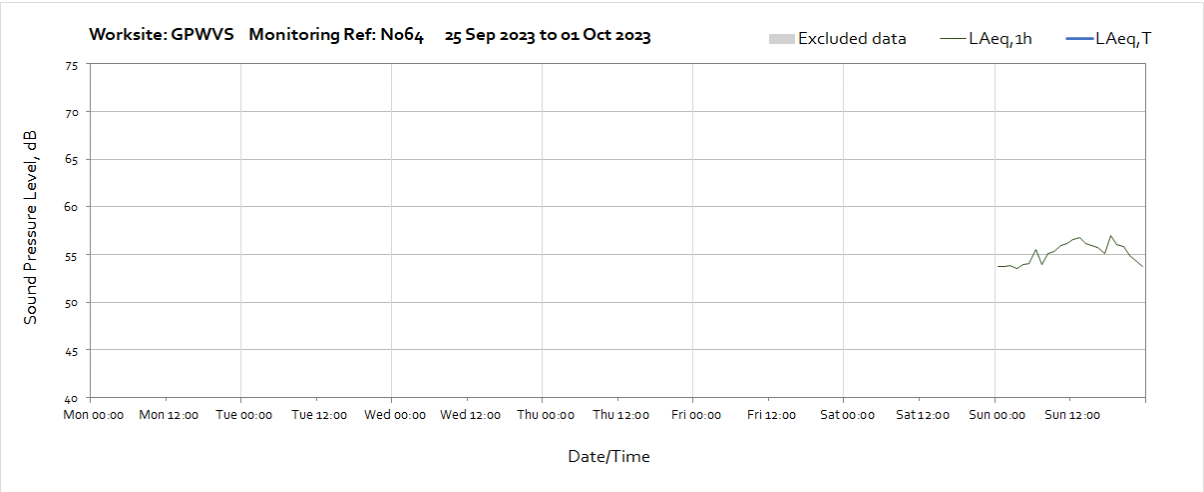
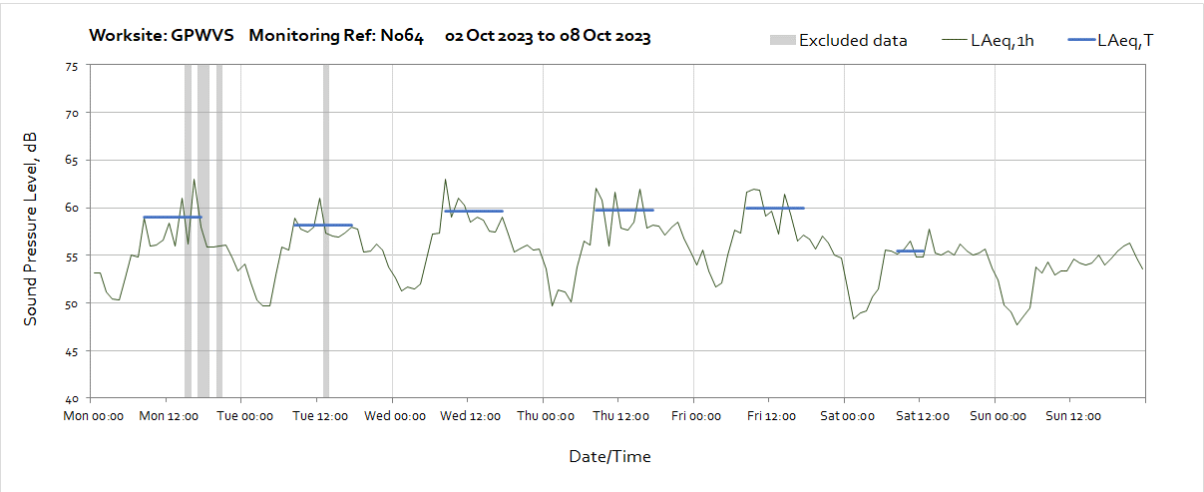
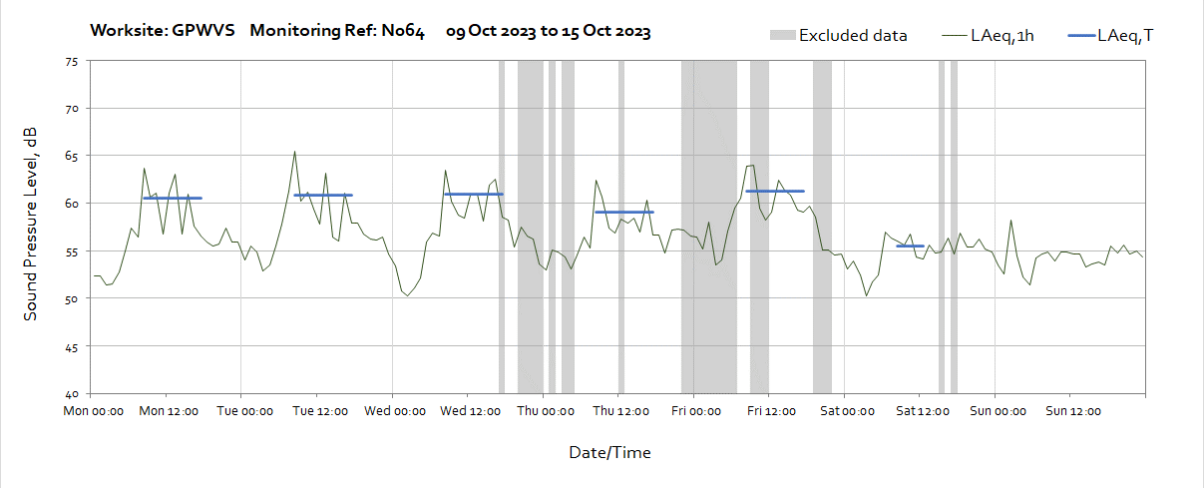
Date/Time



Worksite: GPWVS – Monitoring Ref: N064






Worksite: GPWVS Monitoring Ref: No64 09 Oct 2023 to 15 Oct 2023
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
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Mon 00:00
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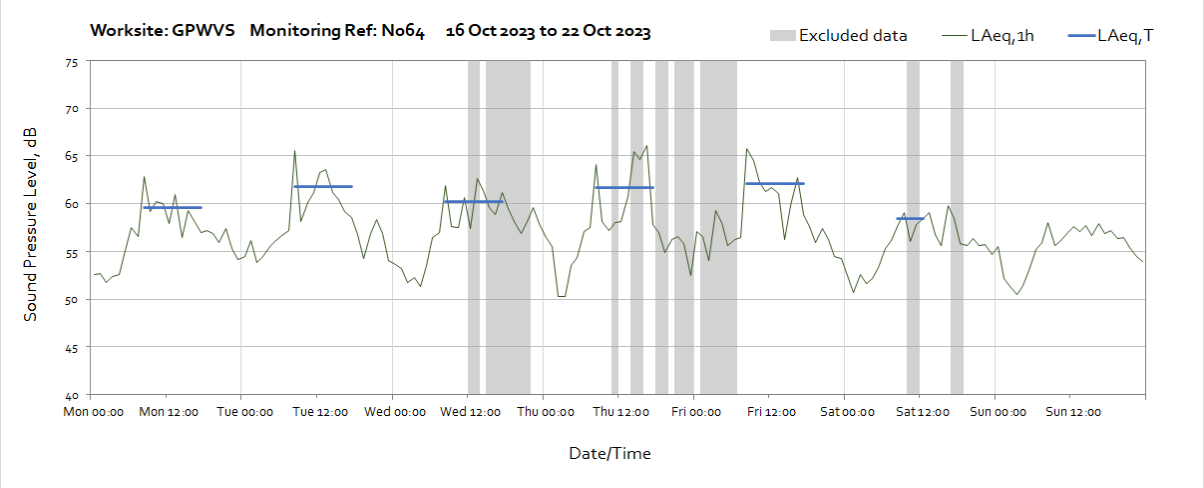
Date/Time


Worksite: GPWVS Monitoring Ref: No64 16 Oct 2023 to 22 Oct 2023
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
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Mon 00:00
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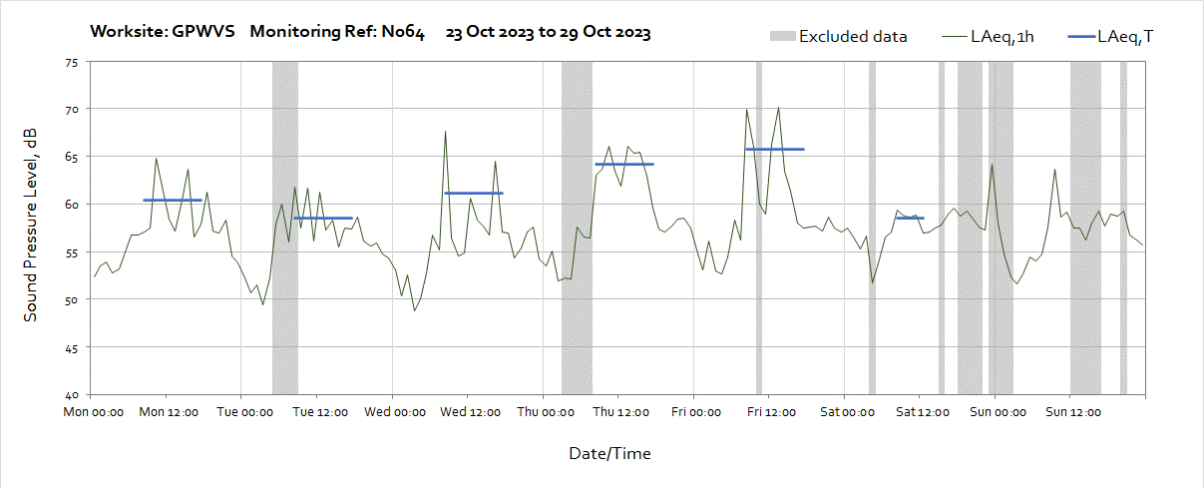
Date/Time


Worksite: GPWVS Monitoring Ref: No64 23 Oct 2023 to 29 Oct 2023
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
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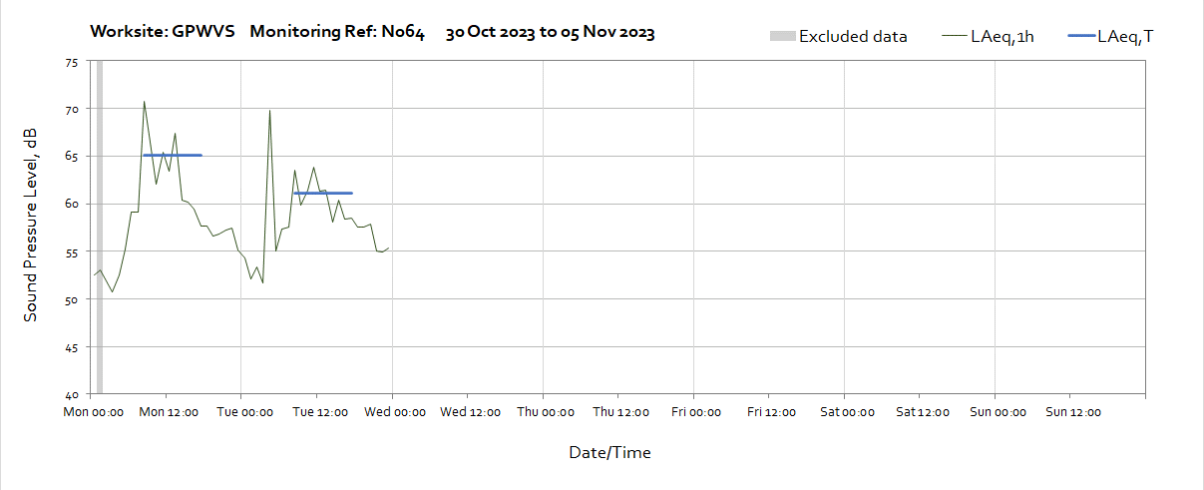
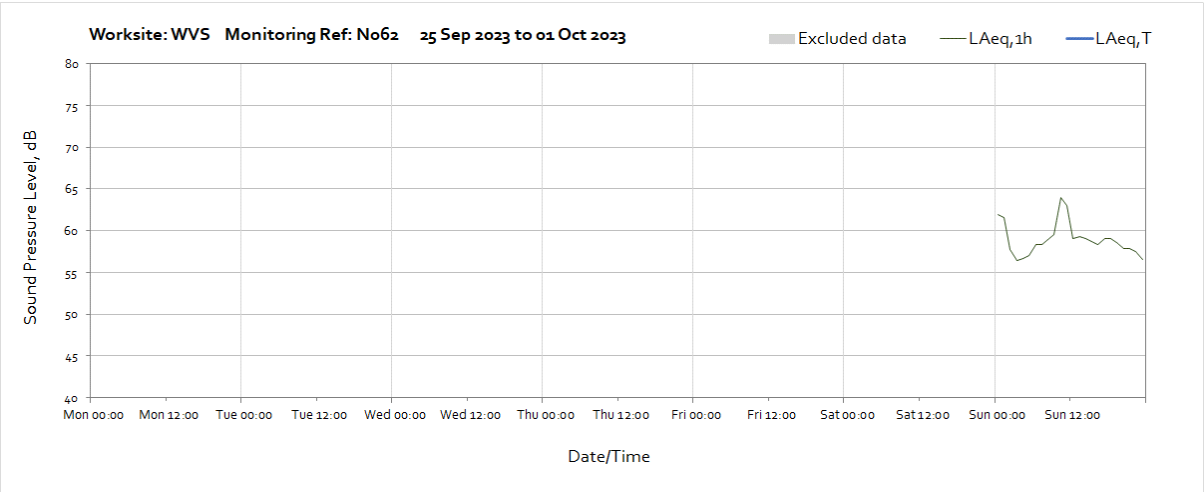
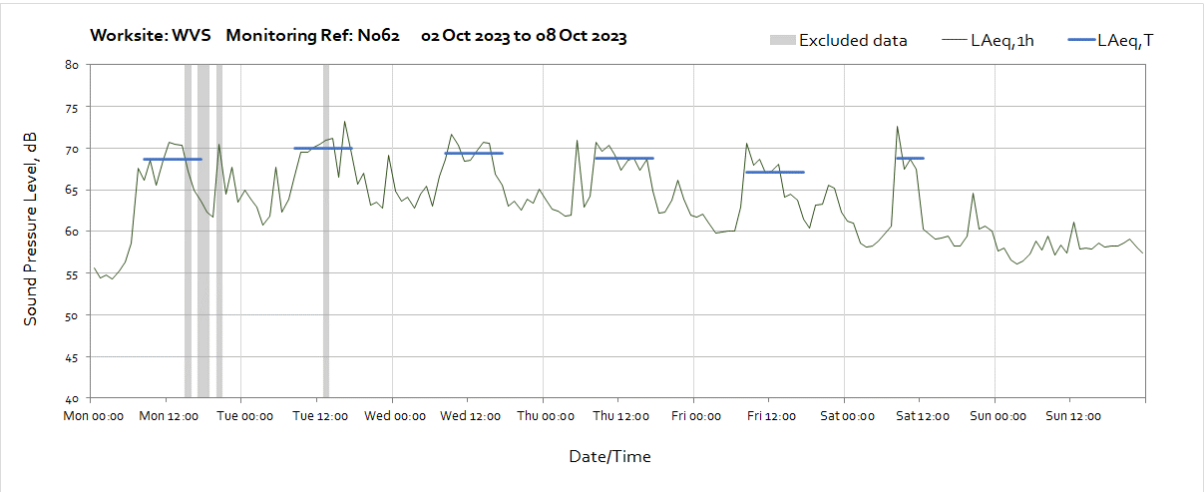
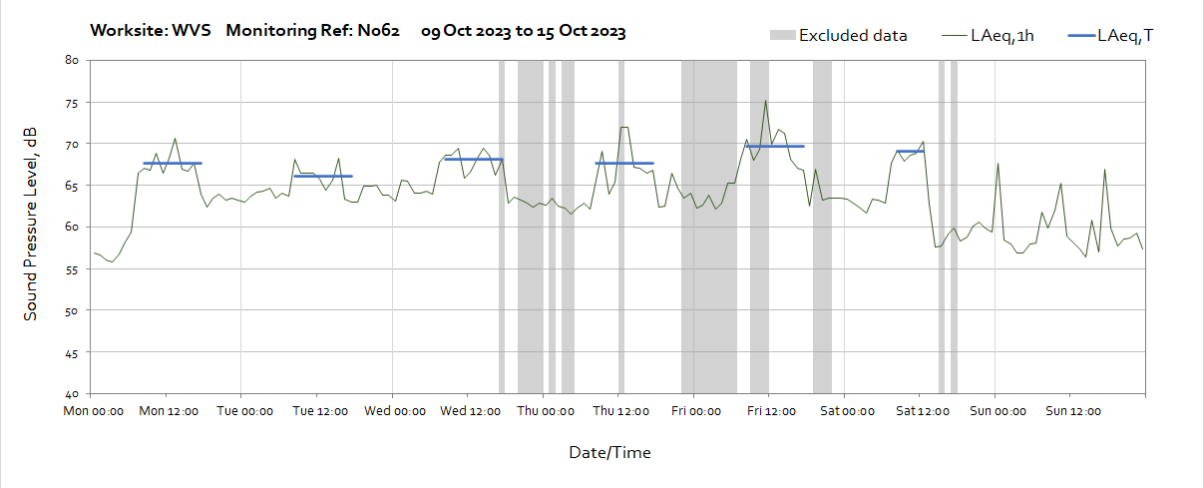
Date/Time



Worksite: WVS – Monitoring Ref: N062






Worksite: WVS Monitoring Ref: No62 09 Oct 2023 to 15 Oct 2023
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
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Mon 00:00
Mon 12:00
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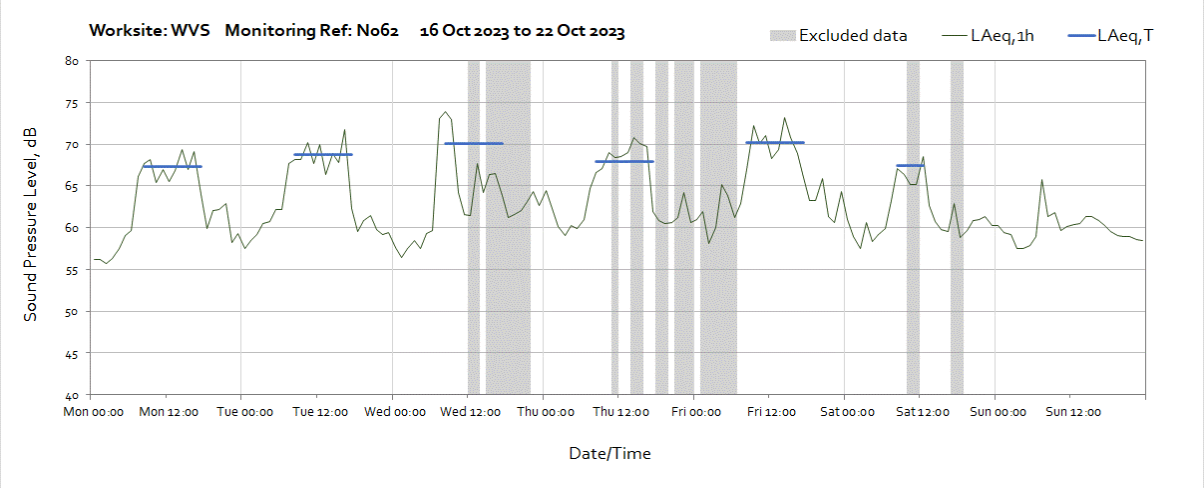
Date/Time


Worksite: WVS Monitoring Ref: No62 16 Oct 2023 to 22 Oct 2023
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
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Mon 00:00
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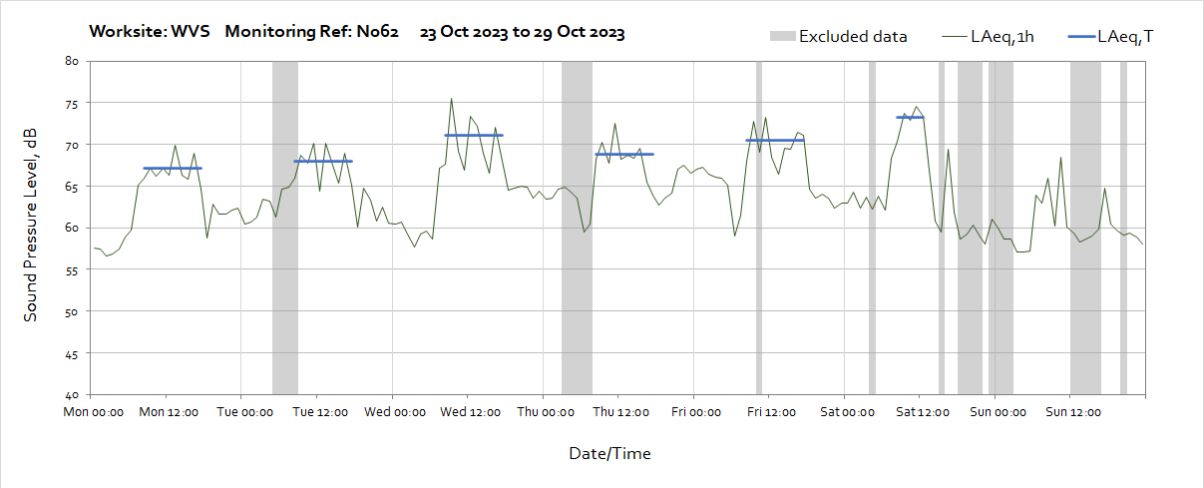
Date/Time


Worksite: WVS Monitoring Ref: No62 23 Oct 2023 to 29 Oct 2023
Excluded data
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LAeq,T
Sound Pressure Level, dB
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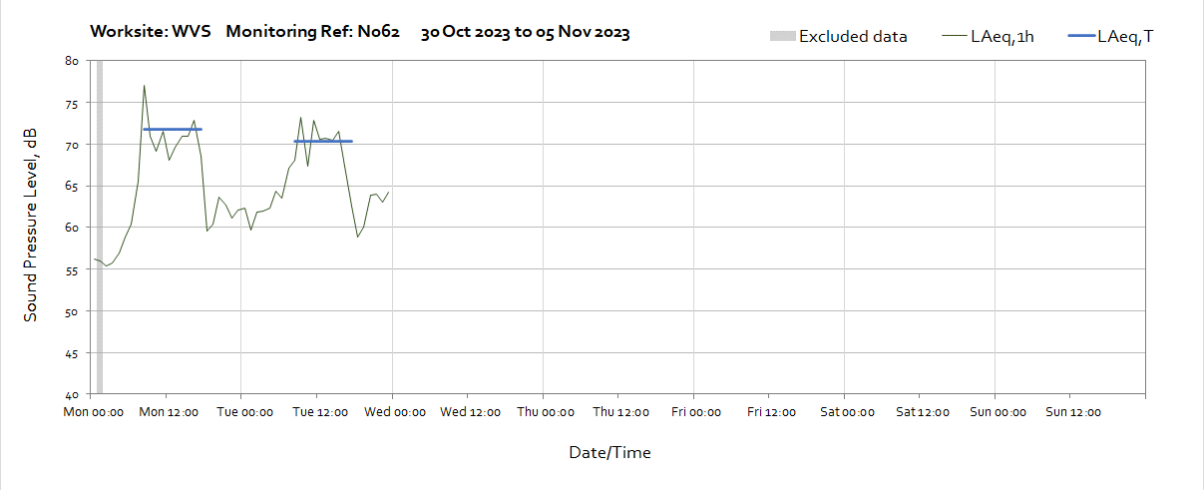
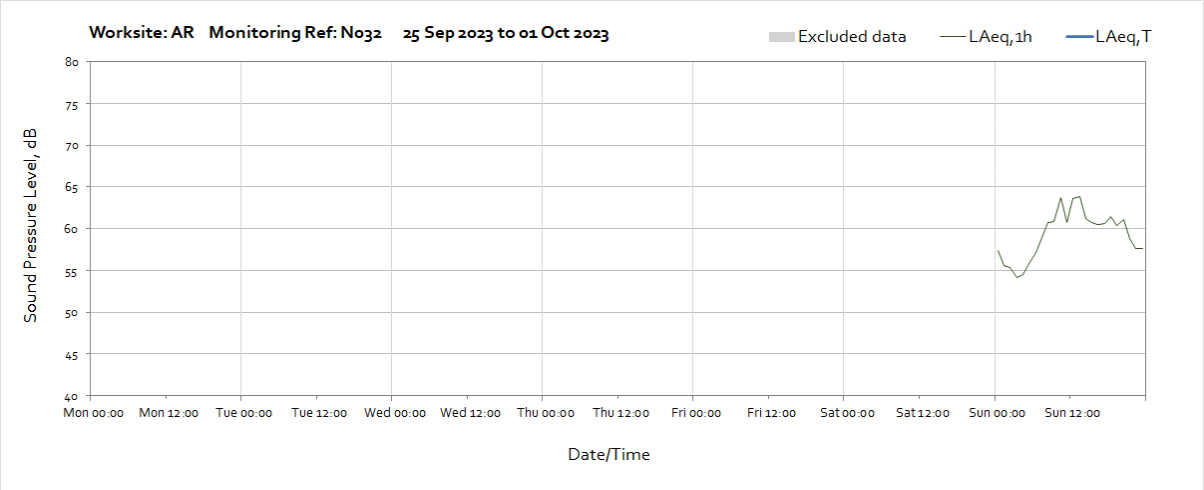
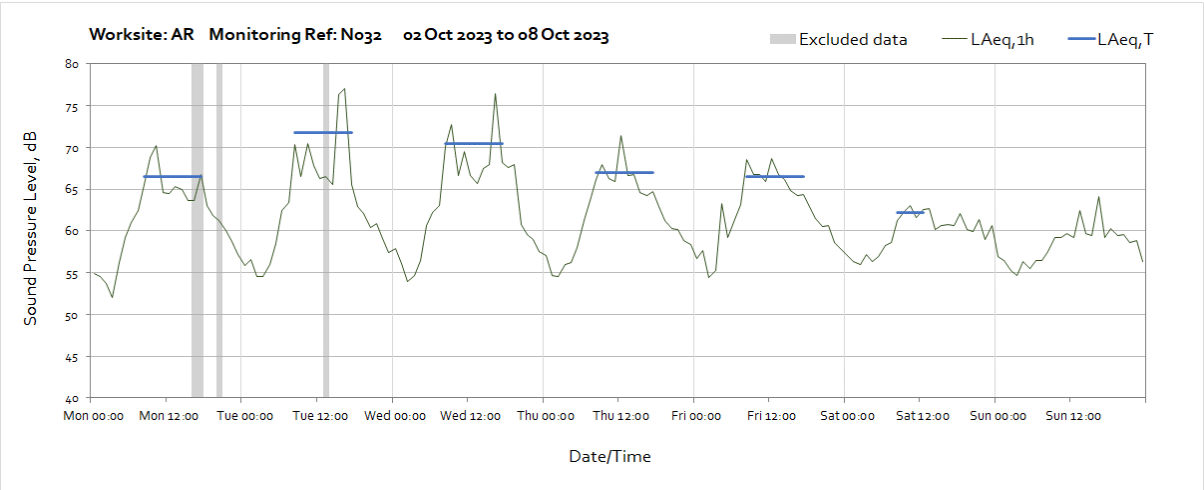
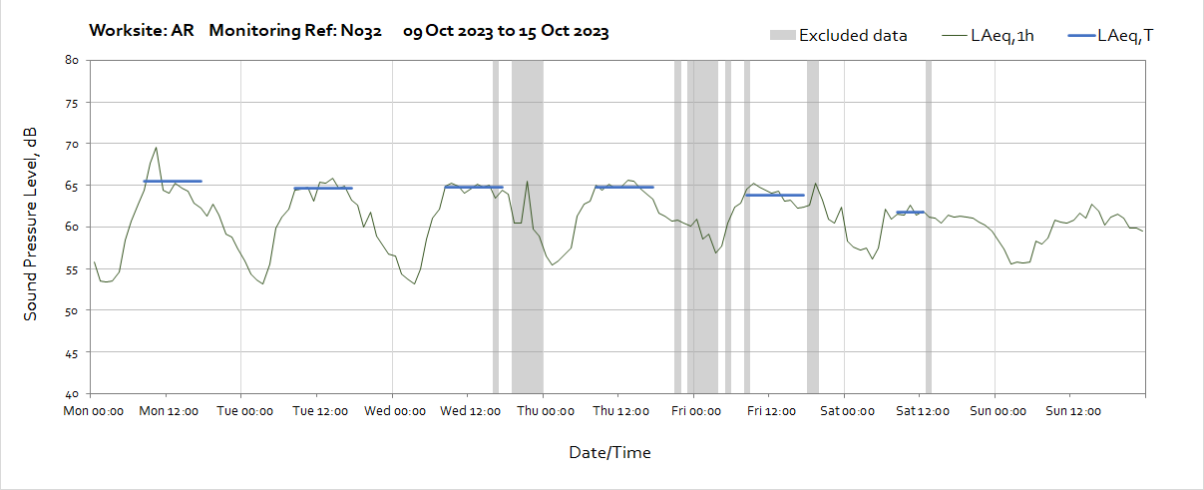
Date/Time



Worksite: AR – Monitoring Ref: N032






Worksite: AR Monitoring Ref: No32 09 Oct 2023 to 15 Oct 2023
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LAeq,T
Sound Pressure Level, dB
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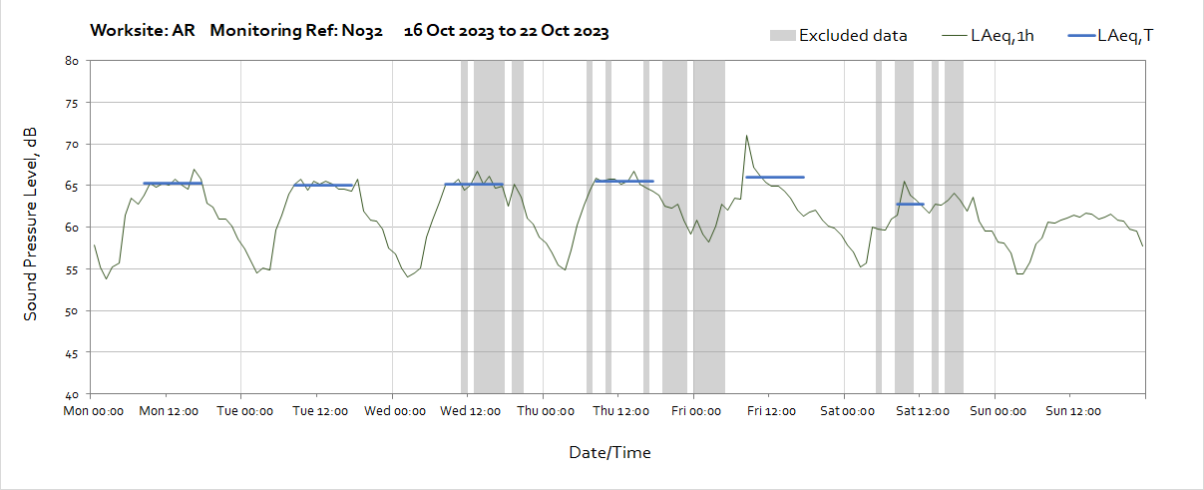
Date/Time


Worksite: AR Monitoring Ref: No32 16 Oct 2023 to 22 Oct 2023
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LAeq,T
Sound Pressure Level, dB
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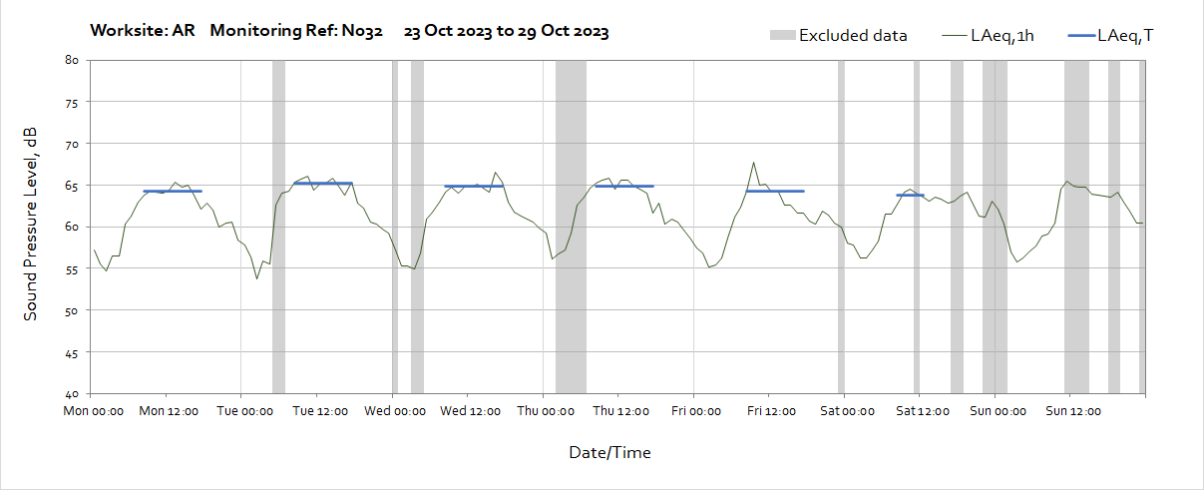
Date/Time


Worksite: AR Monitoring Ref: No32 23 Oct 2023 to 29 Oct 2023
Excluded data
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LAeq,T
Sound Pressure Level, dB
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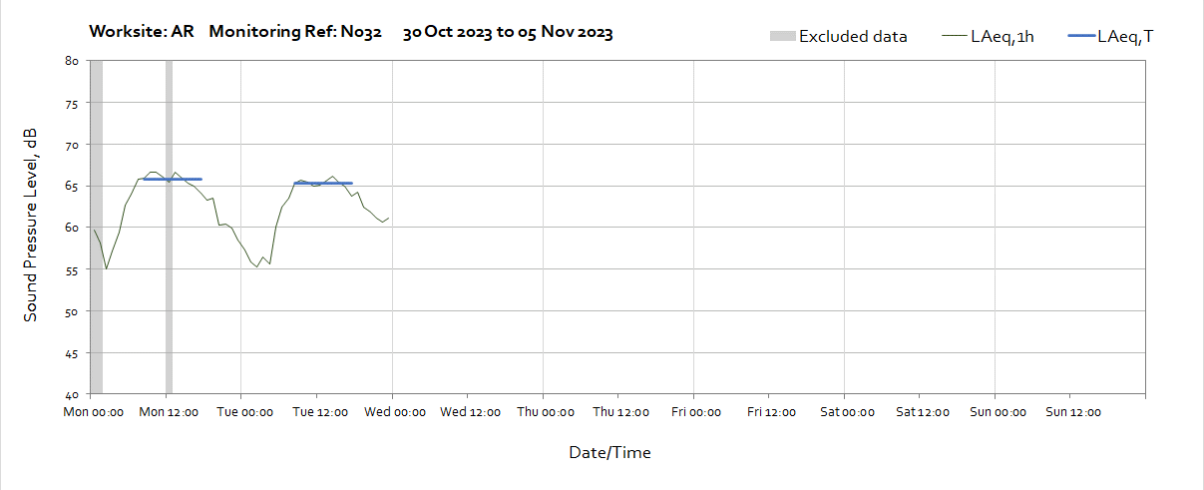
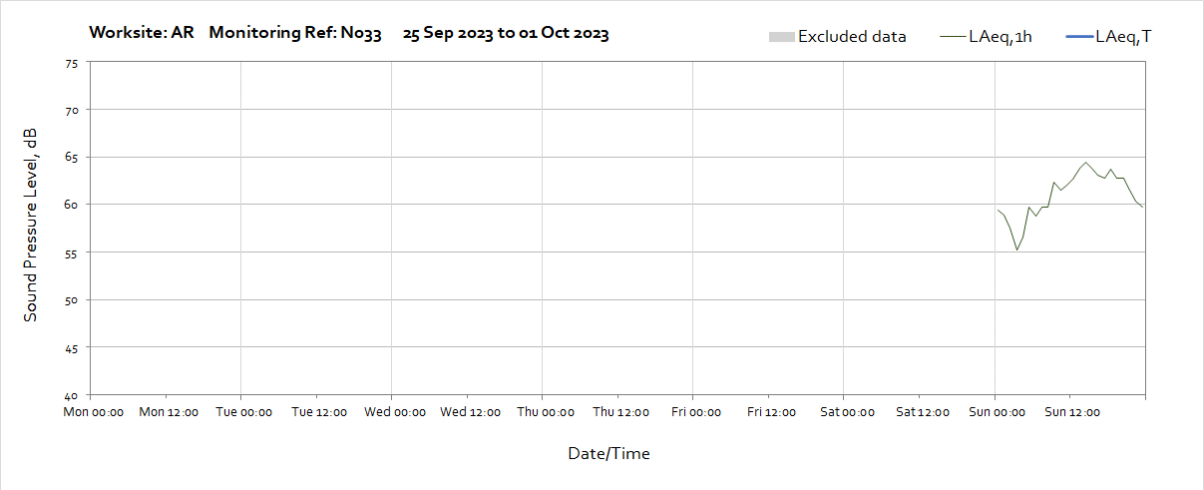
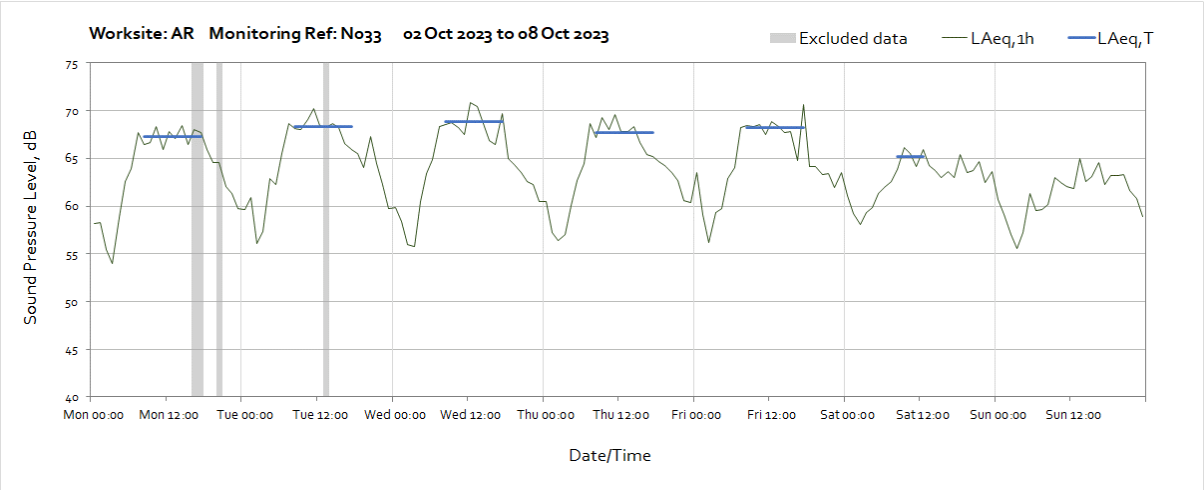
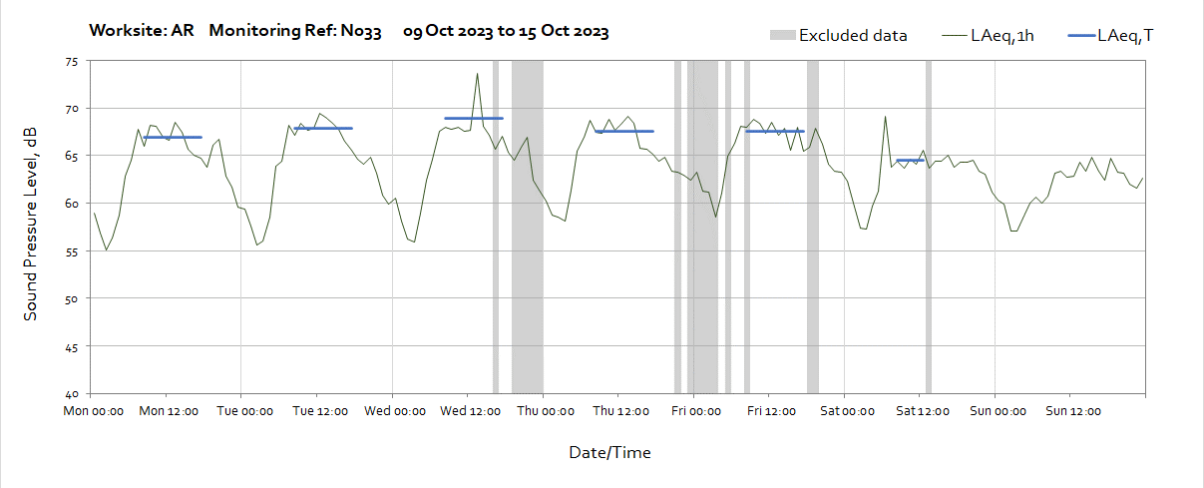
Date/Time



Worksite: AR – Monitoring Ref: N033






Worksite: AR Monitoring Ref: No33 09 Oct 2023 to 15 Oct 2023
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LAeq,T
Sound Pressure Level, dB
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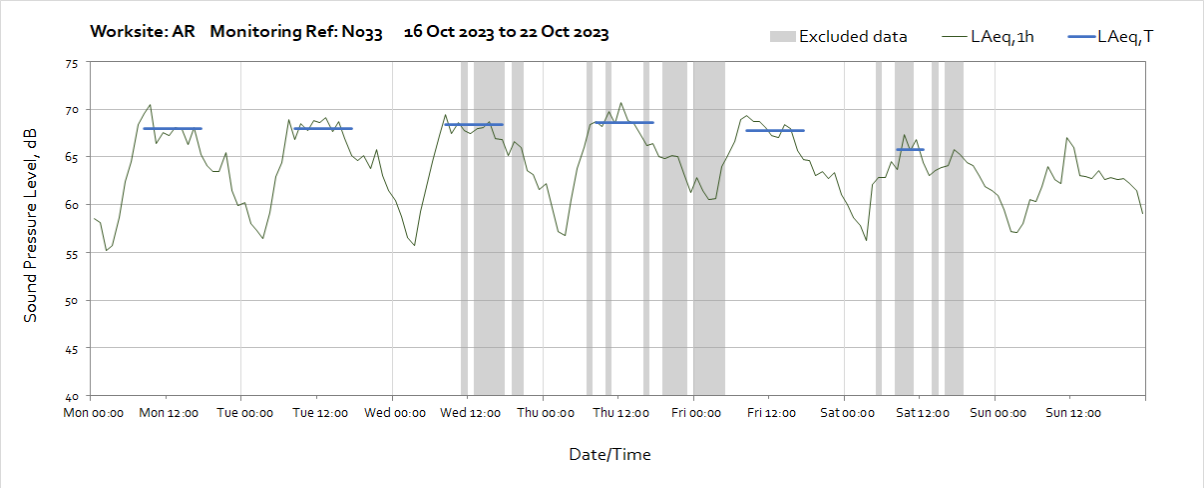
Date/Time


Worksite: AR Monitoring Ref: No33 16 Oct 2023 to 22 Oct 2023
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LAeq,T
Sound Pressure Level, dB
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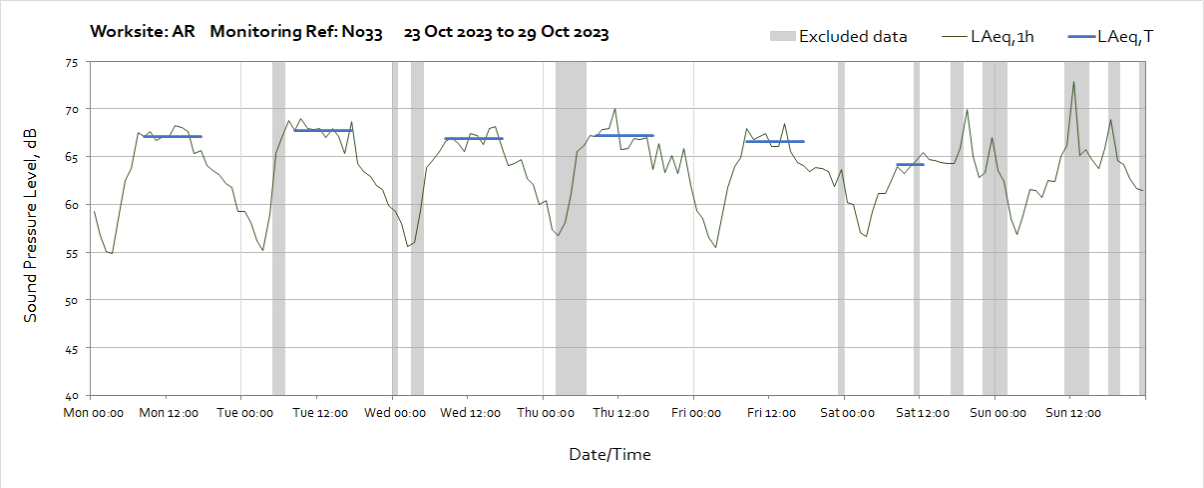
Date/Time


Worksite: AR Monitoring Ref: No33 23 Oct 2023 to 29 Oct 2023
Excluded data
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LAeq,T
Sound Pressure Level, dB
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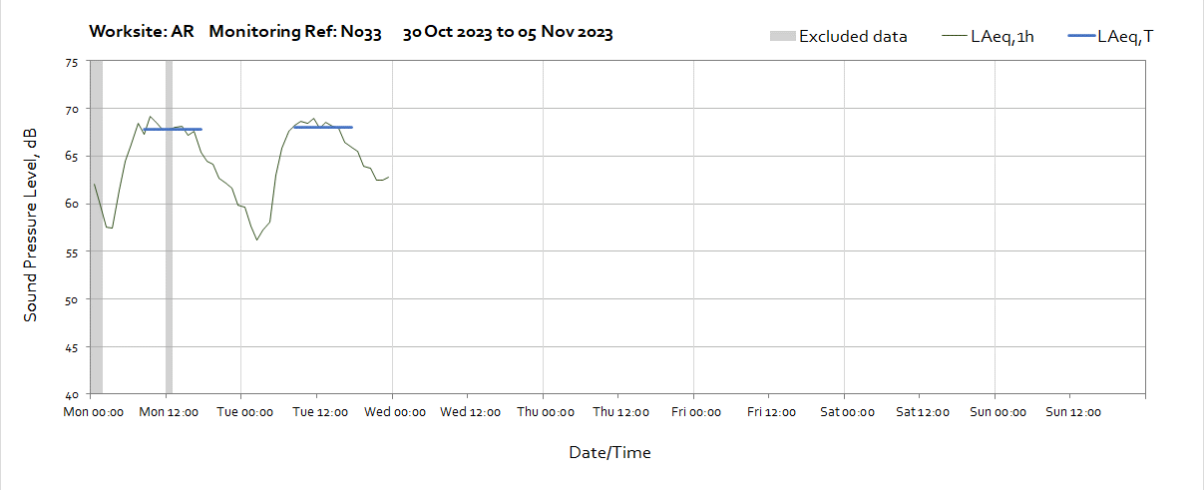
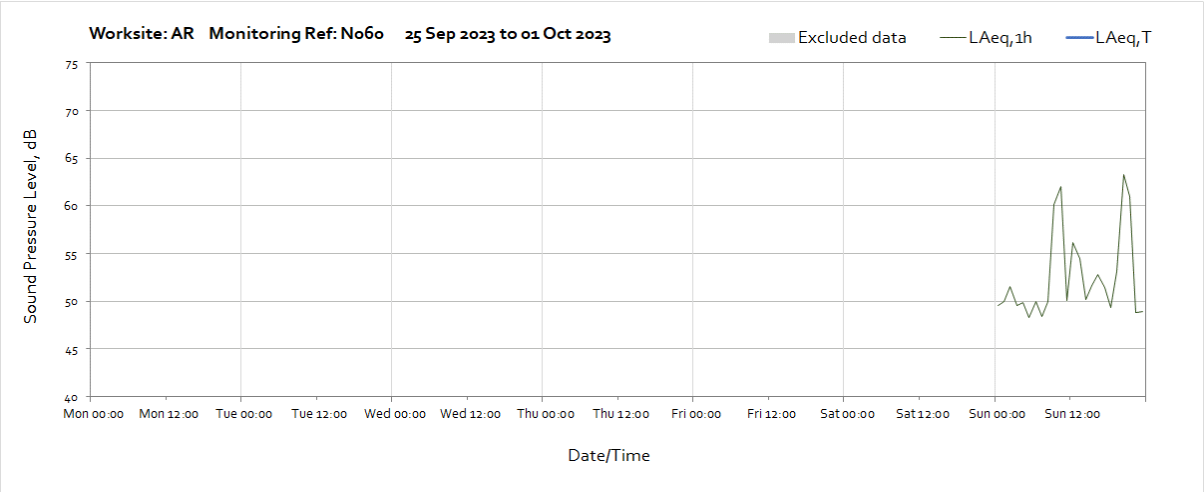
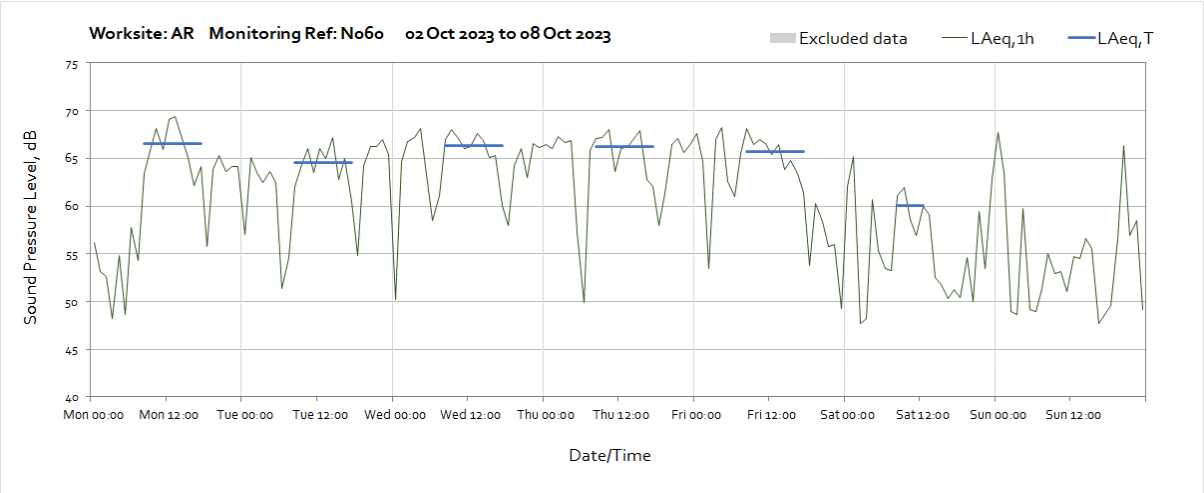
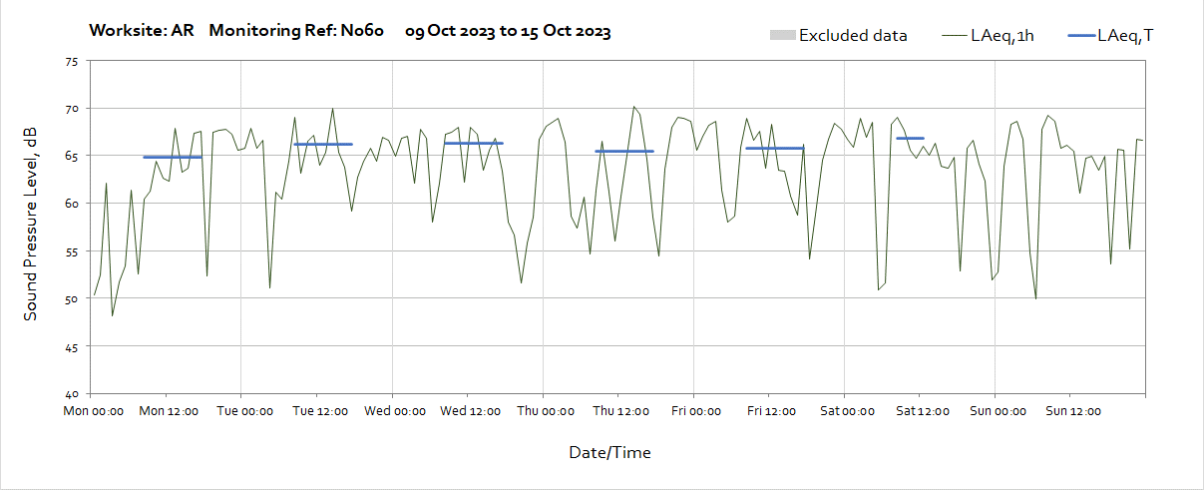
Date/Time



Worksite: AR – Monitoring Ref: N060






Worksite: AR Monitoring Ref: No60 09 Oct 2023 to 15 Oct 2023
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LAeq,T
Sound Pressure Level, dB
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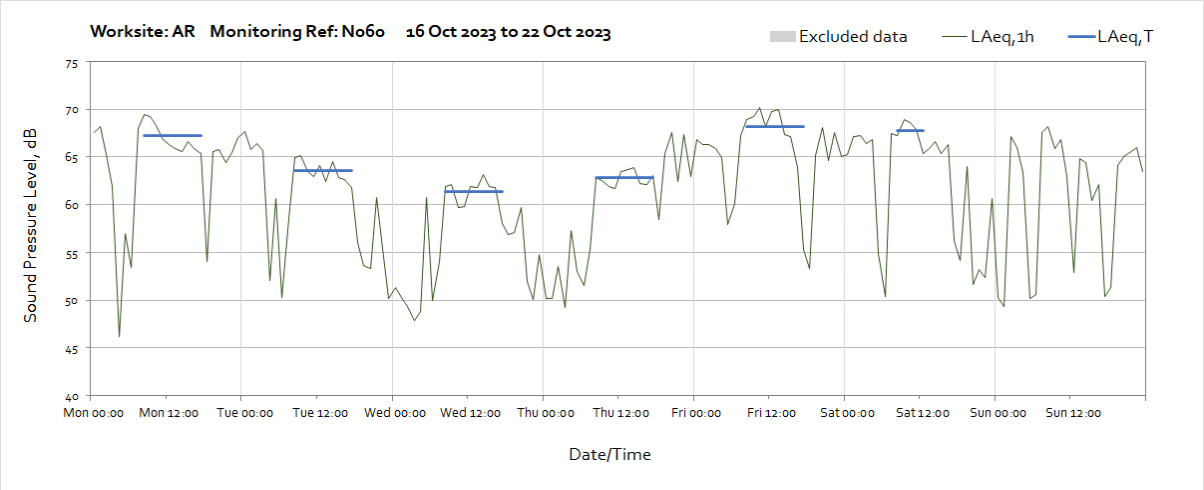
Date/Time


Worksite: AR Monitoring Ref: No60 16 Oct 2023 to 22 Oct 2023
Excluded data
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LAeq,T
Sound Pressure Level, dB
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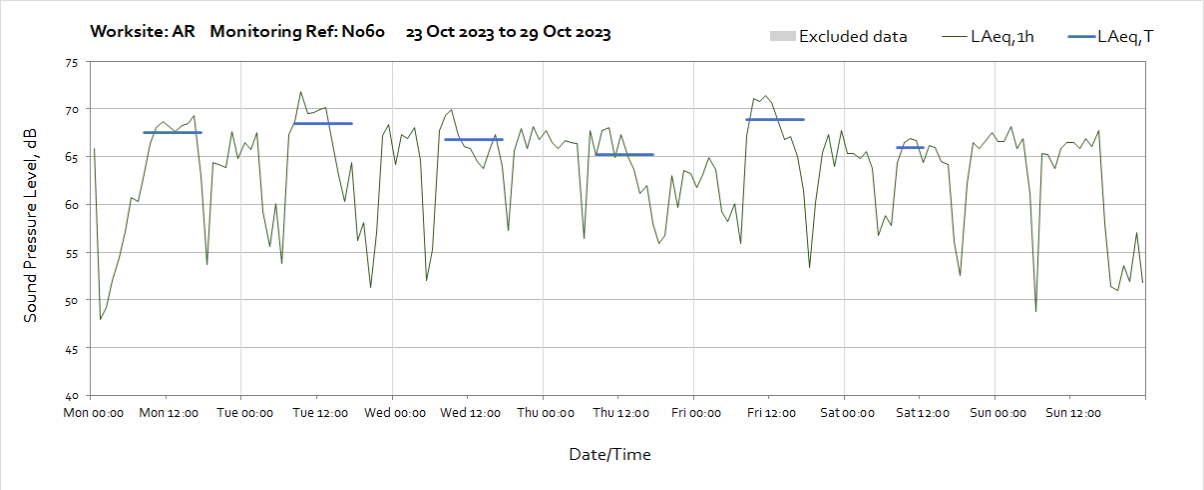
Date/Time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Excluded data
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LAeq,T
Sound Pressure Level, dB
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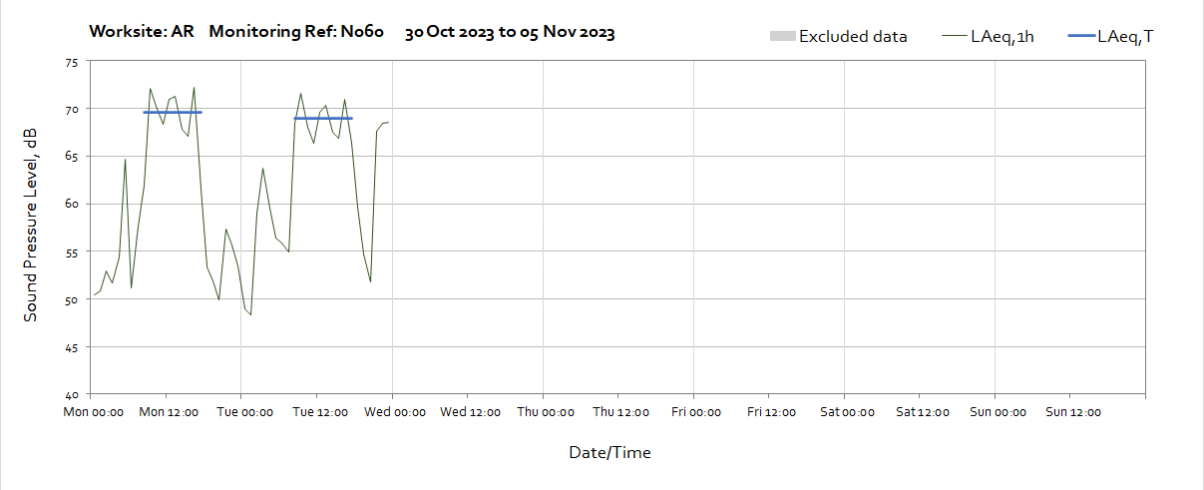
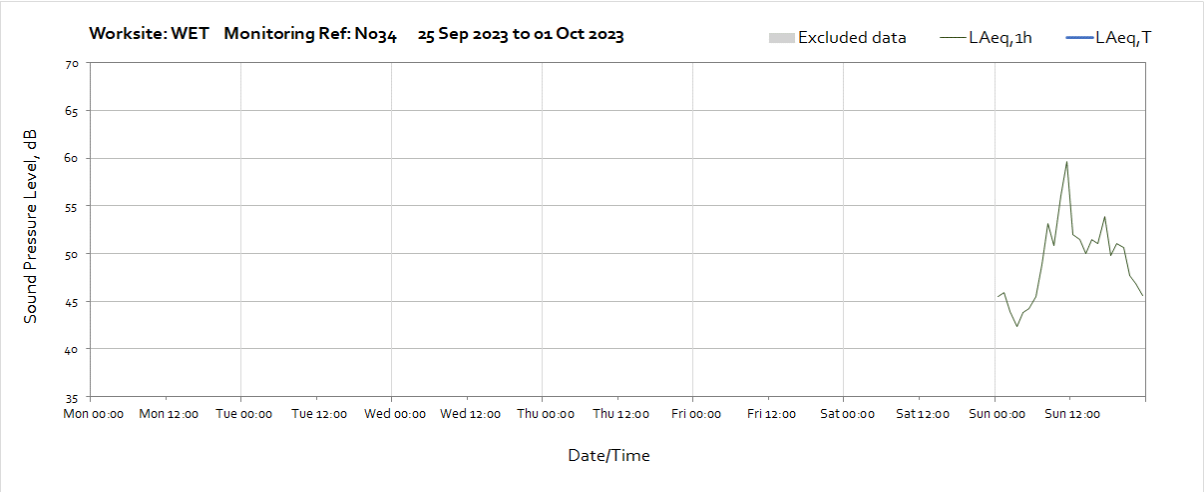
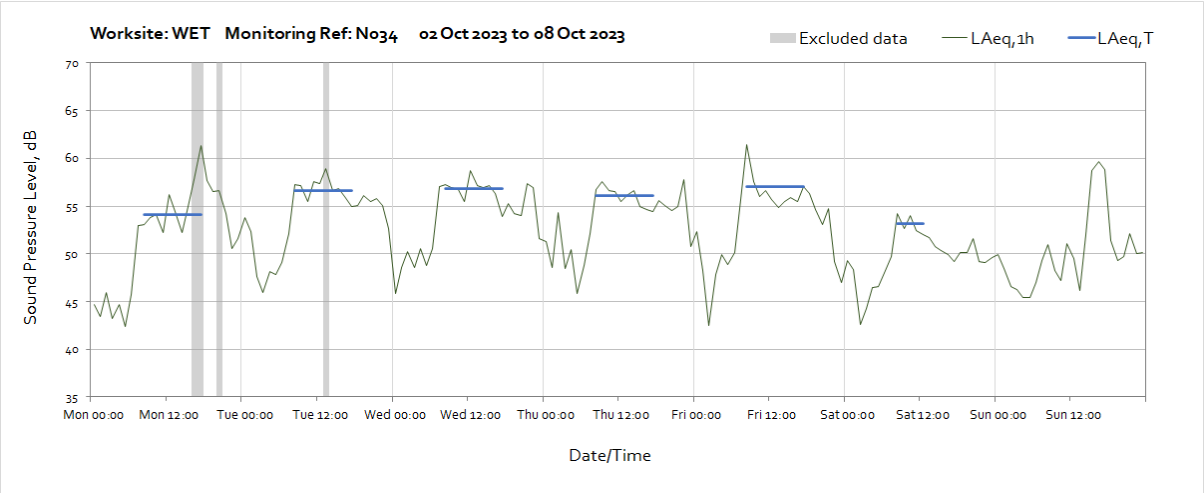
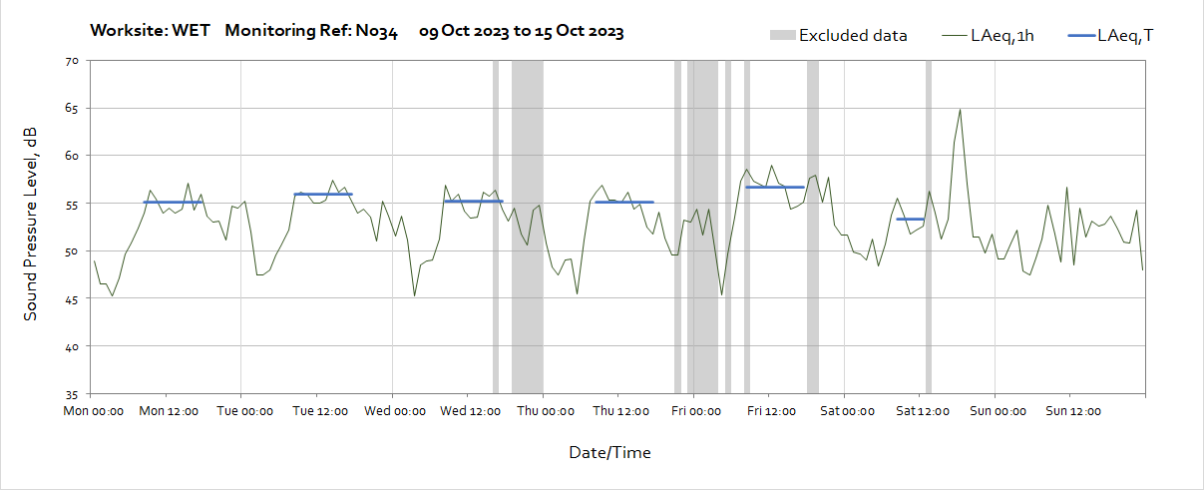
Date/Time



Worksite: WET – Monitoring Ref: N034






Worksite: WET Monitoring Ref: No34 09 Oct 2023 to 15 Oct 2023
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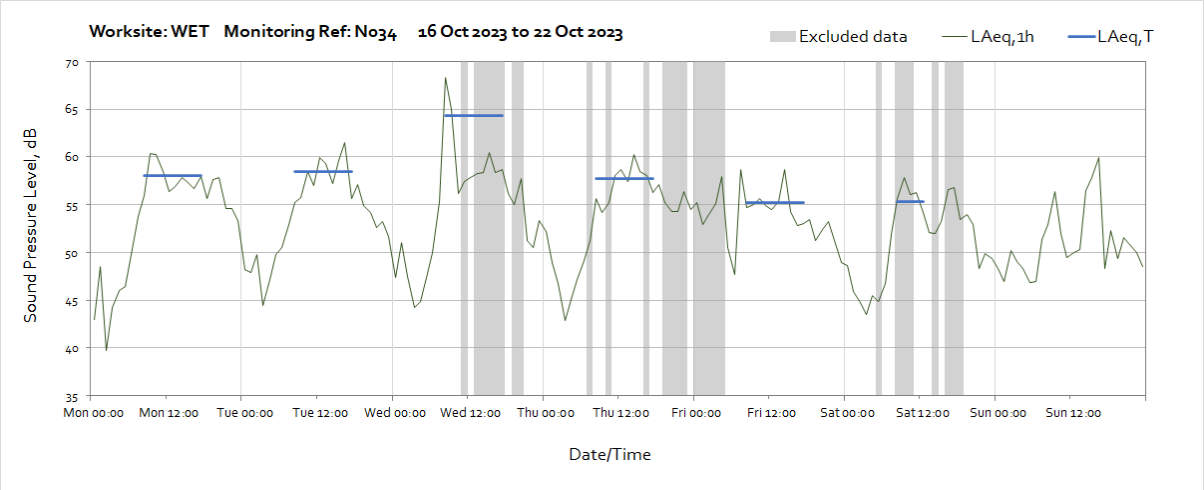
Date/Time


Worksite: WET Monitoring Ref: No34 16 Oct 2023 to 22 Oct 2023
Excluded data
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LAeq,T
Sound Pressure Level, dB
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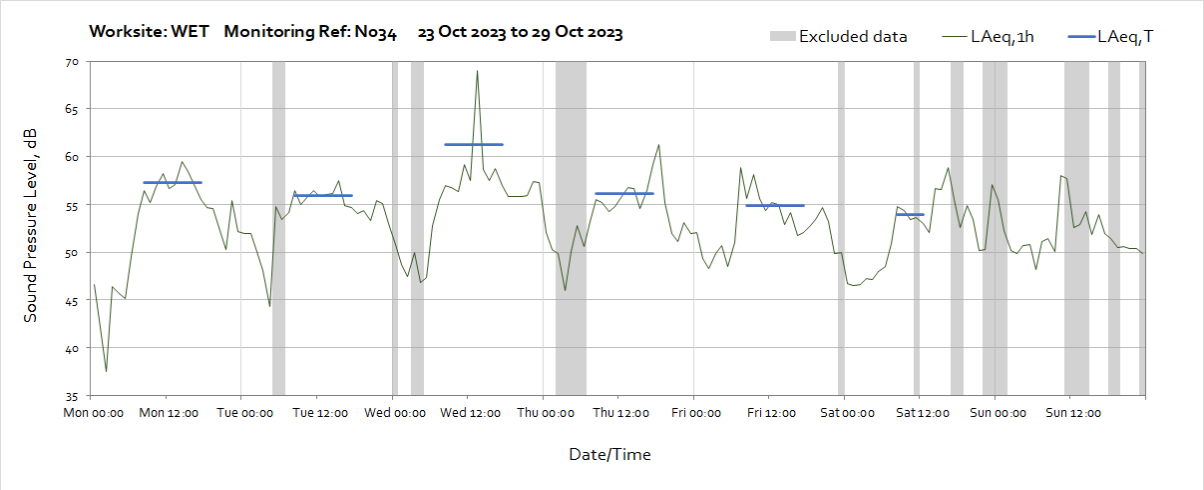
Date/Time


Worksite: WET Monitoring Ref: No34 23 Oct 2023 to 29 Oct 2023
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
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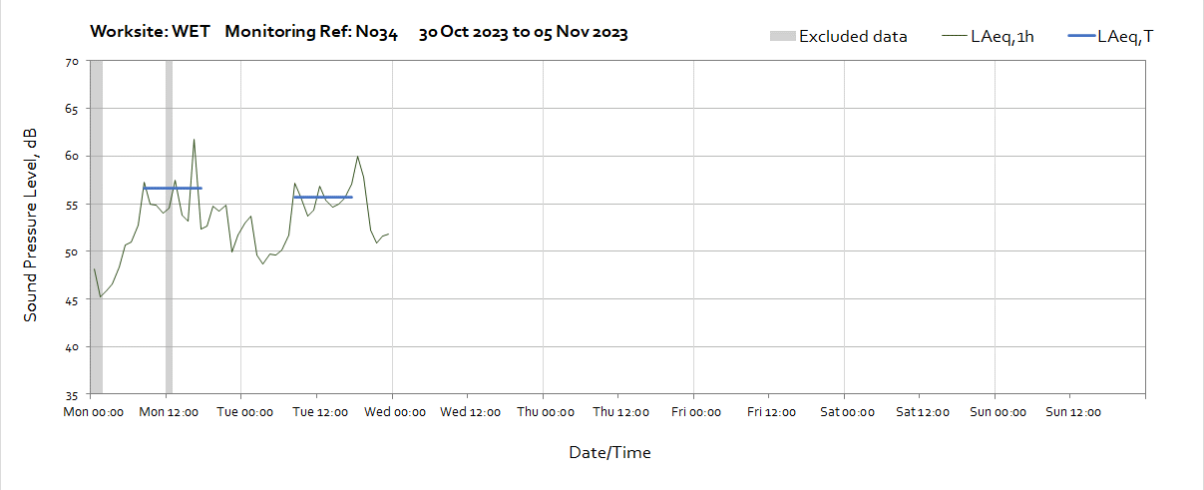
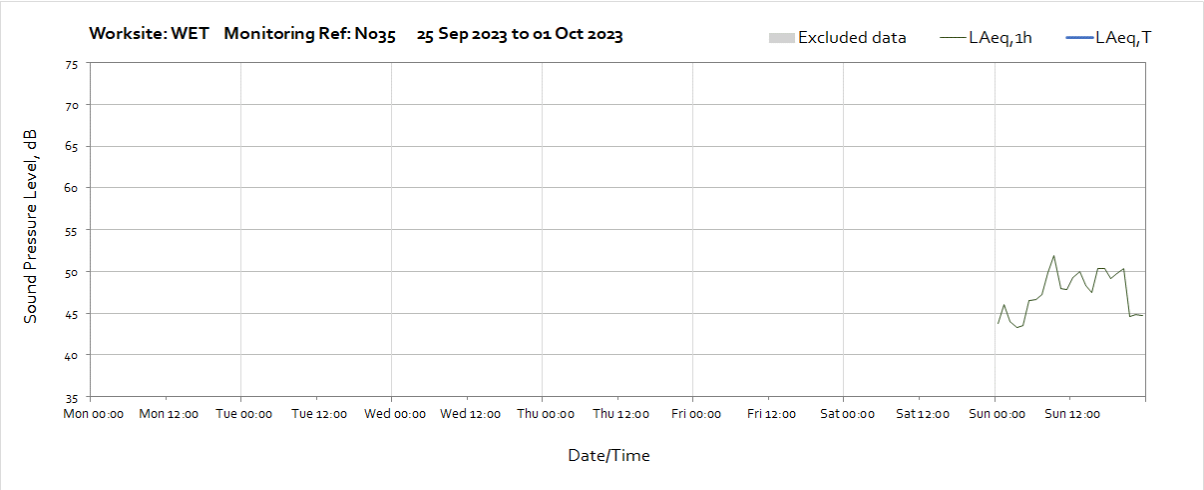
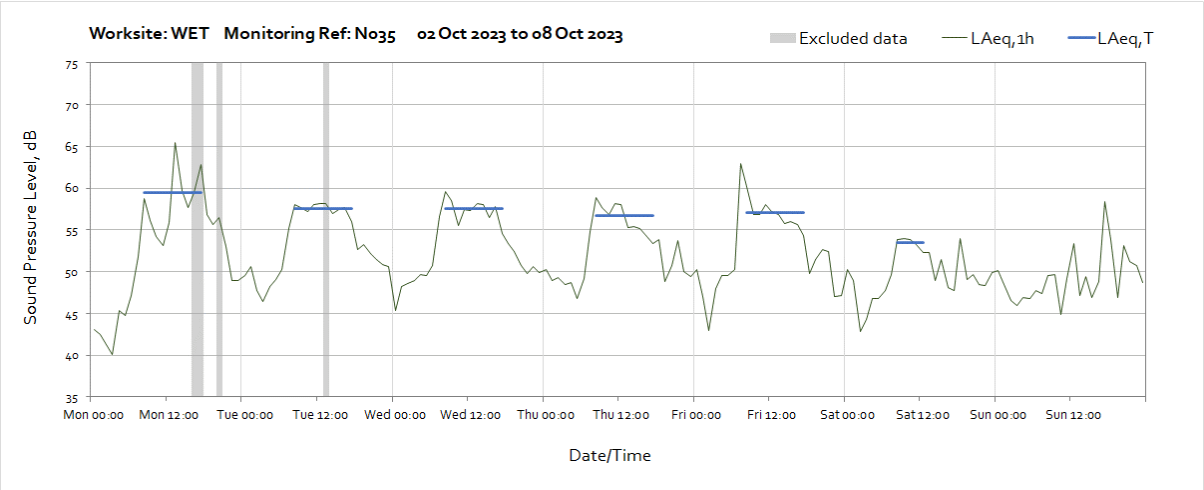
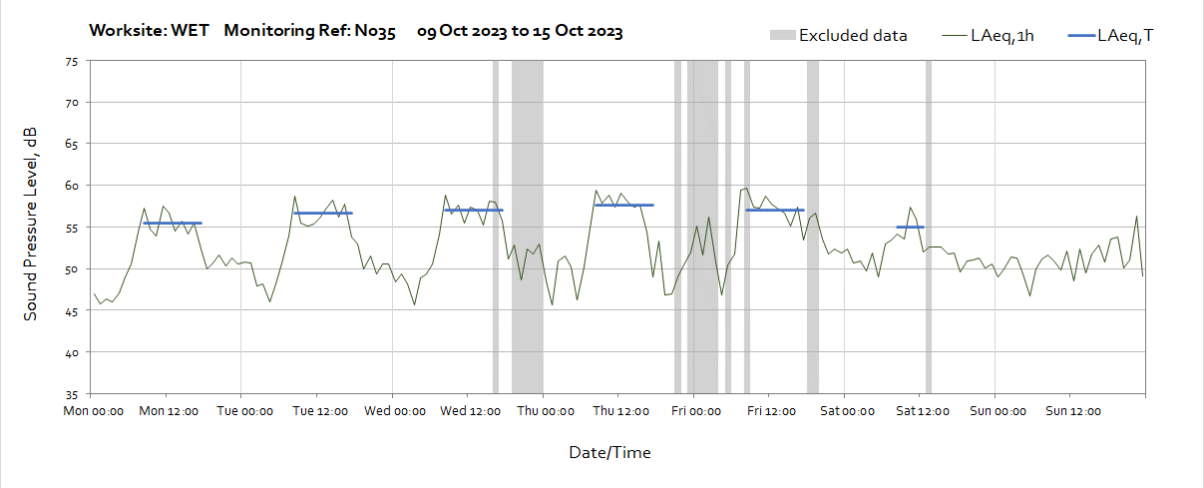
Date/Time



Worksite: WET – Monitoring Ref: N035






Worksite: WET Monitoring Ref: No35 09 Oct 2023 to 15 Oct 2023
Excluded data
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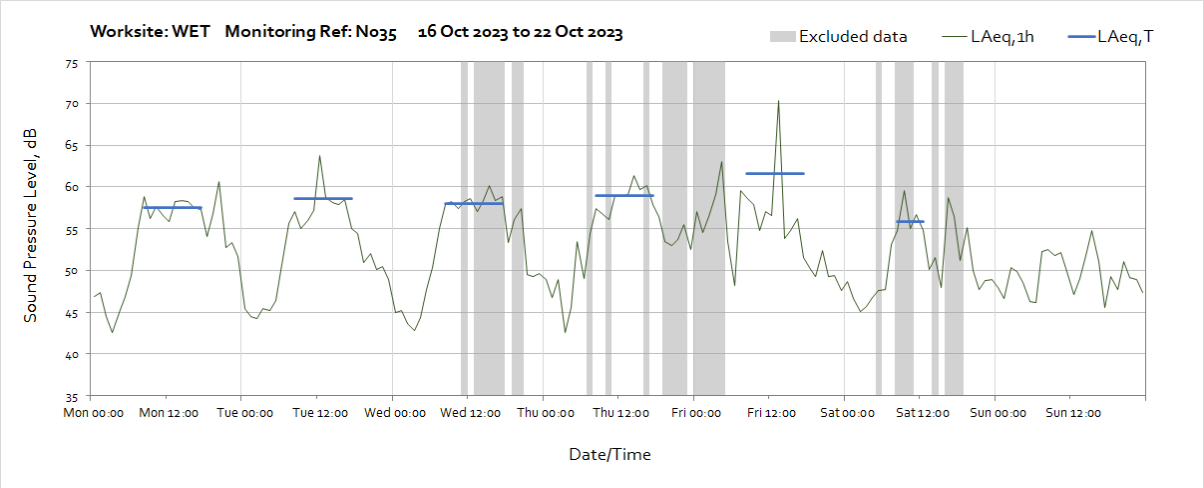
Date/Time


Worksite: WET Monitoring Ref: No35 16 Oct 2023 to 22 Oct 2023
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
75
70
65
60
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50
45
40
35
Mon 00:00
Mon 12:00
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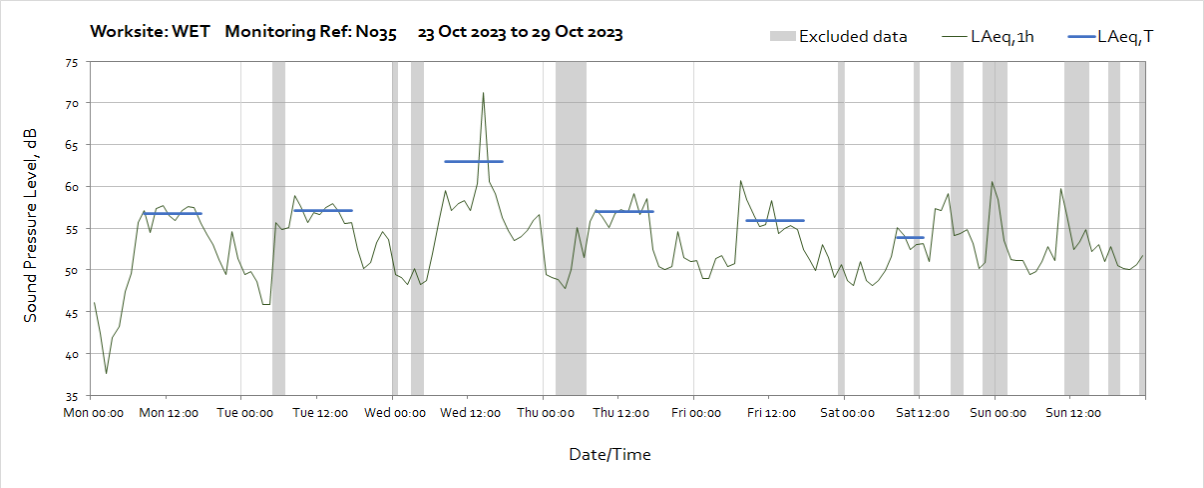
Sun 12:00
Date/Time


Worksite: WET Monitoring Ref: No35 23 Oct 2023 to 29 Oct 2023
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
75
70
65
60
55
50
45
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35
Mon 00:00
Mon 12:00
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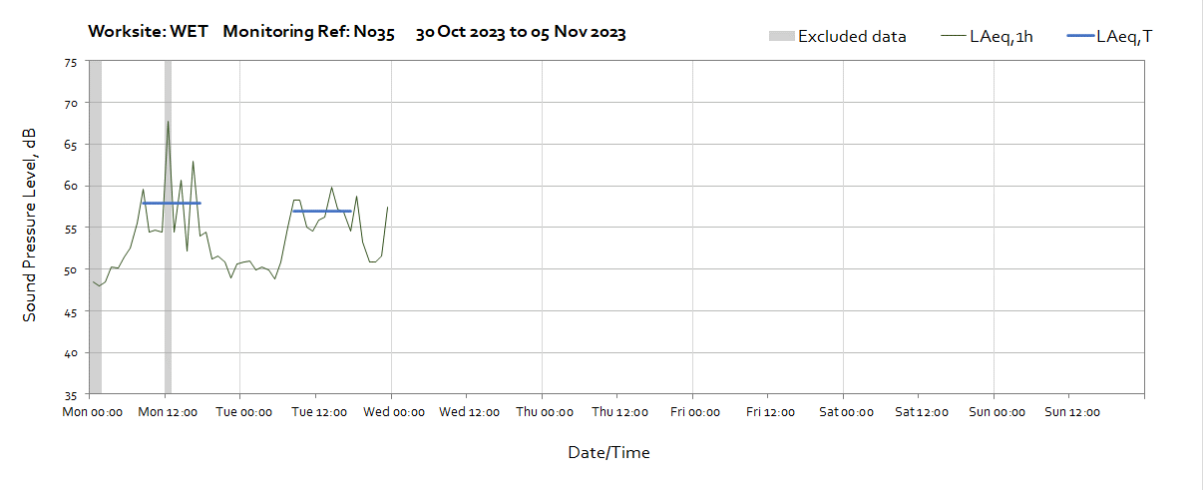
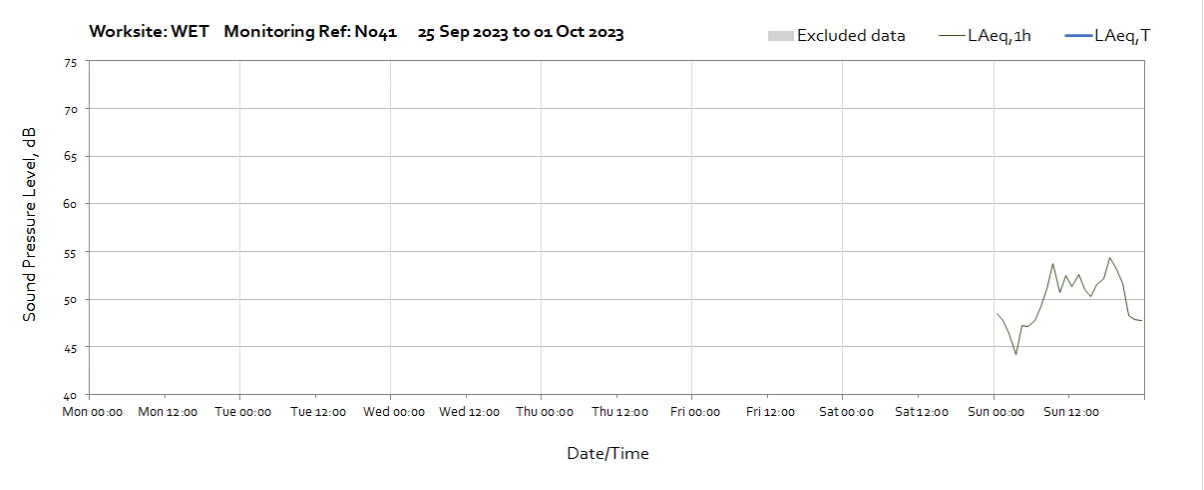
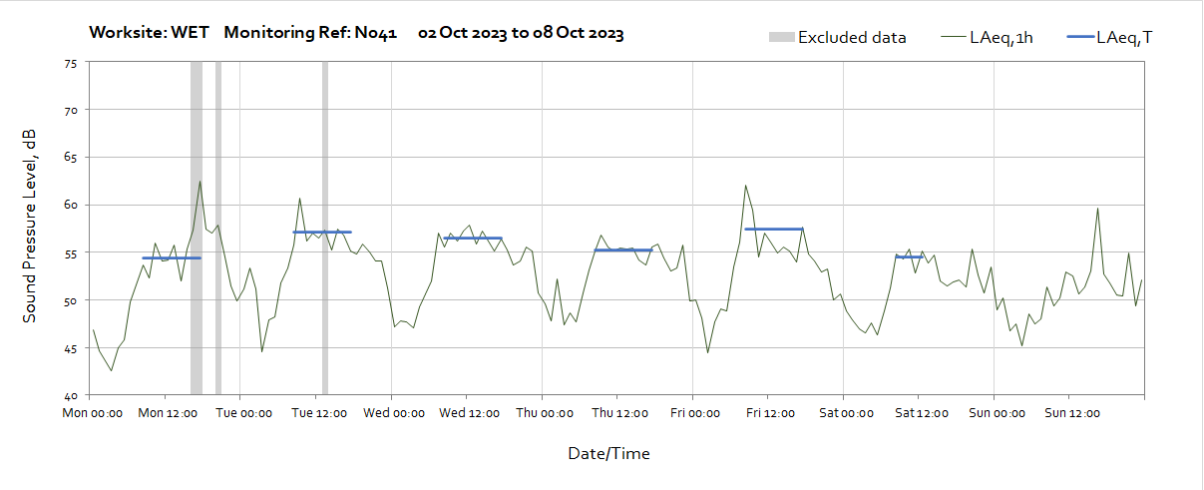
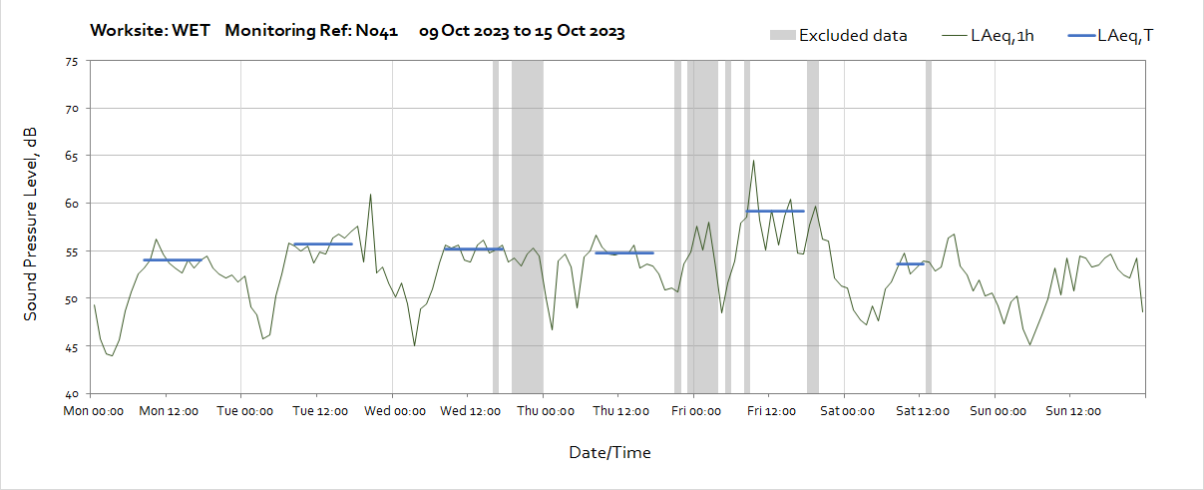
Date/Time

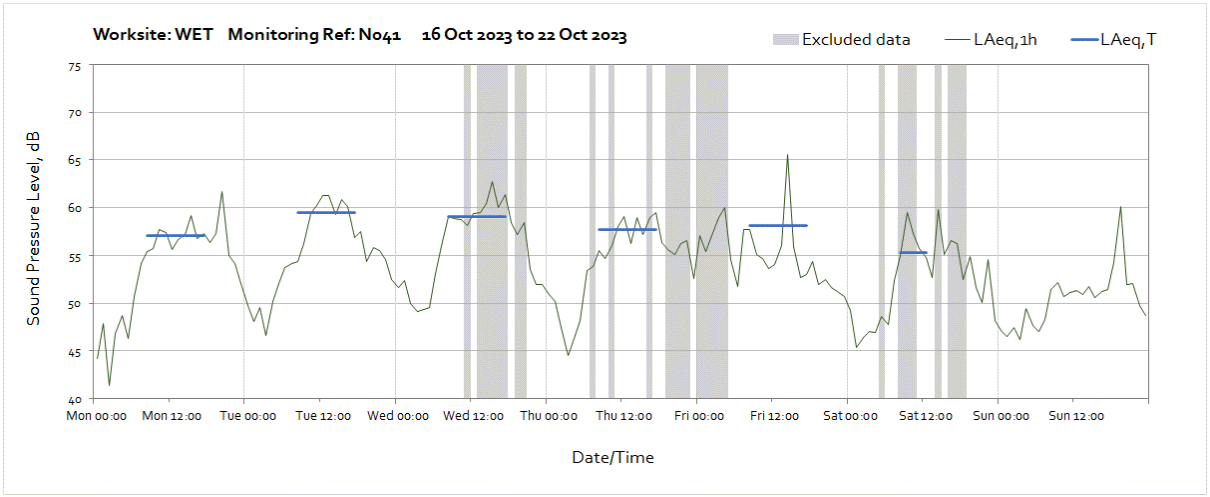


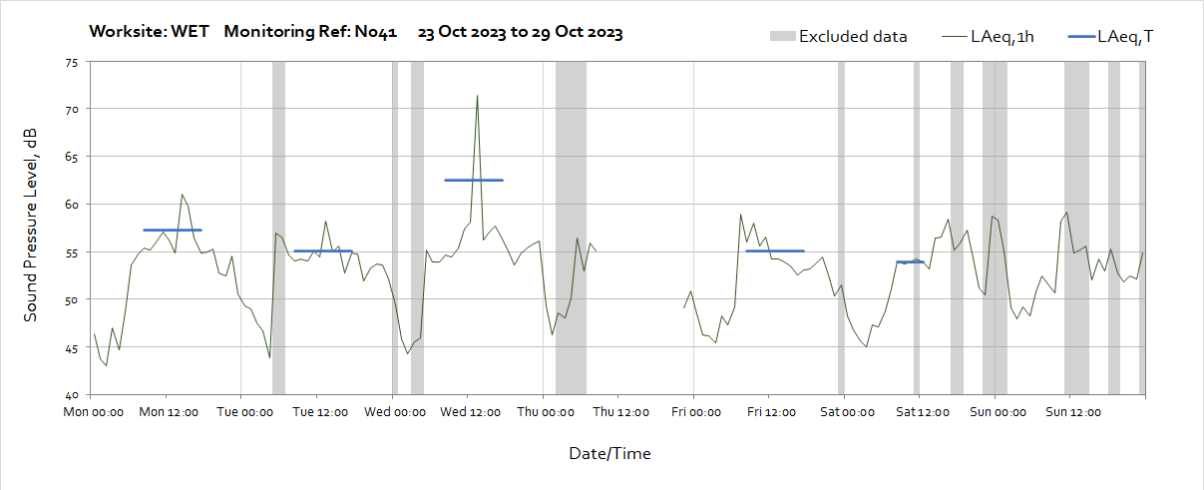
Worksite: WET – Monitoring Ref: N041



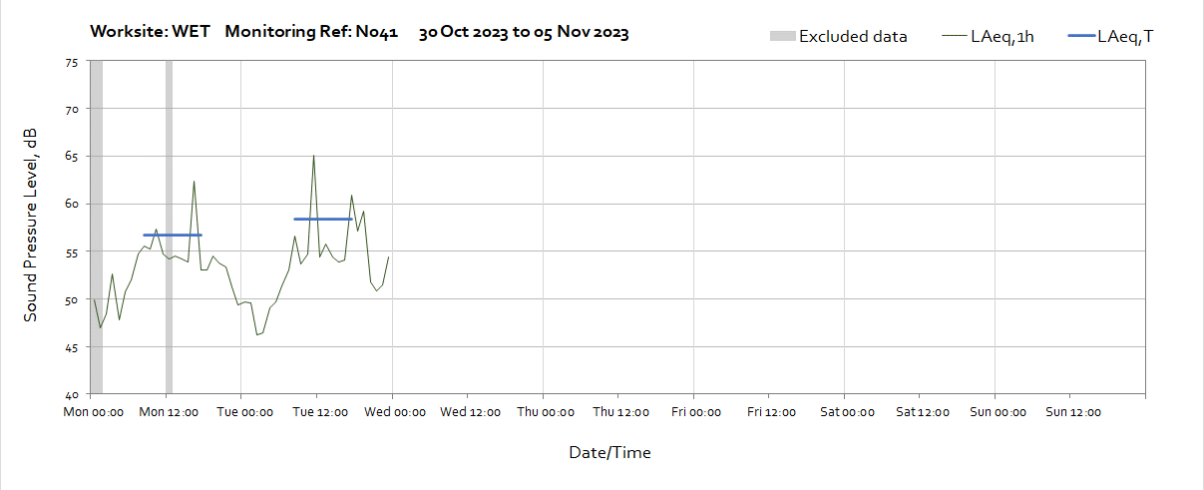




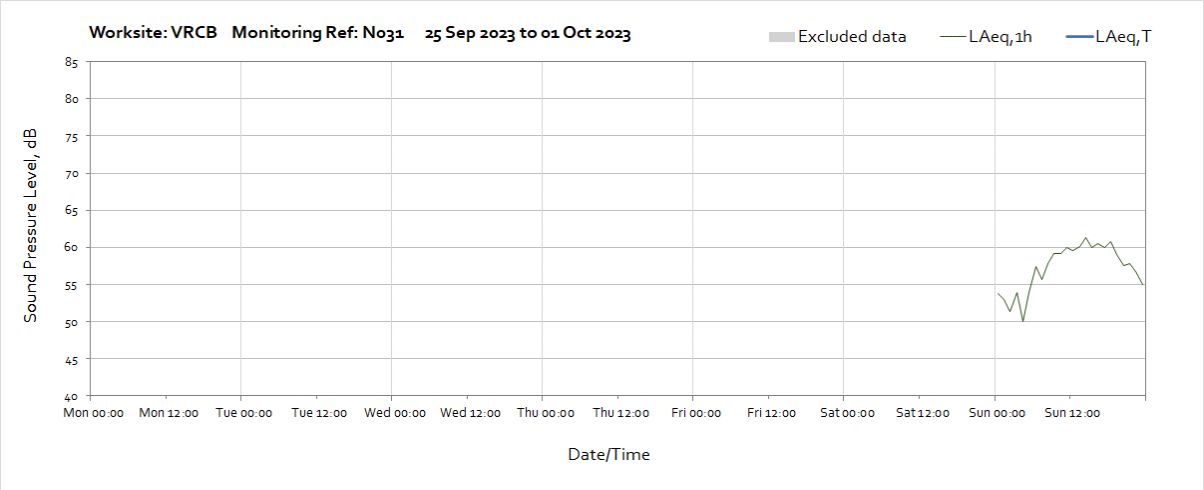


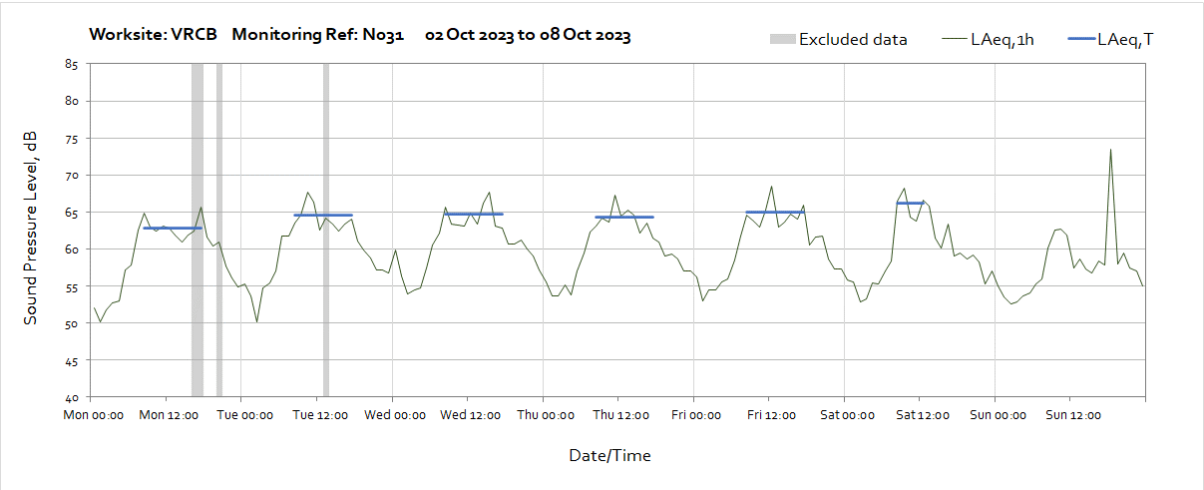


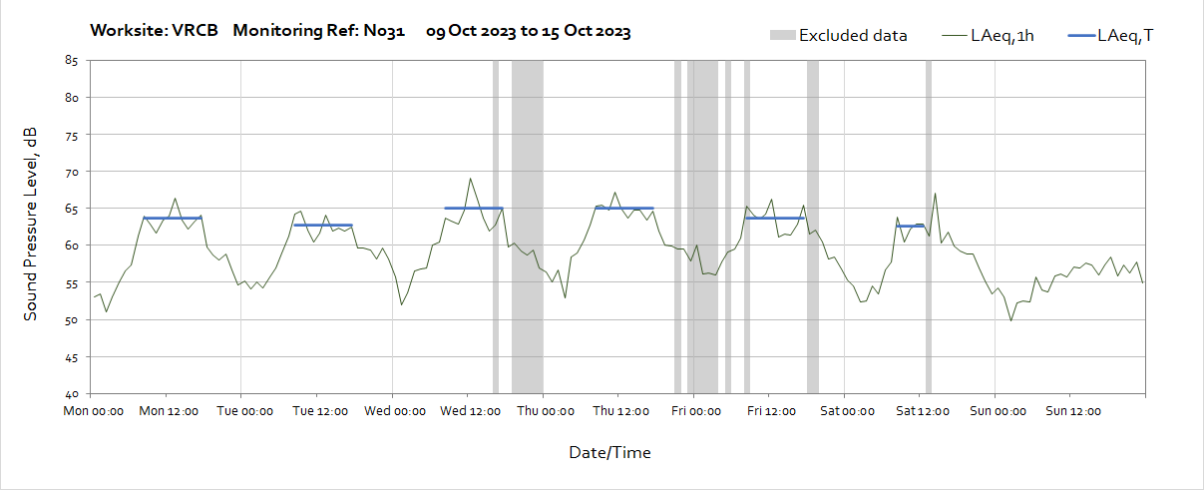
Note: Missing data between 09:00 and 22:00 on Thursday 26th October is currently under investigation.



Worksite: VRCB – Monitoring Ref: N031






Worksite: VRCB Monitoring Ref: No31 09 Oct 2023 to 15 Oct 2023
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
85
80
75
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65
60
55
50
45
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Mon 00:00
Mon 12:00
Tue 00:00
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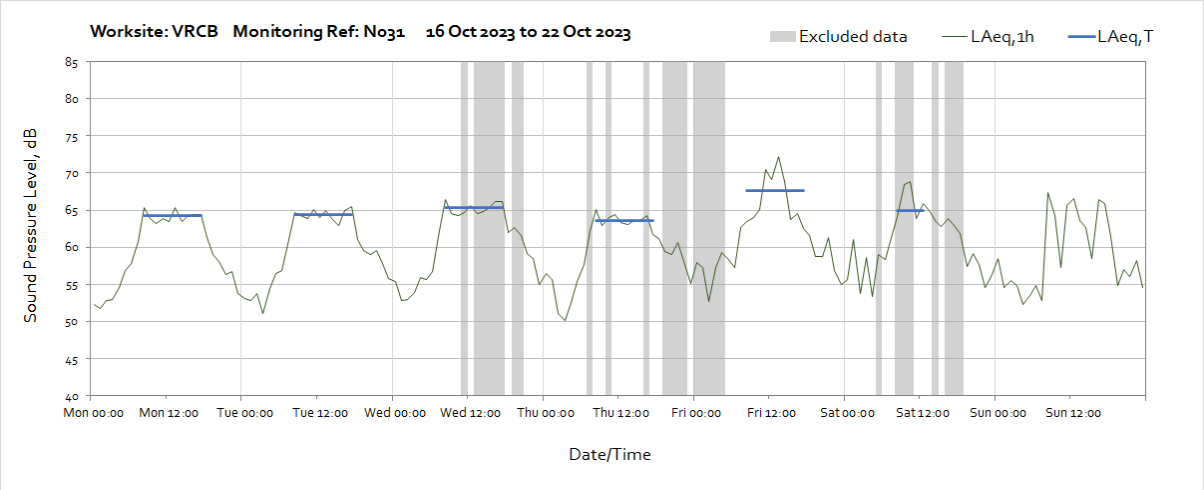
Sun 12:00
Date/Time


Worksite: VRCB Monitoring Ref: No31 16 Oct 2023 to 22 Oct 2023
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
85
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65
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Mon 00:00
Mon 12:00
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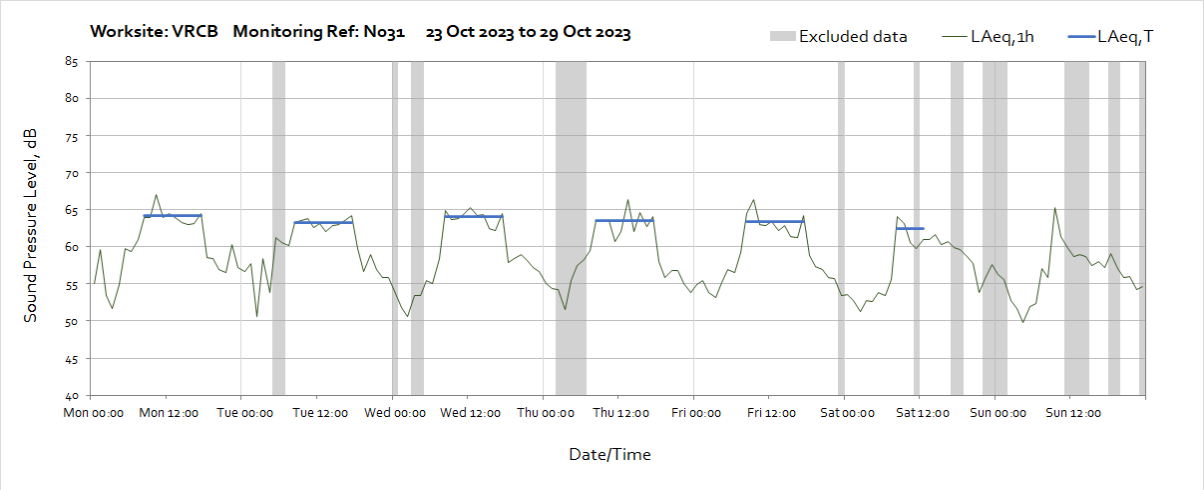
Date/Time


Worksite: VRCB Monitoring Ref: No31 23 Oct 2023 to 29 Oct 2023
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
85
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65
60
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Mon 00:00
Mon 12:00
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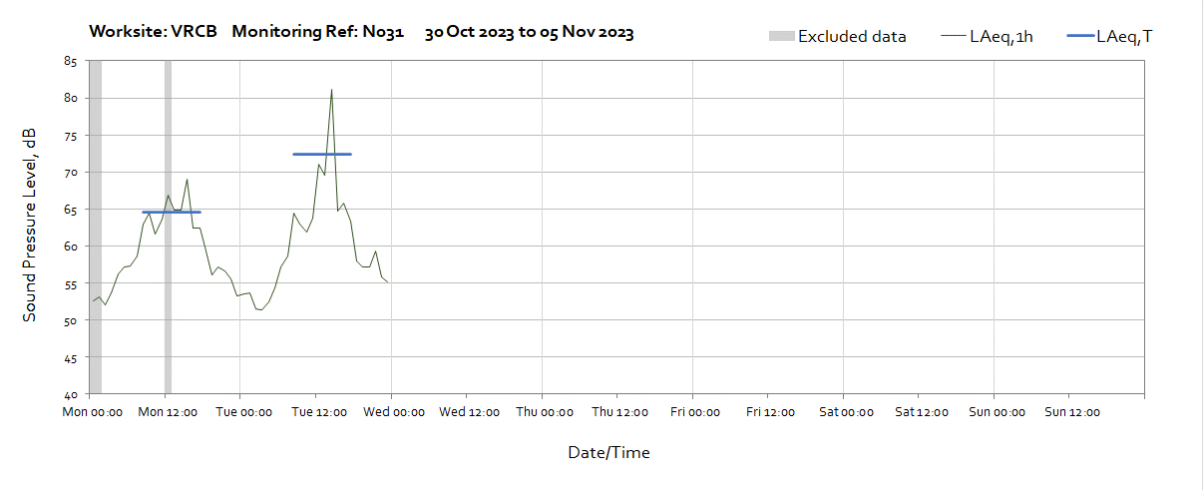
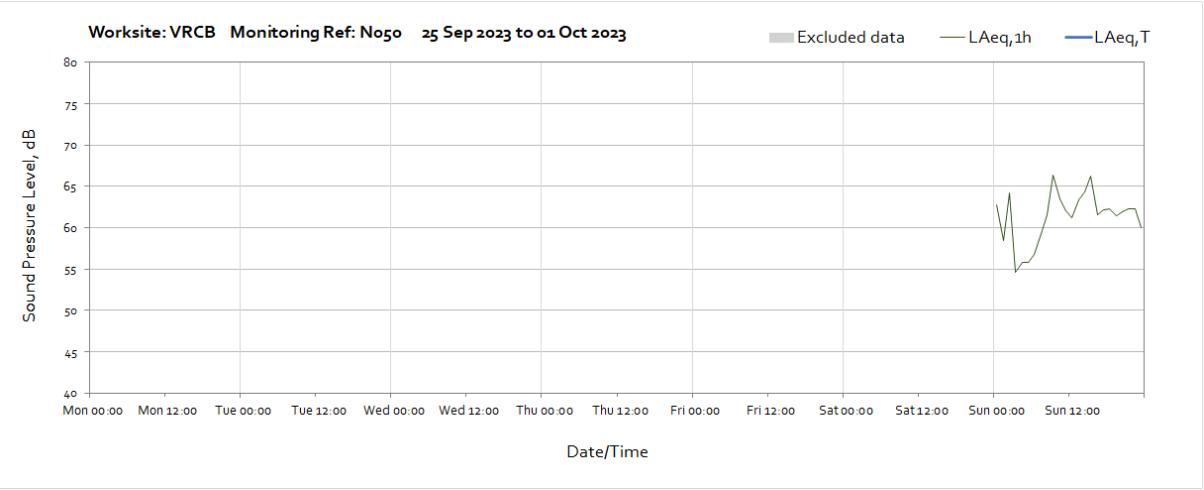
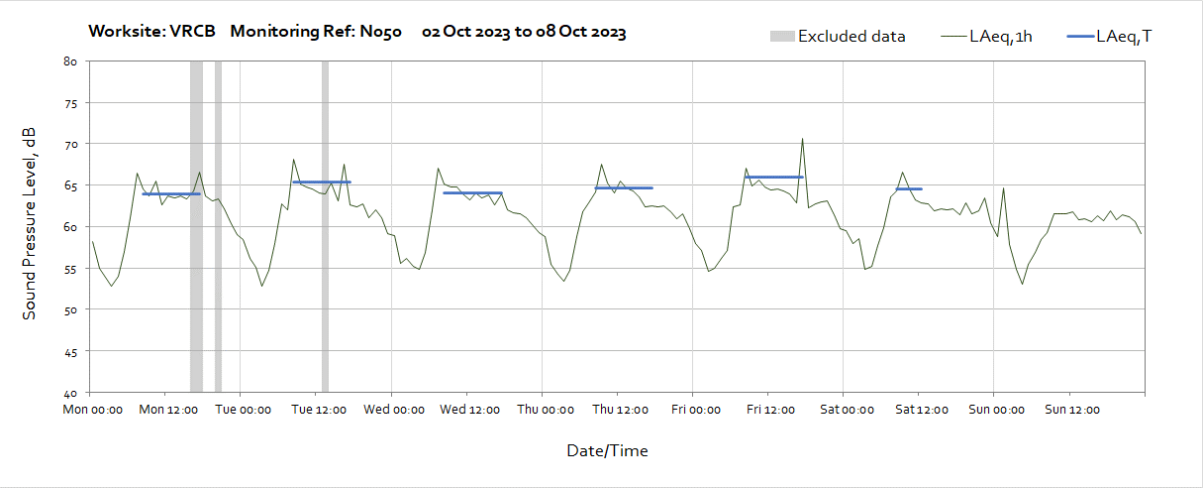
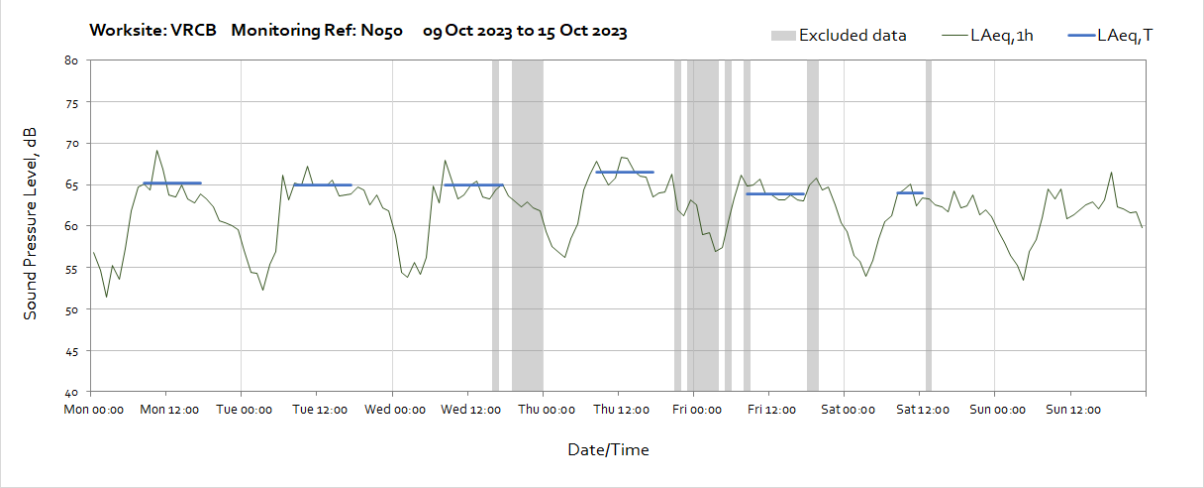
Date/Time



Worksite: VRCB – Monitoring Ref: N050






Worksite: VRCB Monitoring Ref: No50 09 Oct 2023 to 15 Oct 2023
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
80
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60
55
50
45
40
Mon 00:00
Mon 12:00
Tue 00:00
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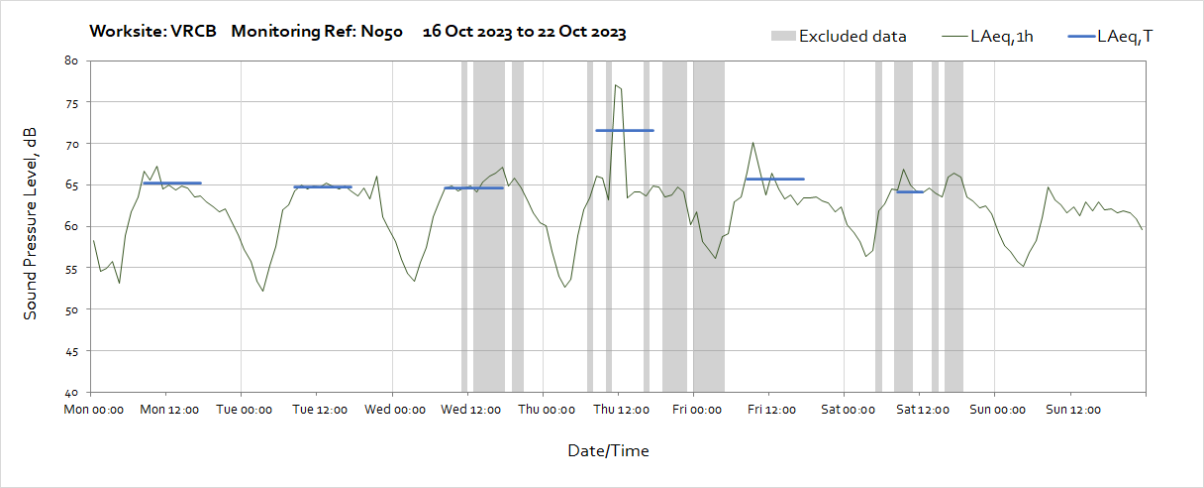
Date/Time


Worksite: VRCB Monitoring Ref: No50 16 Oct 2023 to 22 Oct 2023
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
80
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60
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Mon 00:00
Mon 12:00
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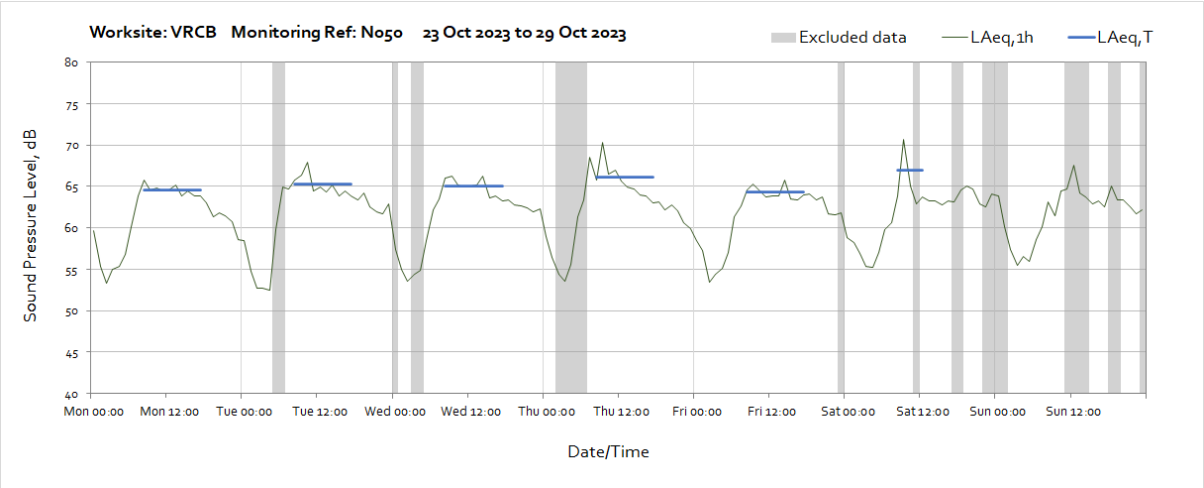
Date/Time


Worksite: VRCB Monitoring Ref: No50 23 Oct 2023 to 29 Oct 2023
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
80
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Mon 00:00
Mon 12:00
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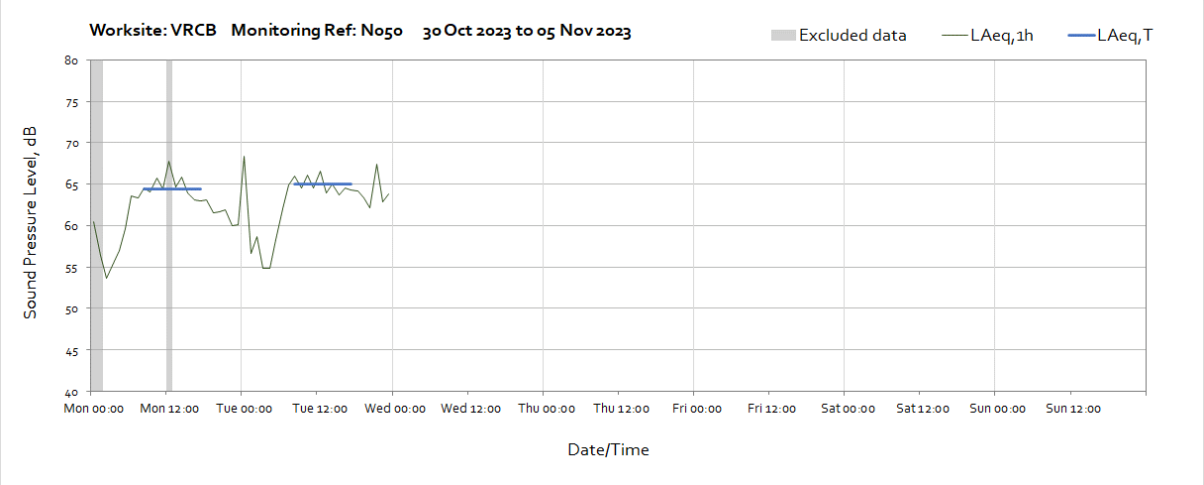
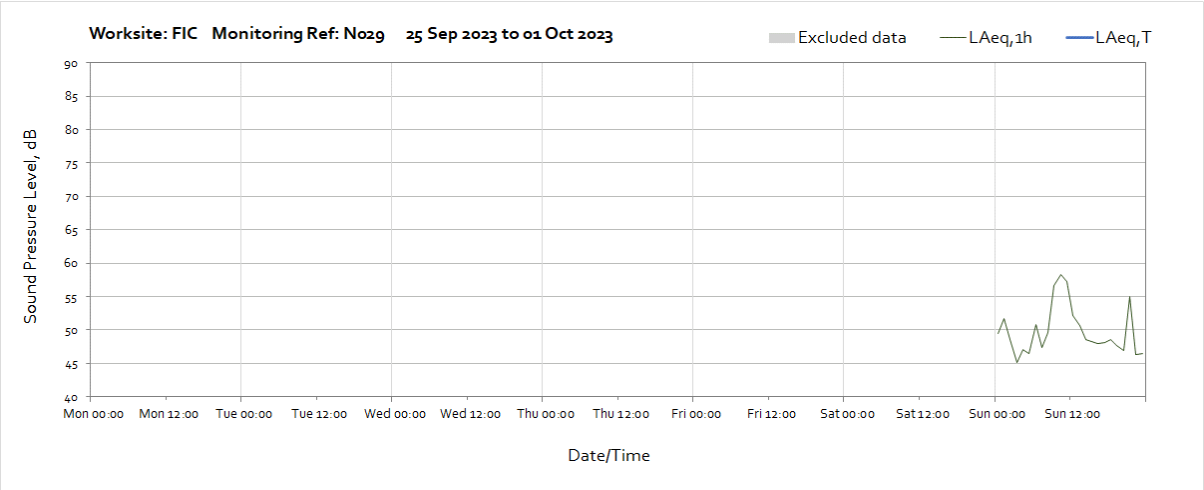
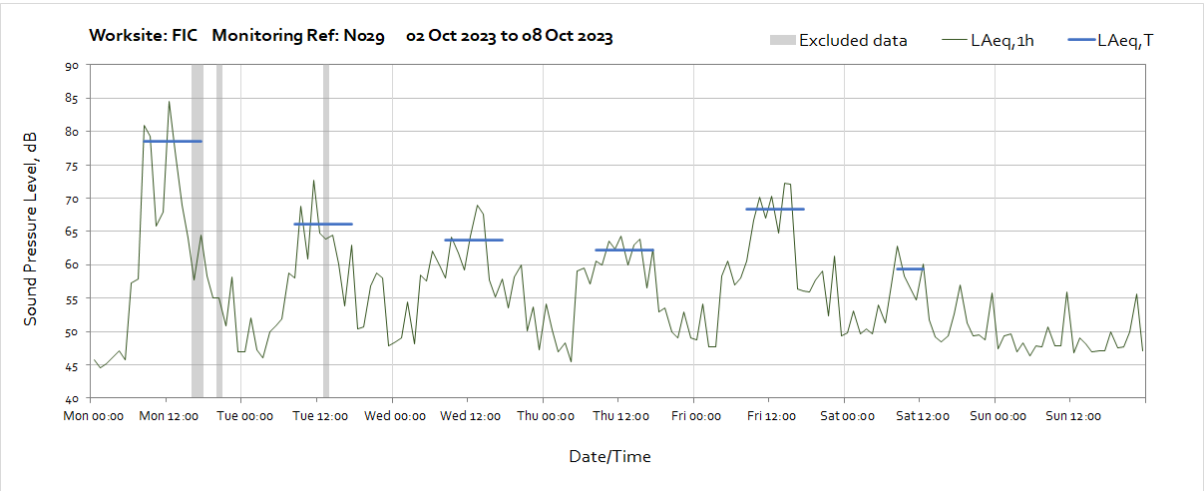
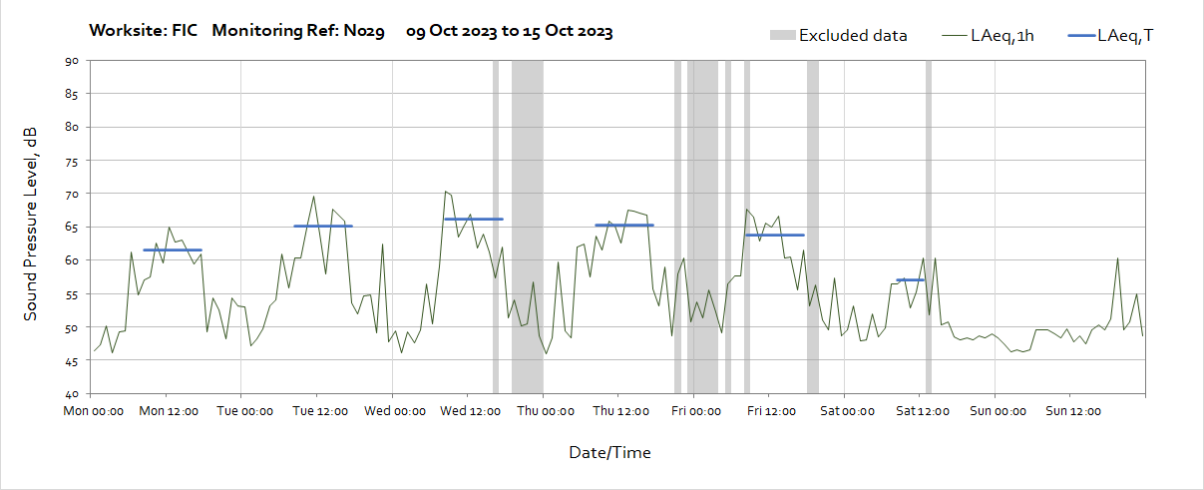
Date/Time



Worksite: FIC – Monitoring Ref: N029






Worksite: FIC Monitoring Ref: No29 09 Oct 2023 to 15 Oct 2023
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
90
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65
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Mon 00:00
Mon 12:00
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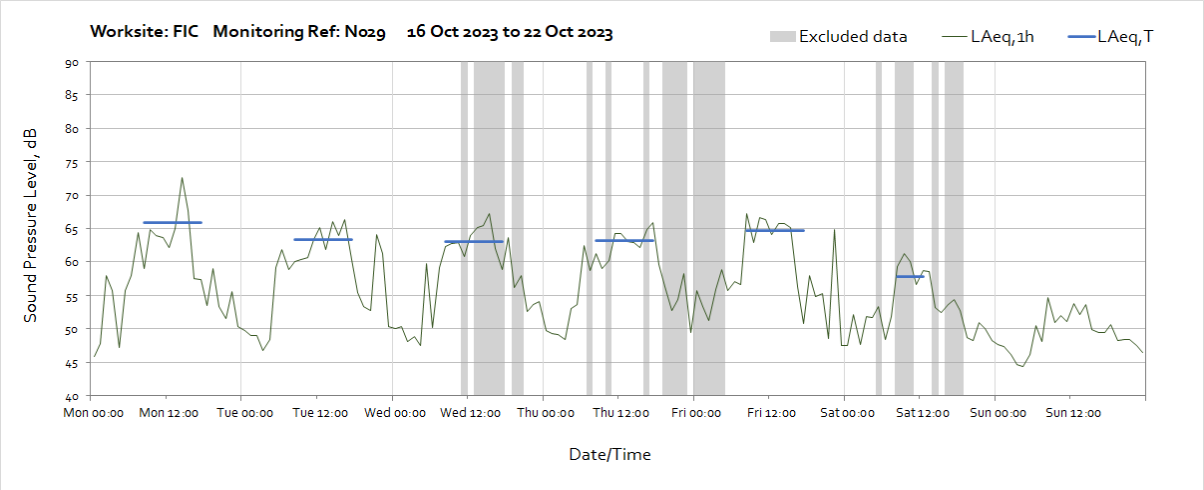
Sun 12:00
Date/Time


Worksite: FIC Monitoring Ref: No29 16 Oct 2023 to 22 Oct 2023
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
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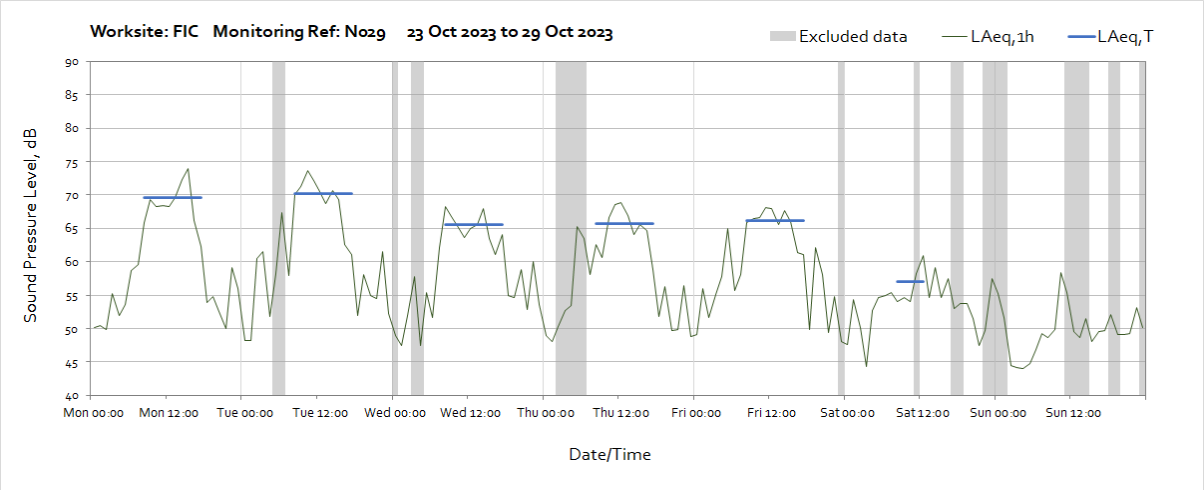
Date/Time


Worksite: FIC Monitoring Ref: No29 23 Oct 2023 to 29 Oct 2023
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
90
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Mon 00:00
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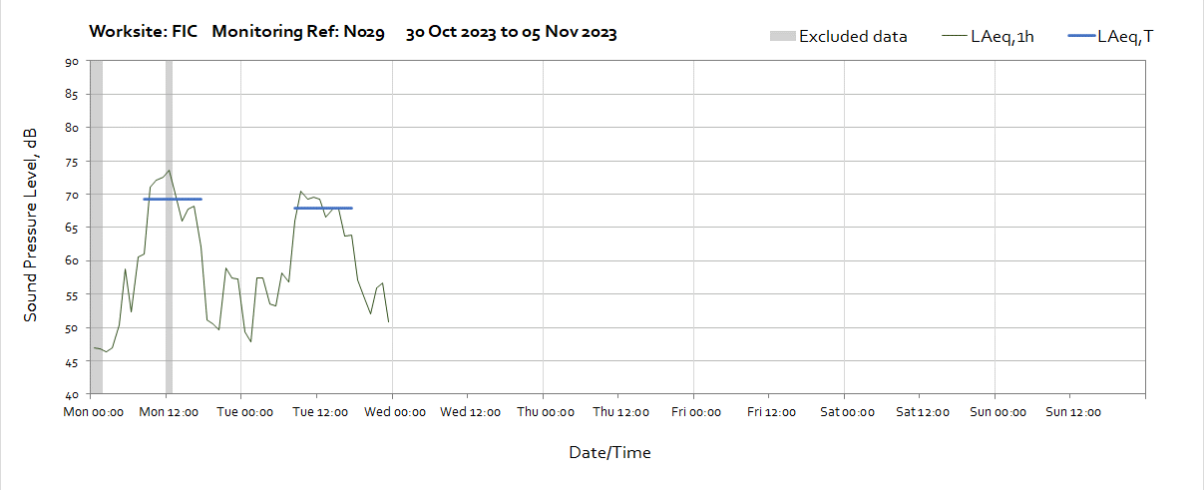
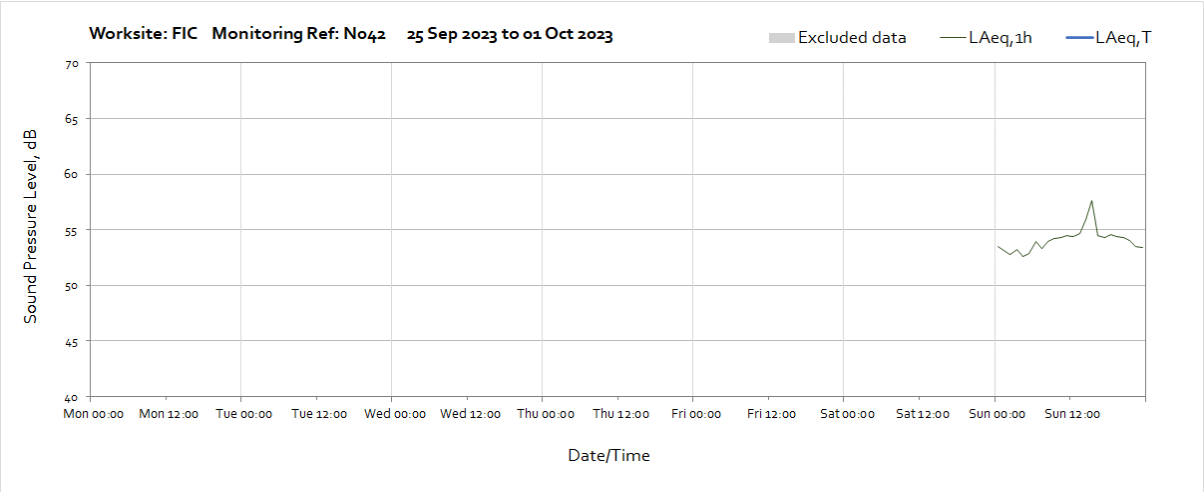
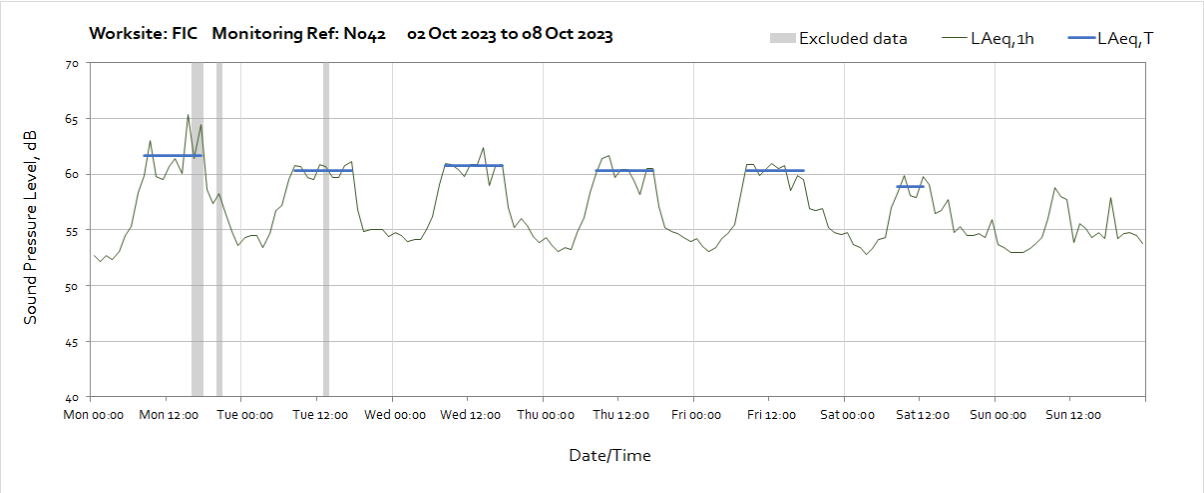
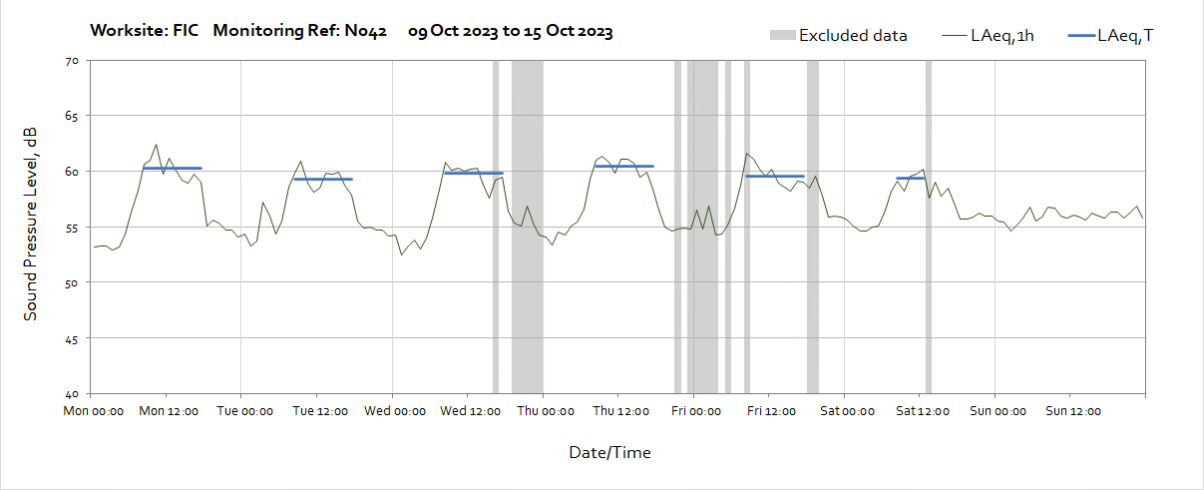
Date/Time



Worksite: FIC – Monitoring Ref: N042






Worksite: FIC Monitoring Ref: No42 09 Oct 2023 to 15 Oct 2023
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
70
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45
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Mon 00:00
Mon 12:00
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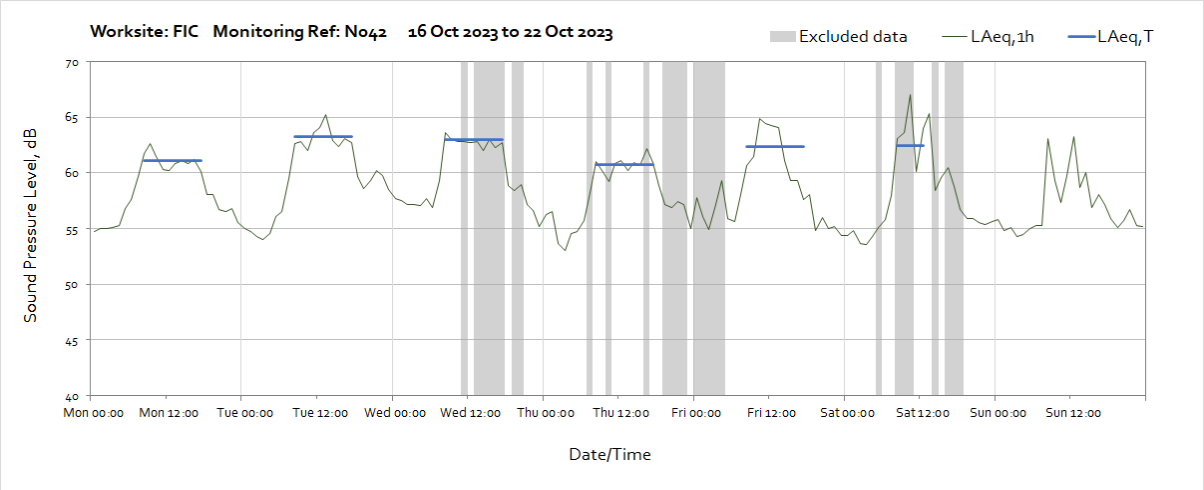
Date/Time


Worksite: FIC Monitoring Ref: No42 16 Oct 2023 to 22 Oct 2023
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
70
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45
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Mon 00:00
Mon 12:00
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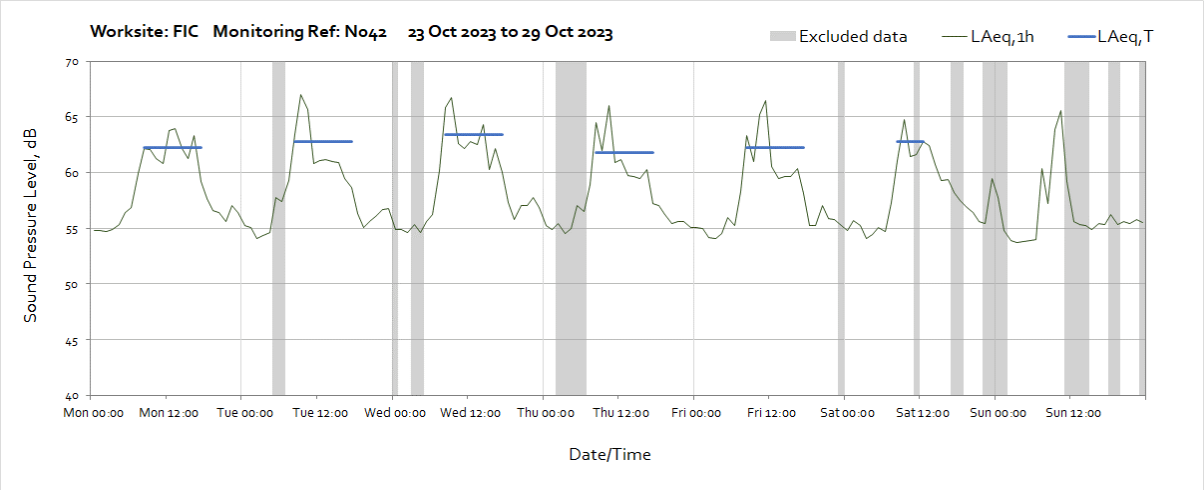
Date/Time


Worksite: FIC Monitoring Ref: No42 23 Oct 2023 to 29 Oct 2023
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
70
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60
55
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45
40
Mon 00:00
Mon 12:00
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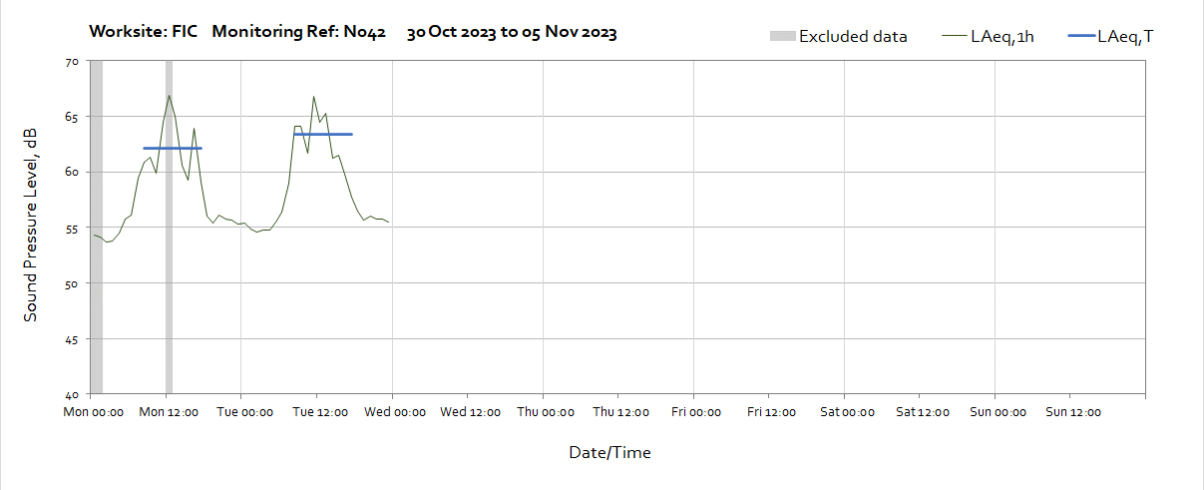
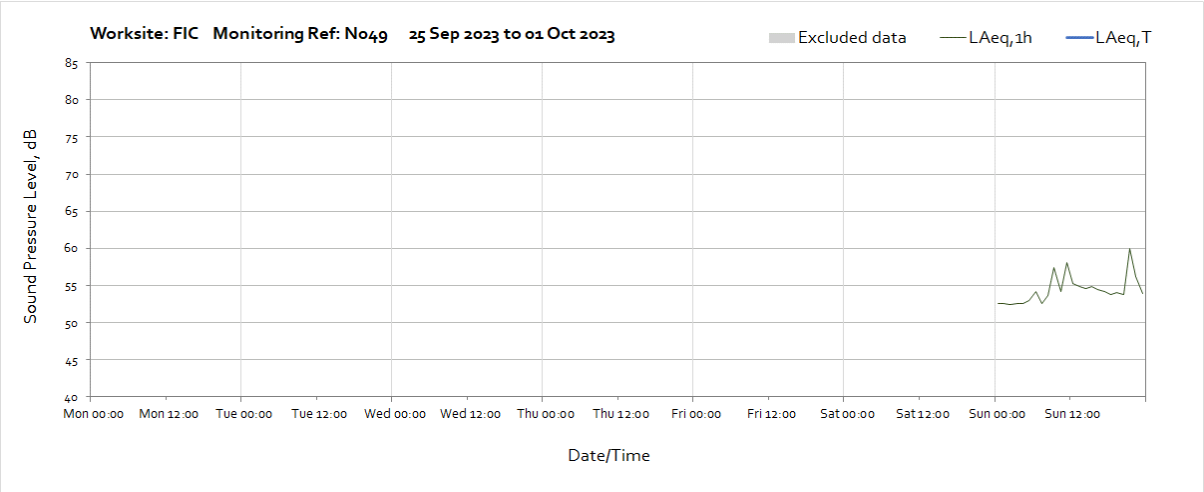
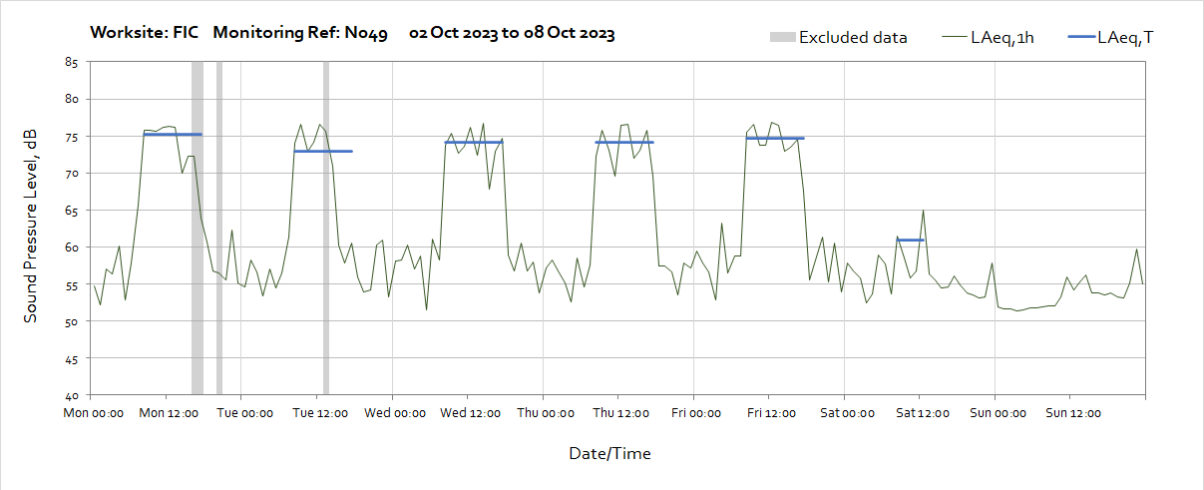
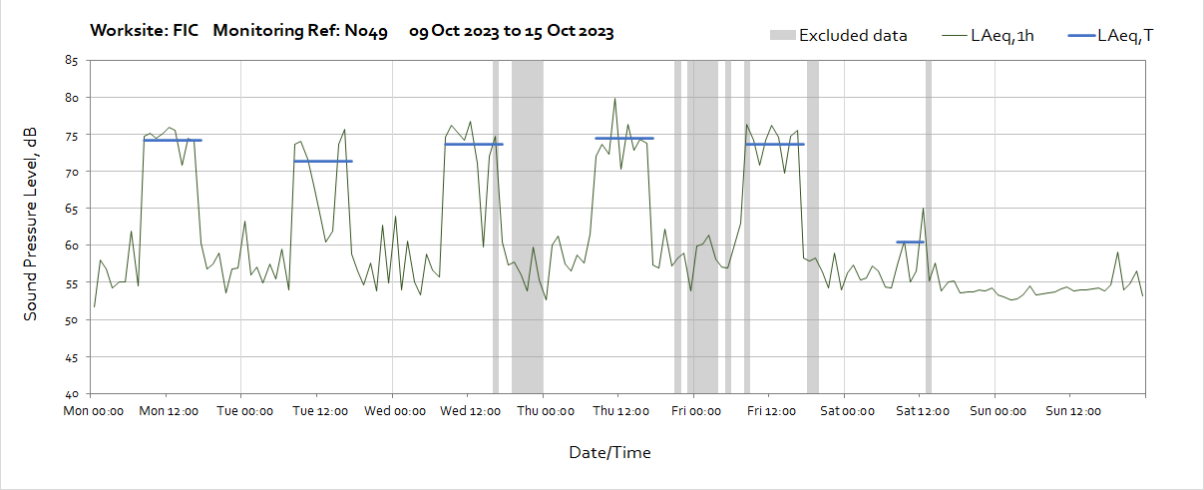
Date/Time

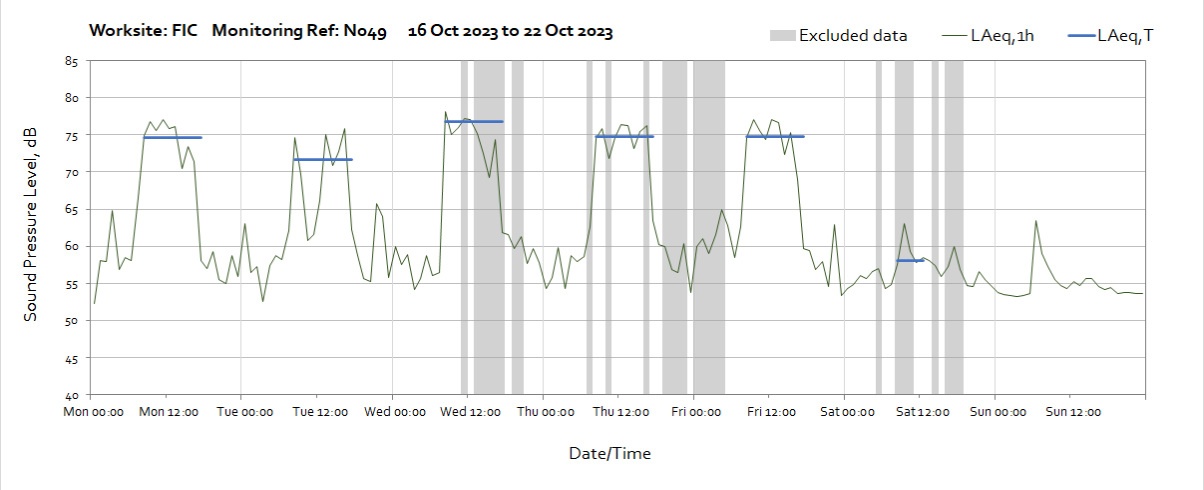


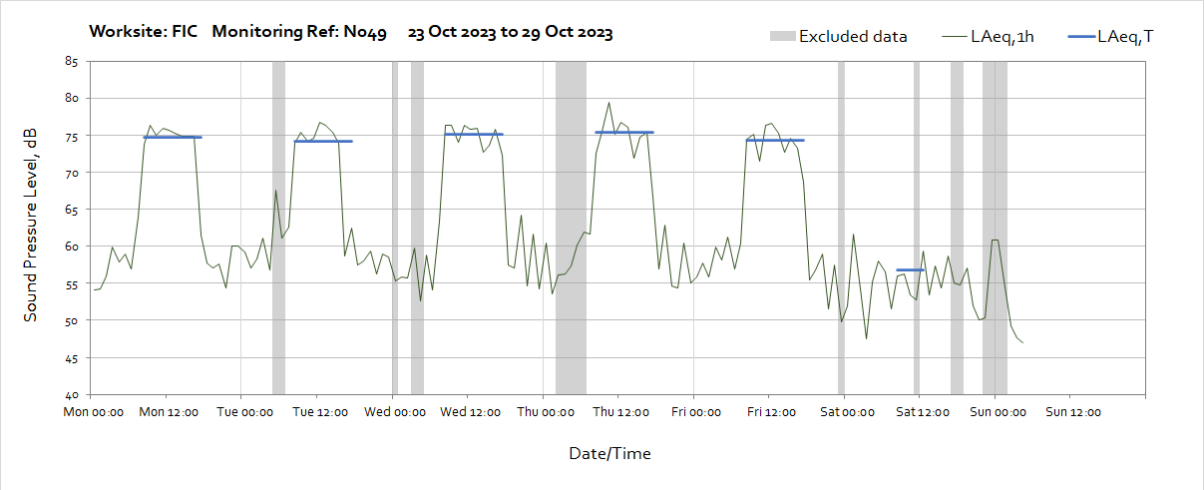
Worksite: FIC – Monitoring Ref: N049



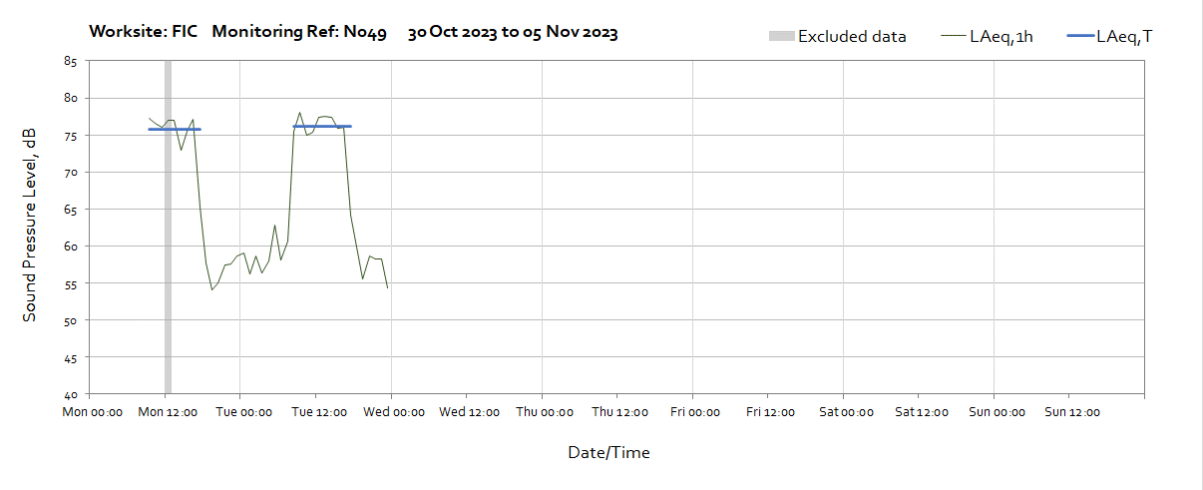






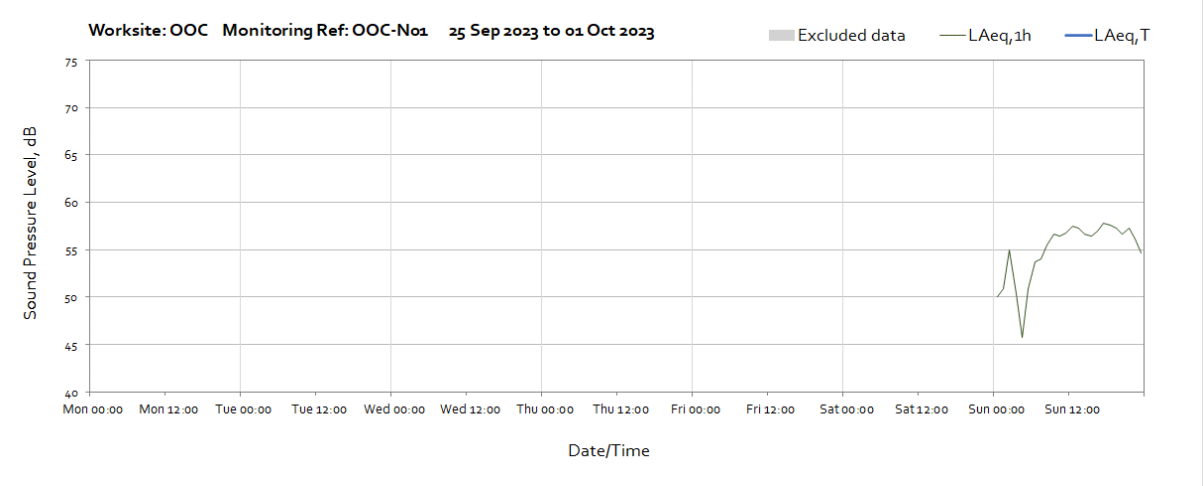


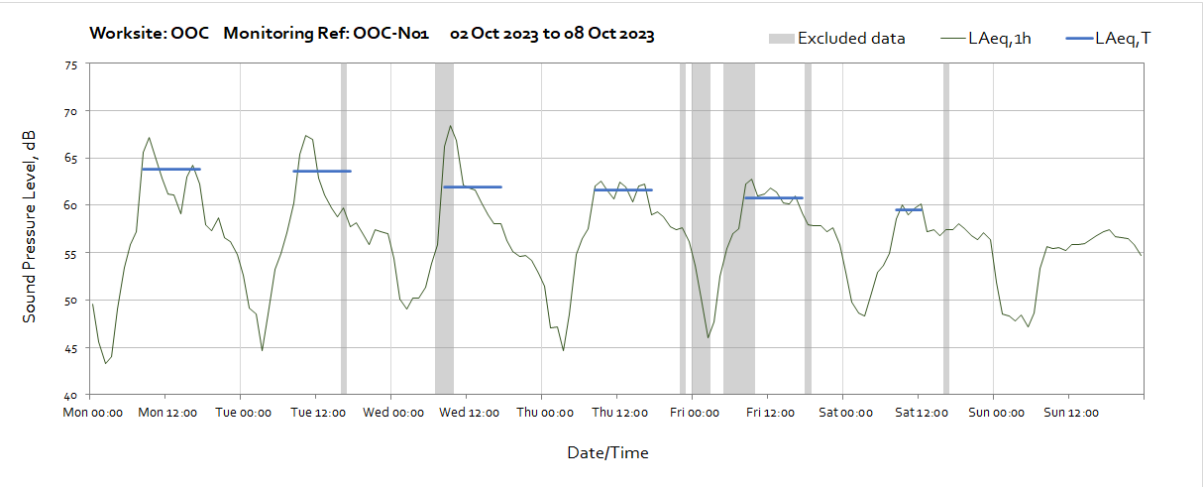
Note: Missing data between 05:00 on Sunday 29th October and 09:00 on Monday 30th October were due to loss of continous power at the monitoring station.

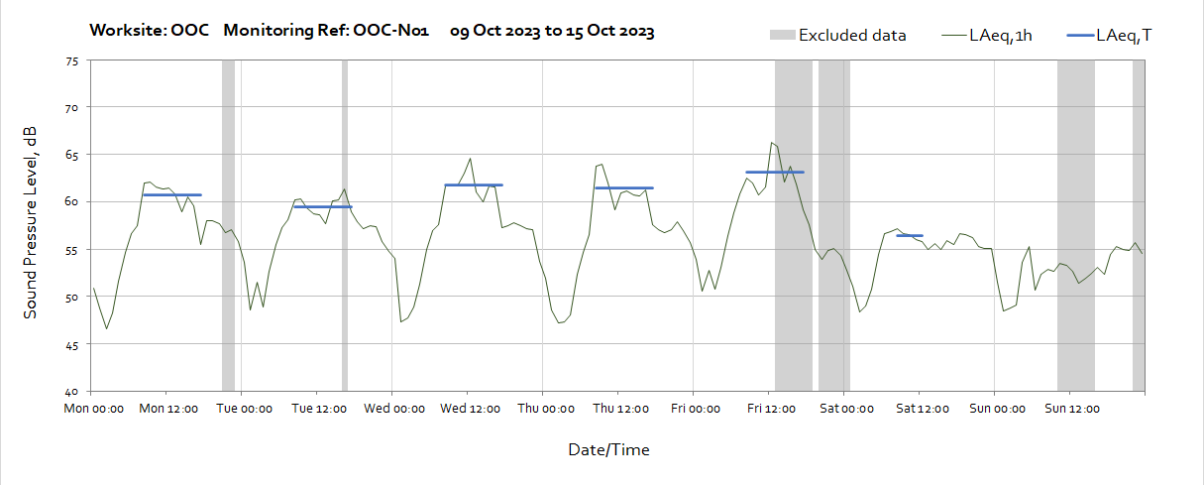


Note: Missing data between 05:00 on Sunday 29th October and 09:00 on Monday 30th October were due to loss of continous power at the monitoring station.

Worksite: OOC – Monitoring Ref: OOC-N01






Worksite: OOC Monitoring Ref: OOC-No1 09 Oct 2023 to 15 Oct 2023
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
75
70
65
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55
50
45
40
Mon 00:00
Mon 12:00
Tue 00:00
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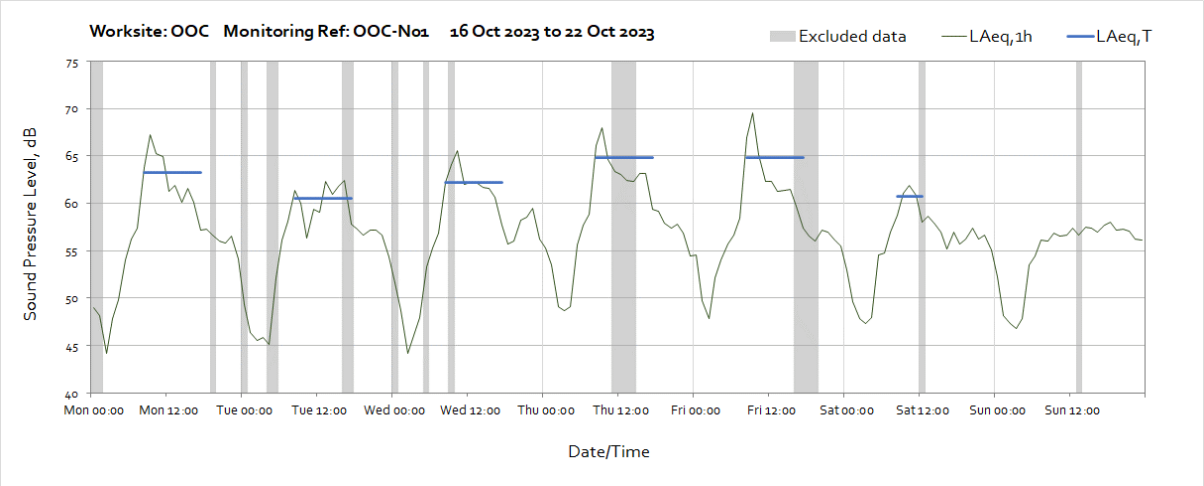
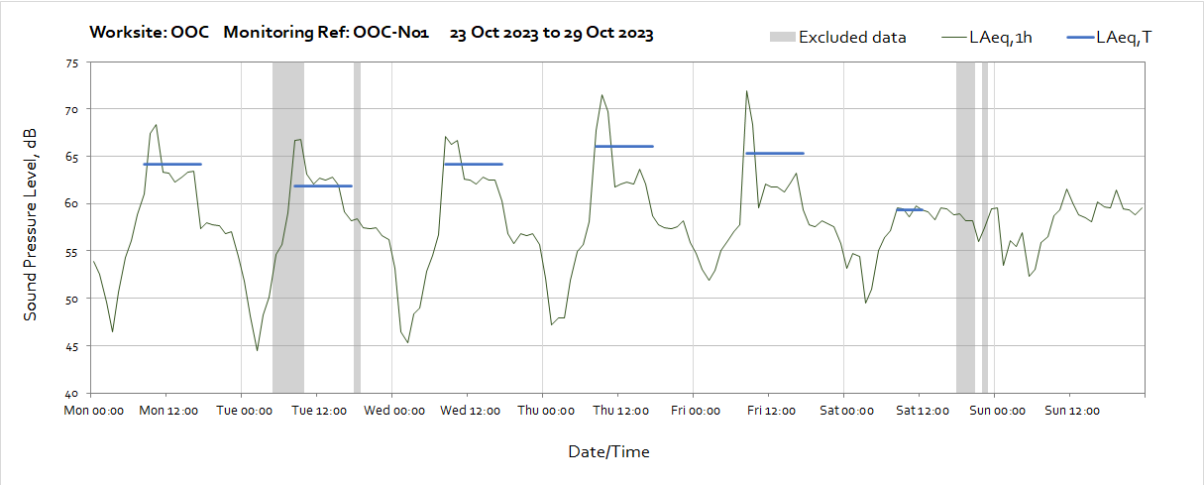
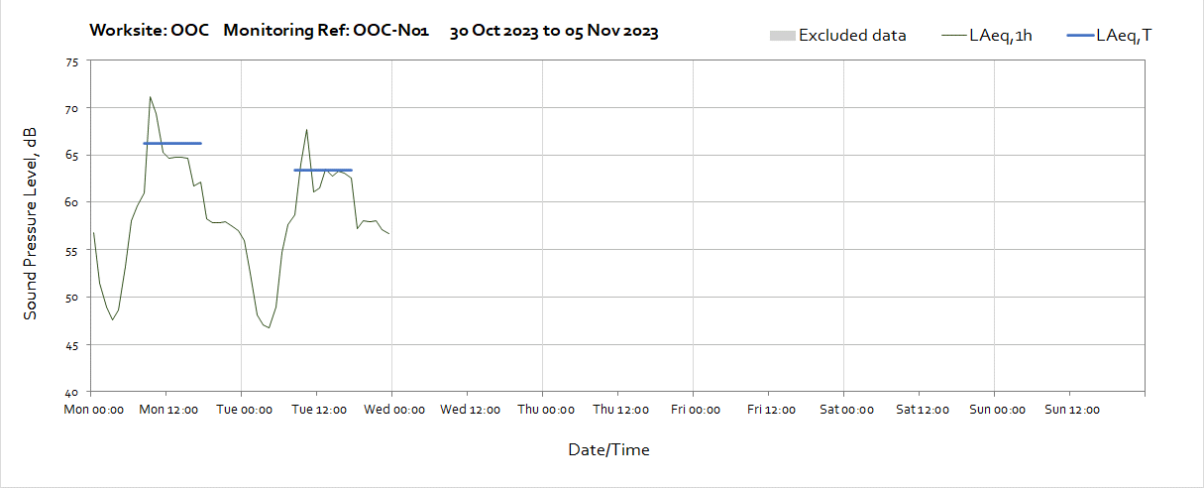
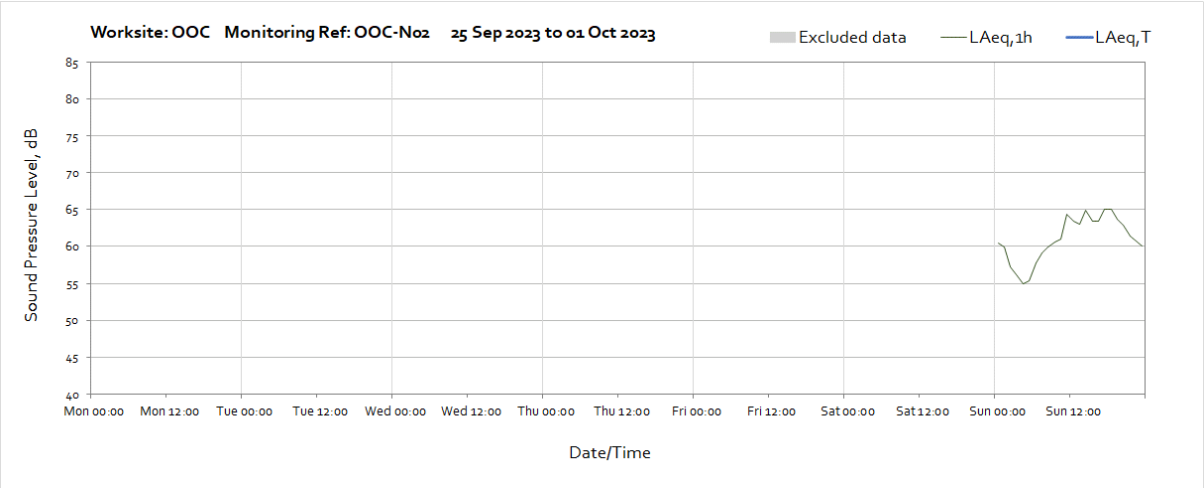
Sun 12:00
Date/Time

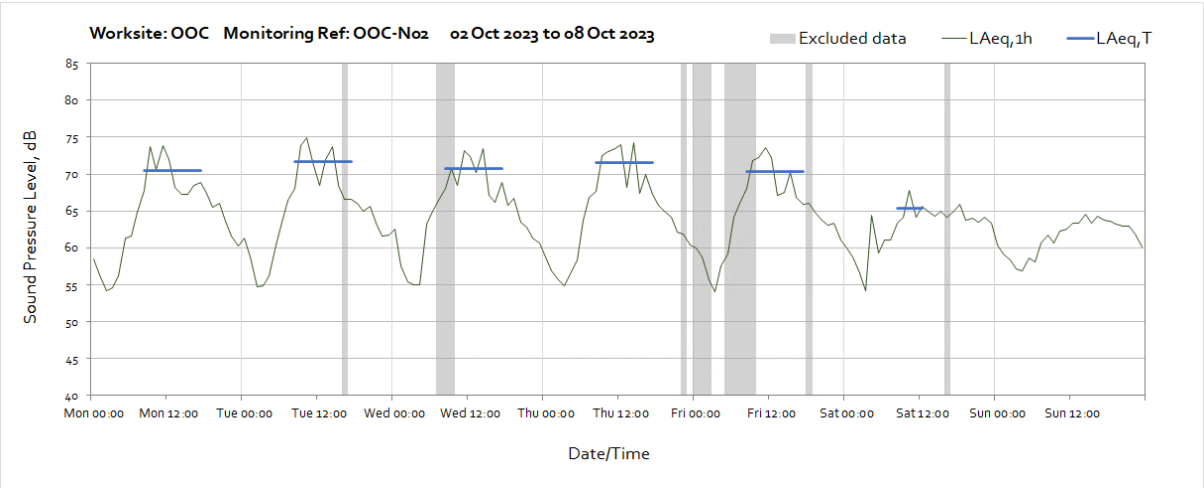

Worksite: OOC Monitoring Ref: OOC-No1 16 Oct 2023 to 22 Oct 2023
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
75
70
65
60
55
50
45
40
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
Wed 12:00
Thu 00:00
Thu 12:00
Fri 00:00
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time

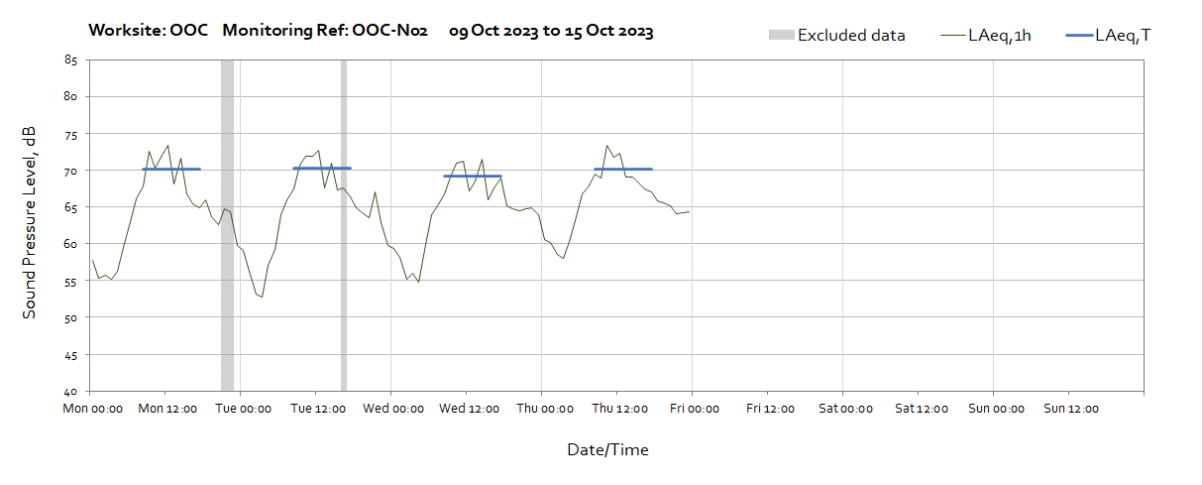

Worksite: OOC Monitoring Ref: OOC-No1 23 Oct 2023 to 29 Oct 2023
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
75
70
65
60
55
50
45
40
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
Wed 12:00
Thu 00:00
Thu 12:00
Fri 00:00
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time



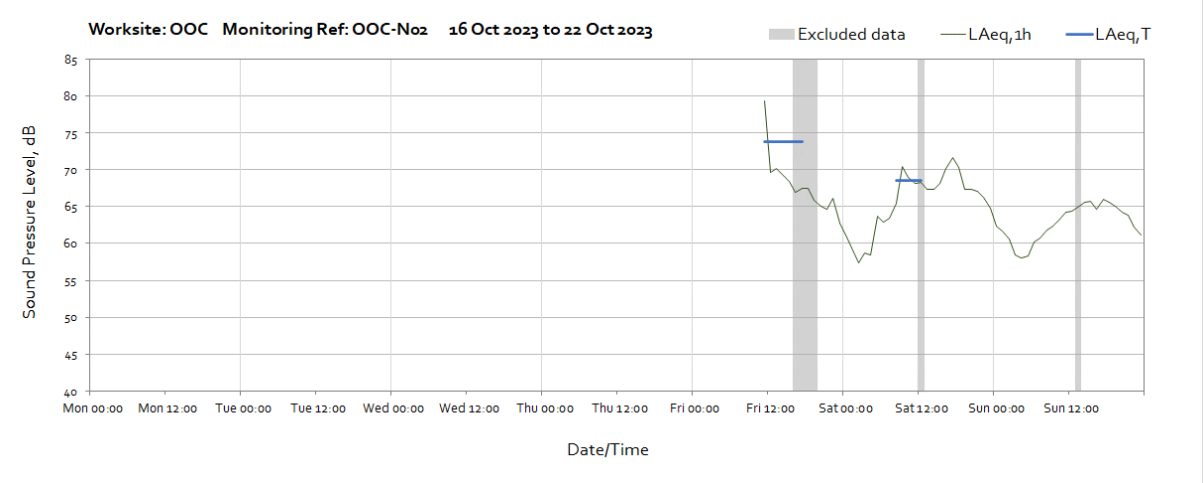
Worksite: OOC – Monitoring Ref: OOC-N02



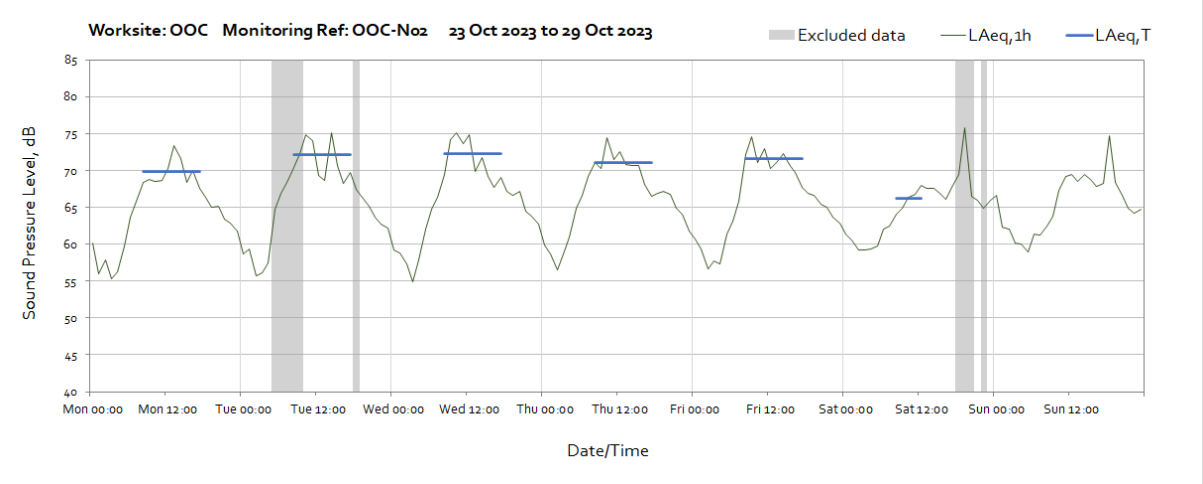


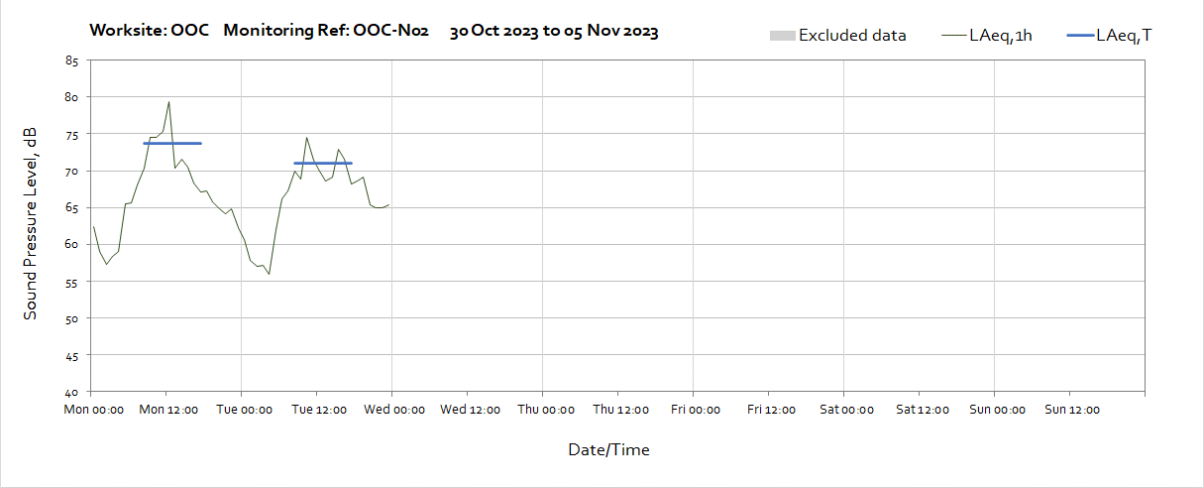


Note: Missing data between 00:00 on Friday 13th October and 11:00 on Friday 20th October were due to a data corruption error. A new monitor was installed to rectify the error.

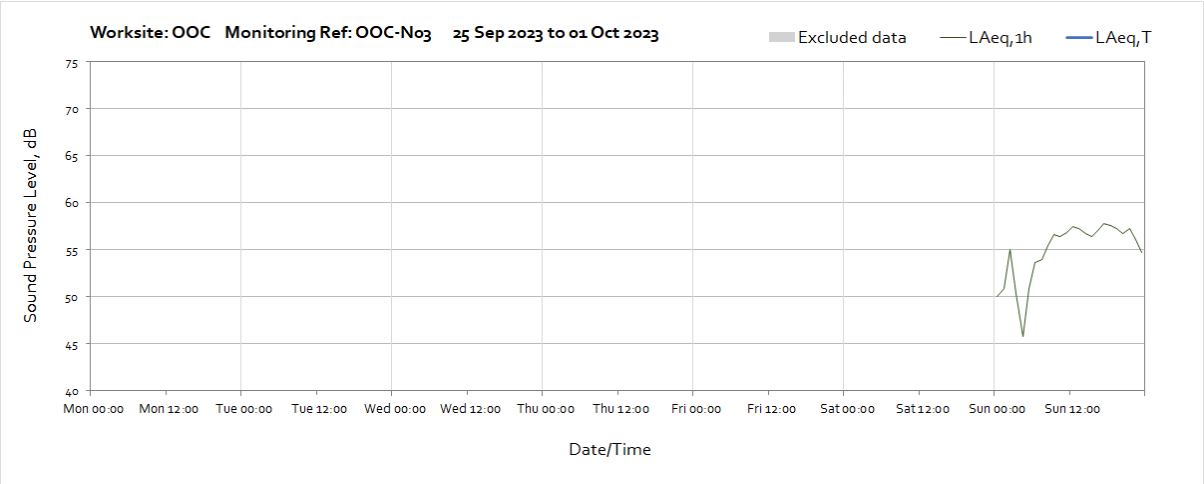


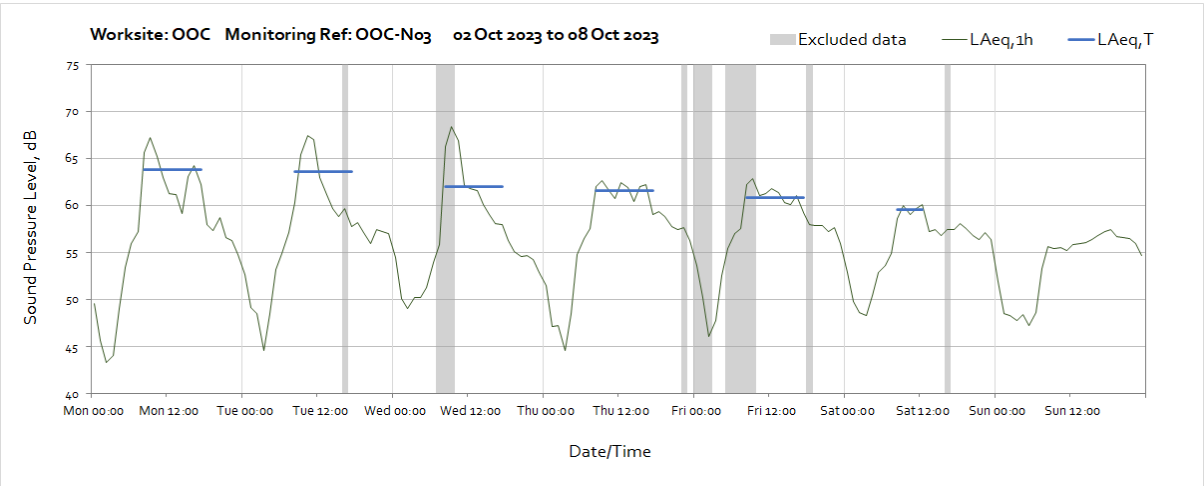
Note: Missing data between 00:00 on Friday 13th October and 11:00 on Friday 20th October were due to a data corruption error. A new monitor was installed to rectify the error.

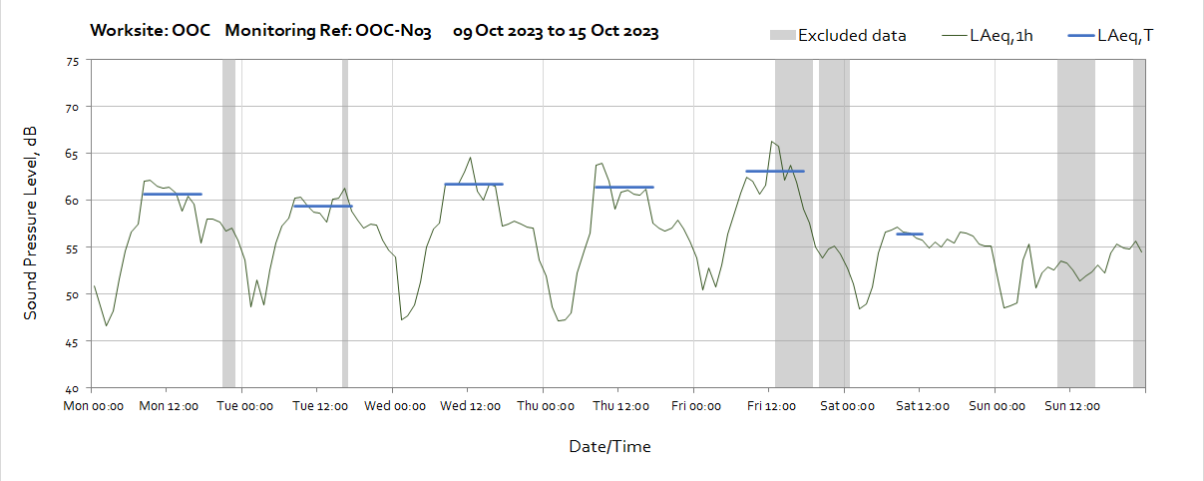


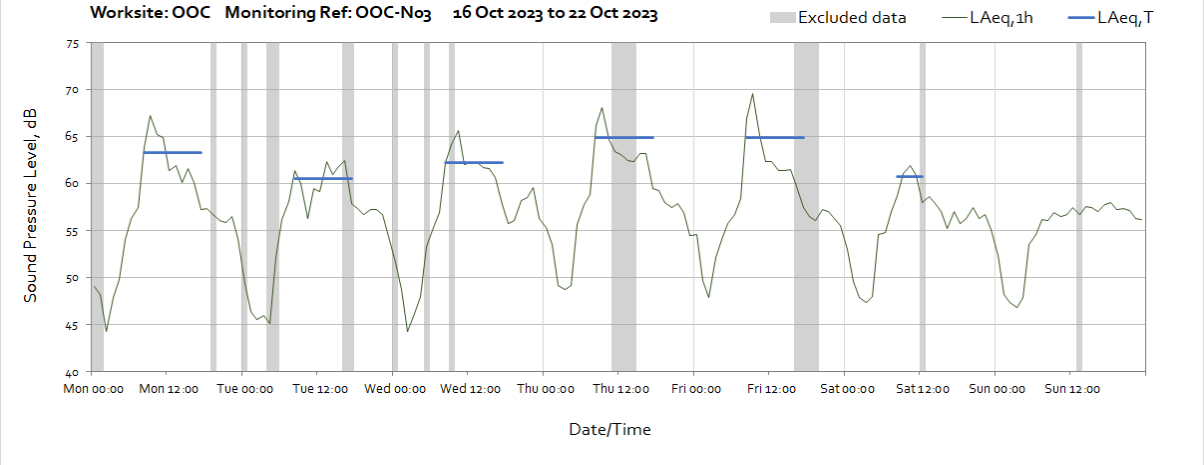


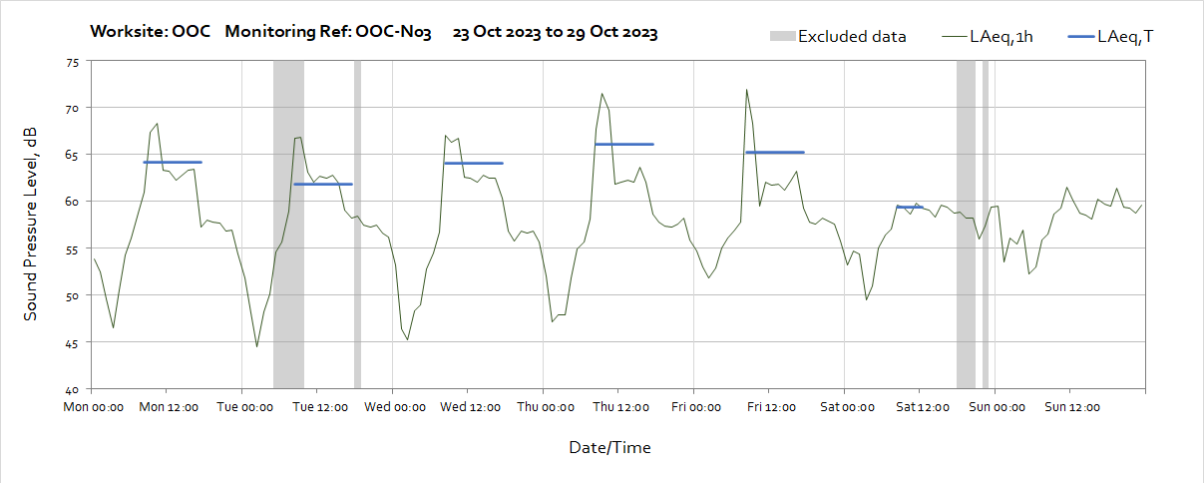
Worksite: OOC – Monitoring Ref: OOC-N03

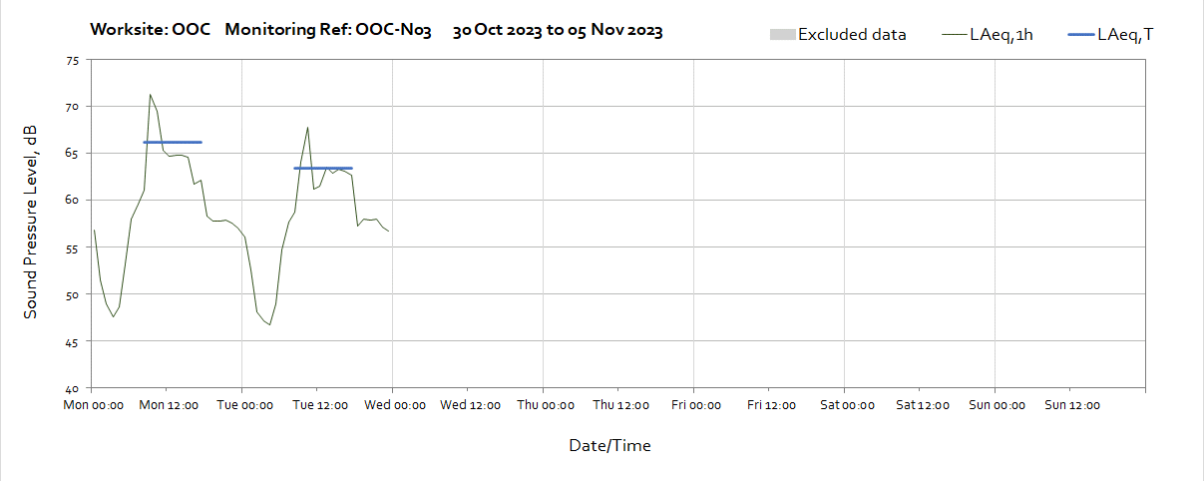





Worksite: OOC Monitoring Ref: OOC-No3 09 Oct 2023 to 15 Oct 2023
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
75
70
65
60
55
50
45
40
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
Wed 12:00
Thu 00:00
Thu 12:00
Fri 00:00
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time


Worksite: OOC Monitoring Ref: OOC-No3 16 Oct 2023 to 22 Oct 2023
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
75
70
65
60
55
50
45
40
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
Wed 12:00
Thu 00:00
Thu 12:00
Fri 00:00
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time

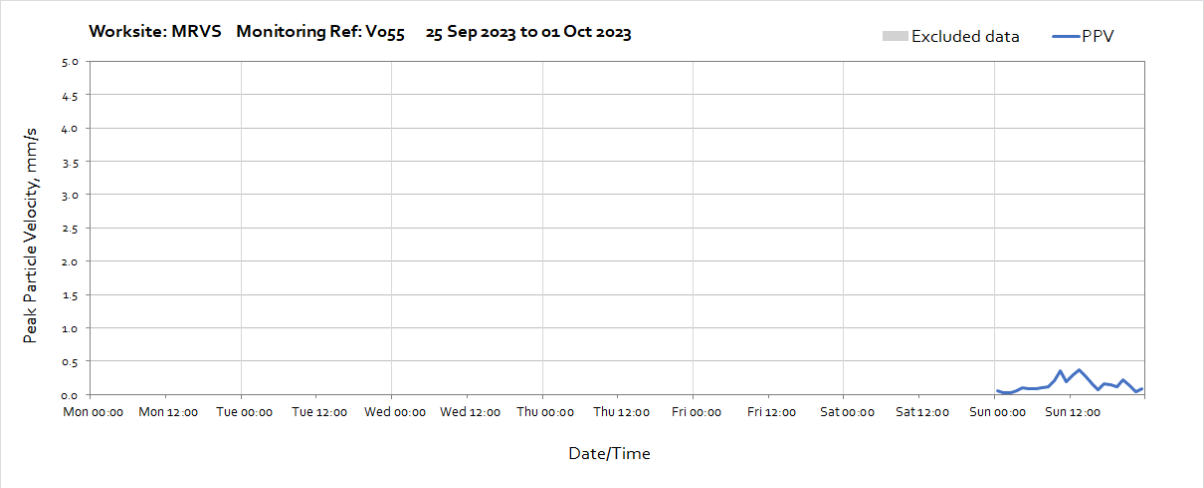

Worksite: OOC Monitoring Ref: OOC-No3 23 Oct 2023 to 29 Oct 2023
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
75
70
65
60
55
50
45
40
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
Wed 12:00
Thu 00:00
Thu 12:00
Fri 00:00
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time

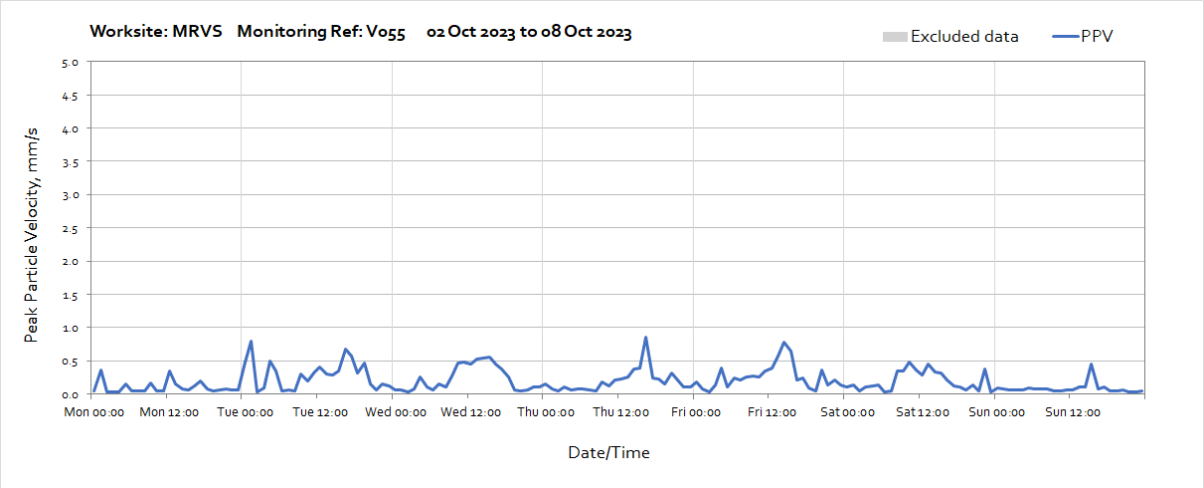

Worksite: OOC Monitoring Ref: OOC-N03 30 Oct 2023 to 05 Nov 2023
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
75
70
65
60
55
50
45
40
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
Wed 12:00
Thu 00:00
Thu 12:00
Fri 00:00
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time

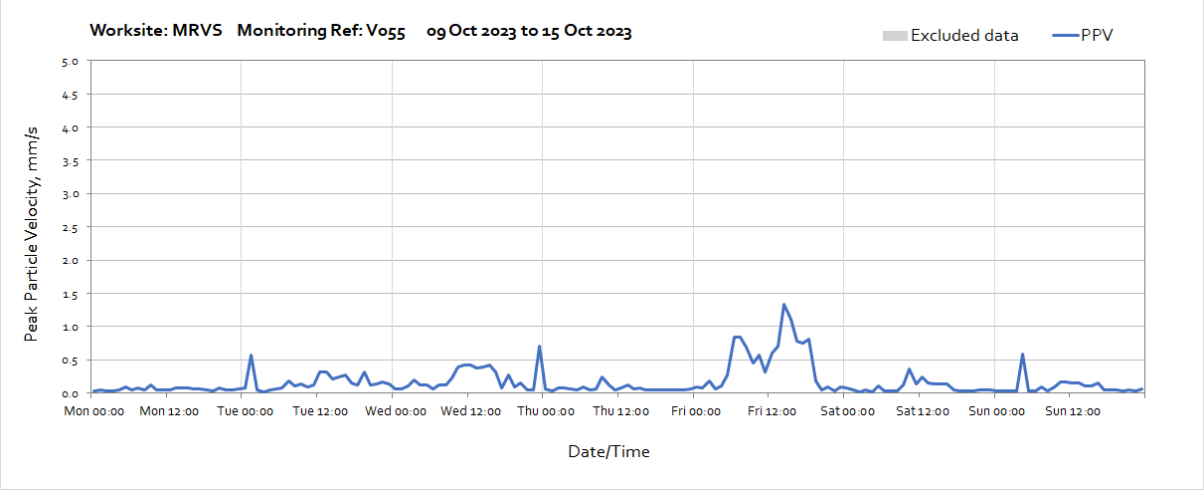
Vibration

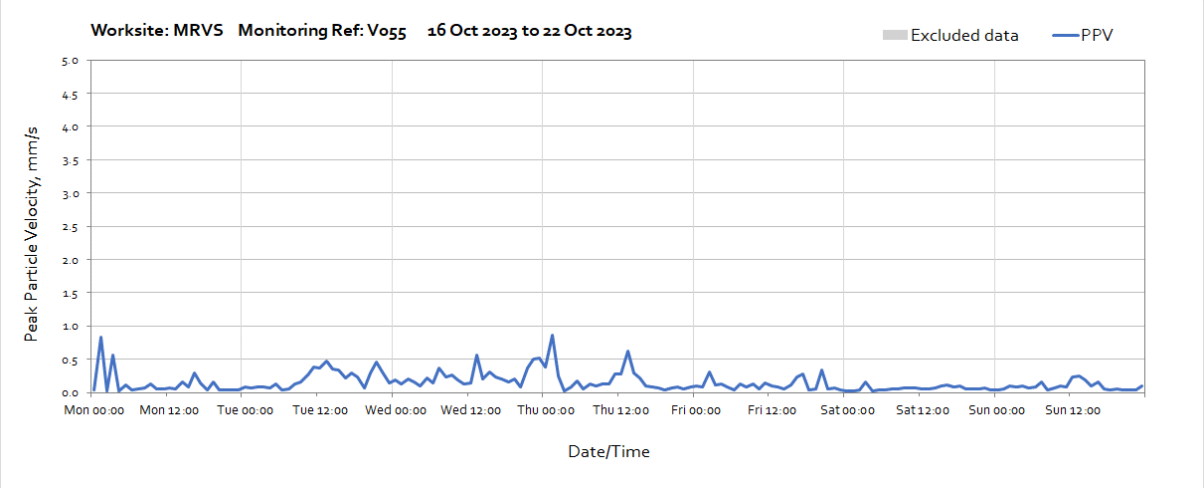
The following graphs show the hourly measured peak particle velocity PPV recorded during the monitoring period. The graphs show the highest PPV of the three orthogonal axis x, y and z. Periods where PPV values have been affected by local interference with the vibration monitor or only measured for part of the period, which are not representative of HS2 construction works, have been greyed out and excluded when calculating values in Table 4 of the main report.

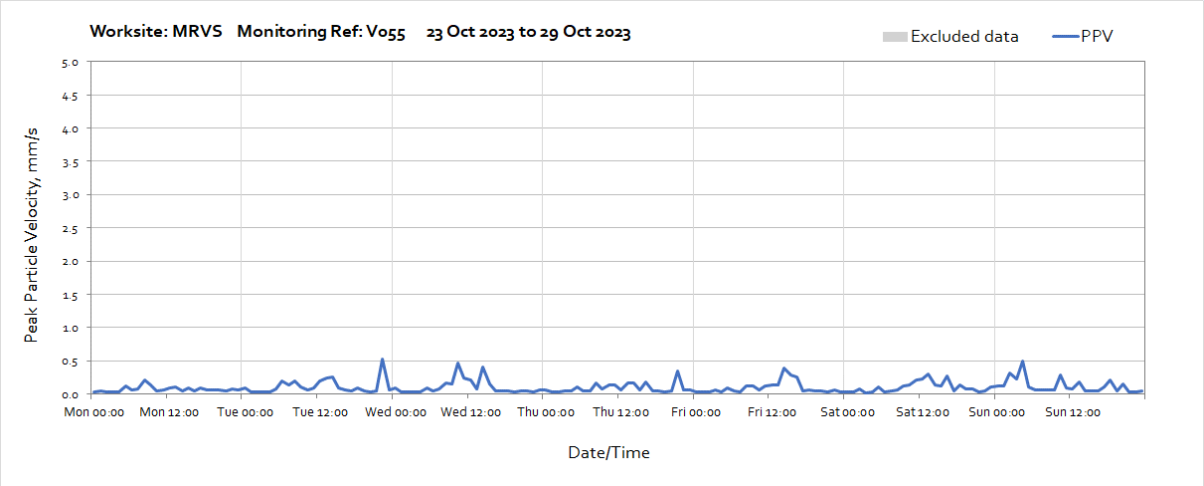
Worksite: MRVS – Monitoring Ref: V055

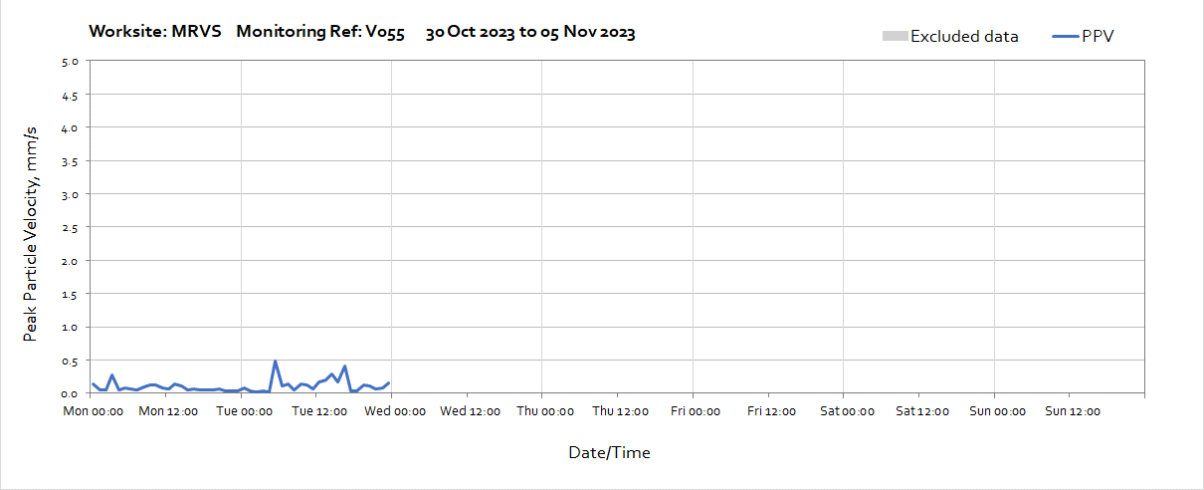




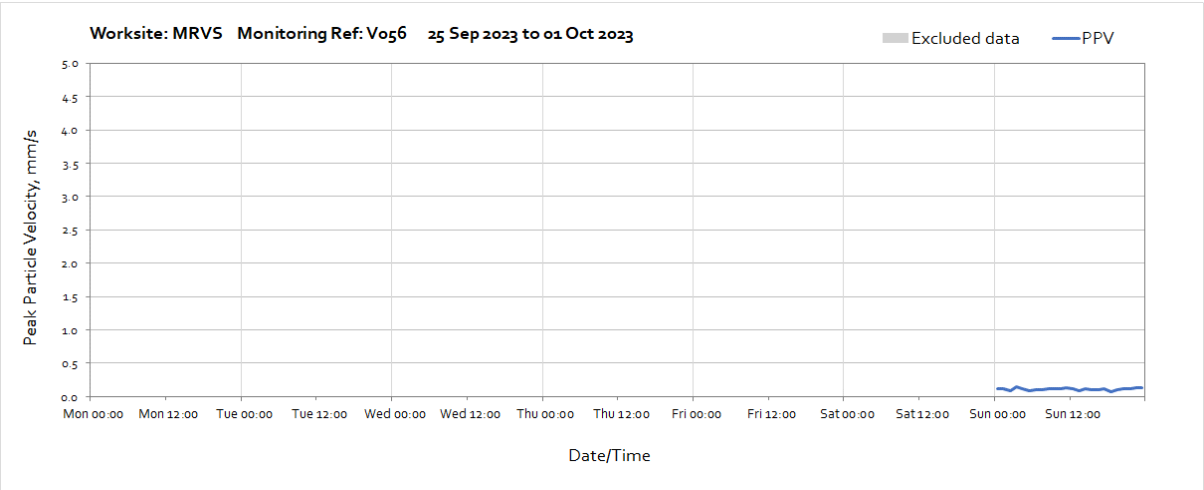

Worksite: MRVS Monitoring Ref: V055 09 Oct 2023 to 15 Oct 2023
Excluded data
PPV
Peak Particle Velocity, mm/s
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
Wed 12:00
Thu 00:00
Thu 12:00
Fri 00:00
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time

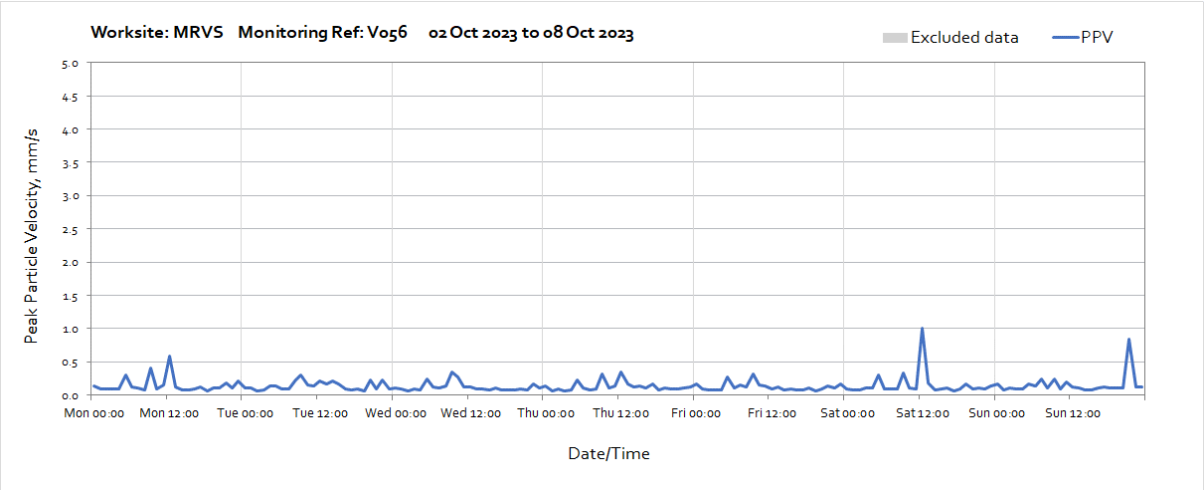

Worksite: MRVS Monitoring Ref: V055 16 Oct 2023 to 22 Oct 2023
Excluded data
PPV
Peak Particle Velocity, mm/s
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
Wed 12:00
Thu 00:00
Thu 12:00
Fri 00:00
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time

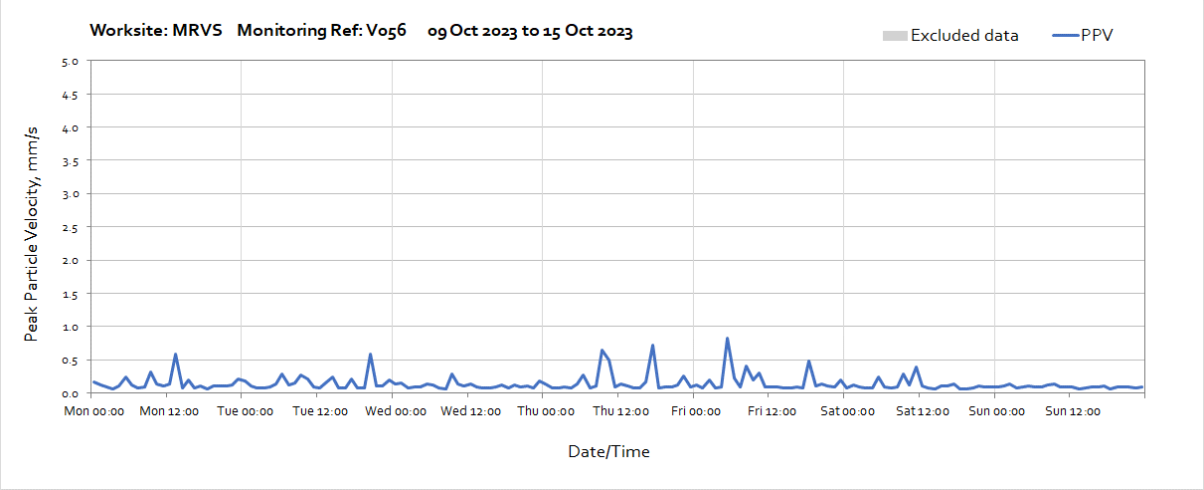

Worksite: MRVS Monitoring Ref: V055 23 Oct 2023 to 29 Oct 2023
Excluded data
PPV
Peak Particle Velocity, mm/s
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
Wed 12:00
Thu 00:00
Thu 12:00
Fri 00:00
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time

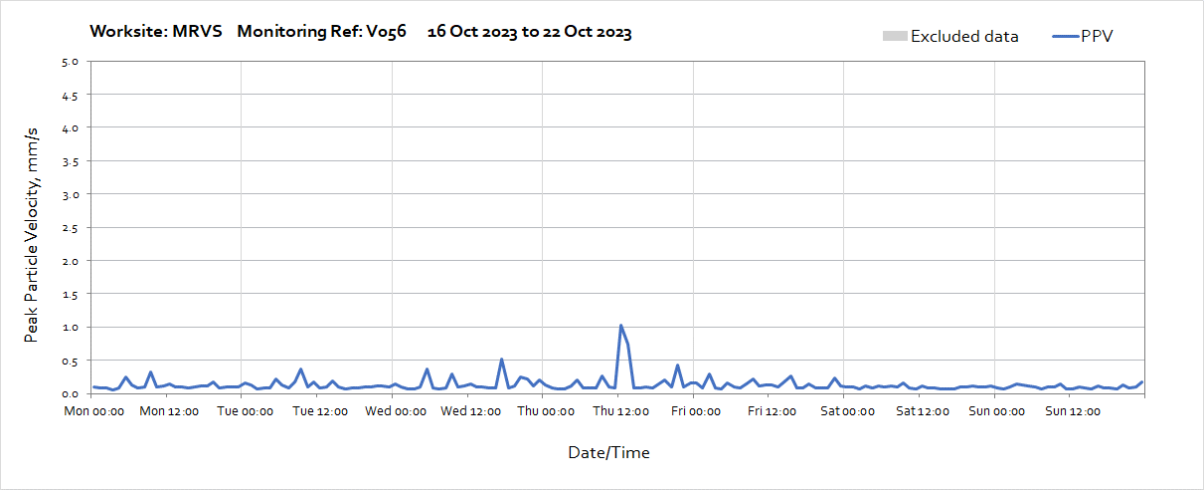


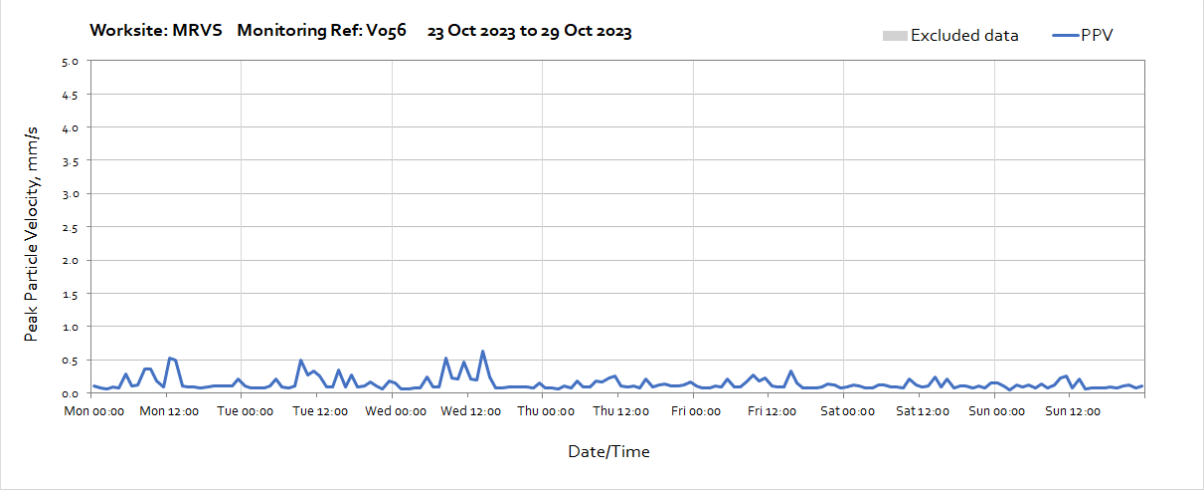
Worksite: MRVS – Monitoring Ref: V056

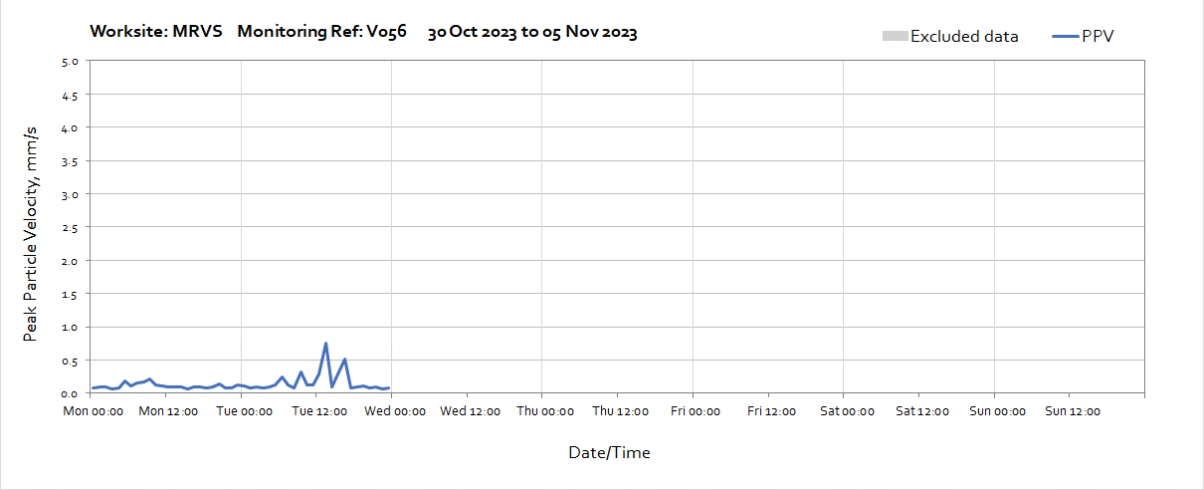




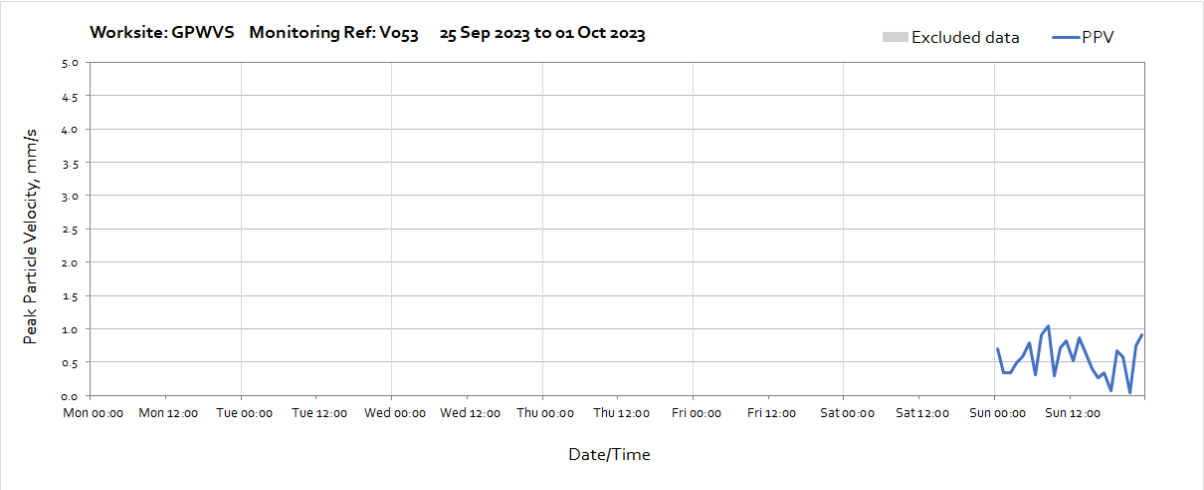

Worksite: MRVS Monitoring Ref: V056 09 Oct 2023 to 15 Oct 2023
Excluded data
PPV
Peak Particle Velocity, mm/s
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
Wed 12:00
Thu 00:00
Thu 12:00
Fri 00:00
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time

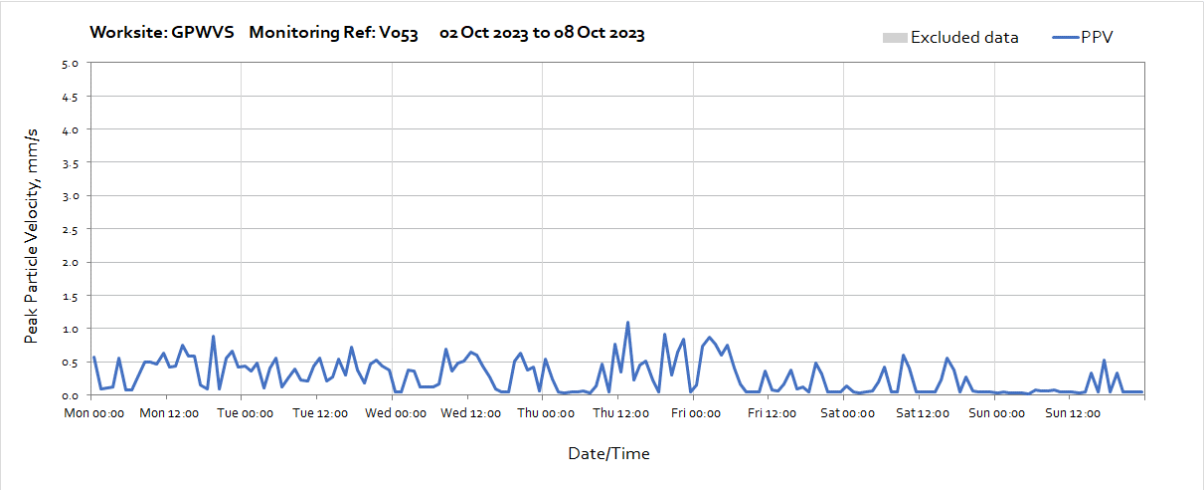

Worksite: MRVS Monitoring Ref: V056 16 Oct 2023 to 22 Oct 2023
Excluded data
PPV
Peak Particle Velocity, mm/s
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
Wed 12:00
Thu 00:00
Thu 12:00
Fri 00:00
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time

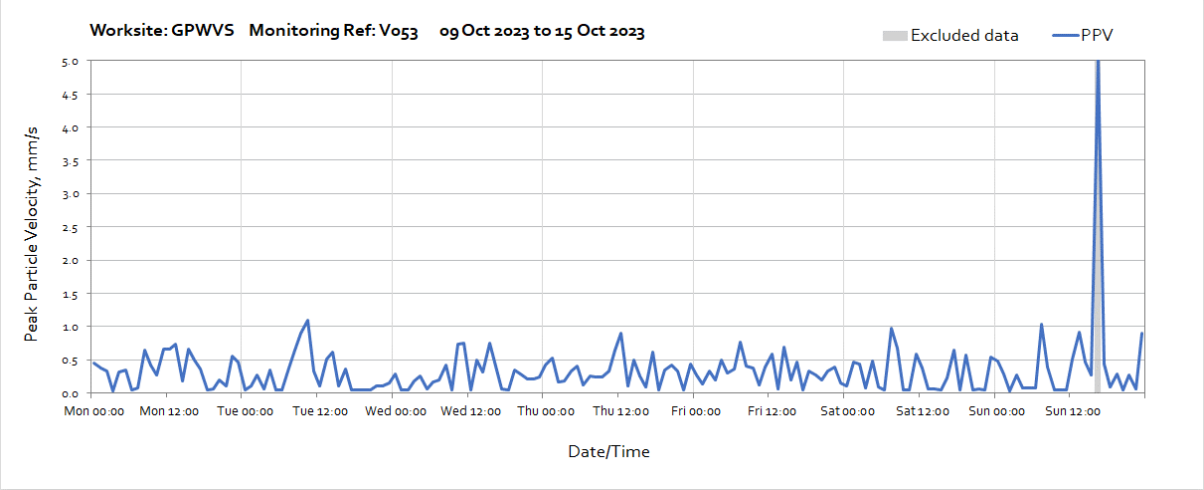

Worksite: MRVS Monitoring Ref: V056 23 Oct 2023 to 29 Oct 2023
Excluded data
PPV
Peak Particle Velocity, mm/s
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
Wed 12:00
Thu 00:00
Thu 12:00
Fri 00:00
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time

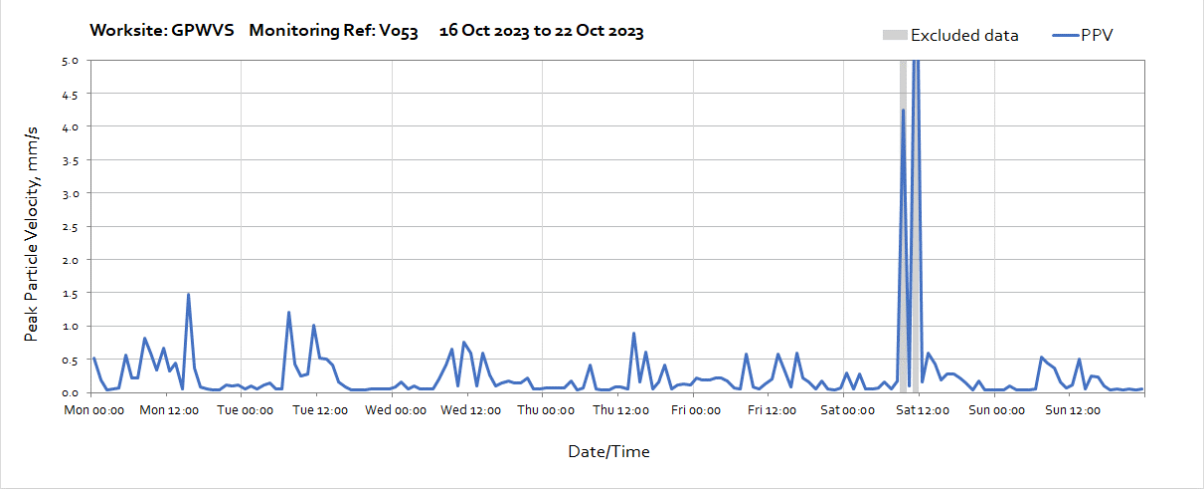


Worksite: GPWVS – Monitoring Ref: V053






Worksite: GPWVS Monitoring Ref: V053 09 Oct 2023 to 15 Oct 2023
Excluded data
PPV
Peak Particle Velocity, mm/s
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
Wed 12:00
Thu 00:00
Thu 12:00
Fri 00:00
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time


Worksite: GPWVS Monitoring Ref: V053 16 Oct 2023 to 22 Oct 2023
Excluded data
PPV
Peak Particle Velocity, mm/s
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
Wed 12:00
Thu 00:00
Thu 12:00
Fri 00:00
Fri 12:00
Sat 00:00
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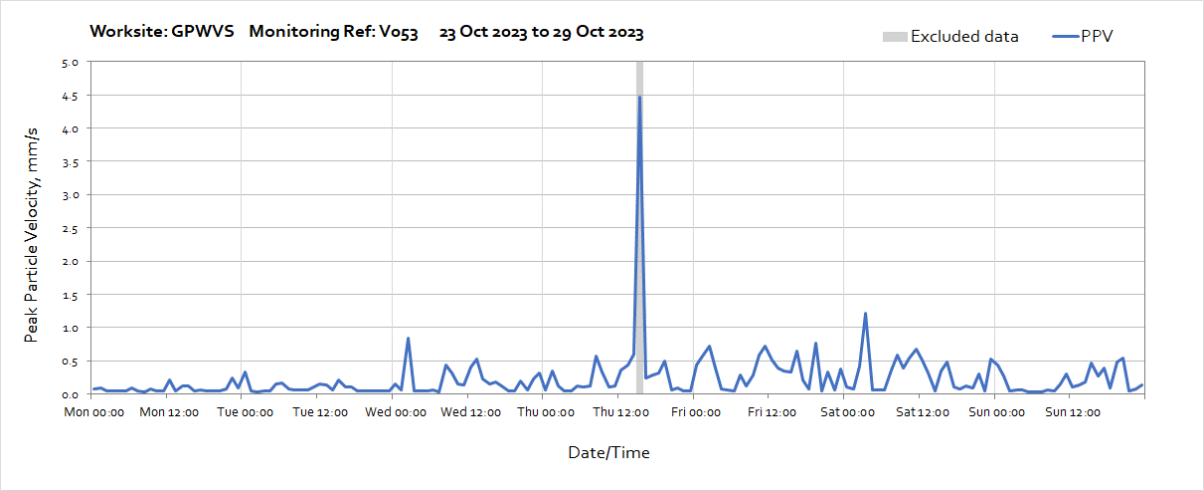
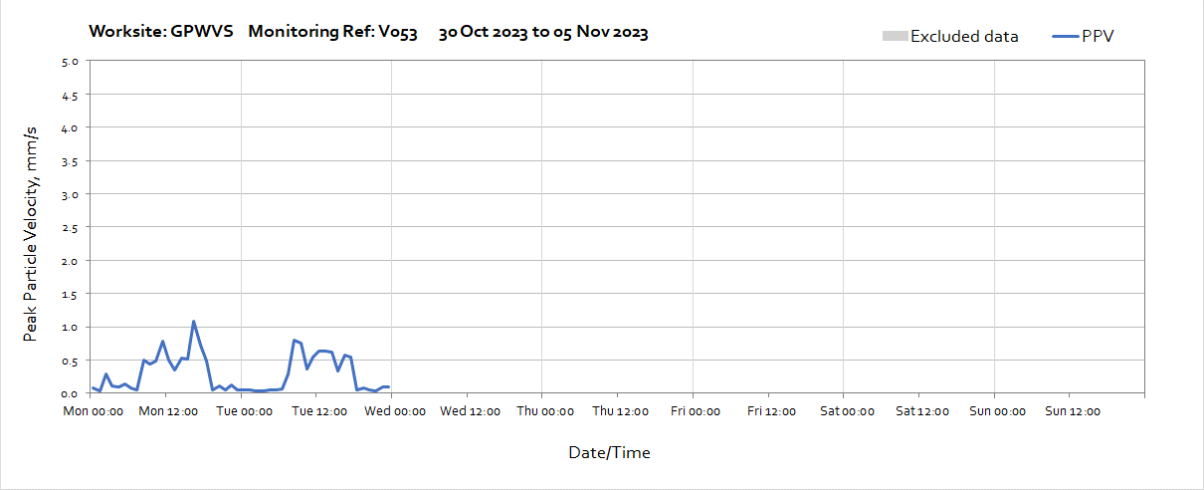
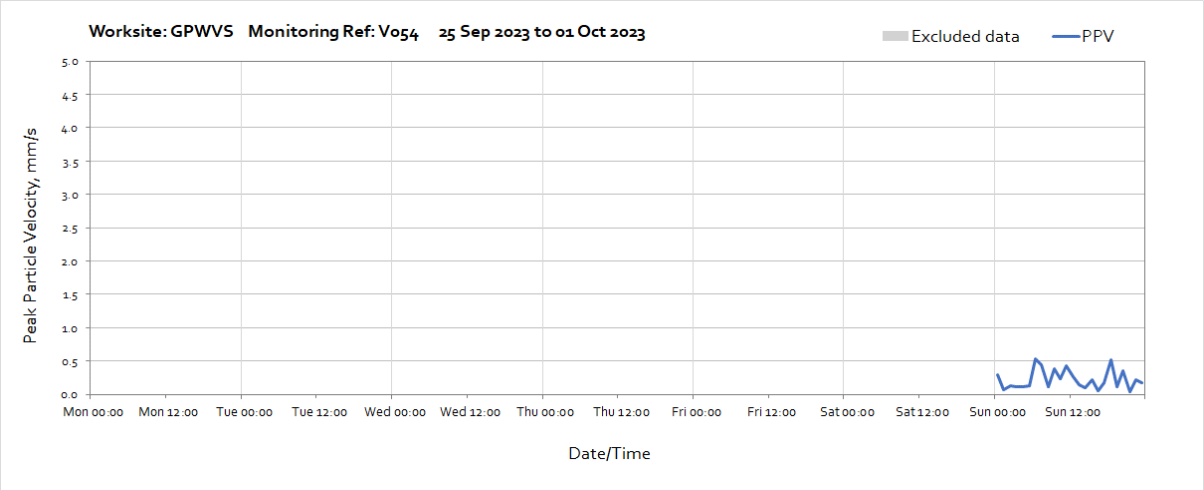
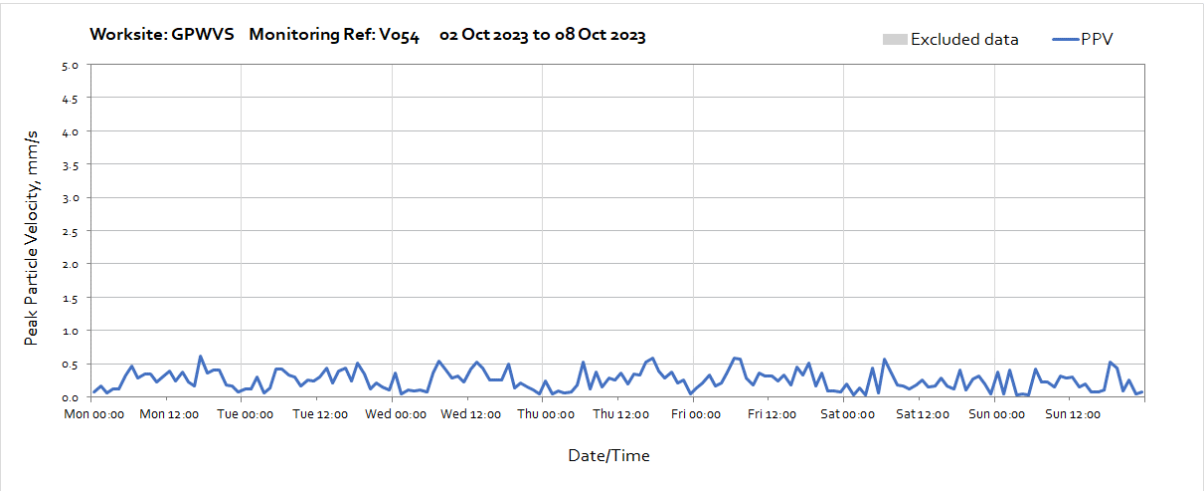
Sun 12:00
Date/Time

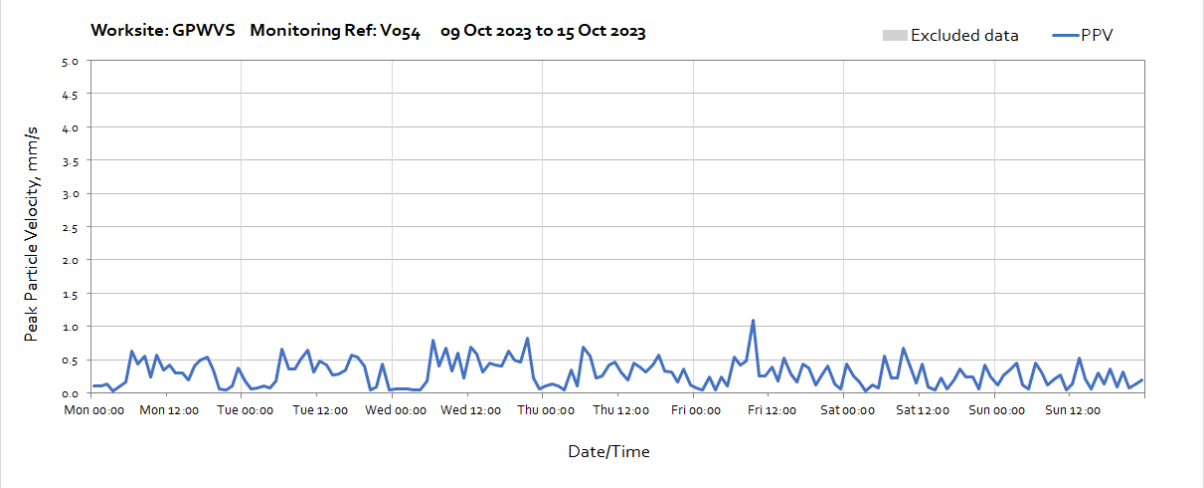

Worksite: GPWVS Monitoring Ref: V053 23 Oct 2023 to 29 Oct 2023
Excluded data
PPV
Peak Particle Velocity, mm/s
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
Wed 12:00
Thu 00:00
Thu 12:00
Fri 00:00
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time

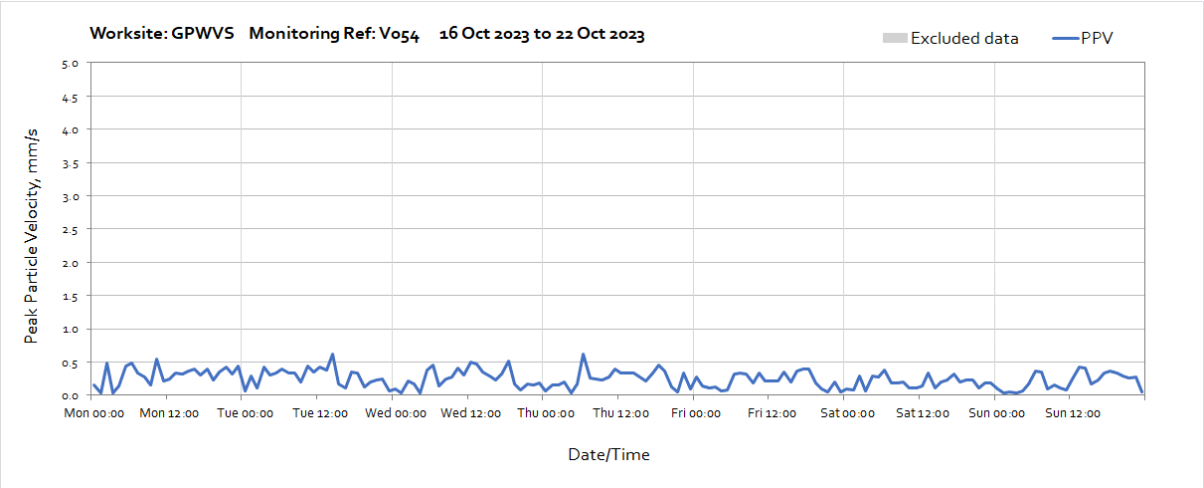


Worksite: GPWVS – Monitoring Ref: V054






Worksite: GPWVS Monitoring Ref: Vo54 09 Oct 2023 to 15 Oct 2023
Excluded data
PPV
Peak Particle Velocity, mm/s
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
Wed 12:00
Thu 00:00
Thu 12:00
Fri 00:00
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time


Worksite: GPWVS Monitoring Ref: Vo54 16 Oct 2023 to 22 Oct 2023
Excluded data
PPV
Peak Particle Velocity, mm/s
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
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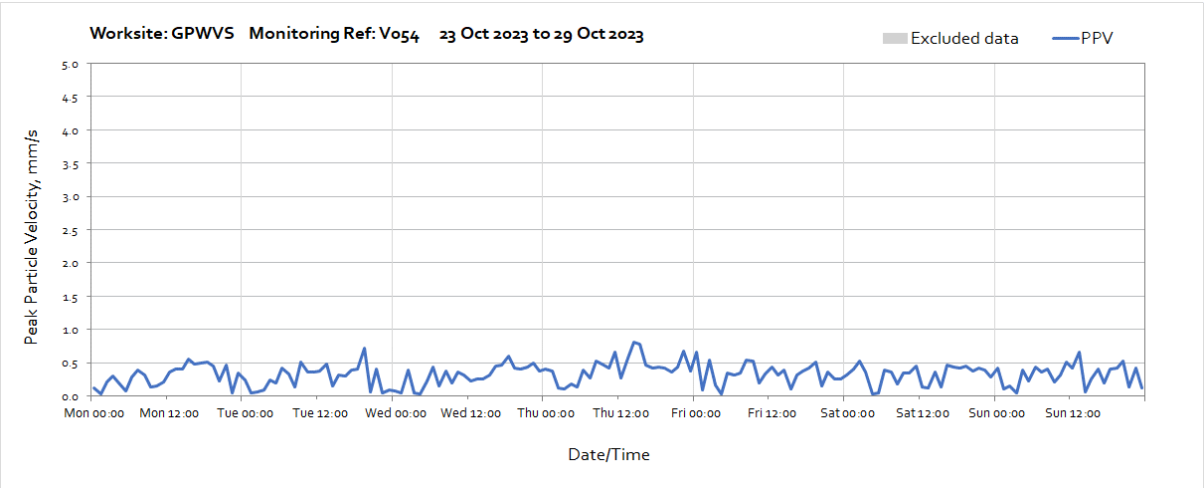
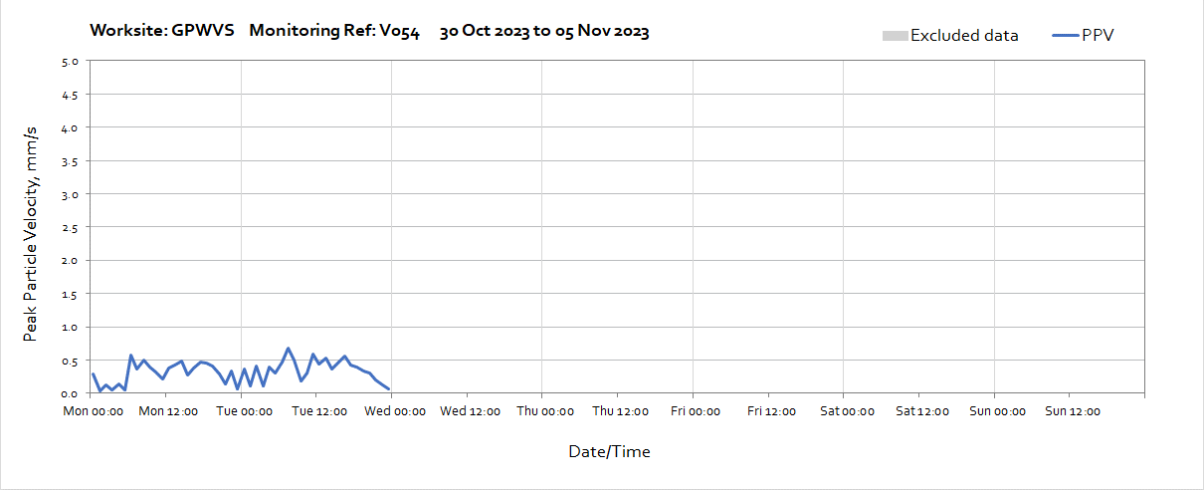
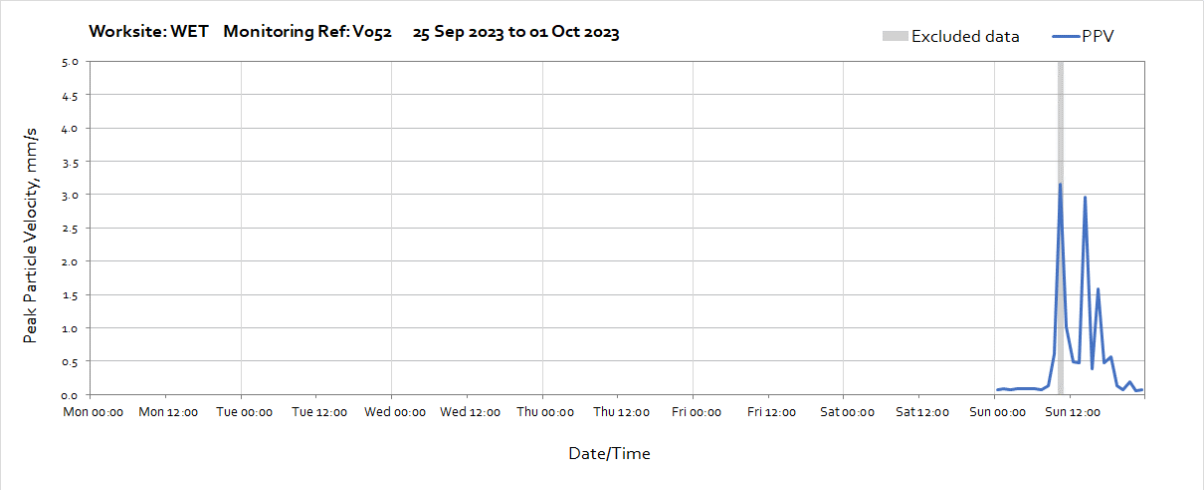
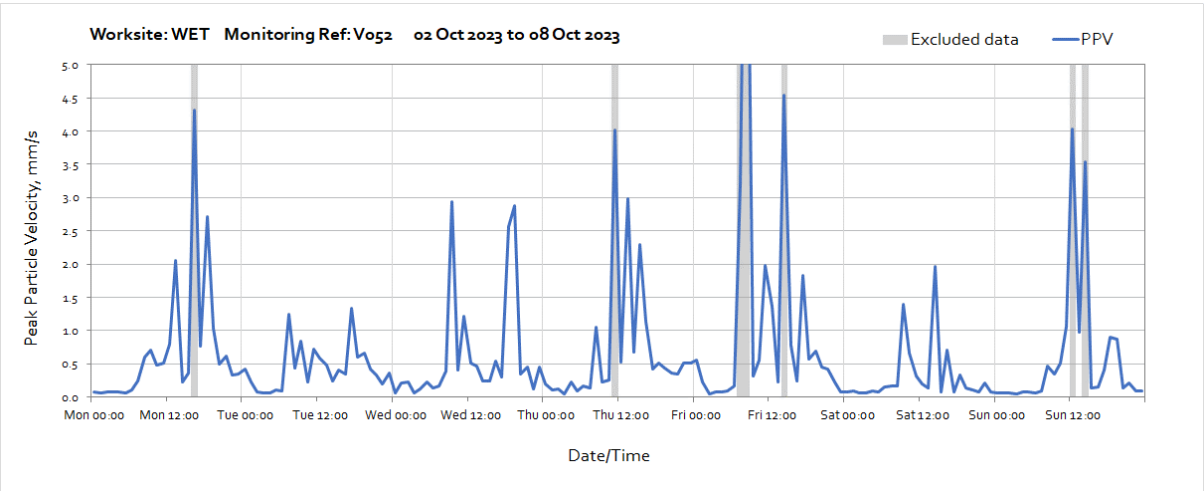
Thu 12:00
Fri 00:00
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time

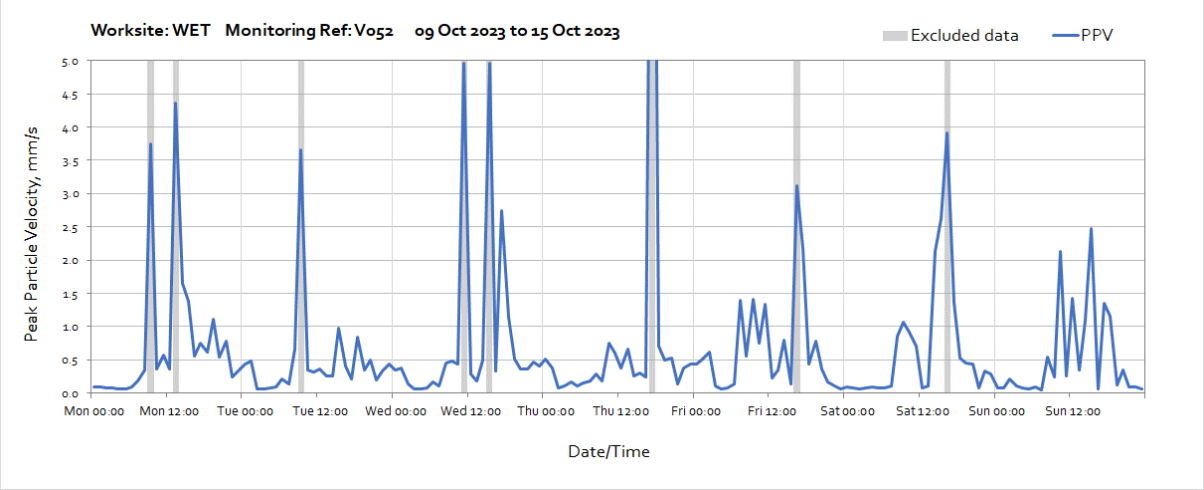

Worksite: GPWVS Monitoring Ref: Vo54 23 Oct 2023 to 29 Oct 2023
Excluded data
PPV
Peak Particle Velocity, mm/s
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
Wed 12:00
Thu 00:00
Thu 12:00
Fri 00:00
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time



Worksite: WET – Monitoring Ref: V052






Worksite: WET Monitoring Ref: V052 09 Oct 2023 to 15 Oct 2023
Excluded data
PPV
Peak Particle Velocity, mm/s
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
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Mon 00:00
Mon 12:00
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Tue 12:00
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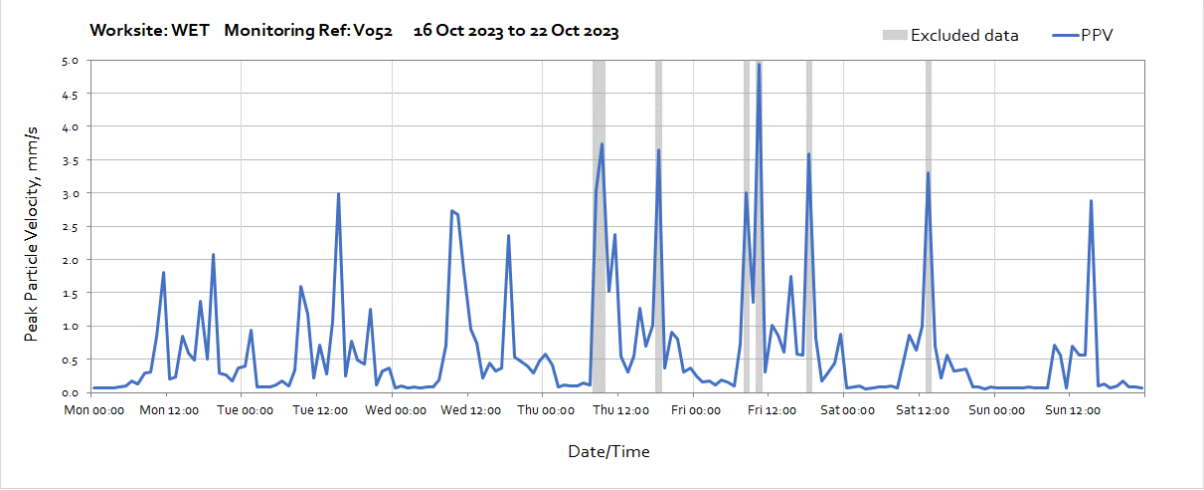
Date/Time


Worksite: WET Monitoring Ref: V052 16 Oct 2023 to 22 Oct 2023
Excluded data
PPV
Peak Particle Velocity, mm/s
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
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Mon 00:00
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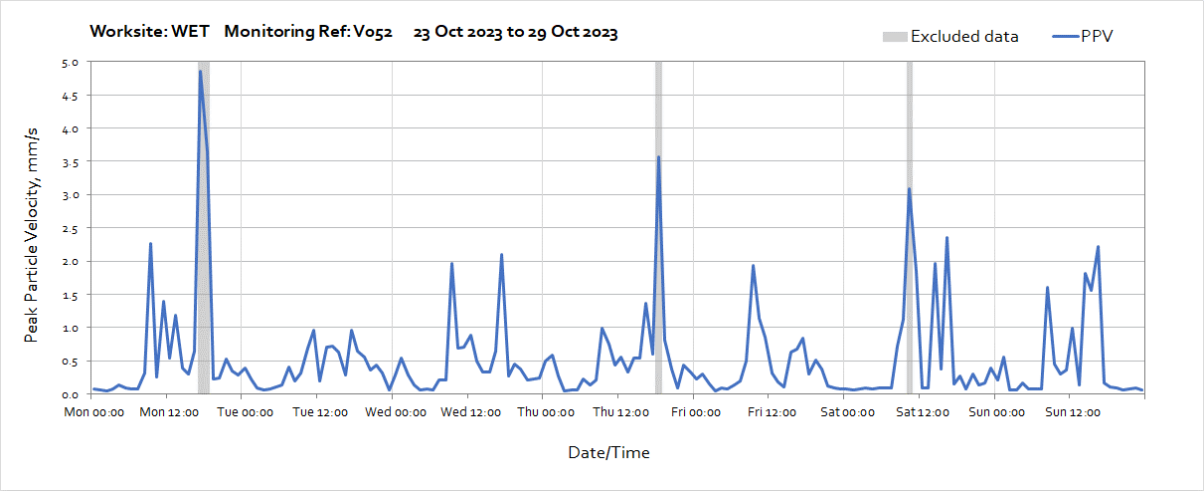
Sun 12:00
Date/Time


Worksite: WET Monitoring Ref: V052 23 Oct 2023 to 29 Oct 2023
Excluded data
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Peak Particle Velocity, mm/s
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4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
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Mon 00:00
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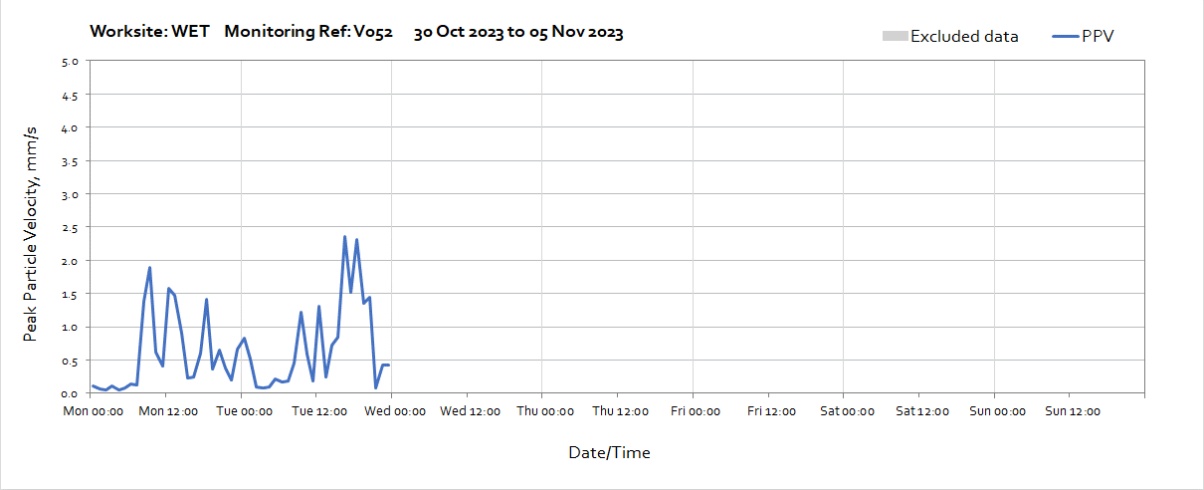
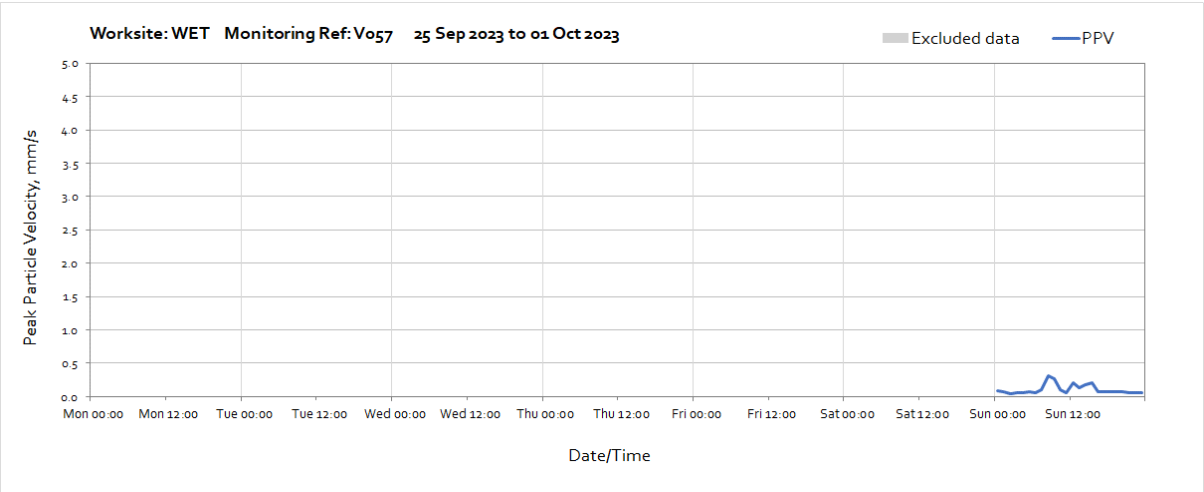
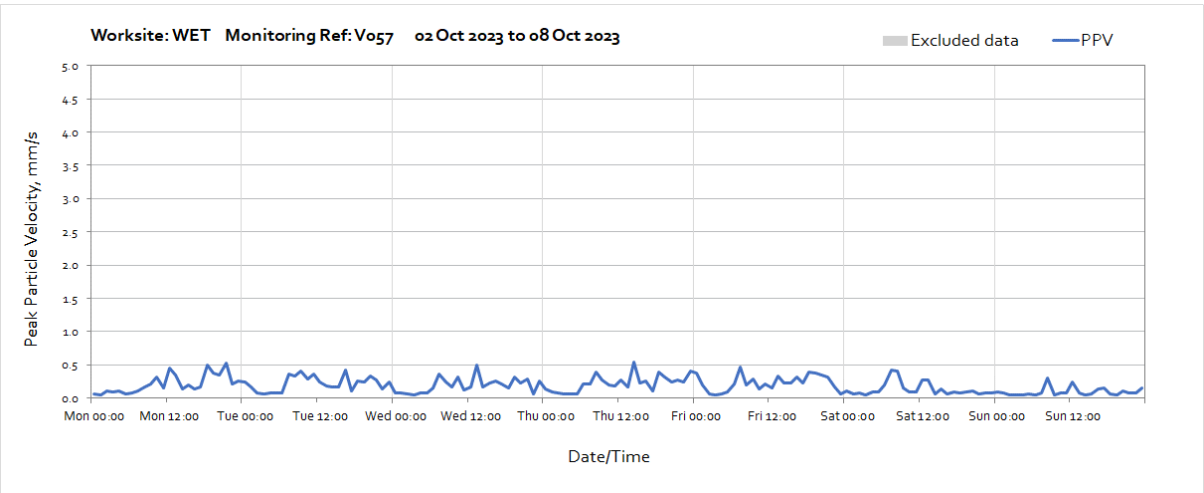
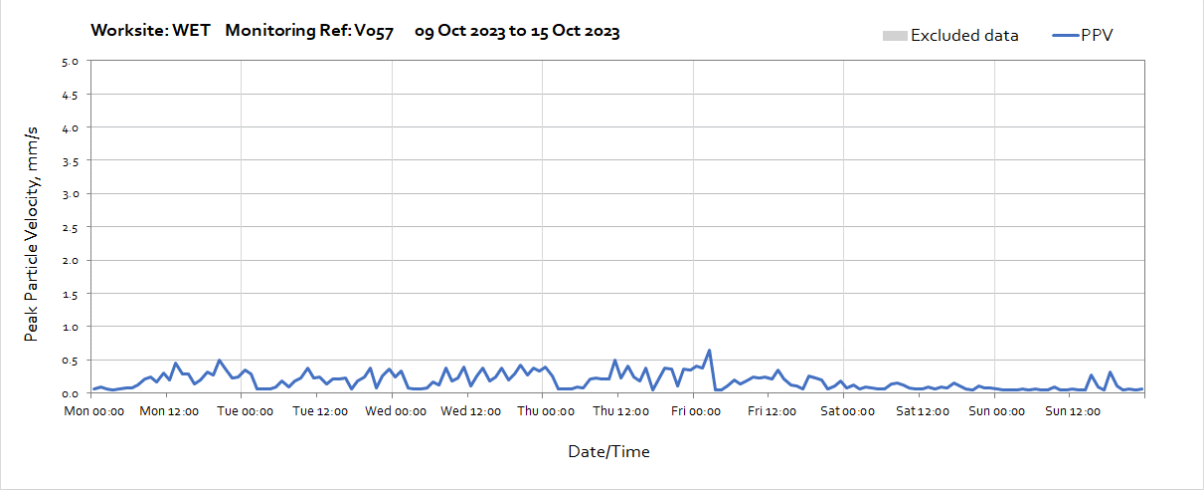
Date/Time



Worksite: WET – Monitoring Ref: V057






Worksite: WET Monitoring Ref: V057 09 Oct 2023 to 15 Oct 2023
Excluded data
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Peak Particle Velocity, mm/s
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4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
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Mon 00:00
Mon 12:00
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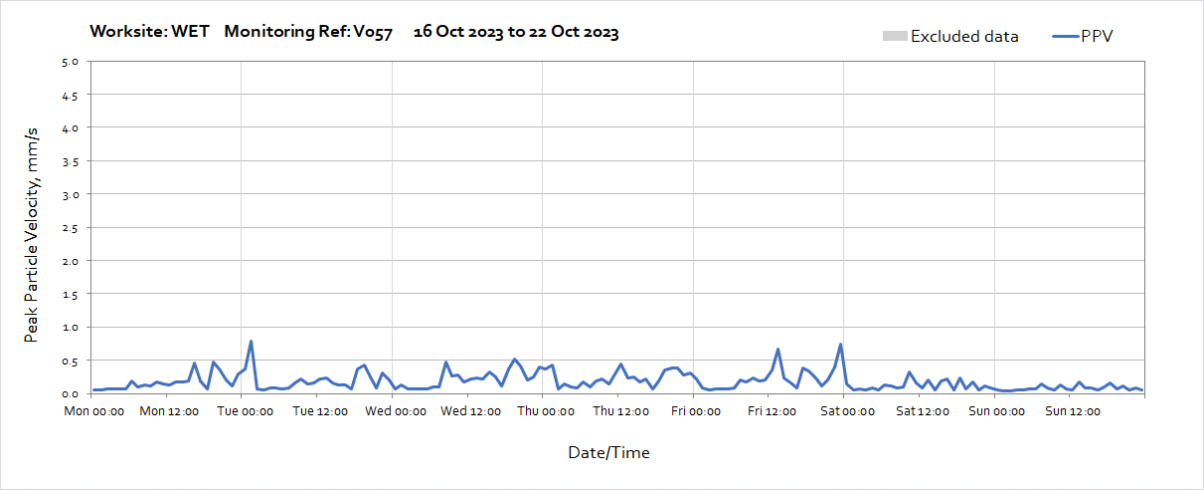
Date/Time


Worksite: WET Monitoring Ref: V057 16 Oct 2023 to 22 Oct 2023
Excluded data
PPV
Peak Particle Velocity, mm/s
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4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
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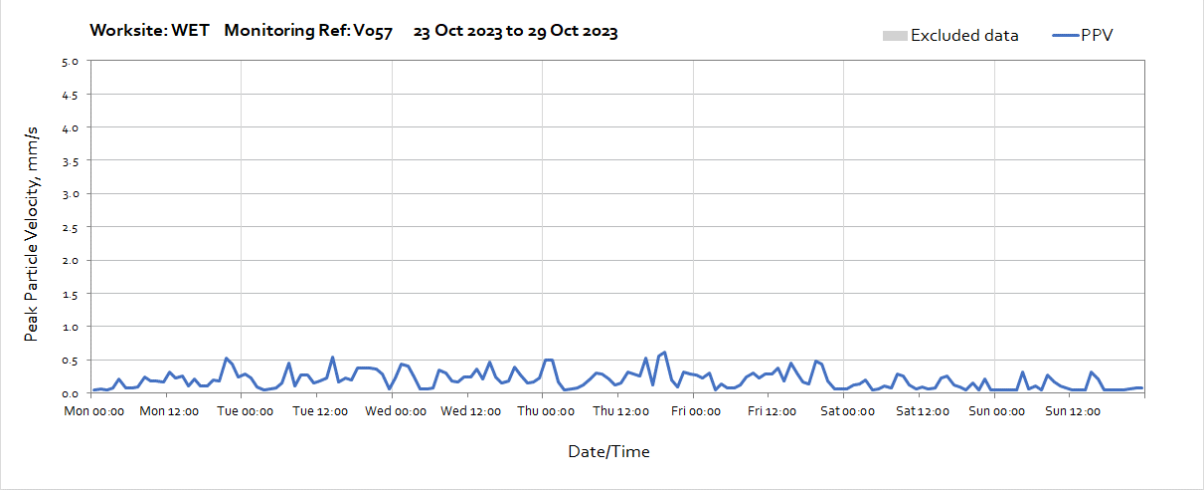
Date/Time


Worksite: WET Monitoring Ref: V057 23 Oct 2023 to 29 Oct 2023
Excluded data
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Peak Particle Velocity, mm/s
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4.0
3.5
3.0
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2.0
1.5
1.0
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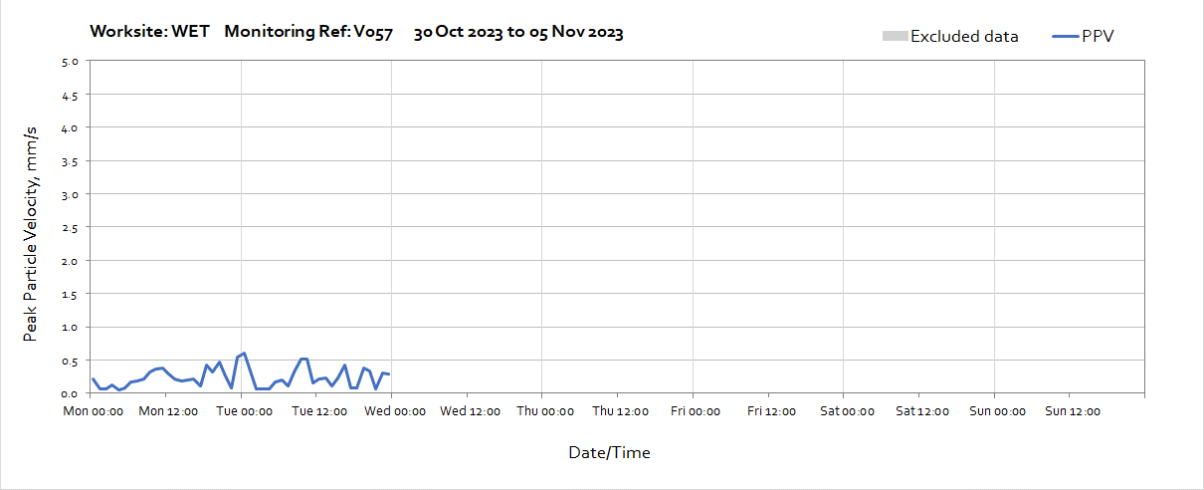
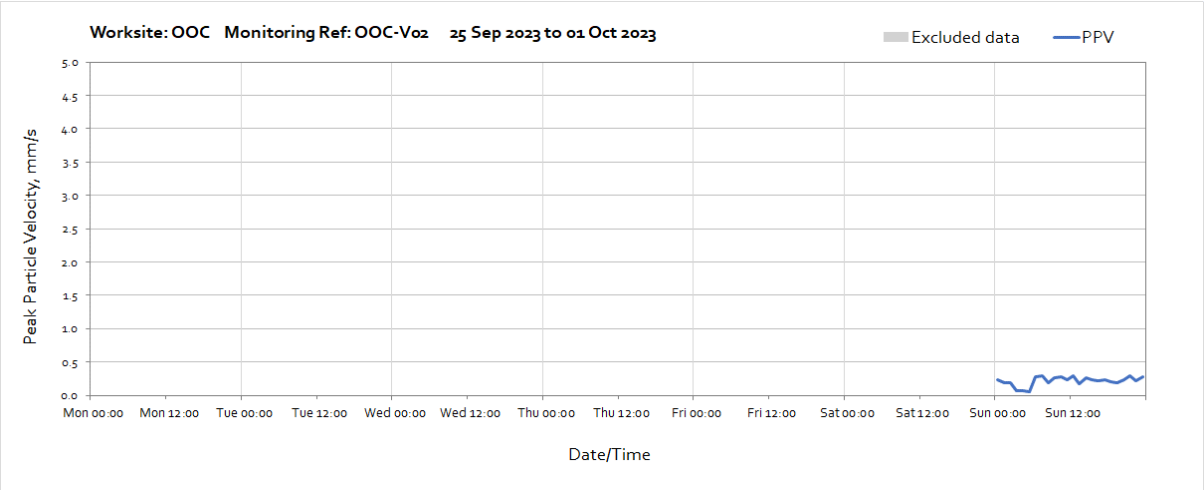
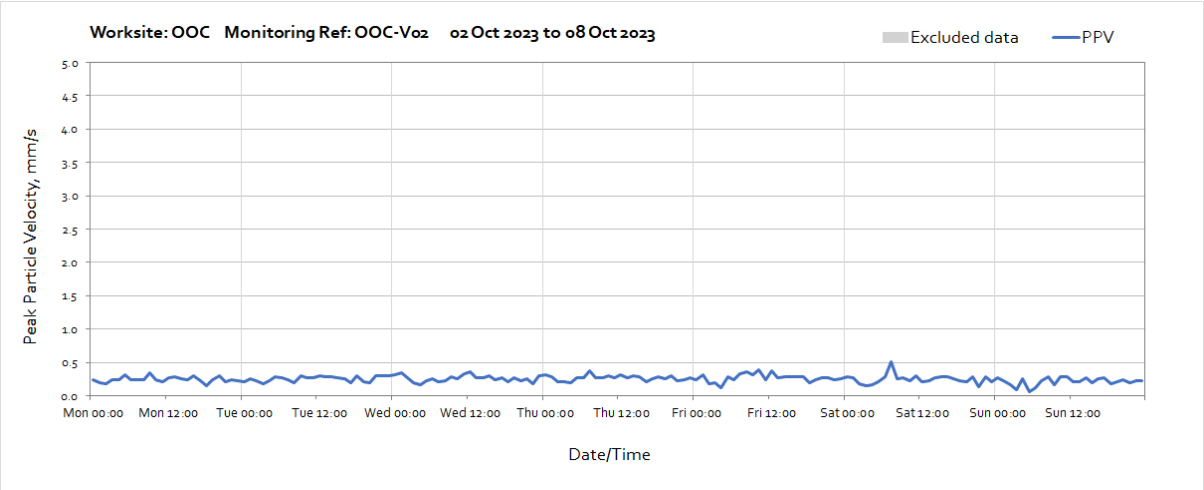
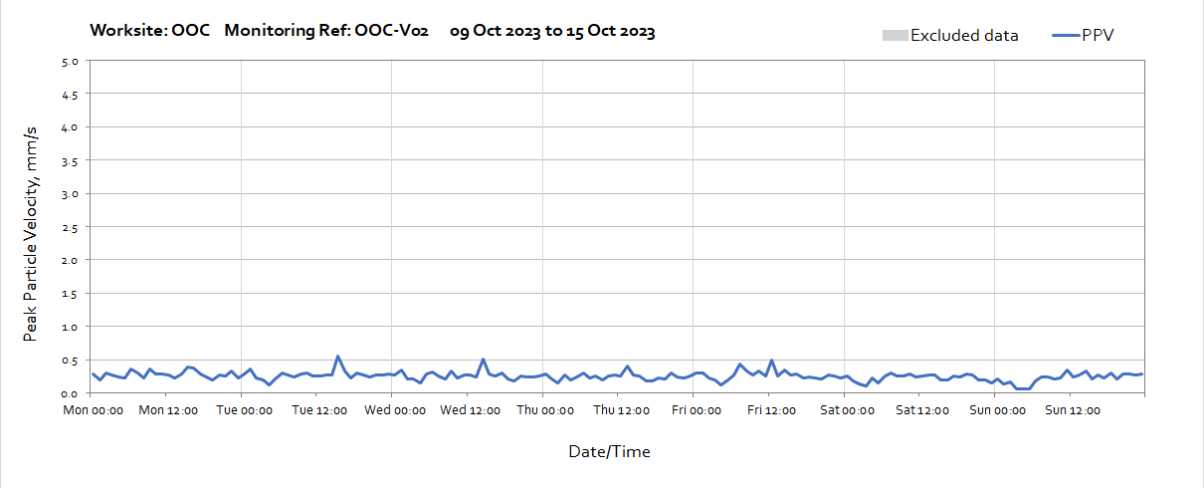
Date/Time



Worksite: OOC – Monitoring Ref: OOC-V02






Worksite: OOC Monitoring Ref: OOC-V02 09 Oct 2023 to 15 Oct 2023
Excluded data
PPV
Peak Particle Velocity, mm/s
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4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Mon 00:00
Mon 12:00
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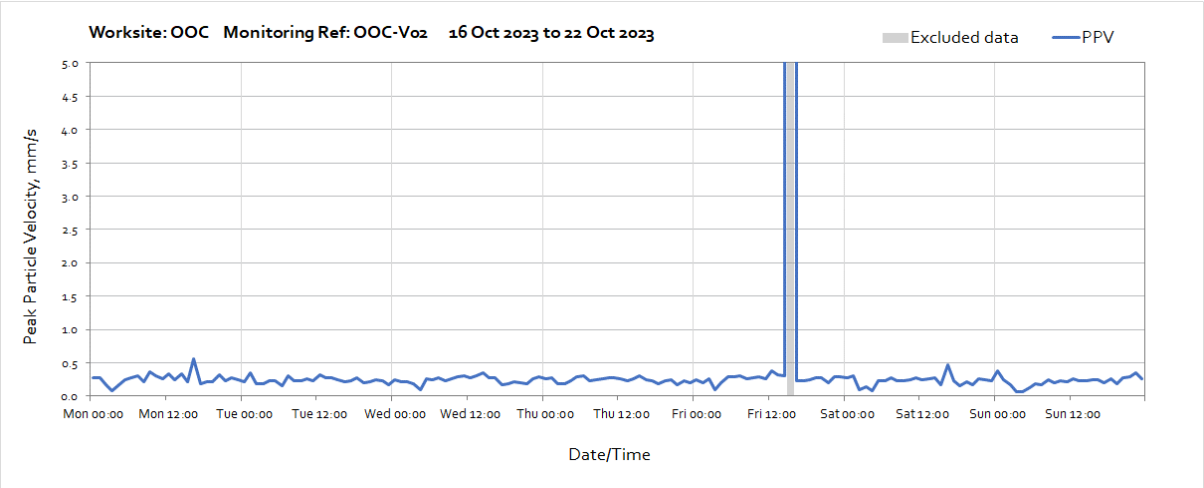
Date/Time


Worksite: OOC Monitoring Ref: OOC-V02 16 Oct 2023 to 22 Oct 2023
Excluded data
PPV
Peak Particle Velocity, mm/s
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4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
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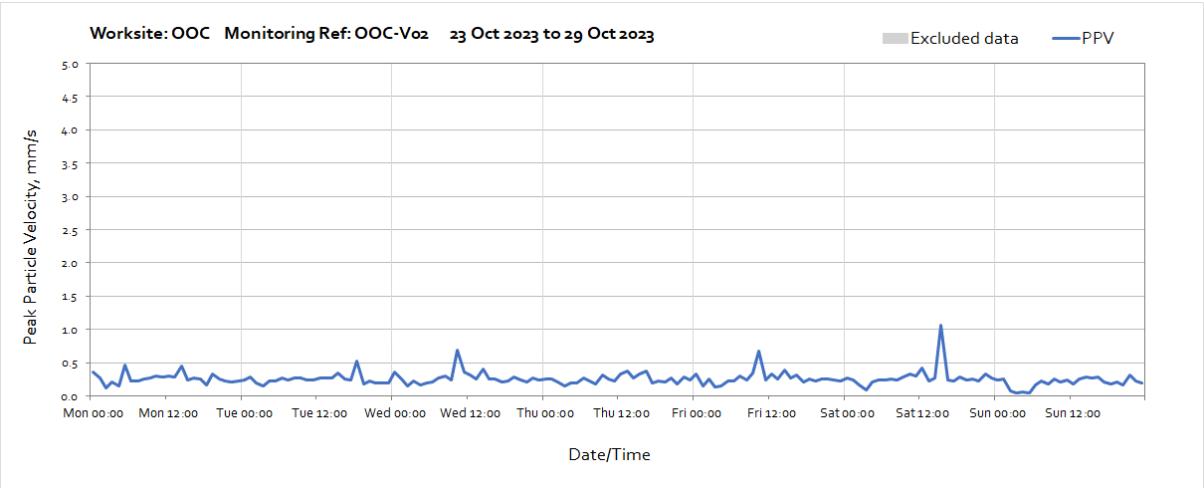
Date/Time


Worksite: OOC Monitoring Ref: OOC-V02 23 Oct 2023 to 29 Oct 2023
Excluded data
PPV
Peak Particle Velocity, mm/s
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3.5
3.0
2.5
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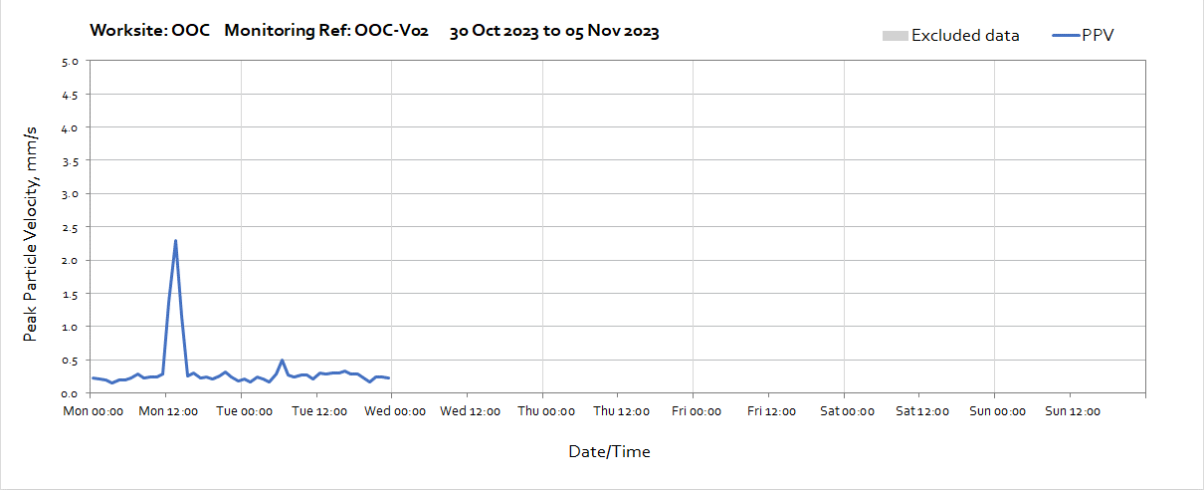
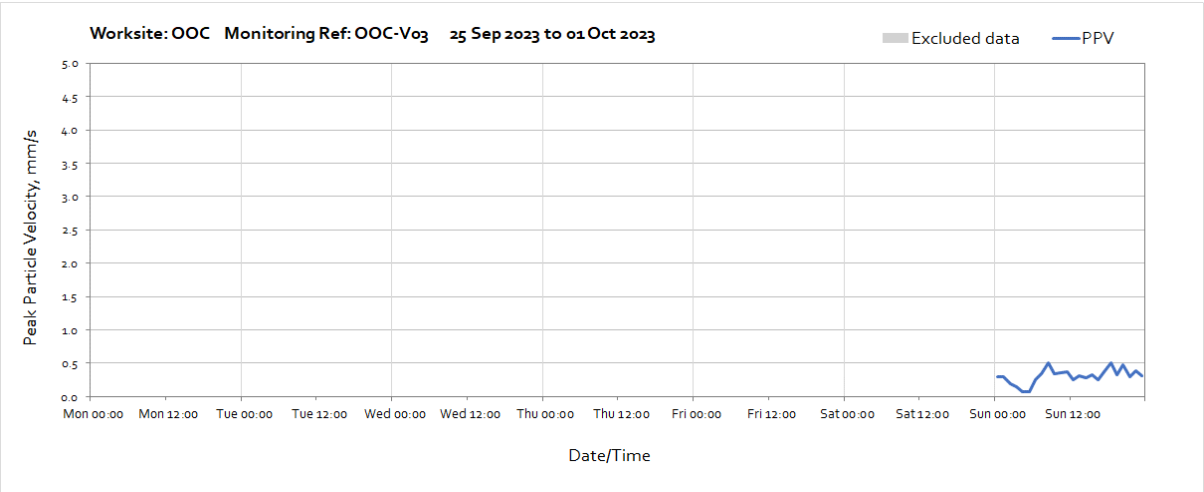
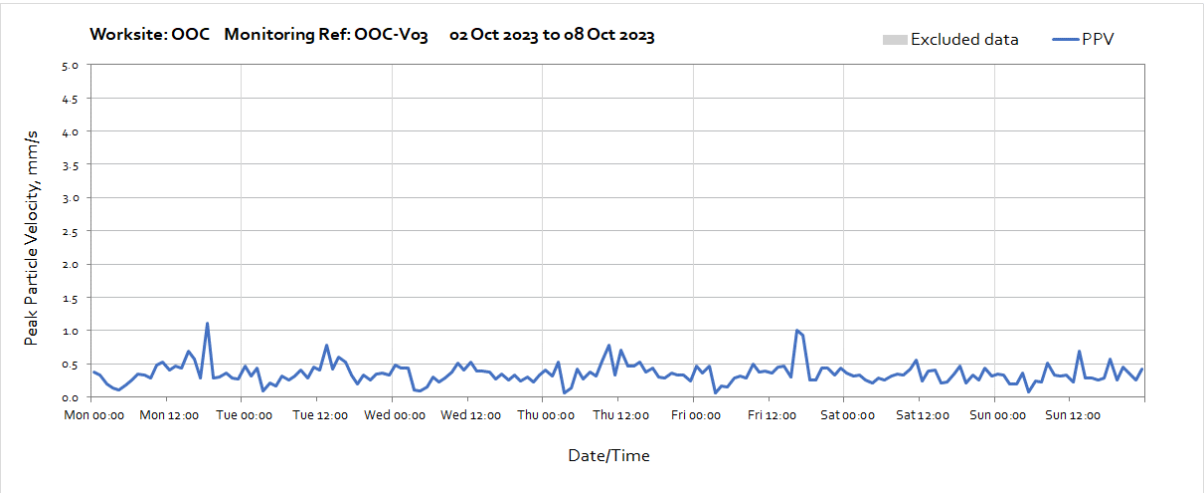
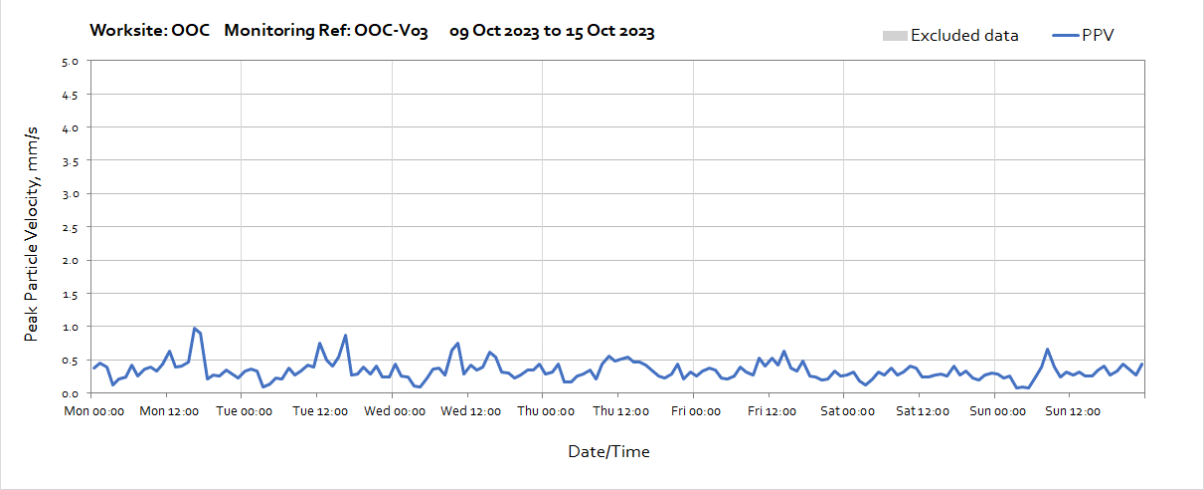
Date/Time



Worksite: OOC – Monitoring Ref: OOC-V03






Worksite: OOC Monitoring Ref: OOC-V03 09 Oct 2023 to 15 Oct 2023
Excluded data
PPV
Peak Particle Velocity, mm/s
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3.5
3.0
2.5
2.0
1.5
1.0
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Mon 00:00
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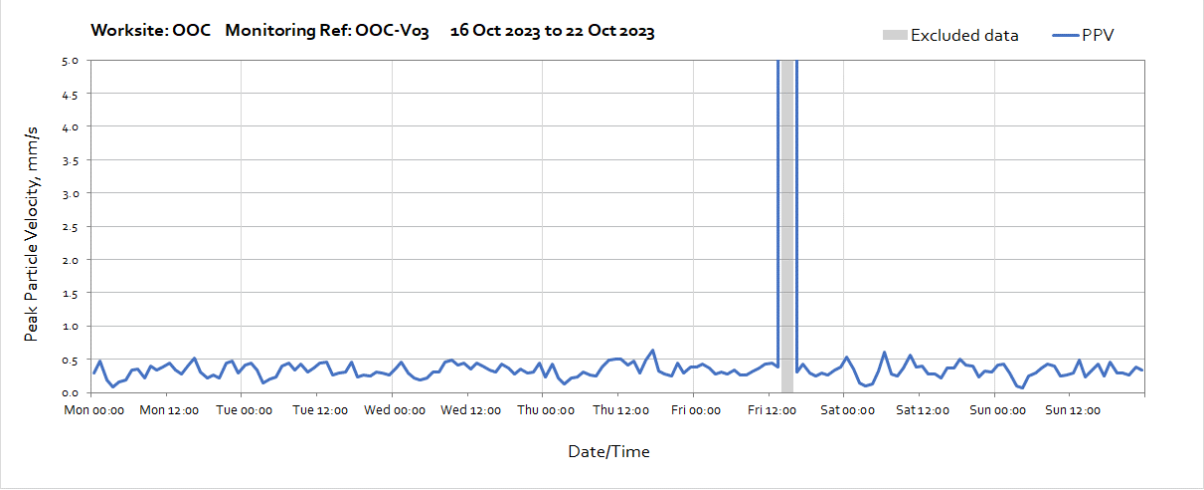
Date/Time


Worksite: OOC Monitoring Ref: OOC-V03 16 Oct 2023 to 22 Oct 2023
Excluded data
PPV
Peak Particle Velocity, mm/s
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4.0
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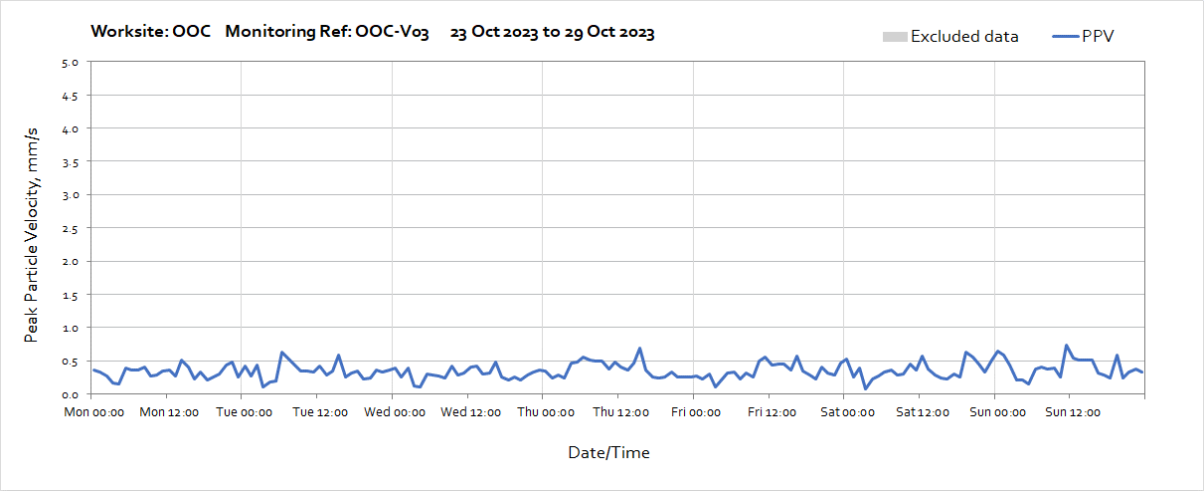
Date/Time


Worksite: OOC Monitoring Ref: OOC-V03 23 Oct 2023 to 29 Oct 2023
Excluded data
PPV
Peak Particle Velocity, mm/s
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4.5
4.0
3.5
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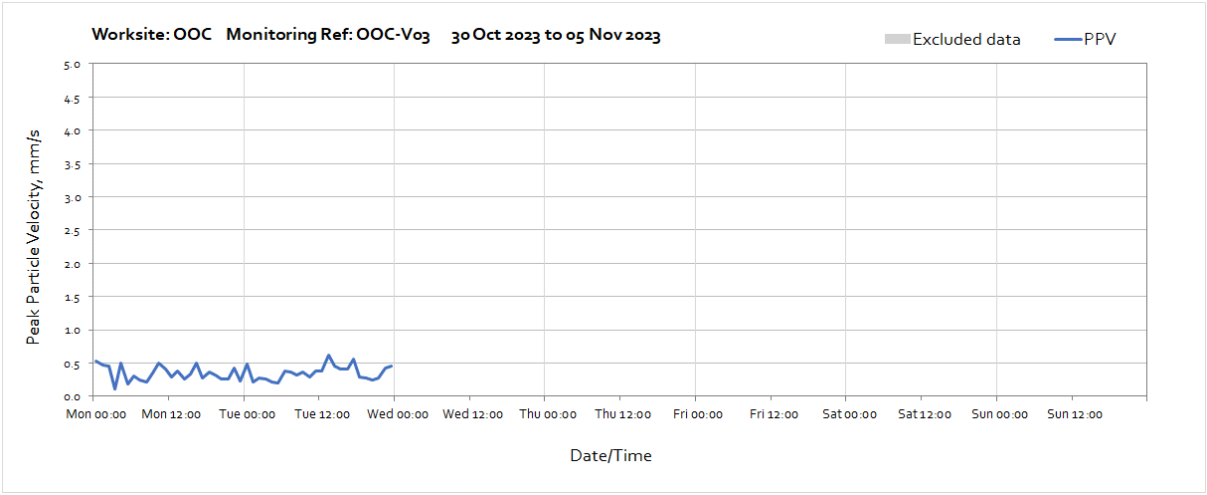
Date/Time


Worksite: OOC Monitoring Ref: OOC-V03 30 Oct 2023 to 05 Nov 2023
Excluded data
PPV
Peak Particle Velocity, mm/s
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4.5
4.0
3.5
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2.5
2.0
1.5
1.0
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Mon 00:00
Mon 12:00
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Date/Time