HS2

January 2023

Construction Noise and Vibration Monthly Report – November 2022

London Borough of Ealing

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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 November 2022.

Within this period monitoring was undertaken at the following worksites:

- Noise monitoring was undertaken in the vicinity of the Atlas Road worksite (ref. AR) where gantry crane works, tunnel boring machine works, site-wide general works, launch ramp works, conveyor works and scaffolding works were underway.
- Noise and vibration monitoring were undertaken in the vicinity of the Willesden EuroTerminal worksite (ref. WET), where trackwork, base plate works, concrete pours, conveyor construction works, installation of guarding, extension of walkways, installation of hopper skirting, cabling works, installation of gantry crane and deliveries were underway.
- Noise monitoring was undertaken in the vicinity of the Victoria Road Crossover Box worksite (worksite ref. VRCB), where:
    - excavation works, diaphragm wall works, steel fixing works, capping beam works, wire sawing works, removal of blocks, panel coring, borehole drilling, tunnel works, installation of ventilation units and services, removal works, installation of access staircase, access ramp works and dig-out works were underway.
    - At Victoria Road Ancillary Shaft, secondary maintenance works, fitting out works, steel fixing and shuttering works were underway.
- Noise monitoring was undertaken in the vicinity of the Flat Iron compound (worksite ref. FIC), where door fixing, installation of wall fans, electrical testing works, cabling works and preparation works were underway.
- Noise and vibration monitoring were undertaken in proximity of the Old Oak Common depot worksite (ref. OOC), where material movement, fixing of reinforced bars, shuttering and form works, site entrance works, diaphragm wall works, construction of capping beams, excavation works, waste removal, drainage installations, utility installation and road sweeping were underway.
- Noise and vibration monitoring were undertaken in proximity of the Scheme 6 worksite (ref. S6), where civil works, signalling works, survey works and overhead line electrification works were underway.
- Noise monitoring was undertaken in proximity of the Mandeville Road Ventilation Shaft worksite (ref.: MRVS), where grouting works, hoarding installation, drainage works and construction of piling platform were underway.

- Noise and vibration monitoring were undertaken in proximity of the Green Park Way Ventilation Shaft worksite (ref. GPWVS), where general site works, installation of shaft services, scaffolding extension works, shaft works, construction of shaft, maintenance of plant and equipment were underway.
- Noise monitoring was undertaken in proximity of the Westgate Ventilation Shaft (ref. WVS), where shuttering works, installation of decks, scaffolding works, installation of reinforcement bars and formworks, concrete pours, formwork dismantling, steel fixing, excavation works, sprayed concrete lining works and plant and equipment maintenance were underway.

Further works, where monitoring was not undertaken, were also underway at:

- Atlas Road Sub-Station where power utility works were underway; and
- Wormwood Scrubs where manhole construction, pipe jacking and tunnelling works 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 exceeded fourteen (14) times during the reporting period.

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

Four (4) complaints were received during the monitoring period. A description of complaints, the results of investigation and any actions taken are detailed in Table 8 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 30th November 2022.

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

- Atlas Road worksite, ref. AR (see plan 4 in Appendix A), where work activities included:
    - Gantry cranes works, including blinding pours, filling works, electrical testing and commissioning works.
    - Tunnel boring machine works, including welding and assembly works, slab works, foundation works, blinding and shutters works, key-clamp works and deliveries.
    - Site-wide general works, including ducting works, steel works, concrete pours, filter drains maintenance and construction of footpaths.
    - Launch ramp works.
    - Conveyor works, including installation of belts and cabling and conveyor commissioning works.
    - Scaffolding works.

- Willesden EuroTerminal worksite, ref. WET (see plan 4 in Appendix A), where work activities included:
    - Trackwork.
    - Base plate works, including grouting and bolting works.
    - Concrete pours.
    - Conveyor construction works, including general site works.
    - Installation of guarding.
    - Extension of walkways.
    - Installation of hopper skirting.
    - Cabling works.
    - Installation of gantry crane.
    - Deliveries, including loading of spoil into railway trucks.
- Victoria Road Crossover Box worksite, ref. VRCB (see plan 4 in Appendix A), where work activities included:
    - Excavation works.
    - Diaphragm wall works, including trimming and demolition works.
    - Steel fixing.
    - Capping beam works, including shuttering and concreting works.
    - Wire sawing works.
    - Removal of blocks.
    - Panel coring.
    - Borehole drilling.
    - Tunnel works, including installation of service brackets, installation of reinforcements, cabling works and concrete works.
    - Installation of ventilation units and services.
    - Removal works.
    - Installation of access staircase.
    - Access ramp works, including construction and spraying of concrete lining.
    - Dig-out works, including installation of steel and shutters, striking of formworks, steel fixing, lifting works and panel remedial works.

    - Victoria Road Ancillary Shaft works comprising secondary maintenance works, fitting out works, steel fixing and shuttering works.
- Flat Iron compound, worksite ref. FIC (see plan 4 in Appendix A), where work activities included:
    - Door fixing.
    - Installation of wall fans.
    - Electrical testing works.
    - Cabling works.
    - Preparation works for concrete casting.
- 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:
    - Material movement.
    - Fixing of reinforced bars, shuttering and form works.
    - Site entrance works, including kerb installation.
    - Diaphragm wall works, including diaphragm wall breakdown.
    - Construction of capping beams.
    - Excavation works.
    - Waste removal.
    - Drainage installation.
    - Utility installation.
    - Road sweeping.
- Scheme 6 worksite, located in the London Borough of Hammersmith and Fulham (LBHF), ref. S6 (see plan 4 in Appendix A), where work activities included:
    - Civil works.
    - Signalling works.
    - Survey works.
    - Overhead line electrification works.
- Mandeville Road Ventilation Shaft worksite, reference MRVS (see plan 1 in Appendix A), where work activities included:
    - Grouting works.

- Hoarding installation.
- Drainage works.
- Construction of piling platform.

- Green Park Way Ventilation Shaft worksite, reference GPWVS (see plan 2 in Appendix A), where work activities included:
  - General site works, including housekeeping works, road sweeping, gardening, installation of key clamp, adjustment of walkways, fencing works, installation of blocks, deliveries, fabrication of sprayed lining concrete panels and strapping works.
  - Installation of shaft services.
  - Scaffolding extension works.
  - Installation of lighting columns, including electrical works.
  - Shaft works, including preparation of platform, removal of machinery, panels and trimming wells, extension of services, drilling rig works, wells trimming, probing works, installation of rings and grouting works.
  - Shaft construction works.
  - Maintenance of plant and equipment.
- Westgate Ventilation Shaft worksite, reference WVS (see plan 3 in Appendix A), where work activities included:
  - Shuttering works, including installation and striking works.
  - Installation of decks.
  - Scaffolding works.
  - Installation of reinforcement bars and formworks.
  - Concrete pouring.
  - Formwork dismantling.
  - Removal of shutters.
  - Steel fixing.
  - Excavation works.
  - Sprayed concrete lining works.
  - Plant and equipment maintenance.

1.1.4 Further works, where monitoring did not take place, were undertaken at:

- Atlas Road Sub-Station where power utility works were underway; and
- Wormwood Scrubs where manhole construction, pipe jacking and tunnelling works 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 November in the LBE area. Table 2 summarises the position of noise and vibration monitoring installations within the LBE area in November 2022.

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

Table 2: Monitoring Locations

Worksite Reference	Measurement Reference	Address
AR	N032	Shaftesbury Gardens
	N033	Outside The Collective, Atlas Road / Victoria Road
	N060	Atlas Road next to Bashey Road
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	Old Oak Common Lane
	OOC-N02	Old Oak Common Lane, Hilltop Works
	OOC-N03	Old Oak Lane Halt, Wells House Road

Worksite Reference	Measurement Reference	Address
	OOC-V02	Kildun Court, Old Oak Common Lane
	OOC-V03	Wells House Road Alleyway
S6	WT-N01	Old Oak Lane Halt, Wells House Road
MRVS	N040	Badminton Close
	N058	Mandeville Road
	N063	Mandeville Road
	V055	Mandeville Road
	V056	Mandeville Road
GPWVS	N059	Green Park Way Ventilation Shaft
	N064	Green Park Way Ventilation Shaft
	V053	Green Park Way, Greenford
	V054	Green Park Way Ventilation Shaft
WVS	N062	Westgate Ventilation Shaft

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
AR	N032	Shaftesbury Gardens	Free-field	64.1 (68.2)	65.5 (66.2)	64.0 (68.1)	62.4 (66.1)	59.2 (64.6)	60.3 (60.5)	63.1 (64.5)	64.1 (68.1)	63.7 (69.9)	59.7 (62.6)	62.5 (67.3)	59.0 (62.9)
	N033	Outside The Collective, Atlas Road/Victoria Road	Free-field	66.7 (70.3)	68.8 (74.2)	65.7 (73.6)	63.3 (67.6)	60.7 (67.3)	61.7 (63.4)	68.7 (75.8)	66.4 (70.2)	64.9 (73.6)	60.3 (64.8)	63.5 (69.5)	60.2 (65.5)
	N060	Atlas Road next to Bashey Road	Free-field	54.1 (62.5)	62.7 (68.9)	54.1 (58.7)	56.7 (65.0)	54.8 (67.2)	55.5 (64.9)	60.9 (61.9)	58.3 (64.3)	58.6 (78.7)	52.6 (68.3)	55.6 (69.5)	57.0 (69.6)
WET	N034	Stephenson Street (north)	Free-field	53.5 (56.3)	56.4 (58.7)	54.4 (57.3)	54.5 (61.3)	50.8 (58.0)	51.8 (52.8)	54.5 (55.8)	54.3 (55.8)	52.9 (61.8)	46.9 (54.4)	52.1 (58.6)	48.7 (52.8)
	N035	Stephenson Street (south)	Free-field	55.1 (58.4)	59.5 (66.8)	52.0 (56.9)	51.3 (56.8)	49.1 (57.0)	52.3 (53.0)	55.5 (57.1)	56.0 (64.1)	54.5 (64.3)	48.0 (56.0)	51.7 (58.4)	48.8 (53.9)
	N041	Junction of Stephenson Street/Goodhall Street	Free-field	54.3 (56.5)	58.1 (60.4)	55.4 (58.6)	54.5 (59.0)	50.9 (56.8)	52.2 (52.8)	55.2 (56.1)	54.9 (56.1)	54.5 (60.9)	50.2 (54.9)	53.6 (58.8)	49.6 (54.2)

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
VRCB	N031	School Road, outside Acton Business Centre	Free-field	64.6	67.1	63.5	60.9	57.8	61.4	65.2	65.2	62.4	56.4	61.2	57.3
				(67.3)	(69.8)	(65.9)	(64.8)	(65.1)	(61.8)	(67.6)	(66.1)	(66.0)	(60.8)	(64.2)	(63.1)
	N050	Acton Square, outside North Acton Station	Free-field	63.8	64.9	62.8	62.1	59.2	63.1	62.7	63.3	62.6	59.4	62.0	57.6
				(66.2)	(66.4)	(64.1)	(69.2)	(70.3)	(63.6)	(63.6)	(65.2)	(65.9)	(67.4)	(65.1)	(61.2)
FIC	N029	Braitrim House, Victoria Road	Free-field	57.5	61.5	55.2	55.2	54.3	57.8	55.1	52.7	52.0	46.7	52.3	53.1
				(66.3)	(64.2)	(63.0)	(68.3)	(65.6)	(59.8)	(57.3)	(53.1)	(57.3)	(52.1)	(64.5)	(63.2)
	N042	Bodens car park	Free-field	60.5	62.3	56.4	54.4	53.1	62.3	59.5	57.9	56.2	51.7	54.8	52.2
				(64.8)	(64.7)	(61.0)	(56.7)	(61.4)	(62.9)	(60.8)	(60.6)	(60.8)	(55.7)	(57.2)	(55.4)
	N049	Flat Iron compound	Free-field	55.8	75.4	57.8	56.5	56.3	56.7	58.0	56.6	53.9	49.8	53.6	56.2
				(62.5)	(79.1)	(63.7)	(65.9)	(72.9)	(57.1)	(63.5)	(64.3)	(61.3)	(59.7)	(61.0)	(67.3)
OOC	OOC-N01	Old Oak Common Lane	Free-field	67.1	69.1	65.9	64.9	61.3	63.1	66.2	65.7	67.2	61.9	65.4	60.4
				(69.0)	(72.0)	(68.2)	(69.3)	(66.8)	(65.9)	(66.7)	(66.3)	(71.7)	(65.5)	(68.0)	(64.5)
	OOC-N02	Old Oak Common Lane, Hilltop Works	Free-field	67.5	70.9	67.3	65.2	61.7	63.2	66.2	66.0	67.0	61.6	65.4	61.0
				(68.9)	(72.0)	(73.5)	(68.2)	(73.2)	(64.4)	(66.4)	(66.3)	(74.1)	(64.5)	(68.0)	(65.1)
	OOC-N03	Old Oak Lane Halt, Wells House Road	Free-field	55.9	59.5	56.7	56.1	52.2	52.9	54.3	53.8	54.9	50.8	55.4	51.9
				(58.8)	(62.9)	(58.9)	(59.7)	(58.9)	(54.9)	(56.8)	(56.2)	(61.3)	(55.4)	(60.4)	(56.5)
S6	WT-N01	Old Oak Lane Halt, Wells House Road	Free-field	59.5	62.7	60.2	59.4	55.5	56.4	58.0	57.8	57.7	53.6	58.6	55.1
				(61.9)	(66.1)	(62.3)	(63.9)	(61.2)	(59.1)	(60.8)	(59.9)	(62.2)	(59.0)	(61.8)	(59.5)

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	55.5	56.3	55.1	55.1	52.4	56.4	54.2	54.4	55.2	52.2	54.8	52.1
				(58.8)	(60.4)	(58.2)	(59.2)	(58.8)	(60.0)	(55.5)	(56.4)	(59.7)	(57.3)	(60.6)	(57.7)
	N058	Mandeville Road	Free-field	56.6	70.6	67.8	65.0	53.0	57.6	70.7	72.0	63.8	55.5	65.1	52.6
				(59.2)	(74.2)	(74.9)	(74.6)	(60.4)	(65.6)	(72.8)	(74.7)	(74.4)	(60.3)	(72.7)	(59.1)
	N063	Mandeville Road	Free-field	61.4	68.2	62.5	61.4	58.9	62.8	65.5	70.0	64.0	60.2	63.7	58.2
				(76.6)	(76.8)	(71.2)	(78.7)	(79.1)	(69.3)	(70.2)	(70.6)	(72.5)	(73.7)	(75.8)	(66.0)
GPWVS	N059	Green Park Way Ventilation Shaft	Free-field	59.9	62.6	57.2	59.1	57.8	55.2	56.2	54.3	55.0	52.7	55.0	53.2
				(64.0)	(70.9)	(60.6)	(64.3)	(63.7)	(58.0)	(57.7)	(55.4)	(60.9)	(58.1)	(59.6)	(58.4)
	N064	Green Park Way Ventilation Shaft	Façade	57.4	60.9	57.4	57.2	54.2	55.0	56.2	55.6	56.1	51.9	55.3	52.6
				(62.6)	(64.2)	(60.1)	(63.2)	(59.6)	(57.8)	(58.3)	(58.1)	(62.8)	(56.7)	(57.4)	(58.1)
WVS	N062	Westgate Ventilation Shaft	Free-field	61.2	64.1	58.5	59.1	56.5	59.2	62.5	58.7	59.4	55.9	58.9	55.8
				(65.0)	(67.7)	(63.1)	(63.8)	(62.9)	(61.5)	(65.6)	(60.6)	(70.2)	(61.3)	(63.7)	(59.8)

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
WET	V052	63, Stephenson Street	3.90 (Y-axis)
	V057	37, Stephenson Street	0.88 (Z-axis)
OOC	OOC-V02	Kildun Court, Old Oak Common Lane	1.73 (Z-axis)
	OOC-V03	Wells House Road Alleyway	0.66 (Y-axis)
GPWVS	V053	Green Park Way, Greenford	2.40 (Z-axis)
	V054	Green Park Way Ventilation Shaft	1.27 (Z-axis)
MRVS	V055	Mandeville Road	0.98 (Y-axis)
	V056	Mandeville Road	1.59 (Z-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
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
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	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

Worksite Reference	Measurement Reference	Site Address	Day (Weekday, Saturday, Sunday, Night)	Time period	Number of exceedances of SOAEL
S6	WT-N01	Old Oak Lane Halt, Wells House Road	Weekdays Nights	1900-2200 2200-0700	1 37
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
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*

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

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

Table 6: Summary of Total Exceedances of SOAEL

Worksite Reference	Measurement Reference	Monitor Address	Total of SOAEL exceedances in the month
S6	WT-N01	Old Oak Lane Halt, Wells House Road	16

2.2.6 Sixteen (16) 24-hour periods that experienced an exceedance of the SOAEL were recorded due to HS2 construction works during November 2022. Exceedances occurred at noise monitor WT-N01 during weekday evenings and night-time periods.

2.2.7 Exceedances of the SOEAL at WT-N01 did not meet the temporal criteria contained within HS2 information paper E23 for triggering noise insulation eligibility, whereby the SOAEL must be exceeded for at least 10 days during any 15-day period.

2.3 Exceedances of Trigger Level

2.3.1 Table 7 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 7: Summary of Exceedances of Trigger Levels

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

2.4 Complaints

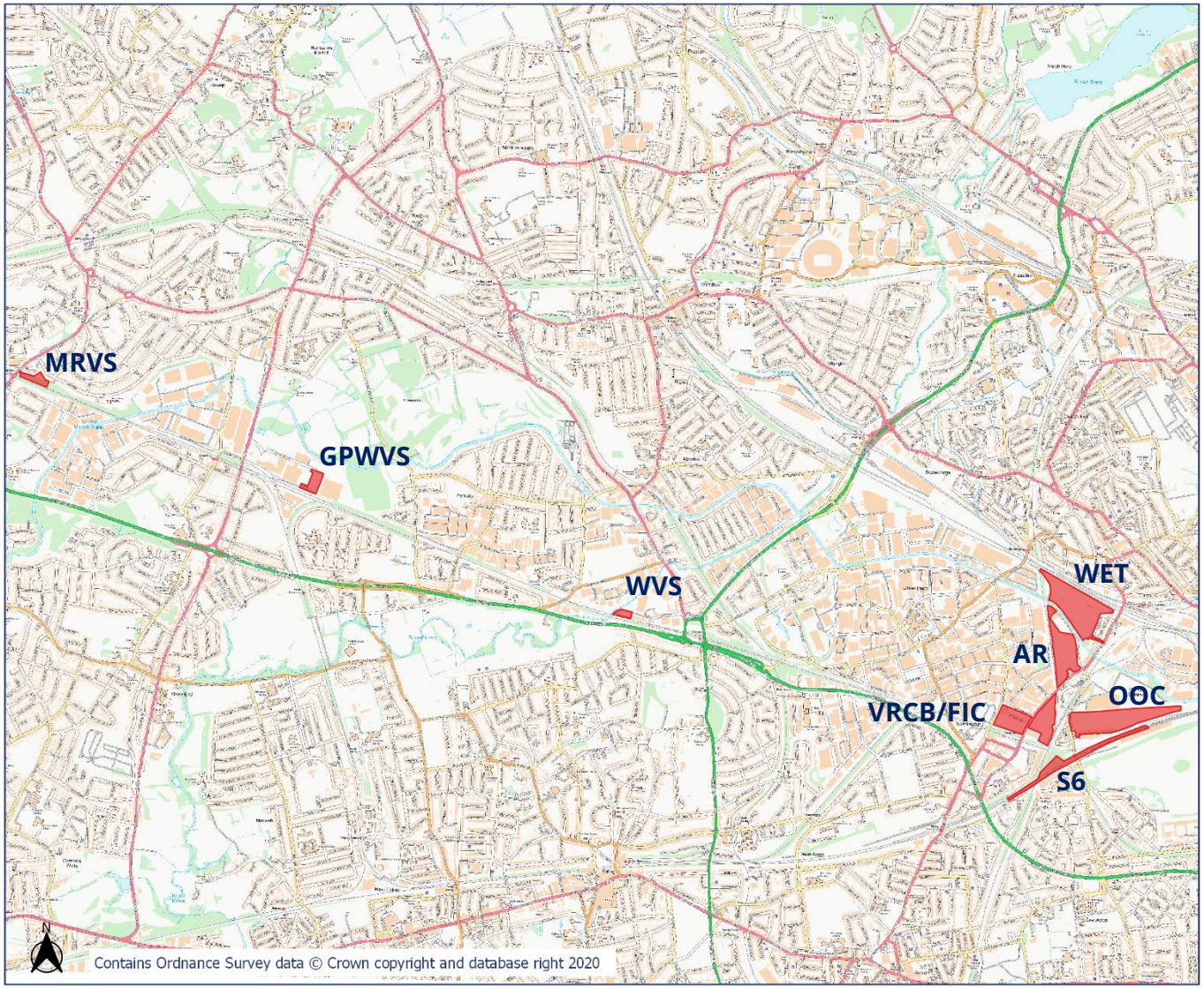
2.4.1 Table 8 provides a summary of complaint information related to noise and vibration received during the reporting period, along with the findings of any investigation.

Table 8: Summary of Complaints

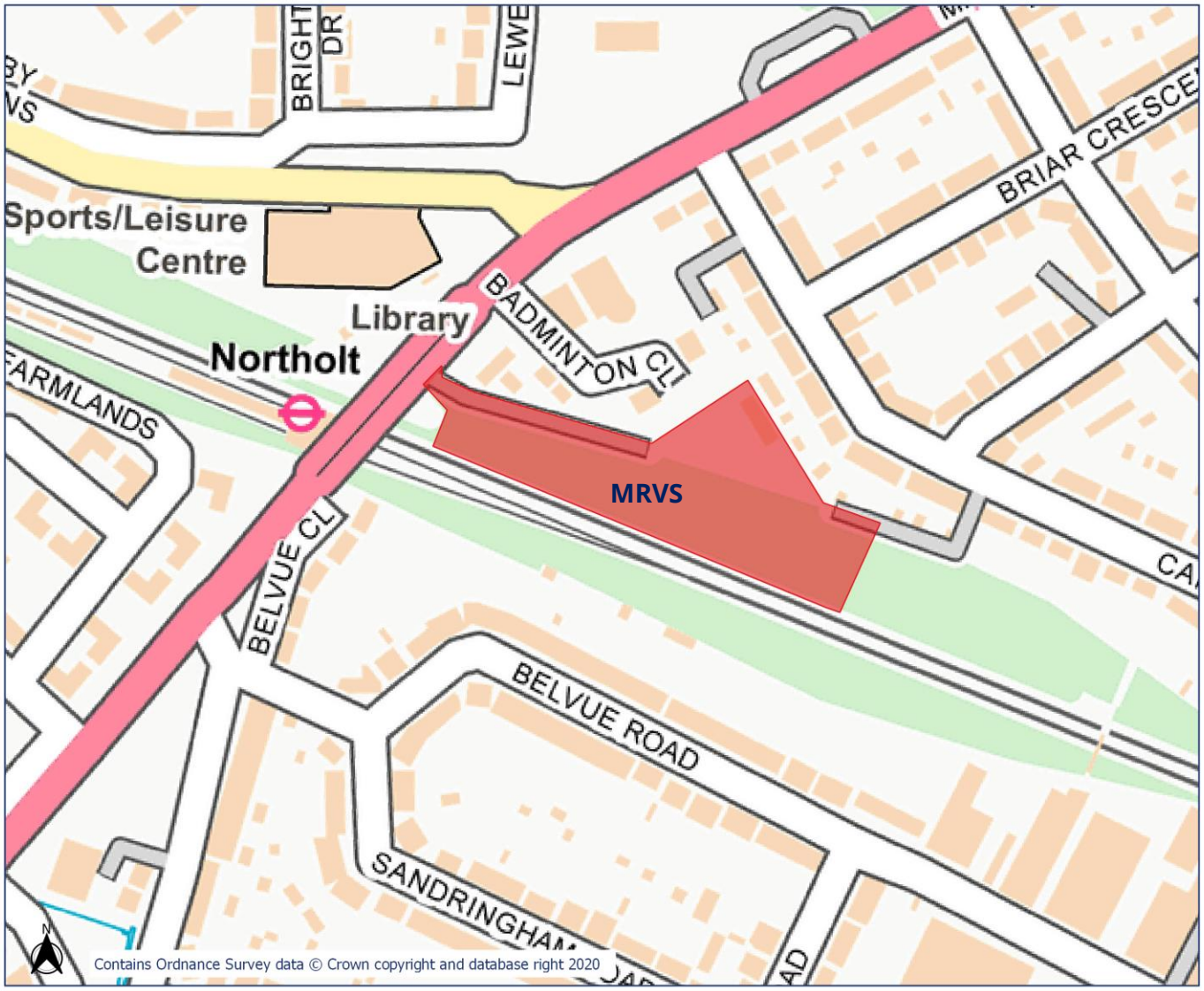
Complaint Reference Number	Worksite Reference	Description of Complaint	Results of Investigation	Actions Taken
HS2-22-85741-E-C	AR	Complaint due to loud, intrusive noise from site until 10:30am.	Investigation proved that the noise was caused by stones stuck in conveyor.	The obstruction was cleared, and the conveyor continued to run as normal. Stakeholder advised to contact if there are any further issues.
HS2-22-44101-C	AR/FIC	Complaint regarding conveyor belt making loud squalling noises causing disturbance even with closed windows.	Investigation showed that noise from the conveyor belt was within prescribed limits.	Walks along the worksites were carried out and no noise matching that reported was noted. Stakeholder advised to contact if there are any further issues.
HS2-22-44167-C HS2-22-44170-C	VRCB	Complaint about noise disturbance caused by conveyor.	The contractors are investigating what additional screening/ installation can be incorporated to the conveyor design to further reduce noise.	Updates were provided to stakeholders.

Appendix A Site Locations

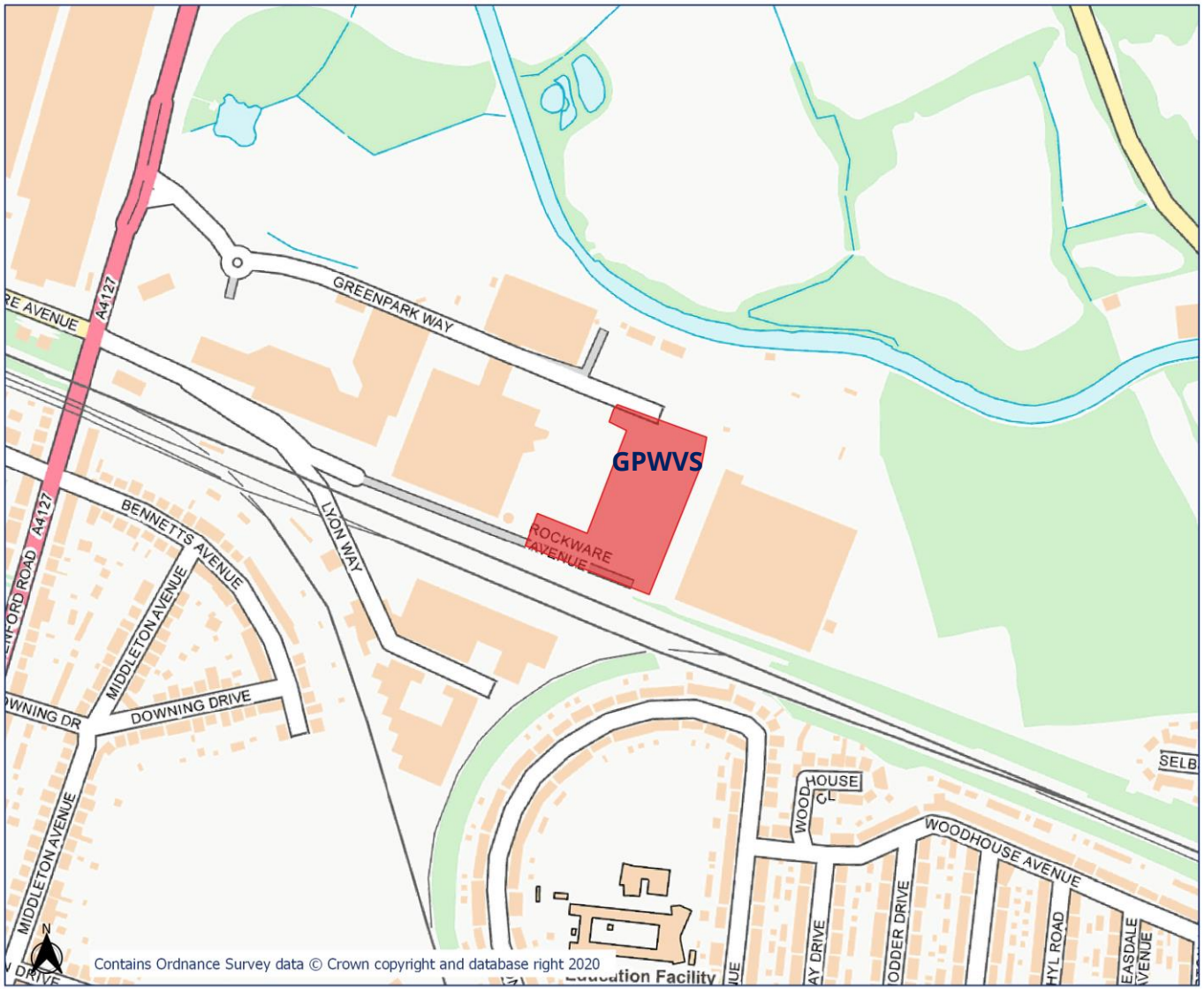
HS2 Worksite identification plan - Overview



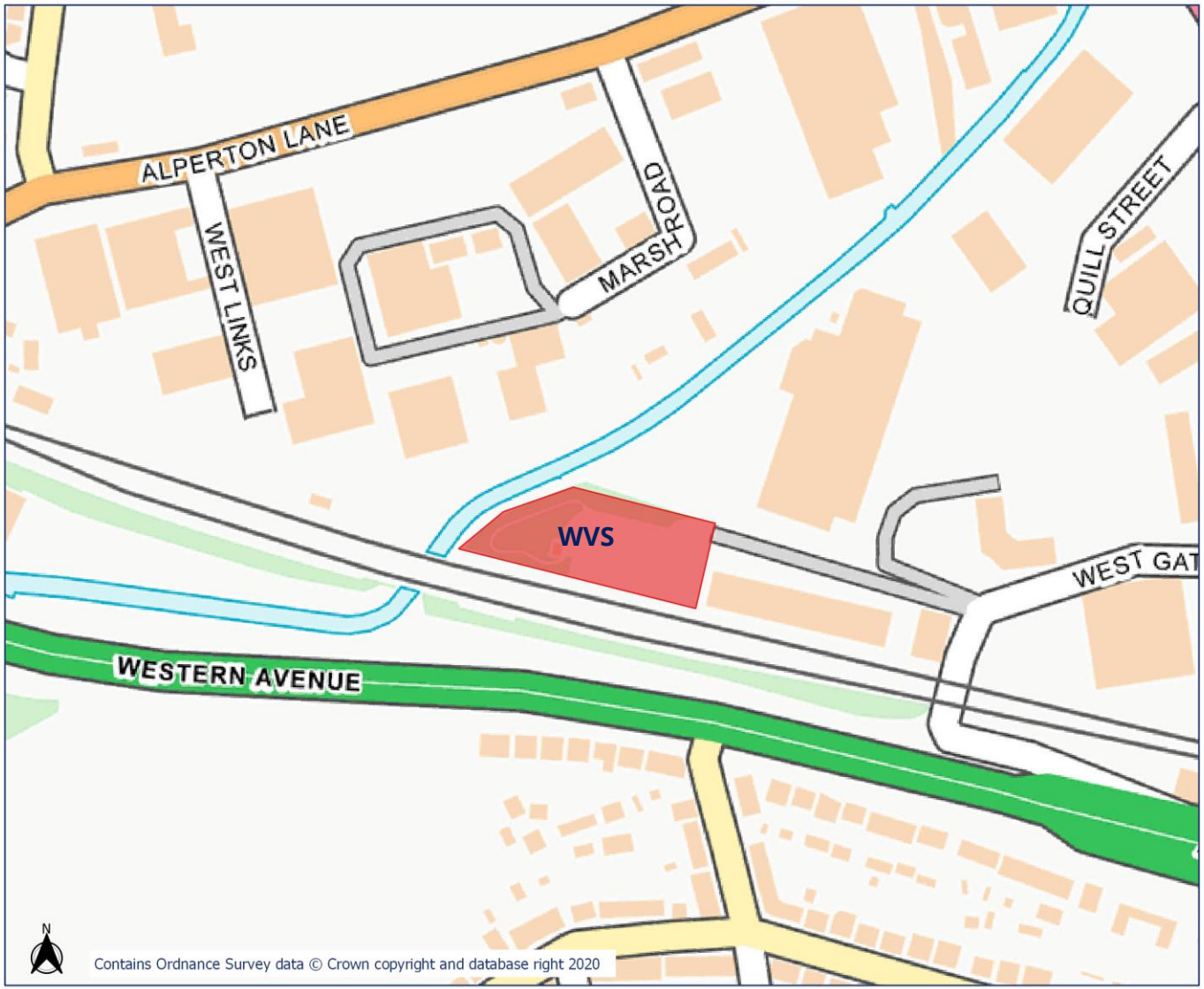
HS2 Worksite Identification Plan - 1



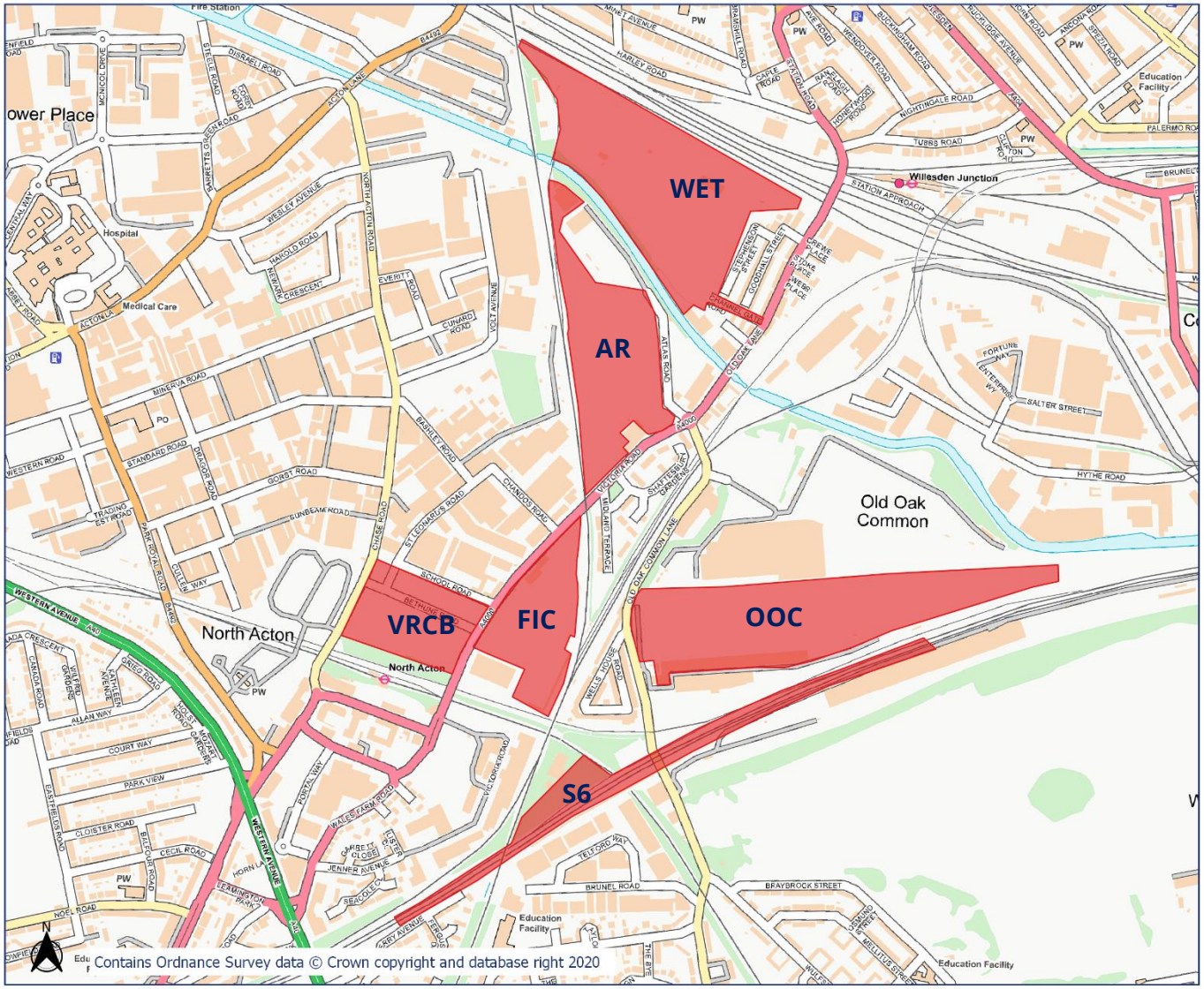
Worksite Identification Plan - 2



Worksite Identification Plan - 3

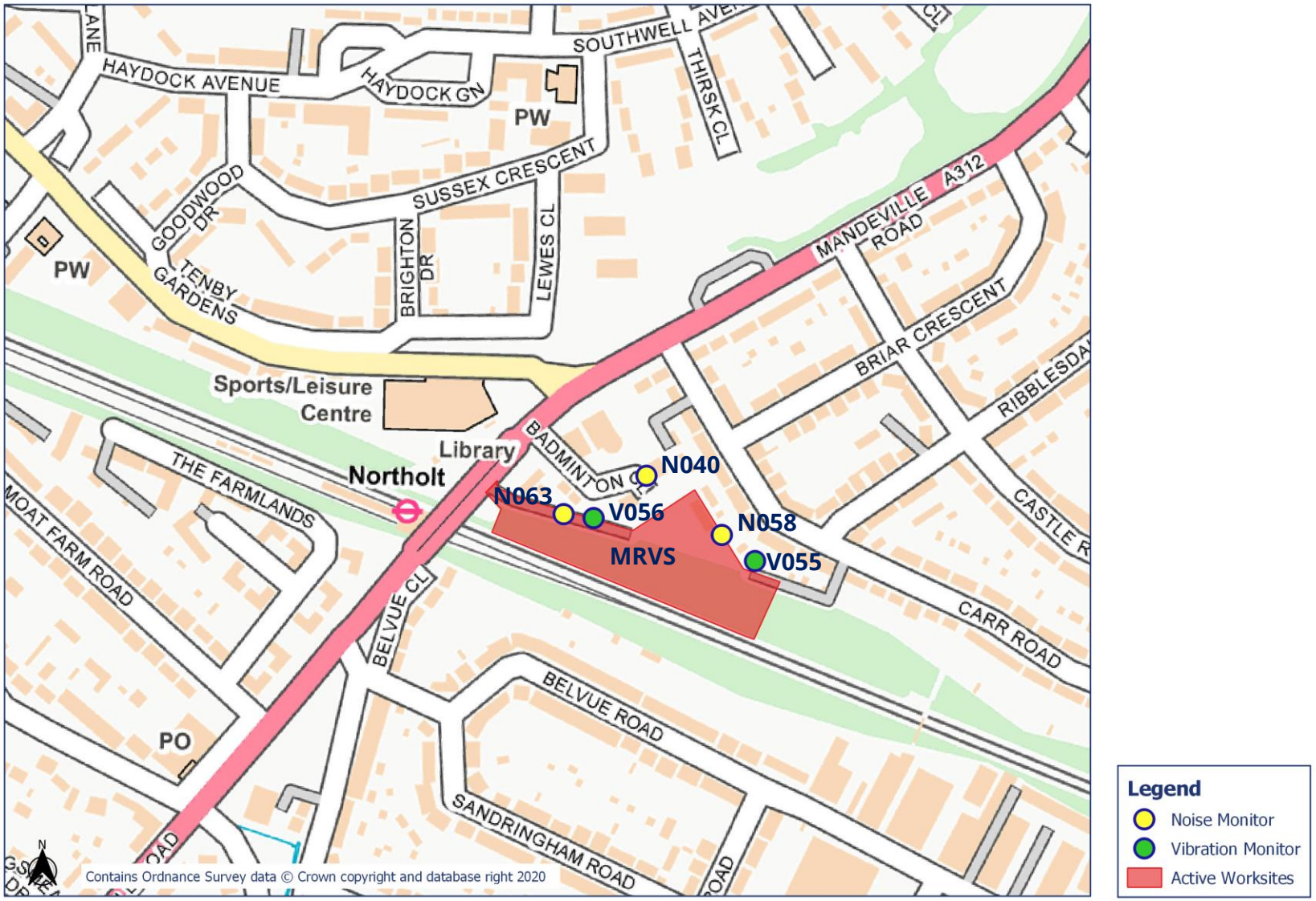


Worksite Identification Plan - 4

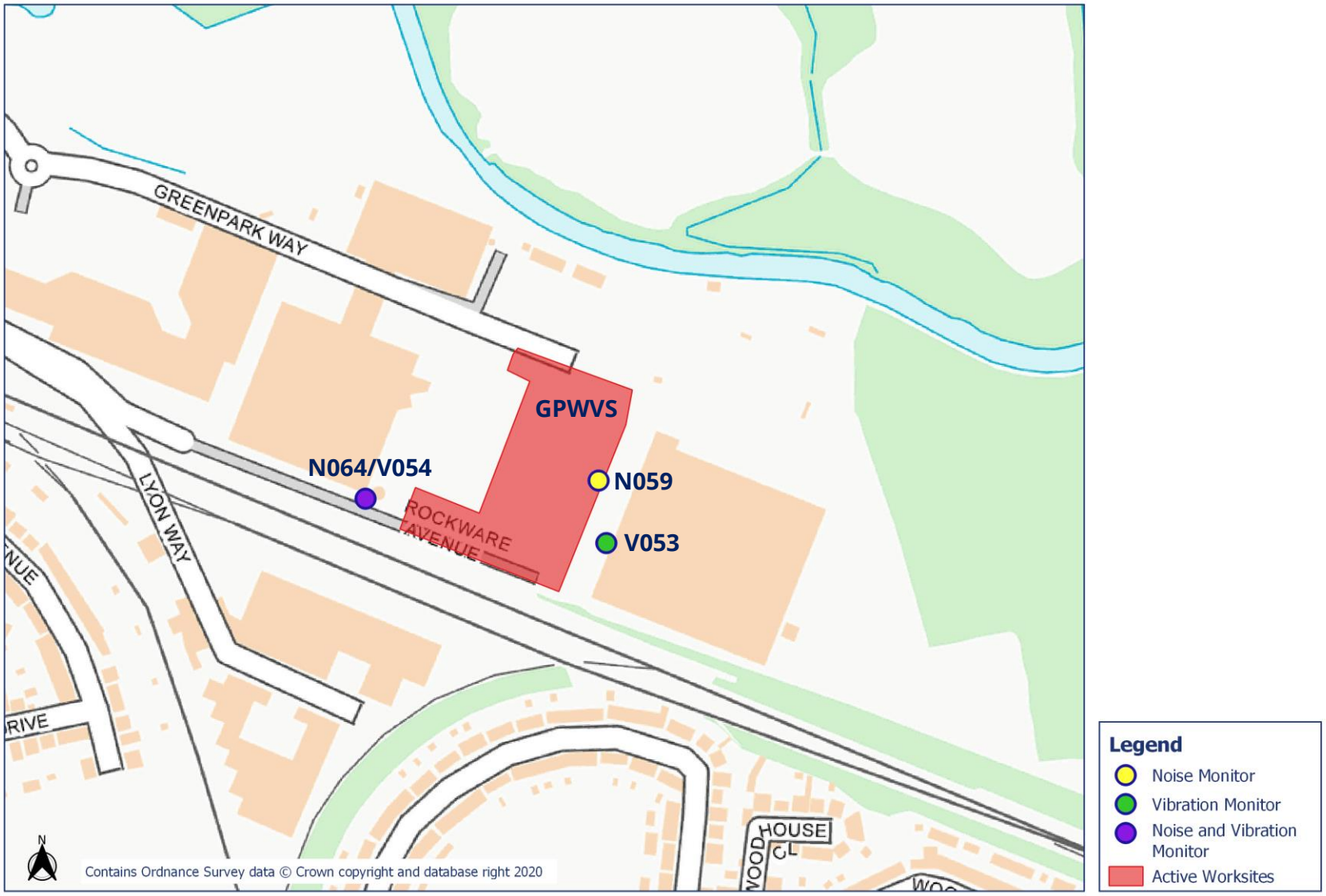


Appendix B Monitoring Locations

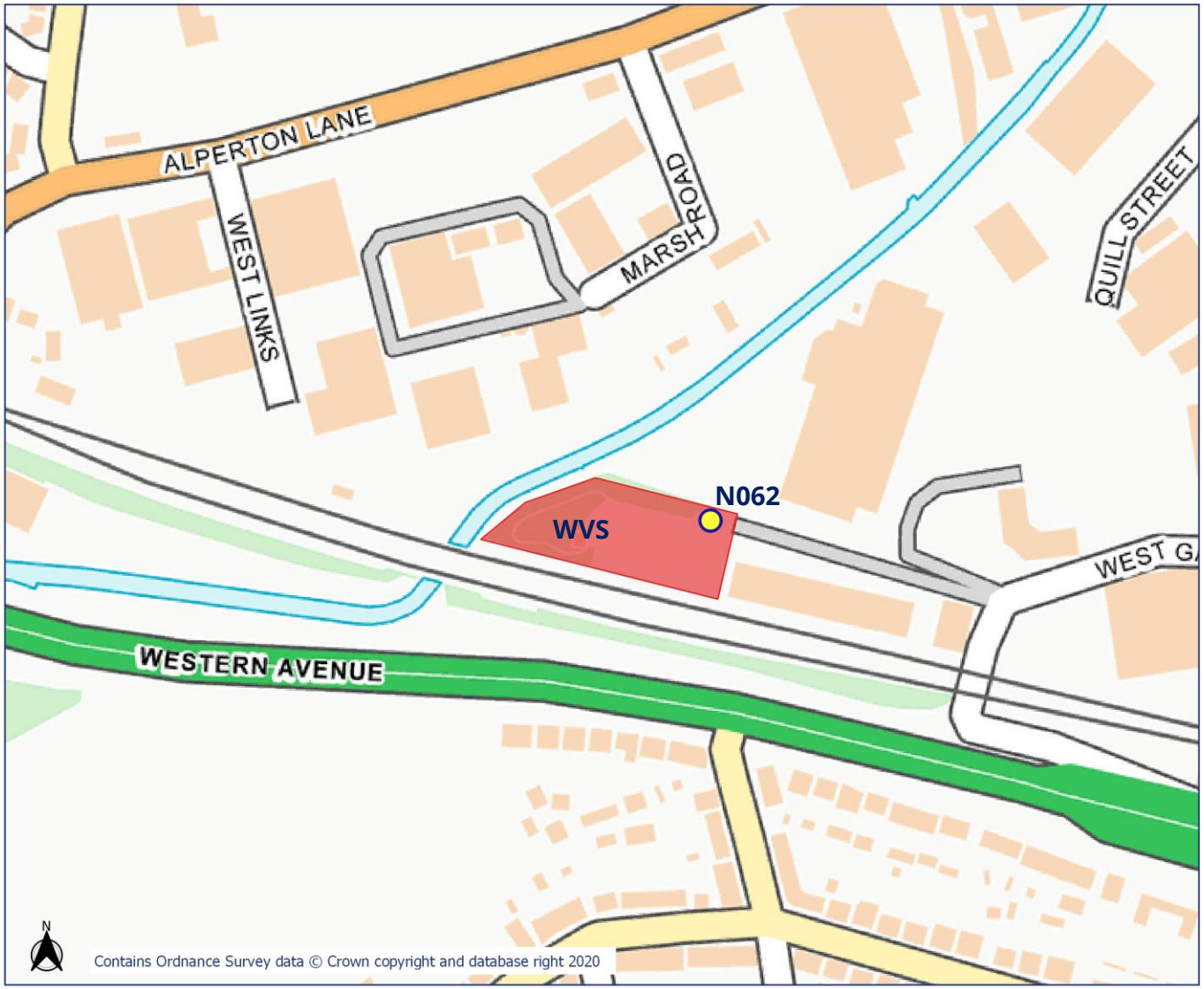
HS2 Noise and Vibration Monitoring Plan - 1



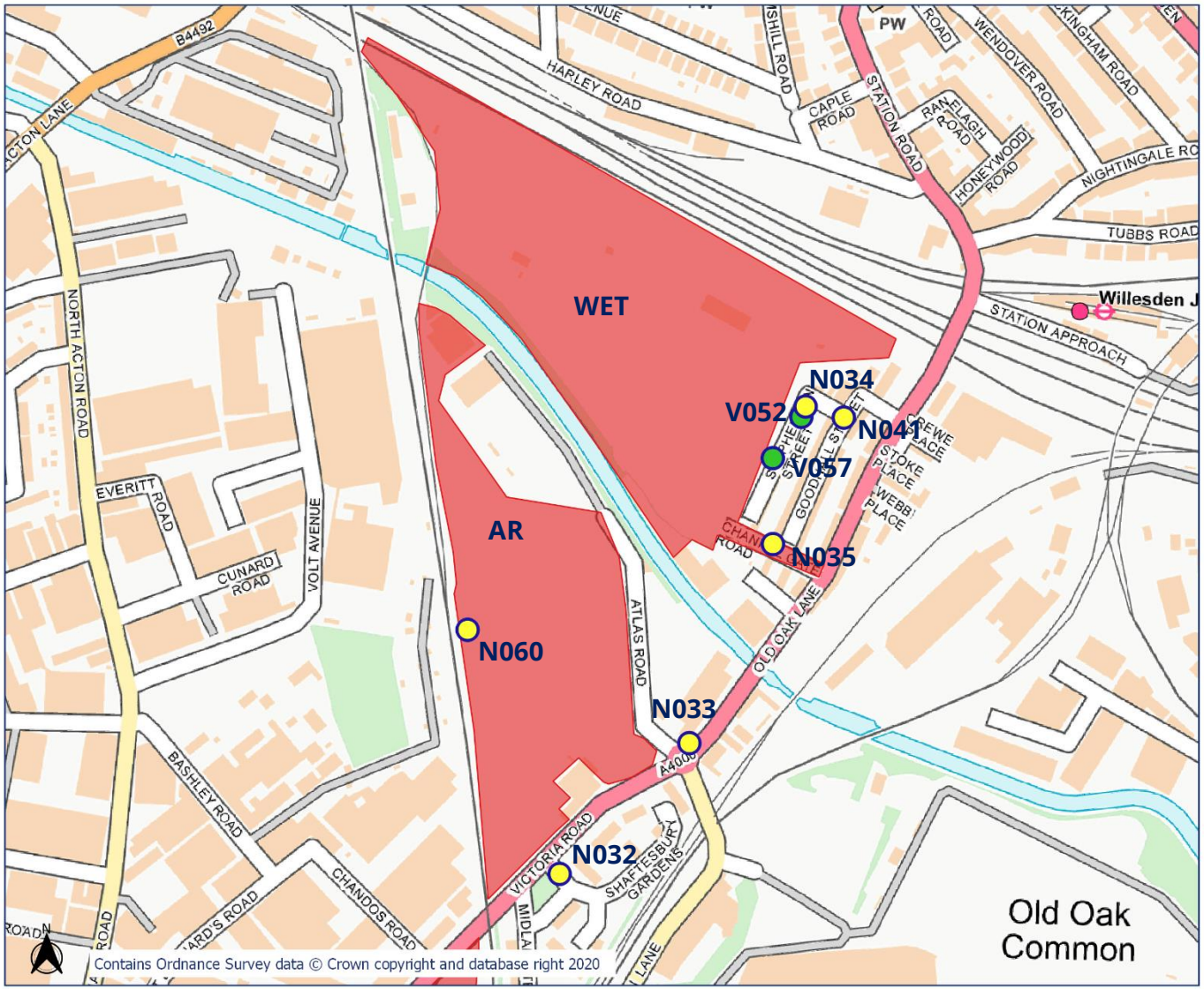
Noise and Vibration Monitoring Plan - 2



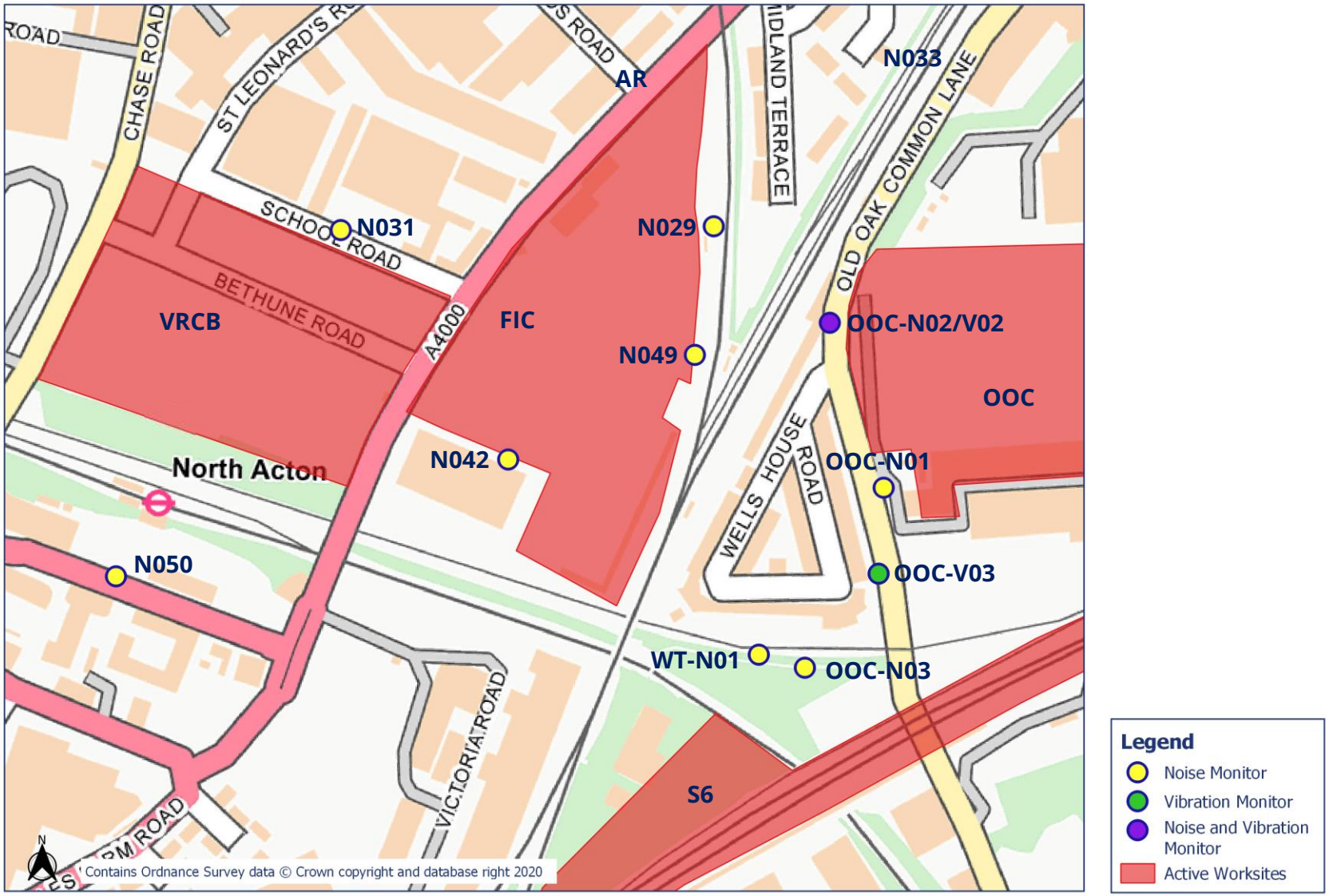
HS2 Noise and Vibration Monitoring Plan - 3



HS2 Noise and Vibration Monitoring Plan - 4



HS2 Noise and Vibration Monitoring Plan - 5

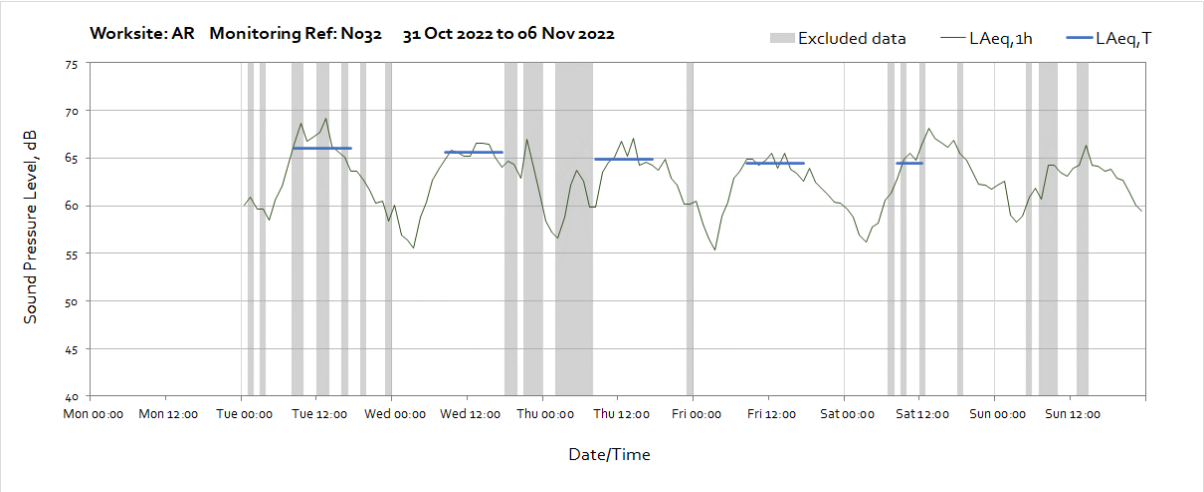


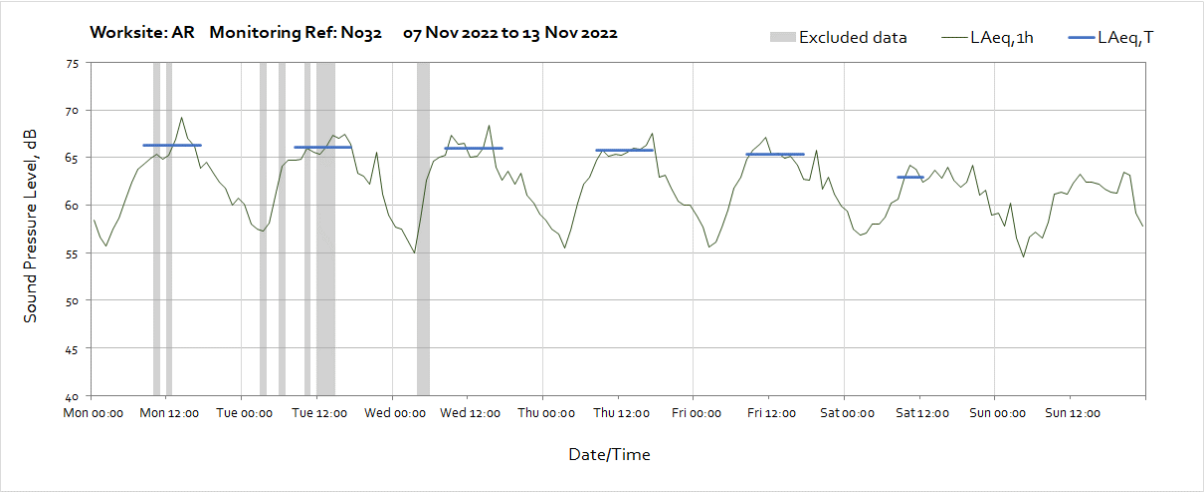
Appendix C Data

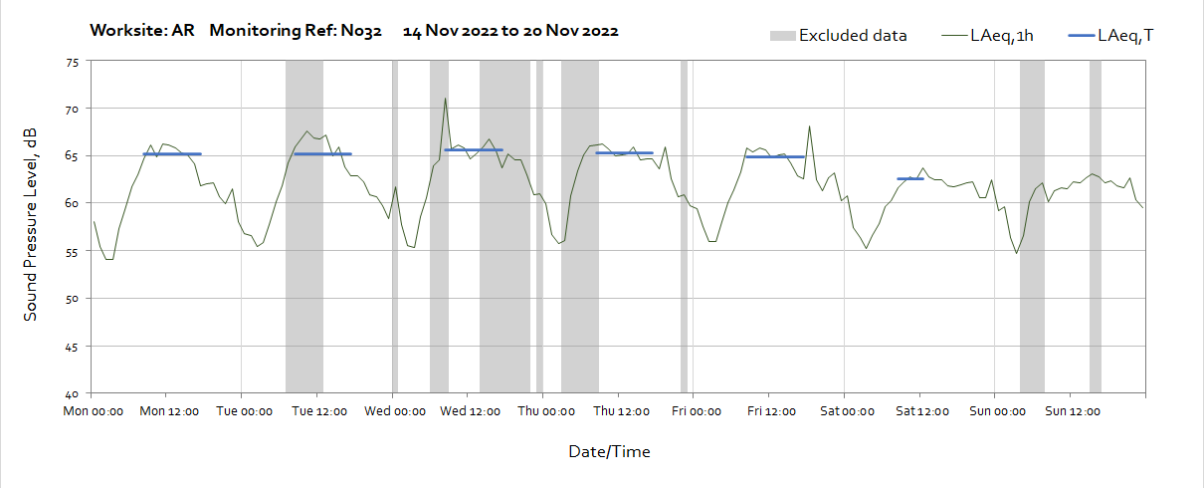
Noise

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 with adversely weather affected noise levels are greyed out and have been excluded from the calculation of the $L_{Aeq,T}$ values in Table 3 of the main report.

Worksite: Atlas Road worksite (AR) – Monitoring Ref: N032



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Excluded data
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LAeq,T
Sound Pressure Level, dB
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65
60
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45
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Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
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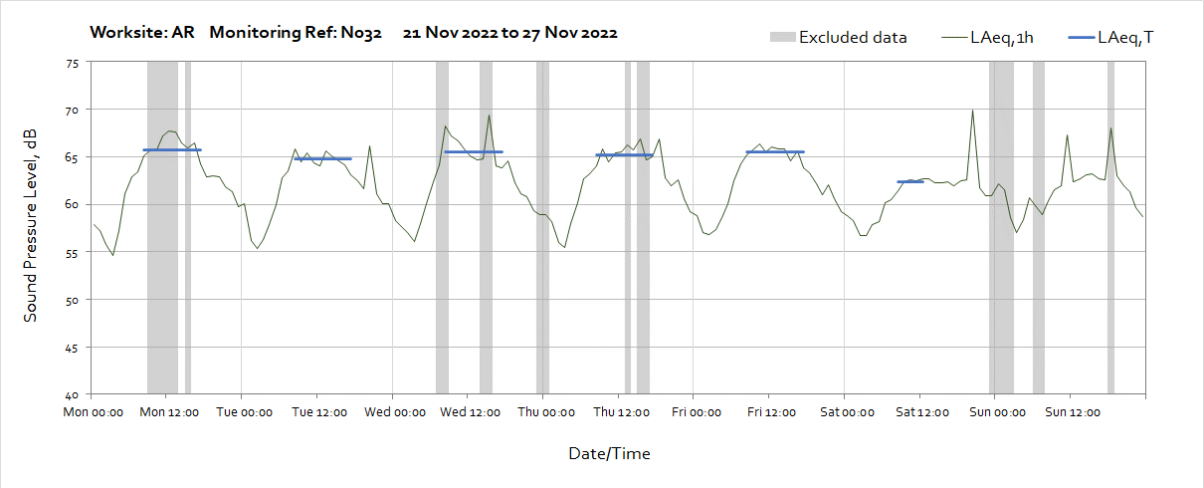
Fri 00:00
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time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Excluded data
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LAeq,T
Sound Pressure Level, dB
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65
60
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45
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Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
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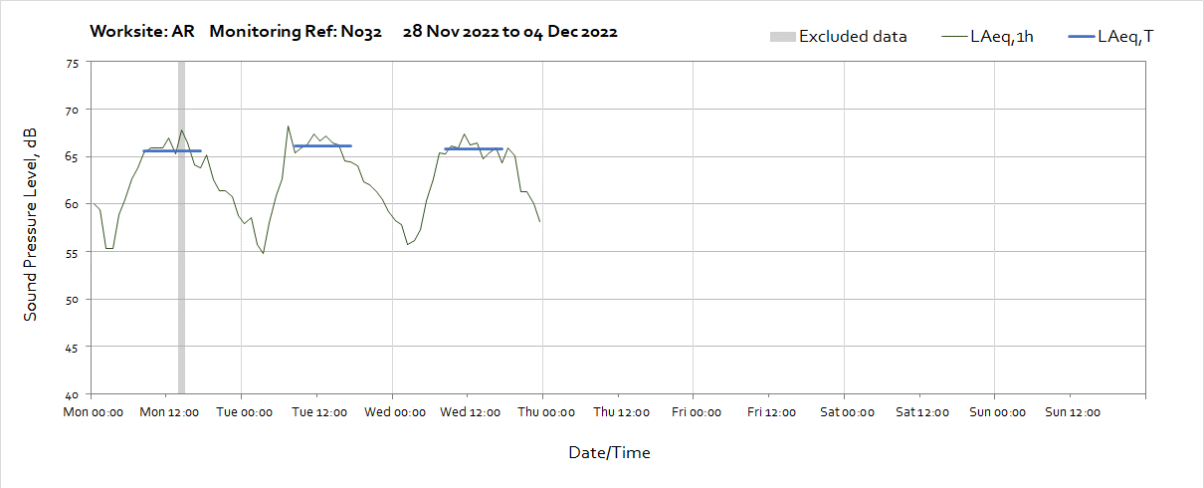
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time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Excluded data
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LAeq,T
Sound Pressure Level, dB
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70
65
60
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50
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
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Sat 12:00
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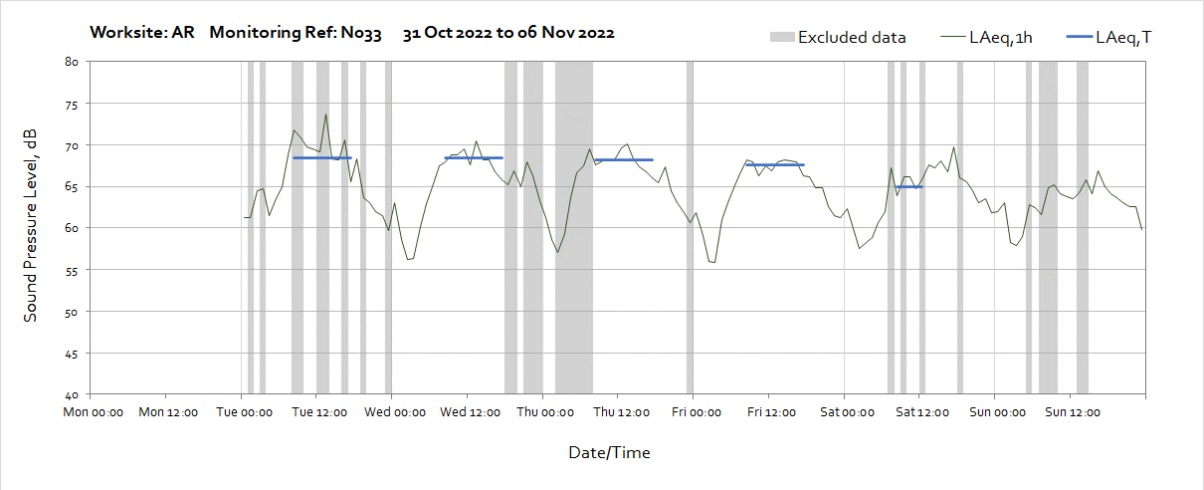
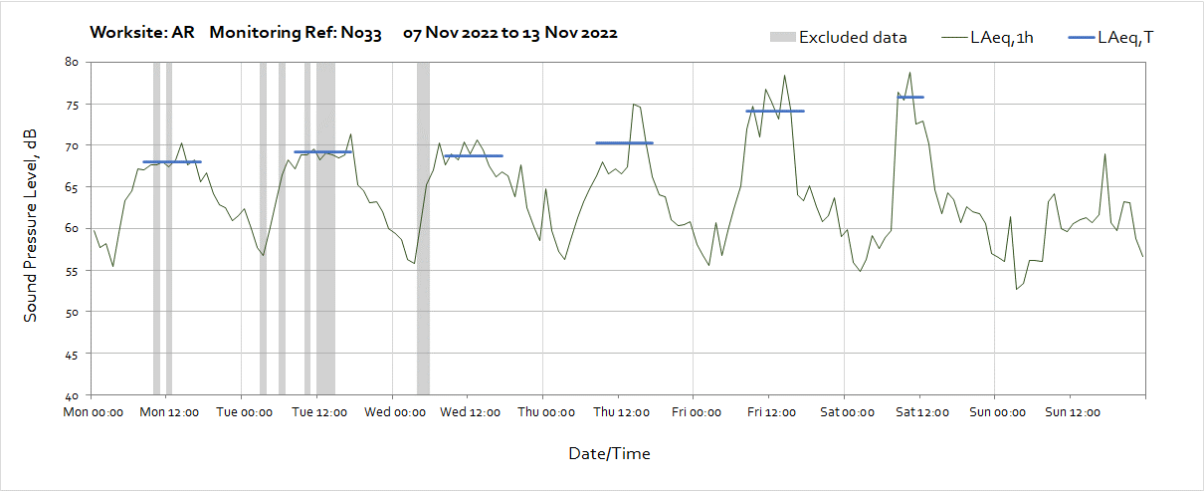
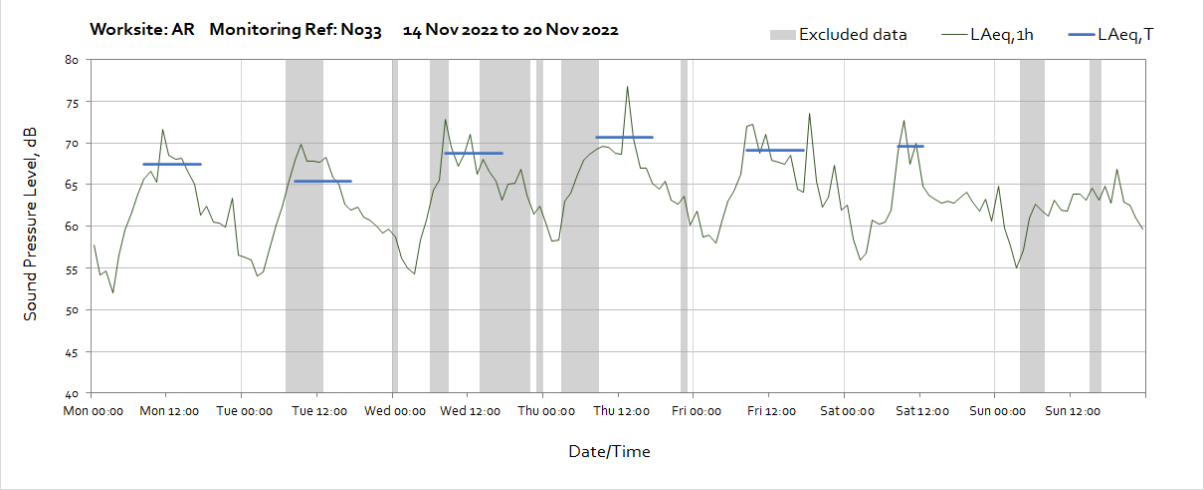
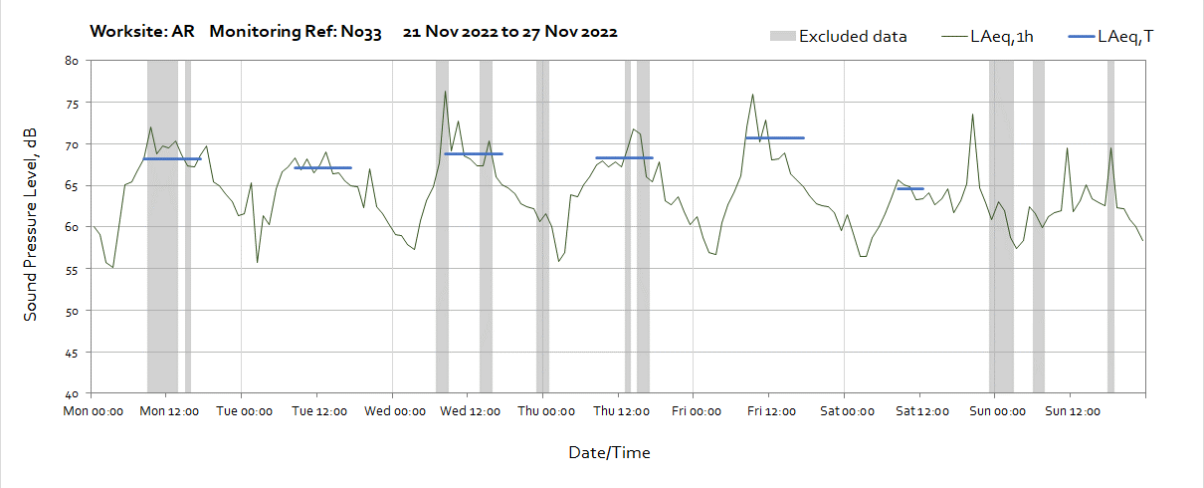
Sun 12:00
Date/Time

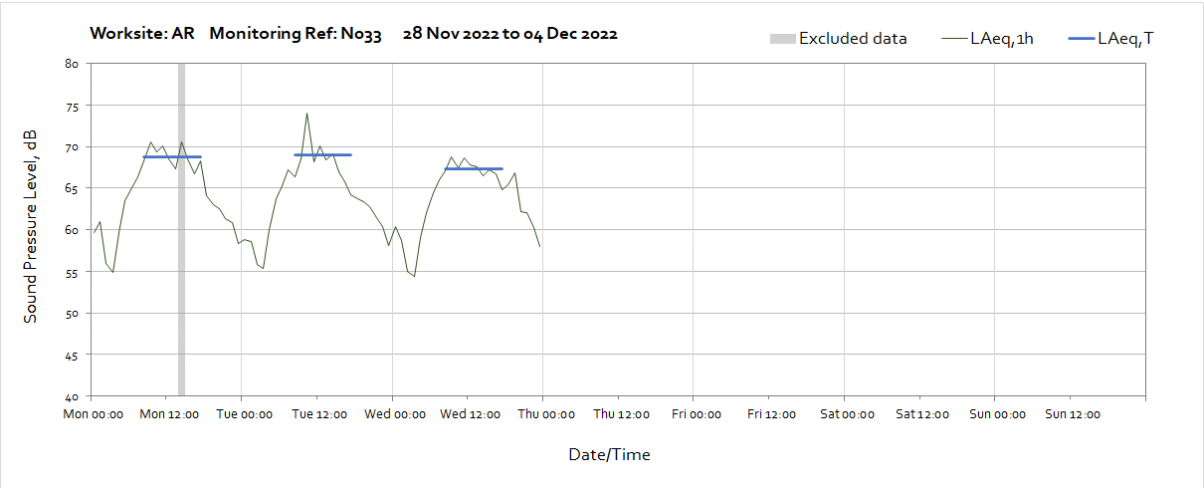
Worksite: Atlas Road worksite (AR) – Monitoring Ref: N033



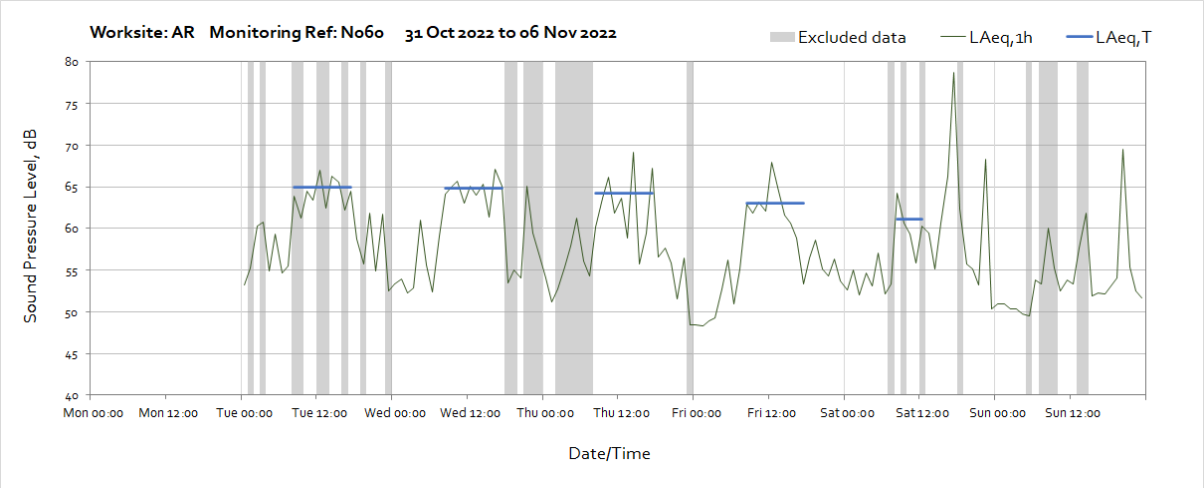


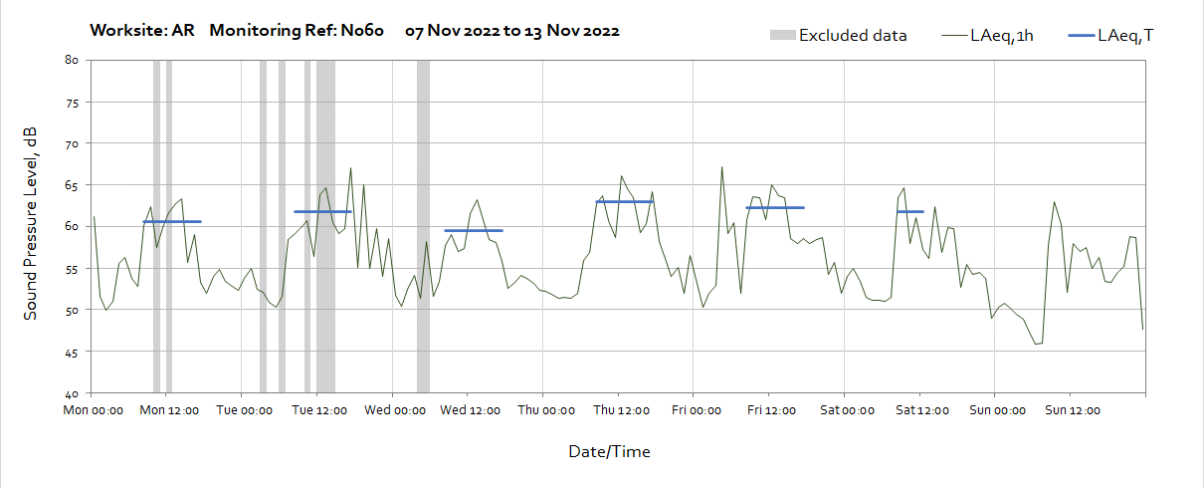






Worksite: Atlas Road worksite (AR) – Monitoring Ref: N060

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70
65
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Mon 12:00
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Tue 12:00
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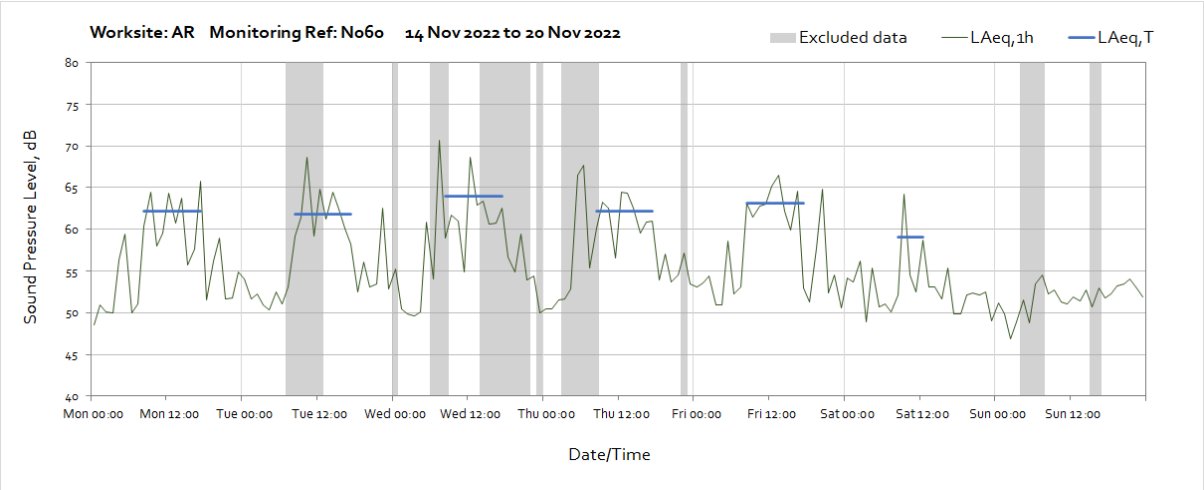
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time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Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
80
75
70
65
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50
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Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
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Sat 00:00
Sat 12:00
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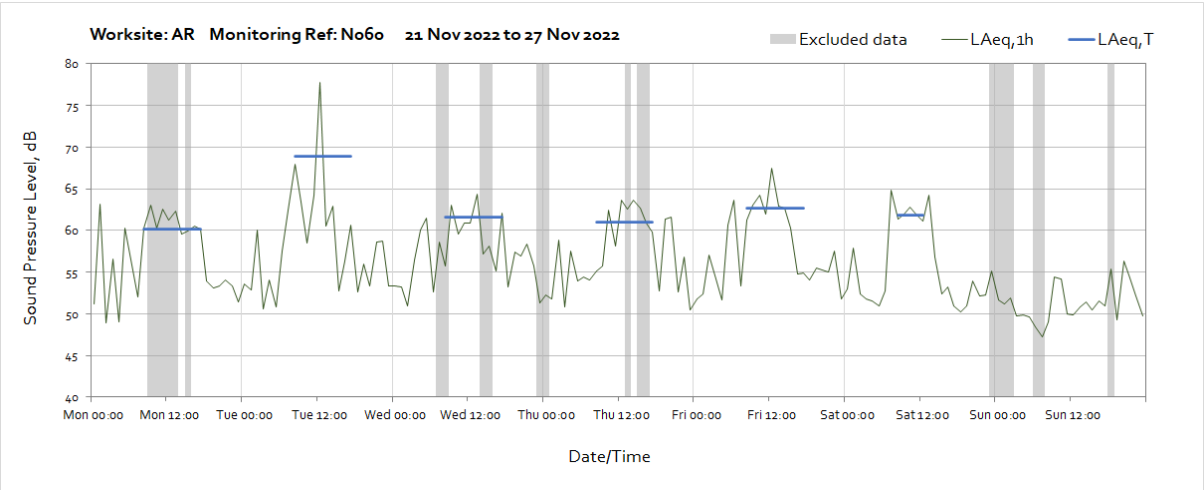
Sun 12:00
Date/Time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LAeq,T
Sound Pressure Level, dB
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75
70
65
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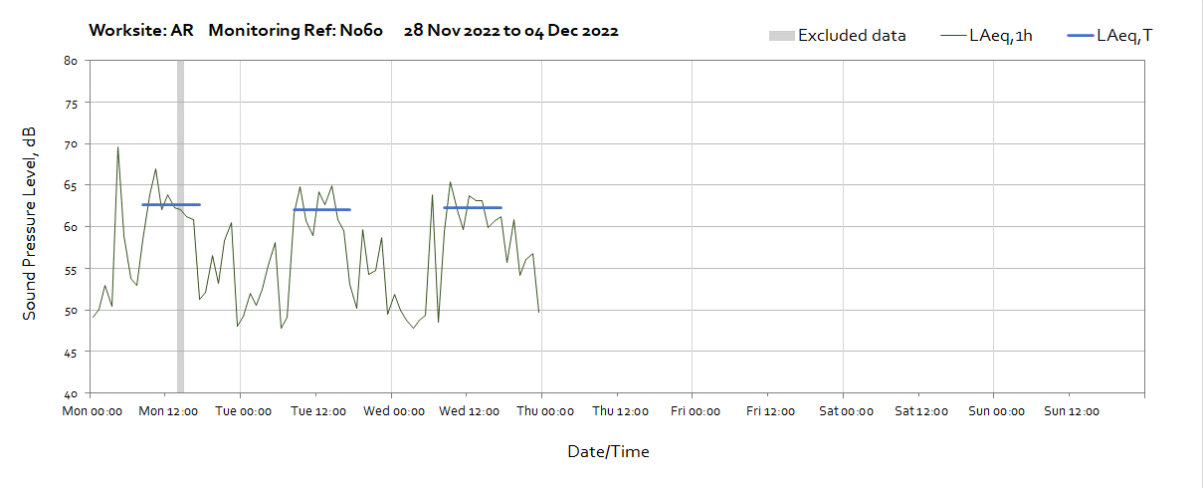
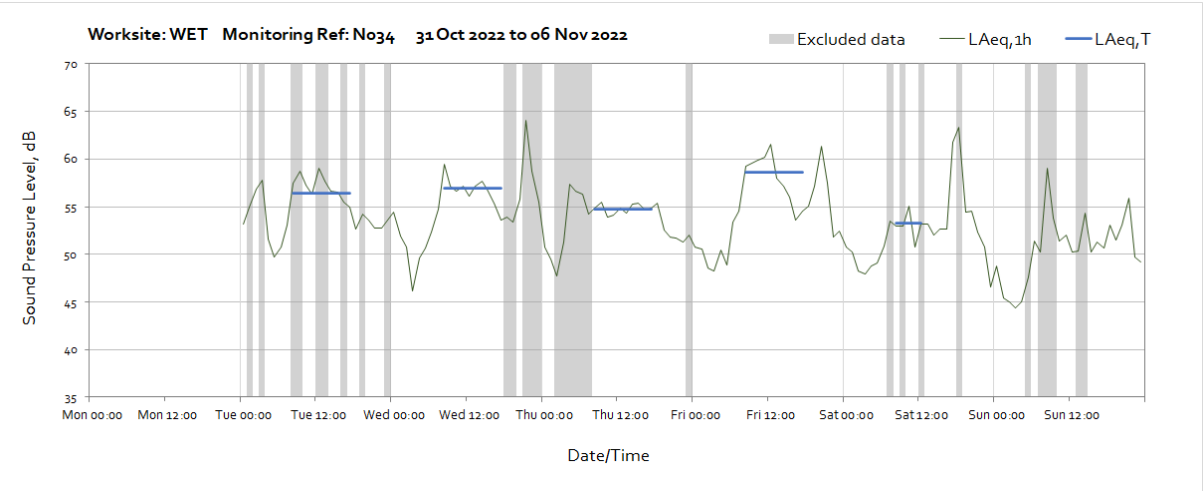
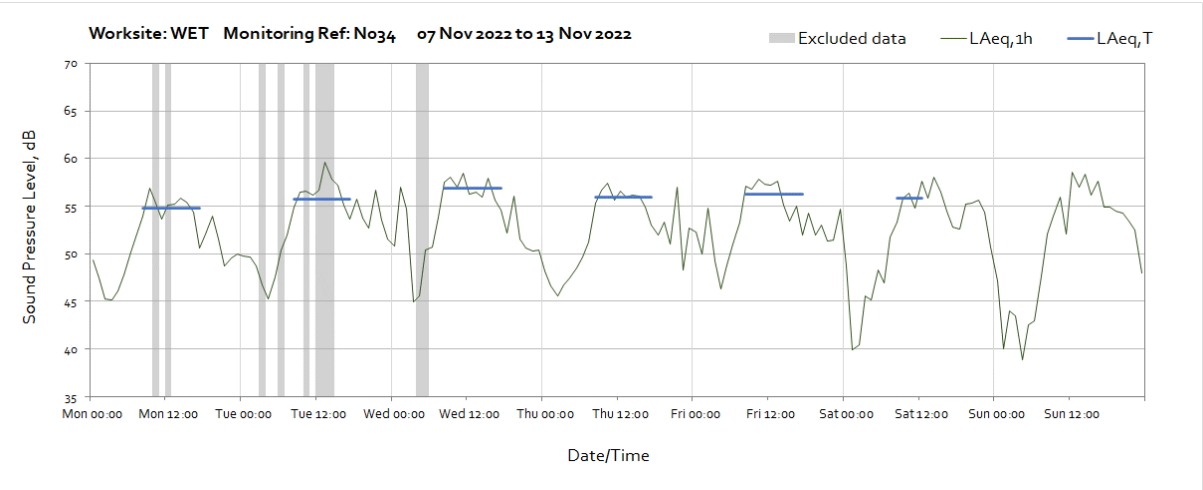
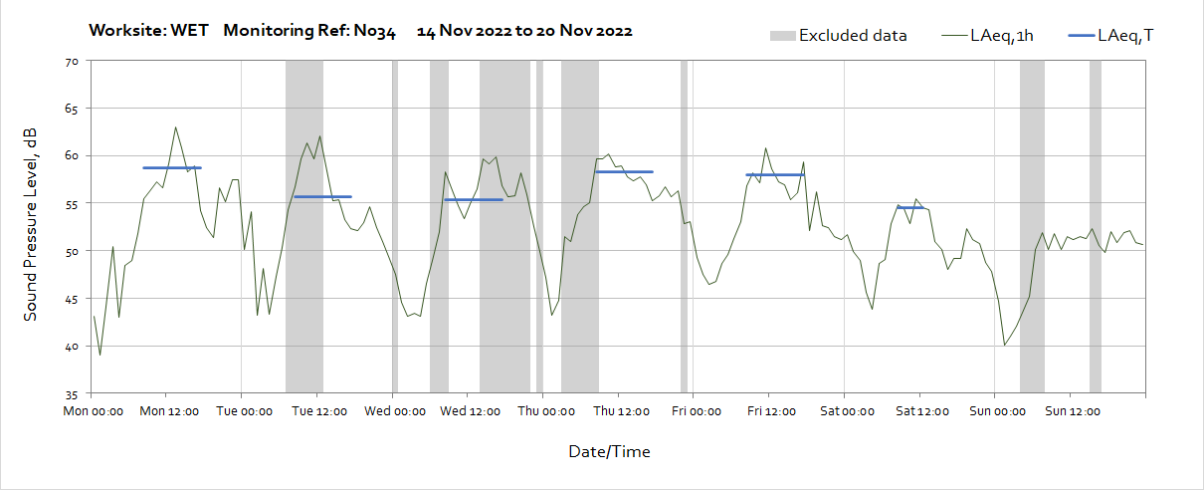
Date/Time



Worksite: Willesden Euro Terminal (WET) – Monitoring Ref: N034



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LAeq,T
Sound Pressure Level, dB
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65
60
55
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Tue 00:00
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Wed 00:00
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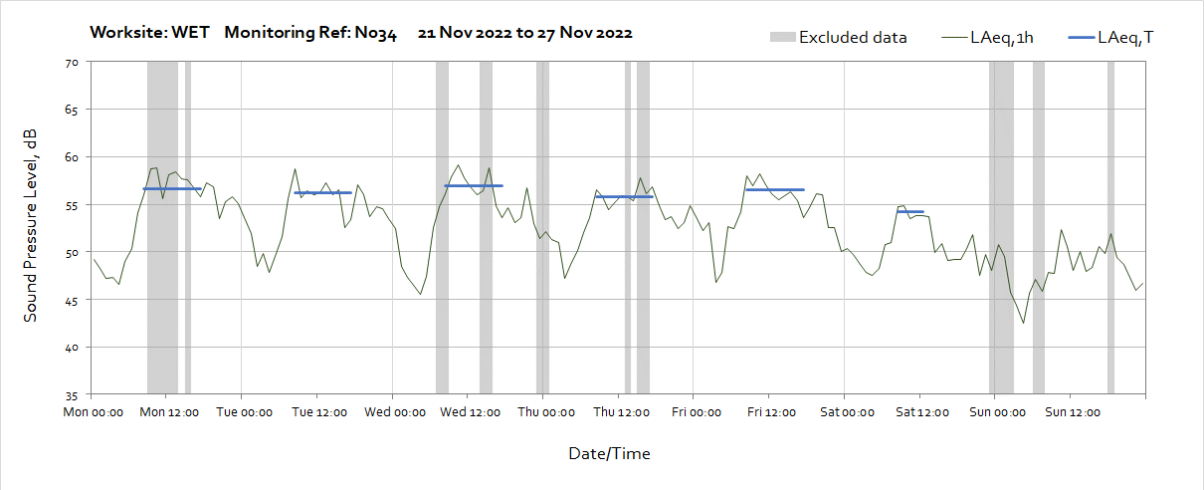
Date/Time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LAeq,T
Sound Pressure Level, dB
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65
60
55
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45
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35
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Tue 00:00
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Wed 00:00
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Fri 00:00
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time


Worksite: WET Monitoring Ref: No34 28 Nov 2022 to 04 Dec 2022
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
70
65
60
55
50
45
40
35
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
Wed 12:00
Thu 00:00
Thu 12:00
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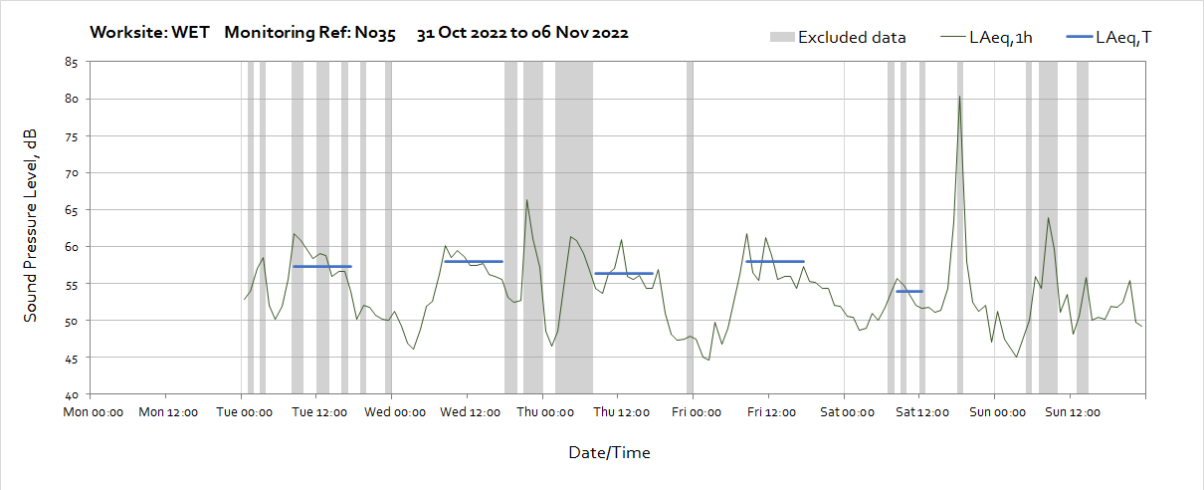
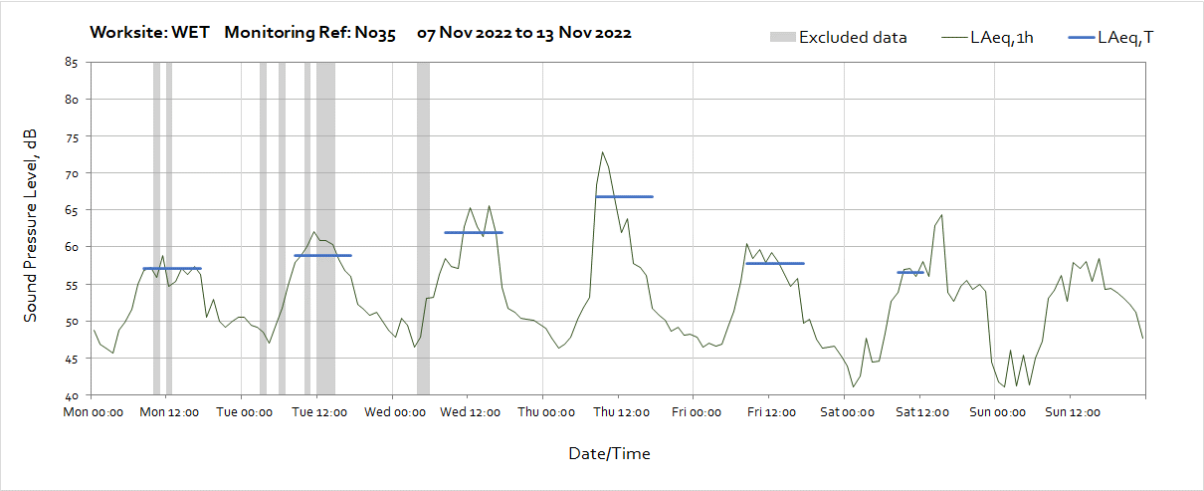
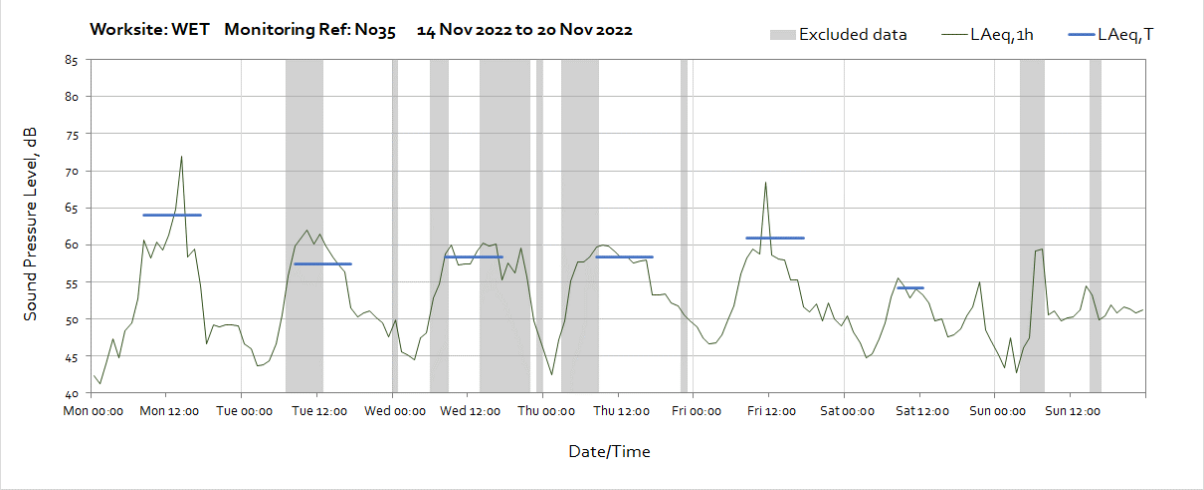
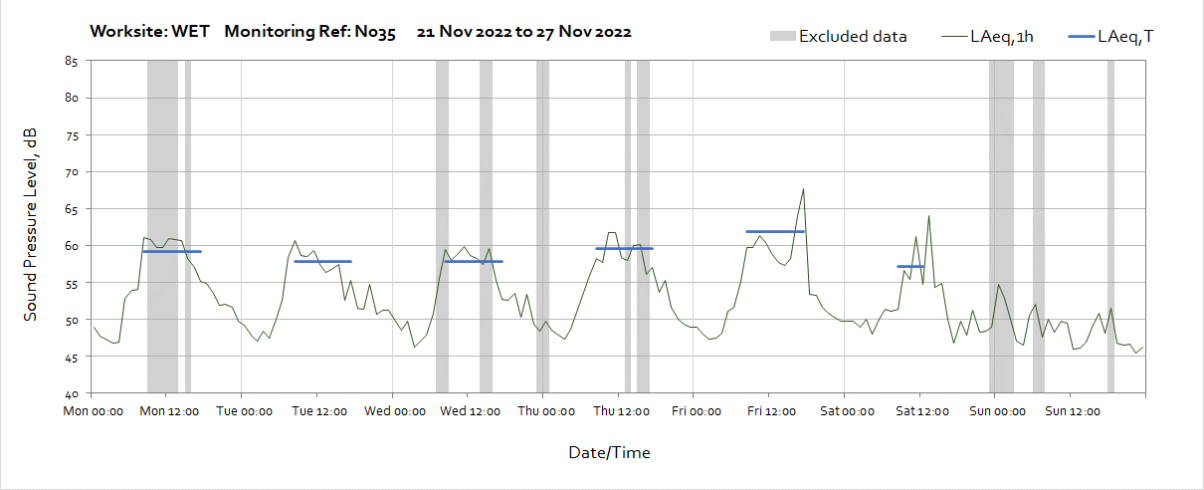
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time

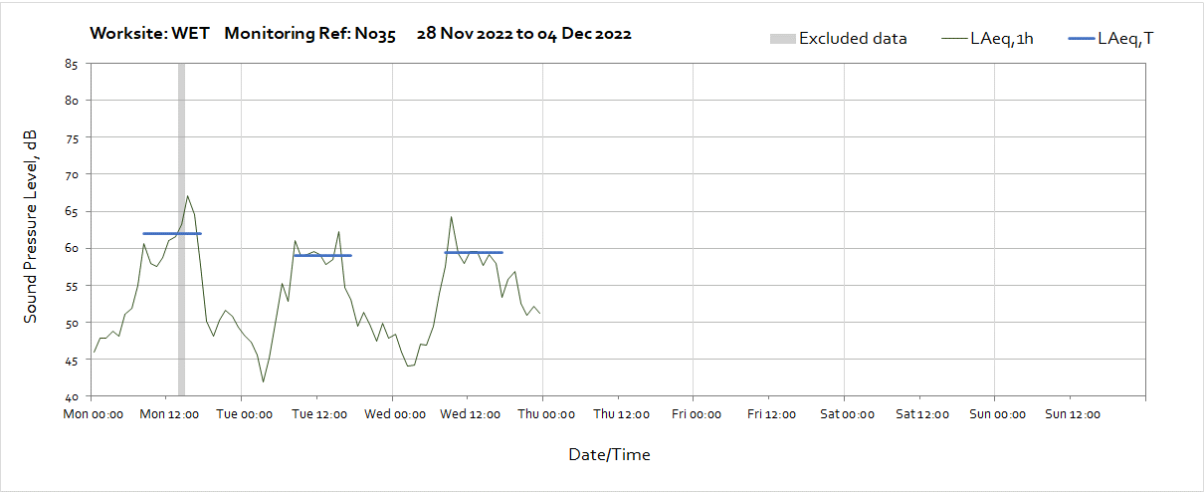
Worksite: Willesden Euro Terminal (WET) – Monitoring Ref: N035



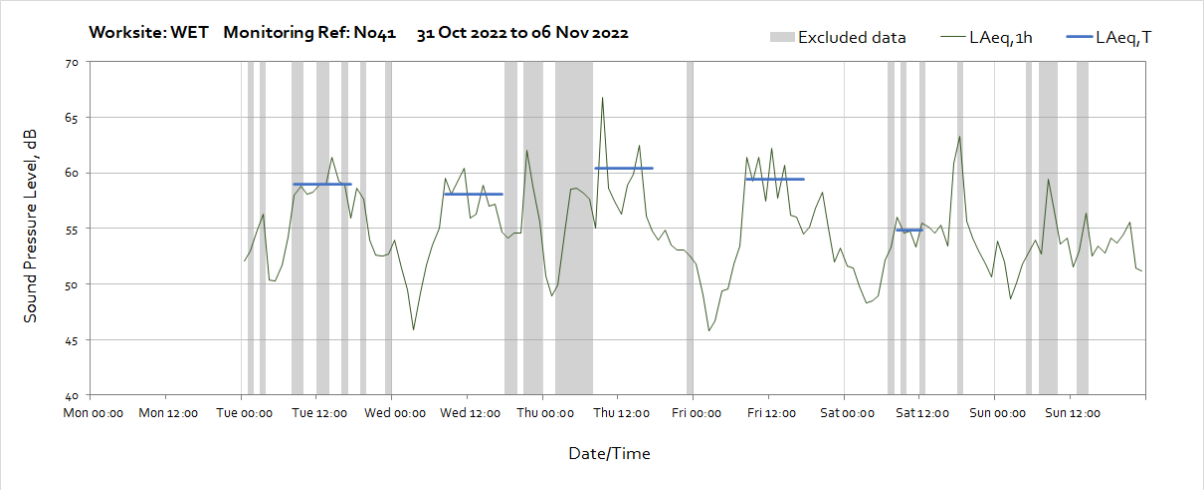


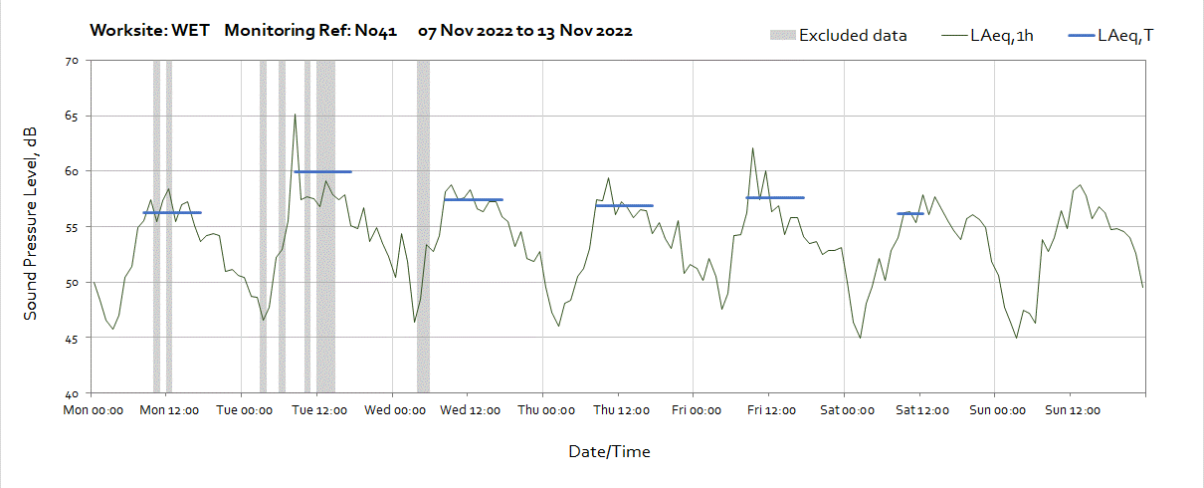






Worksite: Willesden Euro Terminal (WET) – Monitoring Ref: N041

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LAeq,T
Sound Pressure Level, dB
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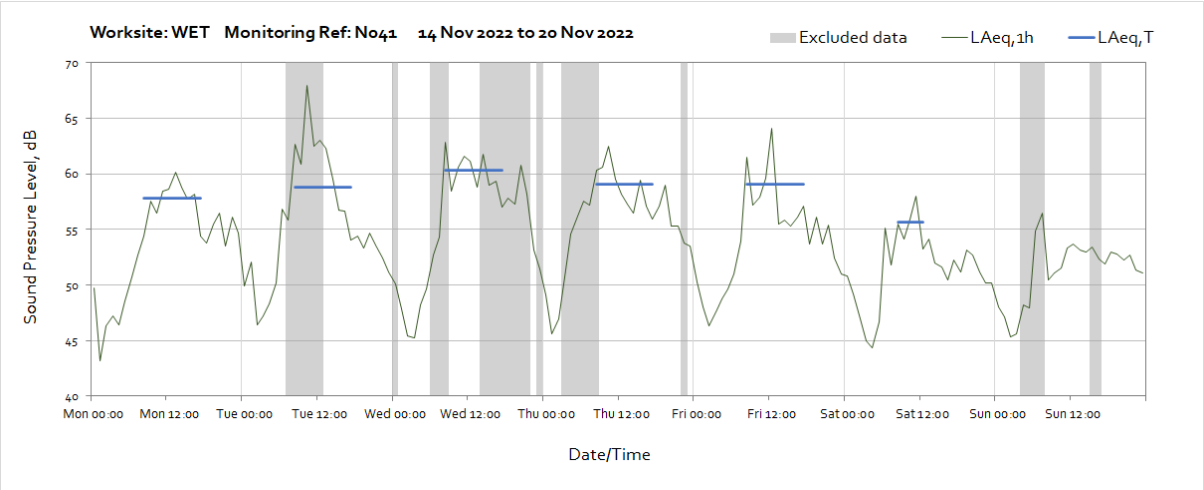
65
60
55
50
45
40
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
Wed 12:00
Thu 00:00
Thu 12:00
Fri 00:00
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time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Excluded data
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LAeq,T
Sound Pressure Level, dB
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65
60
55
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40
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Tue 12:00
Wed 00:00
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Fri 12:00
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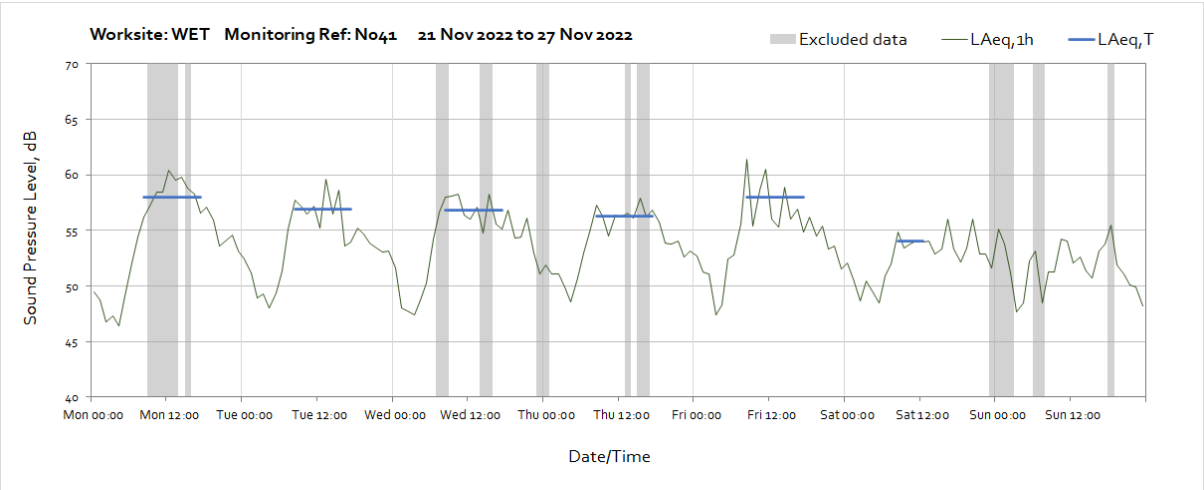
Date/Time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Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
70
65
60
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Mon 00:00
Mon 12:00
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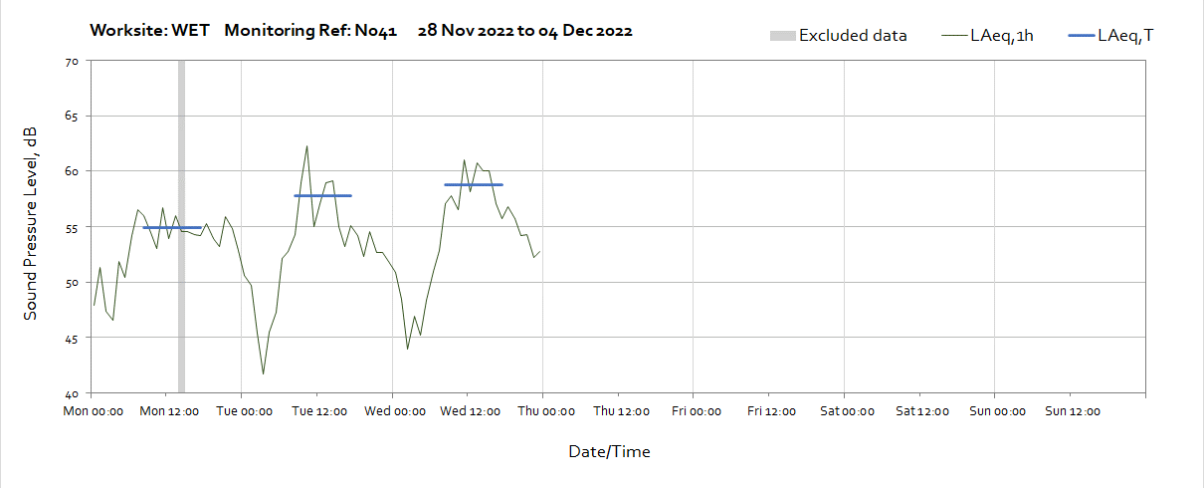
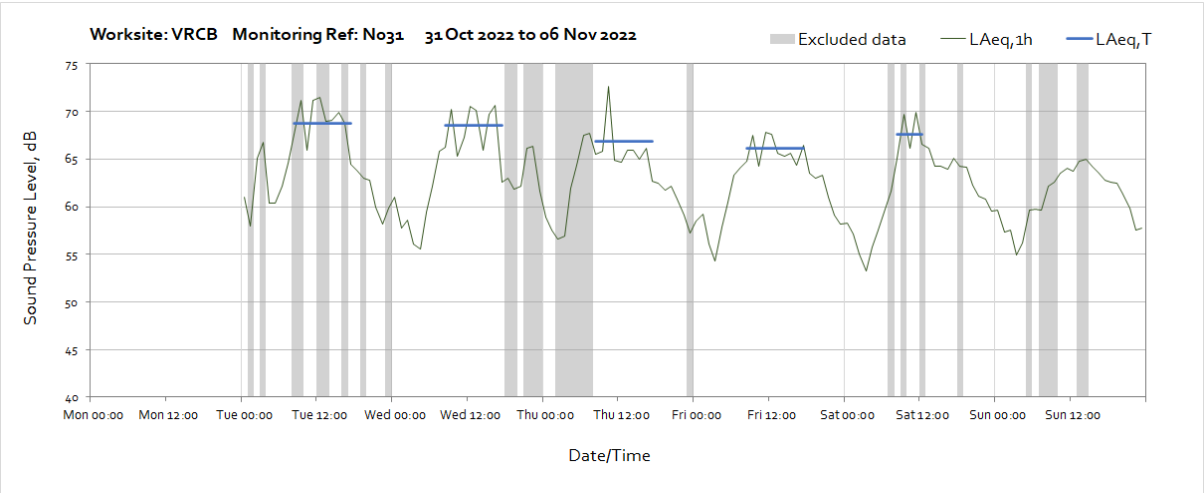
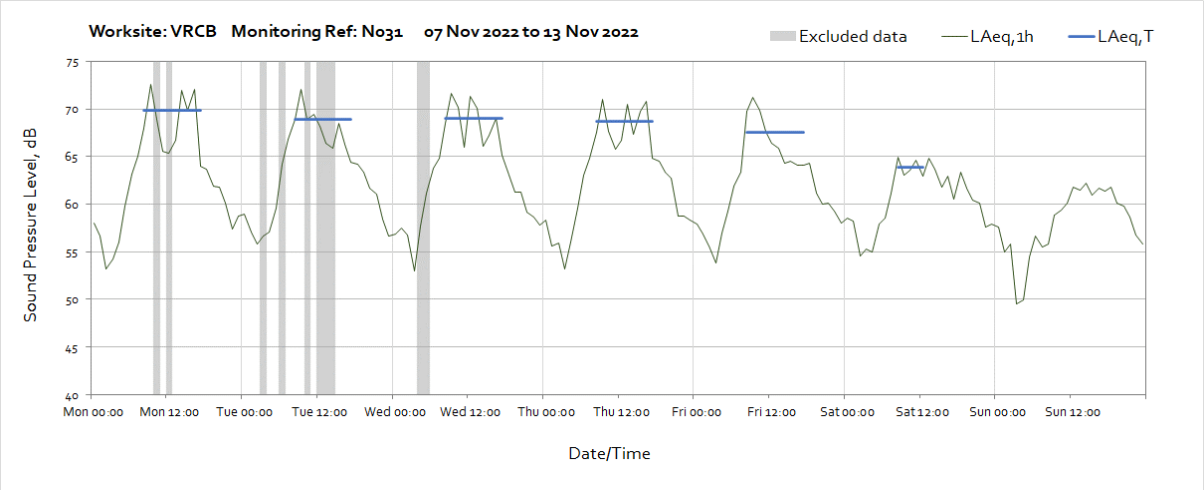
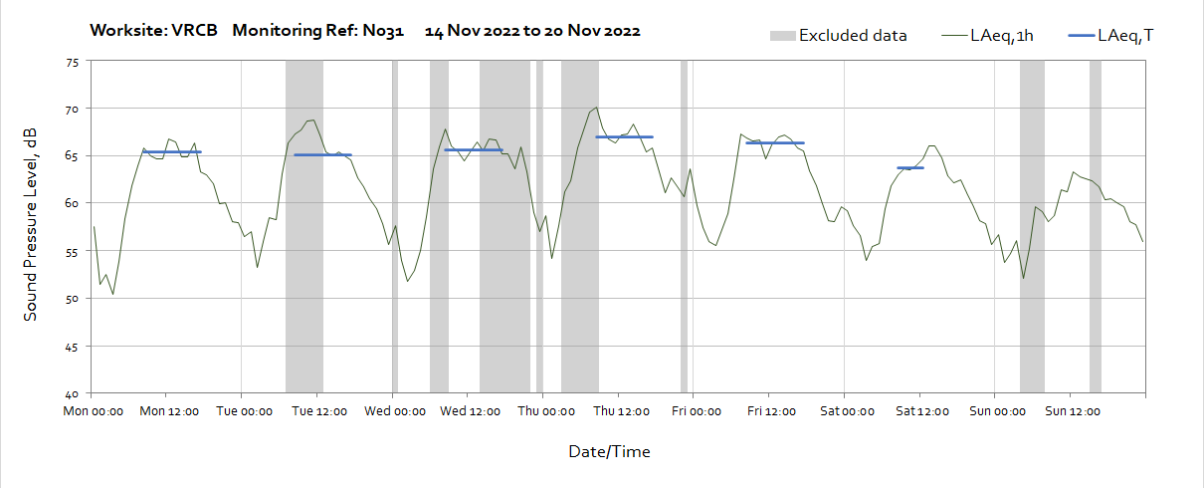
Date/Time



Worksite: Victoria Road Crossover Box (VRCB) – Monitoring Ref: N031






Worksite: VRCB Monitoring Ref: No31 14 Nov 2022 to 20 Nov 2022
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
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70
65
60
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Tue 12:00
Wed 00:00
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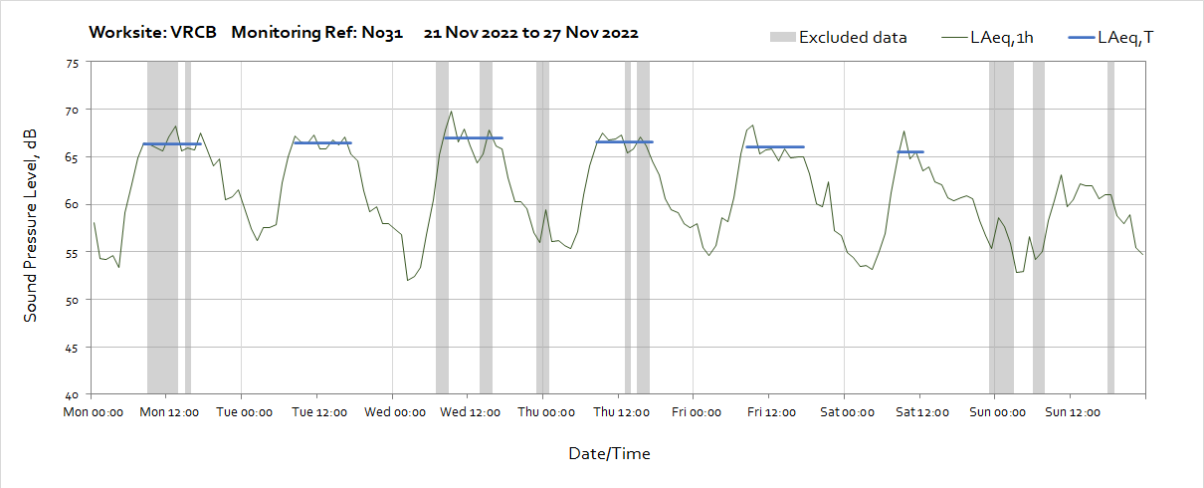
Sun 00:00
Sun 12:00
Date/Time


Worksite: VRCB Monitoring Ref: No31 21 Nov 2022 to 27 Nov 2022
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
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65
60
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Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
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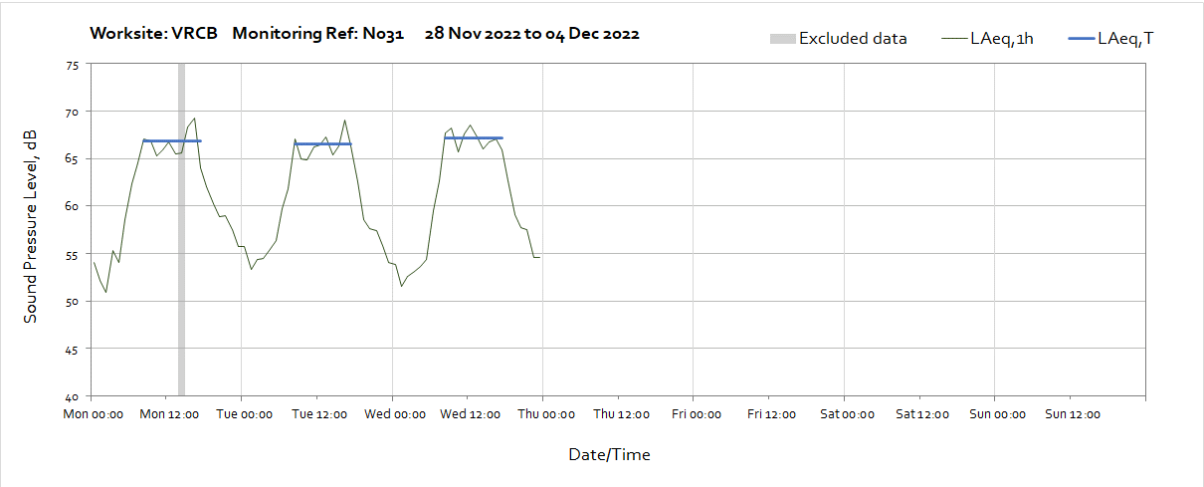
Sun 12:00
Date/Time


Worksite: VRCB Monitoring Ref: No31 28 Nov 2022 to 04 Dec 2022
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
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65
60
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Mon 00:00
Mon 12:00
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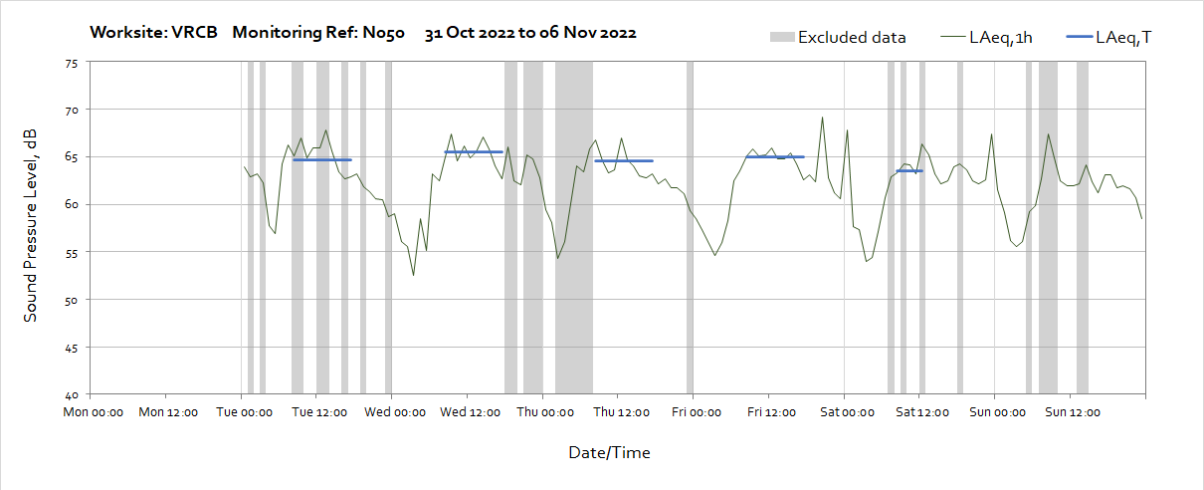
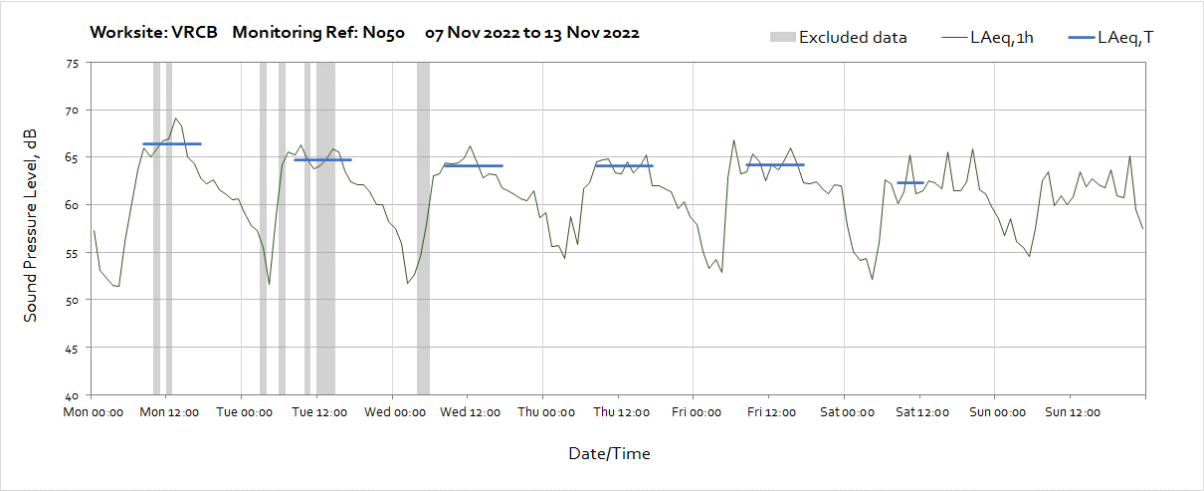
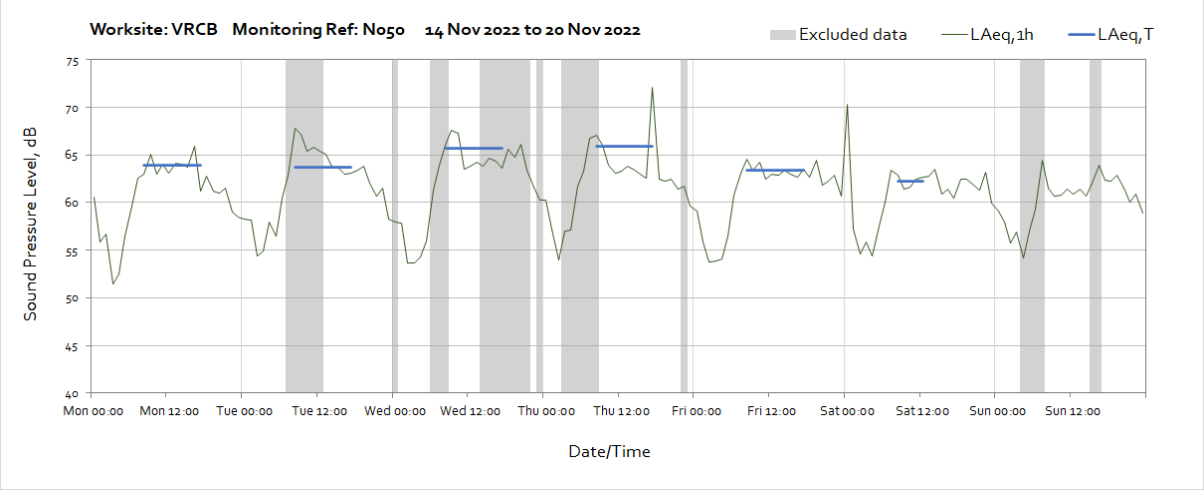
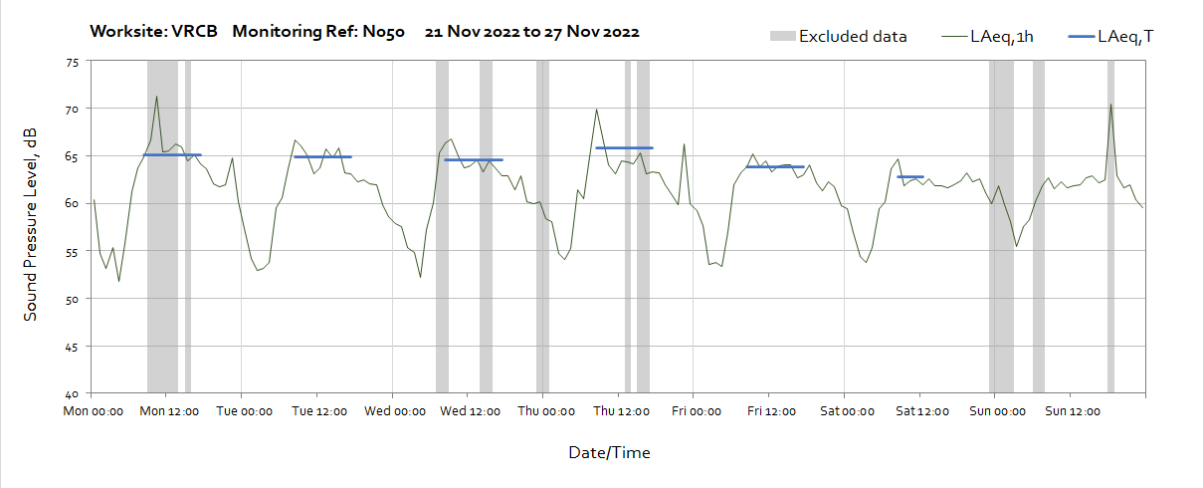
Date/Time

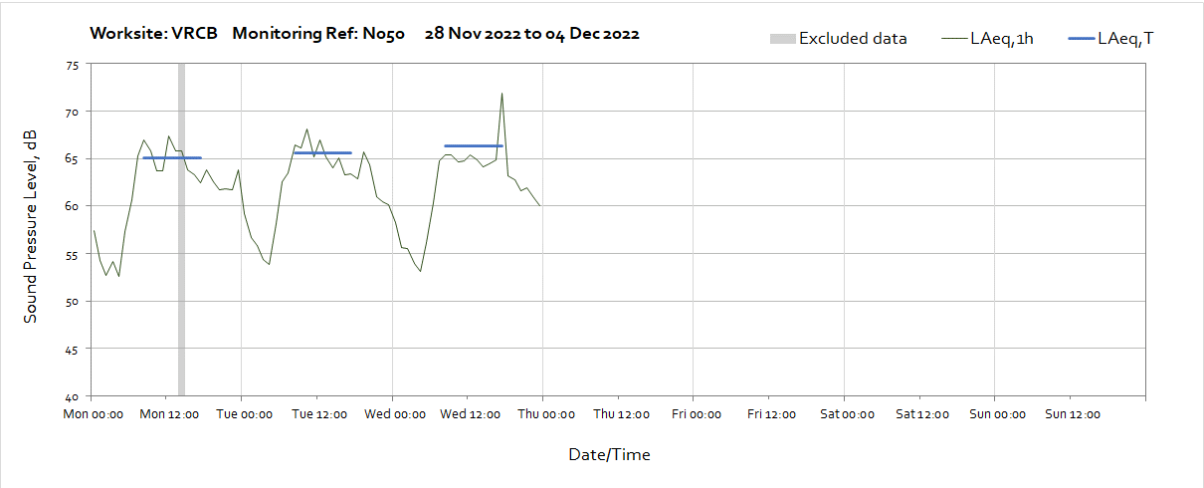
Worksite: Victoria Road Crossover Box (VRCB) – Monitoring Ref: N050



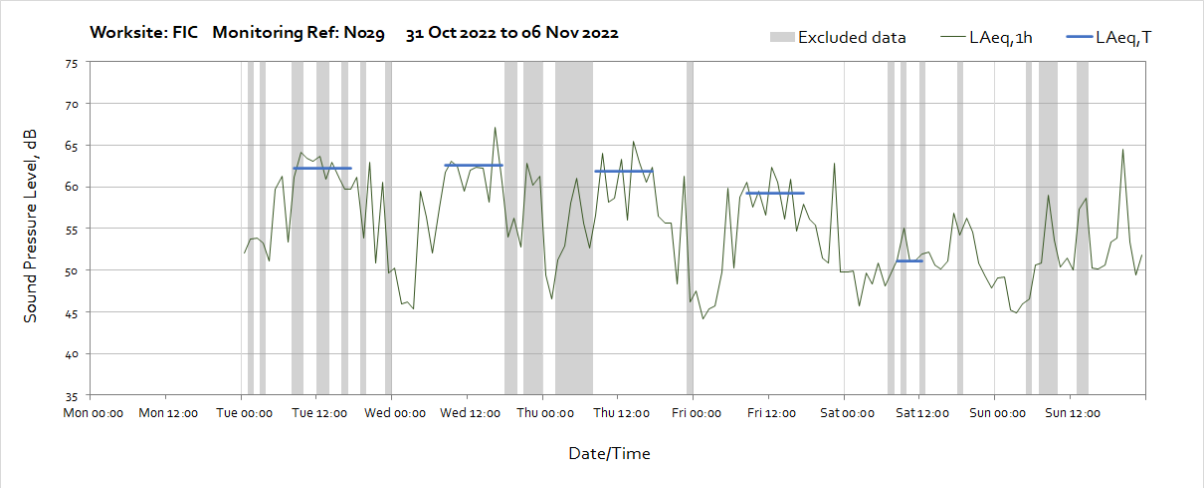


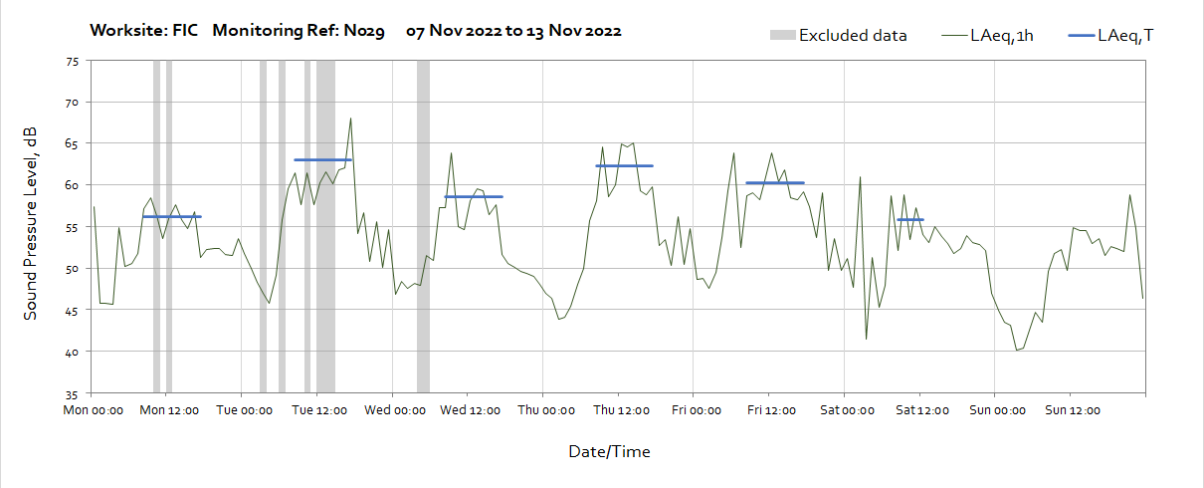






Worksite: Flat Iron Compound (FIC) – Monitoring Ref: N029




Worksite: FIC Monitoring Ref: No29 07 Nov 2022 to 13 Nov 2022
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
75
70
65
60
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45
40
35
Mon 00:00
Mon 12:00
Tue 00:00
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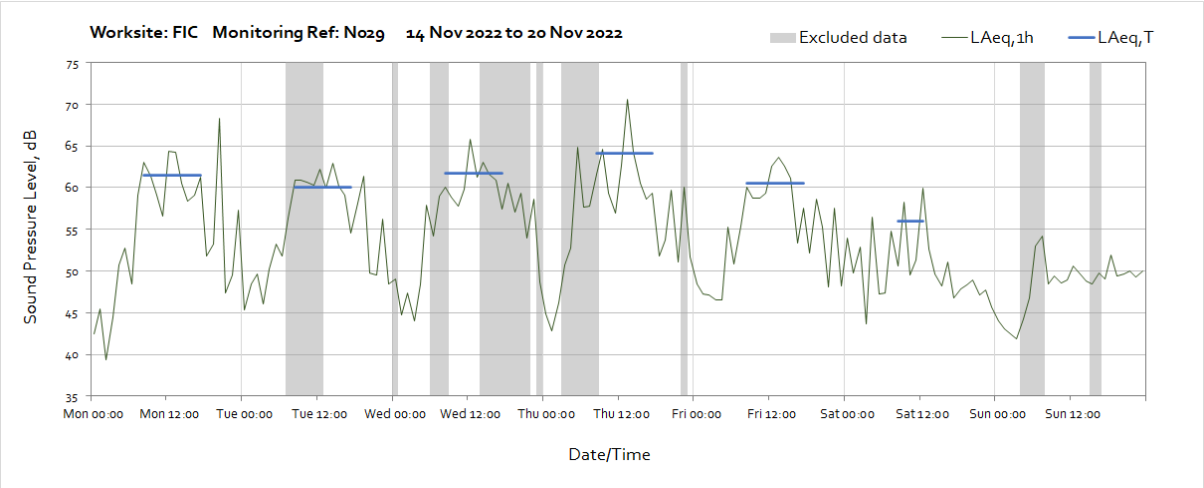
Date/Time


Worksite: FIC Monitoring Ref: No29 14 Nov 2022 to 20 Nov 2022
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
75
70
65
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50
45
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Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
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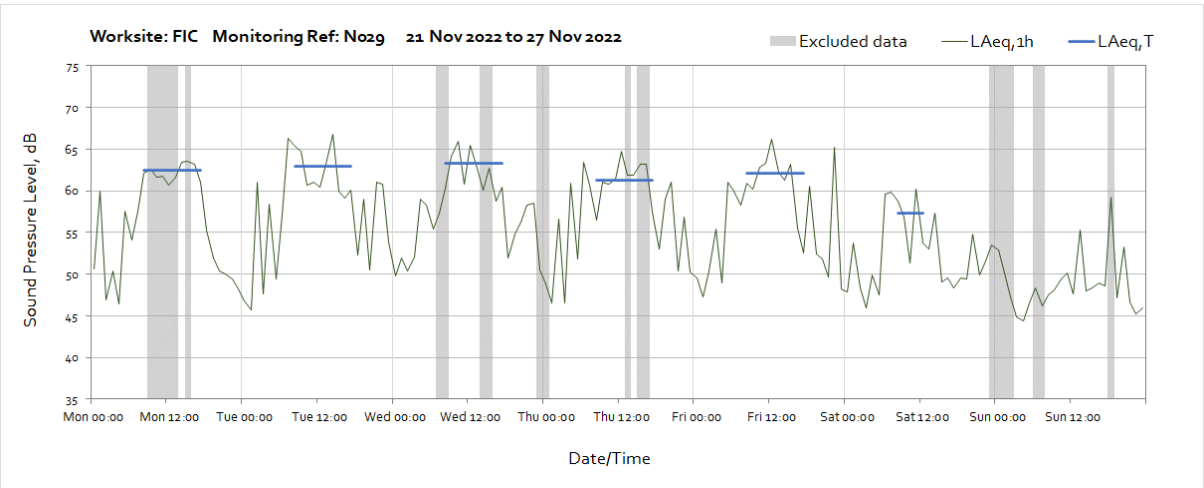
Sun 12:00
Date/Time


Worksite: FIC Monitoring Ref: No29 21 Nov 2022 to 27 Nov 2022
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
75
70
65
60
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45
40
35
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
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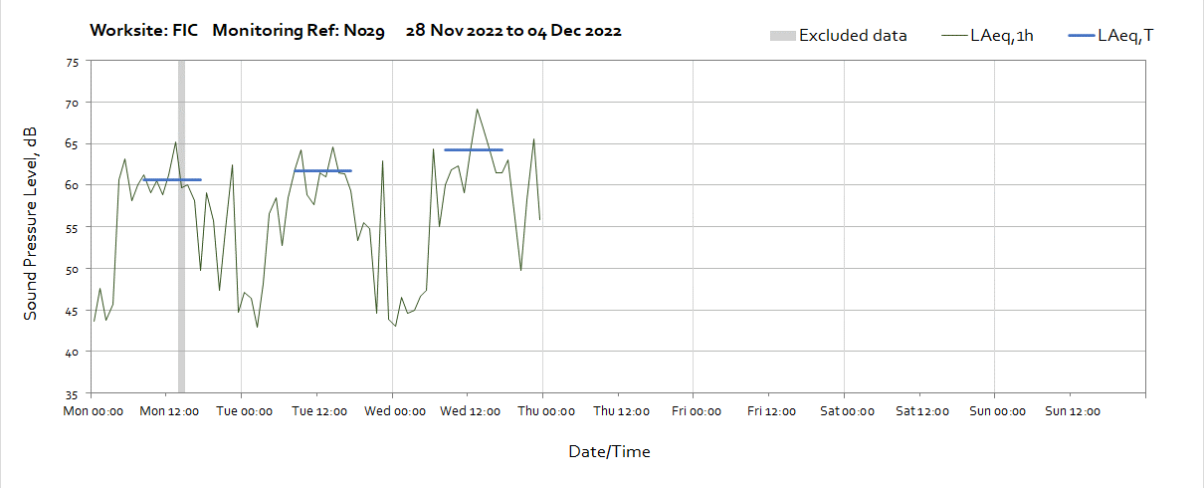
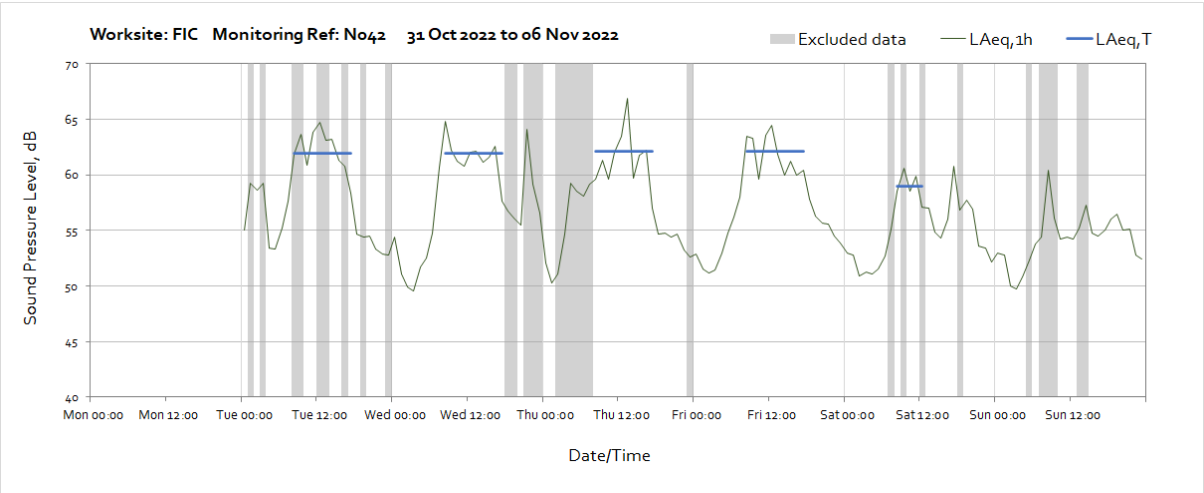
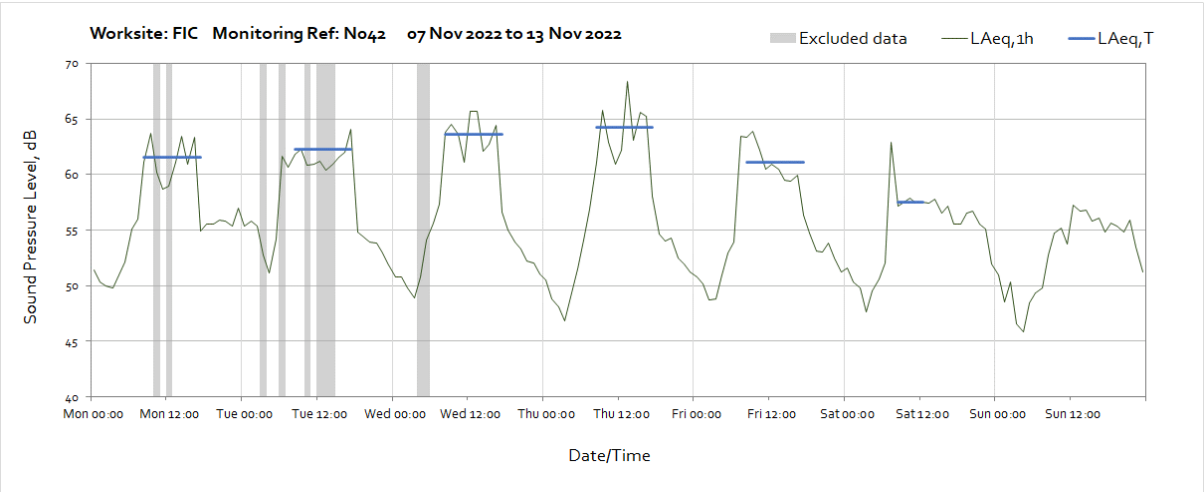
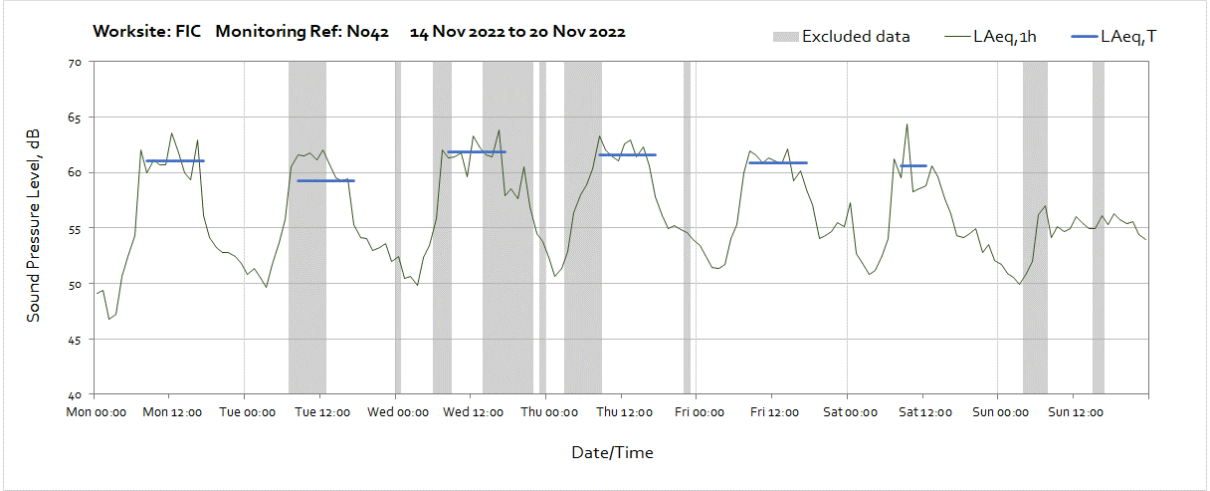
Date/Time



Worksite: Flat Iron Compound (FIC) – Monitoring Ref: N042






Worksite: FIC Monitoring Ref: No42 14 Nov 2022 to 20 Nov 2022
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
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65
60
55
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Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
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Thu 12:00
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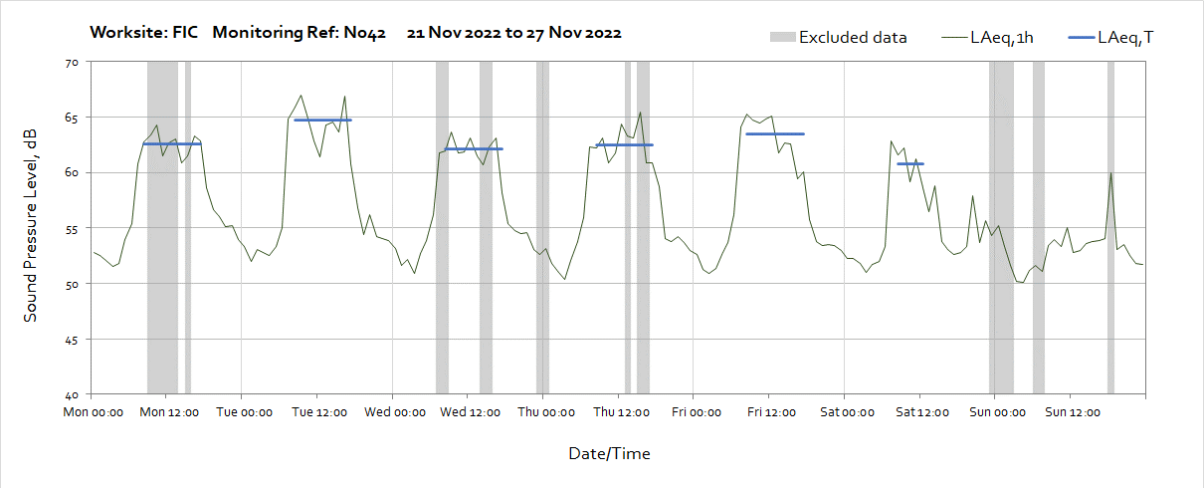
Sun 12:00
Date/Time


Worksite: FIC Monitoring Ref: No42 21 Nov 2022 to 27 Nov 2022
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
70
65
60
55
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45
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Mon 00:00
Mon 12:00
Tue 00:00
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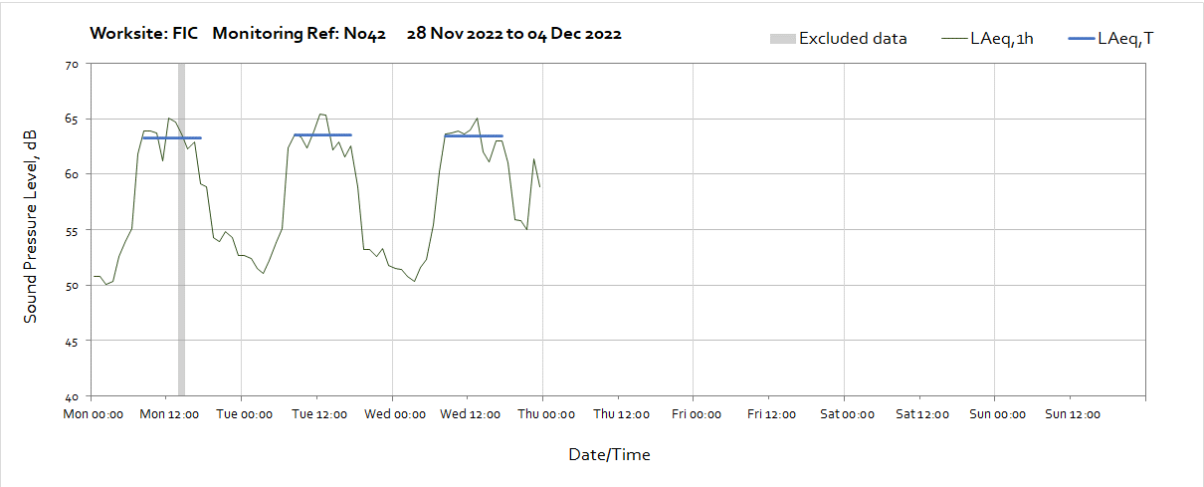
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time


Worksite: FIC Monitoring Ref: No42 28 Nov 2022 to 04 Dec 2022
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
70
65
60
55
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Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
Wed 12:00
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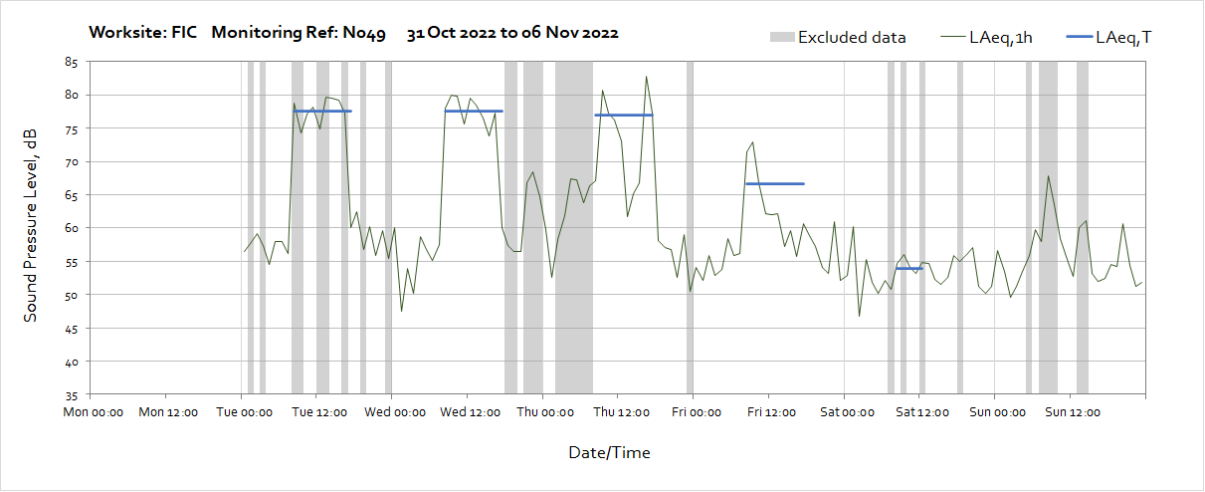
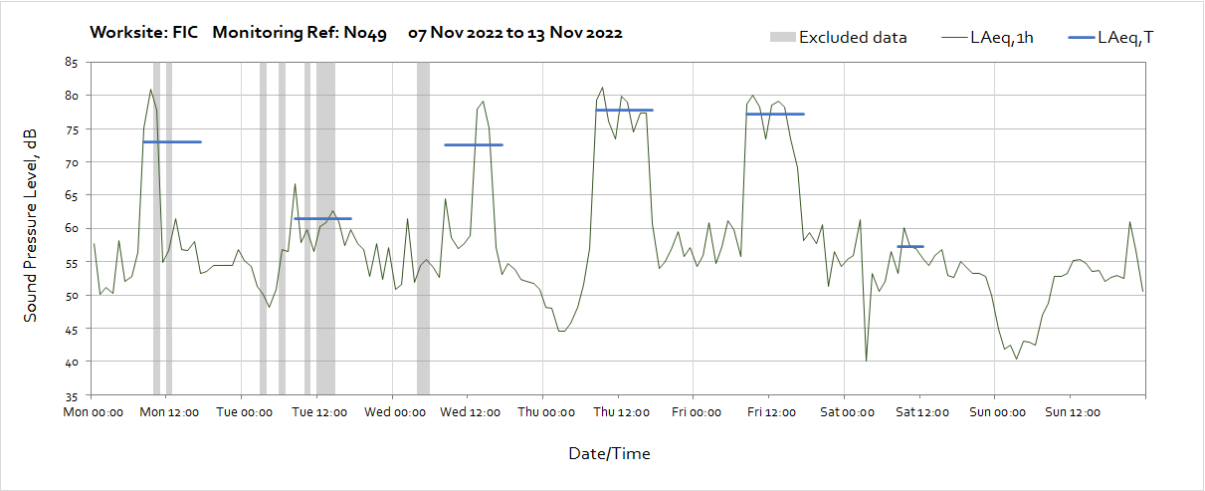
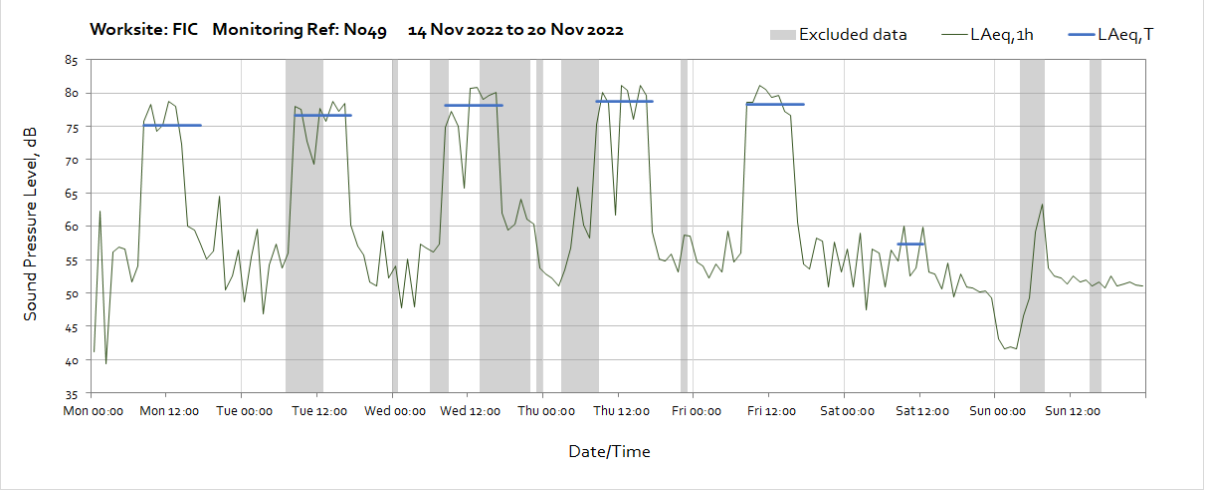
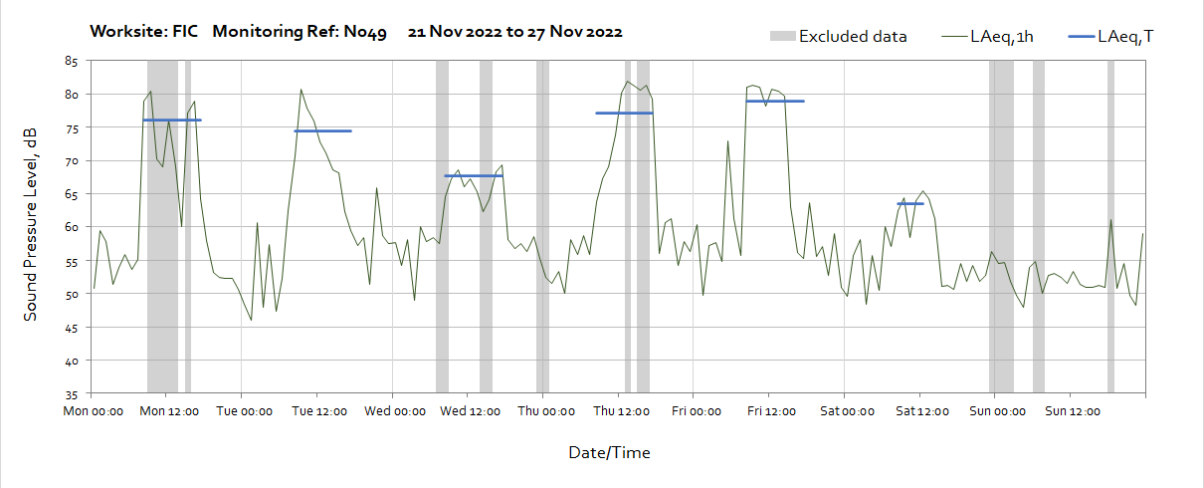
Sun 00:00
Sun 12:00
Date/Time

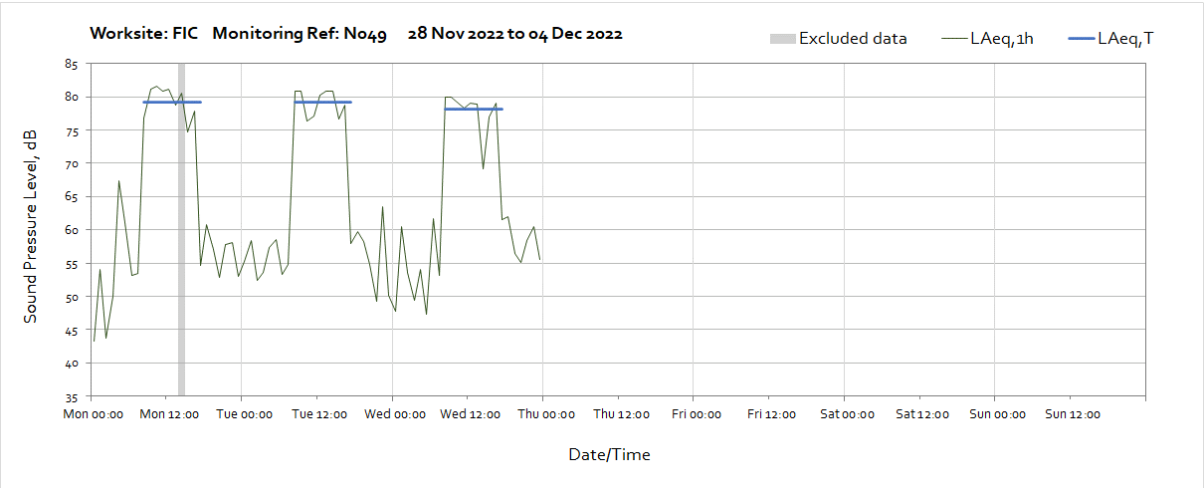
Worksite: Flat Iron Compound (FIC) – Monitoring Ref: N049



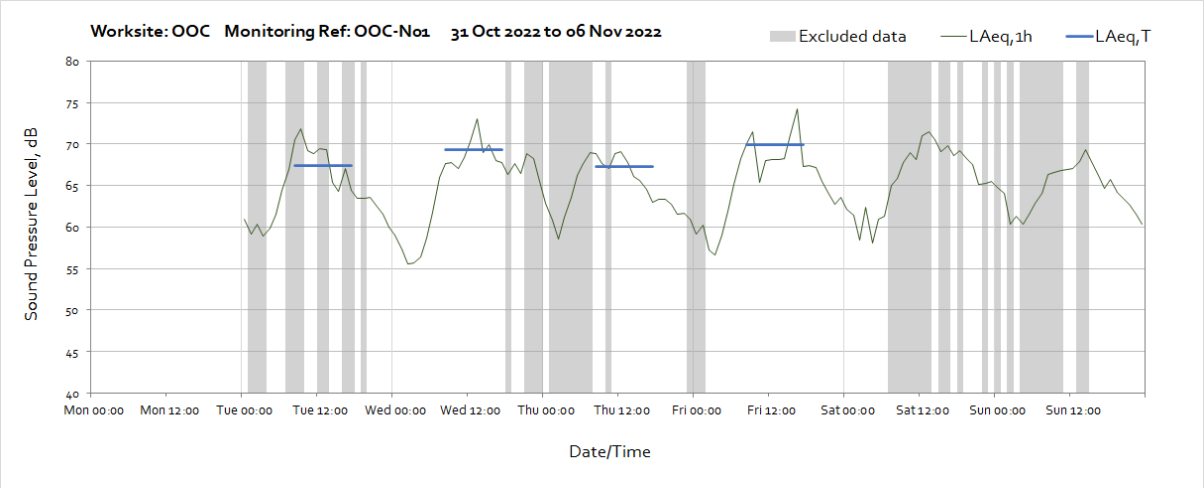


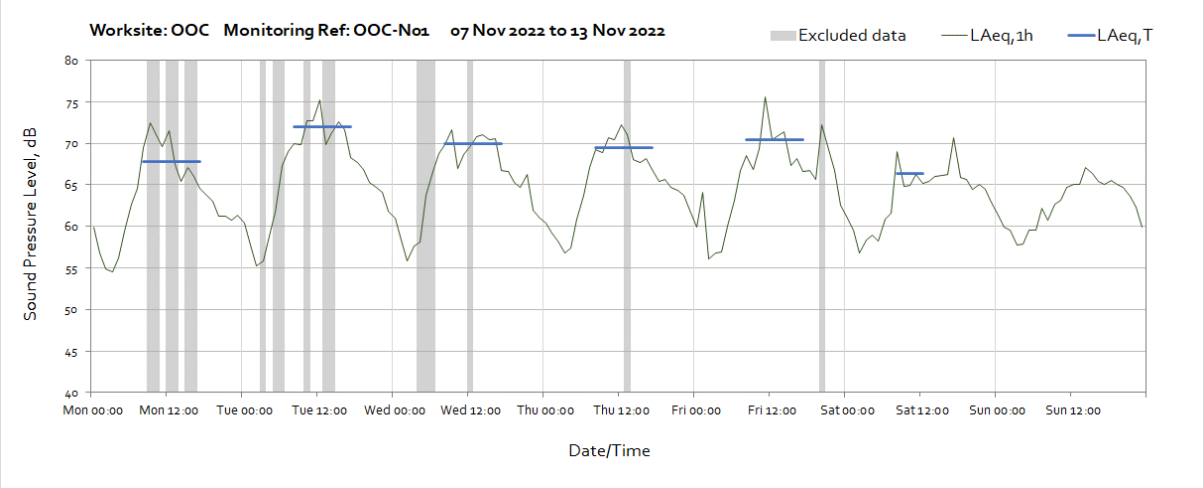






Worksite: Old Oak Common (OOC) – Monitoring Ref: OOC-N01




Worksite: OOC Monitoring Ref: OOC-No1 07 Nov 2022 to 13 Nov 2022
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
80
75
70
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Mon 12:00
Tue 00:00
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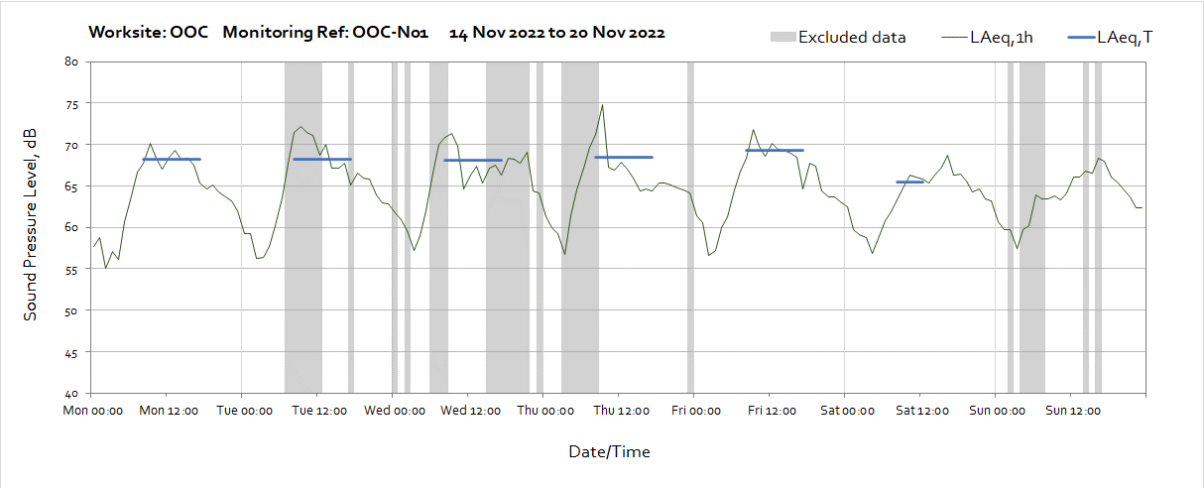
Sun 12:00
Date/Time


Worksite: OOC Monitoring Ref: OOC-No1 14 Nov 2022 to 20 Nov 2022
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
80
75
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50
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40
Mon 00:00
Mon 12:00
Tue 00:00
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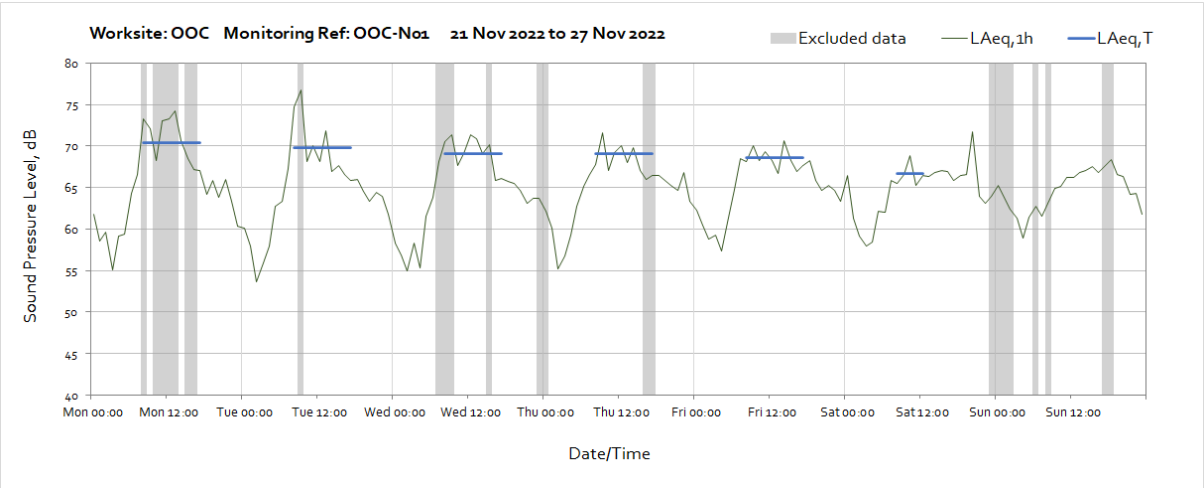
Sun 12:00
Date/Time


Worksite: OOC Monitoring Ref: OOC-No1 21 Nov 2022 to 27 Nov 2022
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
80
75
70
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60
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Mon 00:00
Mon 12:00
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Tue 12:00
Wed 00:00
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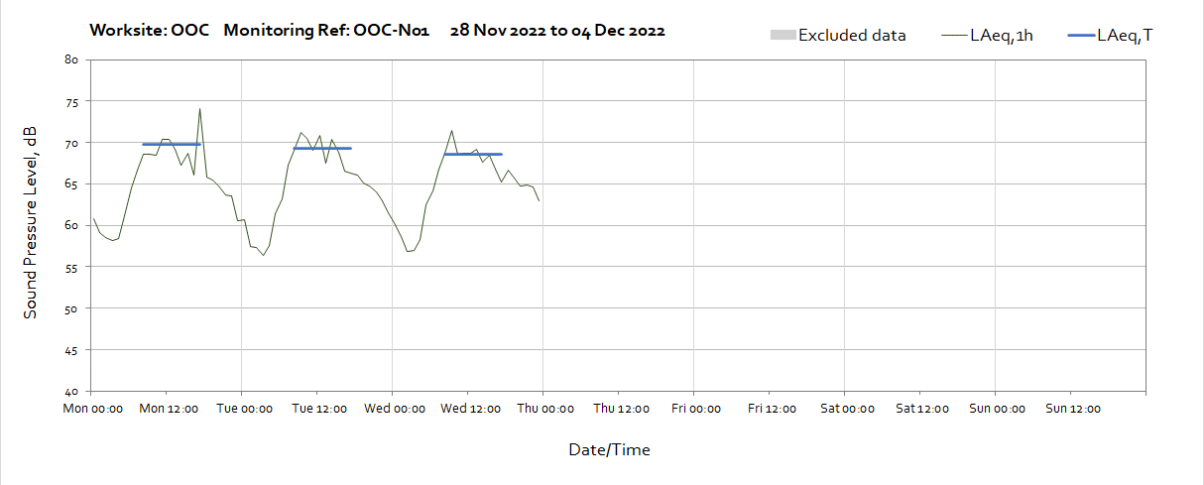
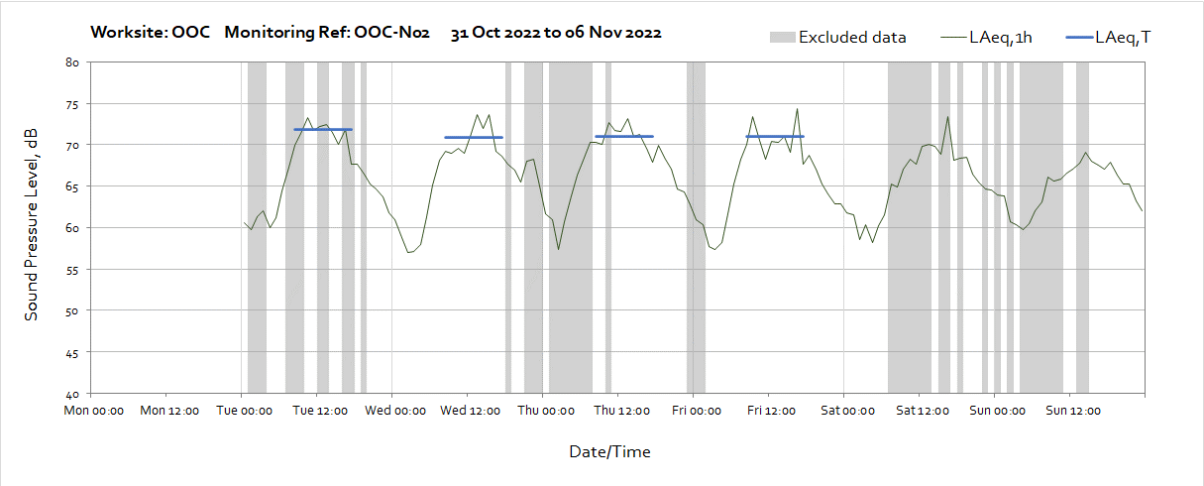
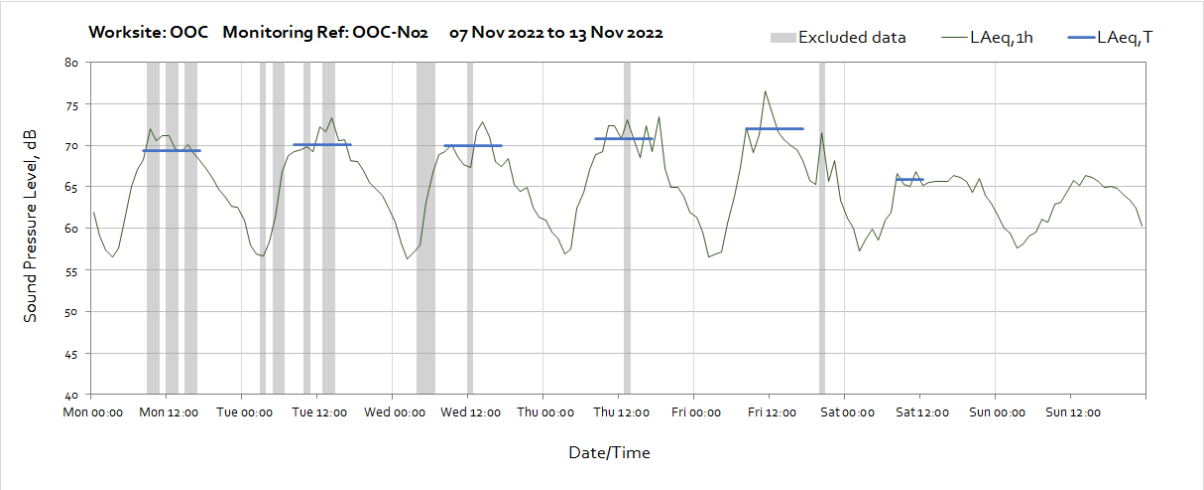
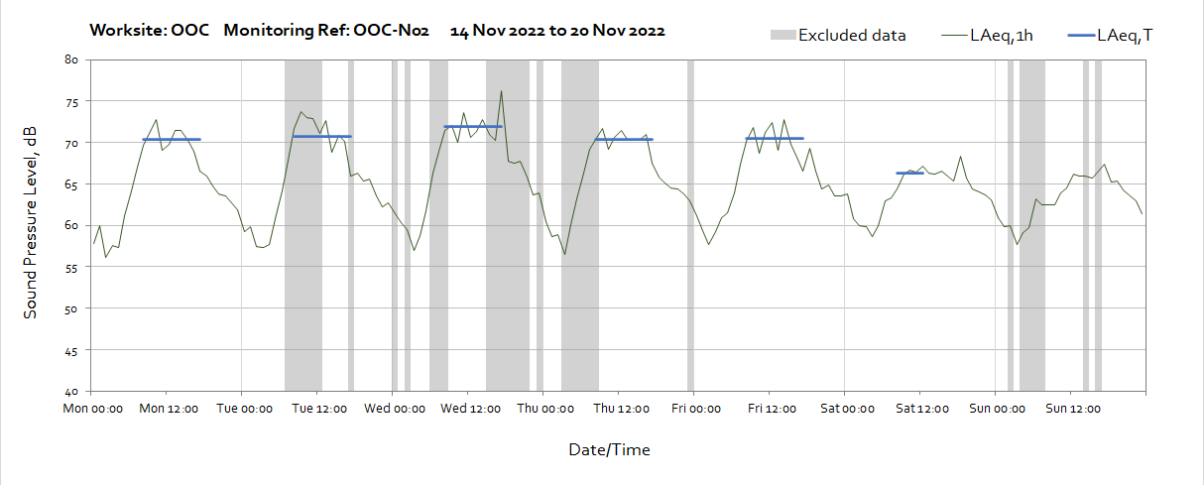
Date/Time



Worksite: Old Oak Common (OOC) – Monitoring Ref: OOC-N02






Worksite: OOC Monitoring Ref: OOC-No2 14 Nov 2022 to 20 Nov 2022
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
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75
70
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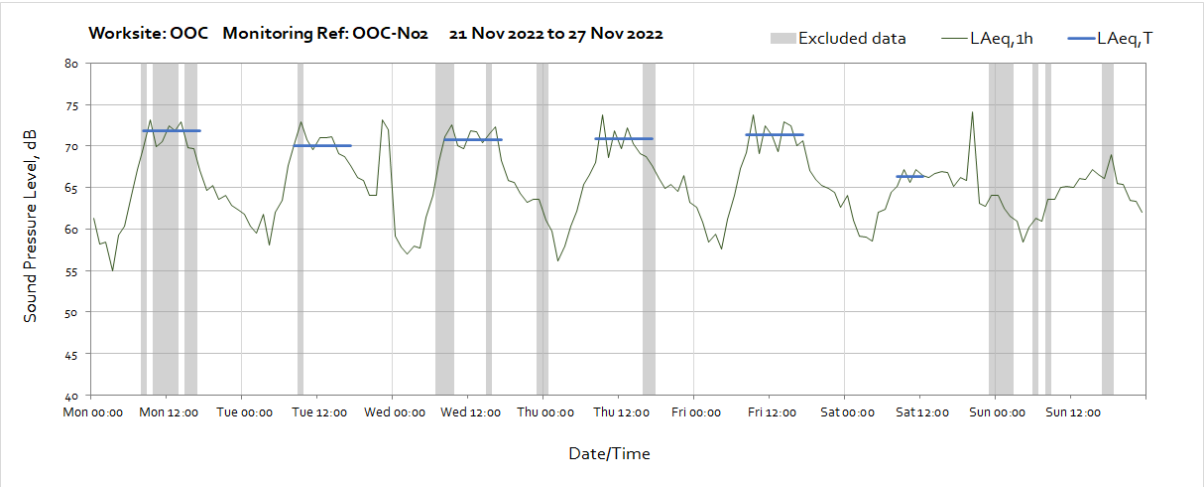
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time


Worksite: OOC Monitoring Ref: OOC-No2 21 Nov 2022 to 27 Nov 2022
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
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75
70
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Tue 12:00
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Fri 12:00
Sat 00:00
Sat 12:00
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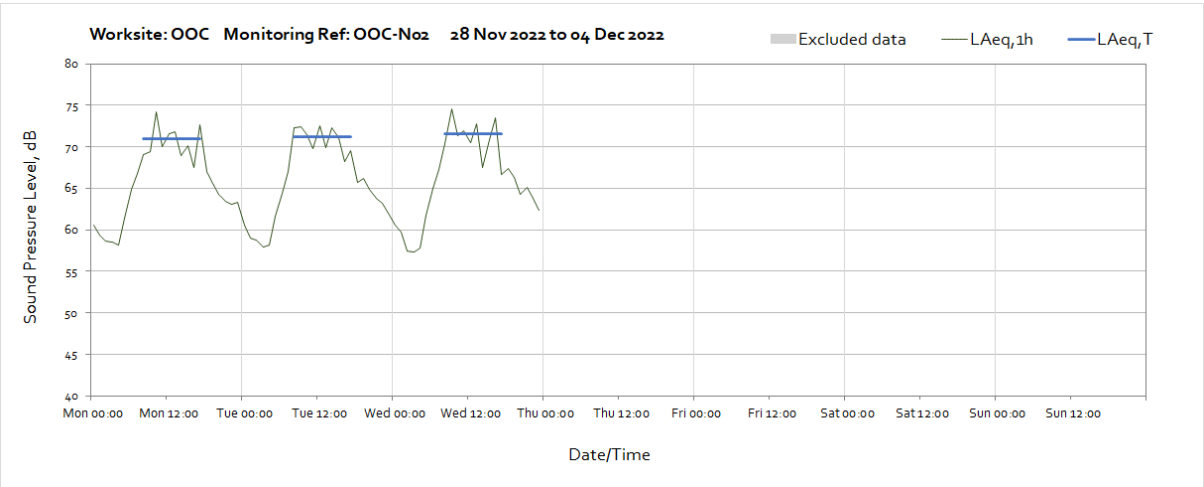
Sun 12:00
Date/Time


Worksite: OOC Monitoring Ref: OOC-No2 28 Nov 2022 to 04 Dec 2022
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
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70
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Mon 00:00
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Tue 12:00
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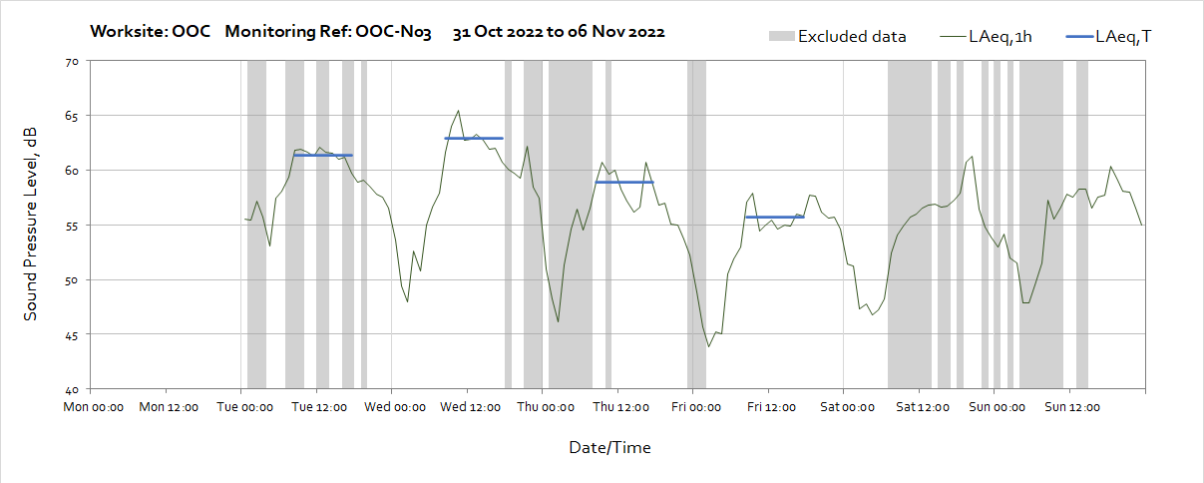
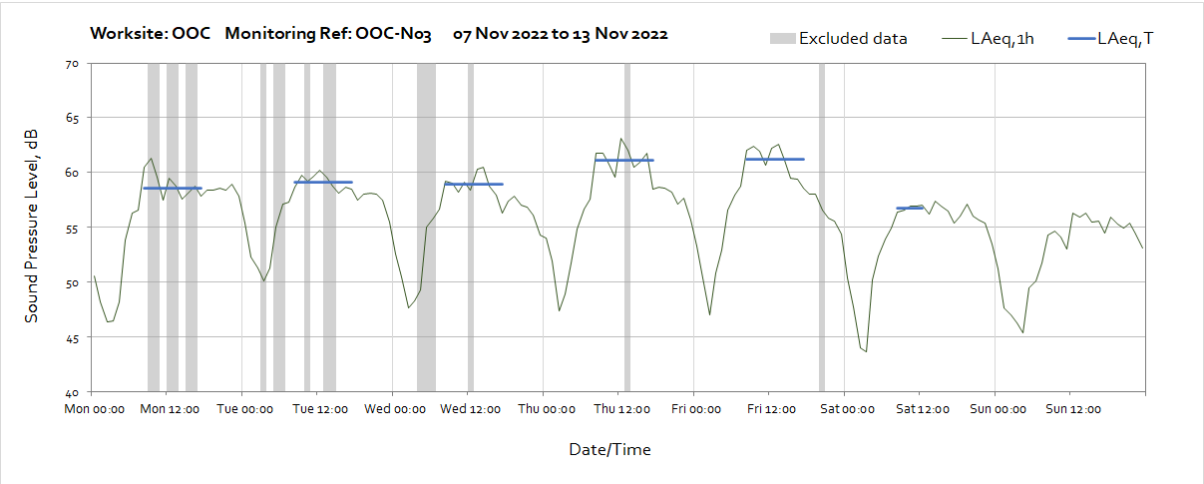
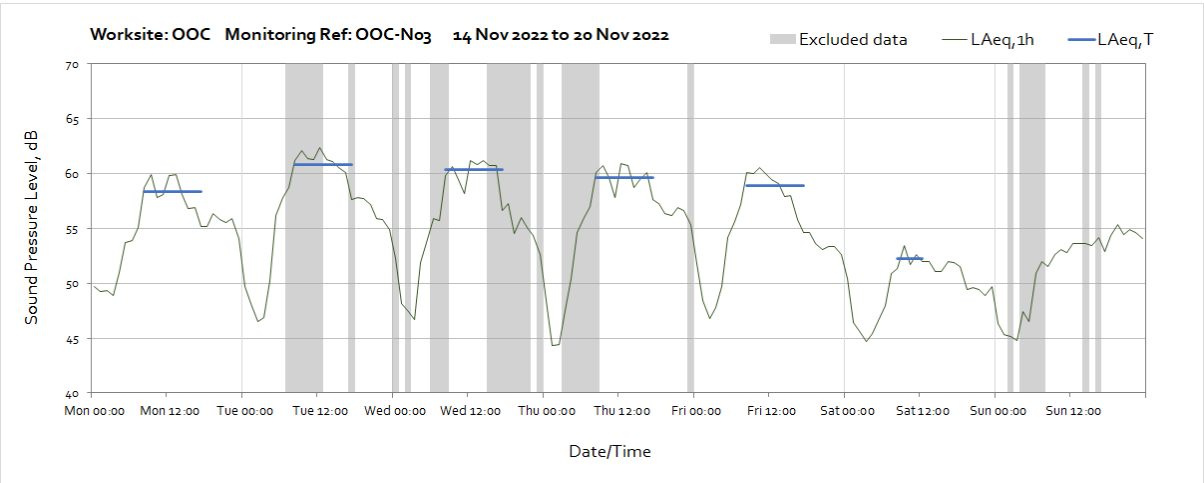
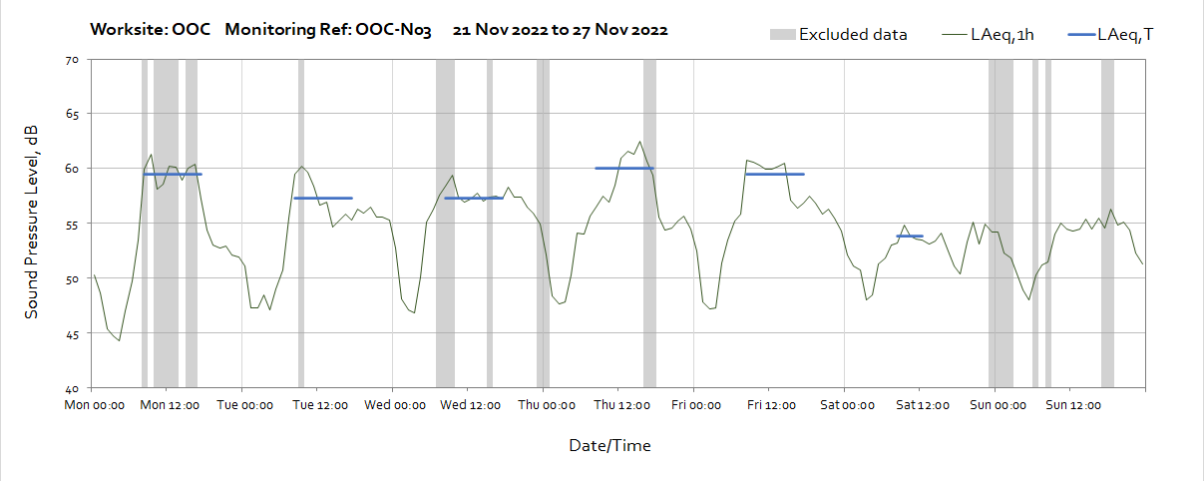
Sun 00:00
Sun 12:00
Date/Time

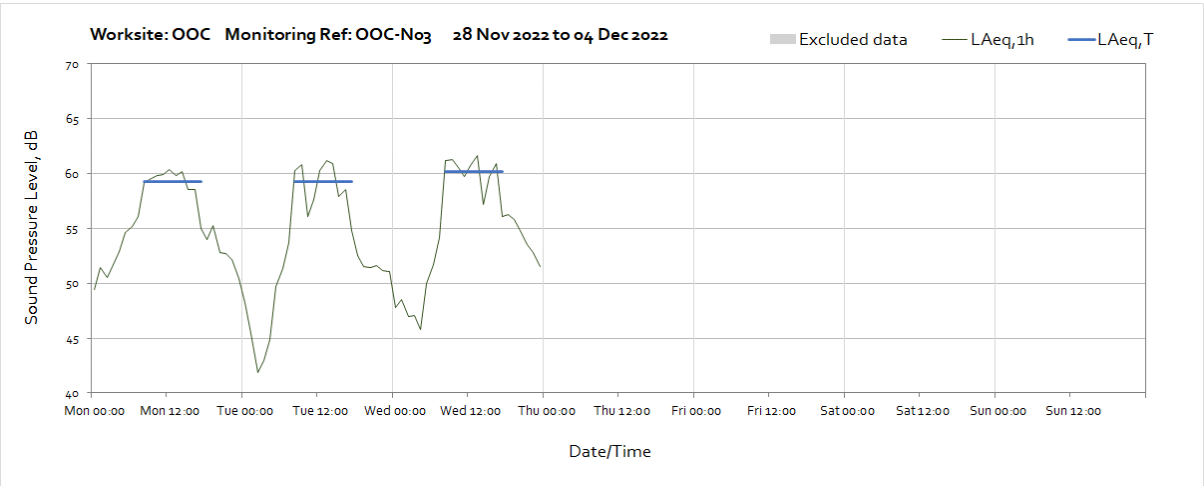
Worksite: Old Oak Common (OOC) – Monitoring Ref: OOC-N03



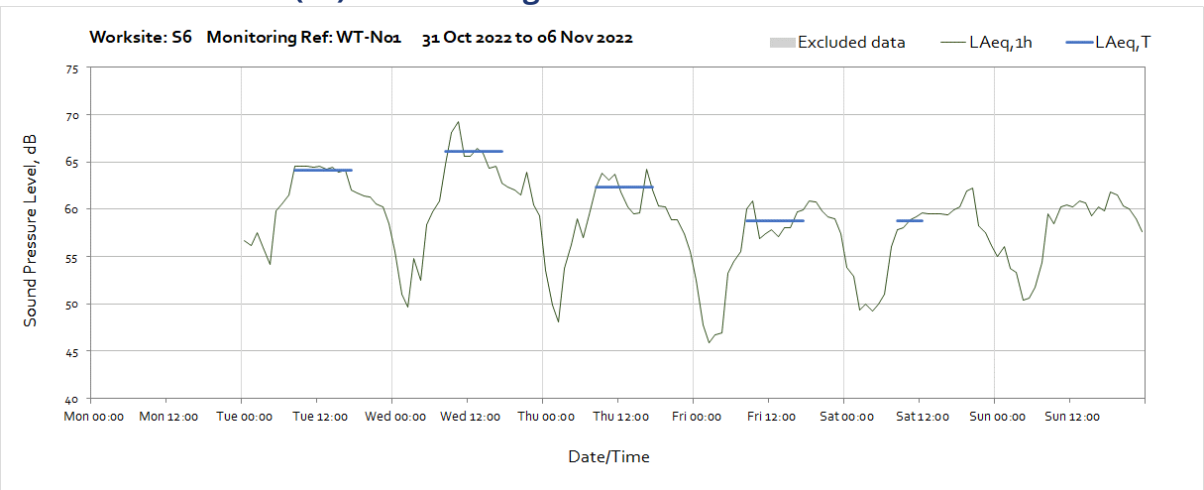


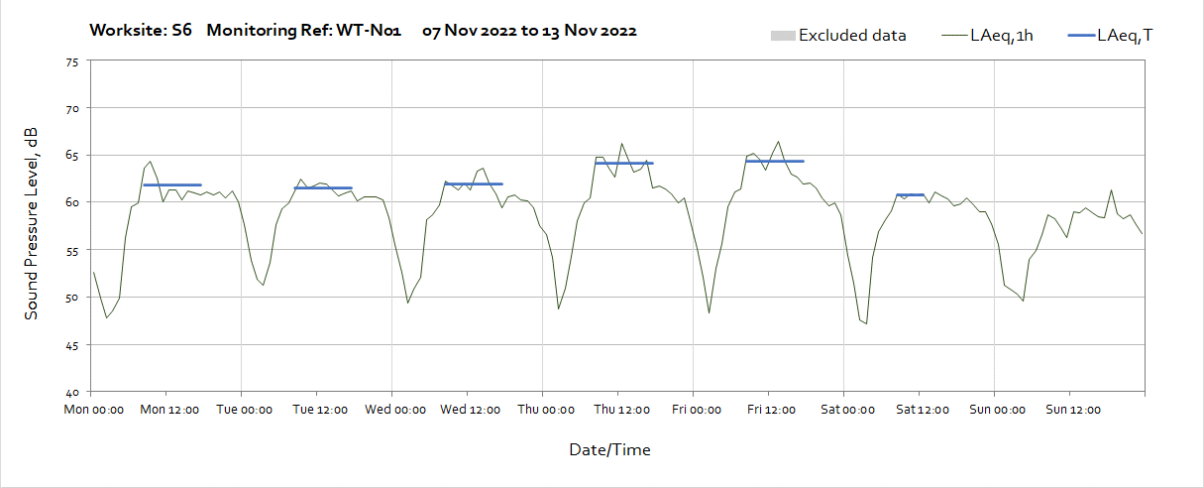






Worksite: Scheme 6 (S6) – Monitoring Ref: WT-N01




Worksite: S6 Monitoring Ref: WT-No1 07 Nov 2022 to 13 Nov 2022
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
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Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
Wed 12:00
Thu 00:00
Thu 12:00
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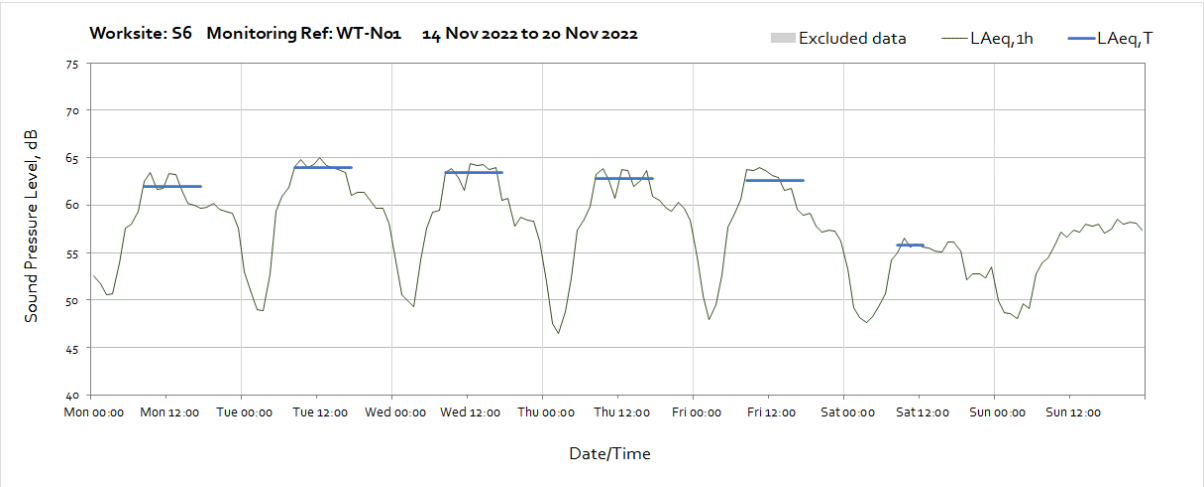
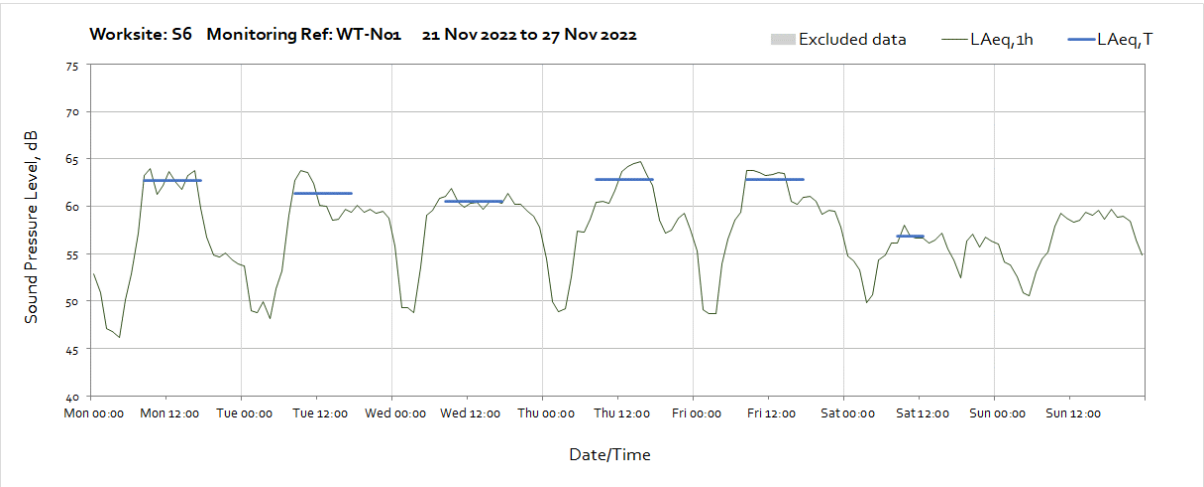
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time


Worksite: S6 Monitoring Ref: WT-No1 14 Nov 2022 to 20 Nov 2022
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: S6 Monitoring Ref: WT-No1 21 Nov 2022 to 27 Nov 2022
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
75
70
65
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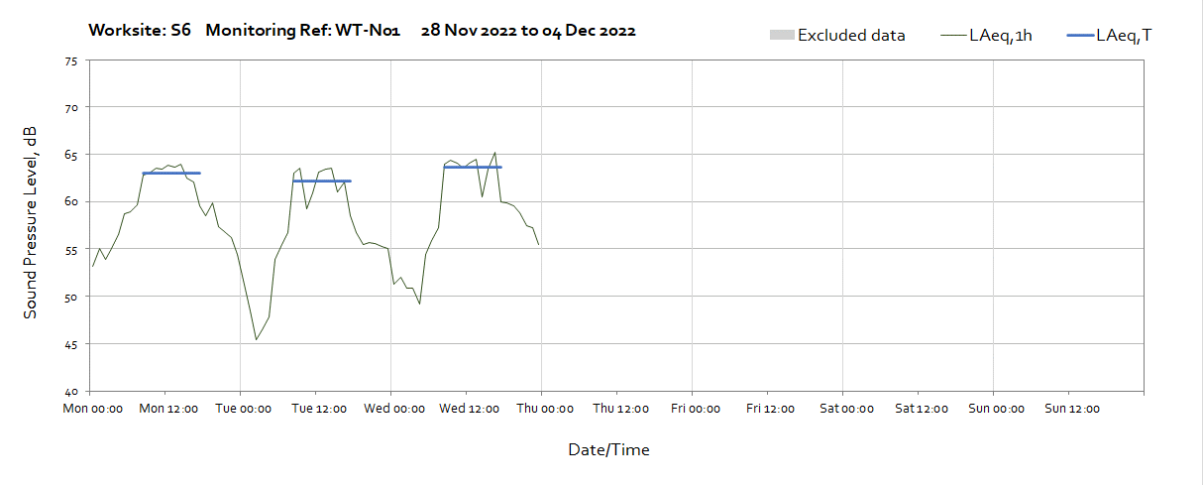
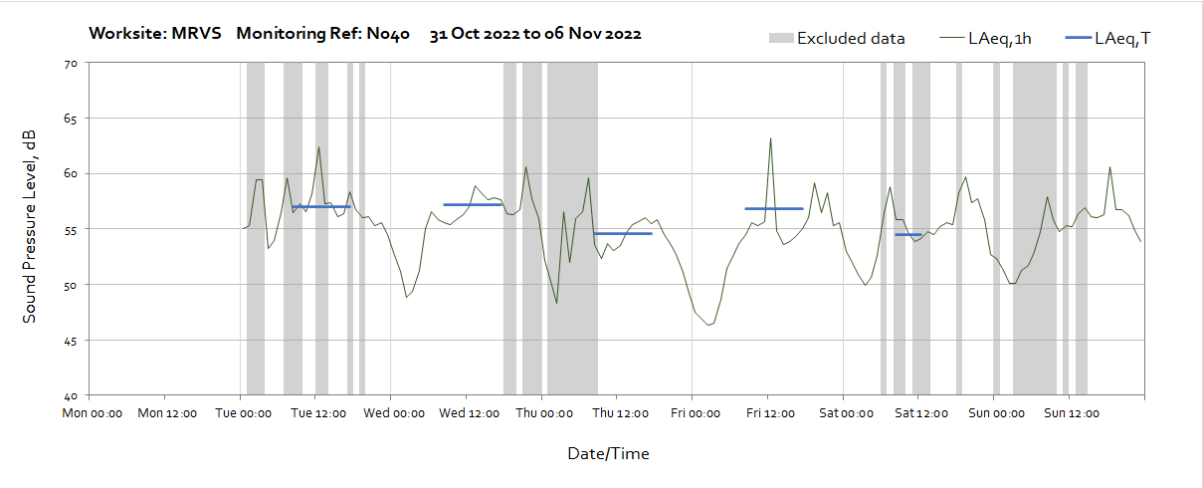
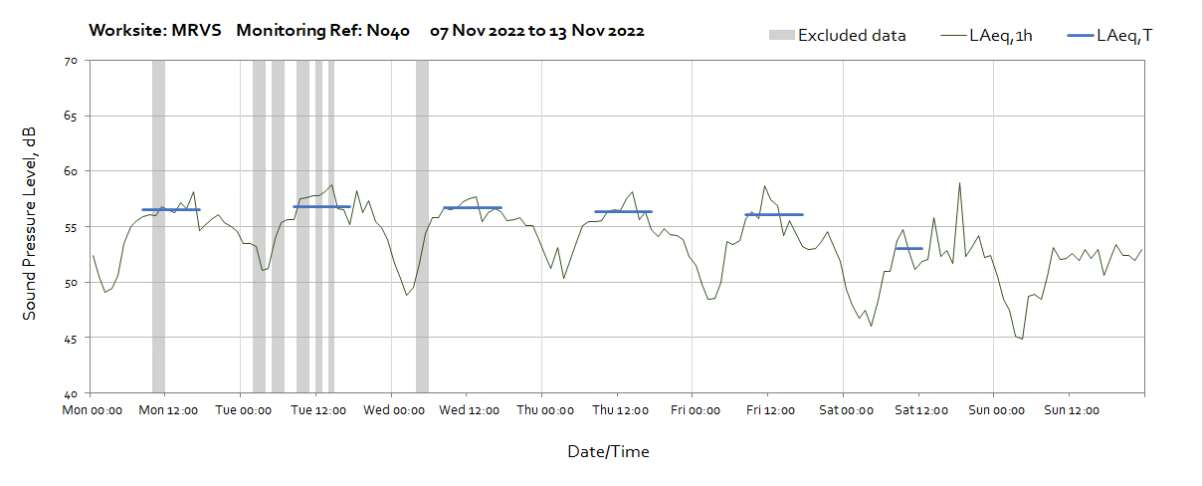
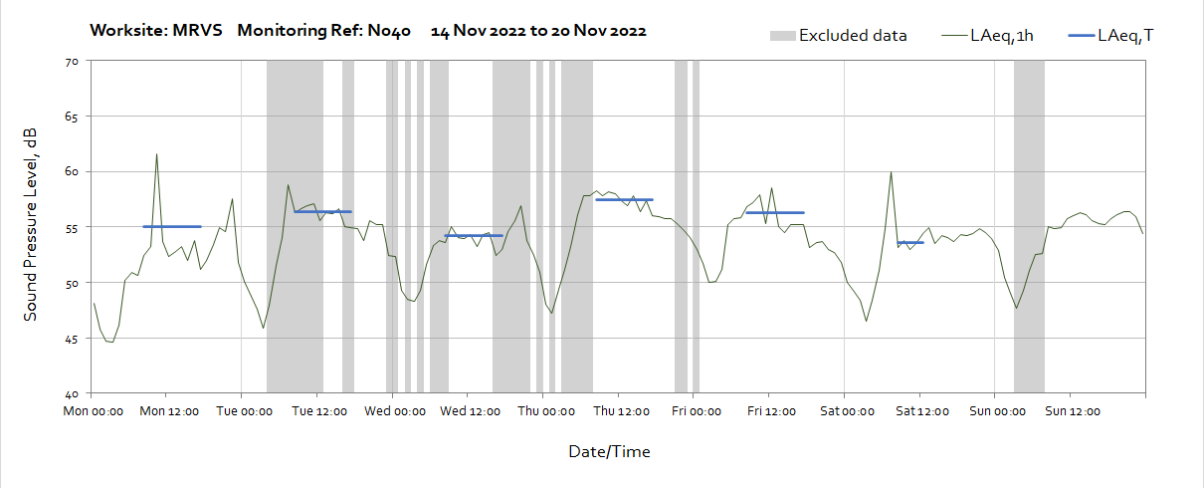
55
50
45
40
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
Wed 12:00
Thu 00:00
Thu 12:00
Fri 00:00
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time



Worksite: Mandeville Road Ventilation Shaft (MRVS) – Monitoring Ref: N040






Worksite: MRVS Monitoring Ref: No40 14 Nov 2022 to 20 Nov 2022
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
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
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Thu 12:00
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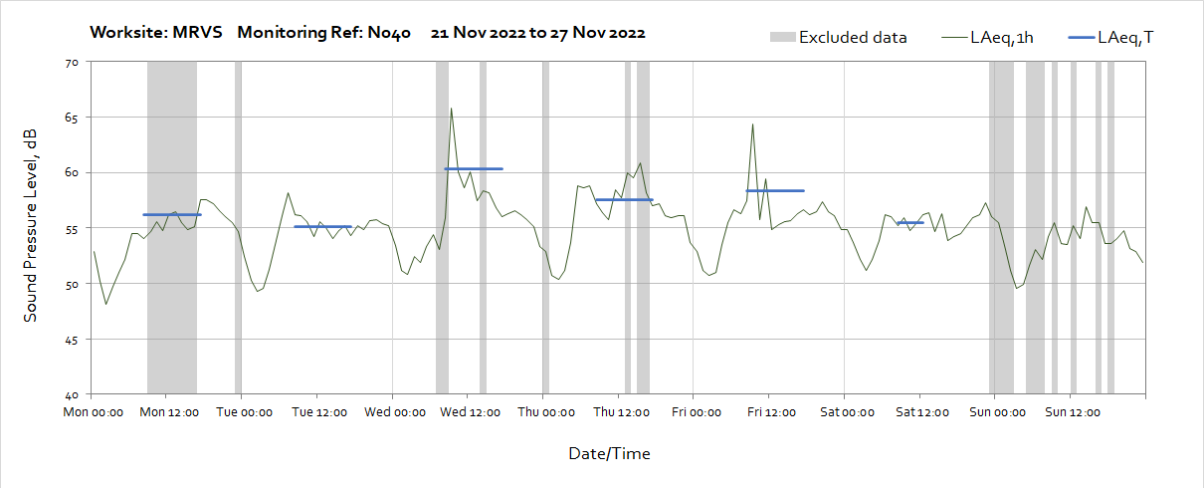
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time


Worksite: MRVS Monitoring Ref: No40 21 Nov 2022 to 27 Nov 2022
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
70
65
60
55
50
45
40
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
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Thu 12:00
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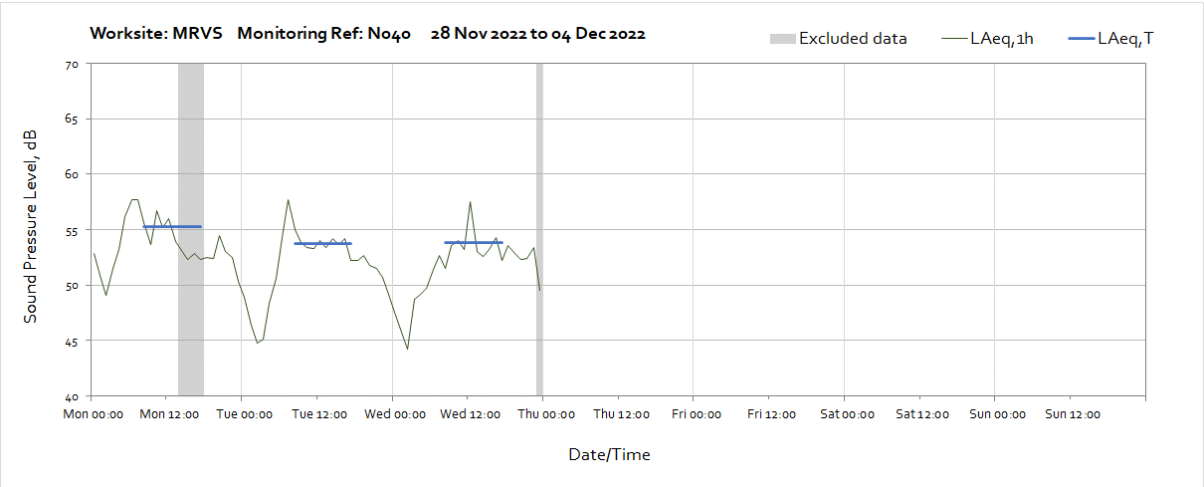
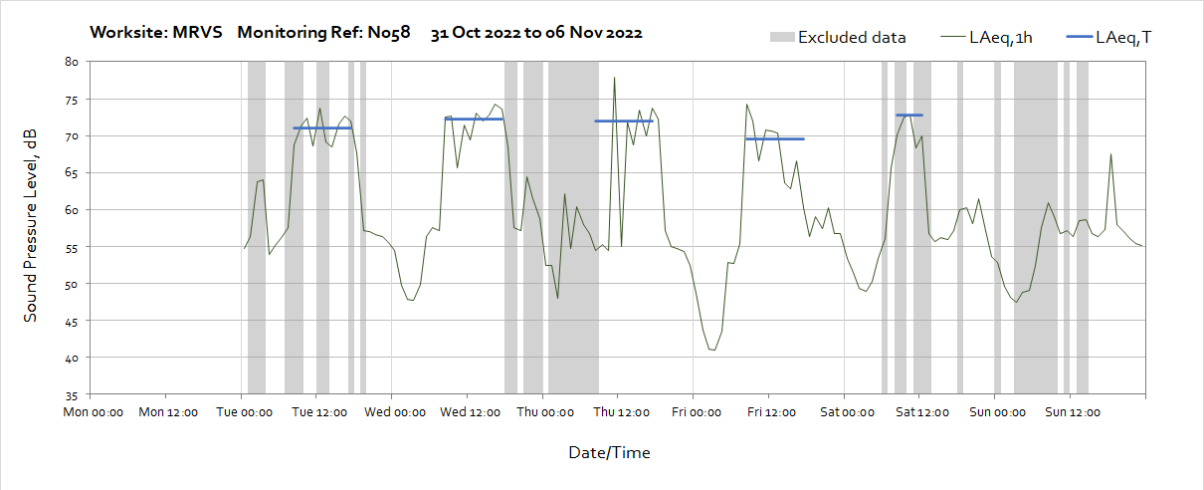
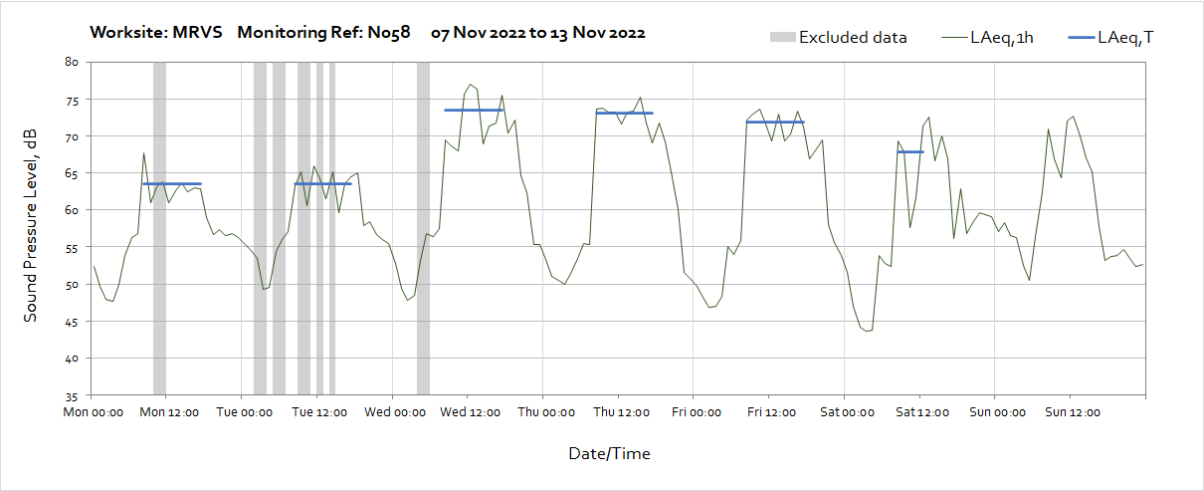
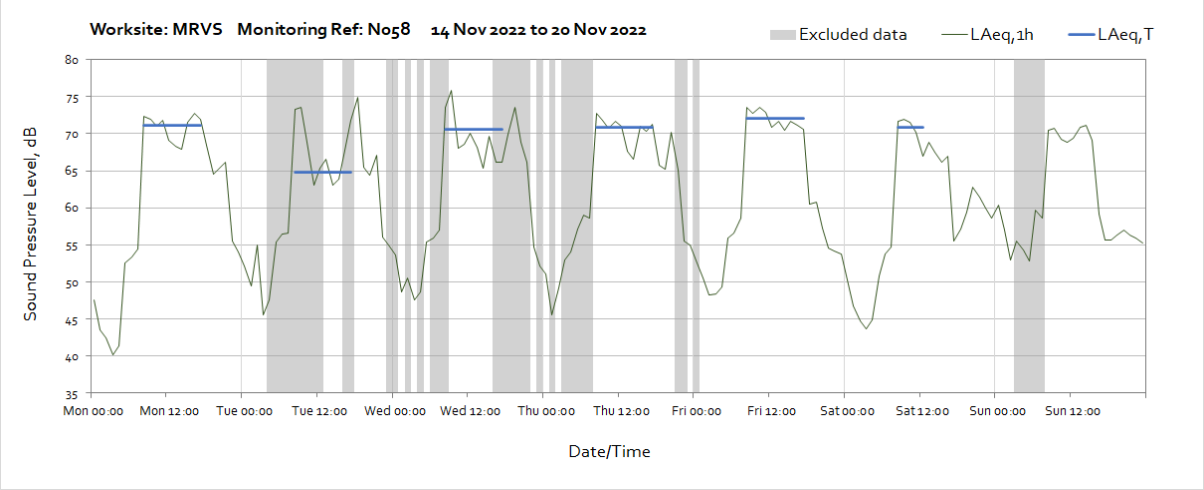
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time

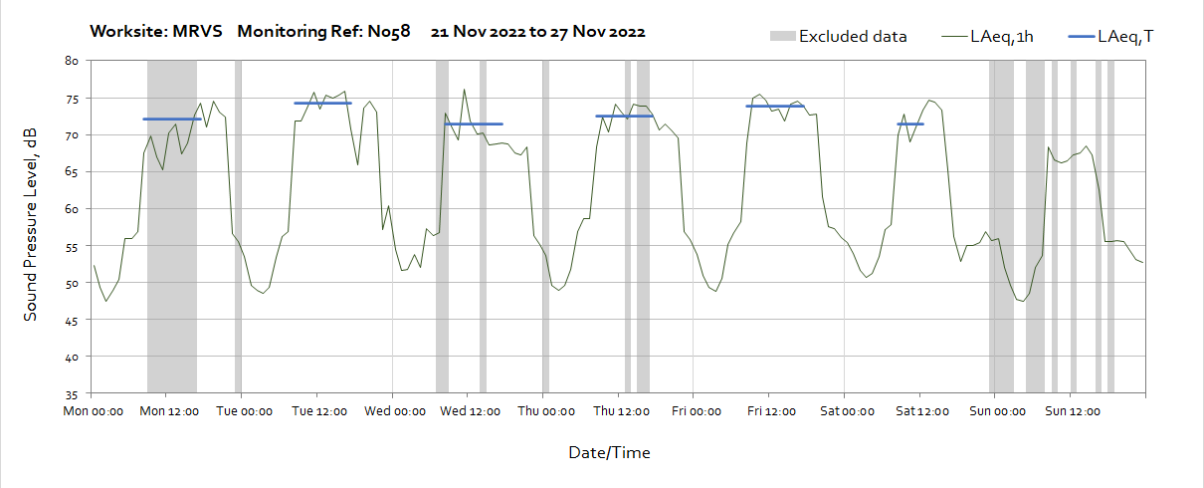

Worksite: MRVS Monitoring Ref: No40 28 Nov 2022 to 04 Dec 2022
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
70
65
60
55
50
45
40
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
Wed 12:00
Thu 00:00
Thu 12:00
Fri 00:00
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time

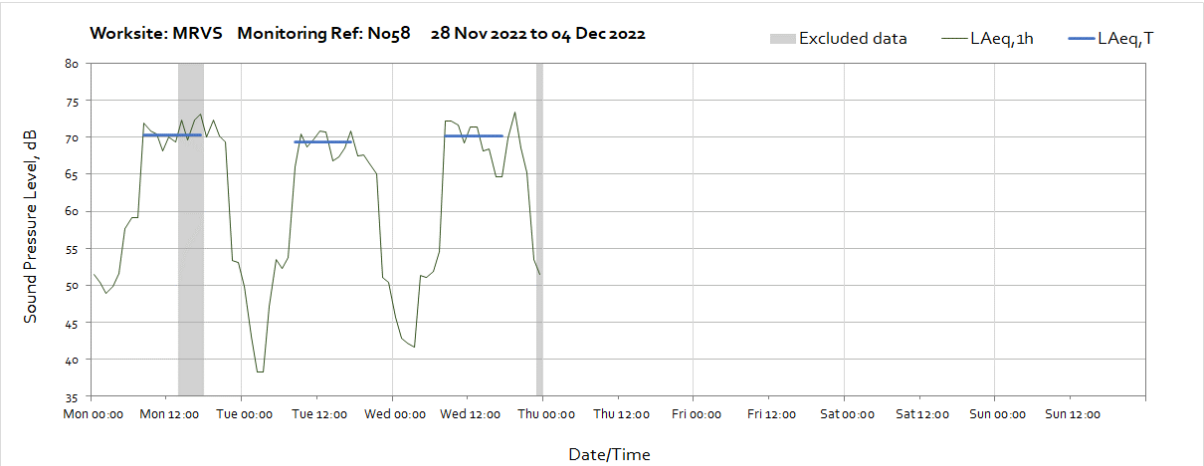
Worksite: Mandeville Road Ventilation Shaft (MRVS) – Monitoring Ref: N058



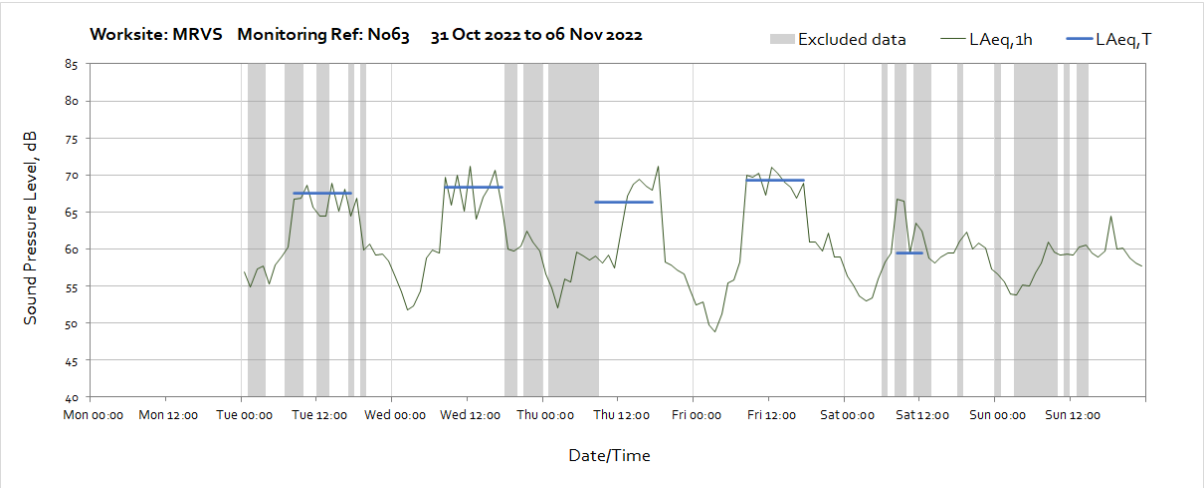


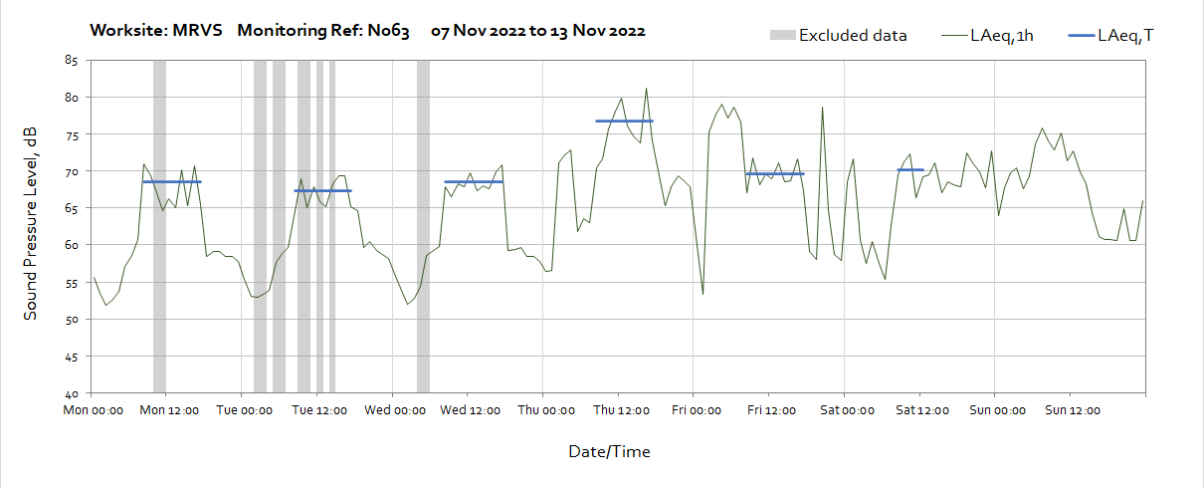


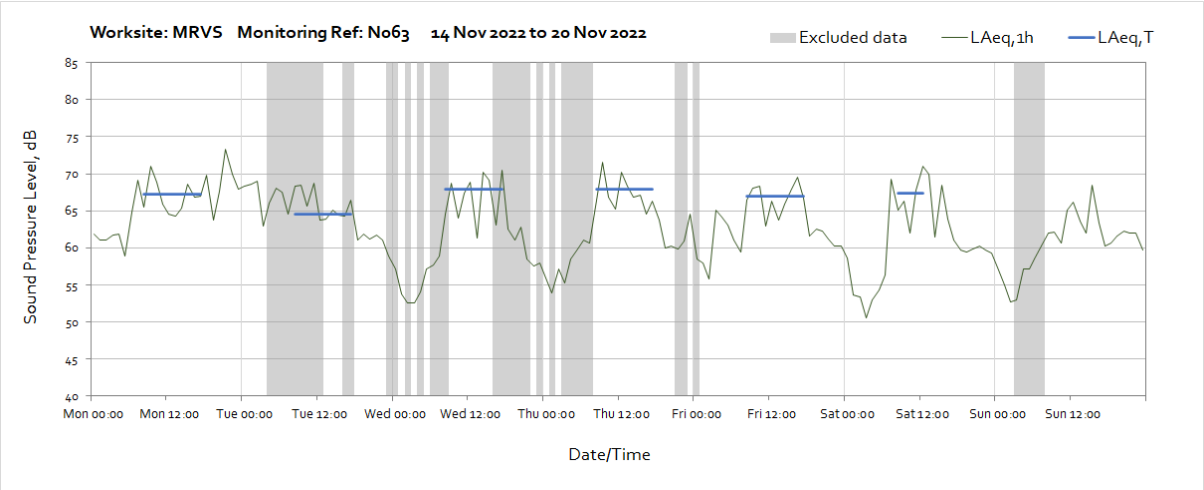


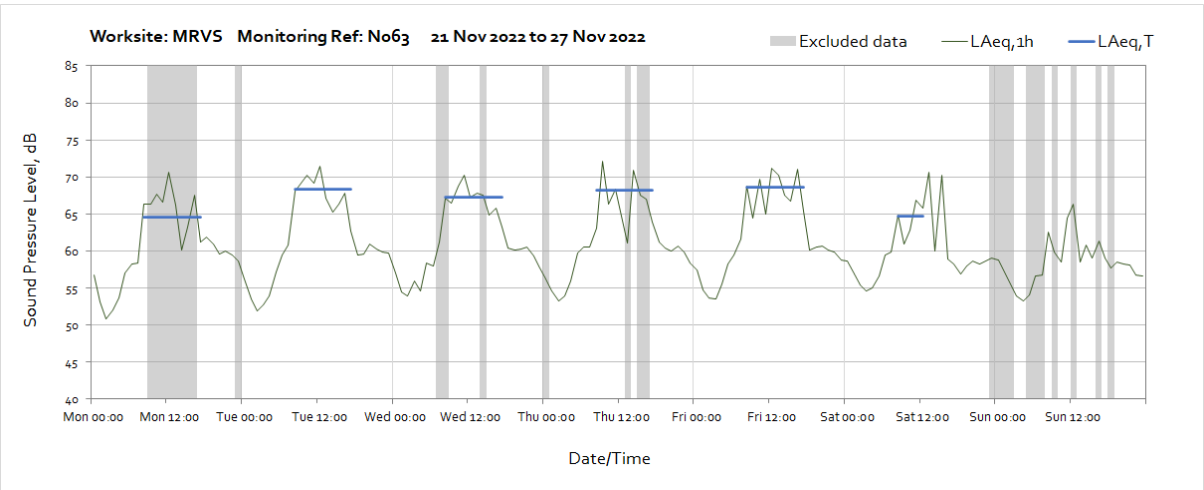


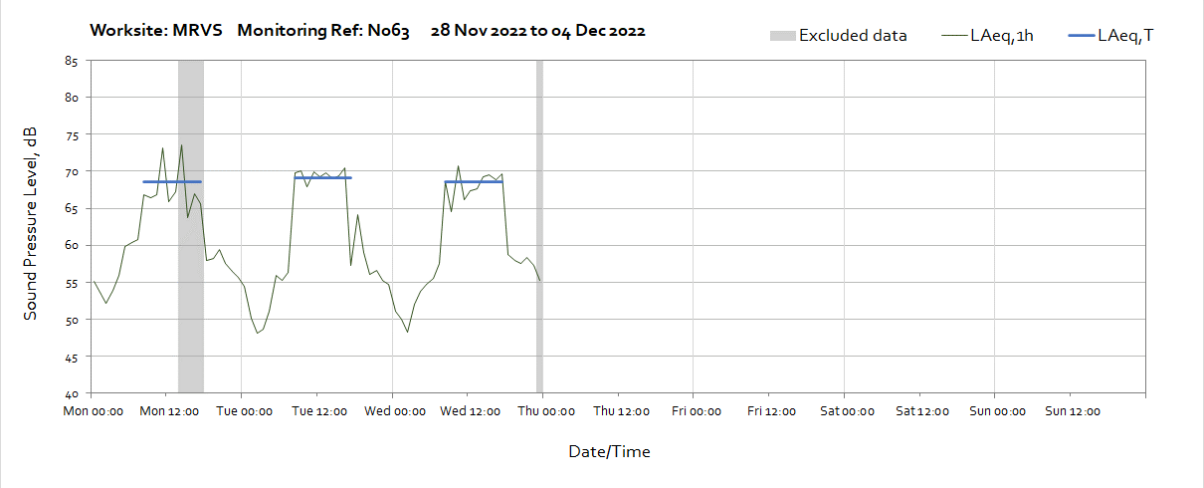
Worksite: Mandeville Road Ventilation Shaft (MRVS) – Monitoring Ref: N063



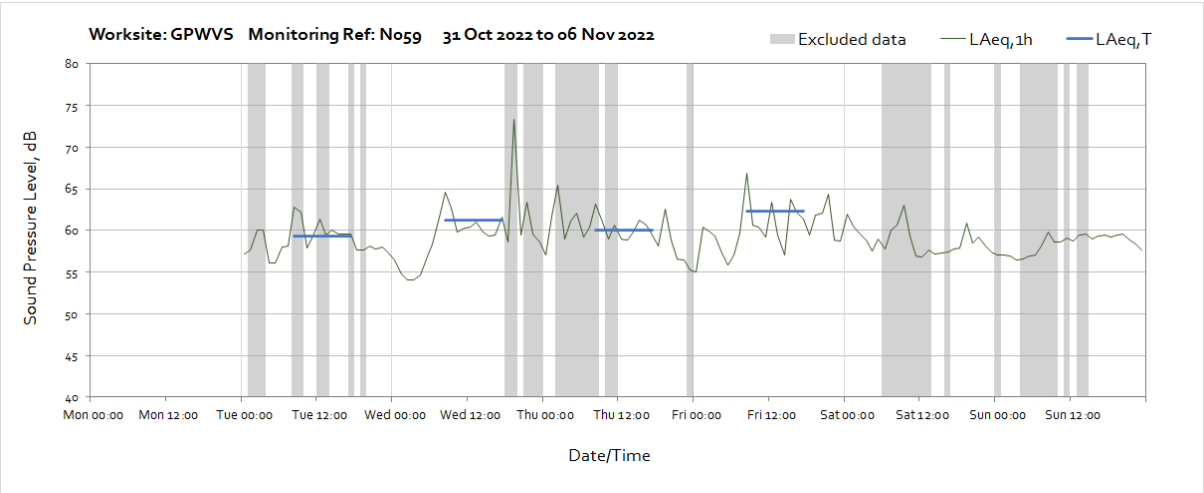

Worksite: MRVS Monitoring Ref: No63 07 Nov 2022 to 13 Nov 2022
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
85
80
75
70
65
60
55
50
45
40
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
Wed 12:00
Thu 00:00
Thu 12:00
Fri 00:00
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time

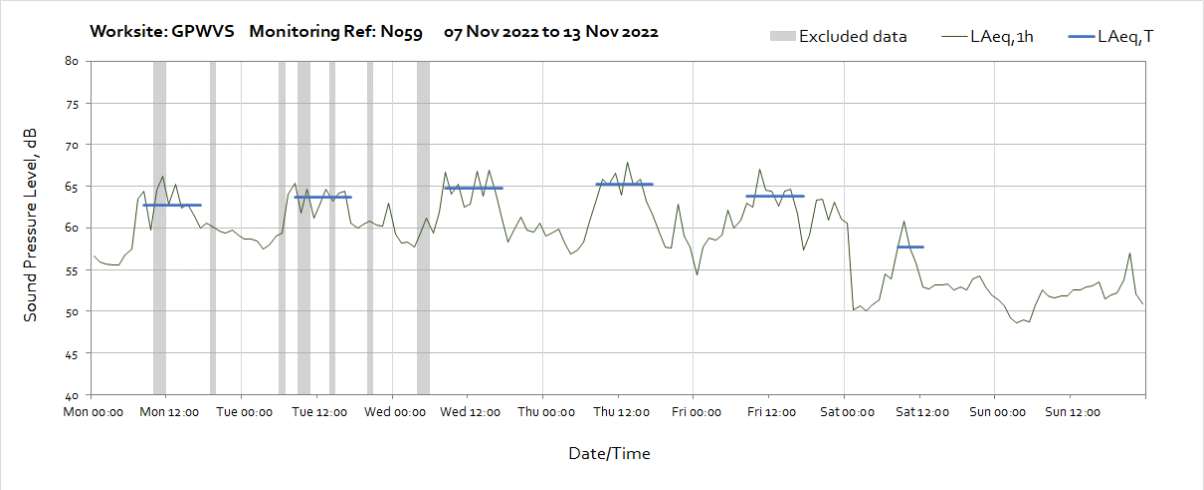

Worksite: MRVS Monitoring Ref: No63 14 Nov 2022 to 20 Nov 2022
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
85
80
75
70
65
60
55
50
45
40
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
Wed 12:00
Thu 00:00
Thu 12:00
Fri 00:00
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time

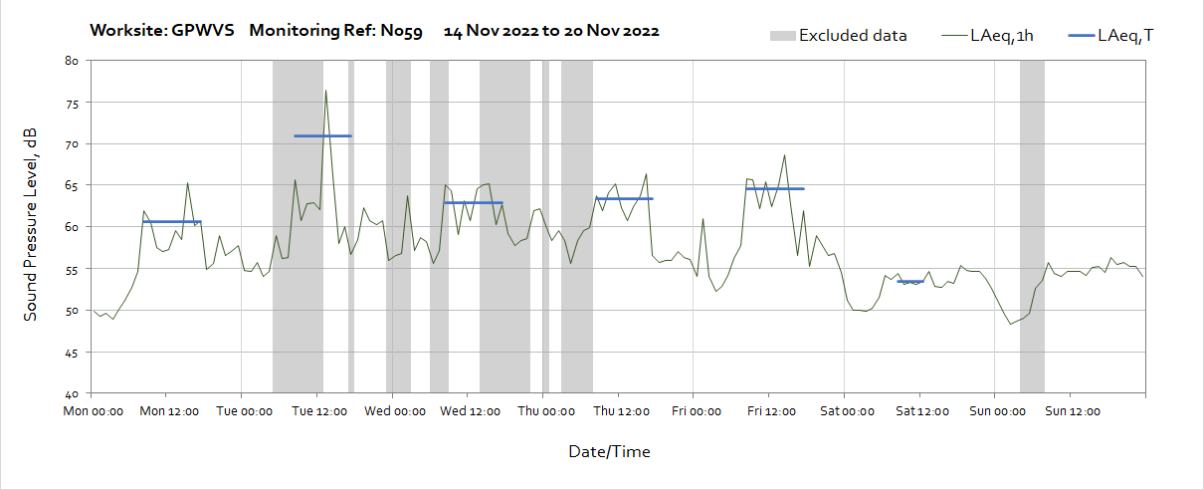

Worksite: MRVS Monitoring Ref: No63 21 Nov 2022 to 27 Nov 2022
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
85
80
75
70
65
60
55
50
45
40
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
Wed 12:00
Thu 00:00
Thu 12:00
Fri 00:00
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time



Worksite: Green Park Way Vent Shaft (GPWVS) – Monitoring Ref: N059






Worksite: GPWVS Monitoring Ref: No59 14 Nov 2022 to 20 Nov 2022
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
80
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
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Thu 12:00
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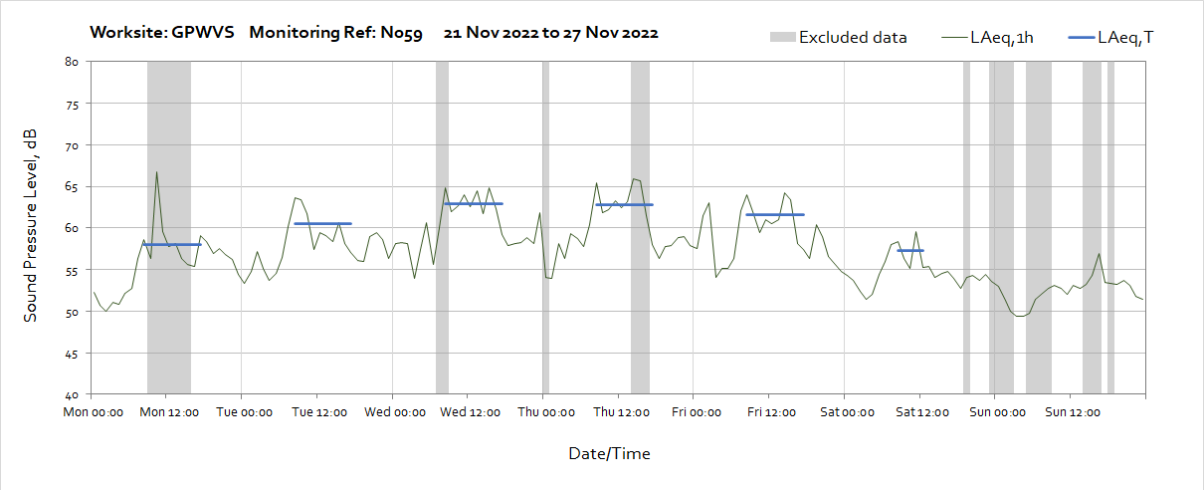
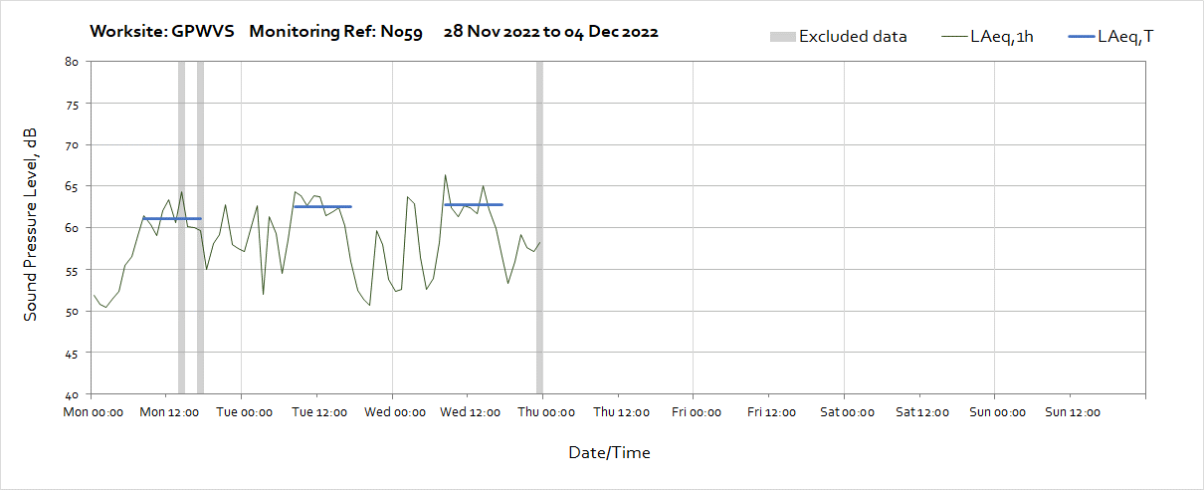
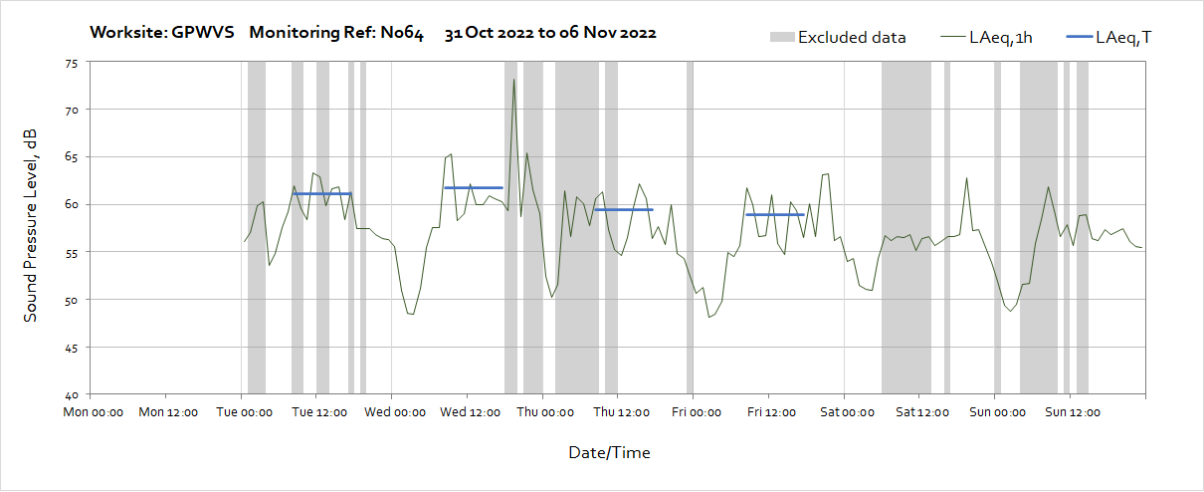
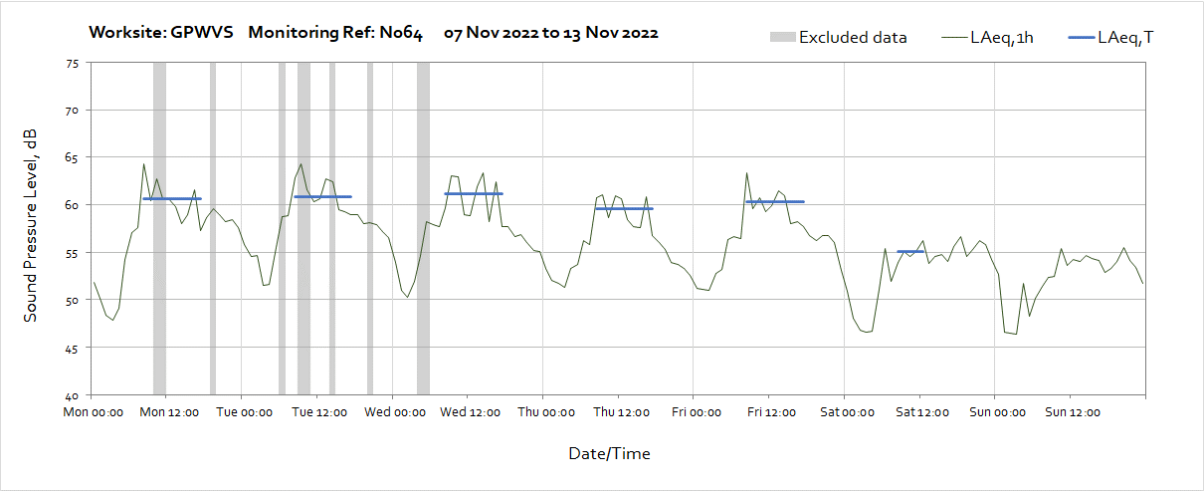
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time

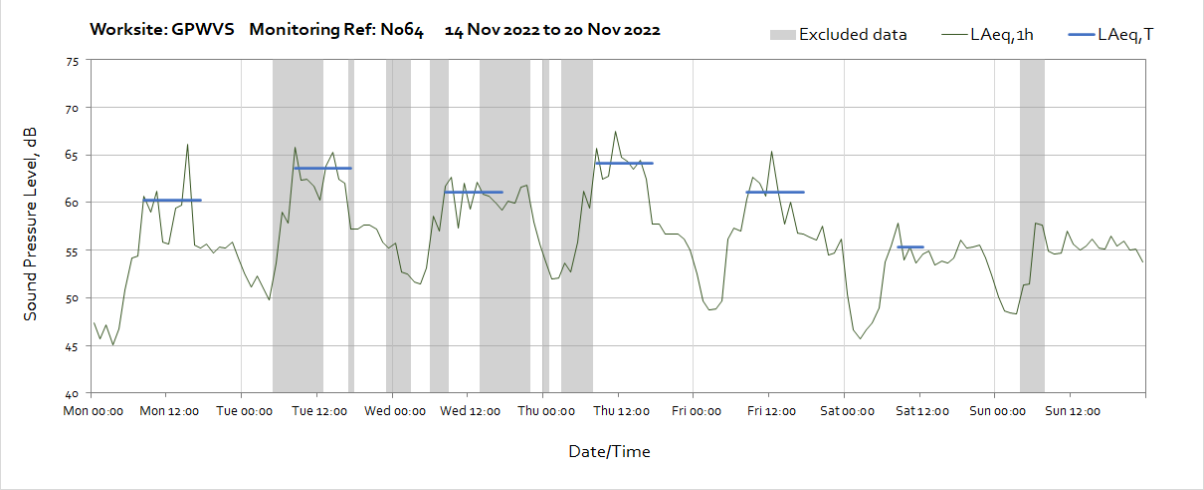

Worksite: GPWVS Monitoring Ref: No59 21 Nov 2022 to 27 Nov 2022
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
80
75
70
65
60
55
50
45
40
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
Wed 12:00
Thu 00:00
Thu 12:00
Fri 00:00
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time

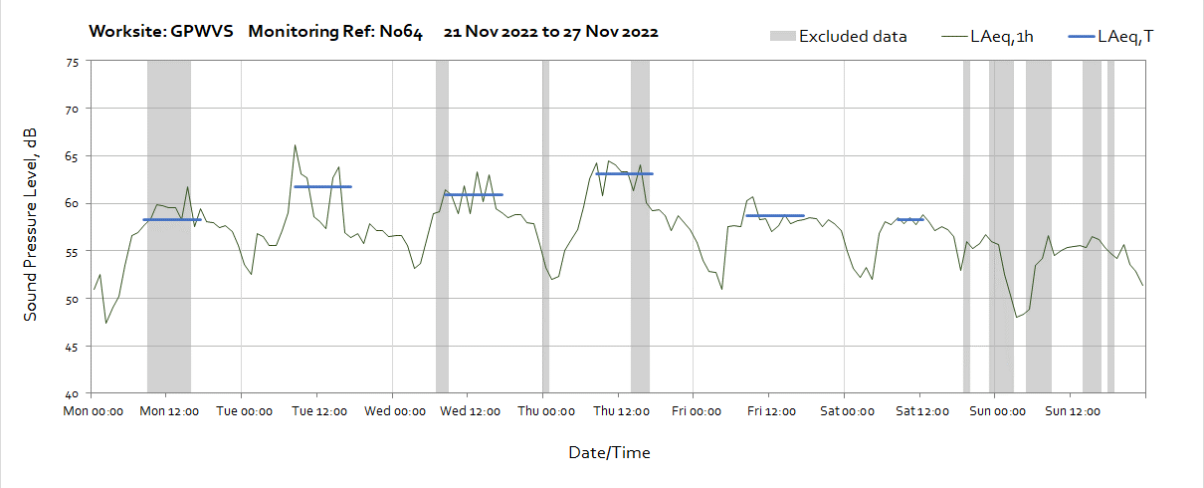

Worksite: GPWVS Monitoring Ref: No59 28 Nov 2022 to 04 Dec 2022
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
80
75
70
65
60
55
50
45
40
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
Wed 12:00
Thu 00:00
Thu 12:00
Fri 00:00
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time

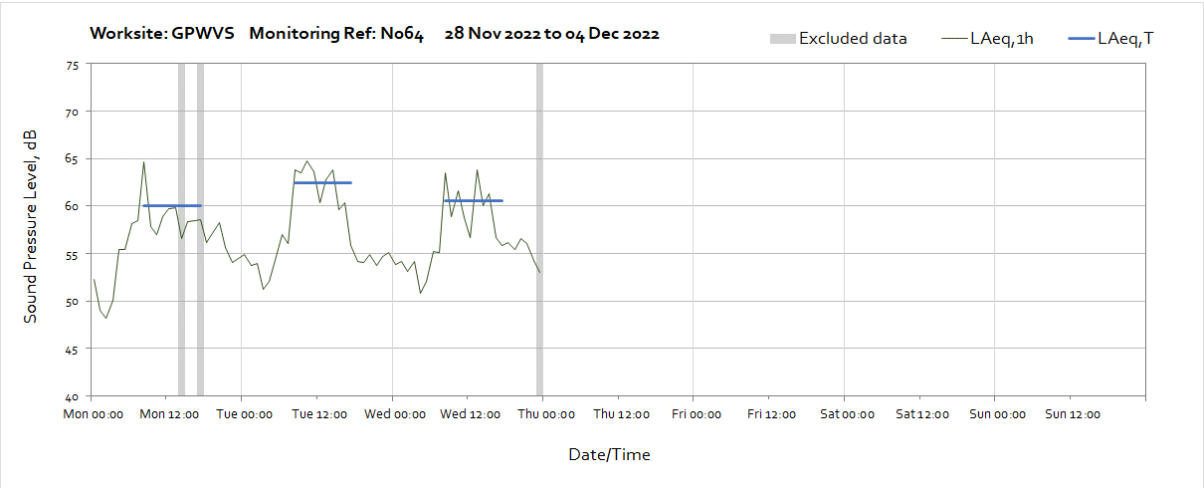
Worksite: Green Park Way Vent Shaft (GPWVS) – Monitoring Ref: N064



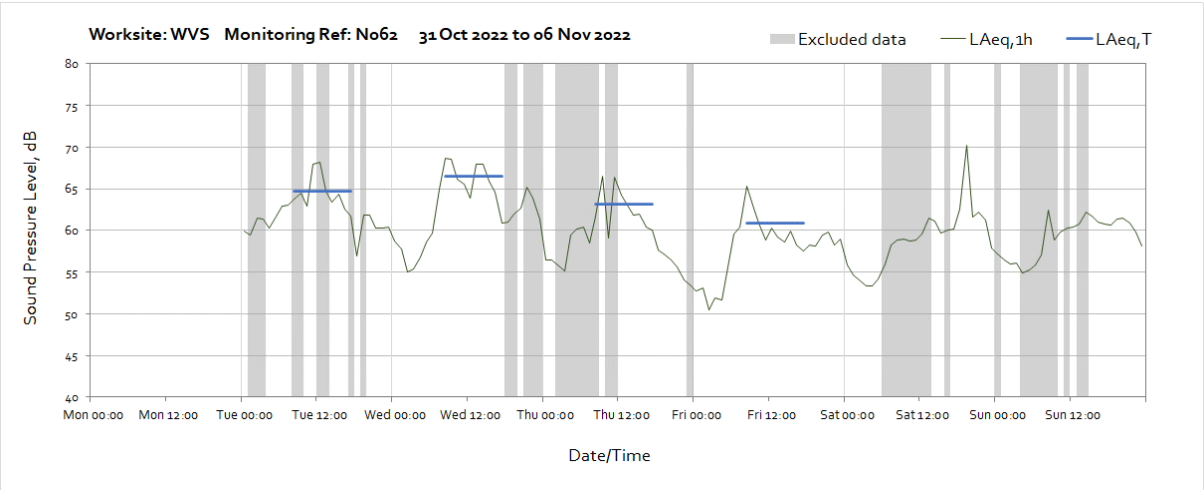


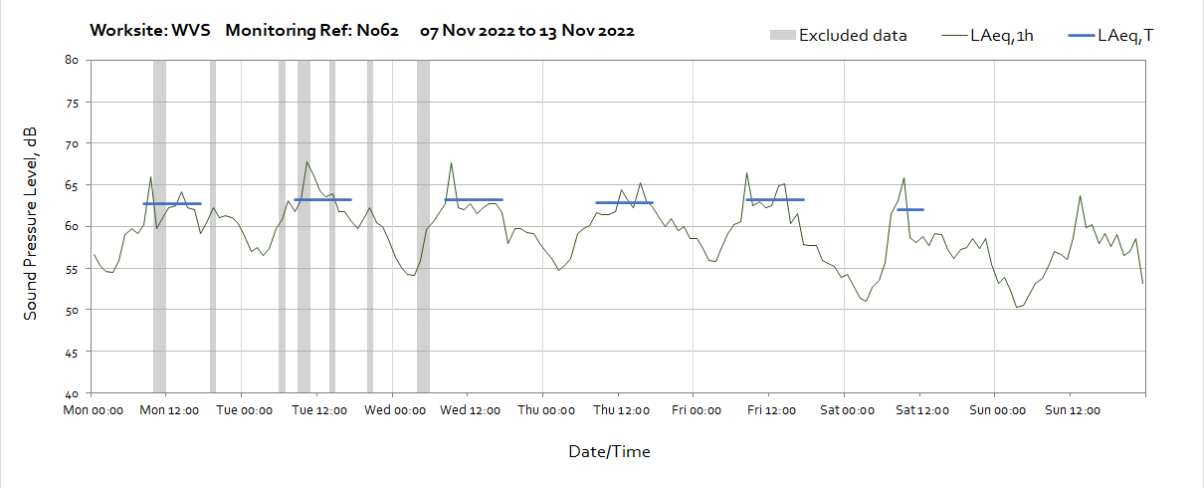


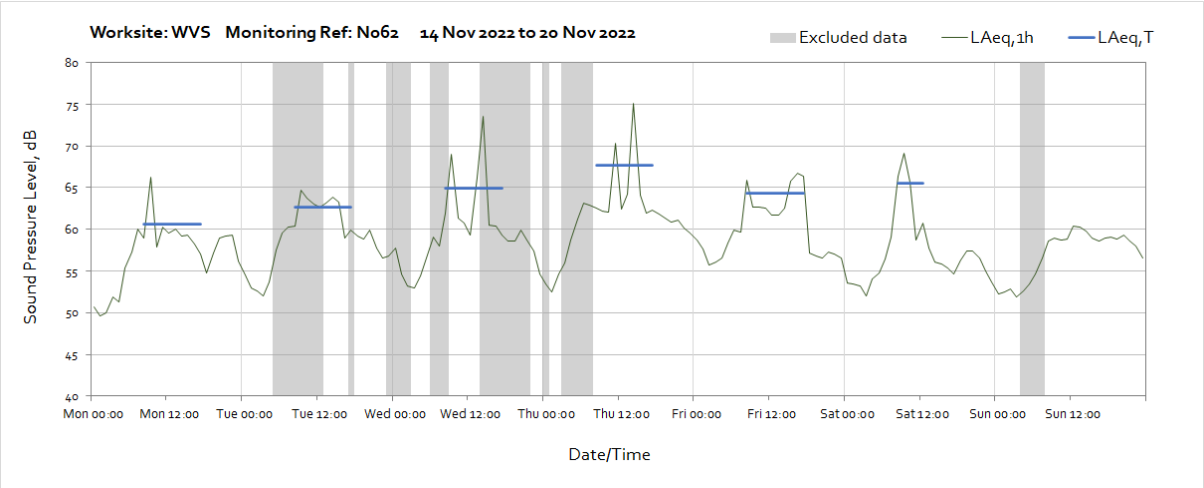


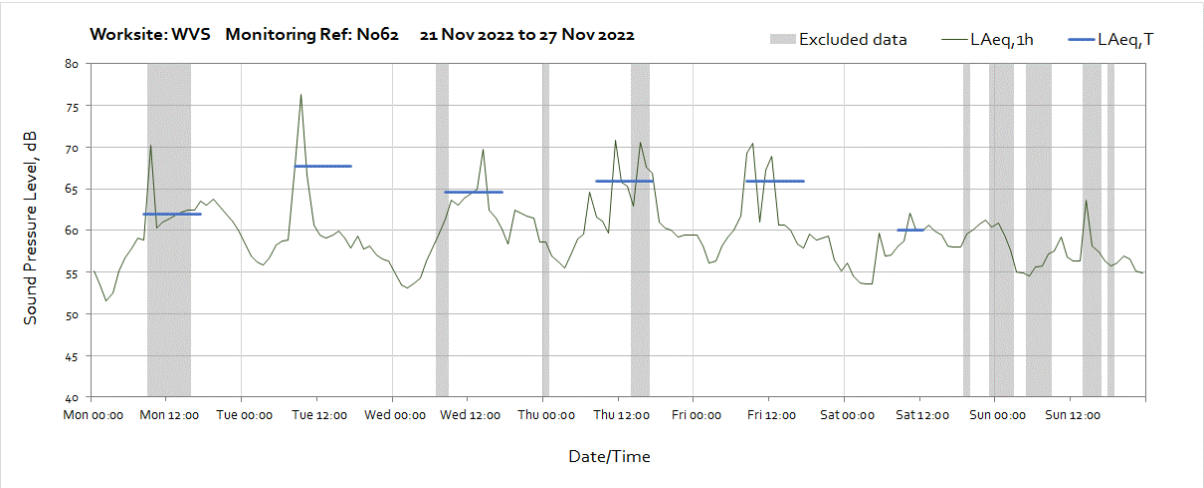


Worksite: Westgate Ventilation Shaft (WVS) – Monitoring Ref: N062




Worksite: WVS Monitoring Ref: No62 07 Nov 2022 to 13 Nov 2022
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
80
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: WVS Monitoring Ref: No62 14 Nov 2022 to 20 Nov 2022
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
80
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: WVS Monitoring Ref: No62 21 Nov 2022 to 27 Nov 2022
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
80
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
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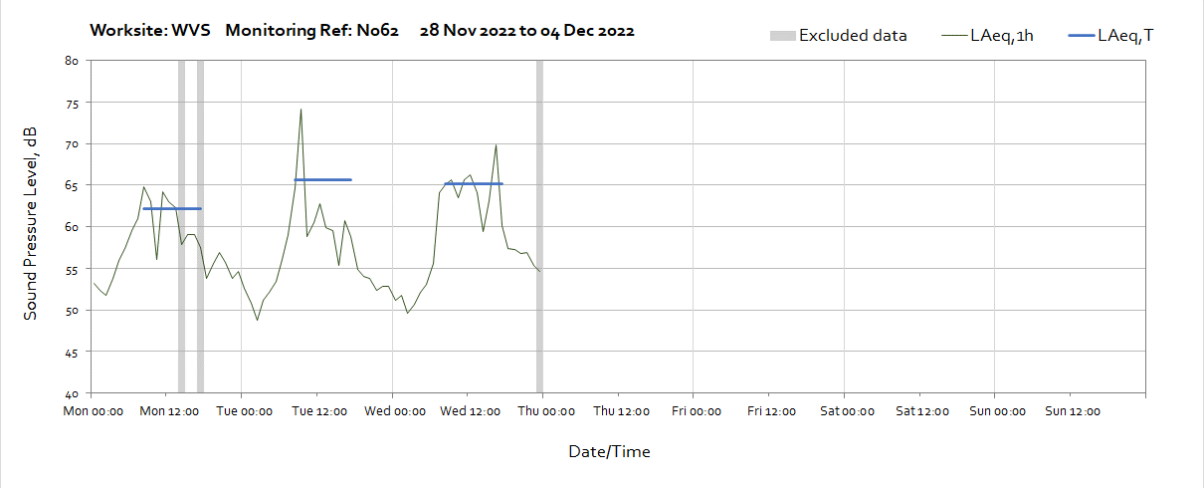
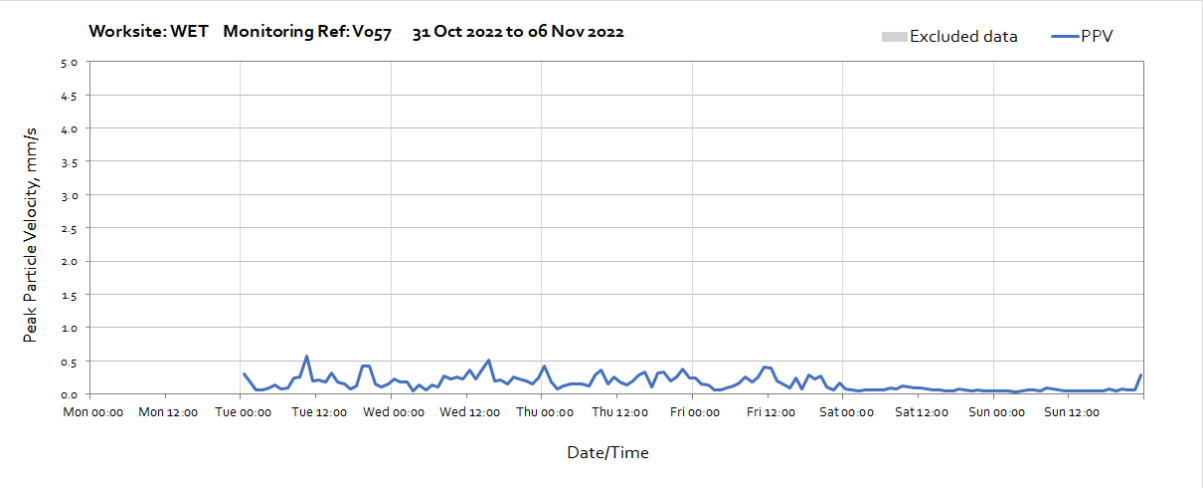
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time

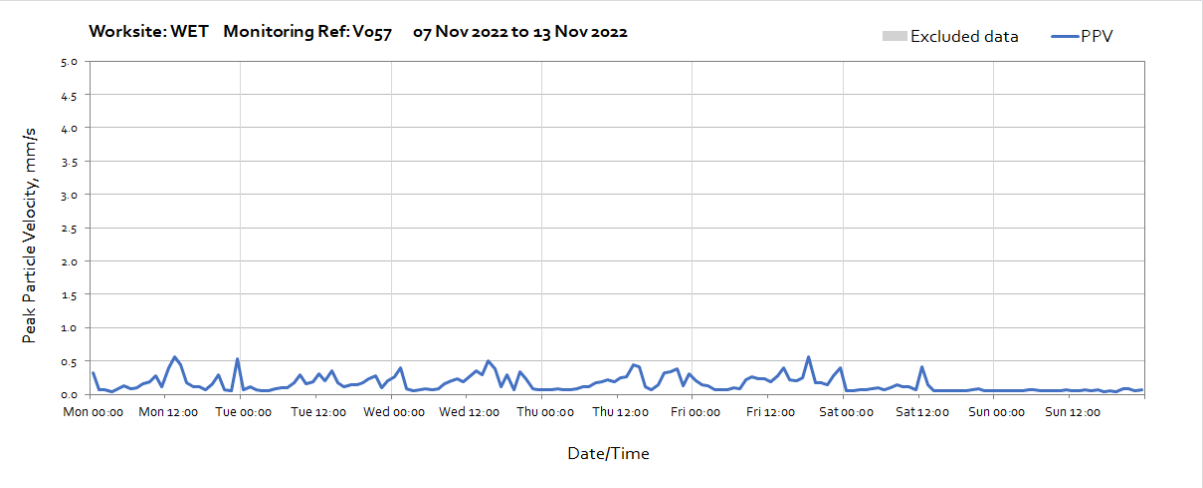

Worksite: WVS Monitoring Ref: No62 28 Nov 2022 to 04 Dec 2022
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
80
75
70
65
60
55
50
45
40
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
Wed 12:00
Thu 00:00
Thu 12:00
Fri 00:00
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time

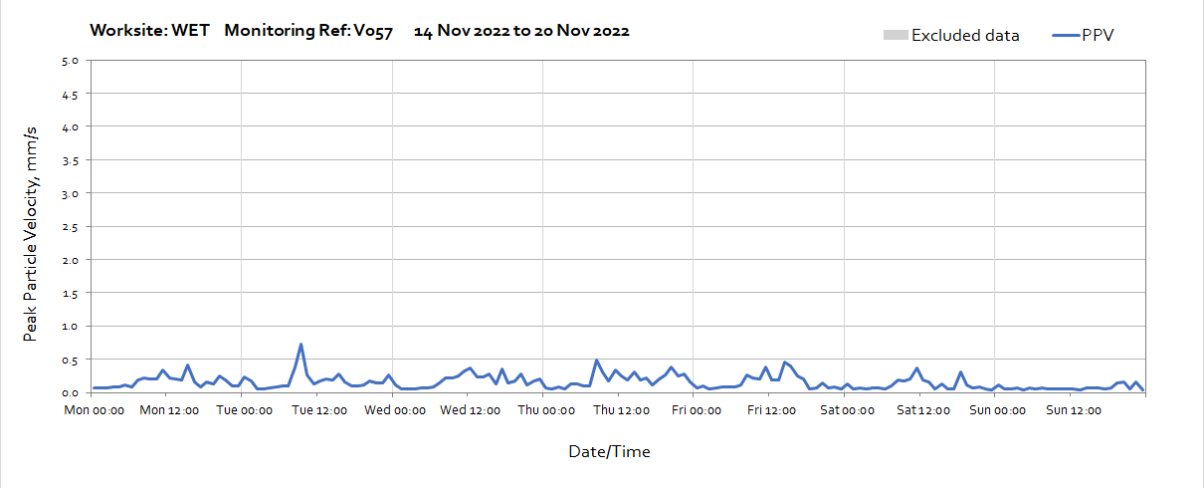
Vibration

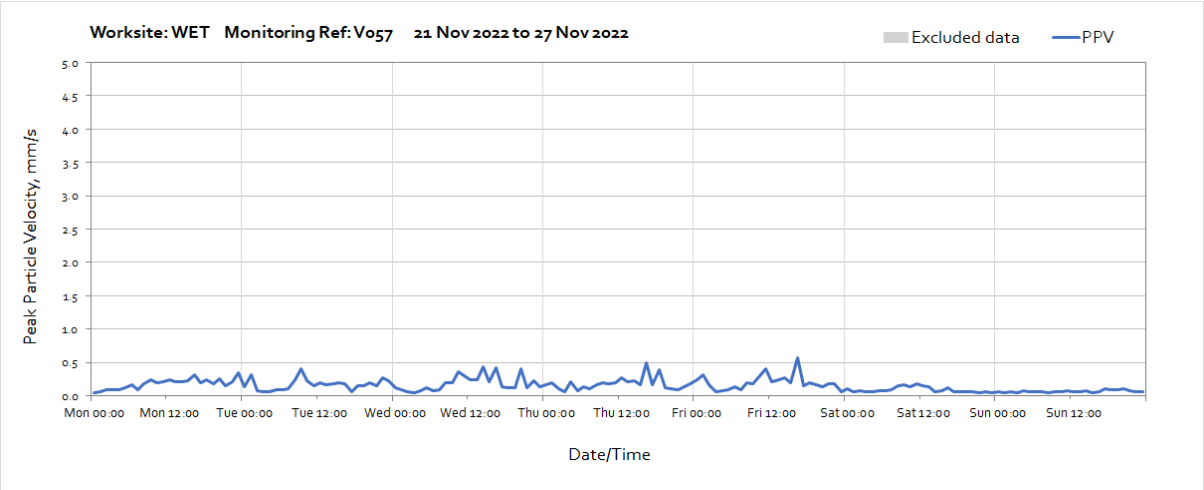
The following graphs show the hourly measured peak particle velocity PPV recorded during the monitoring period. The graphs show the highest PPV of the three orthogonal axis x, y and z. Where high values of PPV were caused by local interference with the vibration monitor, which are not representative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

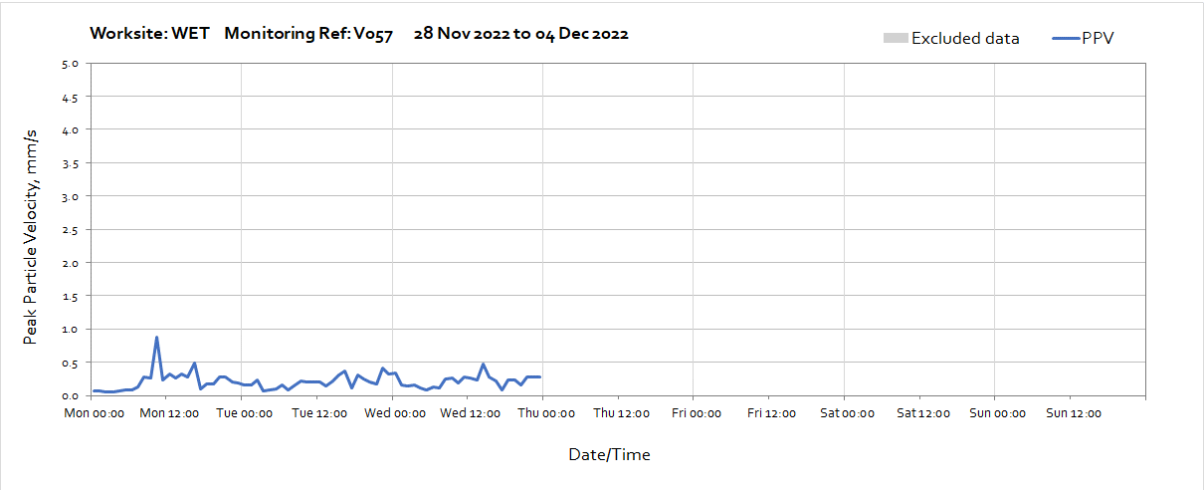
Worksite: Willesden Euro Terminal (WET) – Monitoring Ref: V057



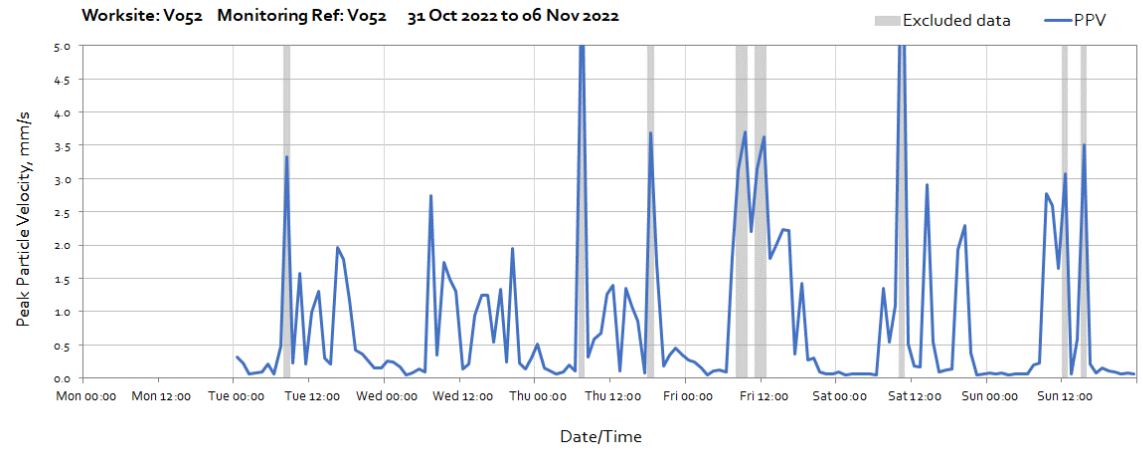


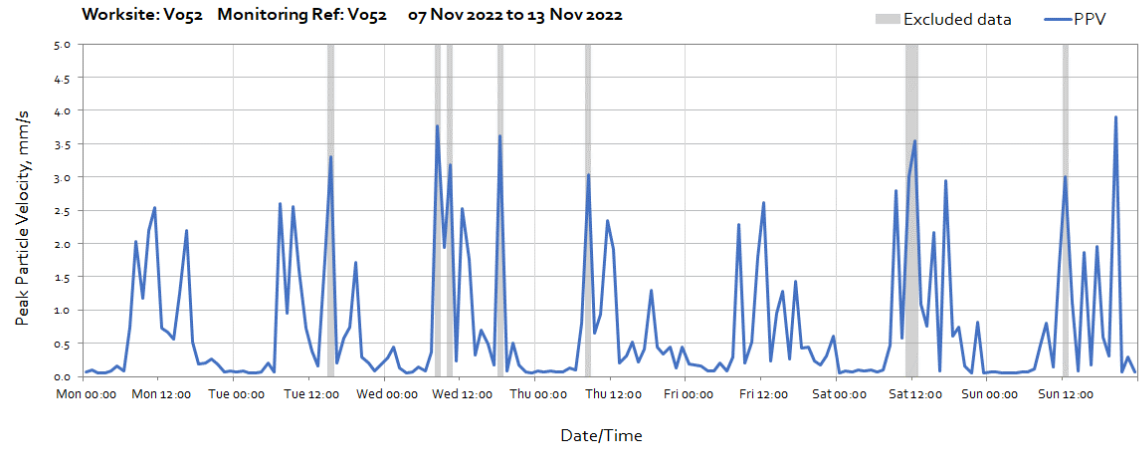

Worksite: WET Monitoring Ref: V057 14 Nov 2022 to 20 Nov 2022
Excluded data
PPV
Peak Particle Velocity, mm/s
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
Wed 12:00
Thu 00:00
Thu 12:00
Fri 00:00
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time

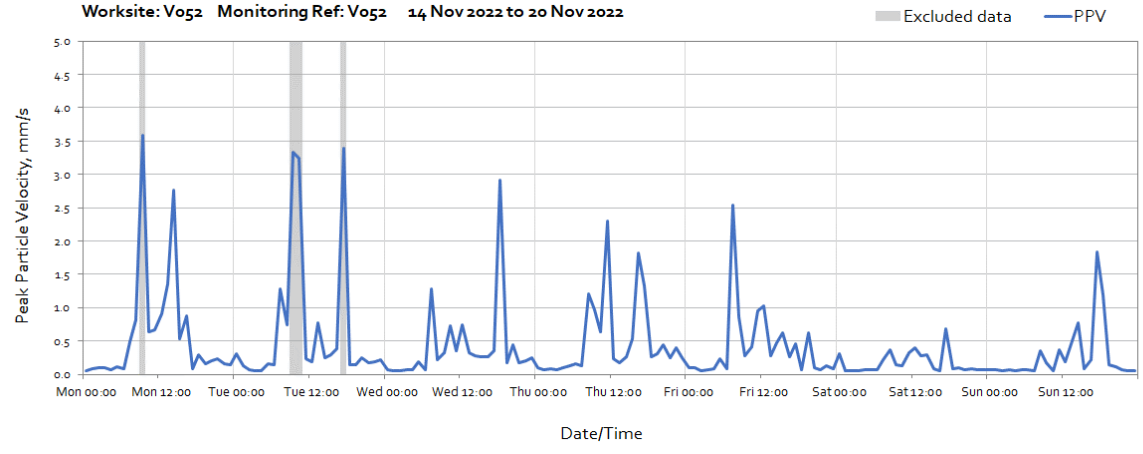

Worksite: WET Monitoring Ref: V057 21 Nov 2022 to 27 Nov 2022
Excluded data
PPV
Peak Particle Velocity, mm/s
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
Wed 12:00
Thu 00:00
Thu 12:00
Fri 00:00
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time

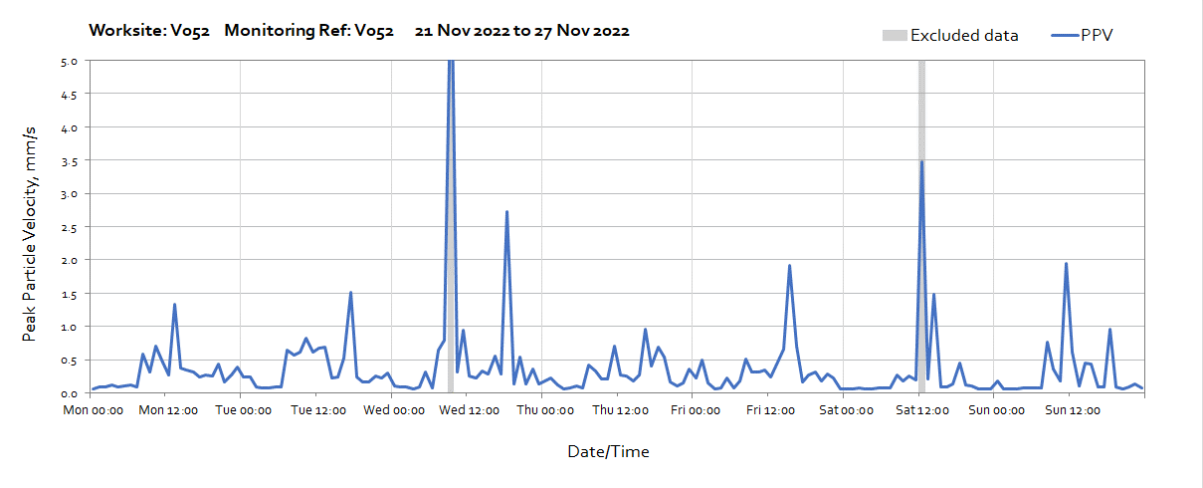

Worksite: WET Monitoring Ref: V057 28 Nov 2022 to 04 Dec 2022
Excluded data
PPV
Peak Particle Velocity, mm/s
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
Wed 12:00
Thu 00:00
Thu 12:00
Fri 00:00
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time

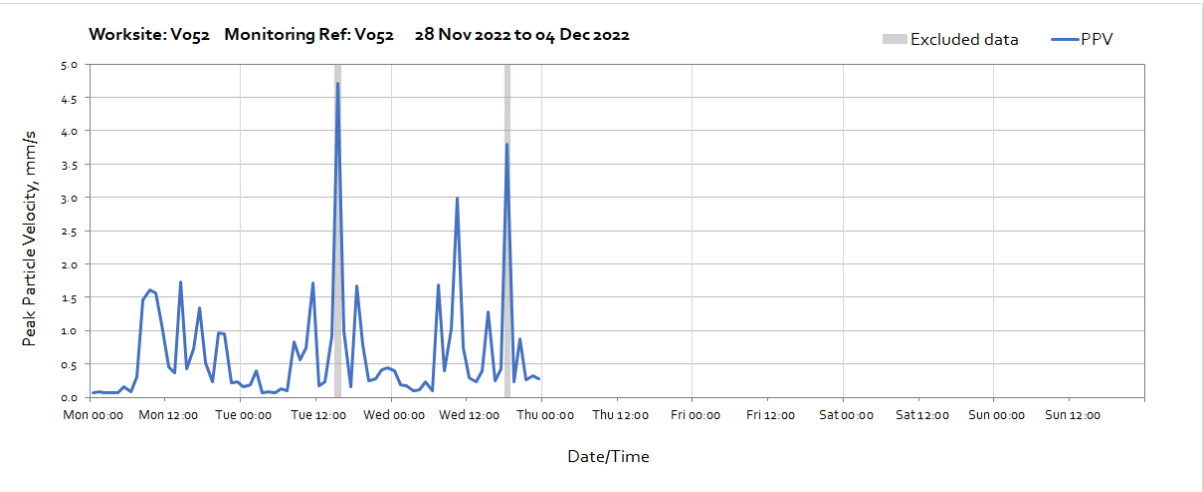
Worksite: Willesden Euro Terminal (WET) – Monitoring Ref: V052



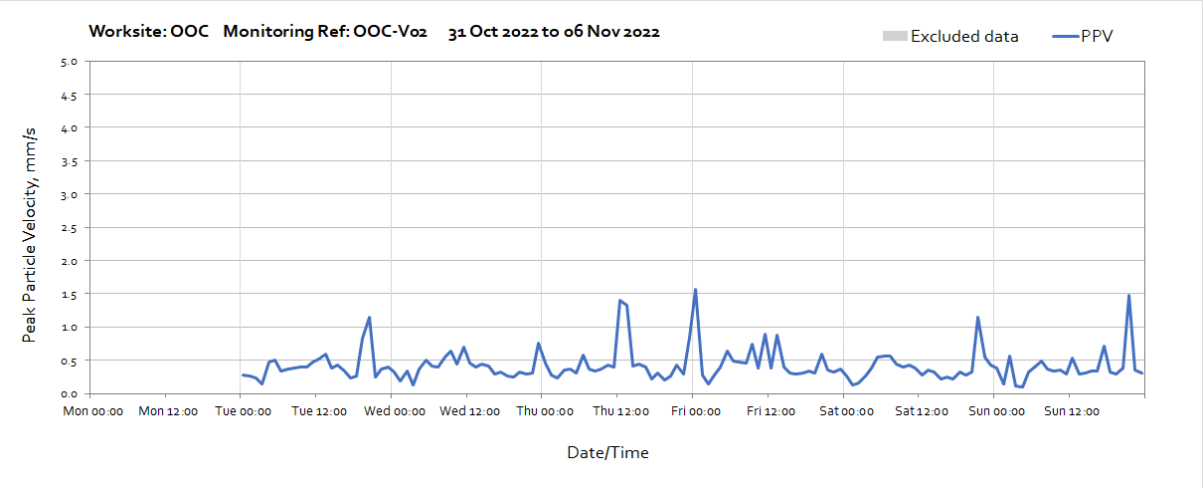


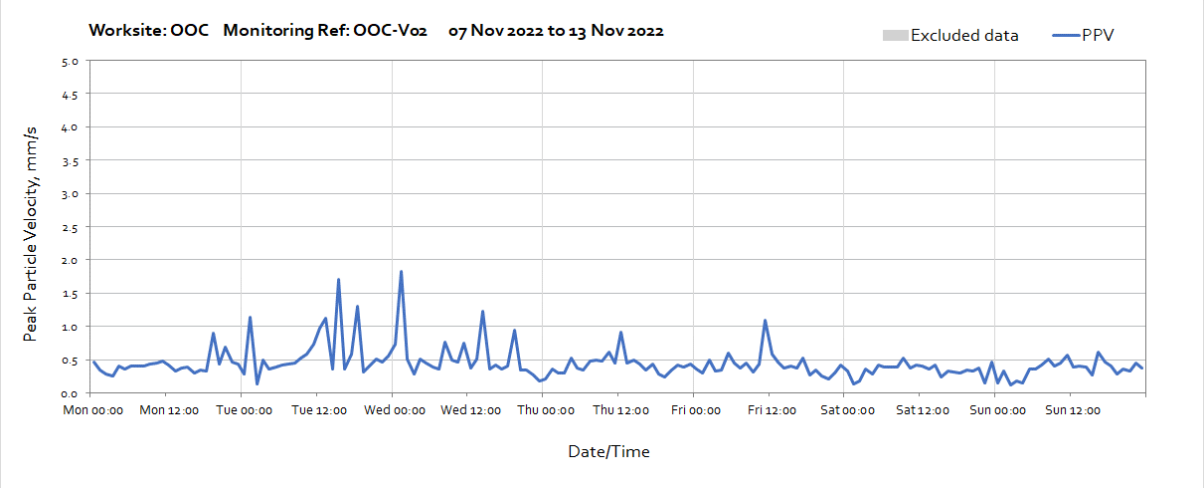


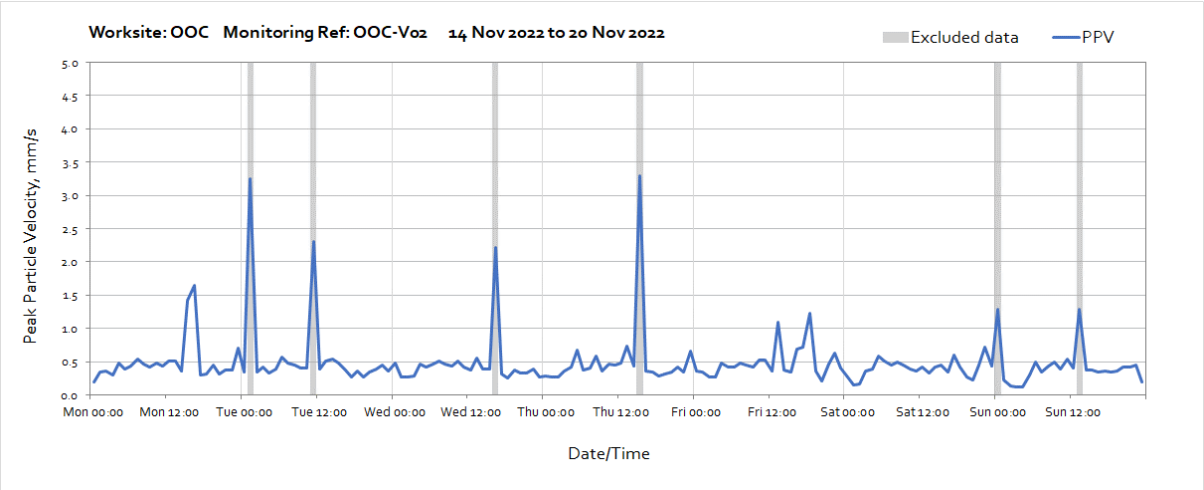


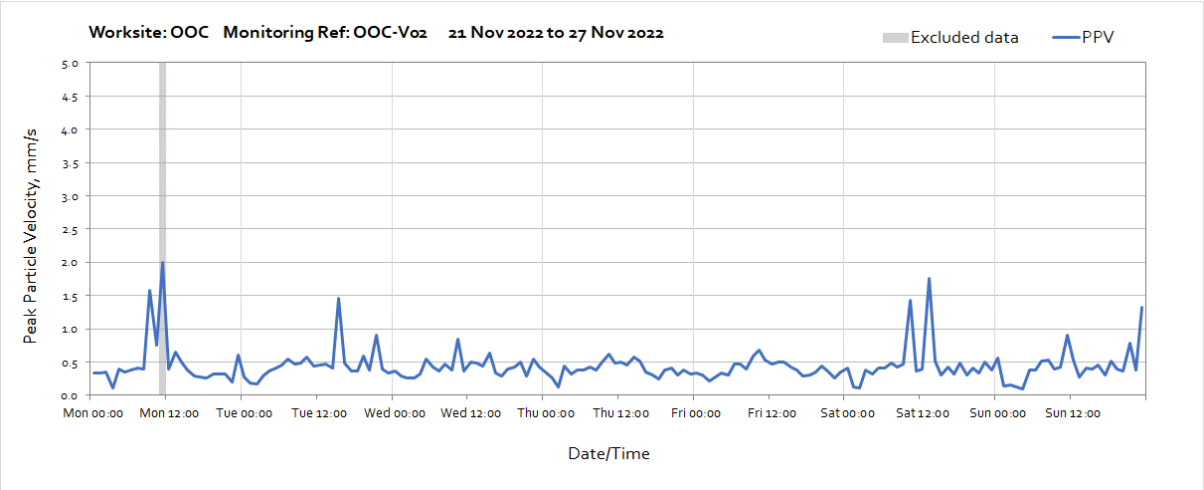


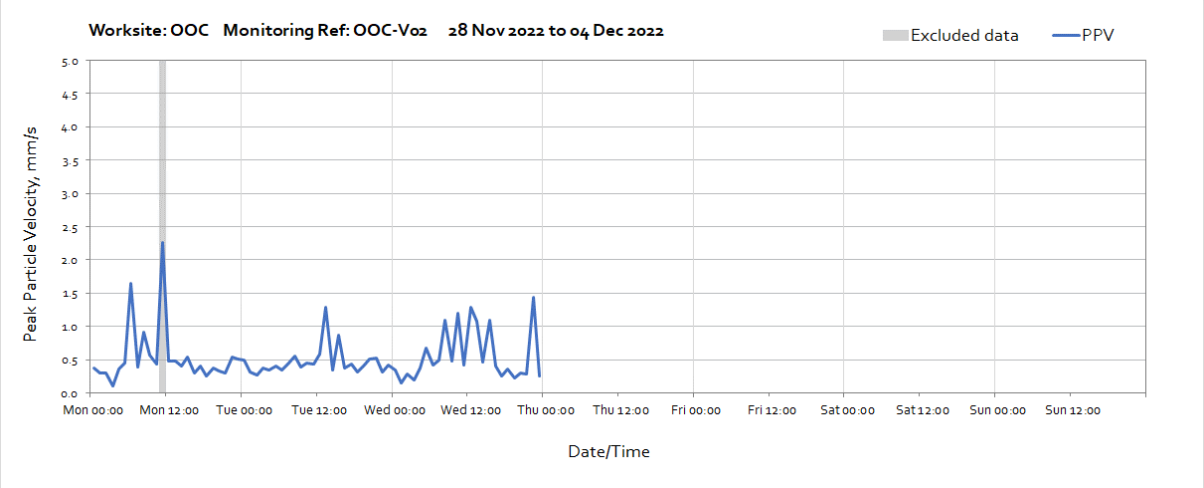
Worksite: Old Oak Common (OOC) – Monitoring Ref: OOC-V02



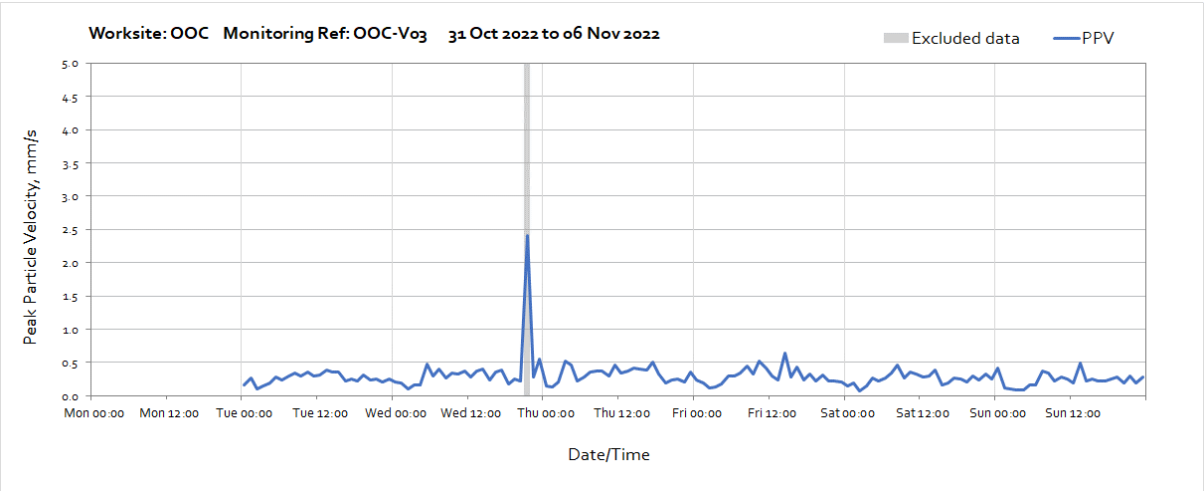

Worksite: OOC Monitoring Ref: OOC-V02 07 Nov 2022 to 13 Nov 2022
Excluded data
PPV
Peak Particle Velocity, mm/s
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
Wed 12:00
Thu 00:00
Thu 12:00
Fri 00:00
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time

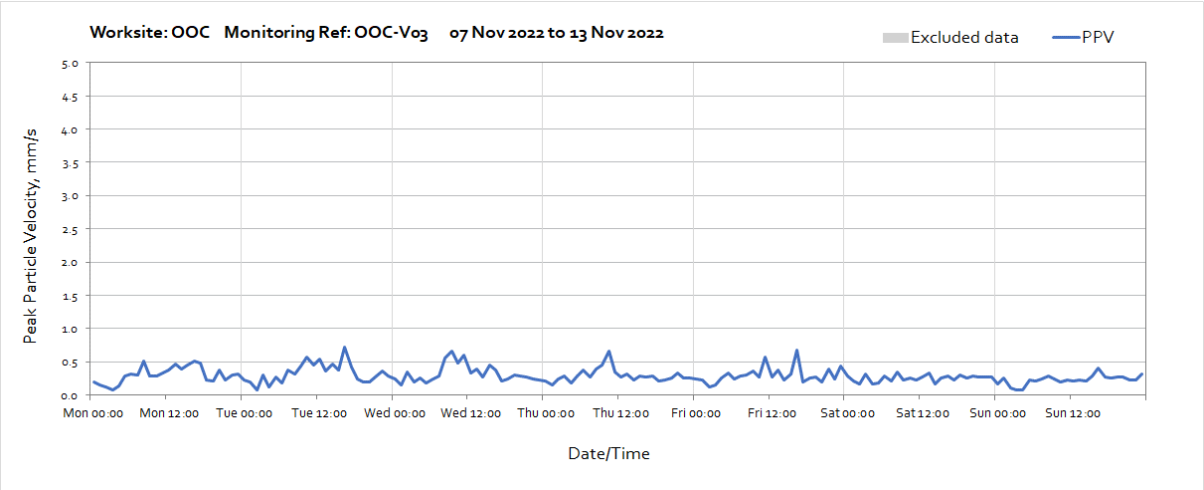

Worksite: OOC Monitoring Ref: OOC-V02 14 Nov 2022 to 20 Nov 2022
Excluded data
PPV
Peak Particle Velocity, mm/s
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
Wed 12:00
Thu 00:00
Thu 12:00
Fri 00:00
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time

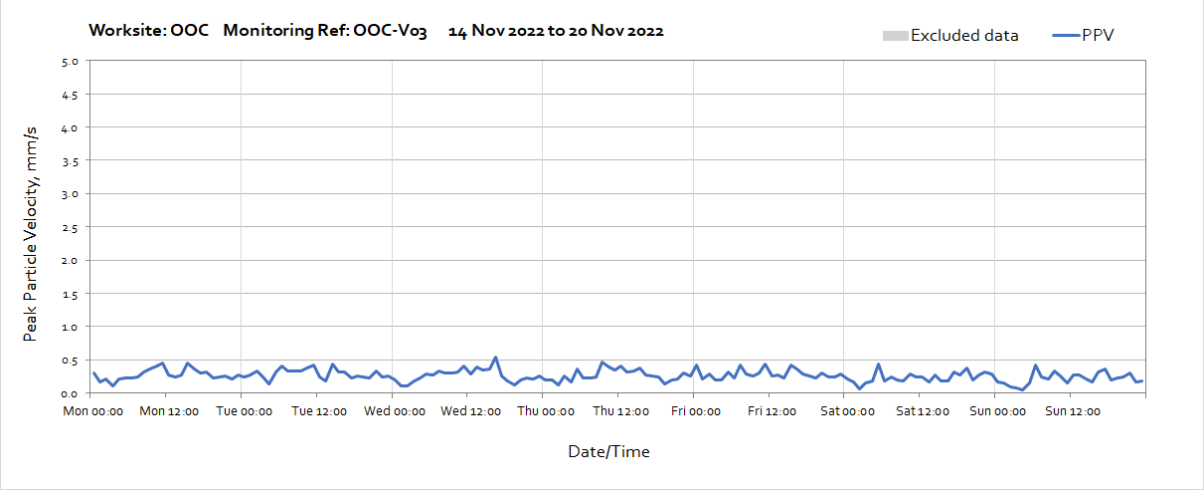

Worksite: OOC Monitoring Ref: OOC-V02 21 Nov 2022 to 27 Nov 2022
Excluded data
PPV
Peak Particle Velocity, mm/s
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
Wed 12:00
Thu 00:00
Thu 12:00
Fri 00:00
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time

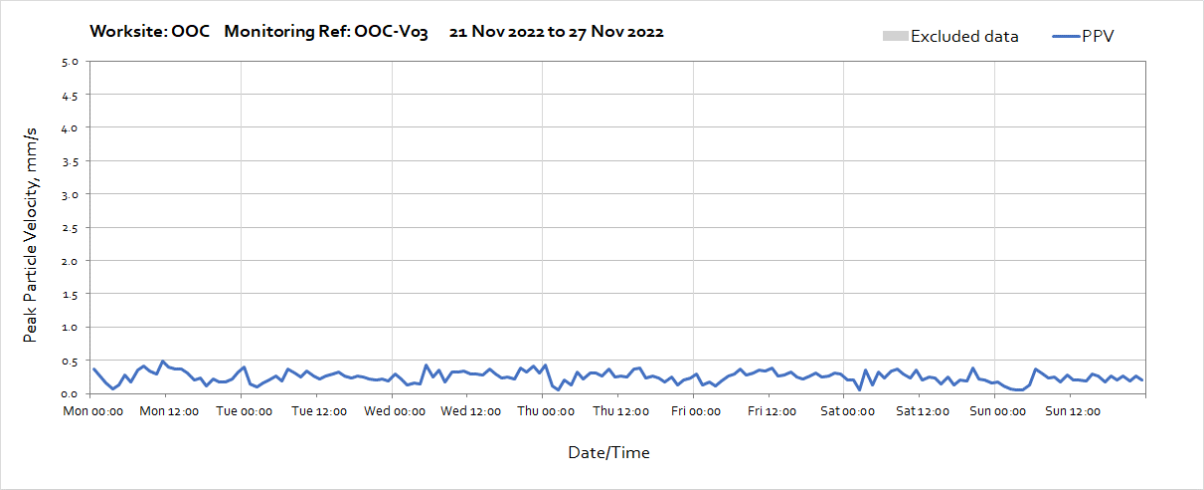


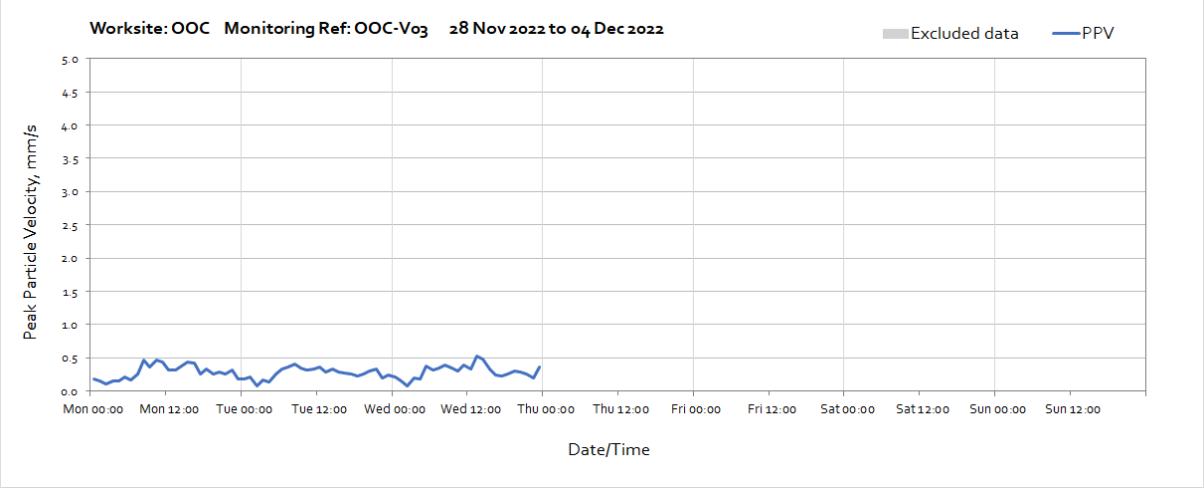
Worksite: Old Oak Common (OOC) – Monitoring Ref: OOC-V03



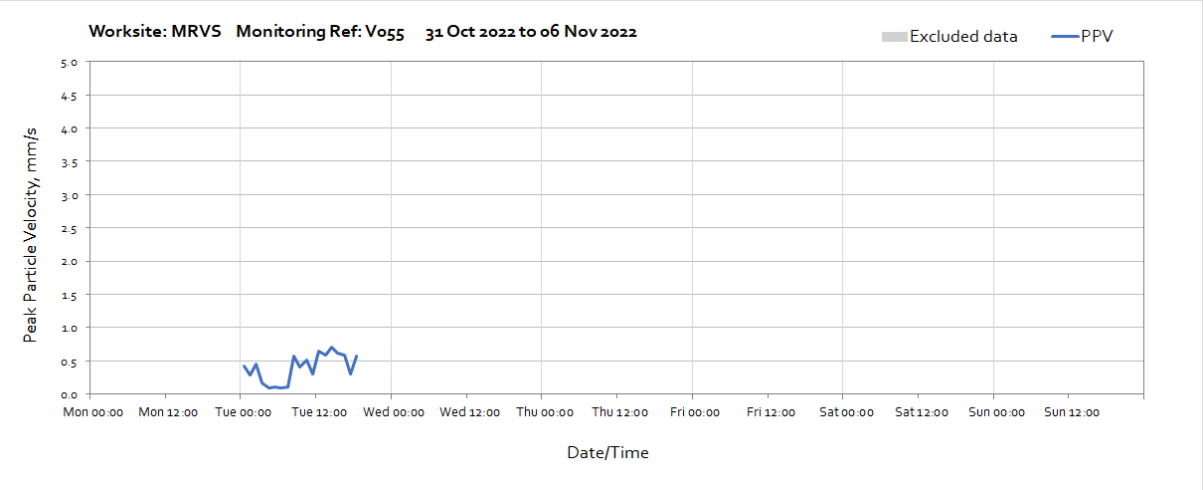



Worksite: OOC Monitoring Ref: OOC-V03 14 Nov 2022 to 20 Nov 2022
Excluded data
PPV
Peak Particle Velocity, mm/s
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
Wed 12:00
Thu 00:00
Thu 12:00
Fri 00:00
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time

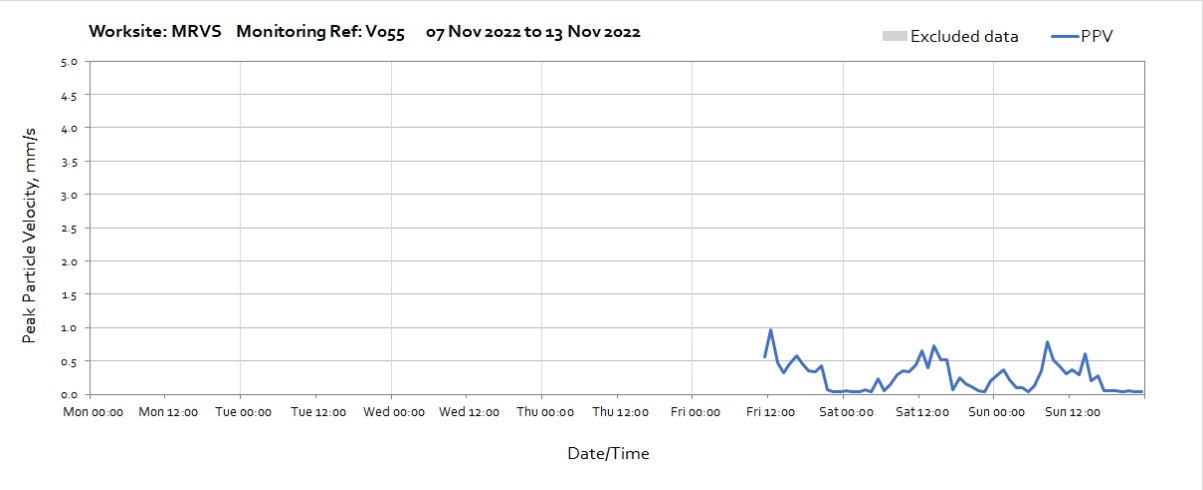

Worksite: OOC Monitoring Ref: OOC-V03 21 Nov 2022 to 27 Nov 2022
Excluded data
PPV
Peak Particle Velocity, mm/s
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
Wed 12:00
Thu 00:00
Thu 12:00
Fri 00:00
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time


Worksite: OOC Monitoring Ref: OOC-V03 28 Nov 2022 to 04 Dec 2022
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

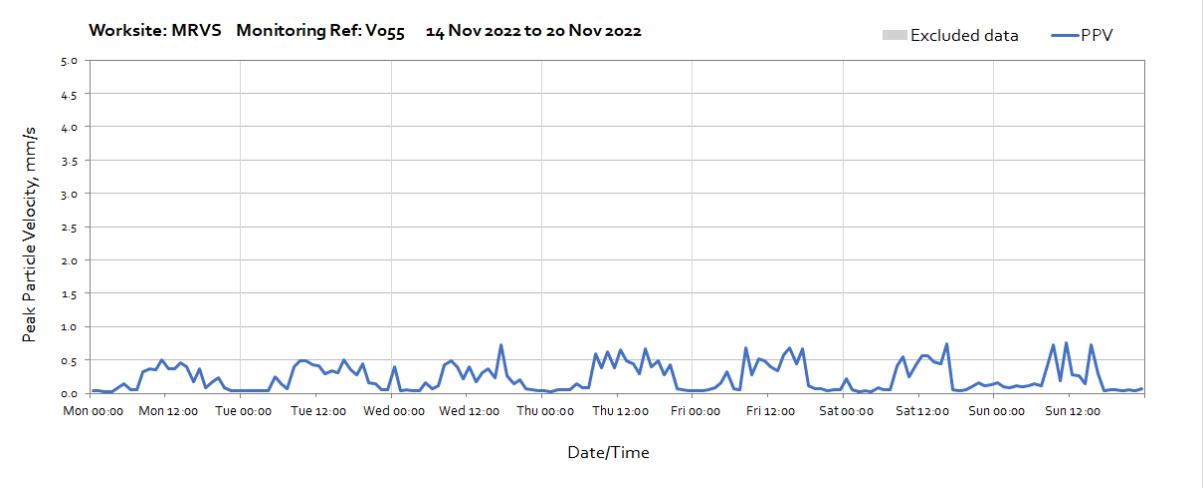
Worksite: Mandeville Road Vent Shaft (MRVS) – Monitoring Ref: V055

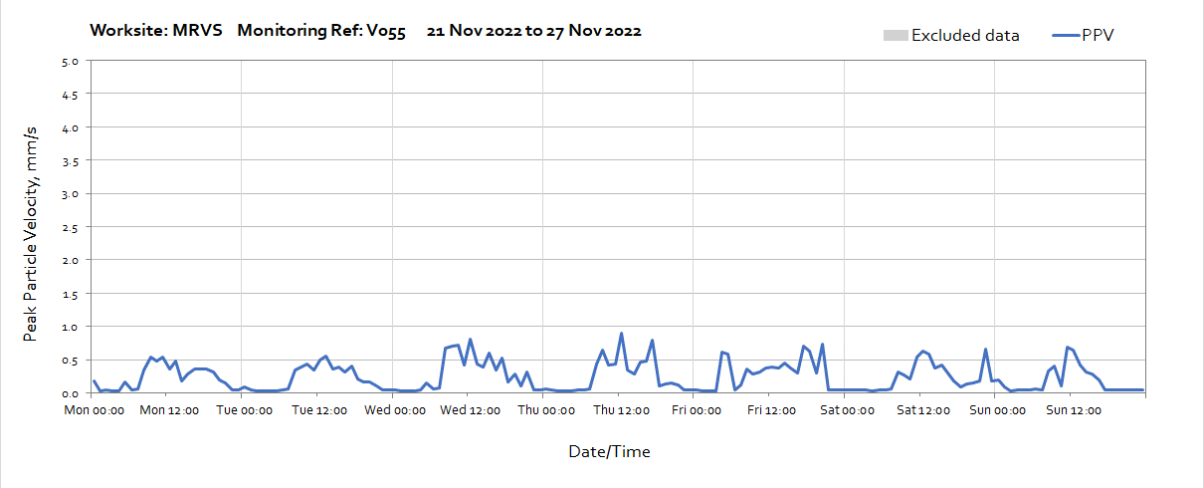


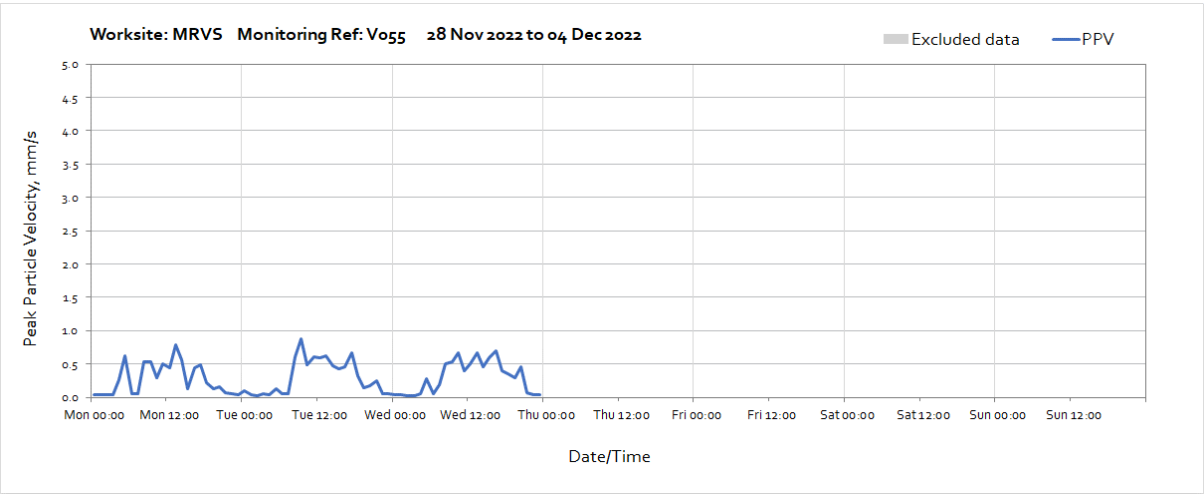
Note: Missing data between 19:00 on Tuesday 1st November and 10:00 on Friday 11th November was due to loss of battery power at the monitoring station.



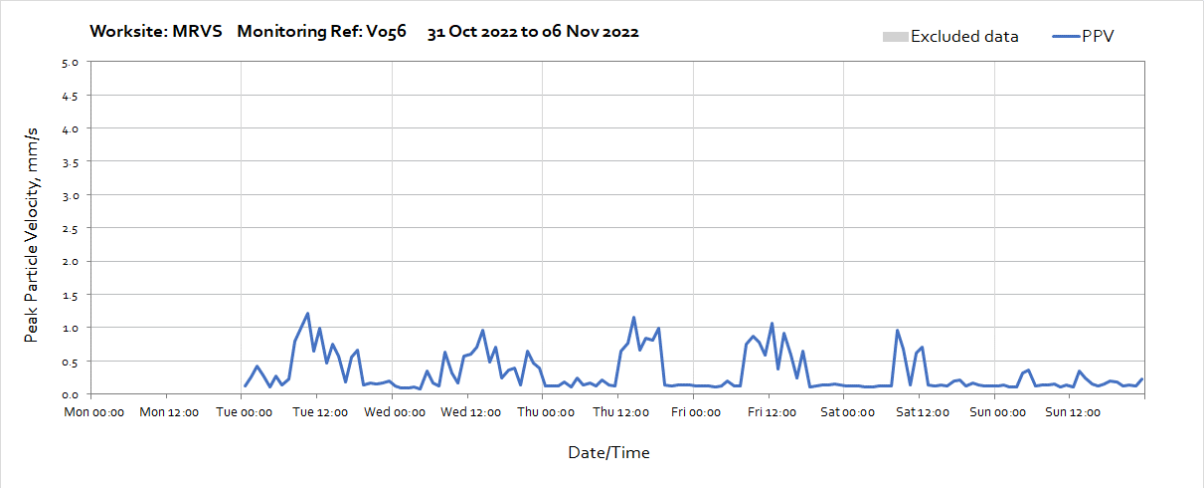
Note: Missing data between 19:00 on Tuesday 1st November and 10:00 on Friday 11th November was due to loss of battery power at the monitoring station.

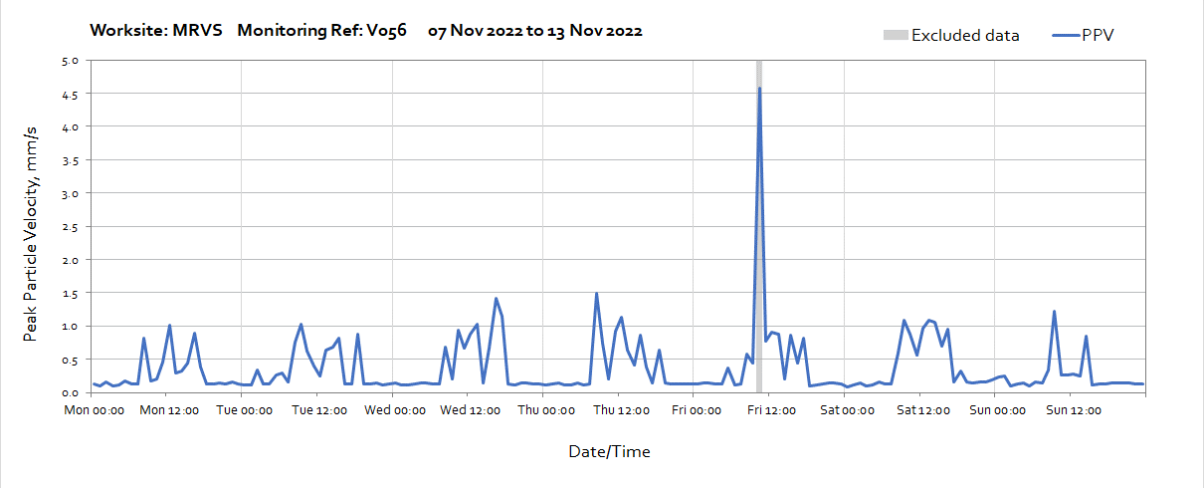


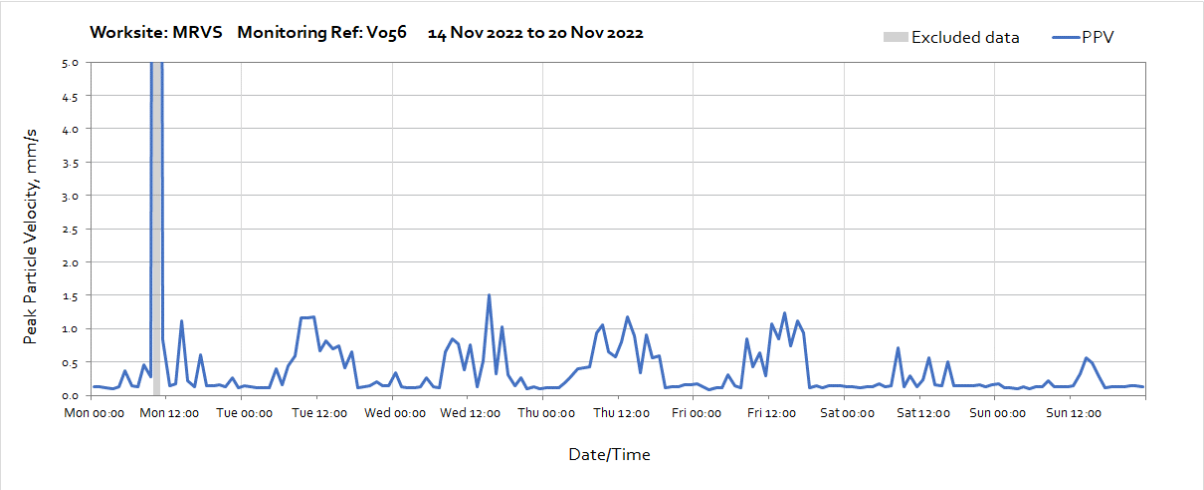


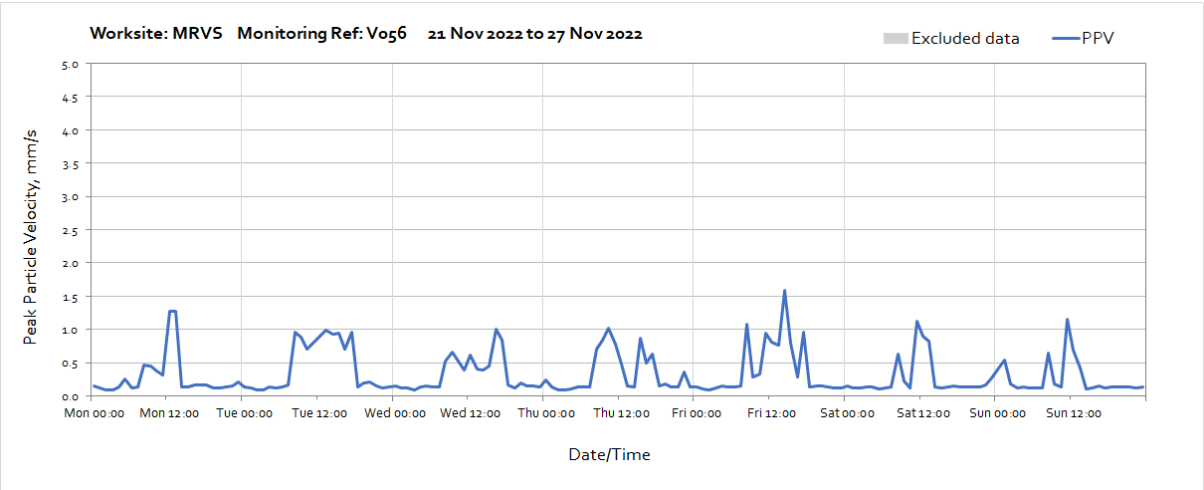


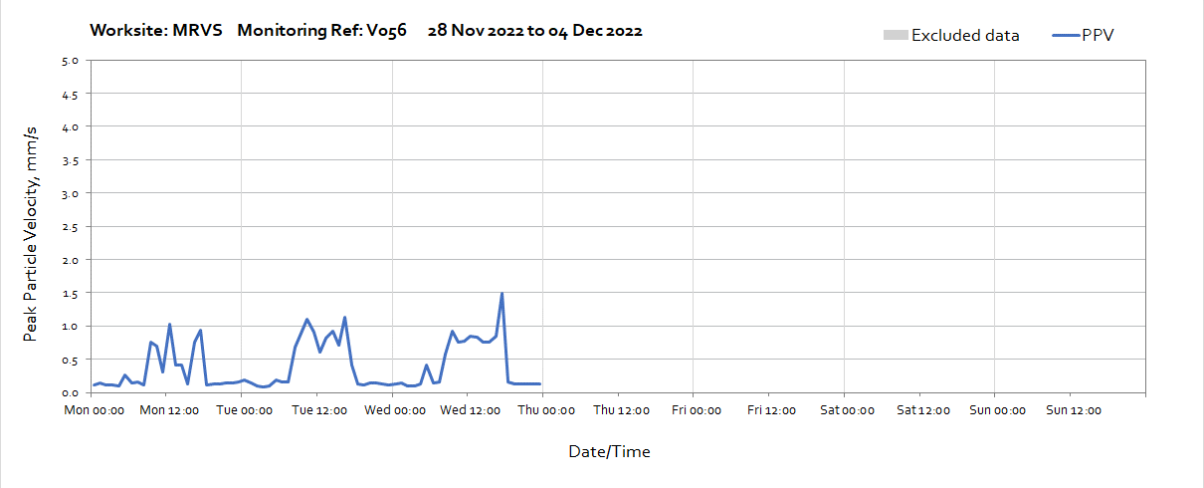
Worksite: Mandeville Road Vent Shaft (MRVS) – Monitoring Ref: V056



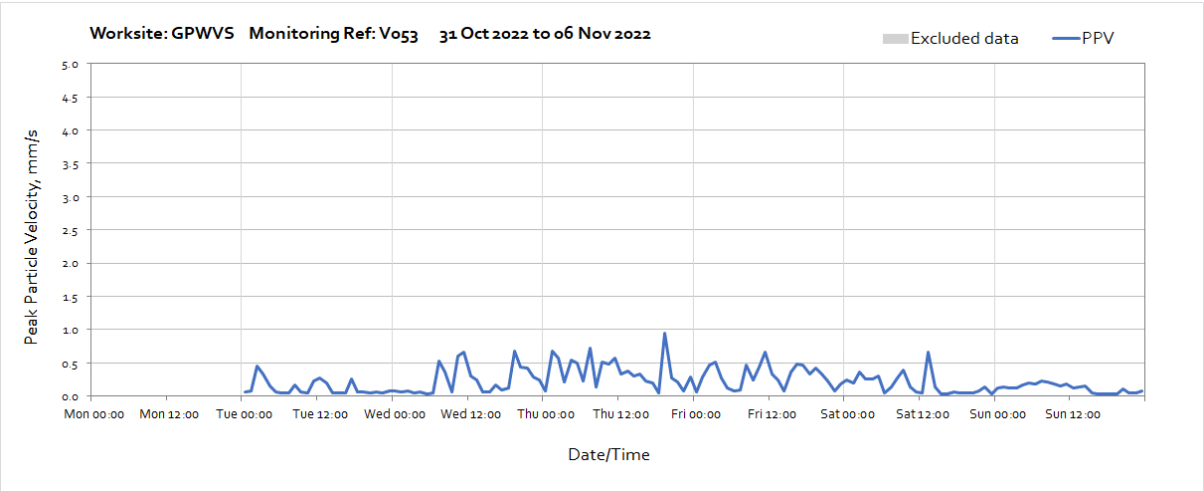

Worksite: MRVS Monitoring Ref: Vo56 07 Nov 2022 to 13 Nov 2022
Excluded data
PPV
Peak Particle Velocity, mm/s
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
Wed 12:00
Thu 00:00
Thu 12:00
Fri 00:00
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time

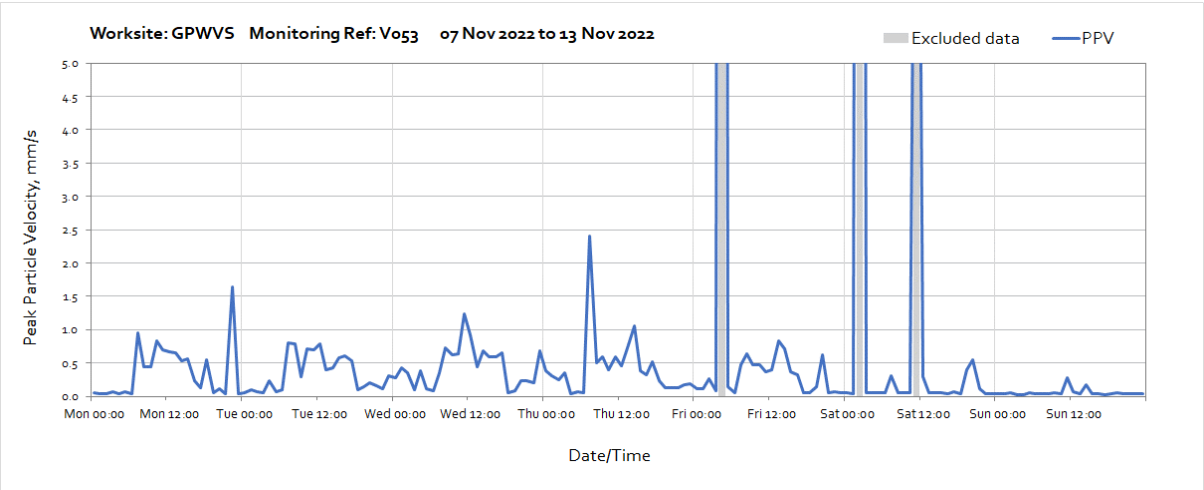

Worksite: MRVS Monitoring Ref: Vo56 14 Nov 2022 to 20 Nov 2022
Excluded data
PPV
Peak Particle Velocity, mm/s
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
Wed 12:00
Thu 00:00
Thu 12:00
Fri 00:00
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time

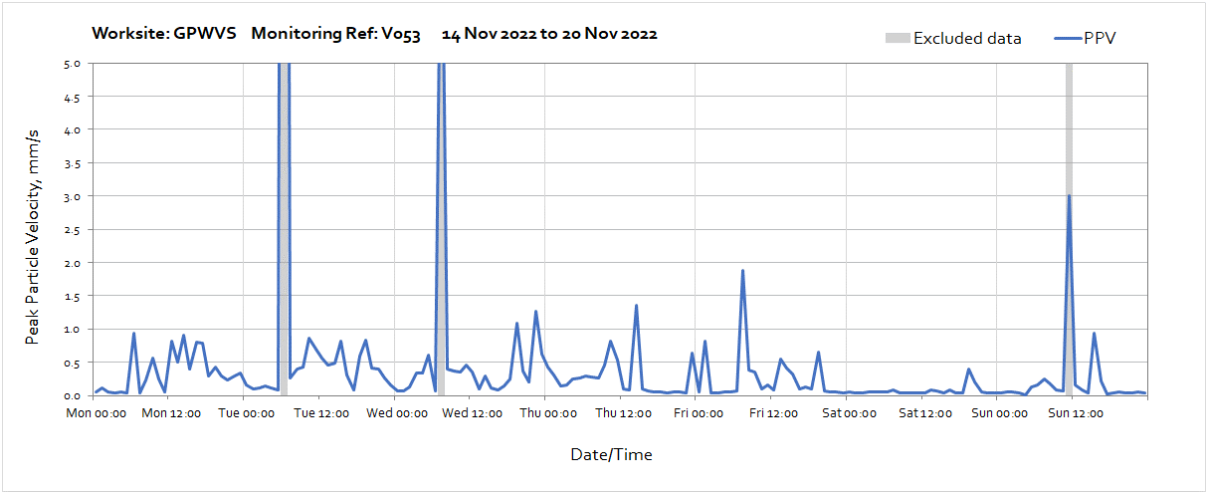

Worksite: MRVS Monitoring Ref: Vo56 21 Nov 2022 to 27 Nov 2022
Excluded data
PPV
Peak Particle Velocity, mm/s
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
Wed 12:00
Thu 00:00
Thu 12:00
Fri 00:00
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time

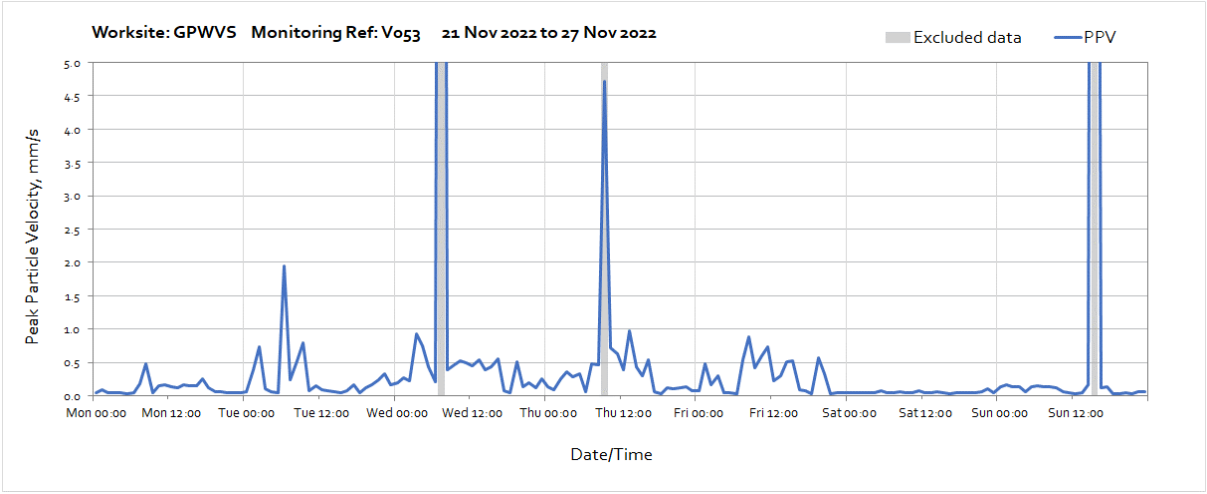


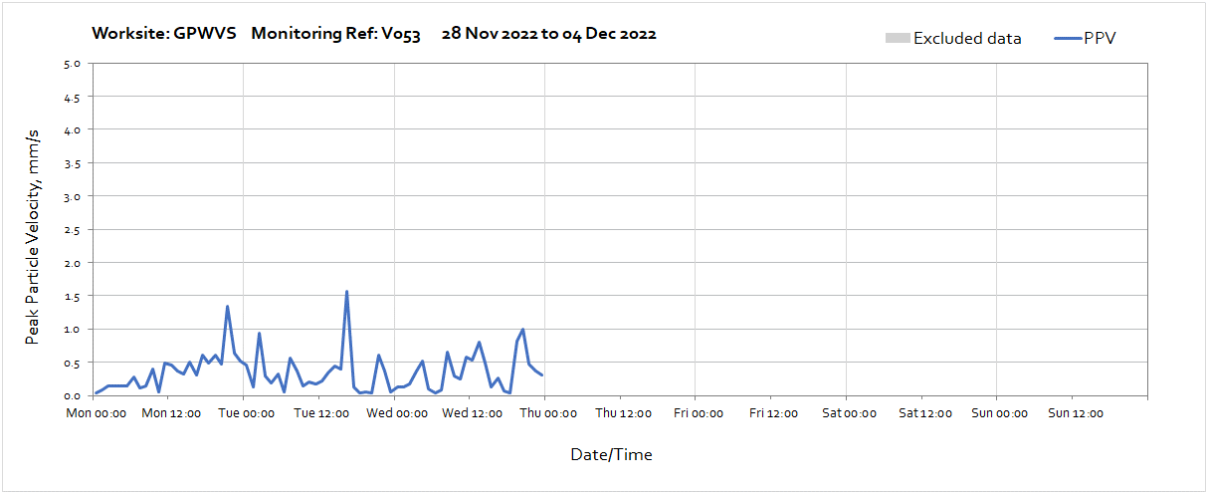
Worksite: Green Park Way Vent Shaft (GPWVS) – Monitoring Ref: V053



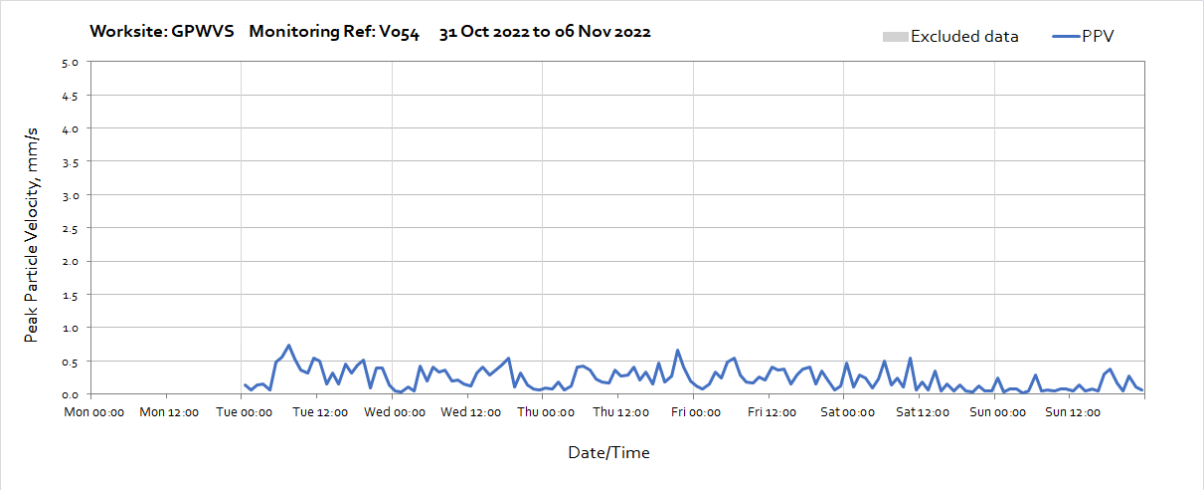


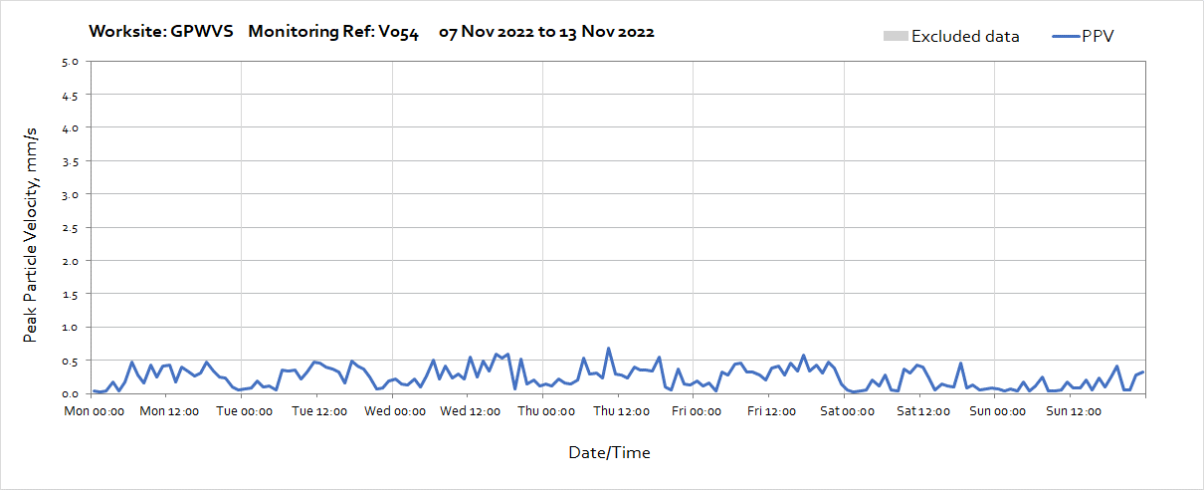

Worksite: GPWVS Monitoring Ref: V053 14 Nov 2022 to 20 Nov 2022
Excluded data
PPV
Peak Particle Velocity, mm/s
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
Wed 12:00
Thu 00:00
Thu 12:00
Fri 00:00
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time

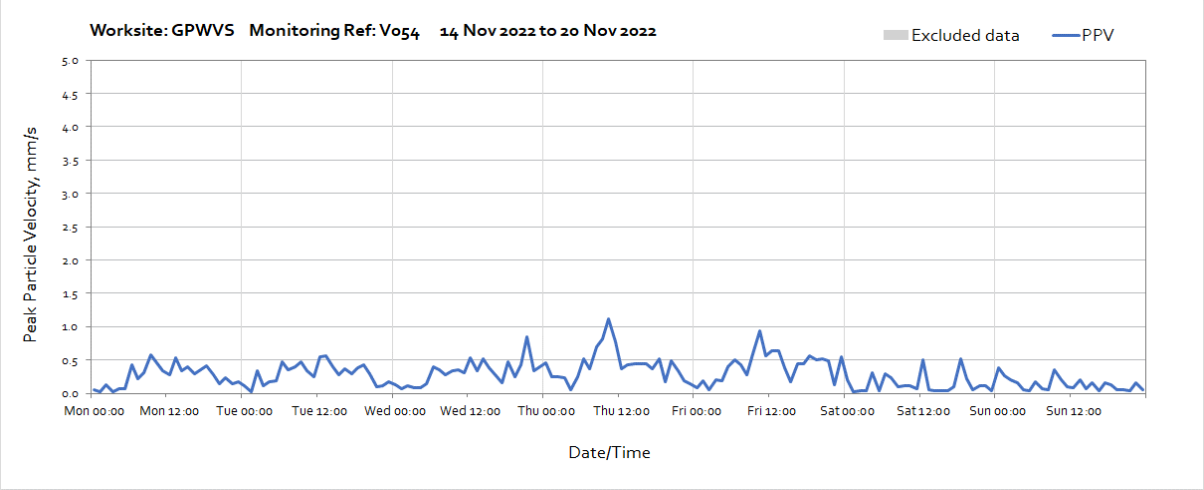

Worksite: GPWVS Monitoring Ref: V053 21 Nov 2022 to 27 Nov 2022
Excluded data
PPV
Peak Particle Velocity, mm/s
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
Wed 12:00
Thu 00:00
Thu 12:00
Fri 00:00
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time

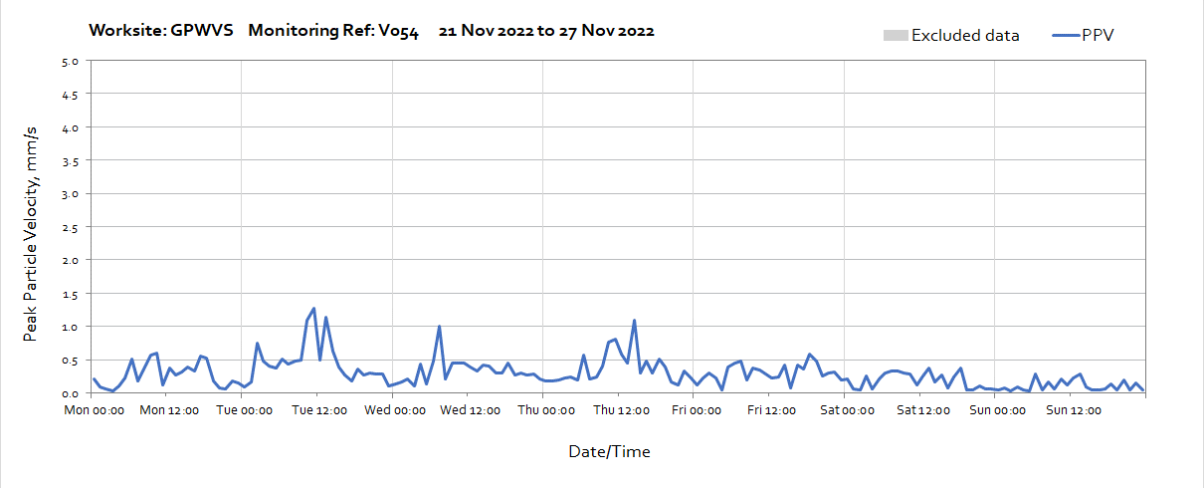

Worksite: GPWVS Monitoring Ref: V053 28 Nov 2022 to 04 Dec 2022
Excluded data
PPV
Peak Particle Velocity, mm/s
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
Wed 12:00
Thu 00:00
Thu 12:00
Fri 00:00
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time

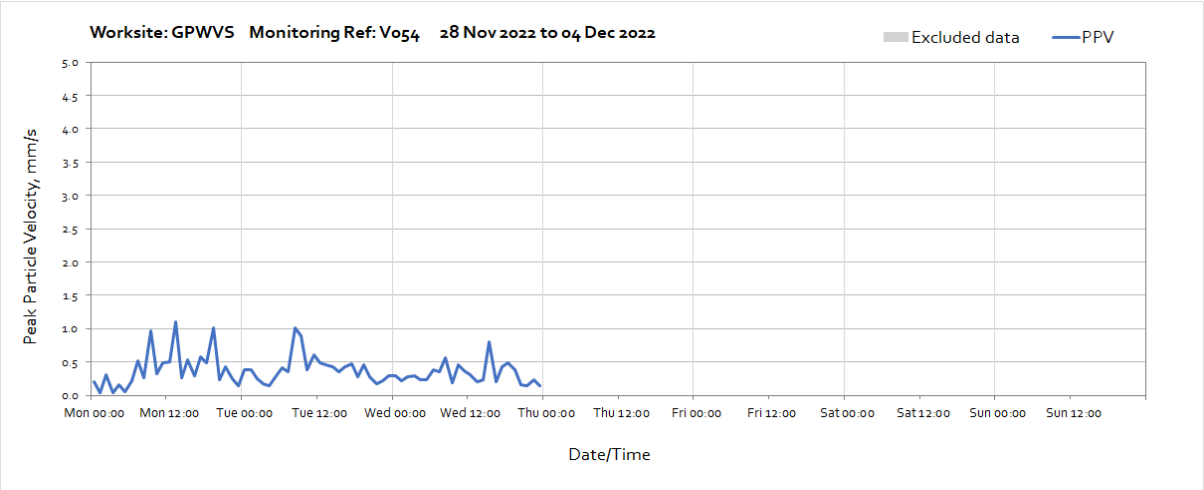
Worksite: Green Park Way Vent Shaft (GPWVS) – Monitoring Ref: V054








Worksite: GPWVS Monitoring Ref: V054 21 Nov 2022 to 27 Nov 2022
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 28 Nov 2022 to 04 Dec 2022
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