HS2

July 2022

Construction Noise and Vibration Monthly Report – May 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 May 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 conveyor works, gantry crane foundation works, tunnel boring machine works, construction of ramps, installation of scaffolding and handrails were underway.
- Noise and vibration monitoring were undertaken in the vicinity of the Willesden EuroTerminal worksite (ref. WET), where deliveries and removal of waste, conveyor works, haul road repair works, gantry foundation works and utility installations were underway.
- Noise monitoring was undertaken in the vicinity of the Victoria Road Crossover Box worksite (worksite ref. VRCB), where:
    - construction of diaphragm wall, crane assembly works and preparation of buttress cages installations were underway.
    - At the Victoria Road Ancillary Shaft, bar fixing, secondary lining works, installation of formworks, concrete drilling, installation of reinforcement material, scaffolding works, striking of shutters, concrete pours, drilling works, resin injections and installation of platforms were underway.
- Noise monitoring was undertaken in the vicinity of the Flat Iron compound (worksite ref. FIC), where fabrication of buttress cage, welding tents sheeting, installation of steel fixing and welding bars, buttress lifting and movement works were underway.
- Noise and vibration monitoring were undertaken in proximity of the Old Oak Common depot worksite (ref. OOC), where excavations, concrete works, concrete breaking out, construction of temporary haul road, drainage installations, piling works, diaphragm wall works, construction of capping beam, conveyor commissioning works, manhole construction, site setup and segment installation were underway.
- Noise monitoring was undertaken in proximity of the Mandeville Road Ventilation Shaft worksite (ref.: MRVS), where excavations works and drilling works were underway.
- Noise and vibration monitoring were undertaken in proximity of the Green Park Way Ventilation Shaft worksite (ref. GPWVS), where vegetation works, road sweeper works, excavation works, drilling works, installation of wells, set up of cranes, shaft works and installation of segments were underway.

- Noise monitoring was undertaken in proximity of the Westgate Ventilation Shaft (ref. WVS), where tunnelling works, extension of ventilation, pipework and cables, panel and flow testing works, air and water services, excavation works, sprayed concrete laying and levelling works were undertaken.

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, site setup and segment installation 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 on one (1) occasion due to HS2 works during the reporting period.

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

Nine (9) 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 31st May 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 5 in Appendix A), where work activities included:
  - Conveyor works, including snagging works on bridges and electrical works;
  - Gantry crane foundation works, including concrete pours, shuttering and fixing works;
  - Tunnel boring machine works, including delivery of components, striking of shutters and concrete lining installation works;
  - Construction works of launch ramp, including shuttering, steel fixing, concreting pours, drilling works, excavations and removal works, drainage, backfilling and cutting works, piling works; and
  - Installation of scaffolding and handrails.

- Willesden EuroTerminal worksite, ref. WET (see plan 5 in Appendix A), where work activities included:
    - Waste deliveries, including loading of soil into railway trucks for removal from site;
    - Conveyor works, including shuttering works, steel works, reinforcement cage, installation of edge protection and bridge segments, scaffolding and steel erection and concrete pours;
    - Haul Road repair works, including installation of kerbs, concrete breaking, and laying reinforcement to re-concrete;
    - Gantry foundation works including excavation and backfilling works, steelworks, installation of reinforcement and shutters; and
    - Installation of power and water tunnel training cabins.
- Victoria Road Crossover Box worksite, ref. VRCB (see plan 6 in Appendix A), where work activities included:
    - Construction of diaphragm wall, including excavation works, installation of cages and concrete works;
    - Preparation works for buttress cages installation, including crane assembly and buttress lifting support; and
    - Victoria Road Ancillary Shaft works comprising bar fixing, secondary lining works, installation of formworks, concrete drilling, installation of reinforcement material, scaffolding works, drilling works, resin injections, striking of shutters, concrete pours and installation of platforms.
- Flat Iron compound, worksite ref. FIC (see plan 6 in Appendix A), where work activities included:
    - Work to buttress included fabrication of buttress cage, welding tents sheeting, installation of steel fixing and welding bars; and
    - Buttress lifting and movement works.
- Old Oak Common depot worksite, located in the London Borough of Hammersmith and Fulham (LBHF), ref. OOC (see plan 7 in Appendix A), where work activities included:
    - Excavation and concrete works;
    - Construction of temporary haul road;
    - Concrete breaking;
    - Drainage installation;

- Piling works;
- Diaphragm wall works;
- Construction of capping beam; and
- Conveyor commissioning.

- Mandeville Road Ventilation Shaft worksite, reference MRVS (see plan 1 in Appendix A), where work activities included:
  - Excavation works of the access ramp and platform; and
  - Drilling works.
- Green Park Way Ventilation Shaft worksite, reference GPWVS (see plan 2 in Appendix A), where work activities included:
  - Vegetation works;
  - Road sweeper works;
  - Preparation of shaft excavation including backfilling works;
  - Drilling works;
  - Installation of wells;
  - Set up of cranes; and
  - Shaft woks including steel fixing, shuttering, excavation works, blinding pours and installation of segments.
- Westgate Ventilation Shaft worksite, reference WVS (see plan 3 in Appendix A), where work activities included:
  - Tunnelling works, including extension of the ventilation, pipework and cables, including excavation, ventilation bagging works, probing works, trimming and concrete spraying works;
  - Panel and flow testing works;
  - Extension works for air and water services;
  - Excavation works; and
  - Preparation for thickening works, including levelling works.

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, site setup and segment installation 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 Nineteen (19) noise and eight (8) vibration monitoring installations were active in May in the LBE area. Table 2 summarises the position of noise and vibration monitoring installations within the LBE area in May 2022.

1.2.2 On Tuesday 15th March 2022, the vibration monitor ref.: OOC-V01, worksite ref.: OOC-V01, was removed as the number of localised events outweighed any activity caused by construction. A more suitable location representative of properties on Wells House Road is being planned.

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
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

Worksite Reference	Measurement Reference	Address
	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-V01	25 Wells House Road
	OOC-V02	Kildun Court, Old Oak Common Lane
	OOC-V03	Wells House Road Alleyway
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	62.9 (64.5)	64.5 (66.3)	62.8 (66.2)	61.2 (64.0)	58.8 (64.2)	60.7 (61.6)	62.2 (62.9)	63.4 (66.9)	62.1 (66.3)	58.0 (61.3)	61.3 (66.0)	58.1 (61.8)
	N033	Outside The Collective, Atlas Road/Victoria Road	Free-field	66.0 (68.3)	68.9 (74.8)	64.8 (71.7)	63.6 (71.3)	61.3 (69.8)	62.9 (63.8)	67.9 (69.9)	64.6 (69.6)	63.0 (68.9)	59.5 (66.6)	63.5 (76.1)	59.8 (66.1)
	N060	Atlas Road next to Bashey Road	Free-field	55.7 (66.3)	64.3 (82.3)	51.7 (55.1)	54.1 (60.4)	56.5 (72.3)	58.7 (62.1)	62.3 (69.8)	54.1 (66.9)	52.8 (59.2)	50.6 (58.8)	52.5 (58.5)	54.6 (71.9)
WET	N034	Stephenson Street (north)	Free-field	52.3 (56.0)	57.4 (63.8)	54.2 (60.8)	52.1 (60.3)	47.5 (54.6)	51.1 (54.5)	53.0 (55.9)	53.0 (56.3)	53.1 (62.5)	44.5 (51.5)	52.1 (57.2)	45.3 (52.1)
	N035	Stephenson Street (south)	Free-field	53.3 (55.9)	56.9 (59.0)	51.2 (56.0)	49.3 (54.3)	47.1 (52.8)	51.2 (55.2)	55.2 (62.4)	50.0 (53.0)	50.5 (55.5)	45.3 (51.3)	50.7 (58.5)	46.4 (56.9)
	N041	Junction of Stephenson Street/Goodhall Street	Free-field	53.9 (56.0)	60.8 (64.7)	55.5 (59.6)	56.7 (69.4)	49.8 (56.3)	53.0 (54.7)	56.4 (62.7)	61.0 (72.0)	56.0 (63.4)	48.9 (58.5)	55.7 (66.4)	48.9 (54.5)

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
VRCB	N031	School Road, outside Acton Business Centre	Free-field	63.4	63.8	62.6	60.8	58.0	59.9	61.6	61.5	61.1	55.6	60.0	57.5
				(65.2)	(65.2)	(64.6)	(64.5)	(63.1)	(60.5)	(63.0)	(62.1)	(66.3)	(60.5)	(65.5)	(61.6)
	N050	Acton Square, outside North Acton Station	Free-field	64.4	65.5	62.9	62.6	60.2	63.1	63.8	62.6	62.9	59.6	62.3	58.8
				(66.4)	(66.3)	(64.9)	(67.8)	(74.9)	(65.8)	(64.0)	(63.6)	(71.2)	(67.9)	(69.3)	(62.6)
FIC	N029	Braitrim House, Victoria Road	Free-field	51.3	61.0	51.3	54.5	57.1	53.3	62.0	54.6	52.8	47.5	52.5	55.3
				(54.4)	(67.6)	(60.5)	(66.8)	(76.8)	(56.5)	(75.7)	(57.9)	(62.3)	(58.8)	(62.4)	(67.4)
	N042	Bodens car park	Free-field	57.2	61.9	56.2	56.9	55.6	56.7	61.7	58.2	56.1	54.0	55.7	52.7
				(59.1)	(68.1)	(60.5)	(62.8)	(63.5)	(58.3)	(66.7)	(61.2)	(59.4)	(58.6)	(62.5)	(57.1)
	N049	Flat Iron compound	Free-field	58.8	66.1	56.8	56.3	63.4	58.5	64.6	62.6	60.4	60.9	57.2	61.8
				(64.1)	(76.3)	(61.8)	(63.3)	(80.9)	(60.5)	(76.1)	(81.4)	(78.1)	(70.5)	(68.6)	(70.2)
OOC	OOC-N01	Old Oak Common Lane	Free-field	64.0	70.1	62.6	61.5	57.1	60.1	67.7	63.8	62.9	54.6	61.5	55.3
				(66.6)	(74.1)	(68.1)	(68.4)	(65.6)	(62.0)	(73.3)	(74.9)	(76.3)	(64.0)	(76.8)	(61.0)
	OOC-N02	Old Oak Common Lane, Hilltop Works	Free-field	67.6	71.8	67.6	65.9	61.6	64.5	67.8	65.8	65.7	60.8	64.3	61.1
				(70.6)	(73.7)	(70.5)	(70.8)	(66.1)	(64.9)	(69.4)	(66.3)	(67.9)	(66.0)	(68.6)	(65.9)
MRVS	N040	Badminton Close	Free-field	53.5	55.5	53.5	53.5	51.4	55.1	54.7	52.1	52.2	49.3	51.8	49.2
				(63.9)	(58.3)	(55.1)	(58.1)	(64.1)	(60.4)	(56.9)	(53.6)	(56.3)	(54.0)	(56.9)	(53.4)
	N058	Mandeville Road	Free-field	53.9	66.1	53.7	53.4	50.6	51.2	67.1	56.2	51.3	46.8	51.7	48.6
				(63.3)	(75.0)	(57.8)	(57.4)	(55.7)	(52.9)	(75.6)	(70.4)	(53.9)	(52.4)	(62.9)	(54.5)

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
	N063	Mandeville Road	Free-field	58.1	67.4	58.1	57.8	55.3	56.7	64.0	56.8	56.4	53.2	56.1	54.3
				(63.2)	(74.1)	(72.5)	(60.0)	(59.8)	(57.9)	(68.5)	(58.3)	(59.5)	(57.9)	(58.5)	(60.9)
GPWVS	N059	Green Park Way Ventilation Shaft	Free-field	57.3	63.1	53.3	52.6	50.8	53.0	55.7	51.8	49.6	46.4	49.7	47.2
				(60.8)	(71.0)	(56.2)	(56.0)	(58.6)	(55.5)	(58.7)	(54.9)	(52.8)	(52.1)	(53.1)	(52.9)
	N064	Green Park Way Ventilation Shaft	Façade	57.5	61.2	56.1	54.9	51.5	54.0	58.7	55.9	53.2	48.9	54.0	49.4
				(62.2)	(66.5)	(62.6)	(61.3)	(60.6)	(55.6)	(63.7)	(60.8)	(56.8)	(60.1)	(59.6)	(59.2)
WVS	N062	Westgate Ventilation Shaft	Free-field	66.3	67.7	59.8	63.6	63.3	55.7	63.6	55.8	56.2	53.6	57.9	54.5
				(74.8)	(70.8)	(66.1)	(71.2)	(70.6)	(57.1)	(64.4)	(57.5)	(61.4)	(59.0)	(67.9)	(60.3)

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	4.77 (Y-axis)
WET	V057	37, Stephenson Street	3.74 (X-axis)
OOC	OOC-V02	Kildun Court, Old Oak Common Lane	0.92 (Z-axis)
	OOC-V03	Wells House Road Alleyway	1.26 (Y-axis)
GPWVS	V053	Green Park Way, Greenford	1.20 (Z-axis)
	V054	Green Park Way Ventilation Shaft	0.97 (Z-axis)
MRVS	V055	Mandeville Road	1.93 (Z-axis)
	V056	Mandeville Road	0.80 (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
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	Saturdays	1300-1400 1400-2200	1 2
	OOC-N02	Old Oak Common Lane, Hilltop Works	All days	All periods	No exceedance
MRVS	N040	Badminton Close	All days	All periods	No exceedance
	N058	Mandeville 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
	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
OOC	OOC-N01	Old Oak Common Lane	1

2.2.6 One (1) exceedance of the SOAEL was recorded due to HS2 construction works during May 2022. The exceedance occurred at the noise monitor OOC-N01 during one Saturday daytime periods.

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.

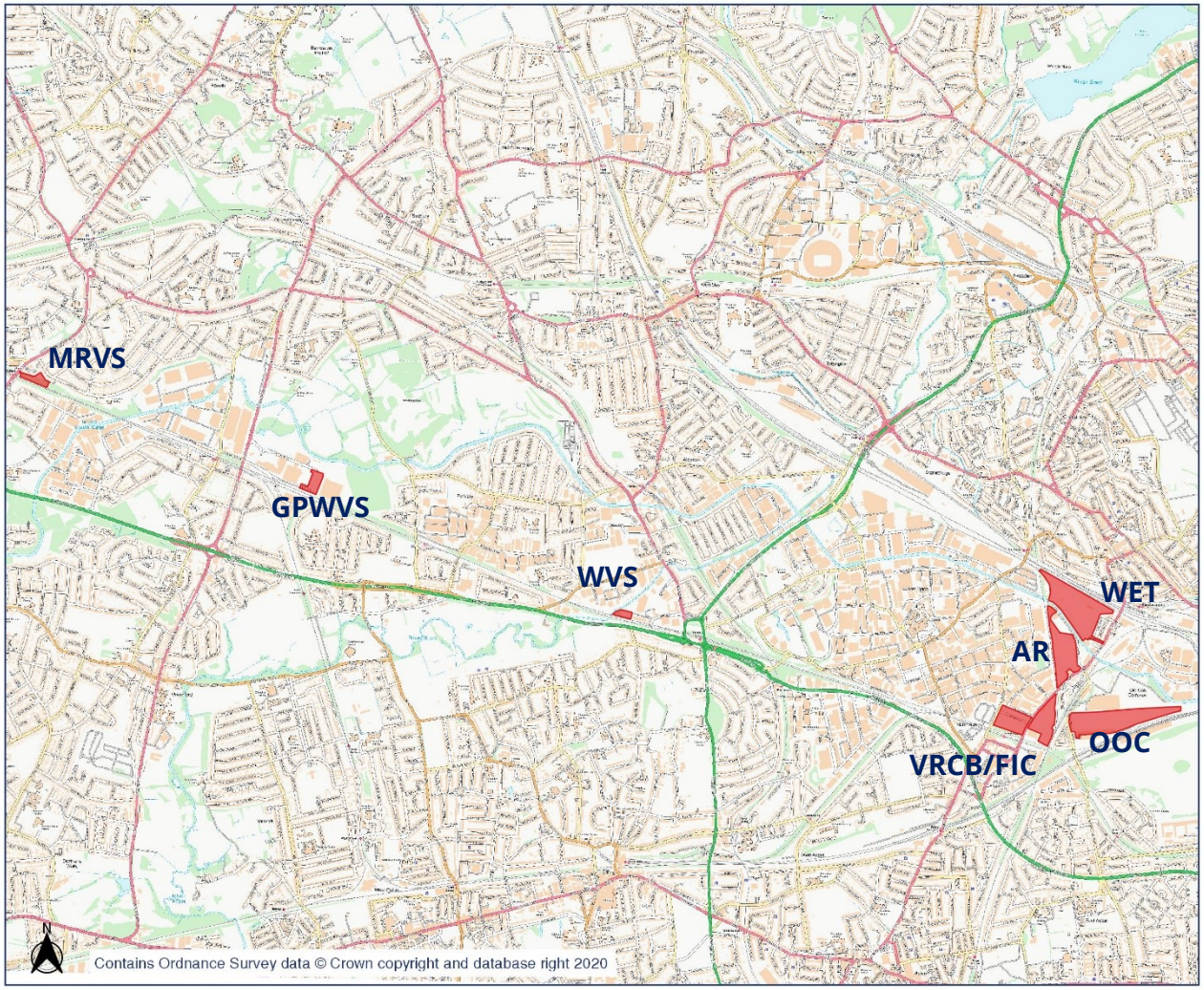
Table 8: Summary of Complaints

Complaint Reference Number	Worksite Reference	Description of Complaint	Results of Investigation	Actions Taken
HS2-22-43599-C	OOC	Complaint about shouting coming from site after 10pm.	No HS2 related works were ongoing at that time and date.	The results of investigations were confirmed to the complainant.
HS2-22-43625-C	MRVS	Complaint about noise and vibration disturbance due to ongoing site works taking place near the complainant's house.	Ongoing investigation of the entire worksite.	The complainant has been contacted and advised of the mitigation measures in place. Also, the contractor confirmed to complainant the noise and vibration monitors in place and their locations.
HS2-22-43629-C	OOC	Complaint due to noise disturbance from cement mixer before 8am.	The investigation showed that concrete pours were ongoing that day. First concrete delivery of the day was before agreed 8am time.	Apology given to stakeholder and briefings re-shared with site team around the matter.
HS2-22-43636-C	OOC/FIC	Complaint about low, repetitive noise heard around midnight.	The investigation showed no ongoing work at that date and time. Only possible (but unlikely cause) was from a site generator already covered in an acoustic blanket.	Further acoustic shielding is looked at for the generator. The complainant has been contacted and information provided.
HS2-22-43637-C	OOC	Complaint due to shouting and banging noises from the site early in the morning.	The investigation included CCTV checking and nothing conclusive was found.	The site team re-briefs will be conducted and new gates for front of site being replaced.
HS2-22-77997-C	OOC	Noise disturbance from shouting taking place at site in the early morning.	The investigation showed that the disturbance was caused by operatives walking onto site.	Measures to be introduced to help minimise the noise disturbance. Resident video to be shown to operatives to raise awareness of how voices are being projected.

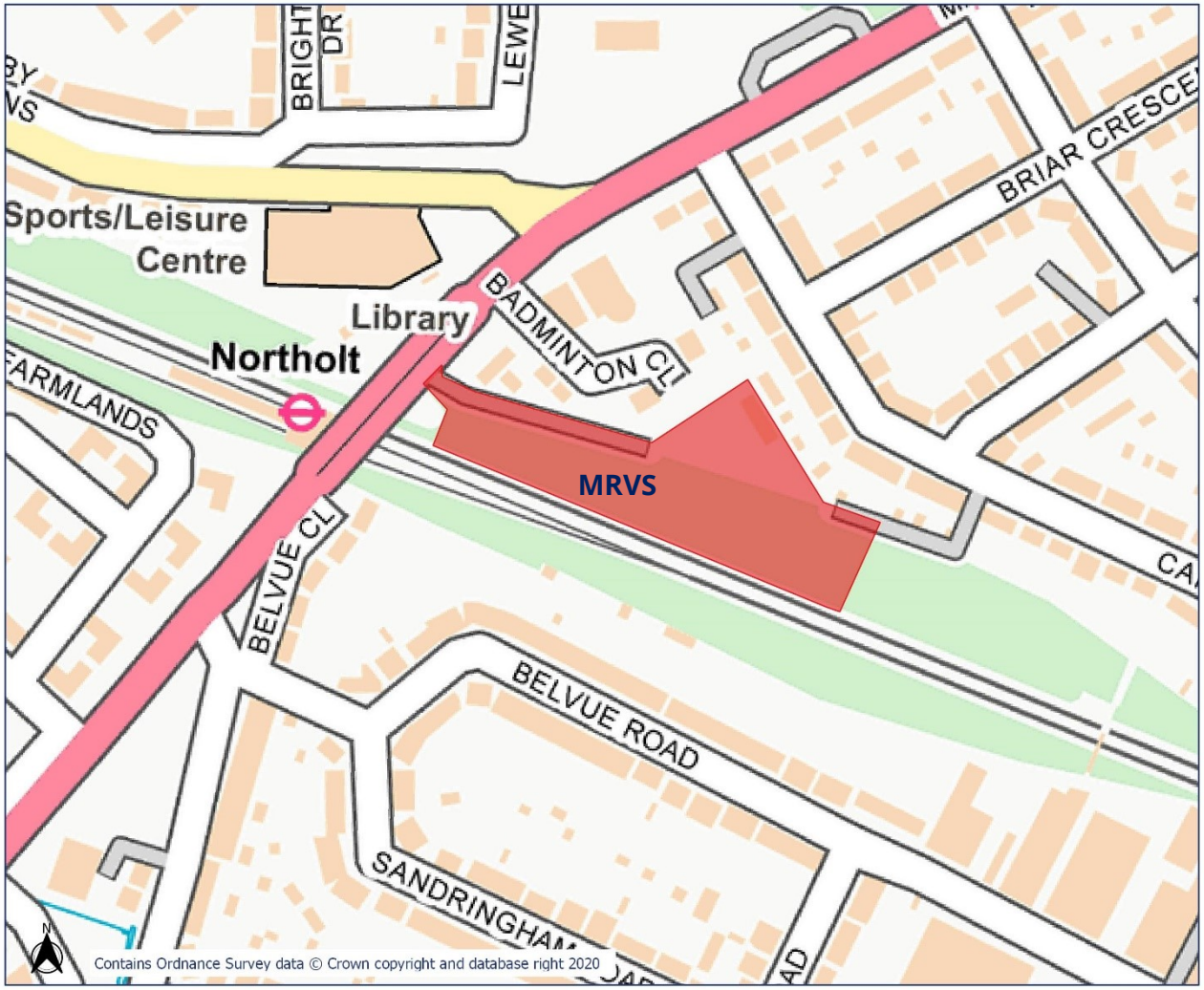
Complaint Reference Number	Worksite Reference	Description of Complaint	Results of Investigation	Actions Taken
HS2-22-43666-C	OOC	Noise disturbance from street sweeper operating close to property.	Road sweepers are used to clean residue deposited by vehicles leaving the site. HS2 has an obligation to clean local area following complaints regarding dirt/dust.	Environmental team have trialled a single engine and fully electric sweeper to overcome the noise issue. Noise levels were identical due to the noise source being the brushes and the suction mechanism. Discussions taking place regarding noise insulation at property which has been previously offered. Further mitigation to be discussed via Special Cases panel.
HS2-22-43679-C	OOC	Complaint due to noise disturbance from site workers at the entrance to the site in the early morning.	Investigation established noise stemmed from security guards engaged in dialogue with a member of the team who had arrived on site.	All site teams briefed in the morning regarding keeping the noise levels down when arriving at work. Site layout is changing regularly with the entrance reconfigured to allow conversations to be held further away. Notices being utilised to remind staff that they need to keep their voices down when arriving and leaving the site. Checklist of further measures to reduce noise to be implemented. Internal campaign to alert all on site to be mindful of noise upon arrival/leaving.
HS2-22-76958-E	WET	Complaint due to screeching noise coming from railway.	The investigation showed that it is more likely to be wheel flange noise common with railway vehicle movements in sidings. Concerns raised with rail logistics team.	Flange lubricators to be checked again in addition to regular inspections. The contractor contacted and informed the complainant.

Appendix A Site Locations

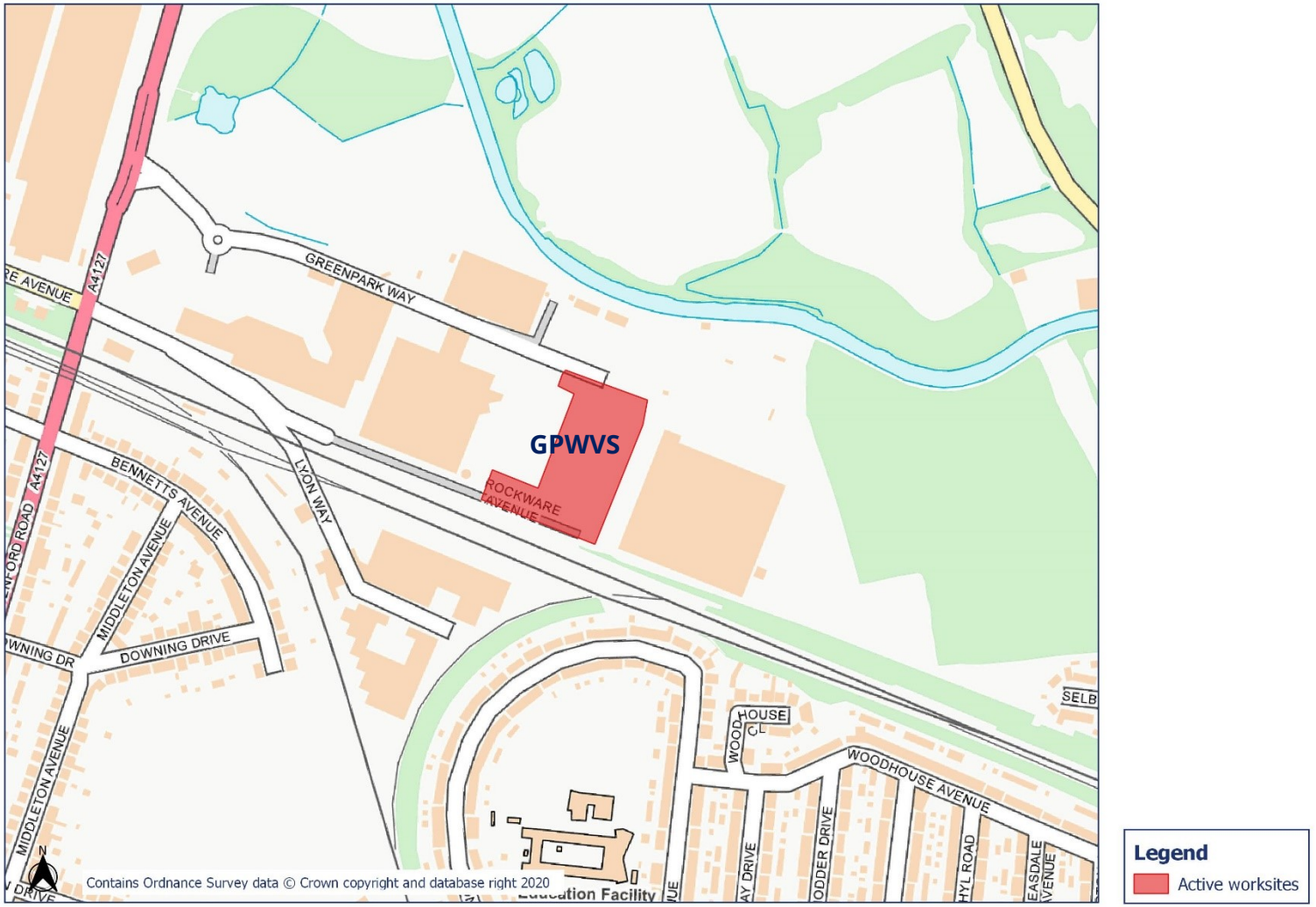
HS2 Worksite identification plan - Overview



HS2 Worksite identification plan - 1

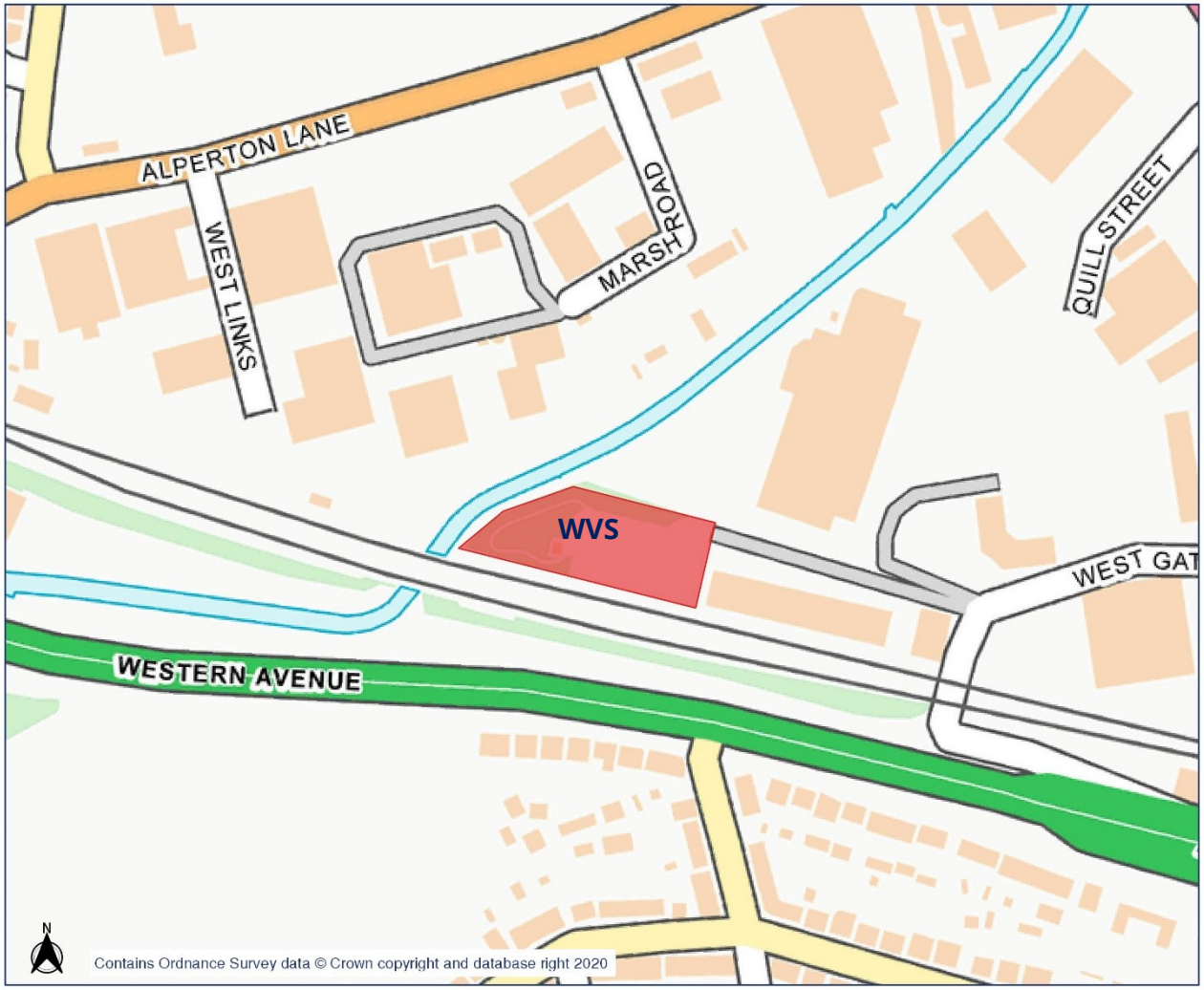


Worksite identification plan - 2



HS2

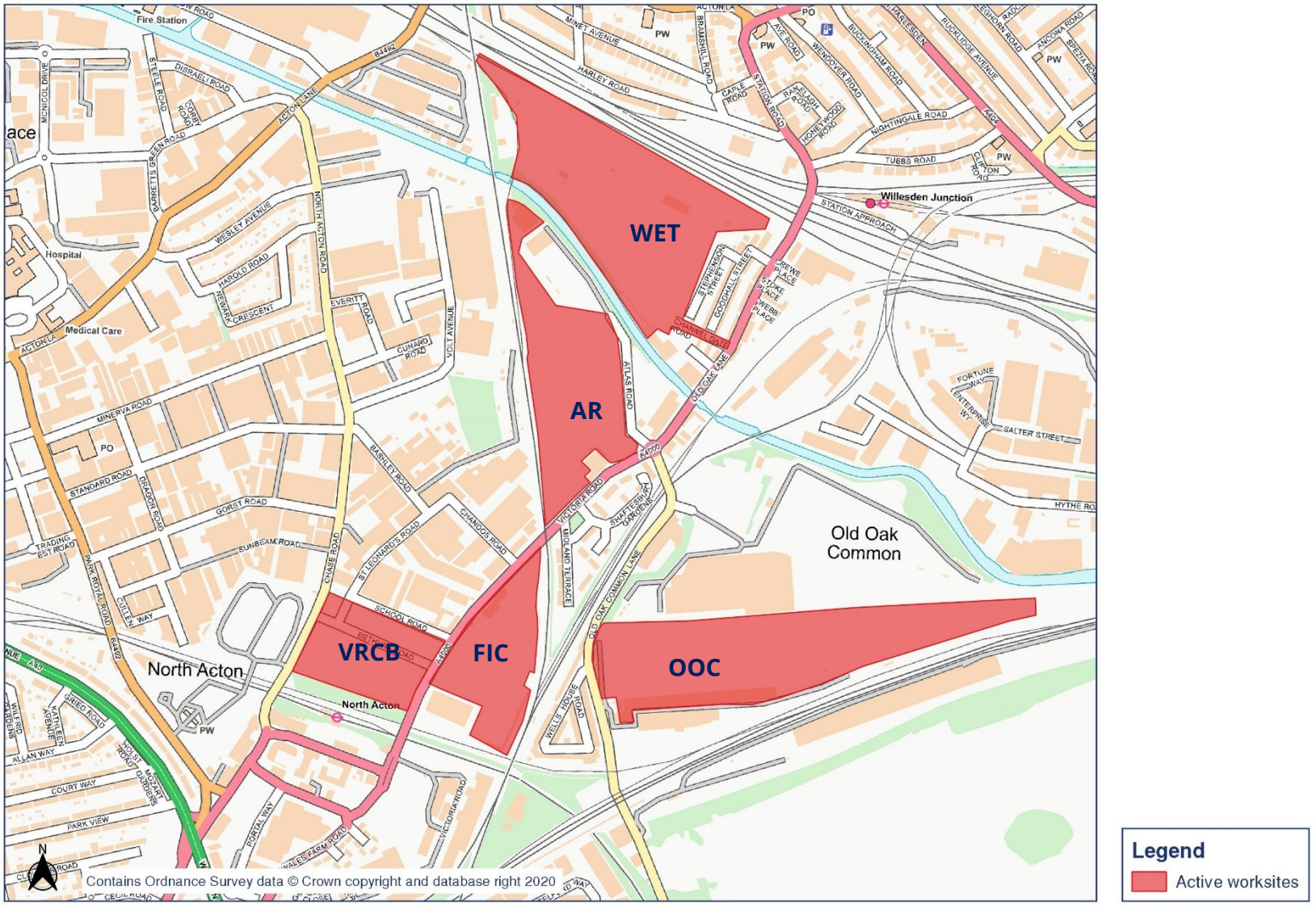
Worksite identification plan - 3



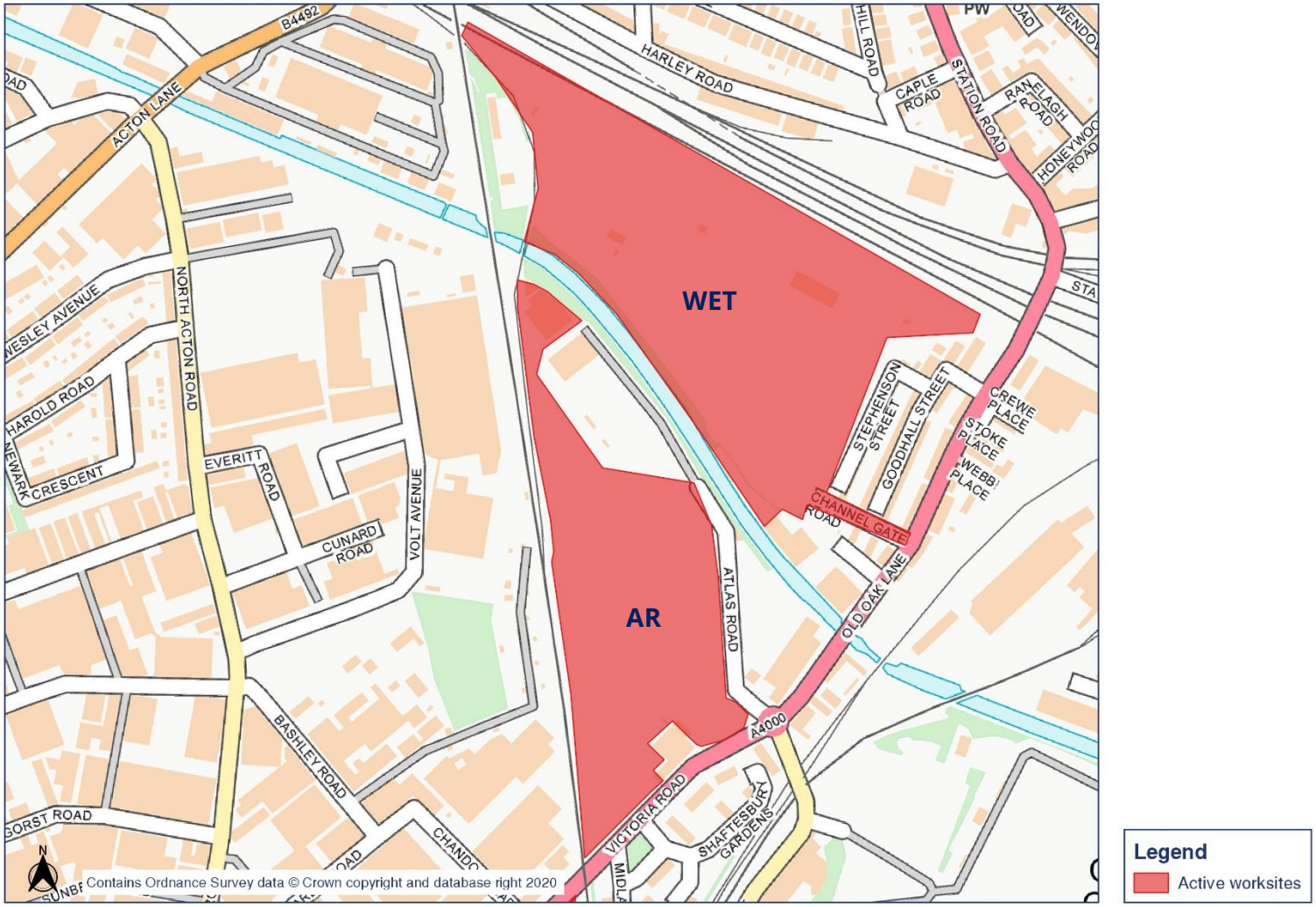
Legend

Active worksites

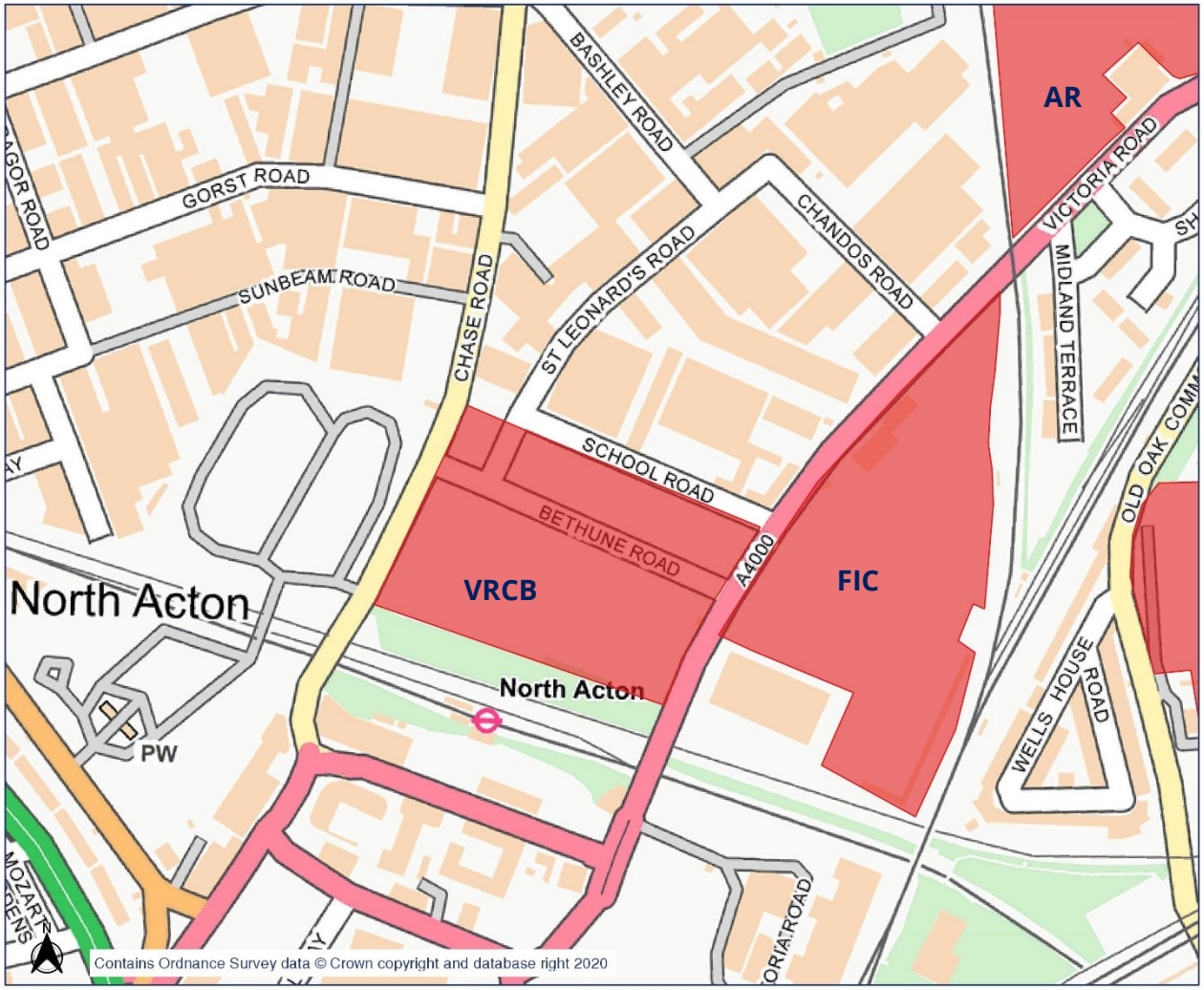
Worksite identification plan - 4



Worksite identification plan - 5

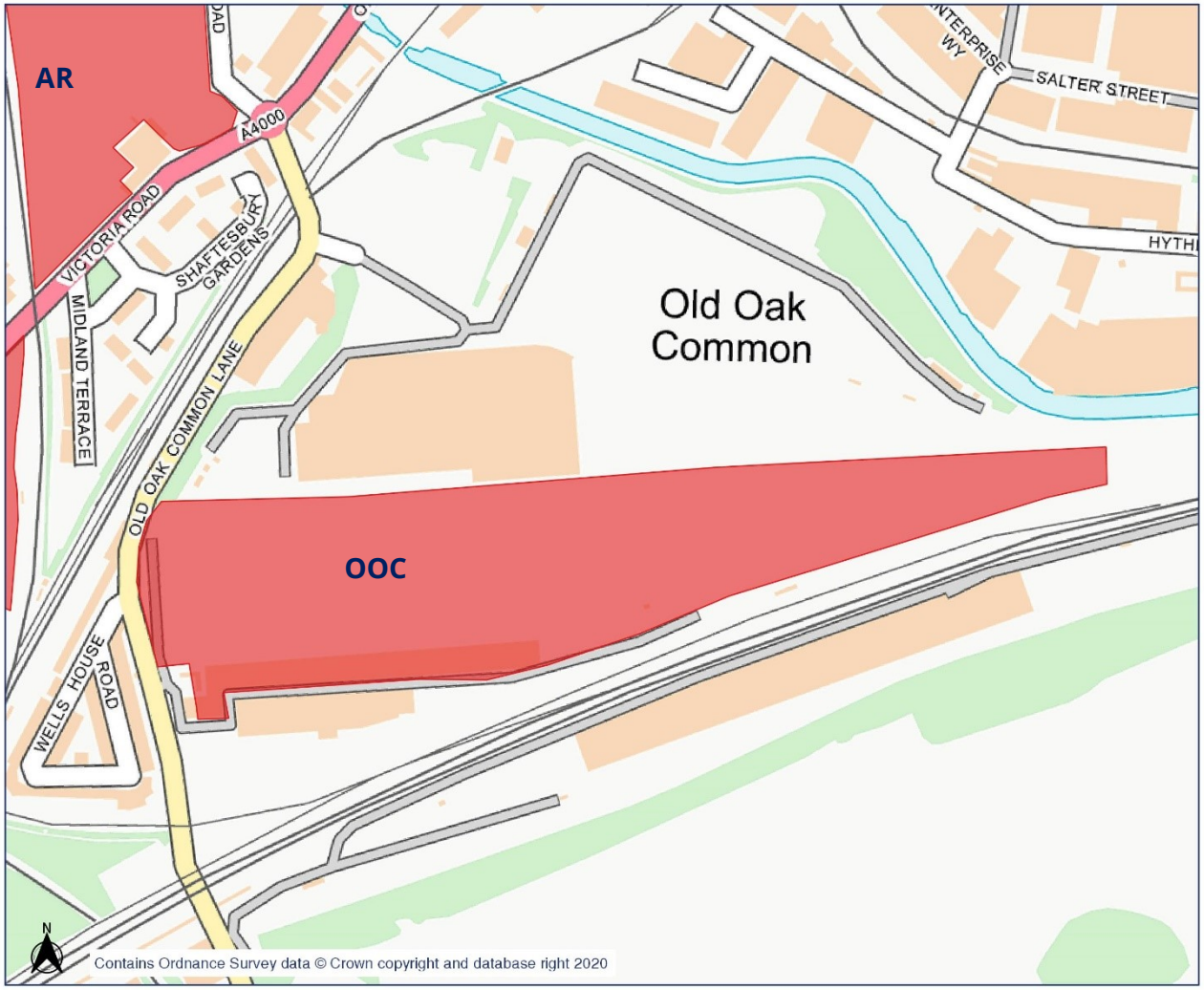


HS2 Worksite identification plan - 6



HS2

Worksite identification plan - 7

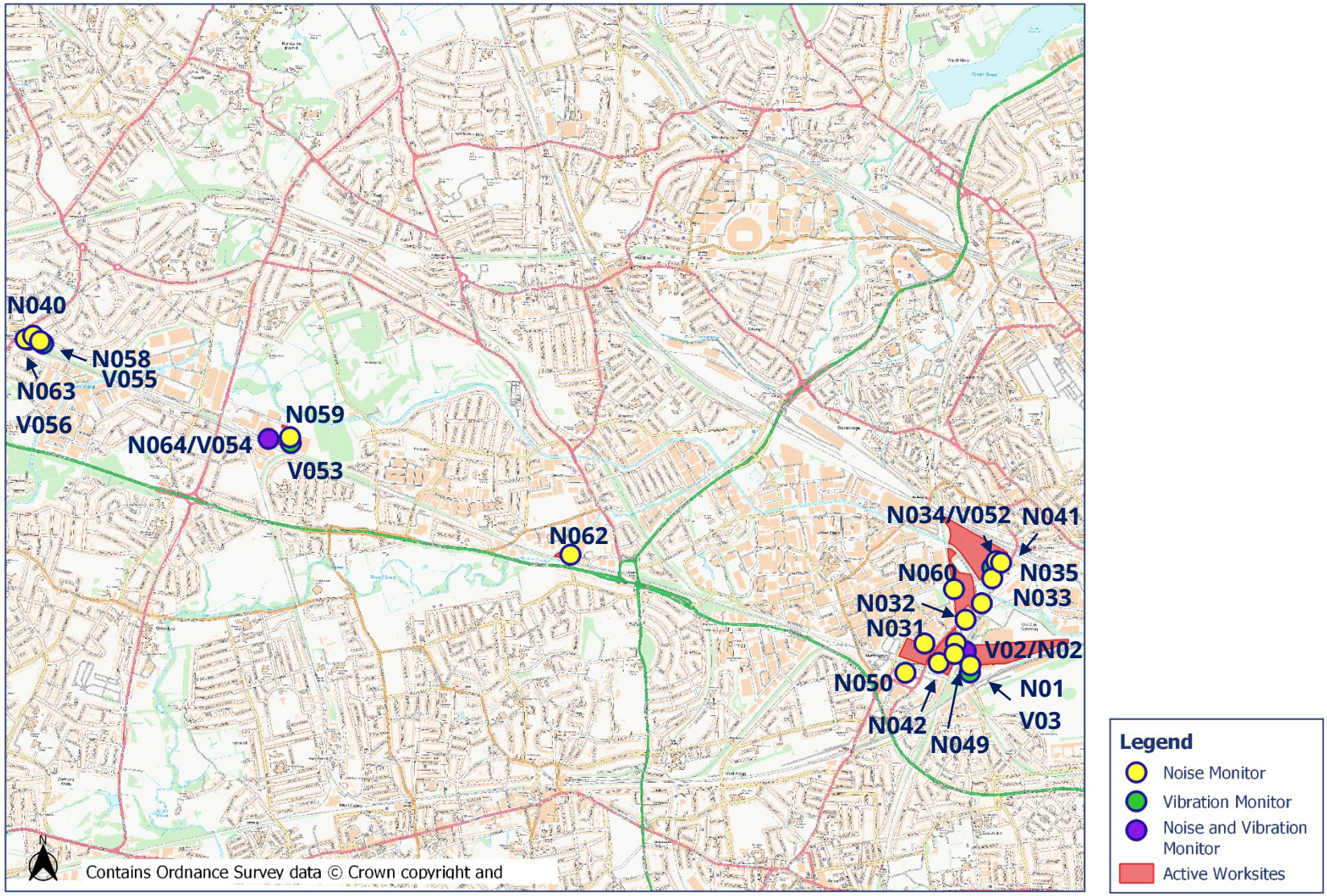


Legend

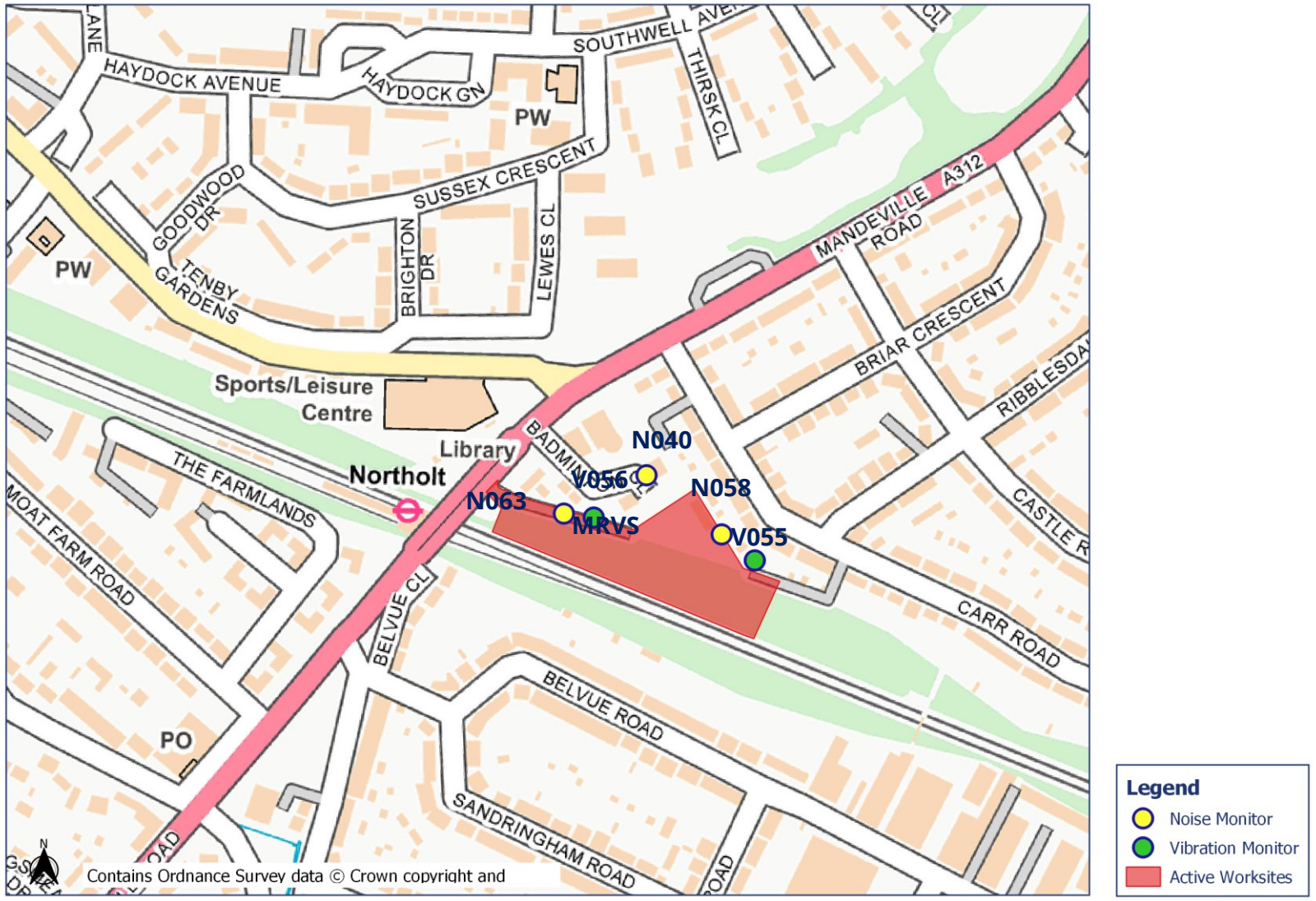
Active worksites

Appendix B Monitoring Locations

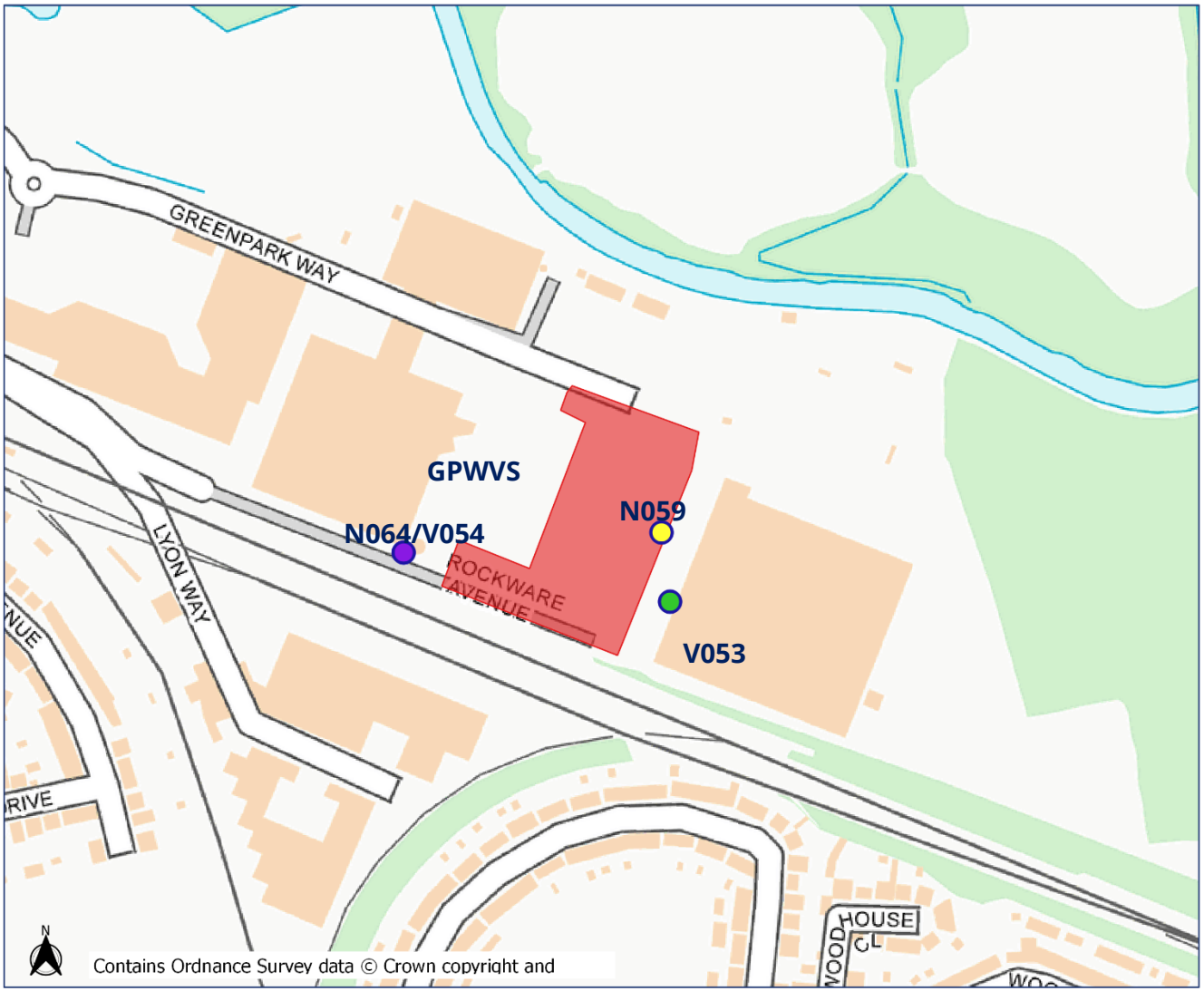
HS2 Noise and Vibration Monitoring Plan - Overview



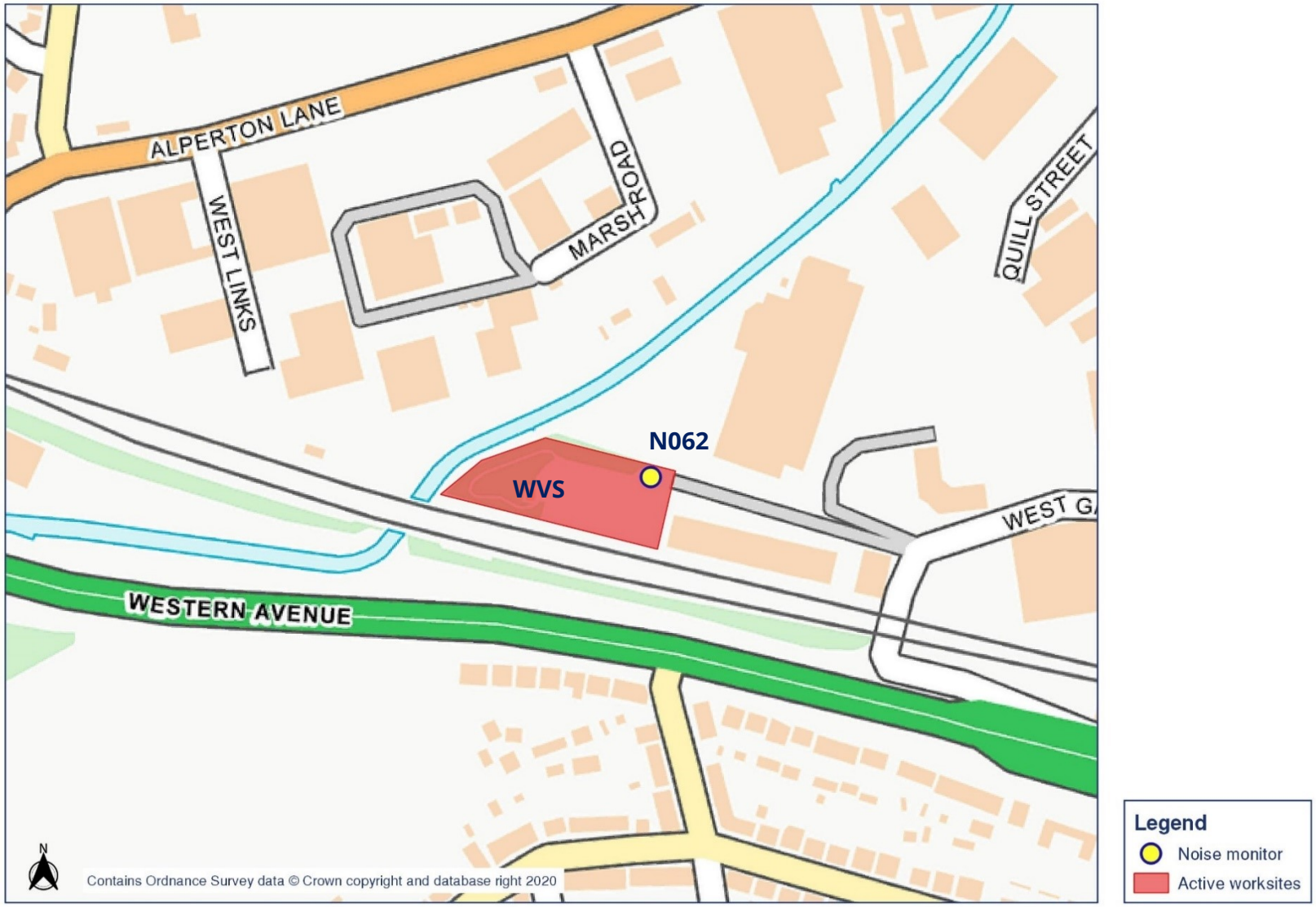
HS2 Noise and Vibration Monitoring Plan - 1



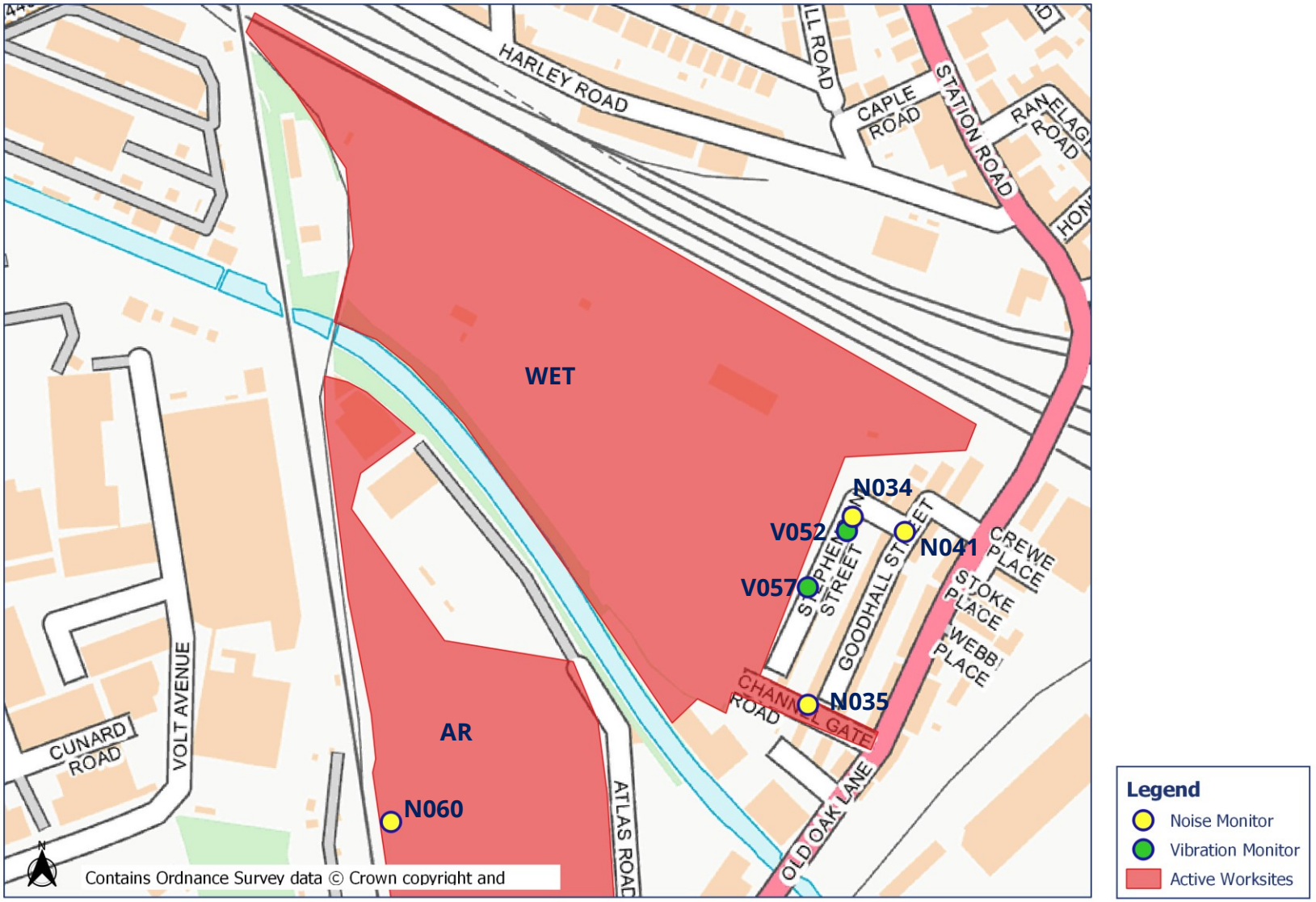
Noise and Vibration Monitoring Plan - 2



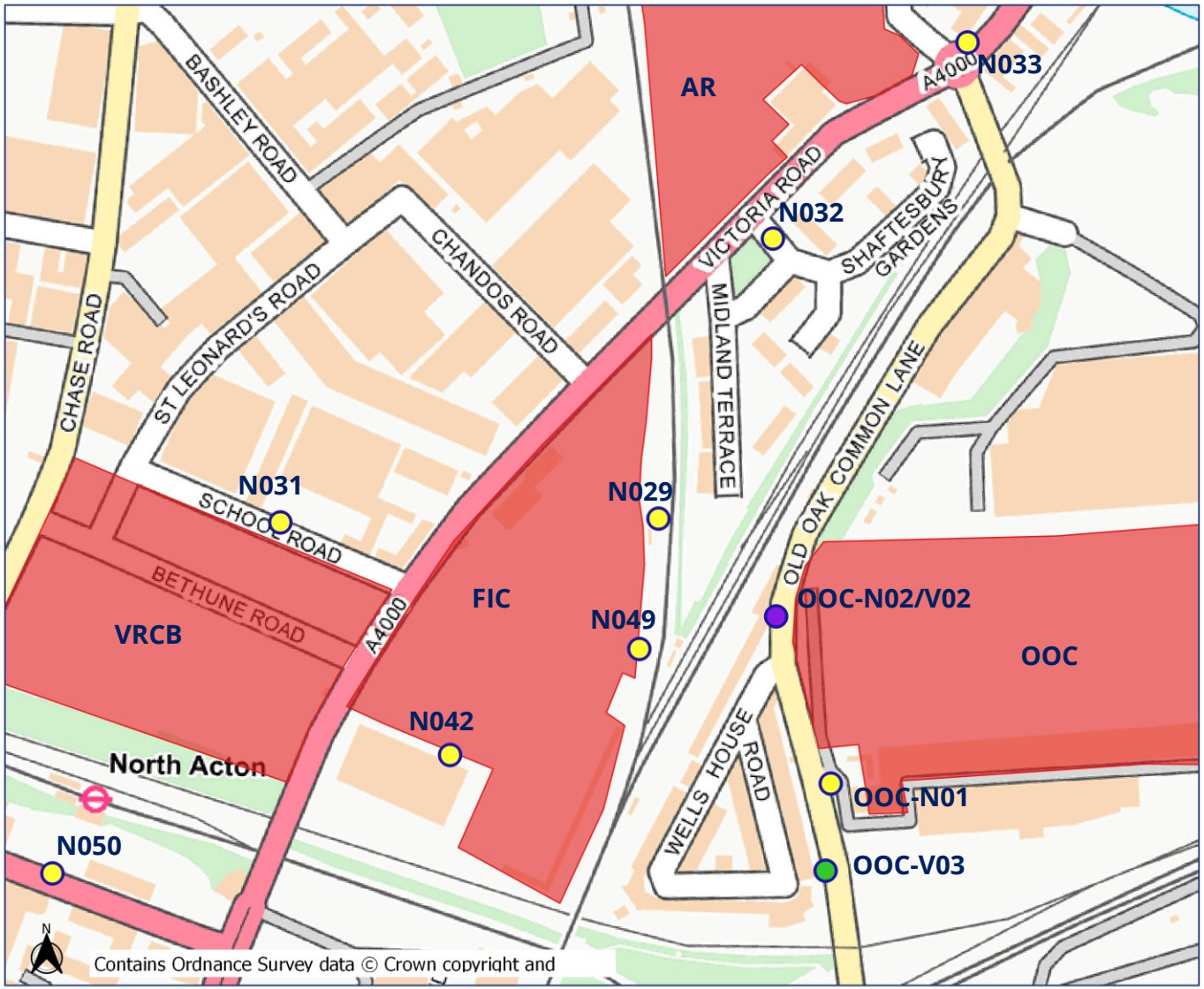
HS2 Noise and vibration monitoring plan - 3



HS2 Noise and Vibration Monitoring Plan - 4



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.

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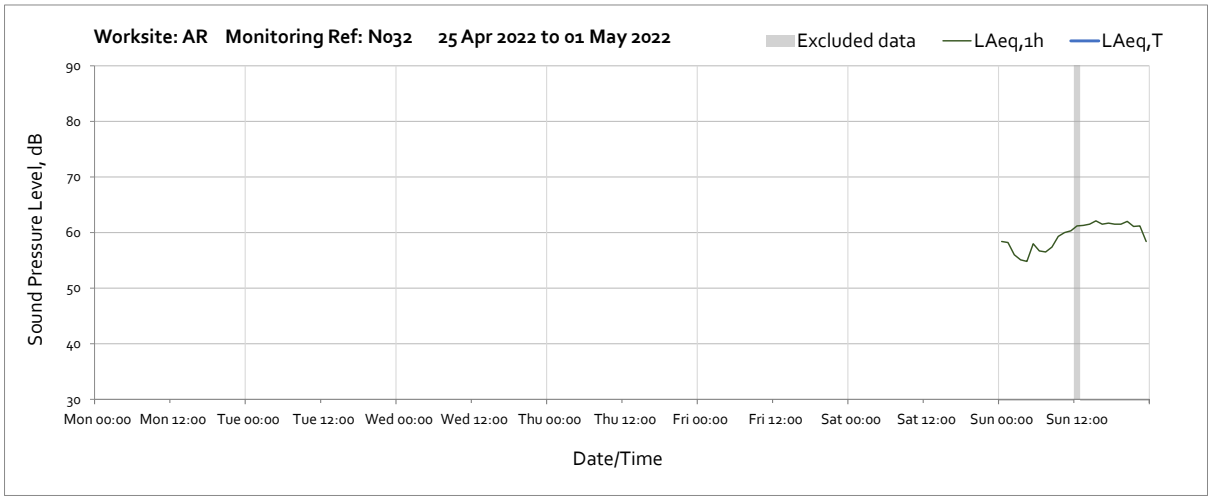

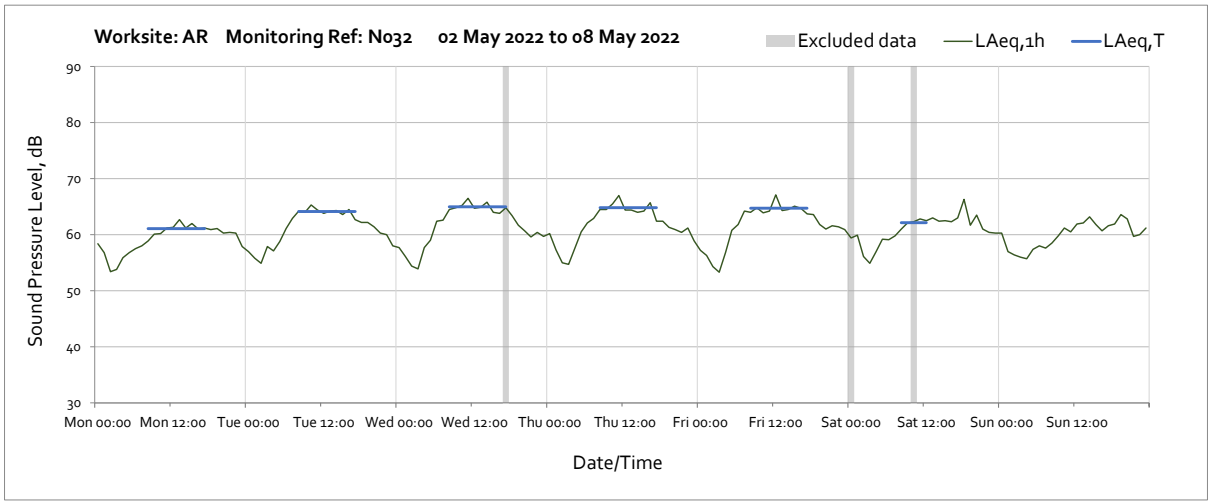

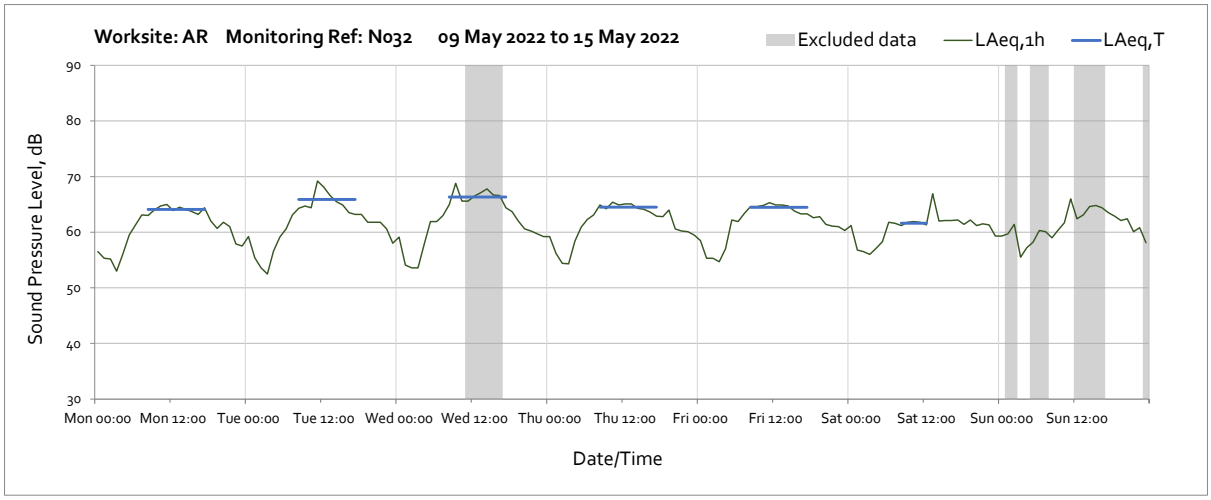
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LAeq,T
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70
60
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40
30
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Date/Time


Worksite: AR Monitoring Ref: No32 16 May 2022 to 22 May 2022
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
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80
70
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30
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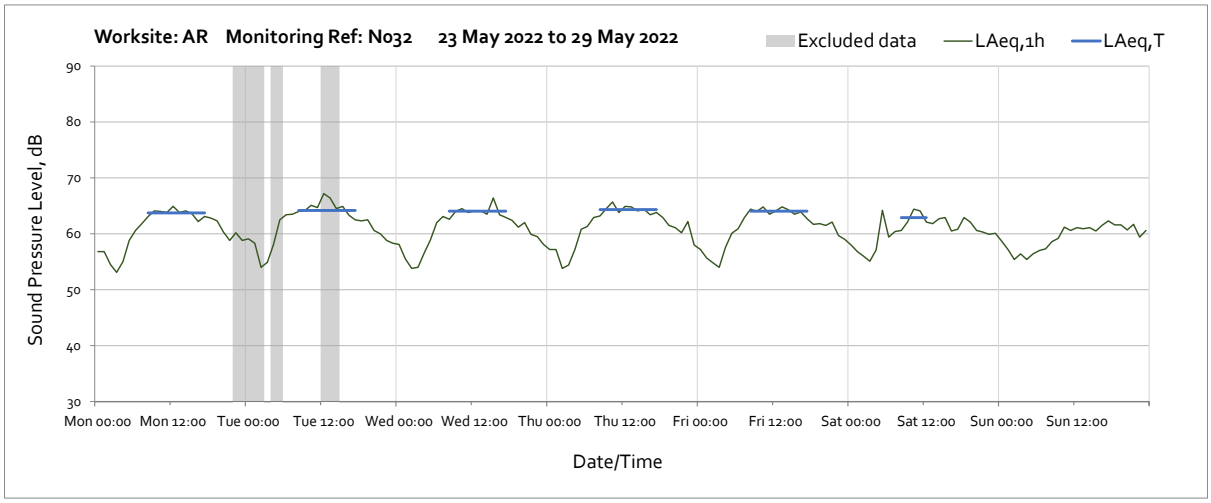
Date/Time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LAeq,T
Sound Pressure Level, dB
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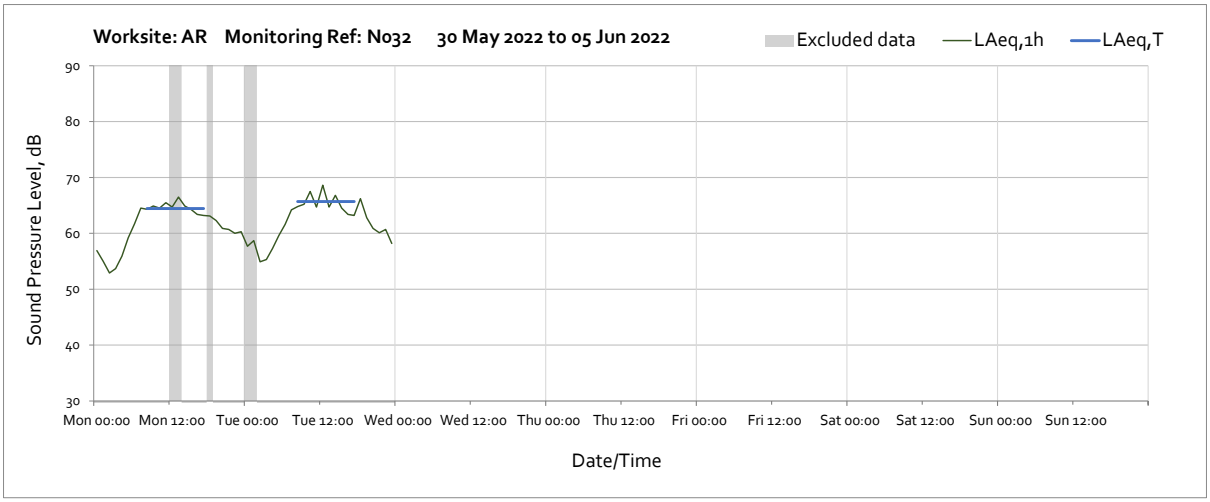

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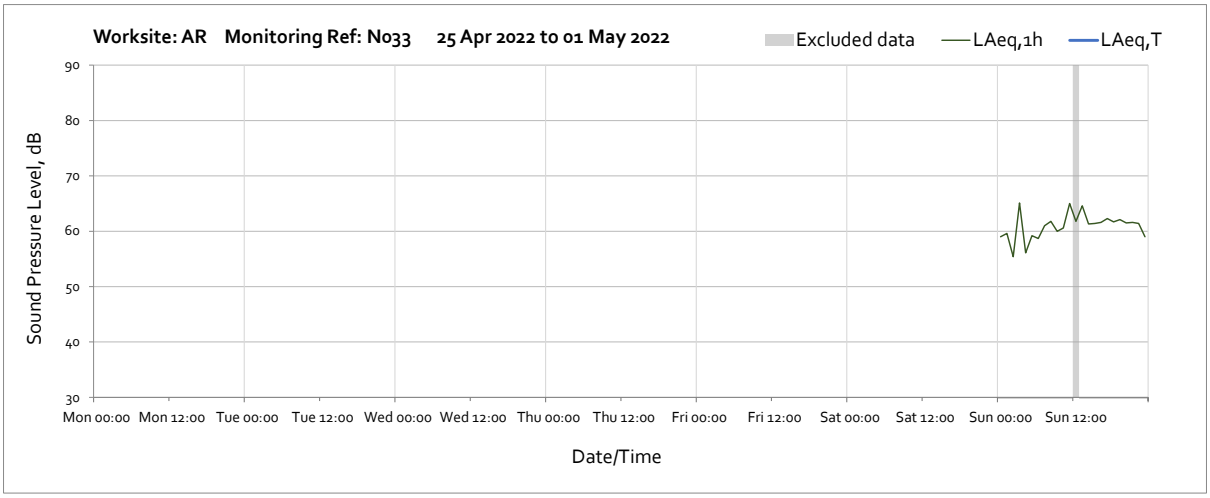

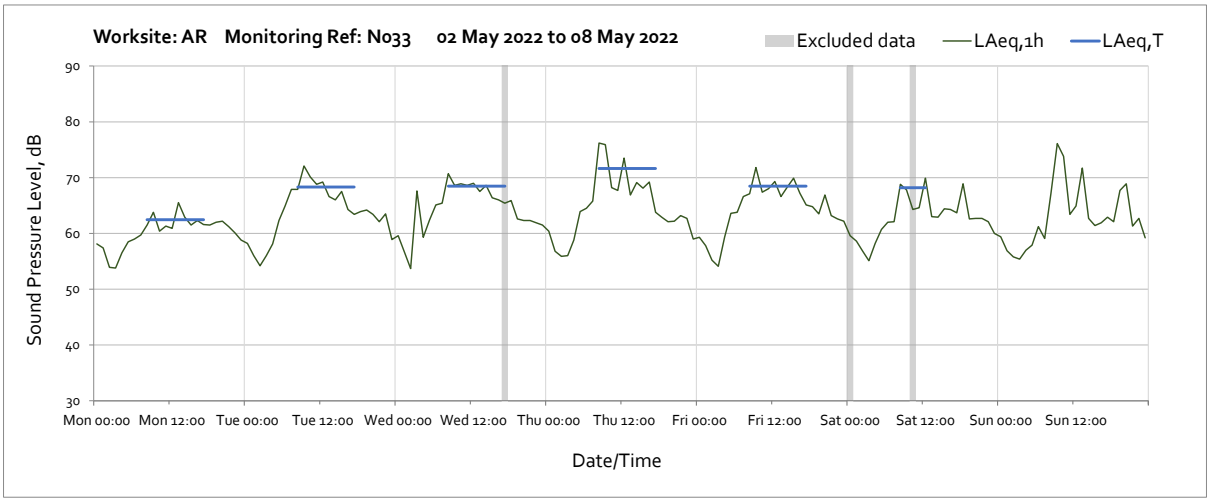

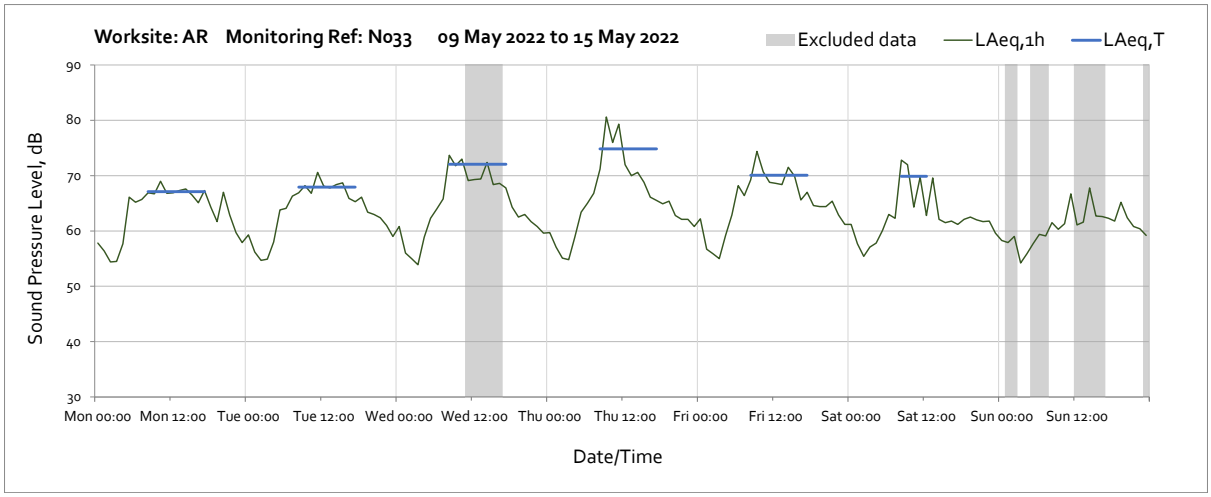
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LAeq,T
Sound Pressure Level, dB
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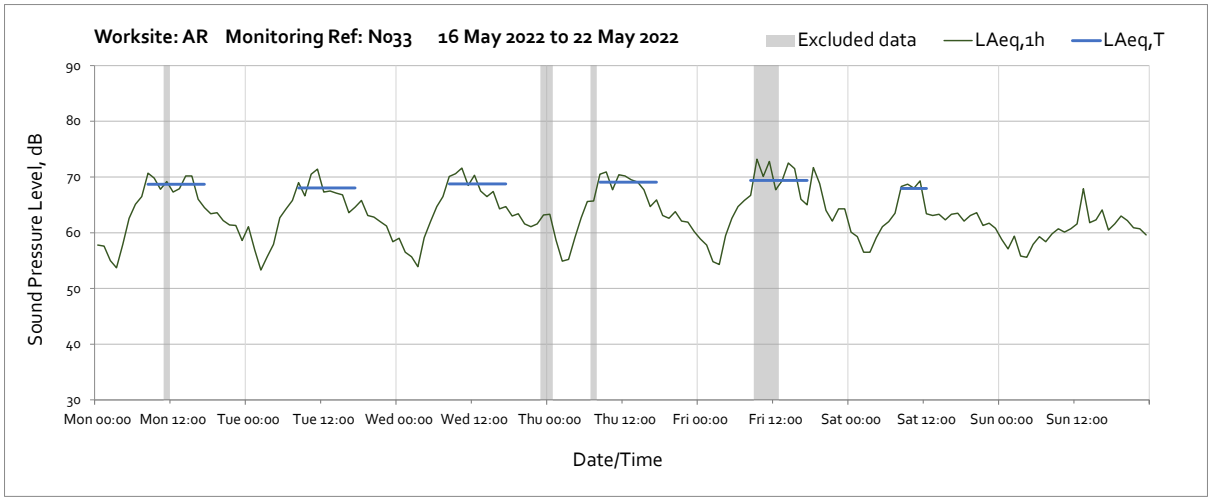
Date/Time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Sound Pressure Level, dB
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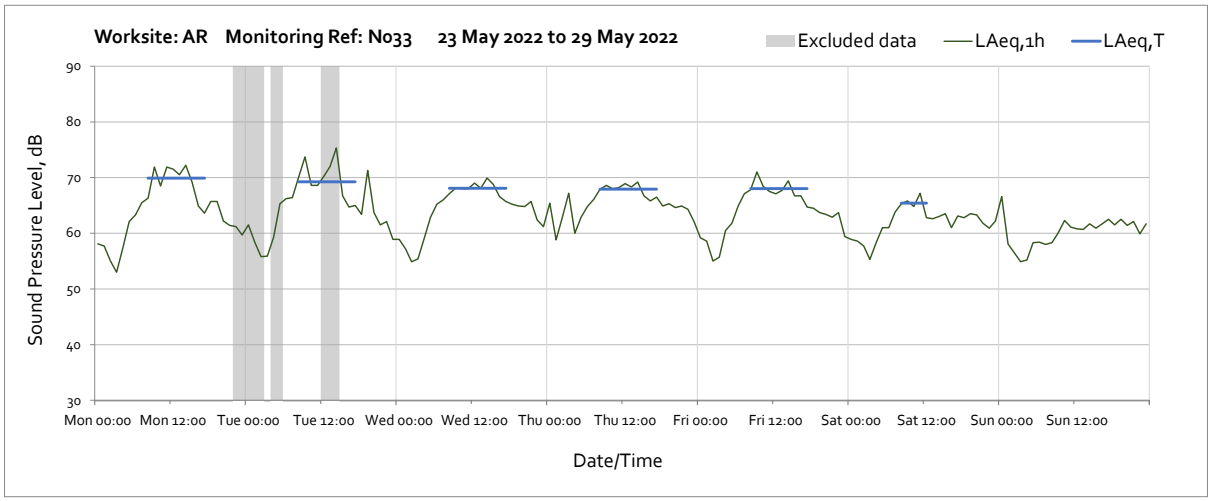
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Sound Pressure Level, dB
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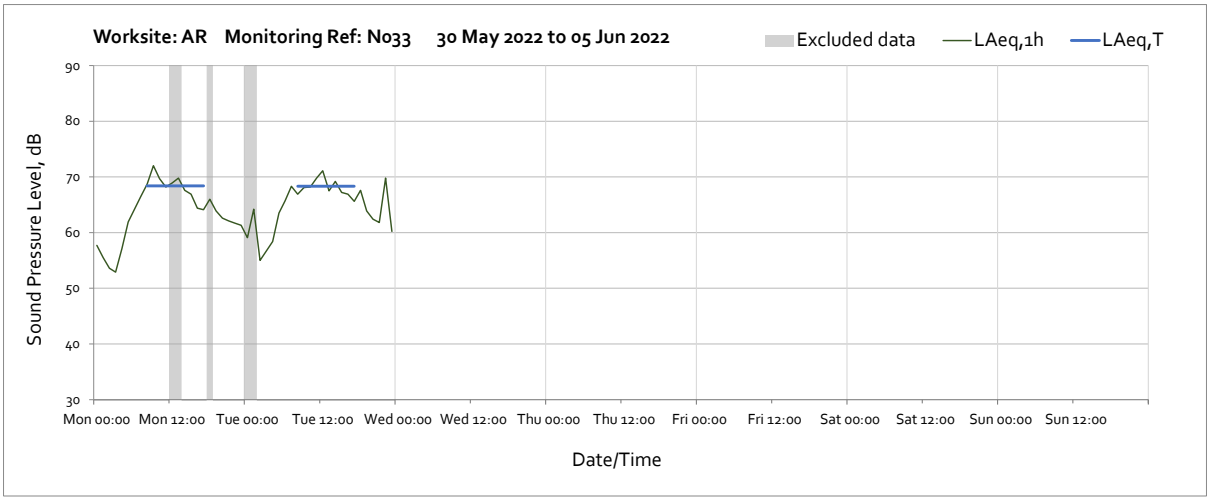

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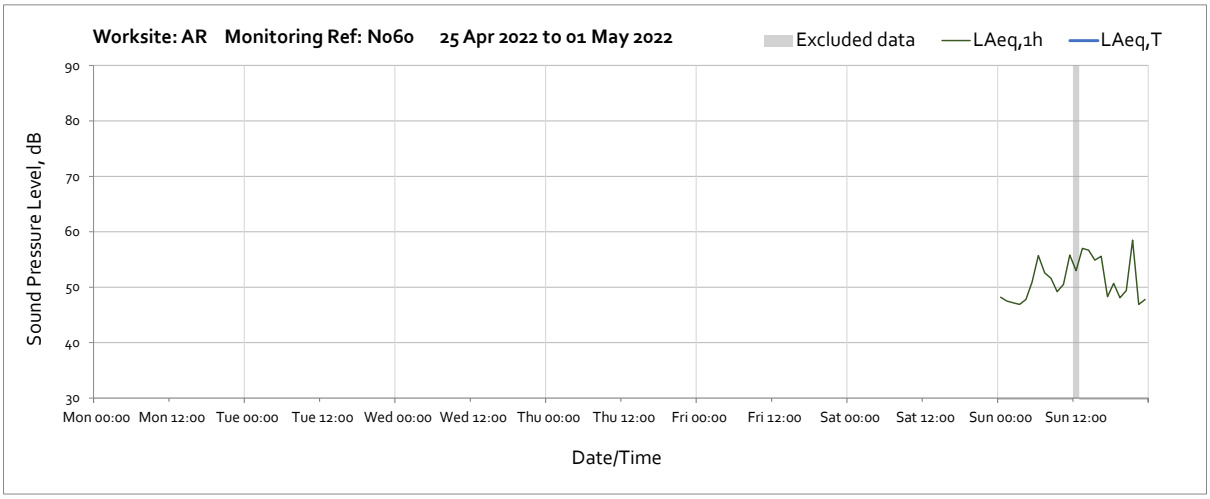

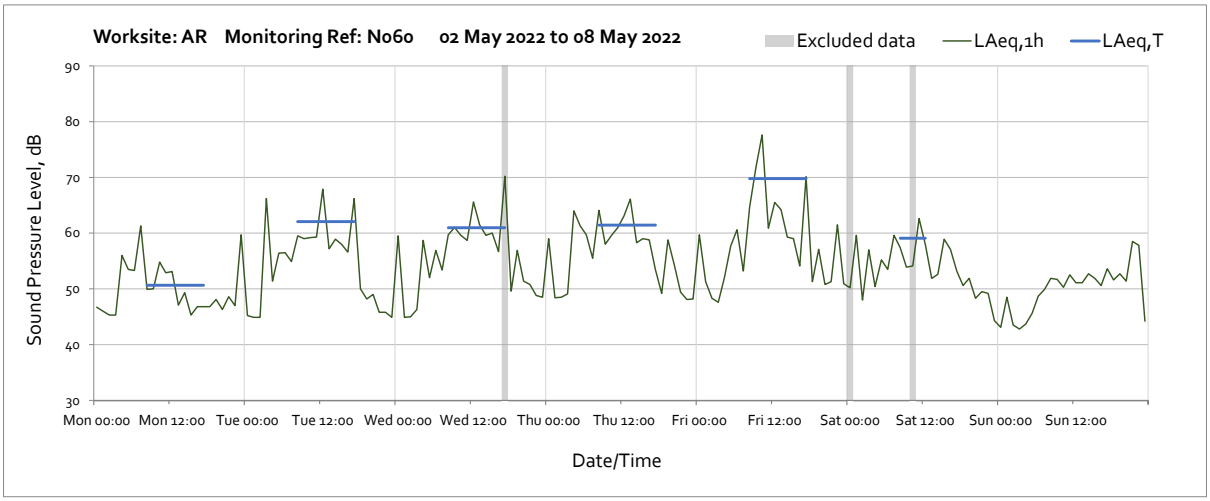

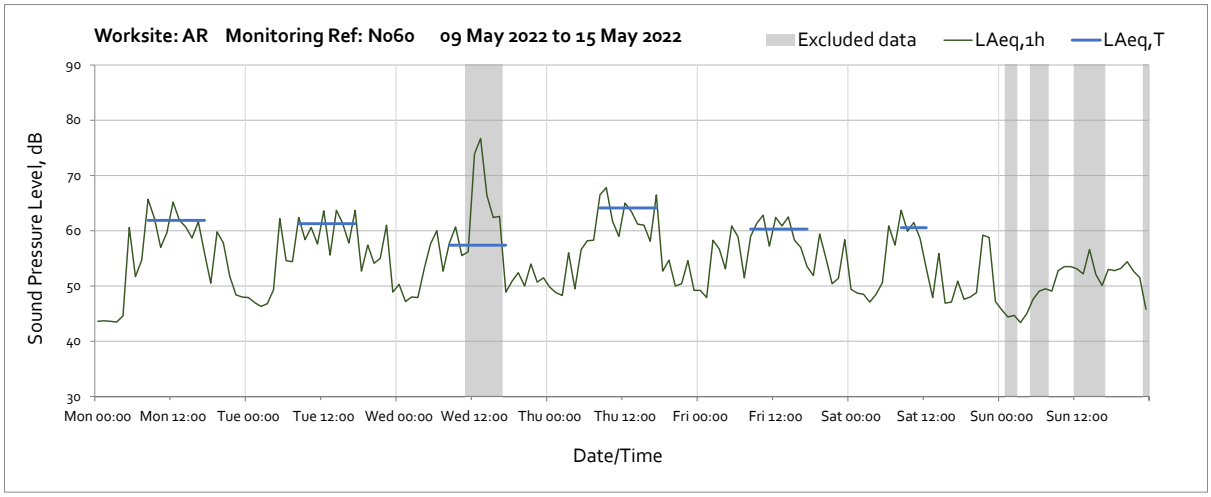
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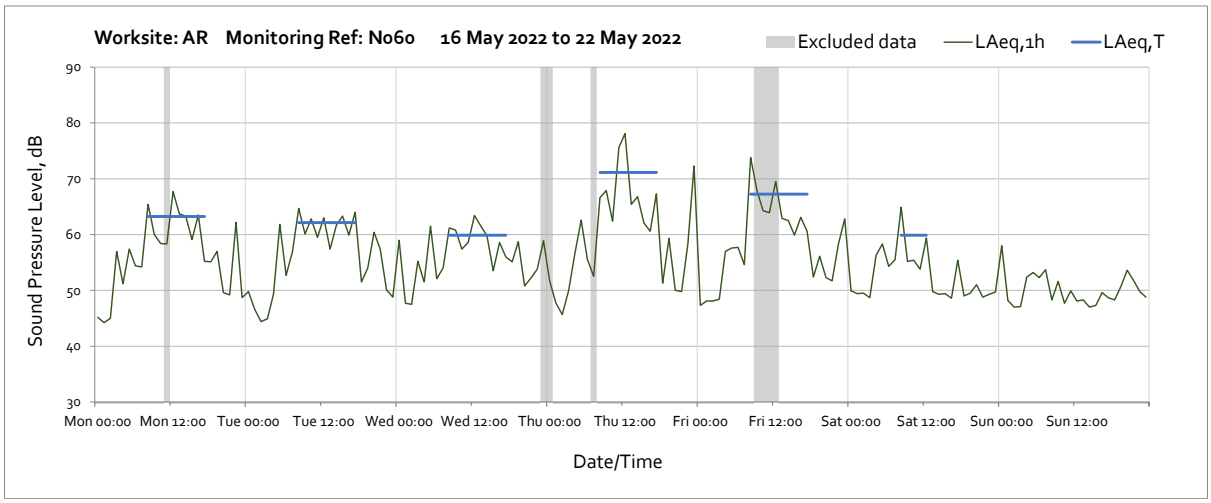
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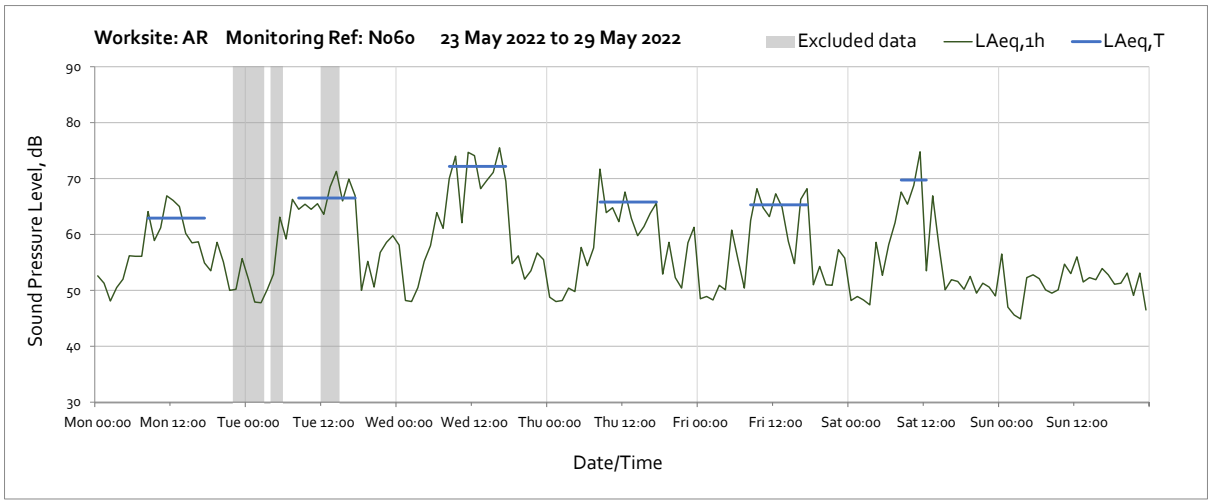
Date/Time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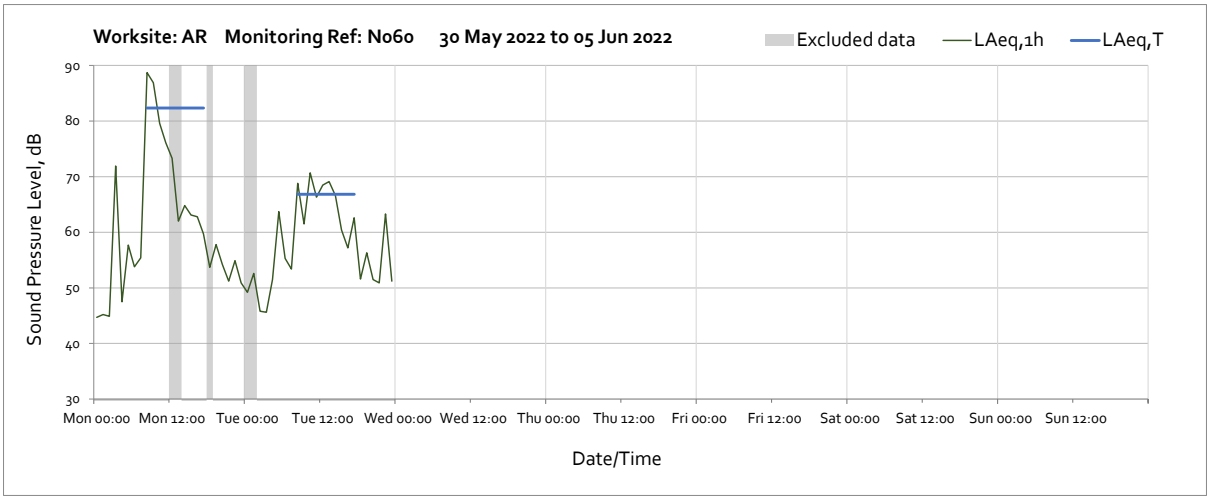

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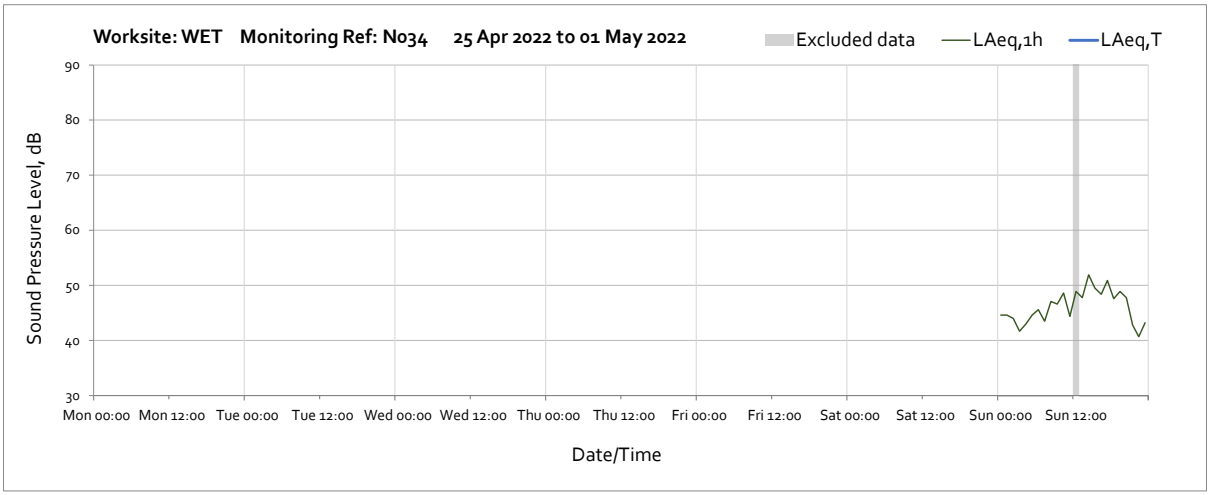

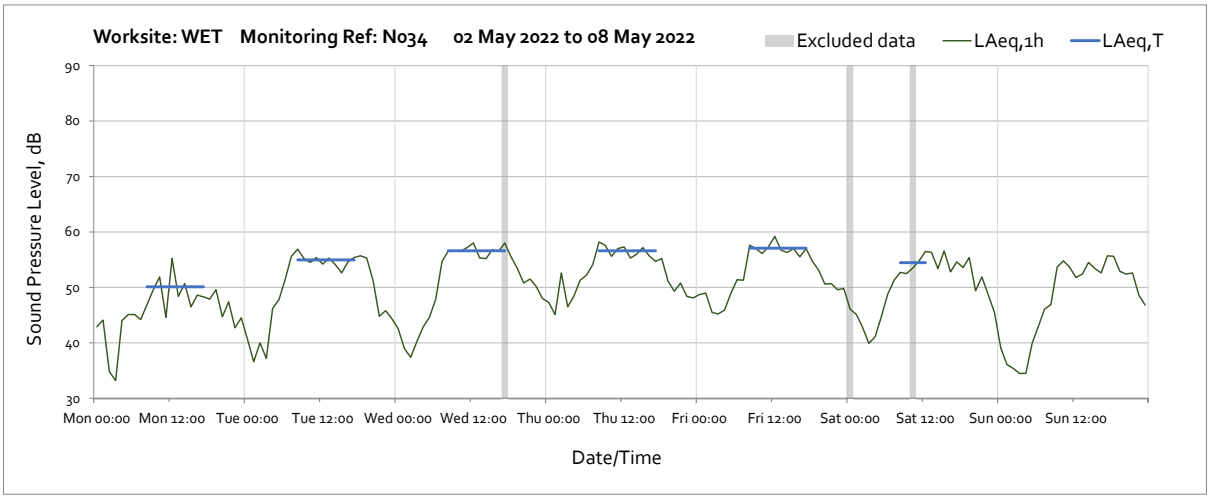

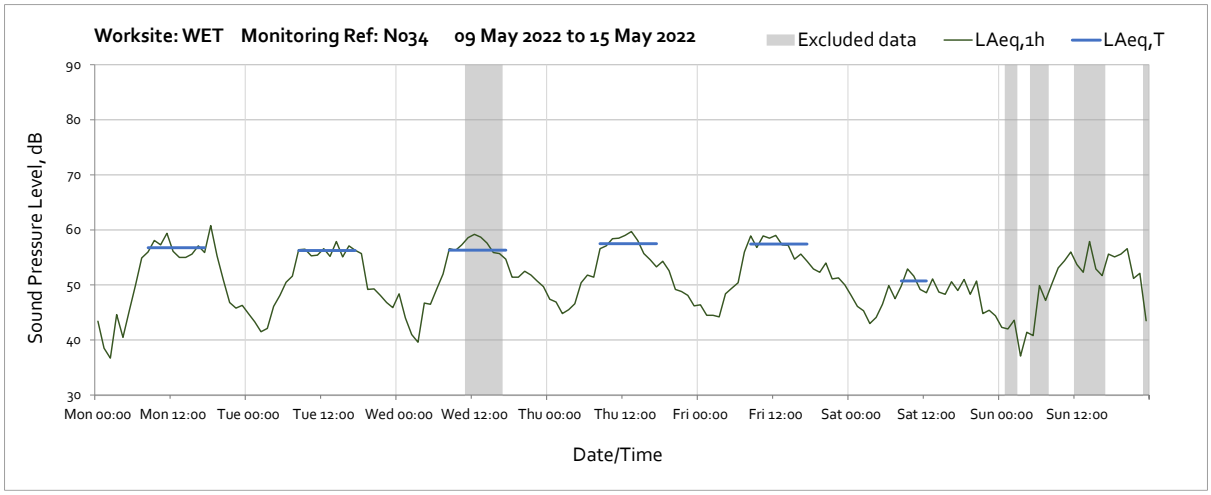
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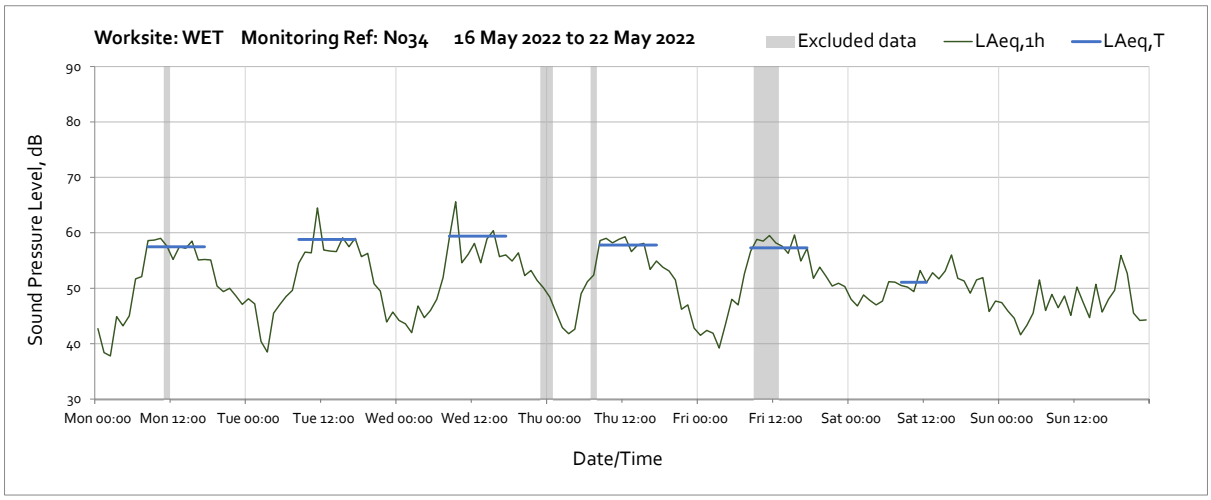
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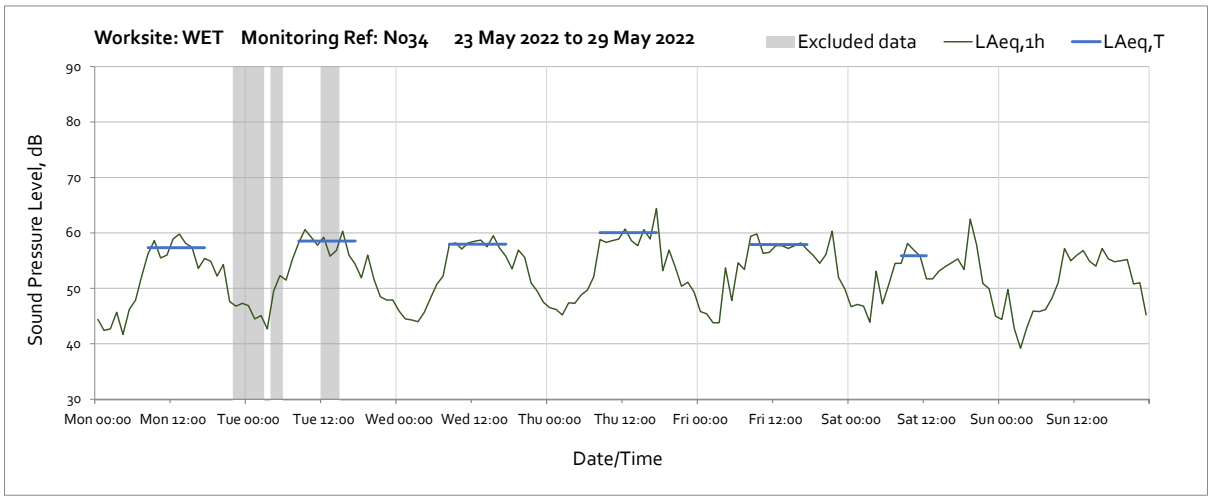
Date/Time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Date/Time

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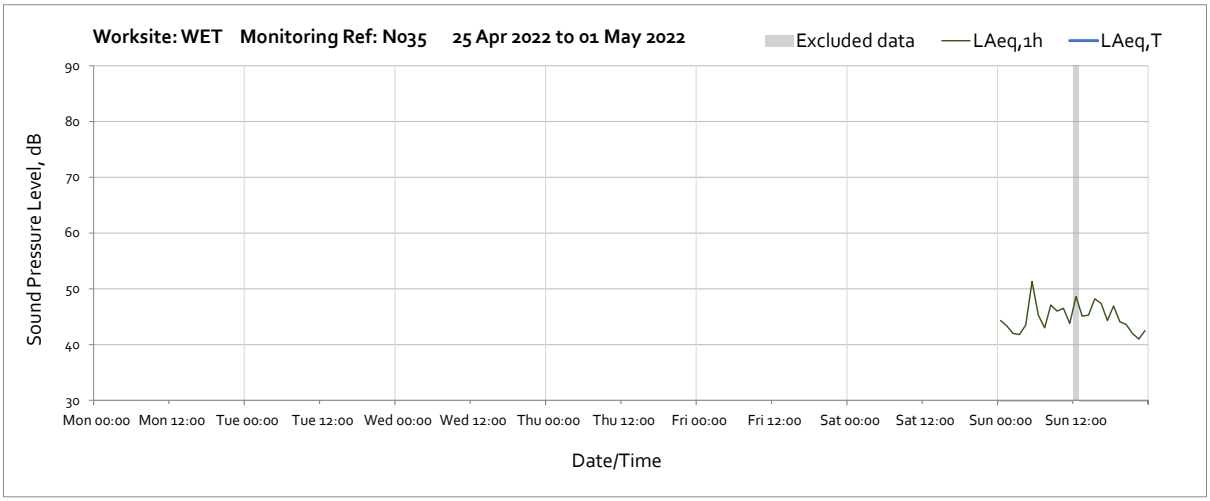

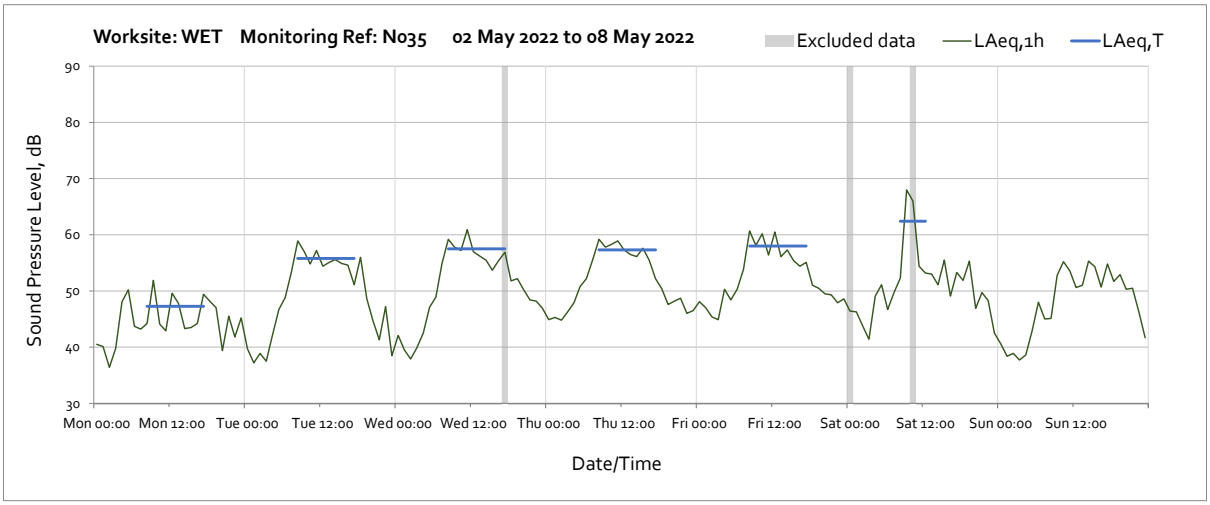

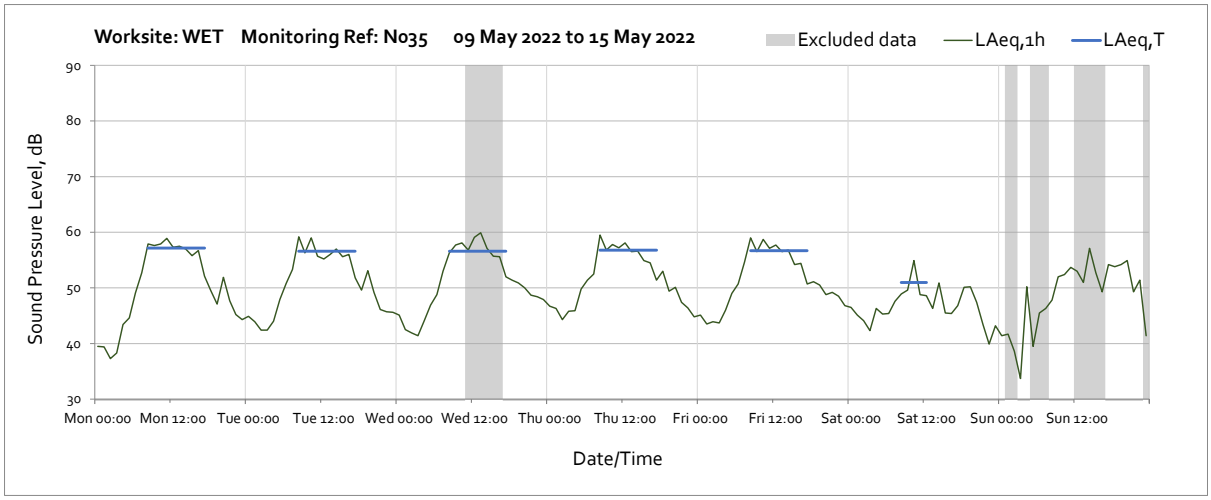
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80
70
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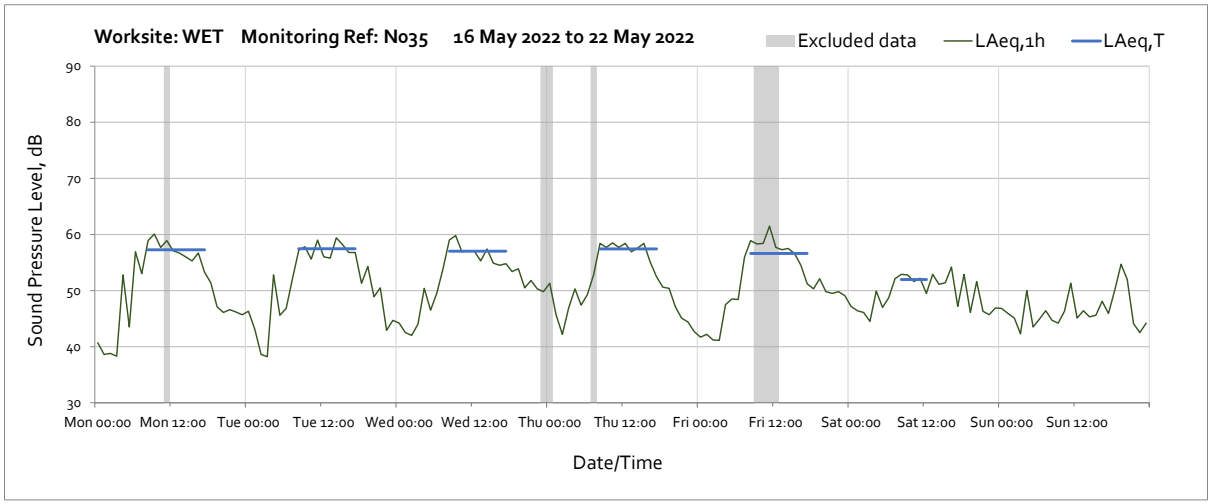
Date/Time


Worksite: WET Monitoring Ref: No35 16 May 2022 to 22 May 2022
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
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80
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60
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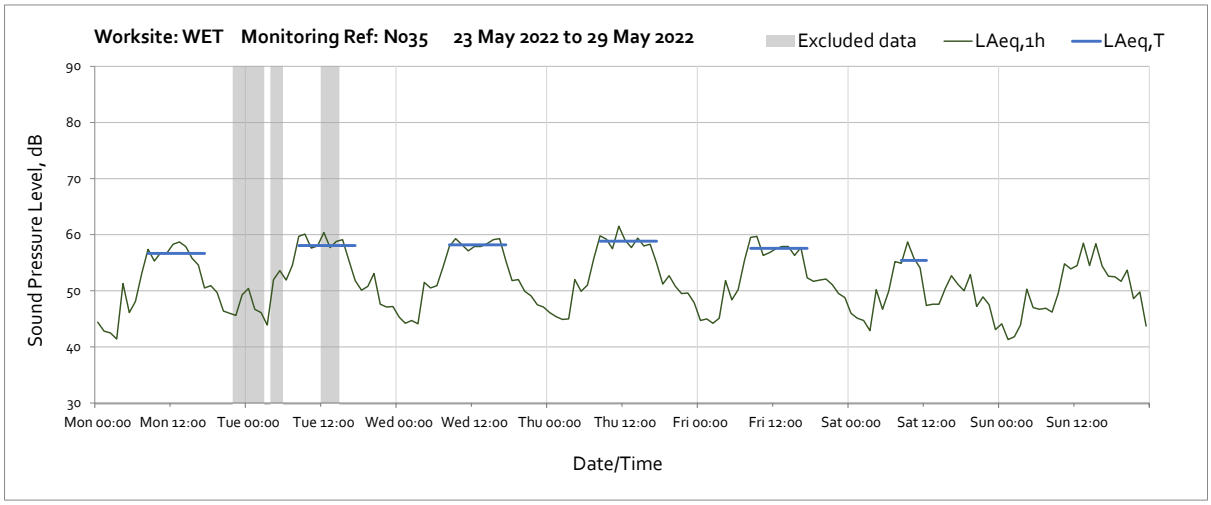
40
30
Mon 00:00 Mon 12:00 Tue 00:00 Tue 12:00 Wed 00:00 Wed 12:00 Thu 00:00 Thu 12:00 Fri 00:00 Fri 12:00 Sat 00:00 Sat 12:00 Sun 00:00 Sun 12:00
Date/Time


Worksite: WET Monitoring Ref: No35 23 May 2022 to 29 May 2022
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
90
80
70
60
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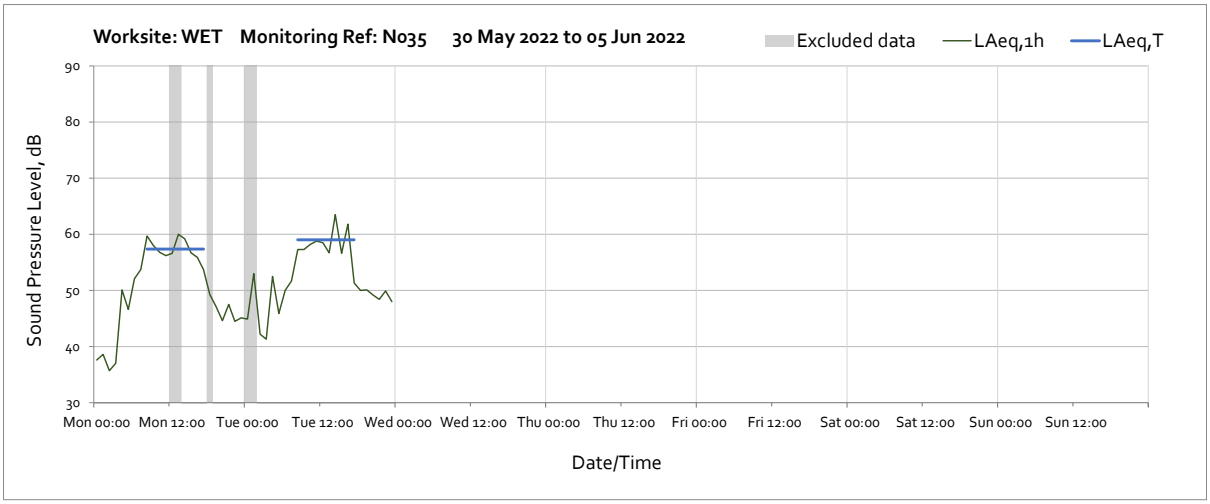
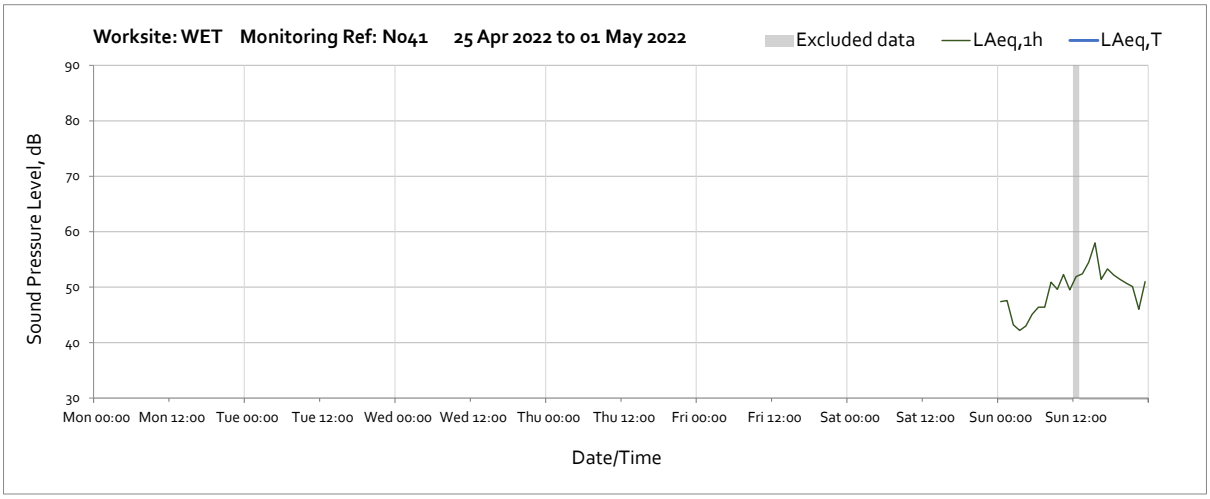
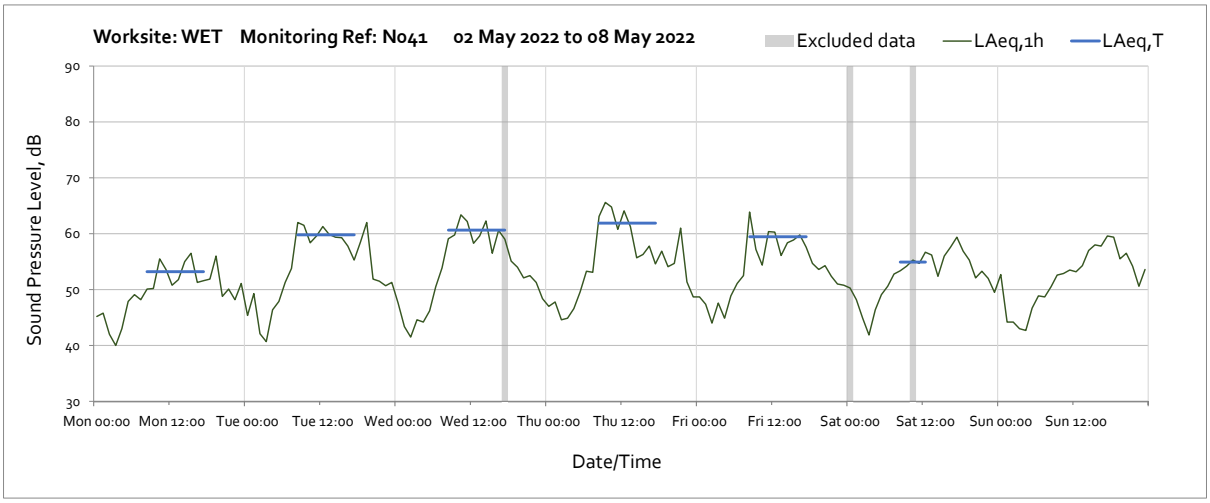
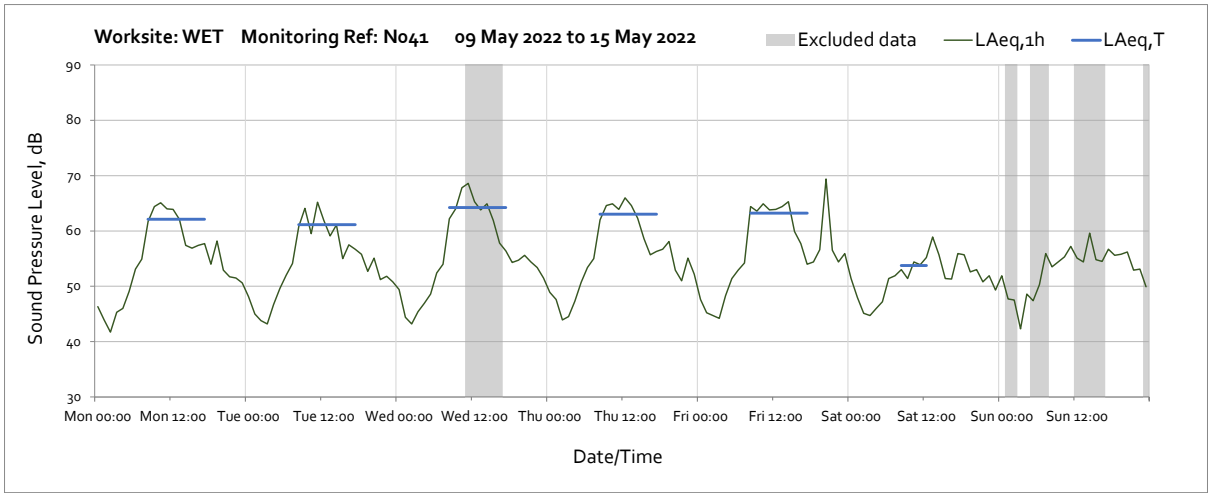
40
30
Mon 00:00 Mon 12:00 Tue 00:00 Tue 12:00 Wed 00:00 Wed 12:00 Thu 00:00 Thu 12:00 Fri 00:00 Fri 12:00 Sat 00:00 Sat 12:00 Sun 00:00 Sun 12:00
Date/Time



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






Worksite: WET Monitoring Ref: No41 09 May 2022 to 15 May 2022
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
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80
70
60
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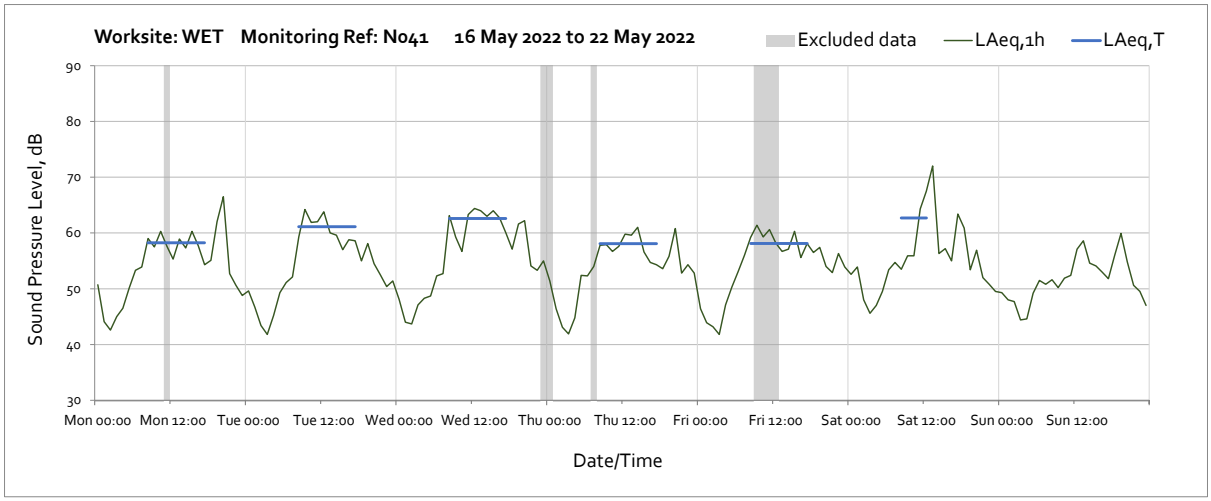
40
30
Mon 00:00 Mon 12:00 Tue 00:00 Tue 12:00 Wed 00:00 Wed 12:00 Thu 00:00 Thu 12:00 Fri 00:00 Fri 12:00 Sat 00:00 Sat 12:00 Sun 00:00 Sun 12:00
Date/Time


Worksite: WET Monitoring Ref: No41 16 May 2022 to 22 May 2022
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
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70
60
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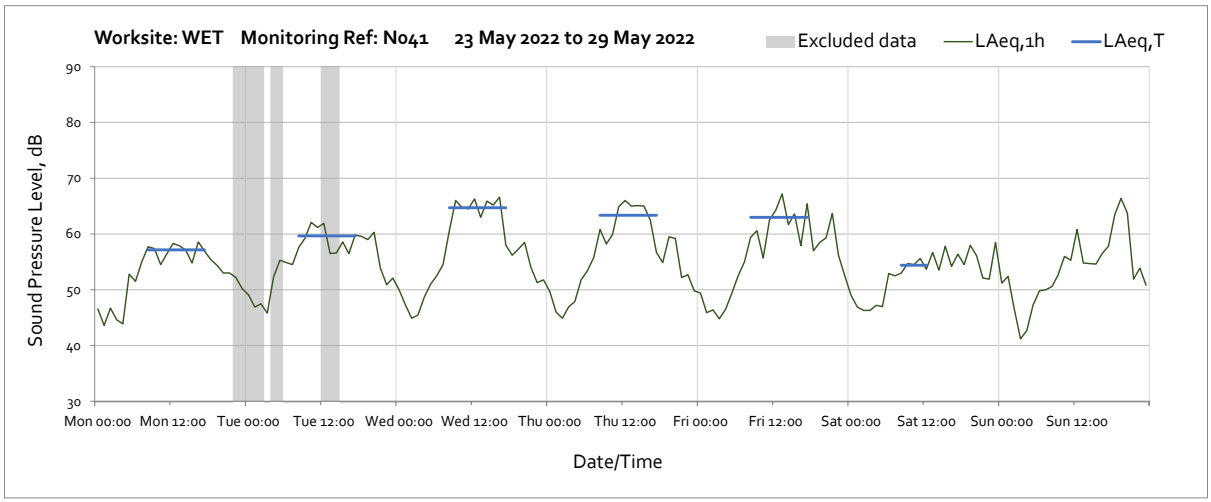
Mon 00:00 Mon 12:00 Tue 00:00 Tue 12:00 Wed 00:00 Wed 12:00 Thu 00:00 Thu 12:00 Fri 00:00 Fri 12:00 Sat 00:00 Sat 12:00 Sun 00:00 Sun 12:00
Date/Time


Worksite: WET Monitoring Ref: No41 23 May 2022 to 29 May 2022
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
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70
60
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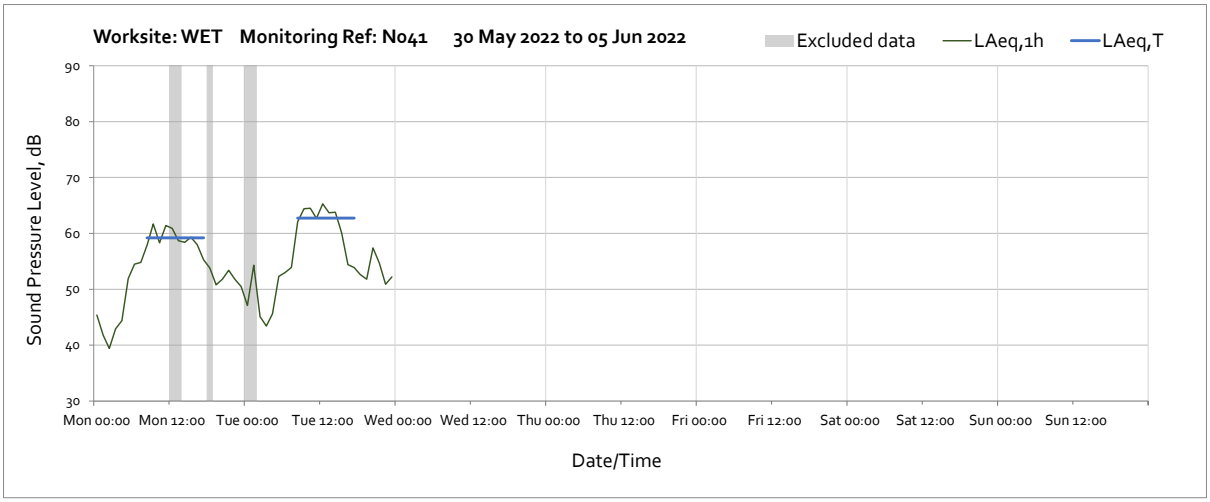
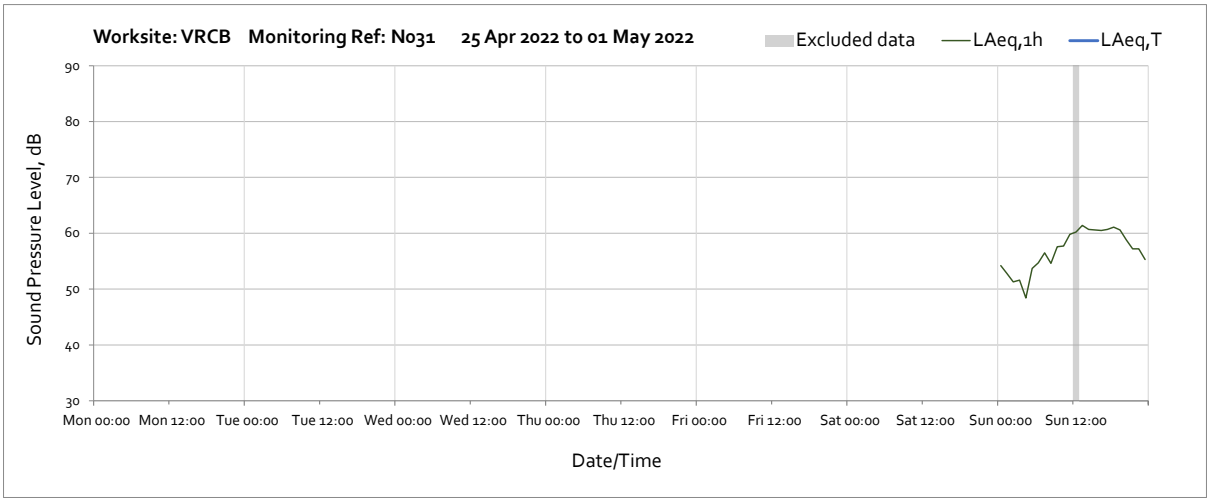
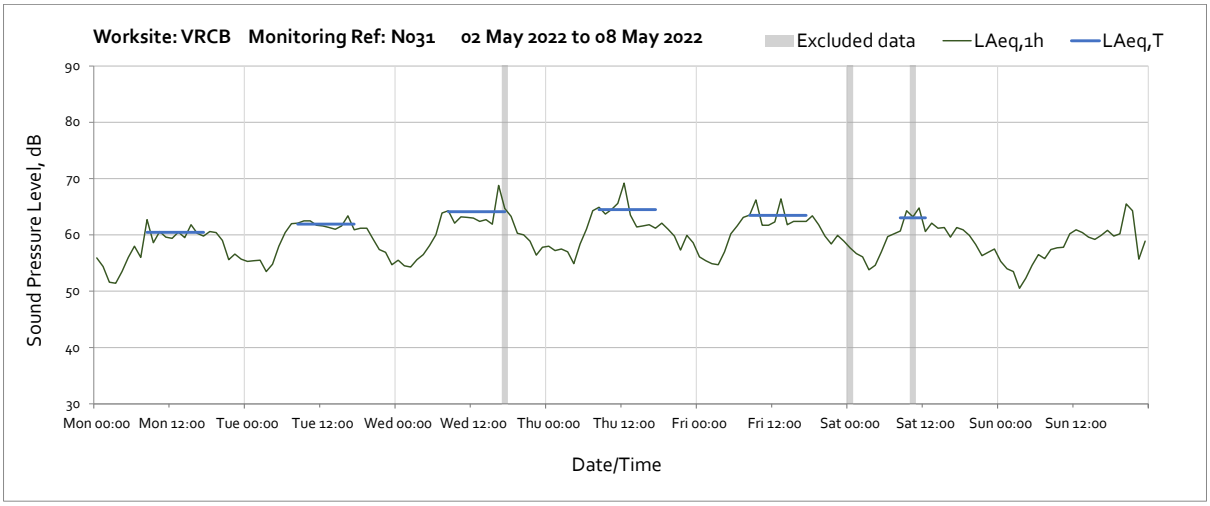
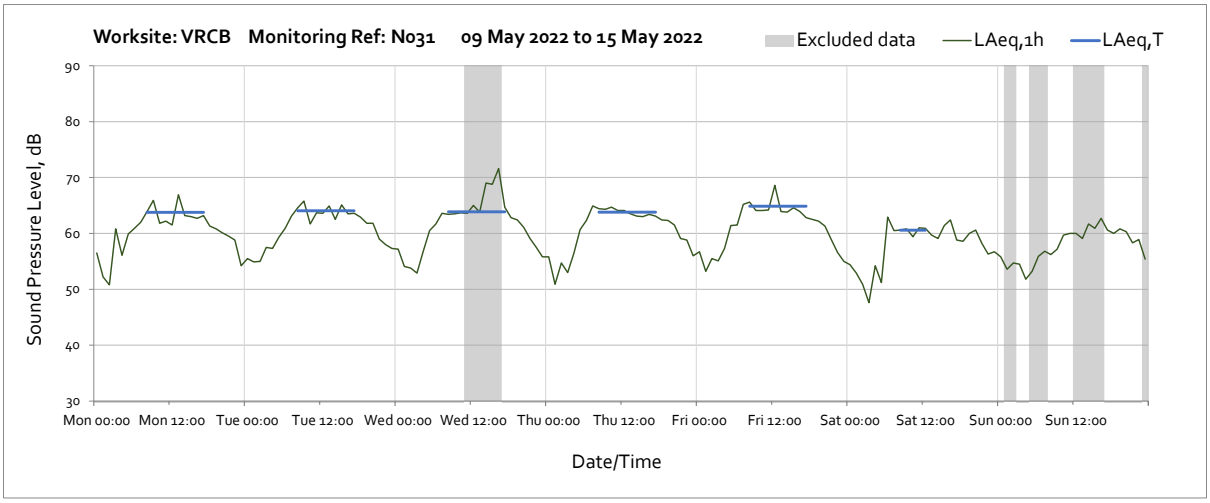
Mon 00:00 Mon 12:00 Tue 00:00 Tue 12:00 Wed 00:00 Wed 12:00 Thu 00:00 Thu 12:00 Fri 00:00 Fri 12:00 Sat 00:00 Sat 12:00 Sun 00:00 Sun 12:00
Date/Time



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






Worksite: VRCB Monitoring Ref: No31 09 May 2022 to 15 May 2022
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
90
80
70
60
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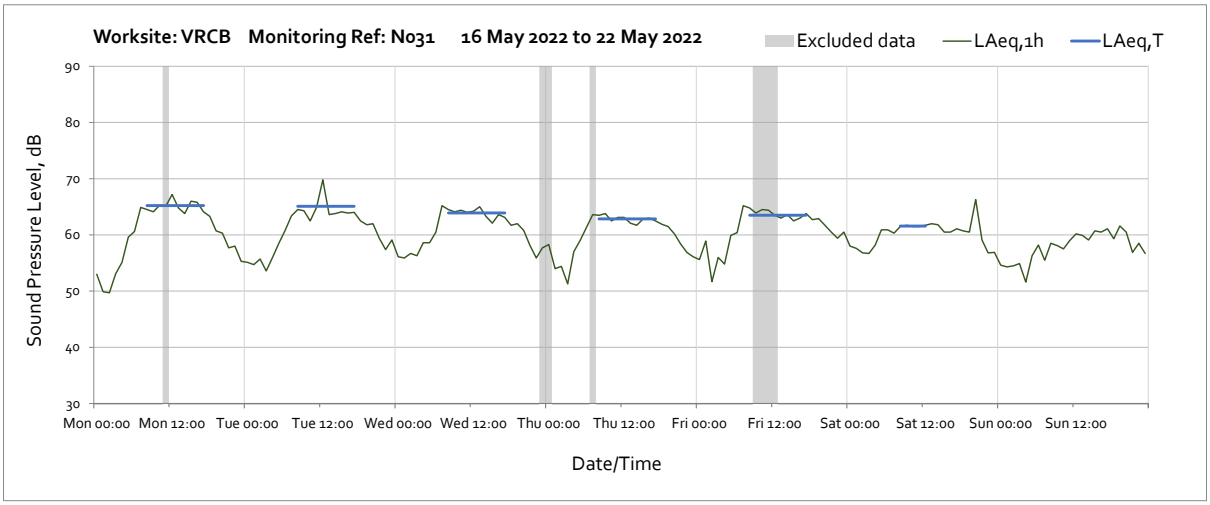
40
30
Mon 00:00 Mon 12:00 Tue 00:00 Tue 12:00 Wed 00:00 Wed 12:00 Thu 00:00 Thu 12:00 Fri 00:00 Fri 12:00 Sat 00:00 Sat 12:00 Sun 00:00 Sun 12:00
Date/Time


Worksite: VRCB Monitoring Ref: No31 16 May 2022 to 22 May 2022
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
90
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70
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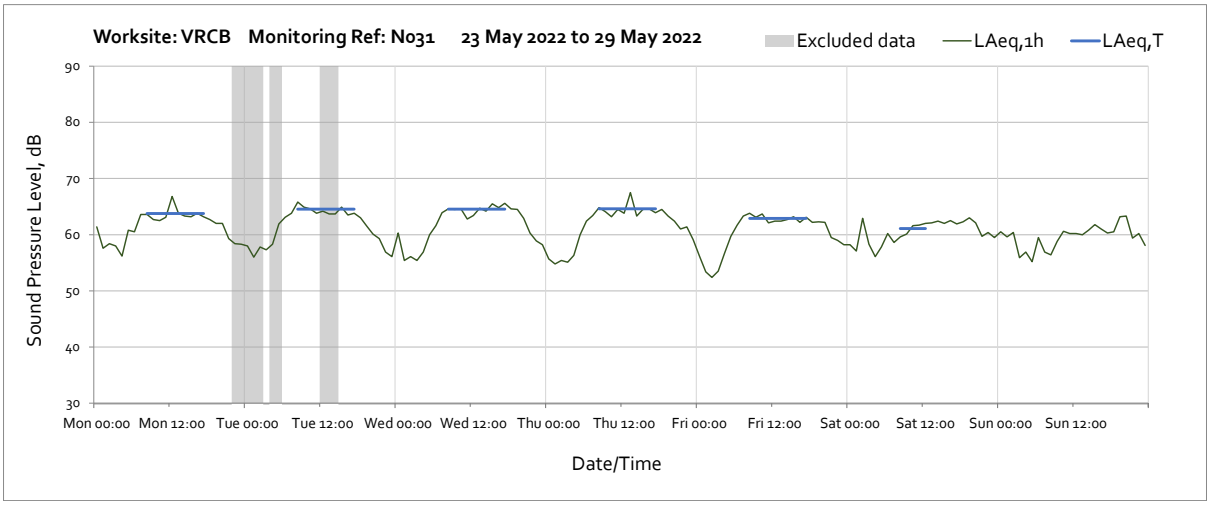
Mon 00:00 Mon 12:00 Tue 00:00 Tue 12:00 Wed 00:00 Wed 12:00 Thu 00:00 Thu 12:00 Fri 00:00 Fri 12:00 Sat 00:00 Sat 12:00 Sun 00:00 Sun 12:00
Date/Time


Worksite: VRCB Monitoring Ref: No31 23 May 2022 to 29 May 2022
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
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80
70
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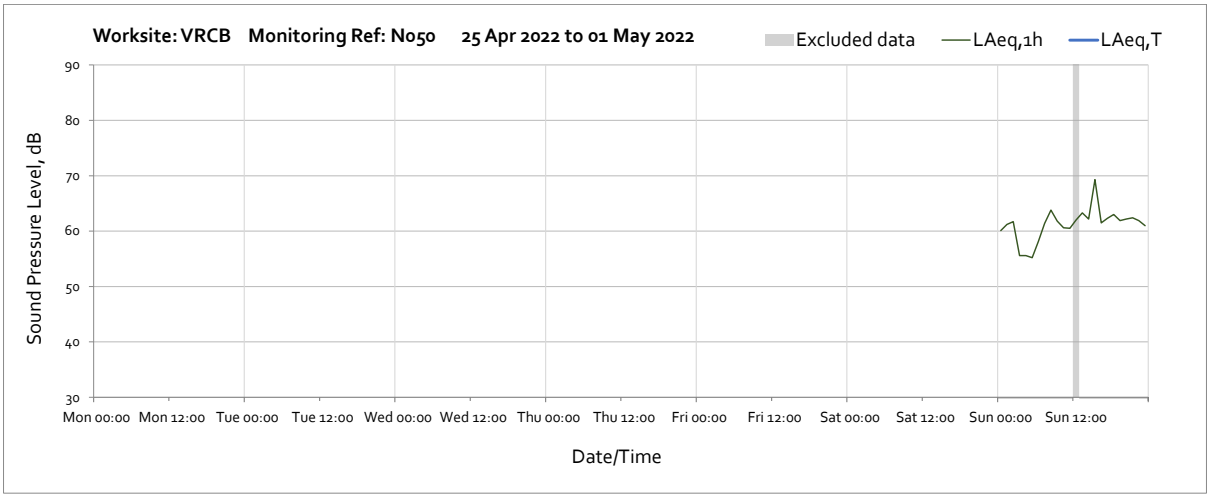
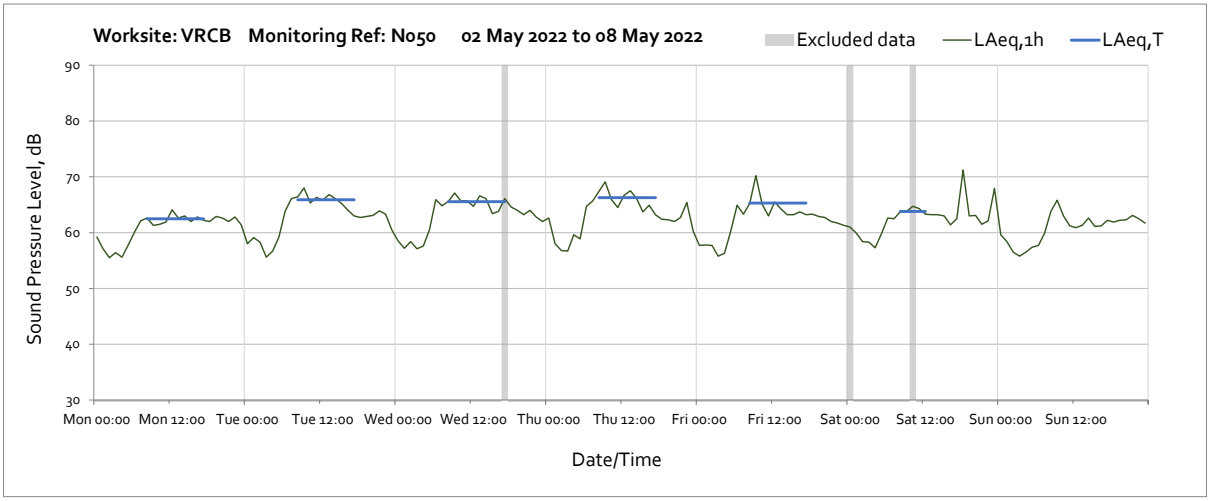
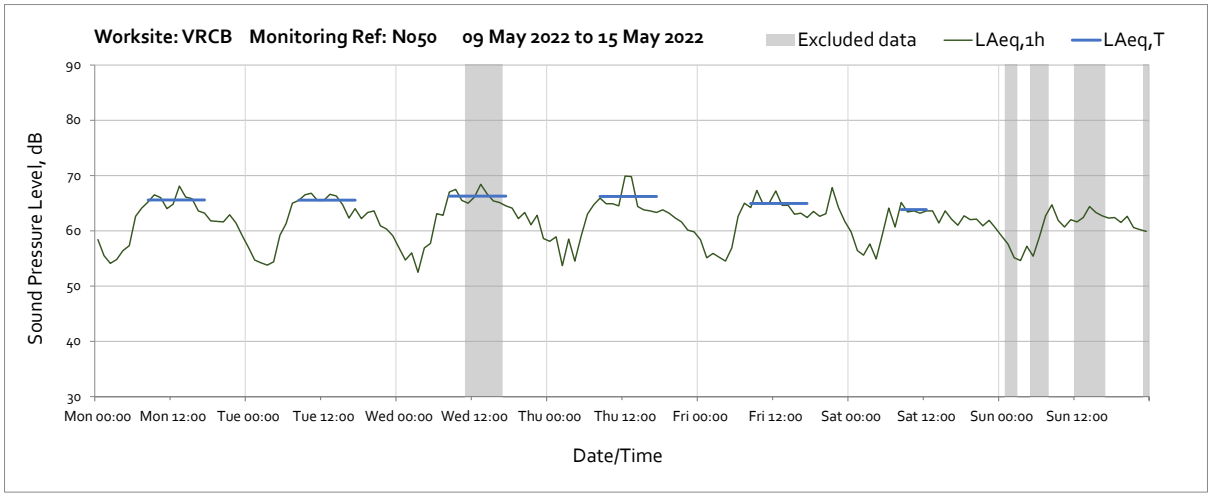
Mon 00:00 Mon 12:00 Tue 00:00 Tue 12:00 Wed 00:00 Wed 12:00 Thu 00:00 Thu 12:00 Fri 00:00 Fri 12:00 Sat 00:00 Sat 12:00 Sun 00:00 Sun 12:00
Date/Time

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






Worksite: VRCB Monitoring Ref: N050 09 May 2022 to 15 May 2022
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
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80
70
60
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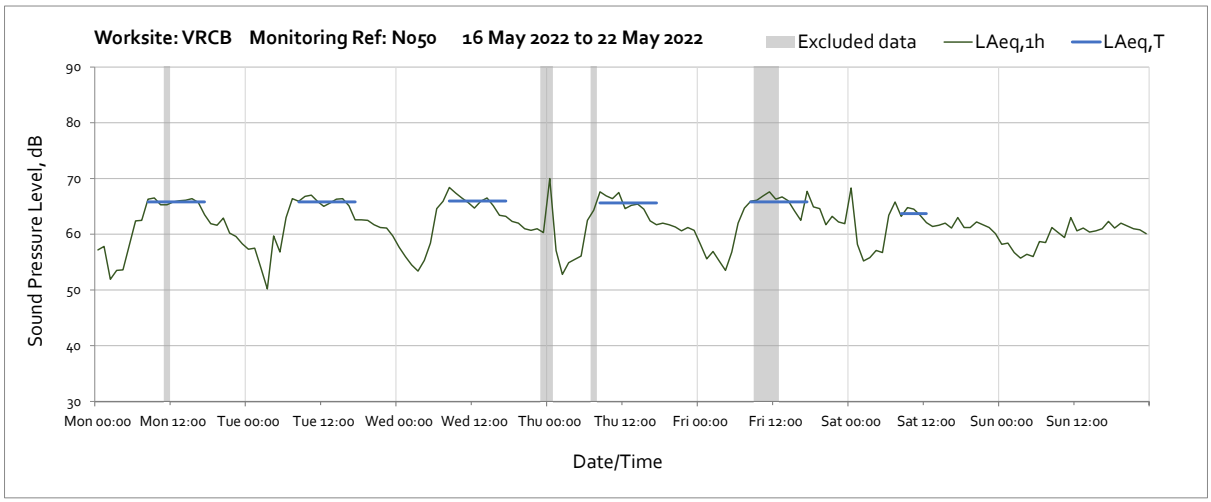
Mon 00:00 Mon 12:00 Tue 00:00 Tue 12:00 Wed 00:00 Wed 12:00 Thu 00:00 Thu 12:00 Fri 00:00 Fri 12:00 Sat 00:00 Sat 12:00 Sun 00:00 Sun 12:00
Date/Time


Worksite: VRCB Monitoring Ref: N050 16 May 2022 to 22 May 2022
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
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80
70
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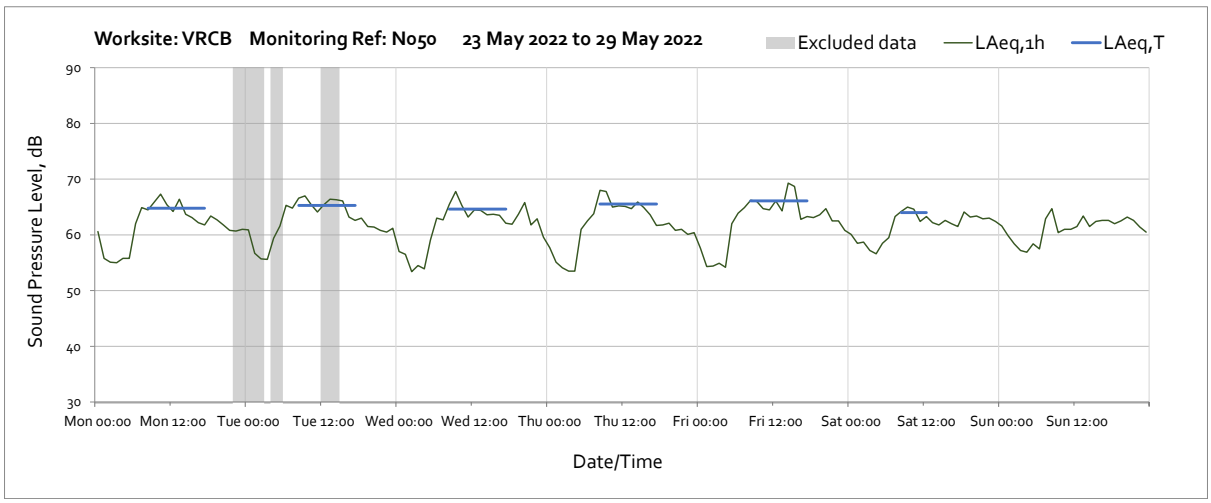
Date/Time


Worksite: VRCB Monitoring Ref: N050 23 May 2022 to 29 May 2022
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
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70
60
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40
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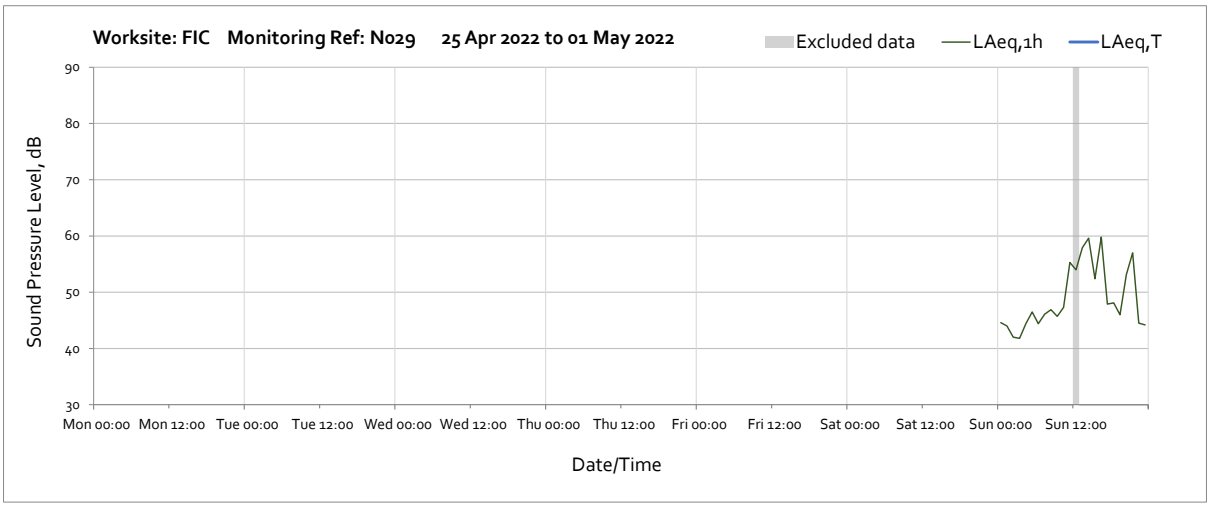
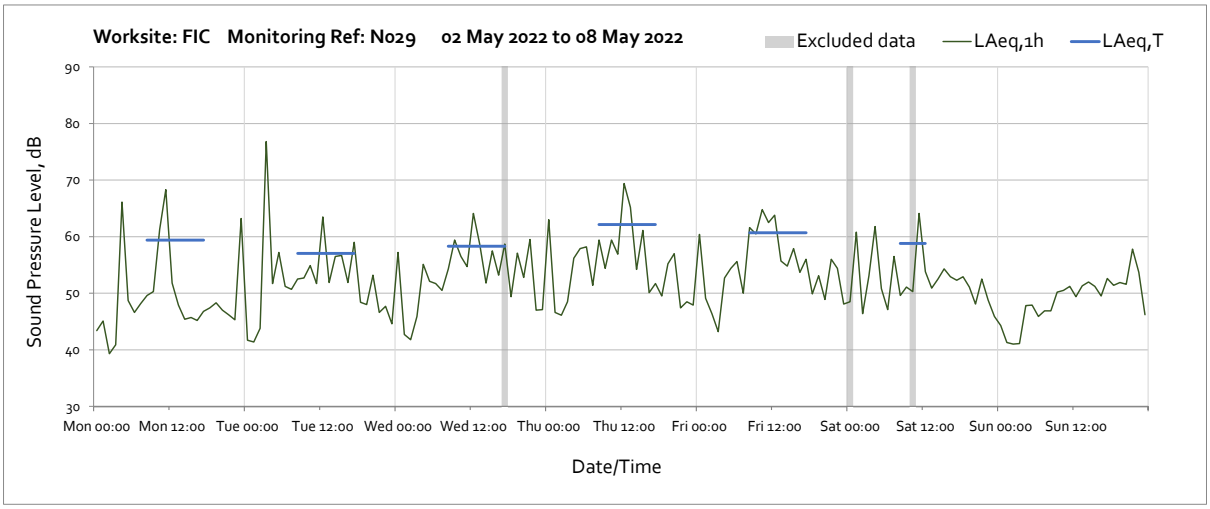
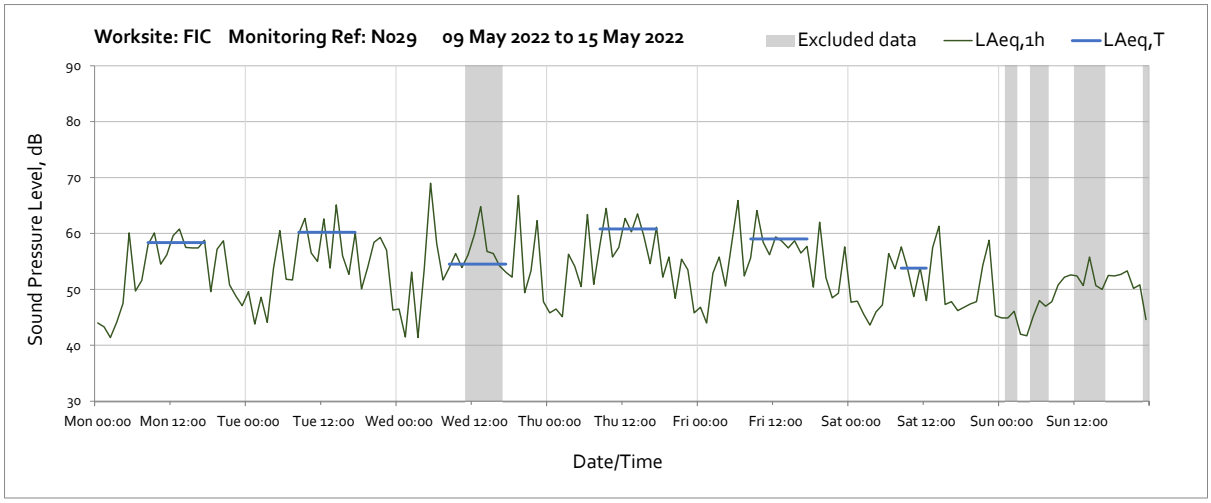
Mon 00:00 Mon 12:00 Tue 00:00 Tue 12:00 Wed 00:00 Wed 12:00 Thu 00:00 Thu 12:00 Fri 00:00 Fri 12:00 Sat 00:00 Sat 12:00 Sun 00:00 Sun 12:00
Date/Time

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






Worksite: FIC Monitoring Ref: No29 09 May 2022 to 15 May 2022
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
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80
70
60
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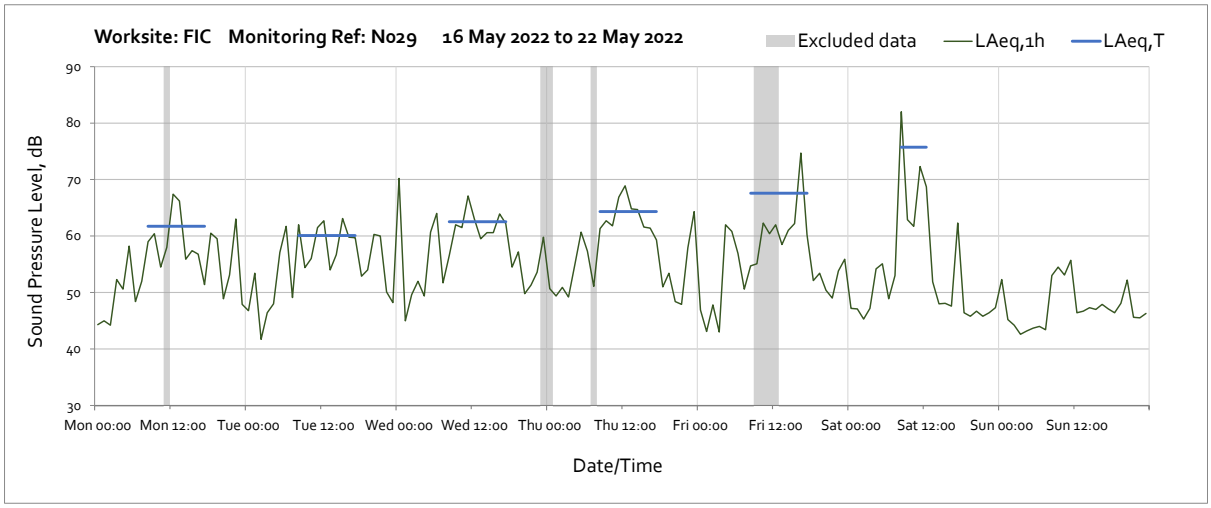
Mon 00:00 Mon 12:00 Tue 00:00 Tue 12:00 Wed 00:00 Wed 12:00 Thu 00:00 Thu 12:00 Fri 00:00 Fri 12:00 Sat 00:00 Sat 12:00 Sun 00:00 Sun 12:00
Date/Time


Worksite: FIC Monitoring Ref: No29 16 May 2022 to 22 May 2022
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
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70
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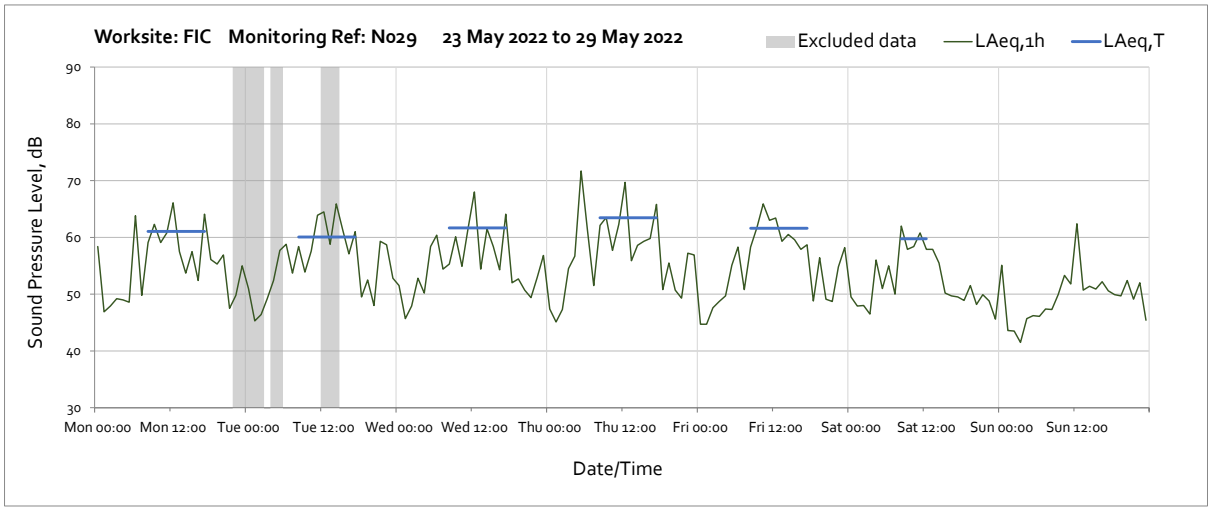
Mon 00:00 Mon 12:00 Tue 00:00 Tue 12:00 Wed 00:00 Wed 12:00 Thu 00:00 Thu 12:00 Fri 00:00 Fri 12:00 Sat 00:00 Sat 12:00 Sun 00:00 Sun 12:00
Date/Time


Worksite: FIC Monitoring Ref: No29 23 May 2022 to 29 May 2022
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
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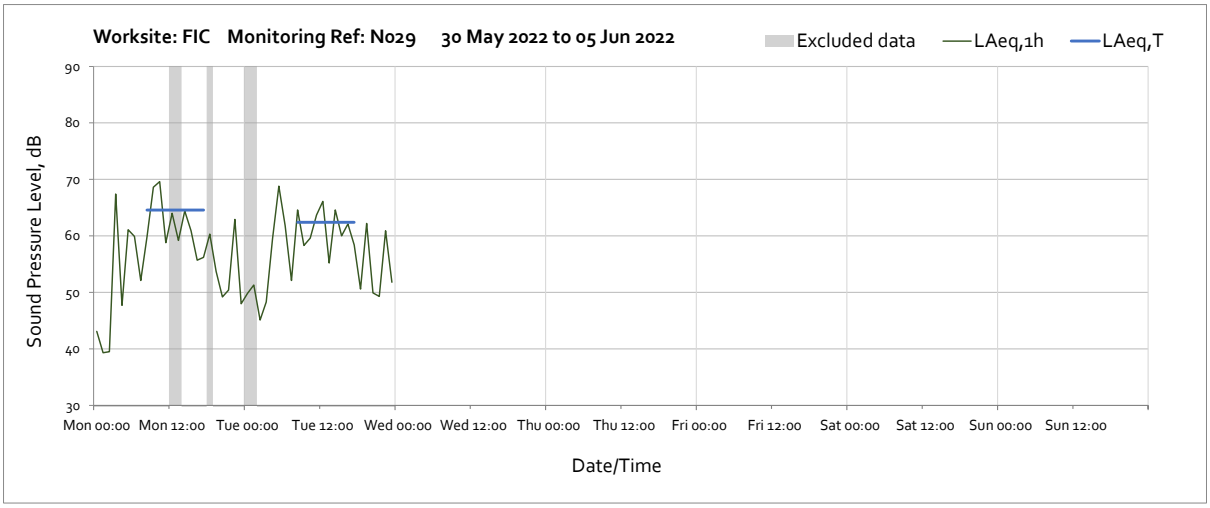
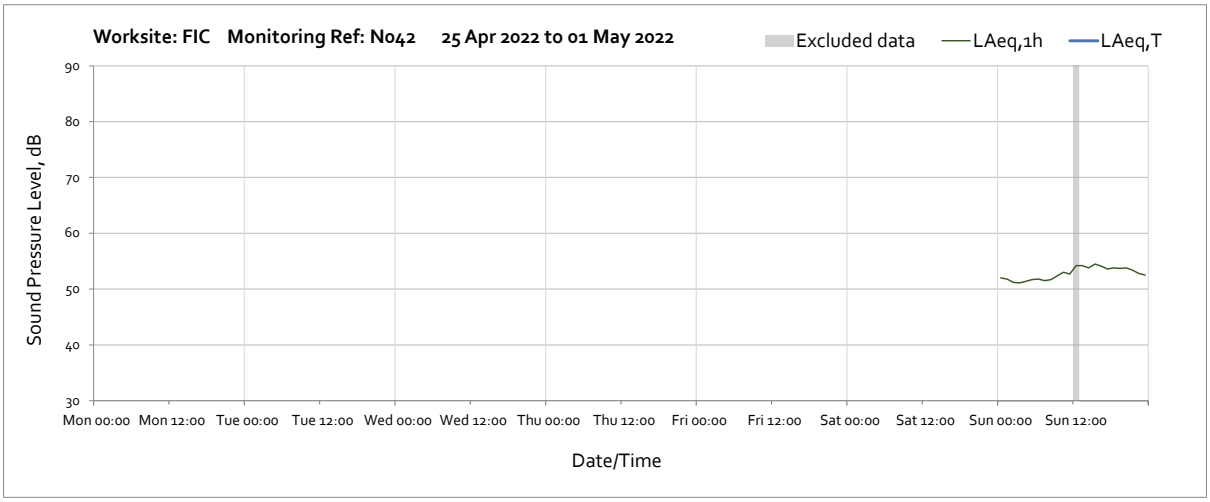
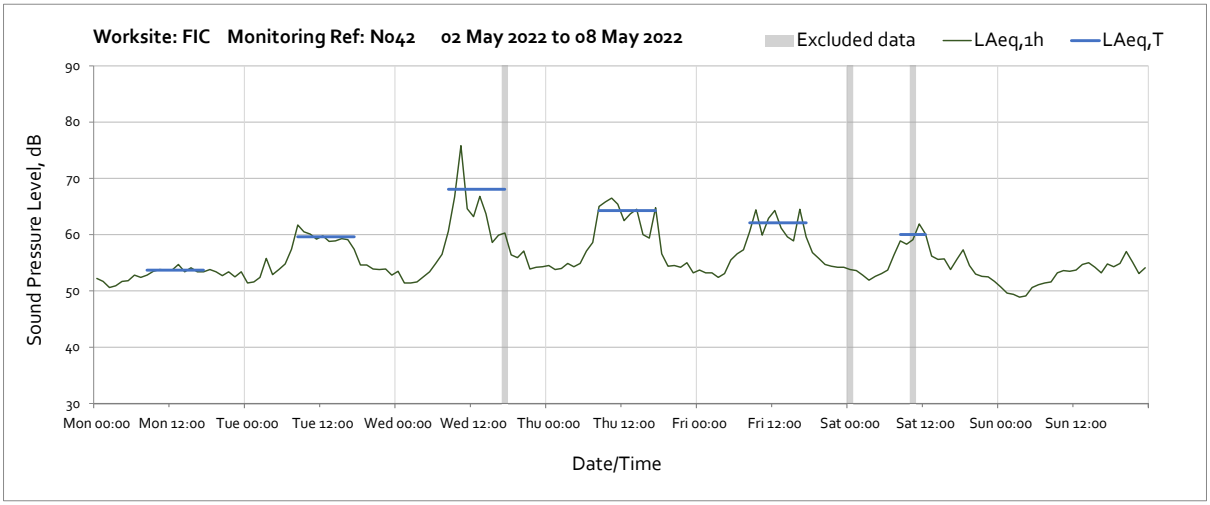
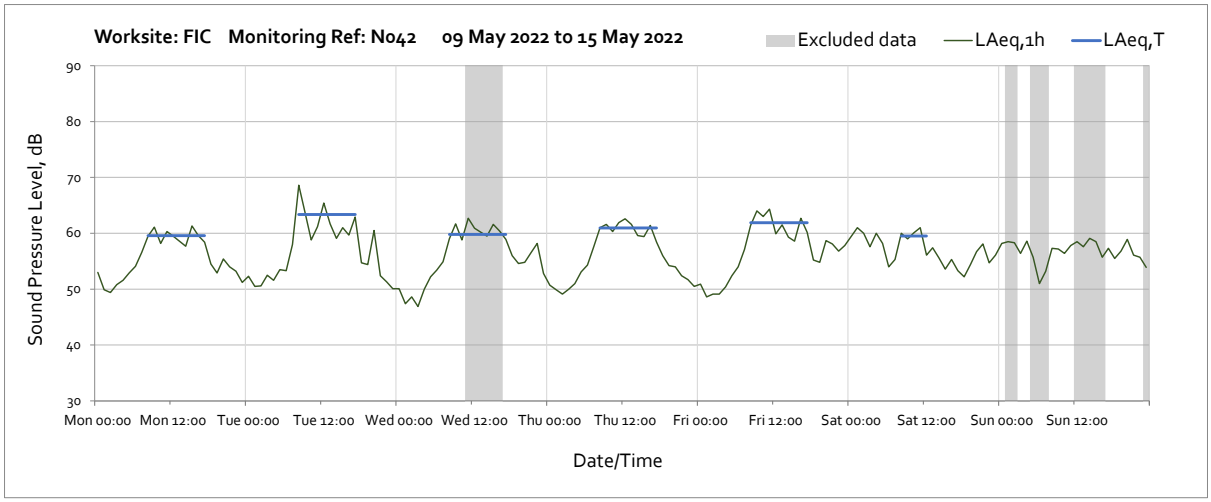
Date/Time



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






Worksite: FIC Monitoring Ref: No42 09 May 2022 to 15 May 2022
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
90
80
70
60
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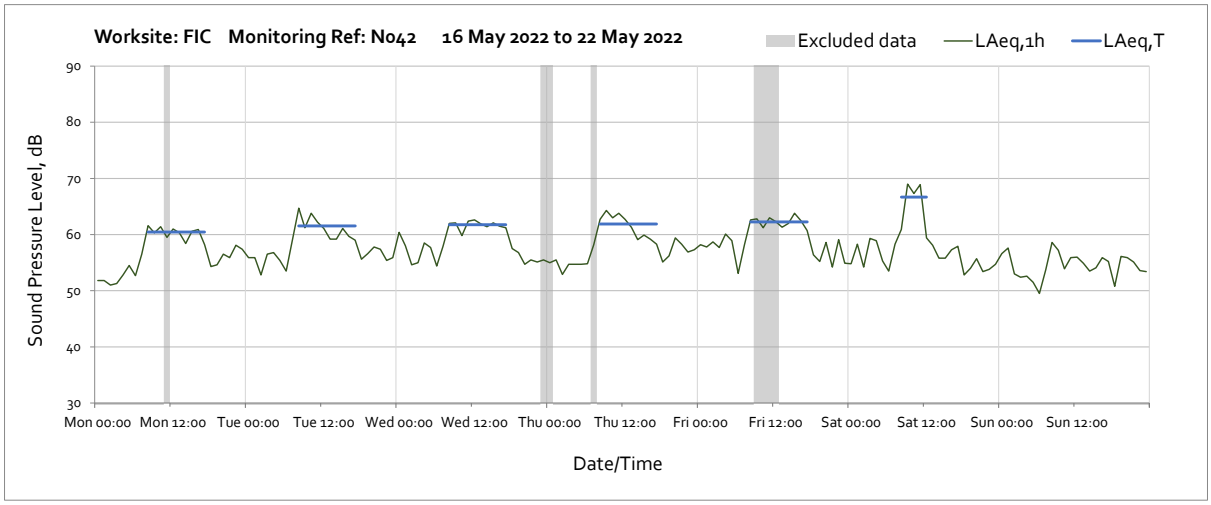
40
30
Mon 00:00 Mon 12:00 Tue 00:00 Tue 12:00 Wed 00:00 Wed 12:00 Thu 00:00 Thu 12:00 Fri 00:00 Fri 12:00 Sat 00:00 Sat 12:00 Sun 00:00 Sun 12:00
Date/Time


Worksite: FIC Monitoring Ref: No42 16 May 2022 to 22 May 2022
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
90
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70
60
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40
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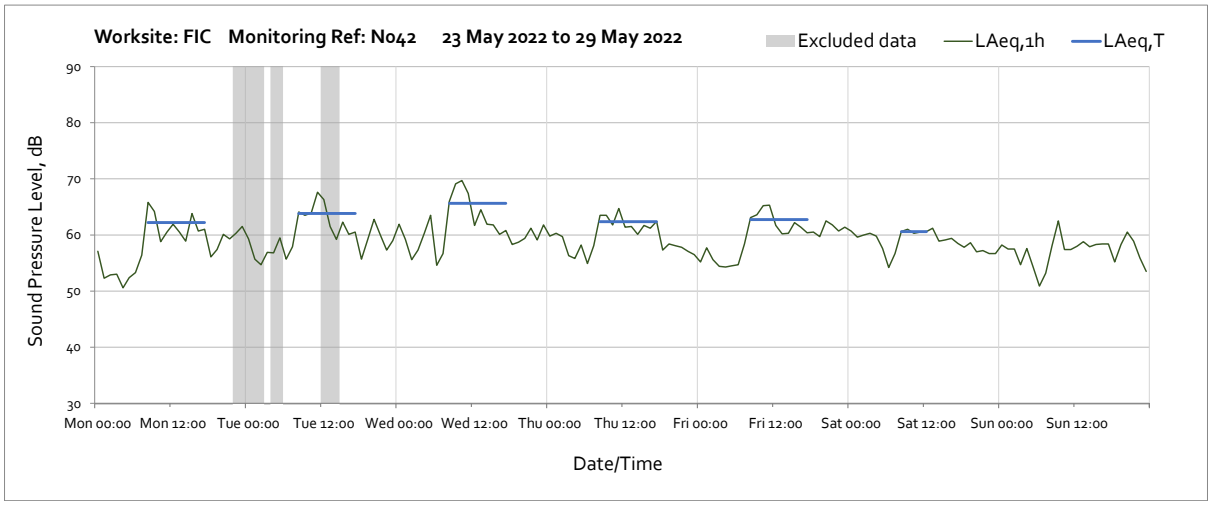
Mon 00:00 Mon 12:00 Tue 00:00 Tue 12:00 Wed 00:00 Wed 12:00 Thu 00:00 Thu 12:00 Fri 00:00 Fri 12:00 Sat 00:00 Sat 12:00 Sun 00:00 Sun 12:00
Date/Time


Worksite: FIC Monitoring Ref: No42 23 May 2022 to 29 May 2022
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
90
80
70
60
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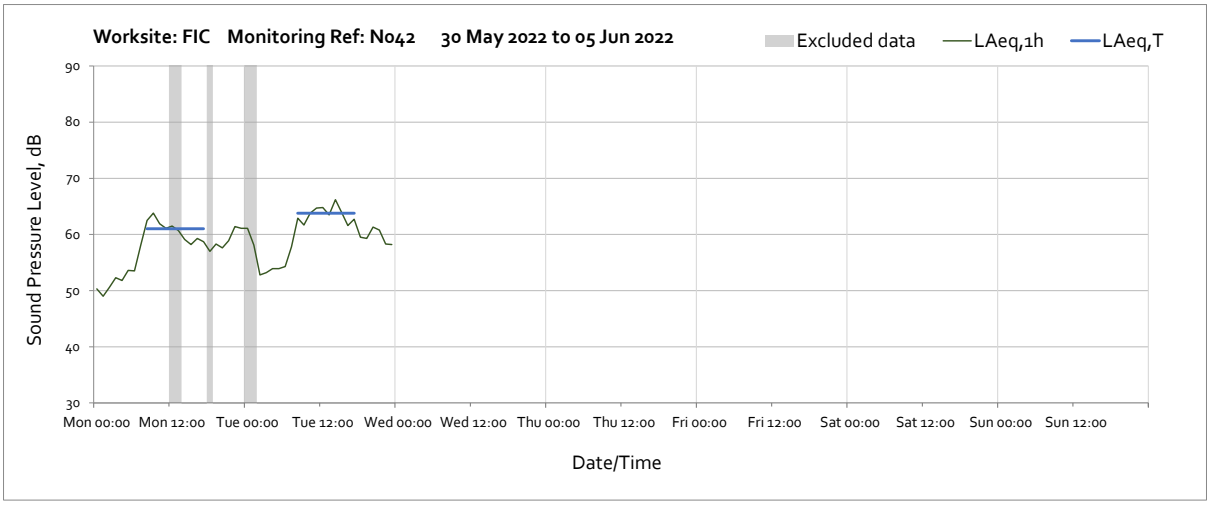
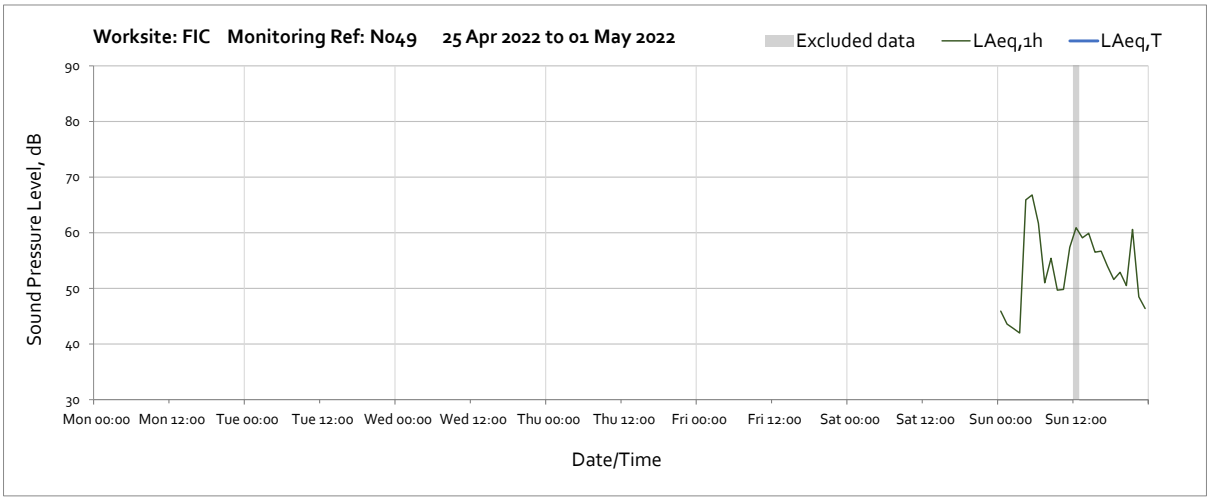
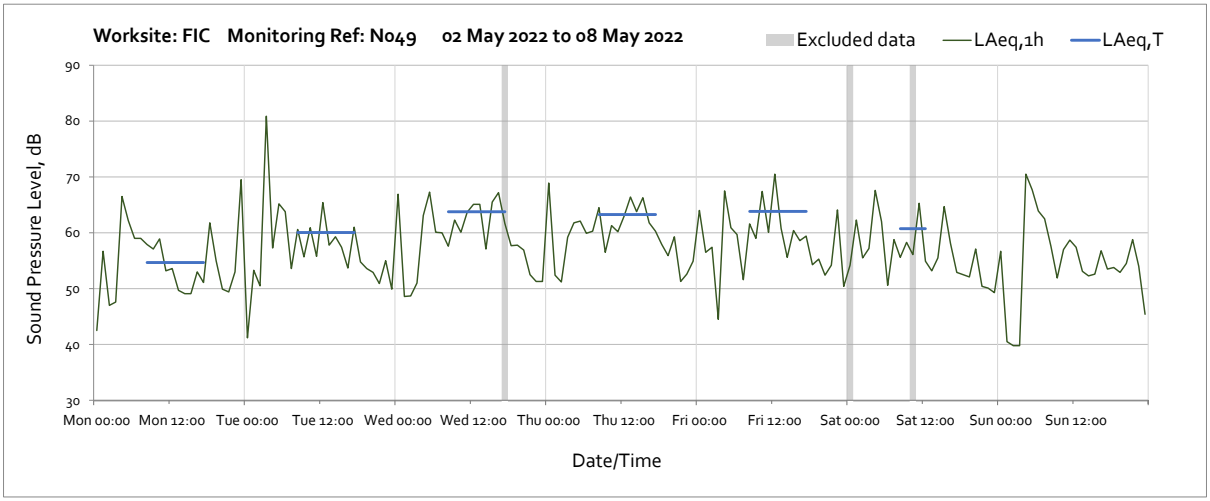
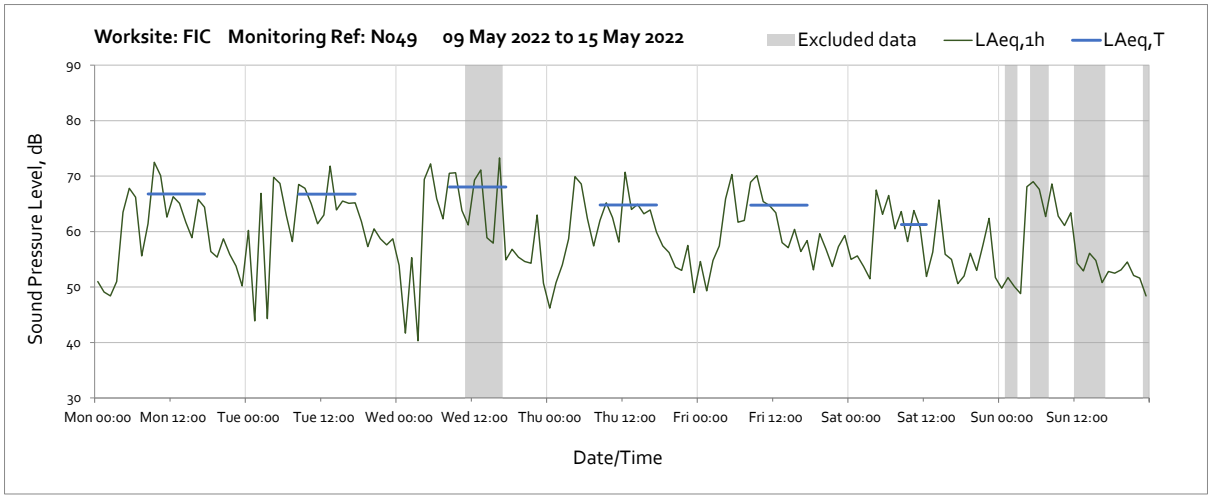
30
Mon 00:00 Mon 12:00 Tue 00:00 Tue 12:00 Wed 00:00 Wed 12:00 Thu 00:00 Thu 12:00 Fri 00:00 Fri 12:00 Sat 00:00 Sat 12:00 Sun 00:00 Sun 12:00
Date/Time



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






Worksite: FIC Monitoring Ref: No49 09 May 2022 to 15 May 2022
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
90
80
70
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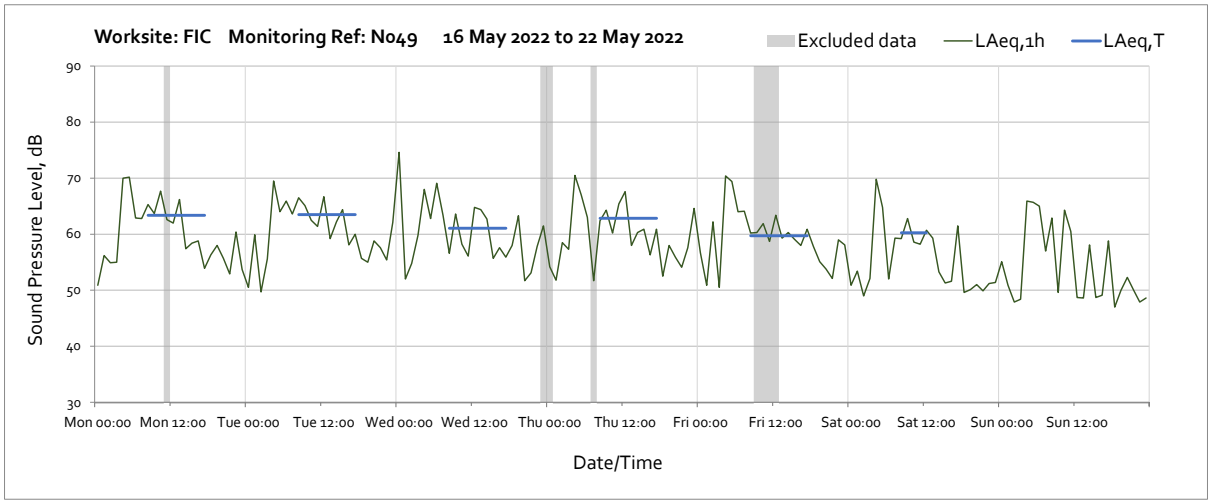
Sun 00:00
Sun 12:00
Date/Time


Worksite: FIC Monitoring Ref: No49 16 May 2022 to 22 May 2022
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
90
80
70
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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Thu 12:00
Fri 00:00
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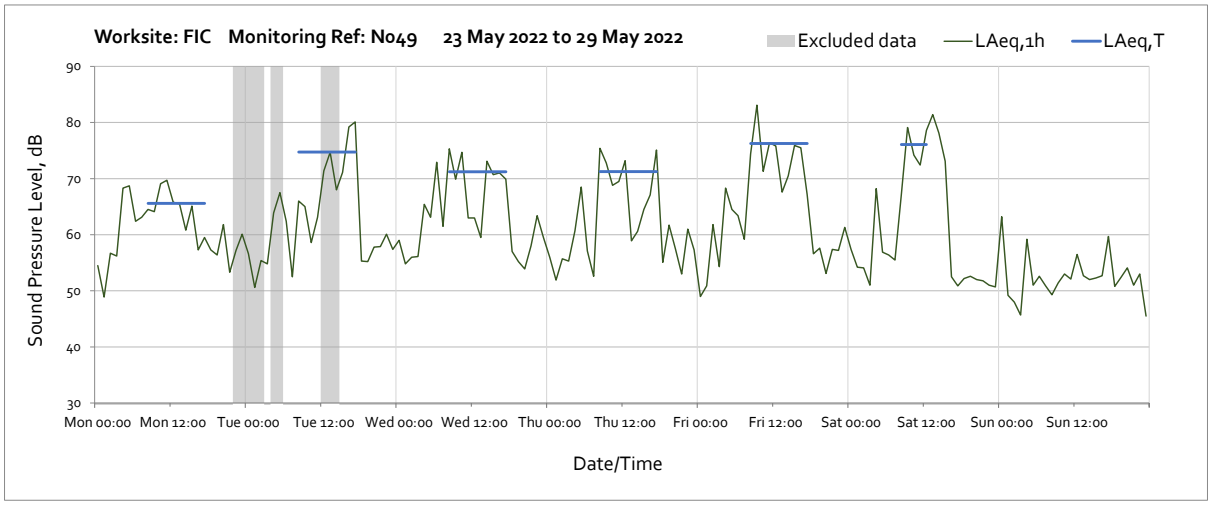
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time


Worksite: FIC Monitoring Ref: No49 23 May 2022 to 29 May 2022
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
90
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70
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Wed 00:00
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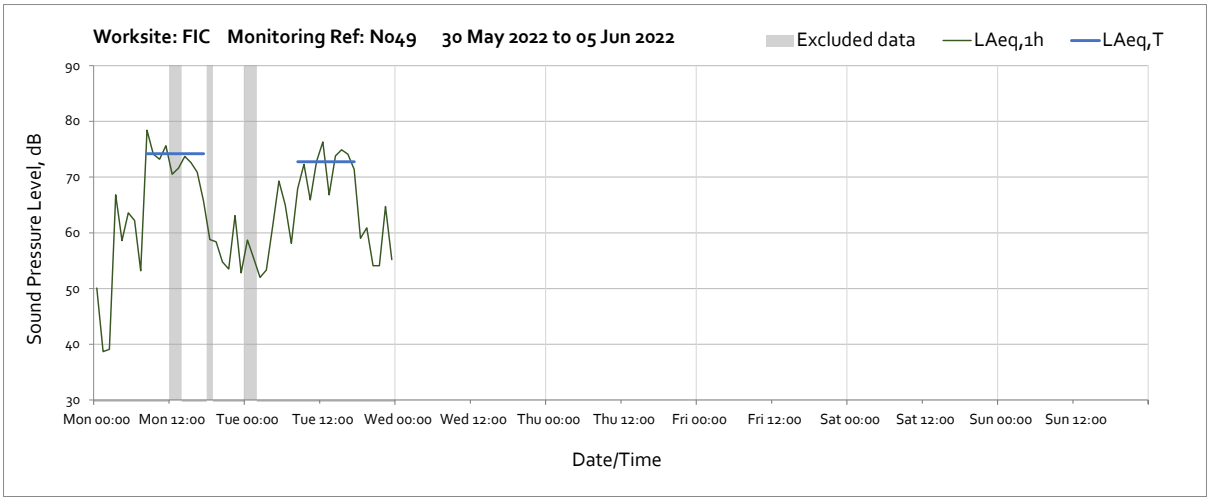
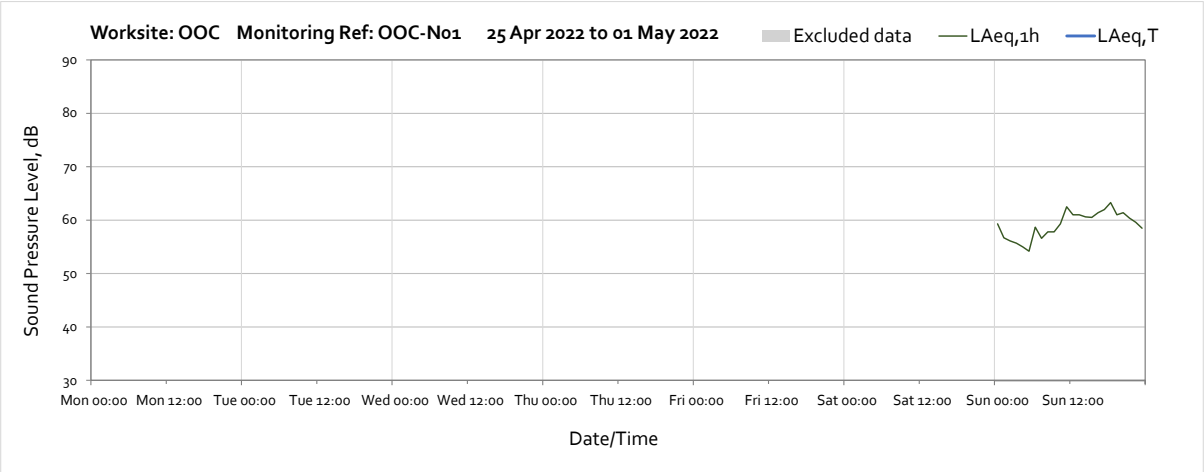
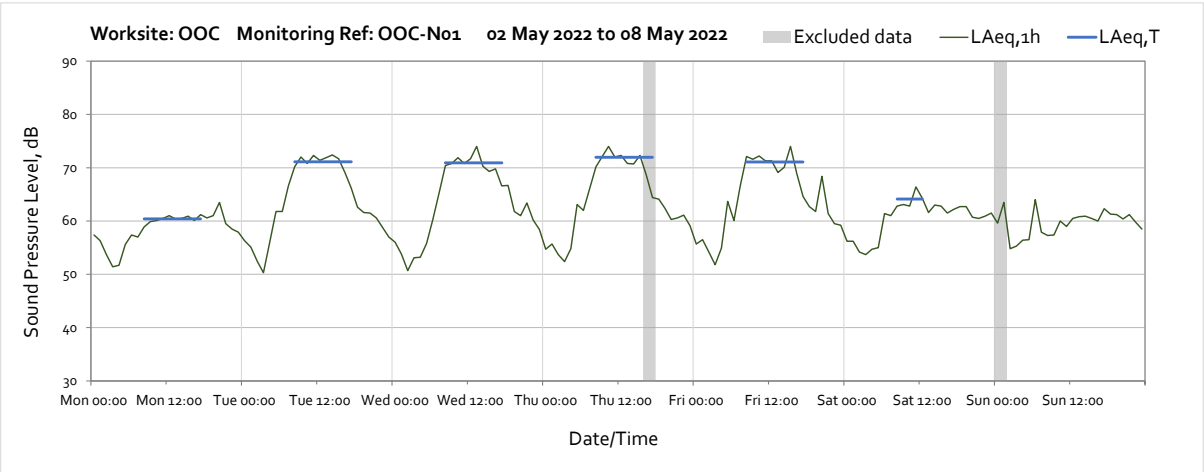
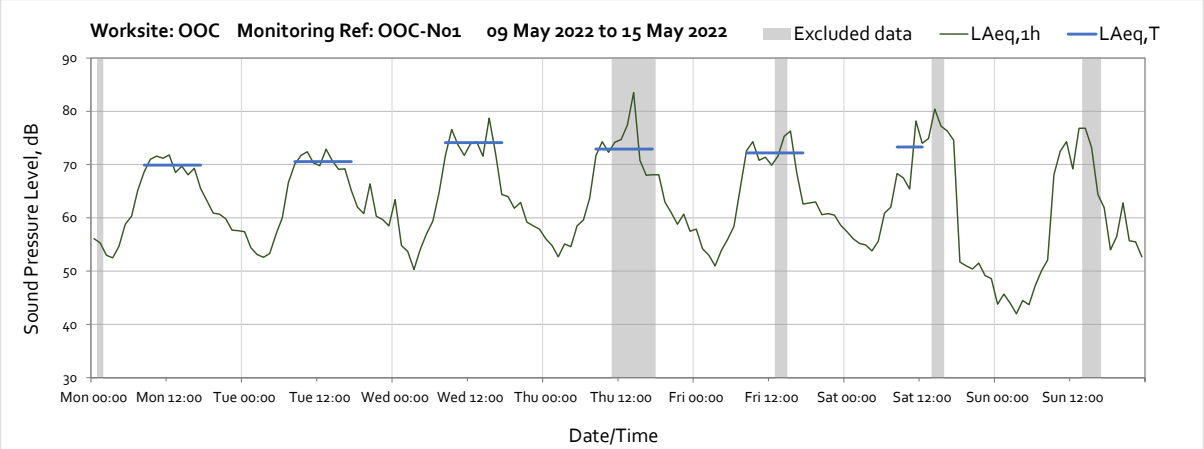
Sun 12:00
Date/Time



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






Worksite: OOC Monitoring Ref: OOC-No1 09 May 2022 to 15 May 2022
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
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80
70
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50
40
30
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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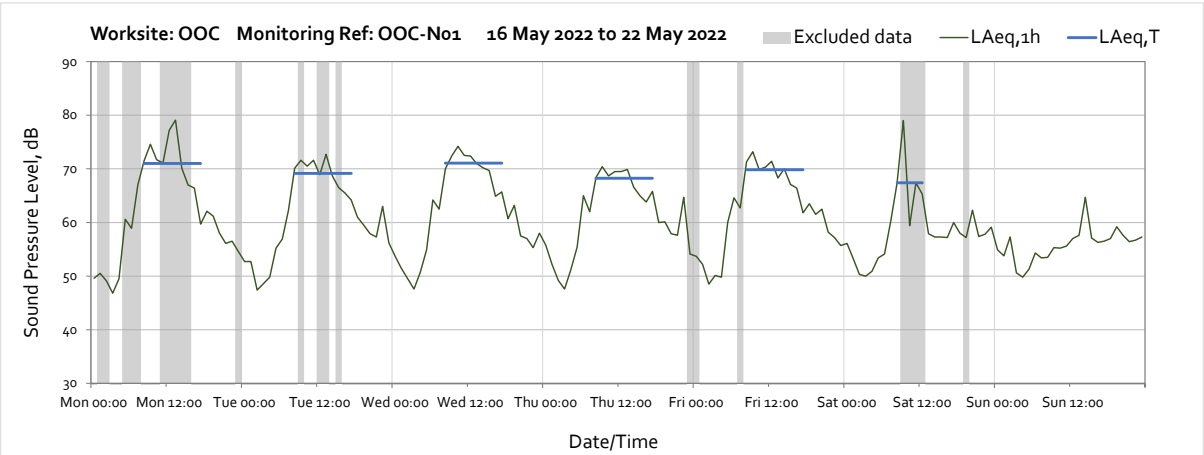
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time


Worksite: OOC Monitoring Ref: OOC-No1 16 May 2022 to 22 May 2022
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
90
80
70
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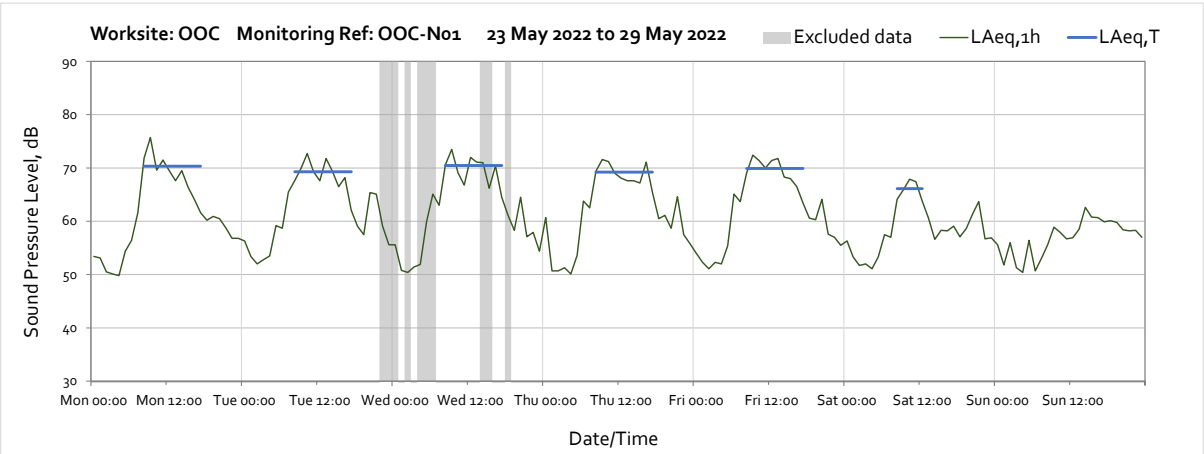
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
Wed 12:00
Thu 00:00
Thu 12:00
Fri 00:00
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time


Worksite: OOC Monitoring Ref: OOC-No1 23 May 2022 to 29 May 2022
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
90
80
70
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Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
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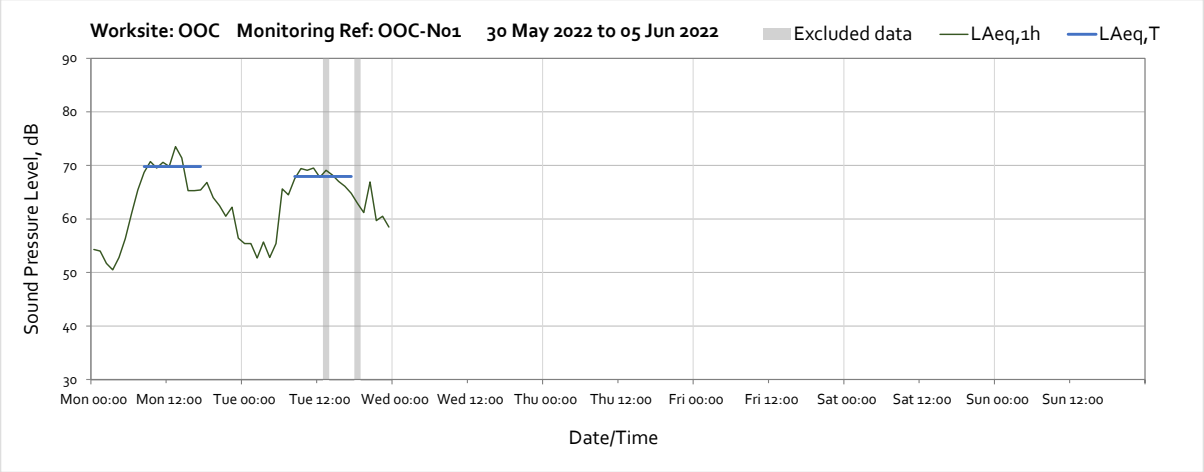
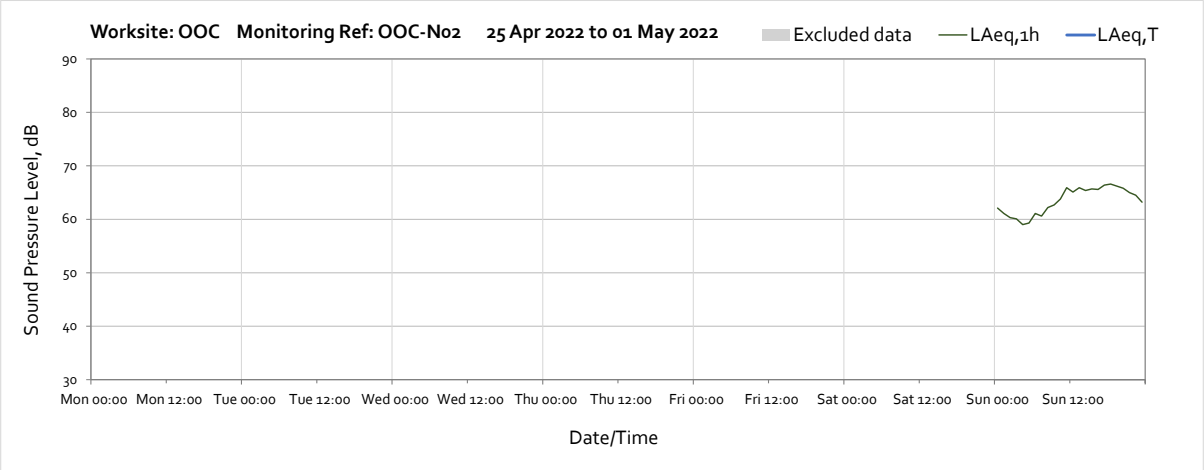
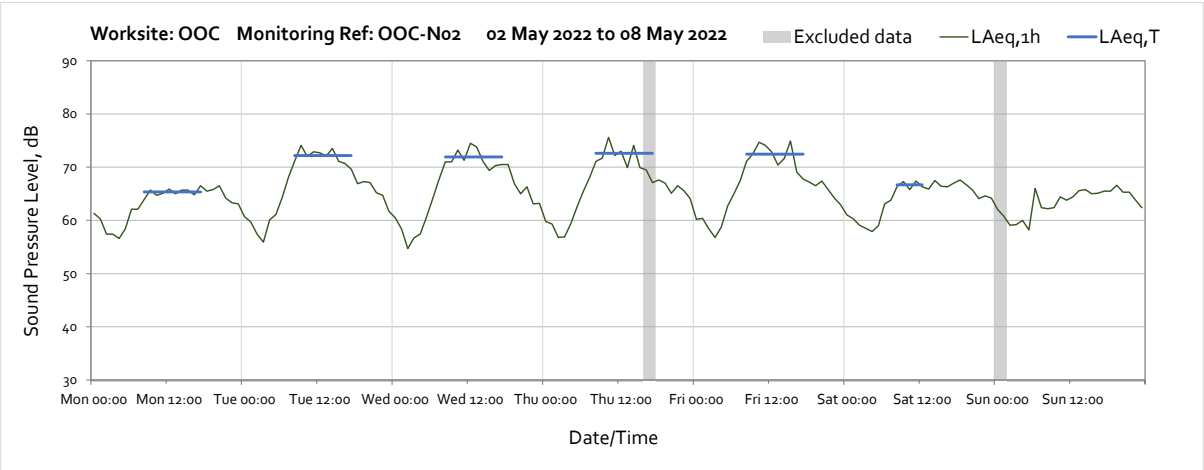
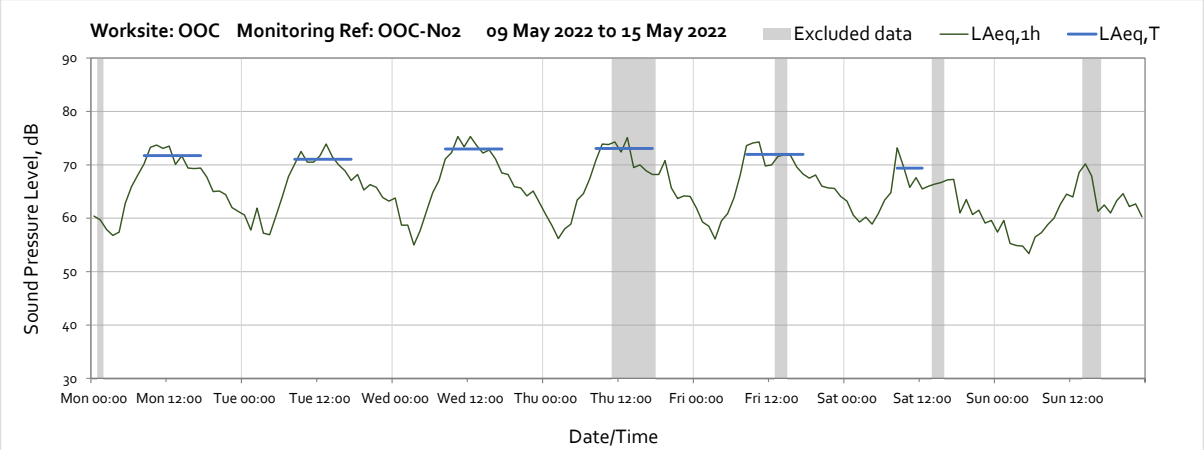
Thu 12:00
Fri 00:00
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time



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






Worksite: OOC Monitoring Ref: OOC-No2 09 May 2022 to 15 May 2022
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
90
80
70
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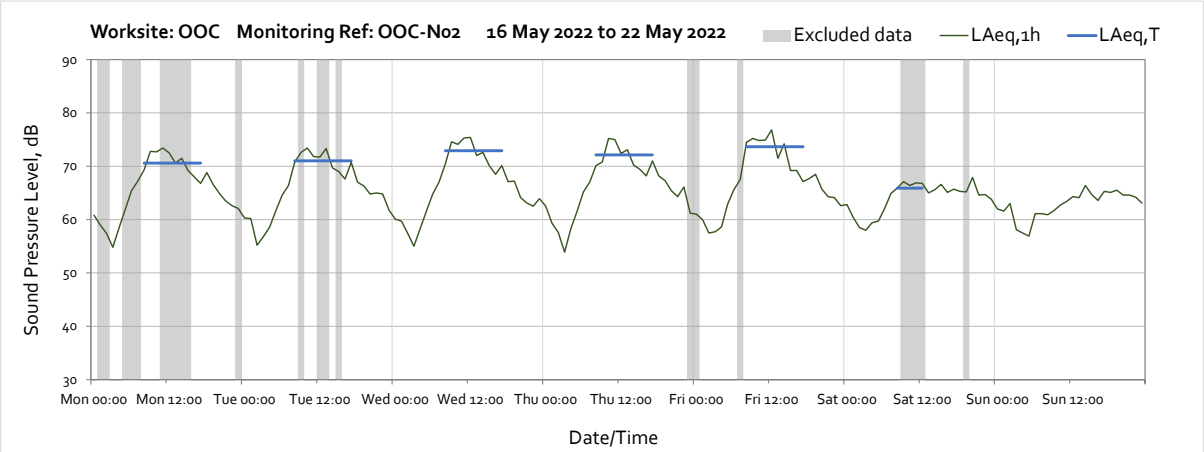
40
30
Mon 00:00 Mon 12:00 Tue 00:00 Tue 12:00 Wed 00:00 Wed 12:00 Thu 00:00 Thu 12:00 Fri 00:00 Fri 12:00 Sat 00:00 Sat 12:00 Sun 00:00 Sun 12:00
Date/Time


Worksite: OOC Monitoring Ref: OOC-No2 16 May 2022 to 22 May 2022
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
90
80
70
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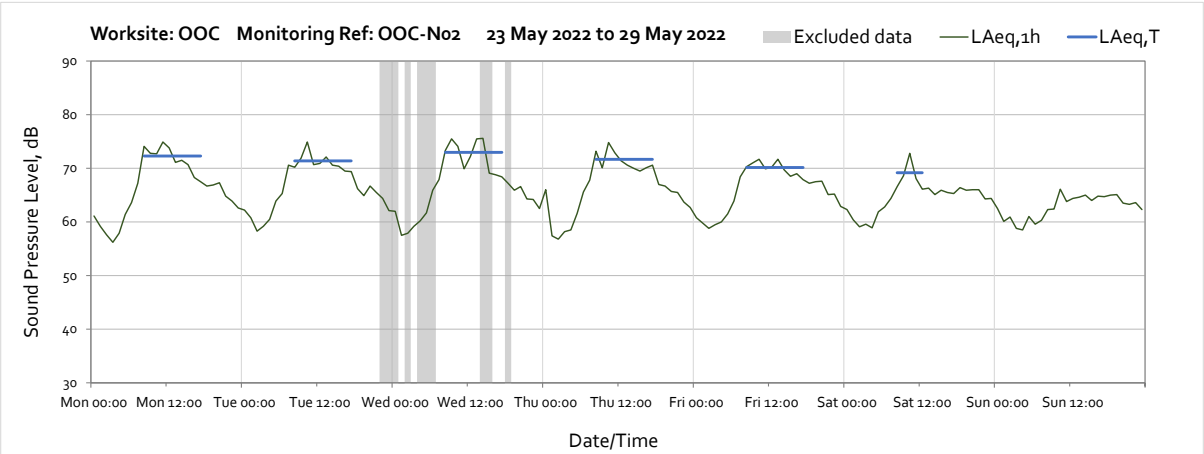
40
30
Mon 00:00 Mon 12:00 Tue 00:00 Tue 12:00 Wed 00:00 Wed 12:00 Thu 00:00 Thu 12:00 Fri 00:00 Fri 12:00 Sat 00:00 Sat 12:00 Sun 00:00 Sun 12:00
Date/Time


Worksite: OOC Monitoring Ref: OOC-No2 23 May 2022 to 29 May 2022
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
90
80
70
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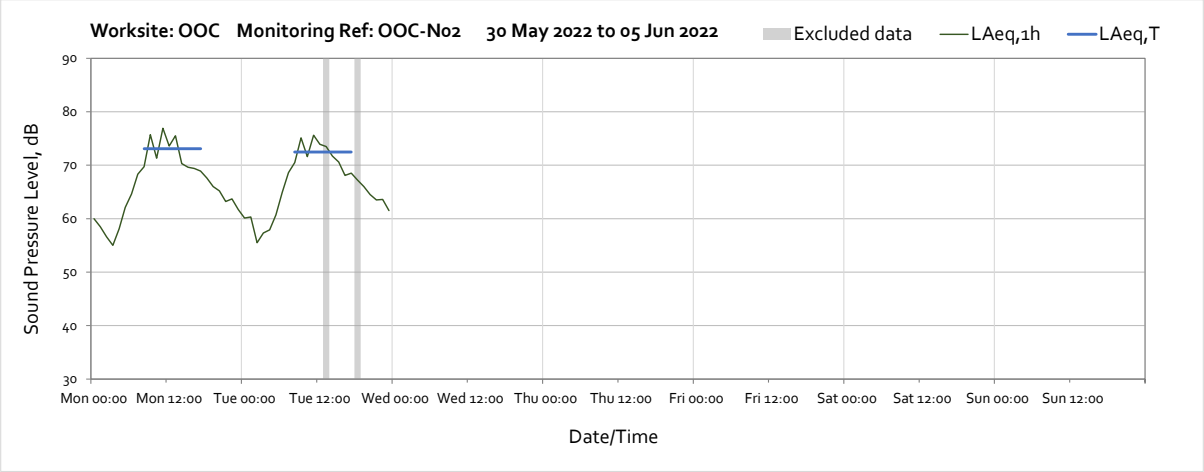
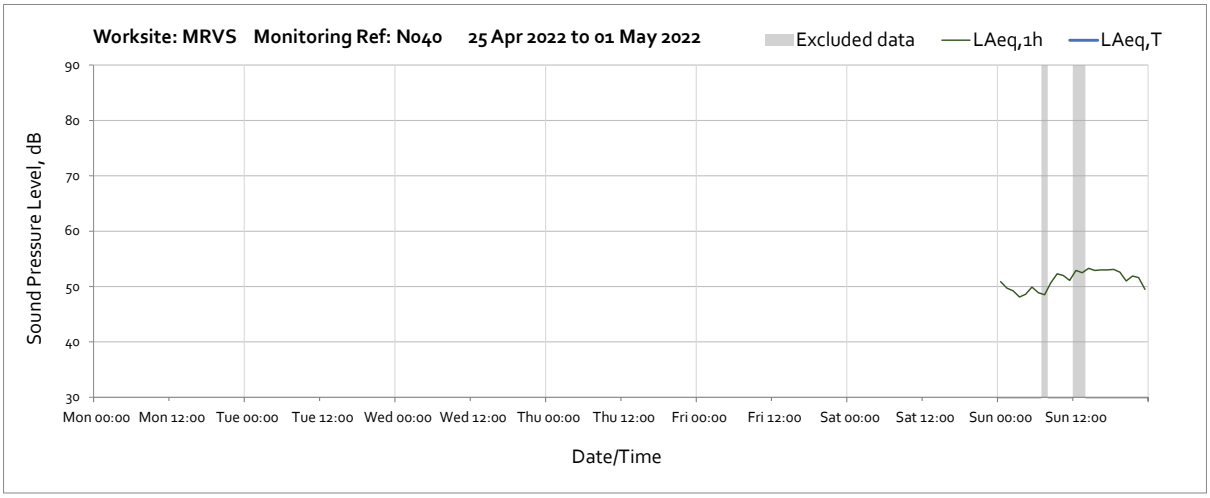
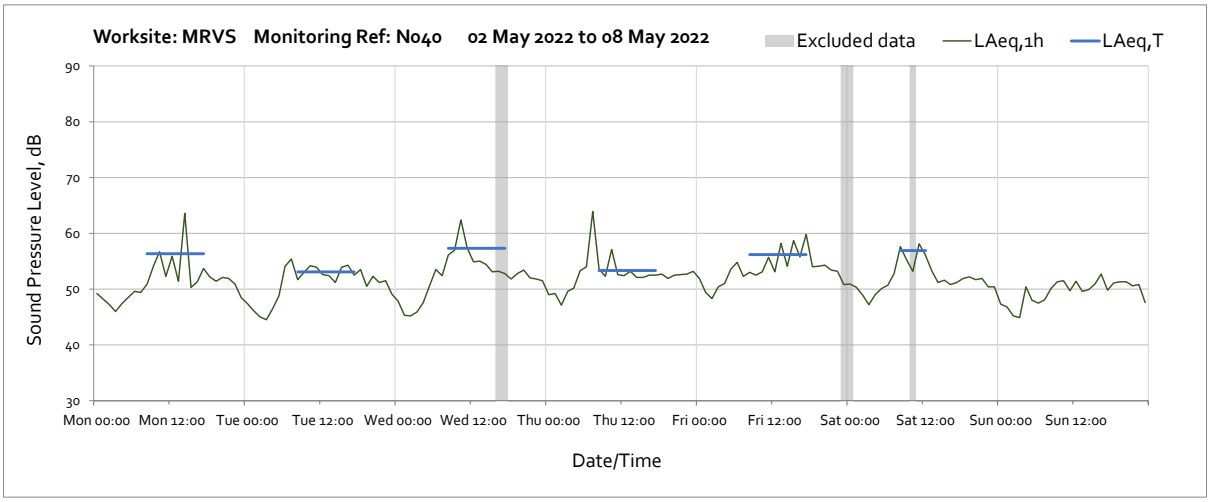
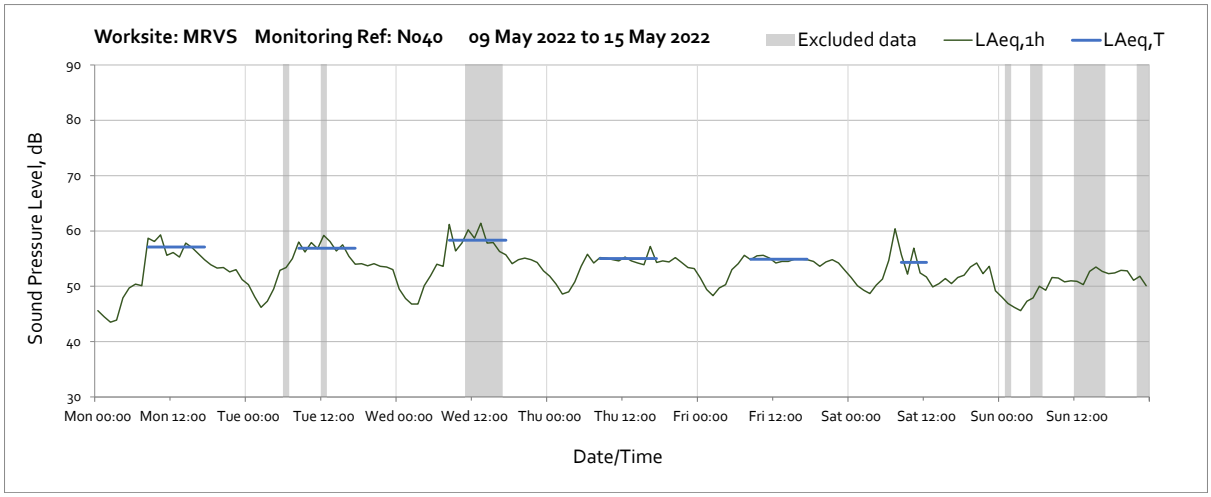
40
30
Mon 00:00 Mon 12:00 Tue 00:00 Tue 12:00 Wed 00:00 Wed 12:00 Thu 00:00 Thu 12:00 Fri 00:00 Fri 12:00 Sat 00:00 Sat 12:00 Sun 00:00 Sun 12:00
Date/Time

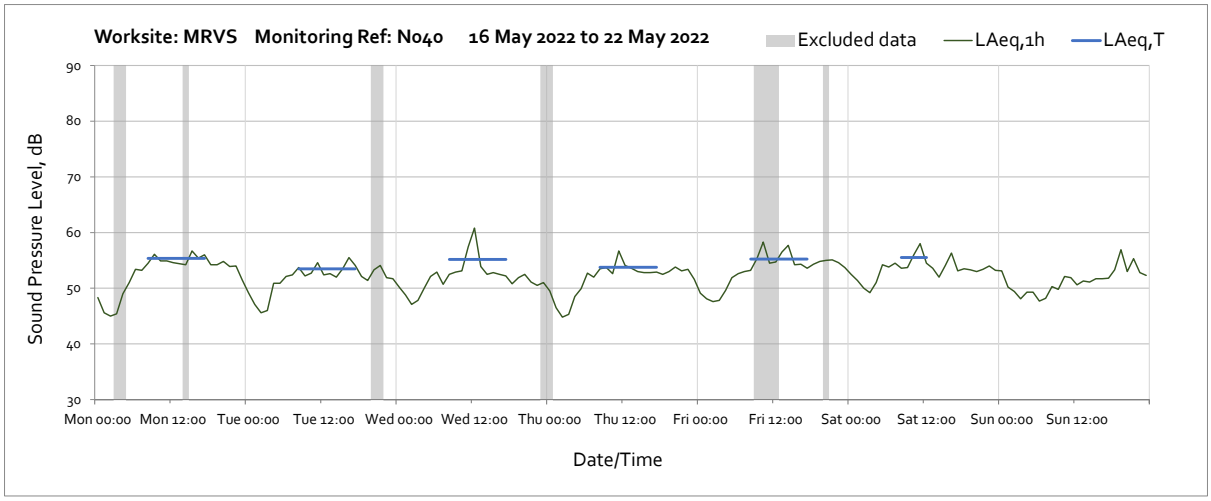


Worksite: Mandeville Road Ventilation Shaft (MRVS) – Monitoring Ref: N040






Worksite: MRVS Monitoring Ref: No40 09 May 2022 to 15 May 2022
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
90
80
70
60
50
40
30
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: No40 16 May 2022 to 22 May 2022
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
90
80
70
60
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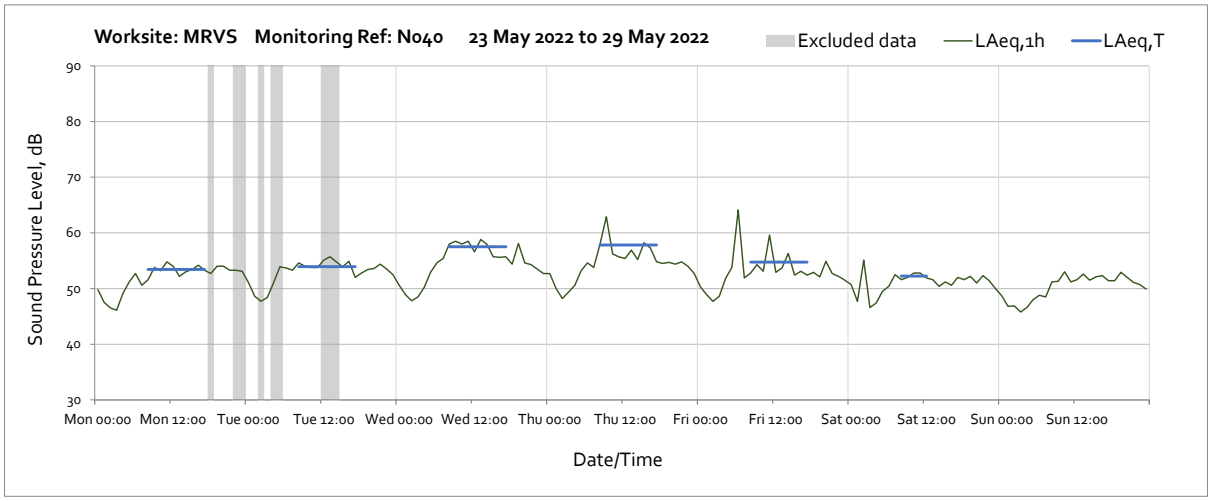
40
30
Mon 00:00 Mon 12:00 Tue 00:00 Tue 12:00 Wed 00:00 Wed 12:00 Thu 00:00 Thu 12:00 Fri 00:00 Fri 12:00 Sat 00:00 Sat 12:00 Sun 00:00 Sun 12:00
Date/Time


Worksite: MRVS Monitoring Ref: No40 23 May 2022 to 29 May 2022
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
90
80
70
60
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40
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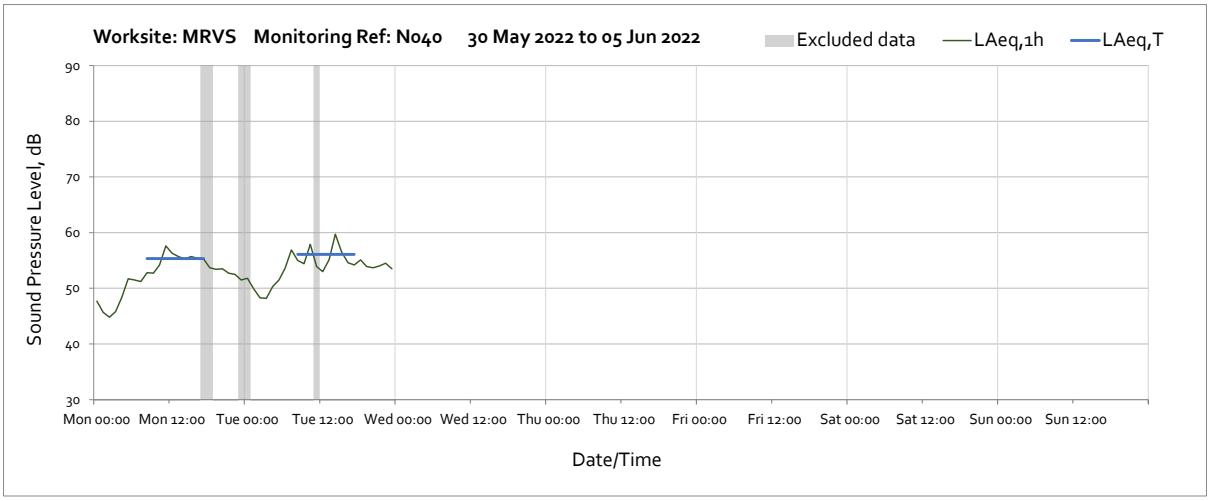
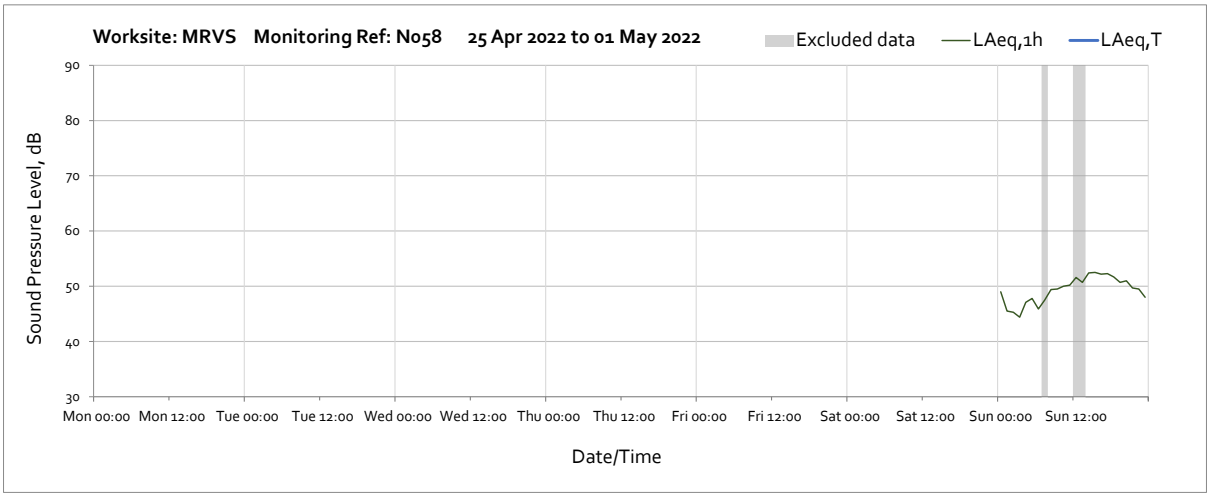
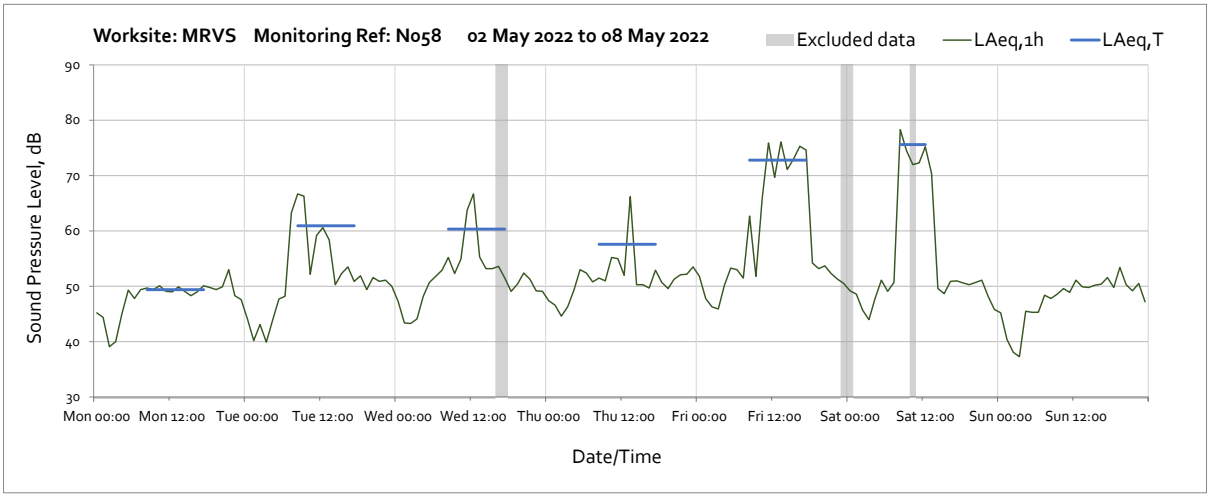
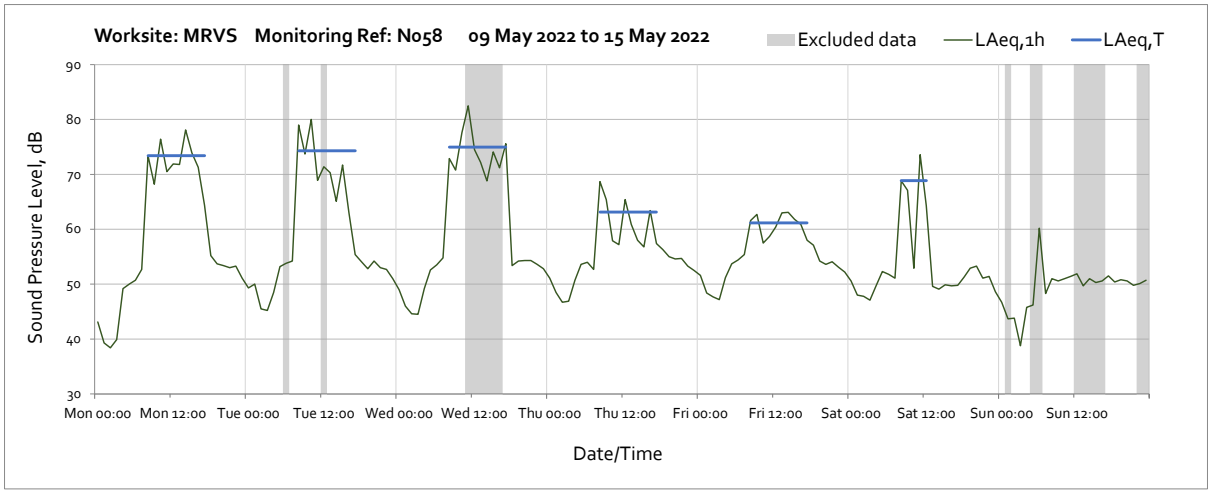
Mon 00:00 Mon 12:00 Tue 00:00 Tue 12:00 Wed 00:00 Wed 12:00 Thu 00:00 Thu 12:00 Fri 00:00 Fri 12:00 Sat 00:00 Sat 12:00 Sun 00:00 Sun 12:00
Date/Time



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






Worksite: MRVS Monitoring Ref: No58 09 May 2022 to 15 May 2022
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
90
80
70
60
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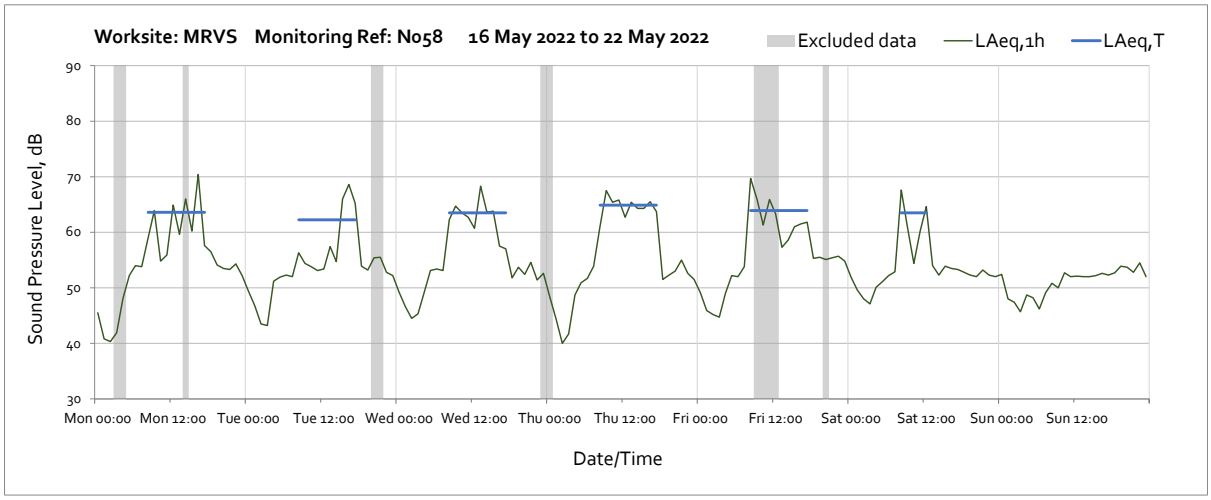
40
30
Mon 00:00 Mon 12:00 Tue 00:00 Tue 12:00 Wed 00:00 Wed 12:00 Thu 00:00 Thu 12:00 Fri 00:00 Fri 12:00 Sat 00:00 Sat 12:00 Sun 00:00 Sun 12:00
Date/Time


Worksite: MRVS Monitoring Ref: No58 16 May 2022 to 22 May 2022
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
90
80
70
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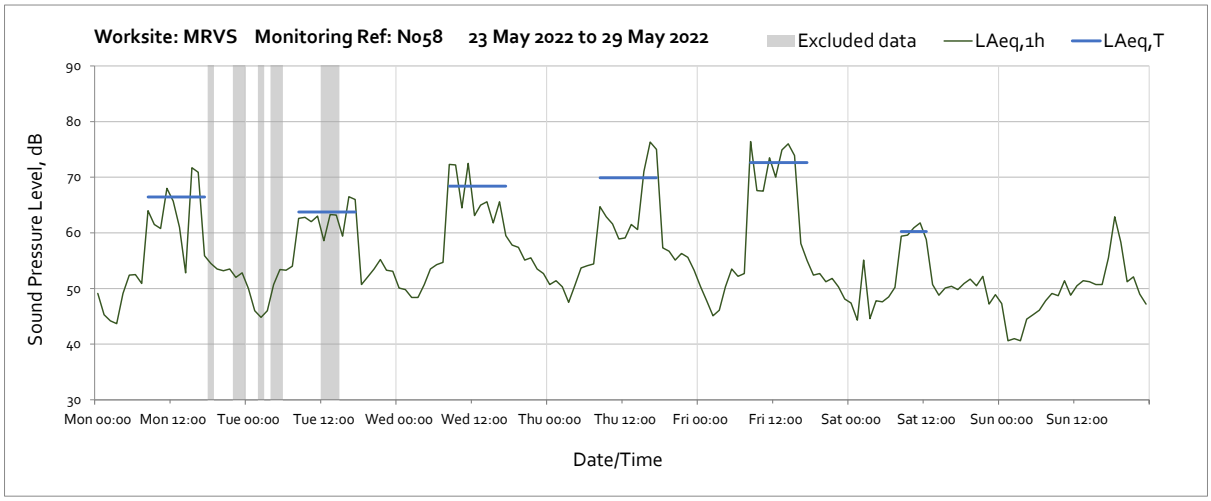
Mon 00:00 Mon 12:00 Tue 00:00 Tue 12:00 Wed 00:00 Wed 12:00 Thu 00:00 Thu 12:00 Fri 00:00 Fri 12:00 Sat 00:00 Sat 12:00 Sun 00:00 Sun 12:00
Date/Time


Worksite: MRVS Monitoring Ref: No58 23 May 2022 to 29 May 2022
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
90
80
70
60
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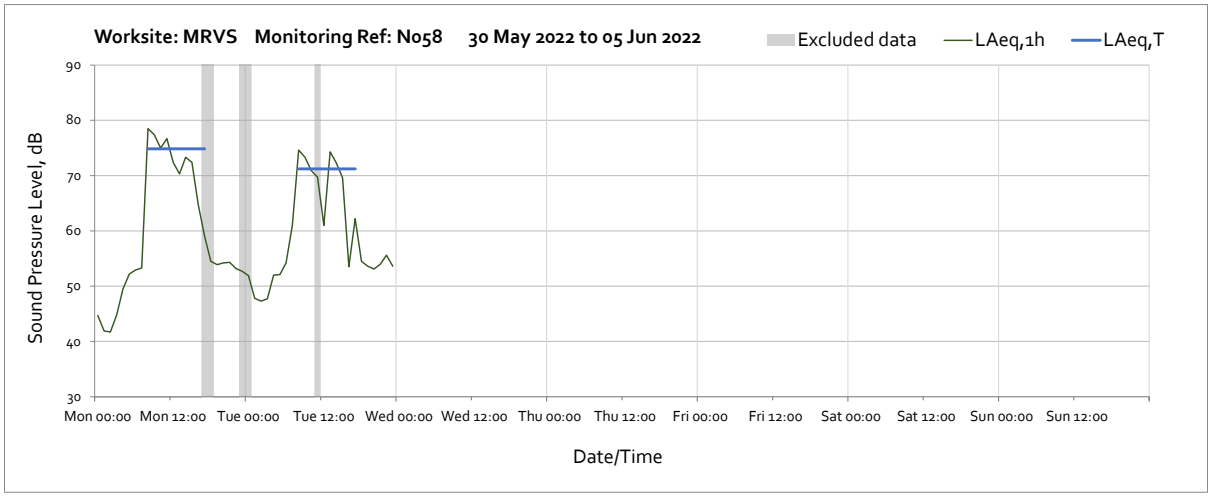
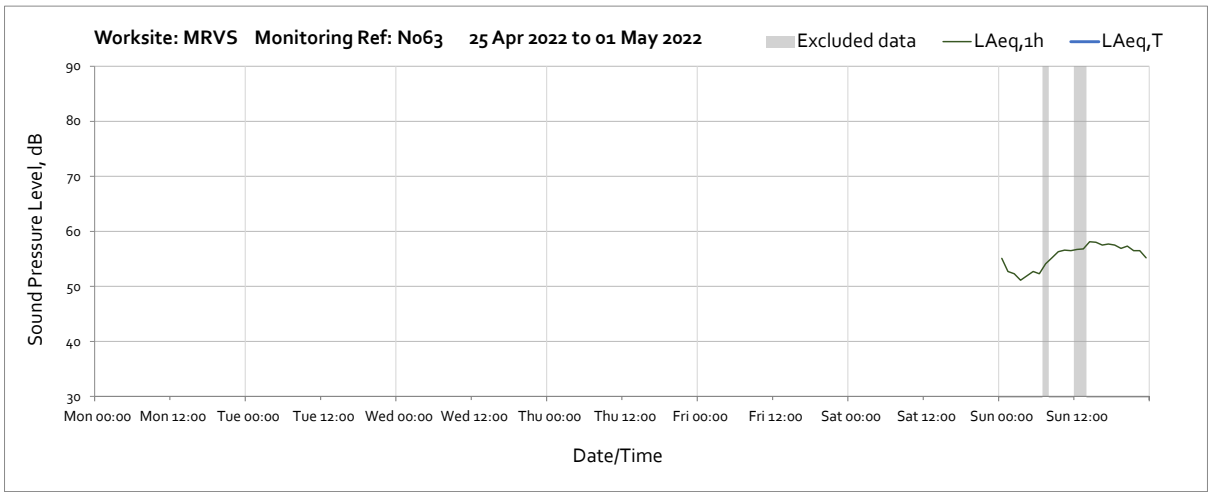
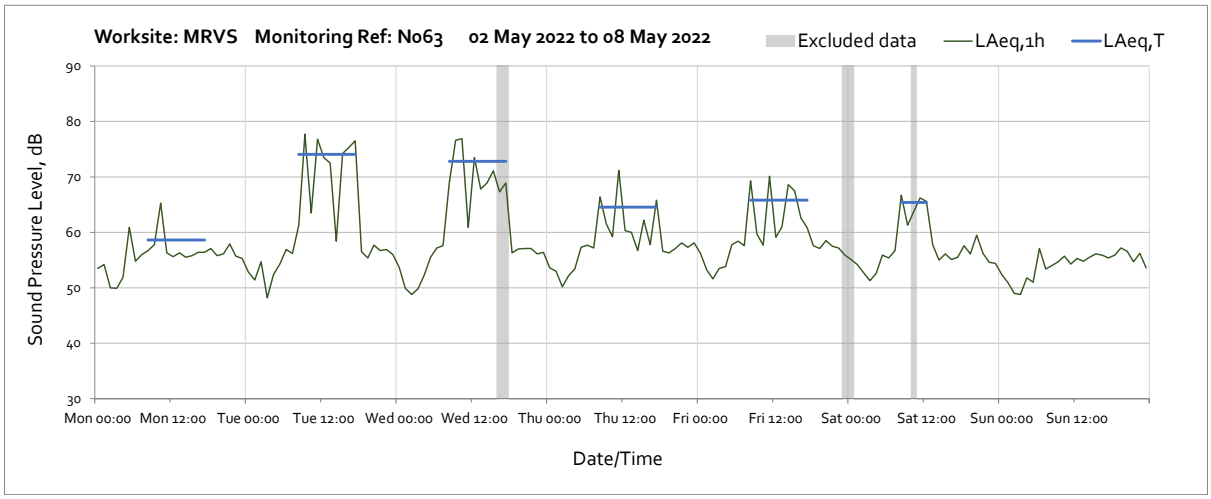
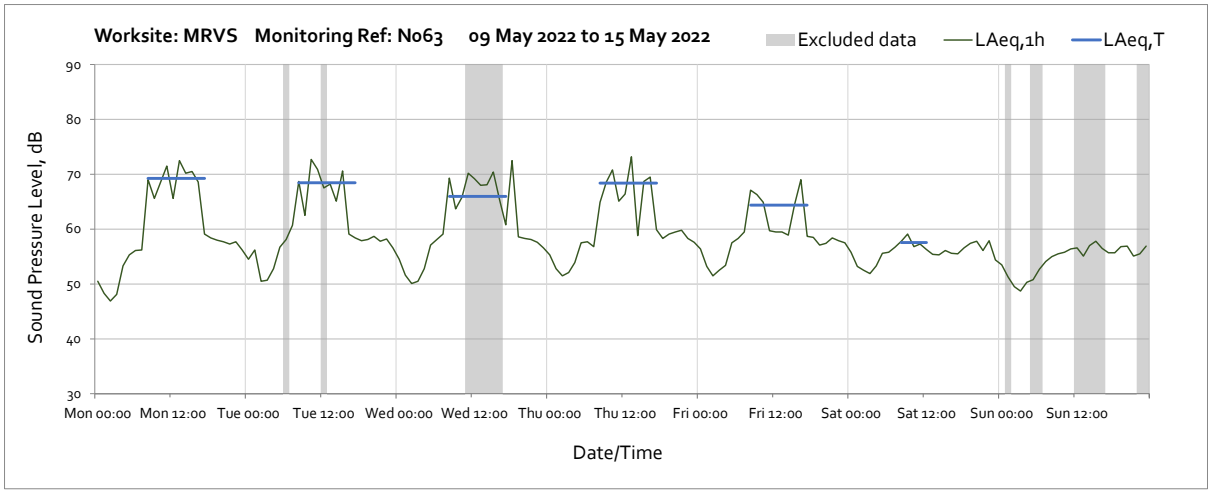
40
30
Mon 00:00 Mon 12:00 Tue 00:00 Tue 12:00 Wed 00:00 Wed 12:00 Thu 00:00 Thu 12:00 Fri 00:00 Fri 12:00 Sat 00:00 Sat 12:00 Sun 00:00 Sun 12:00
Date/Time



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






Worksite: MRVS Monitoring Ref: No63 09 May 2022 to 15 May 2022
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
90
80
70
60
50
40
30
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
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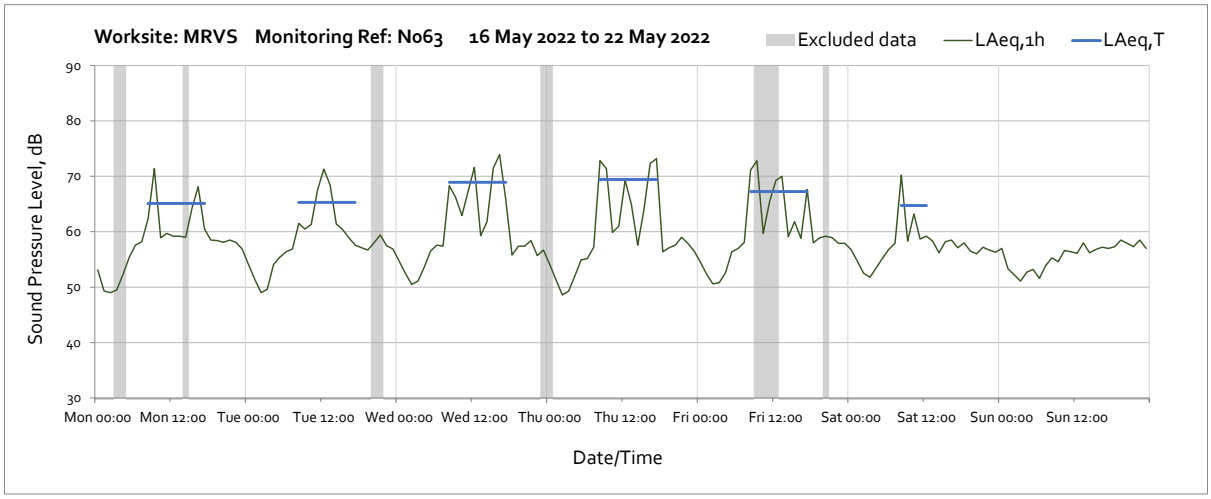
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time


Worksite: MRVS Monitoring Ref: No63 16 May 2022 to 22 May 2022
Excluded data
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LAeq,T
Sound Pressure Level, dB
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70
60
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Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
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Sat 12:00
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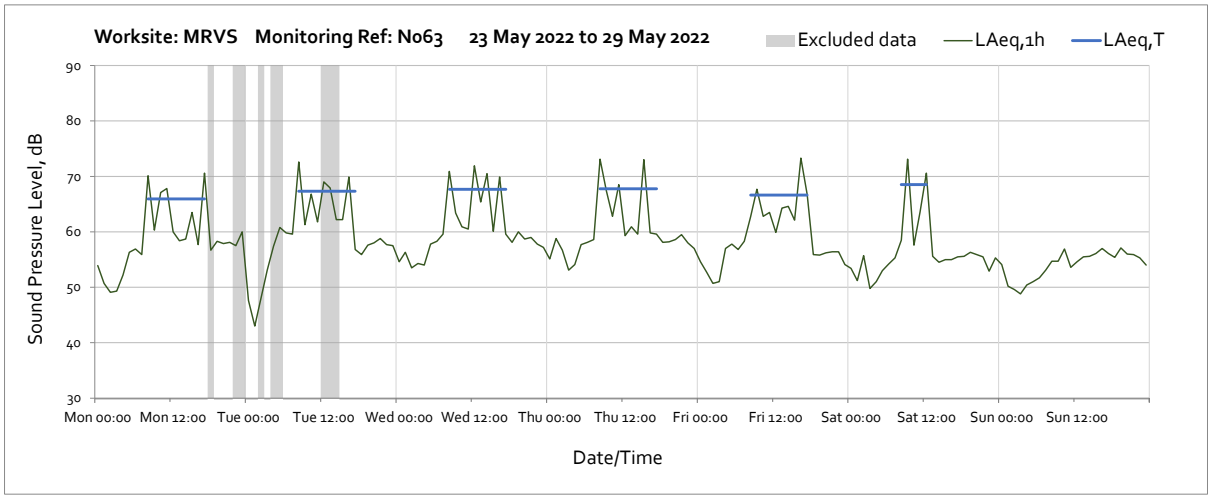
Sun 12:00
Date/Time


Worksite: MRVS Monitoring Ref: No63 23 May 2022 to 29 May 2022
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
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80
70
60
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Tue 12:00
Wed 00:00
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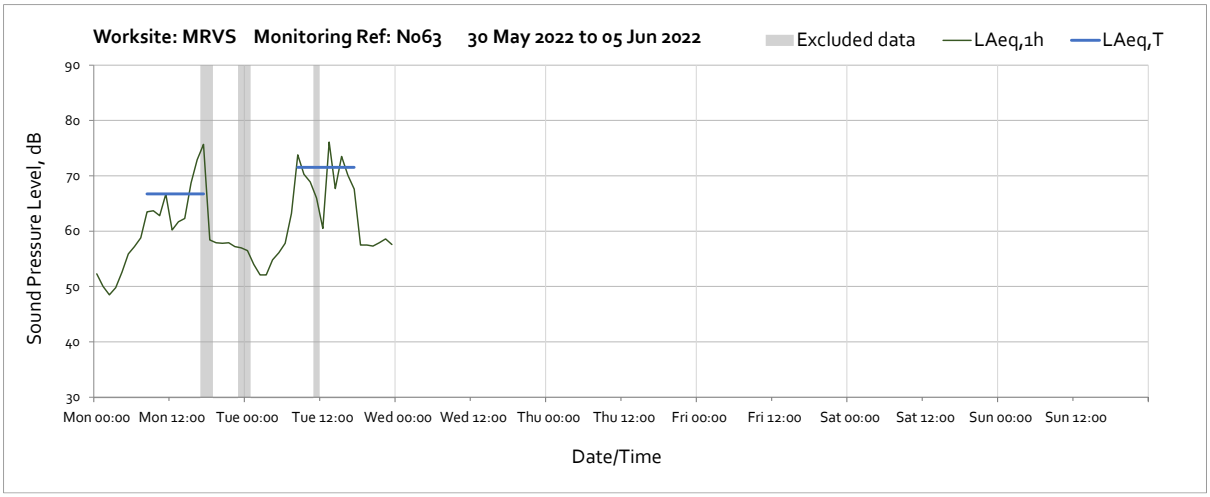
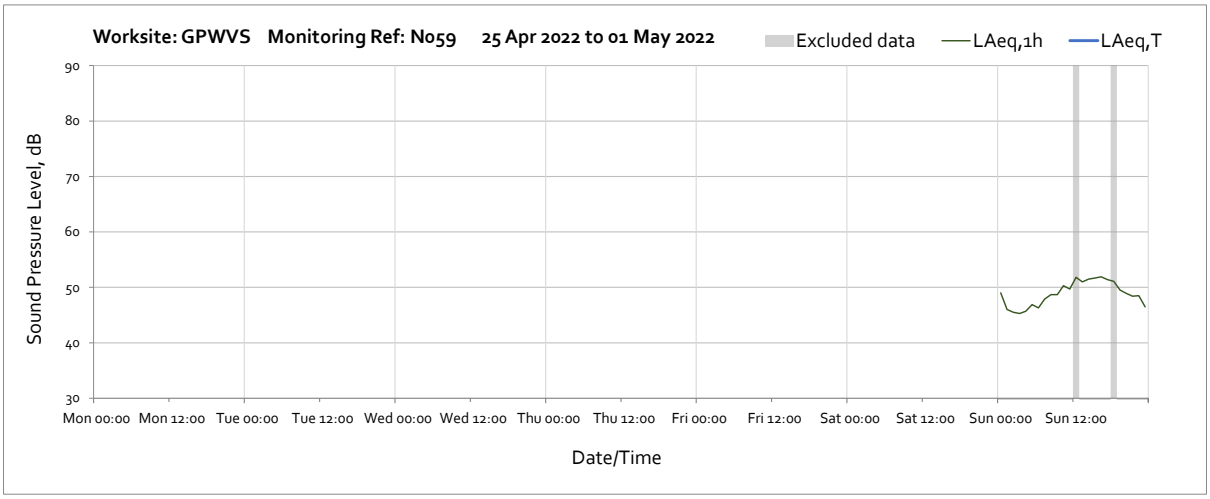
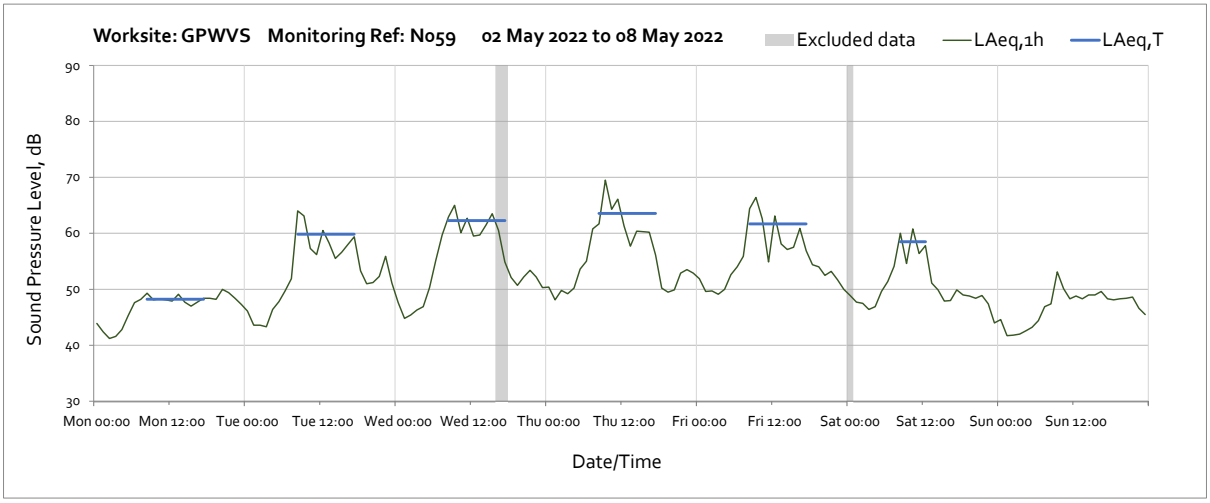
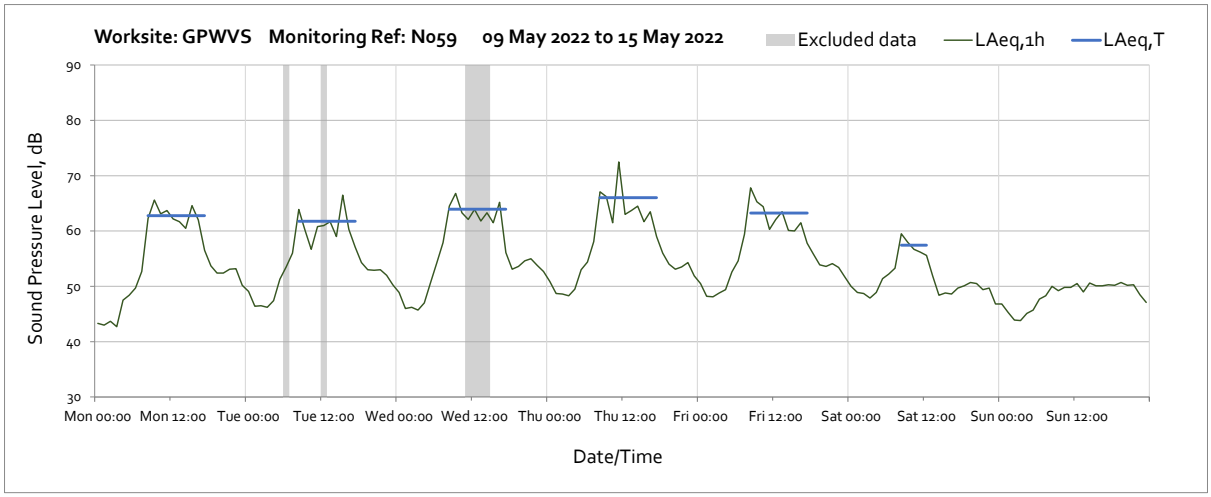
Sun 00:00
Sun 12:00
Date/Time



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






Worksite: GPWVS Monitoring Ref: No59 09 May 2022 to 15 May 2022
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
90
80
70
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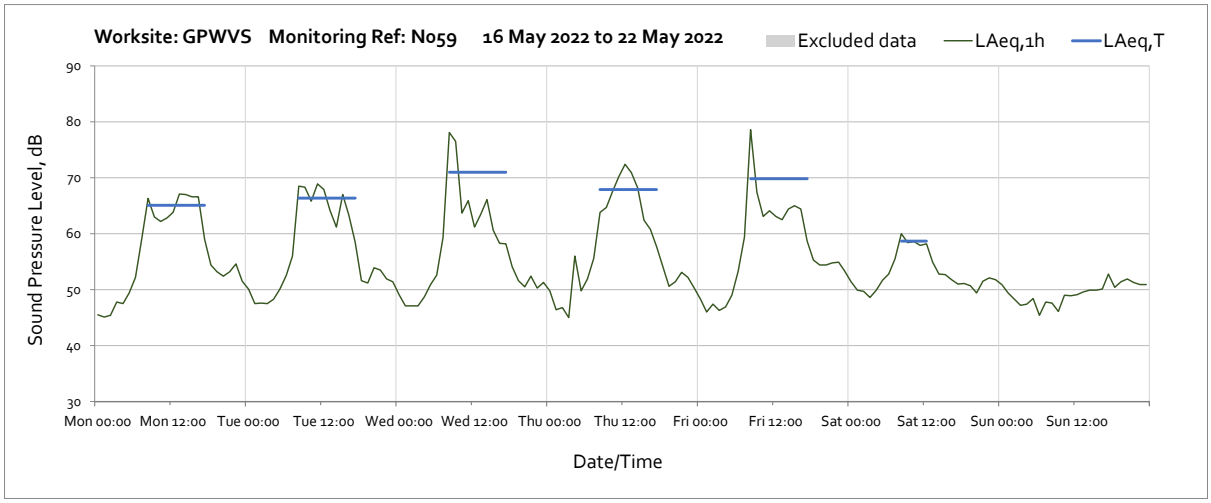
40
30
Mon 00:00 Mon 12:00 Tue 00:00 Tue 12:00 Wed 00:00 Wed 12:00 Thu 00:00 Thu 12:00 Fri 00:00 Fri 12:00 Sat 00:00 Sat 12:00 Sun 00:00 Sun 12:00
Date/Time


Worksite: GPWVS Monitoring Ref: No59 16 May 2022 to 22 May 2022
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
90
80
70
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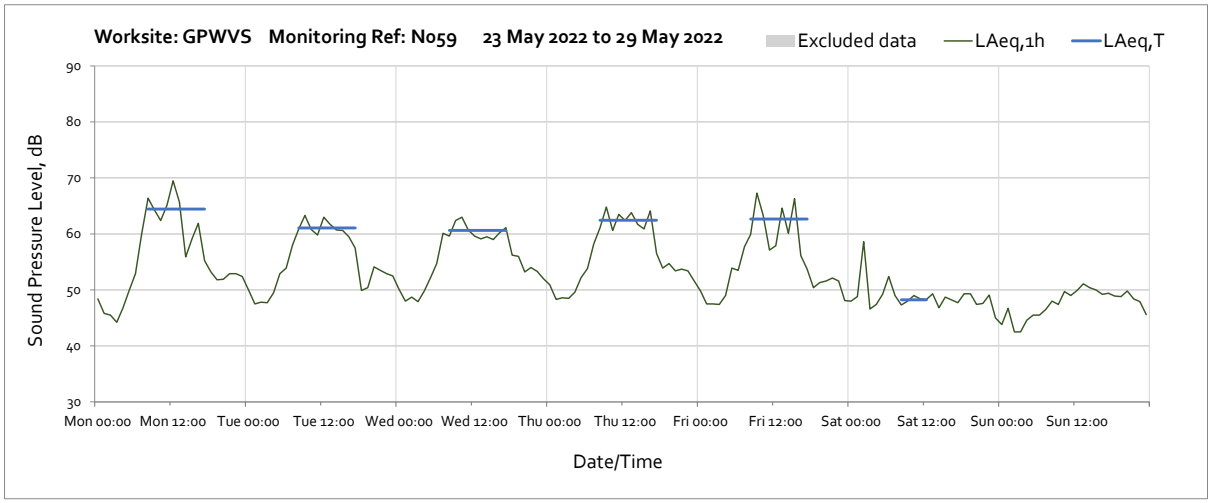
40
30
Mon 00:00 Mon 12:00 Tue 00:00 Tue 12:00 Wed 00:00 Wed 12:00 Thu 00:00 Thu 12:00 Fri 00:00 Fri 12:00 Sat 00:00 Sat 12:00 Sun 00:00 Sun 12:00
Date/Time


Worksite: GPWVS Monitoring Ref: No59 23 May 2022 to 29 May 2022
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
90
80
70
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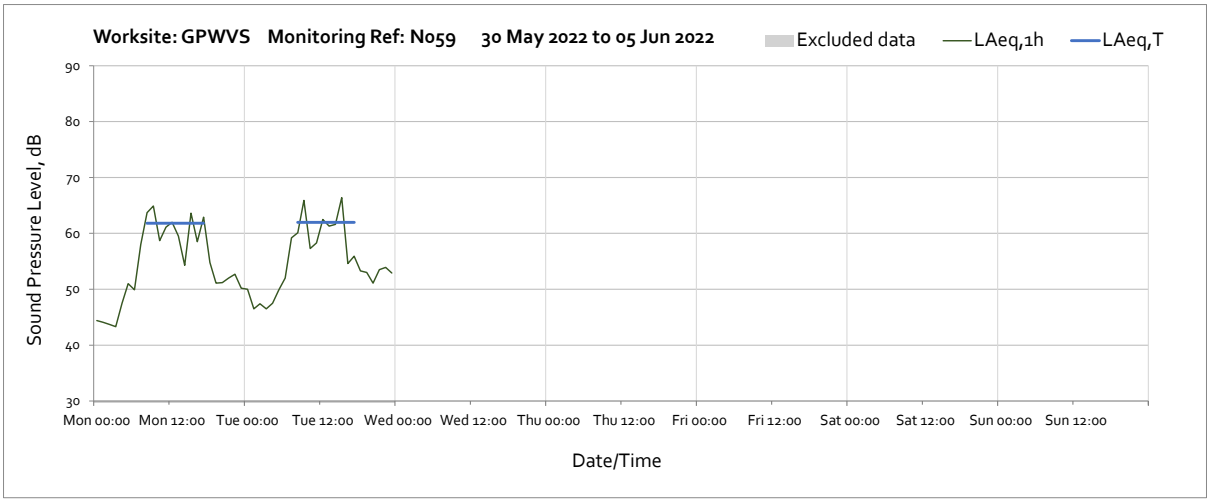
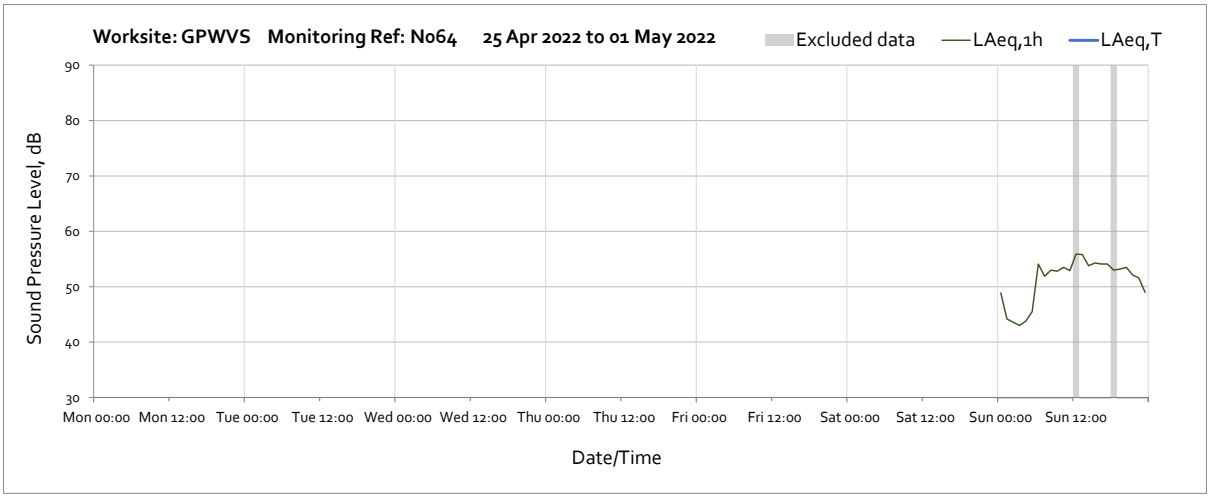
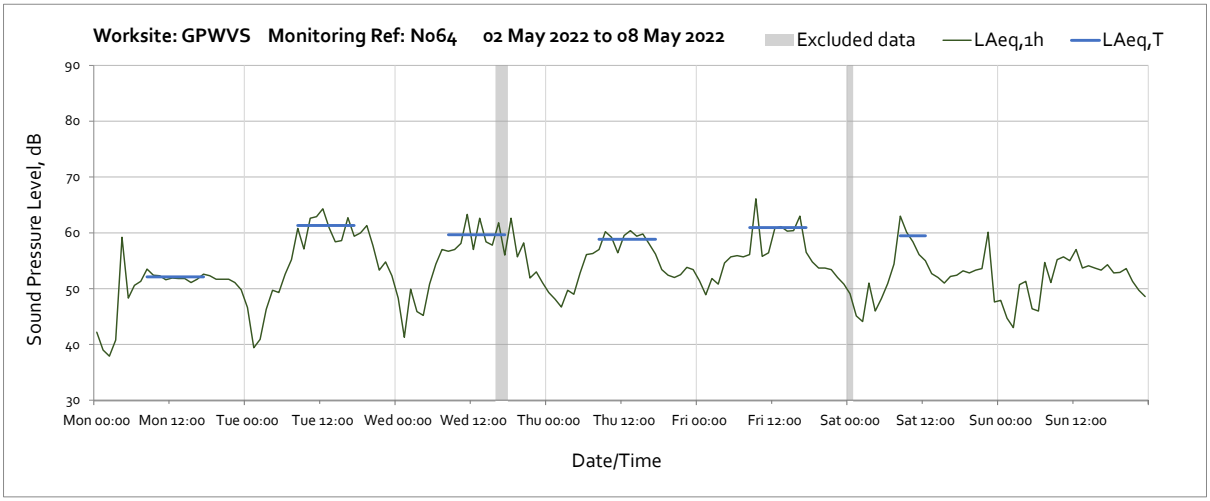
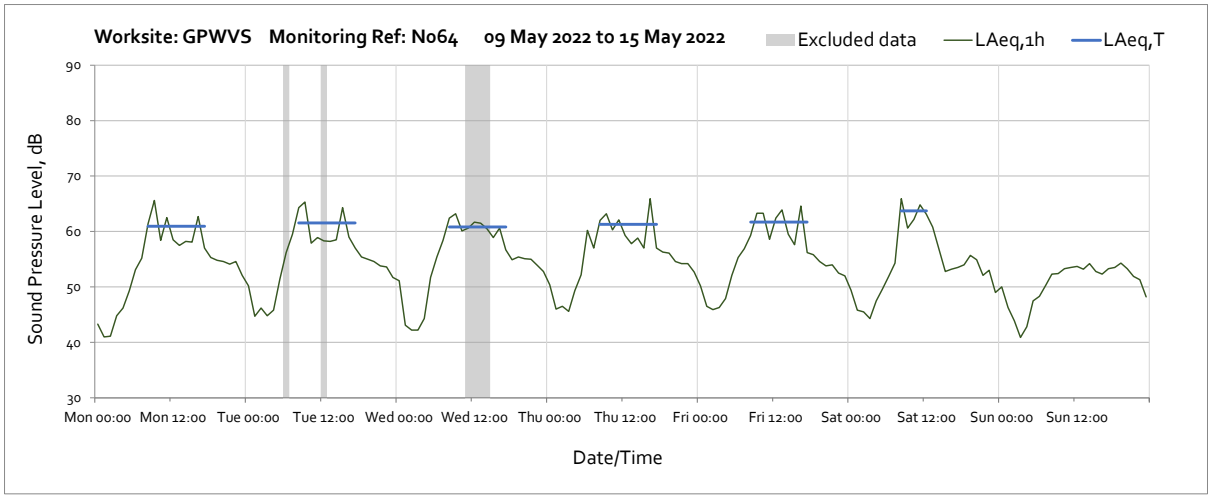
40
30
Mon 00:00 Mon 12:00 Tue 00:00 Tue 12:00 Wed 00:00 Wed 12:00 Thu 00:00 Thu 12:00 Fri 00:00 Fri 12:00 Sat 00:00 Sat 12:00 Sun 00:00 Sun 12:00
Date/Time



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






Worksite: GPWVS Monitoring Ref: No64 09 May 2022 to 15 May 2022
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
90
80
70
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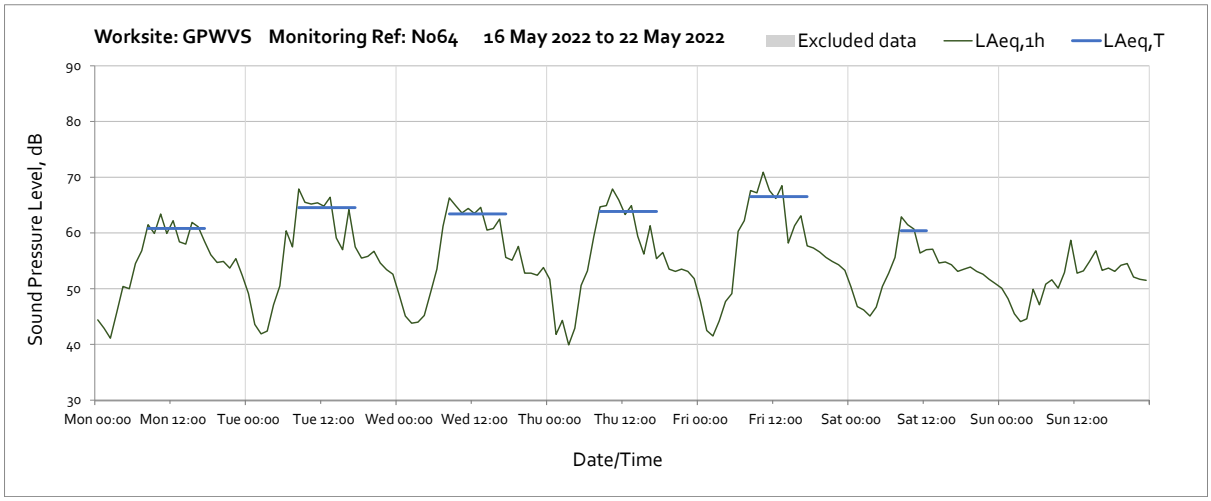
40
30
Mon 00:00 Mon 12:00 Tue 00:00 Tue 12:00 Wed 00:00 Wed 12:00 Thu 00:00 Thu 12:00 Fri 00:00 Fri 12:00 Sat 00:00 Sat 12:00 Sun 00:00 Sun 12:00
Date/Time


Worksite: GPWVS Monitoring Ref: No64 16 May 2022 to 22 May 2022
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
90
80
70
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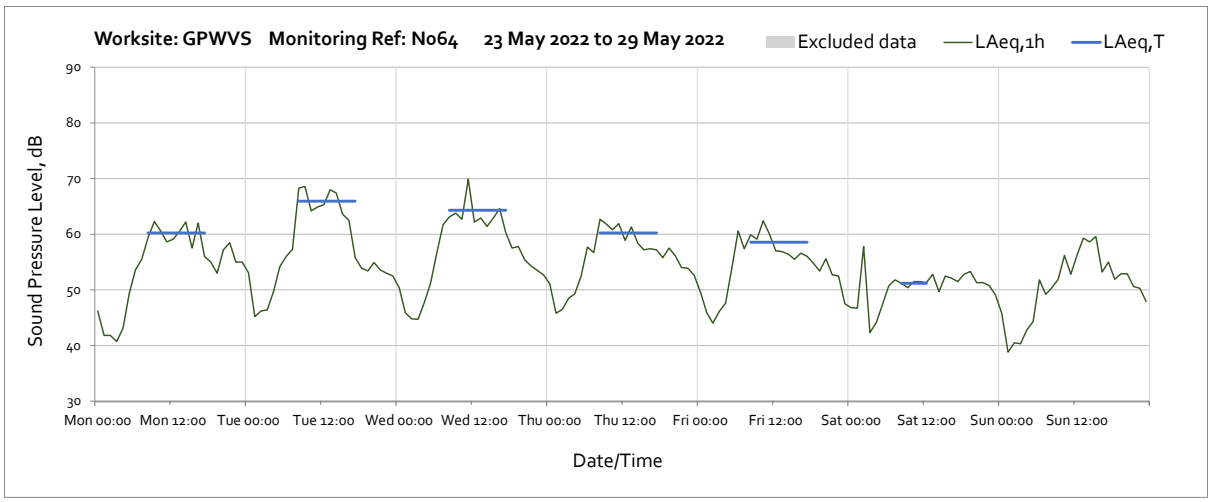
40
30
Mon 00:00 Mon 12:00 Tue 00:00 Tue 12:00 Wed 00:00 Wed 12:00 Thu 00:00 Thu 12:00 Fri 00:00 Fri 12:00 Sat 00:00 Sat 12:00 Sun 00:00 Sun 12:00
Date/Time


Worksite: GPWVS Monitoring Ref: No64 23 May 2022 to 29 May 2022
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
90
80
70
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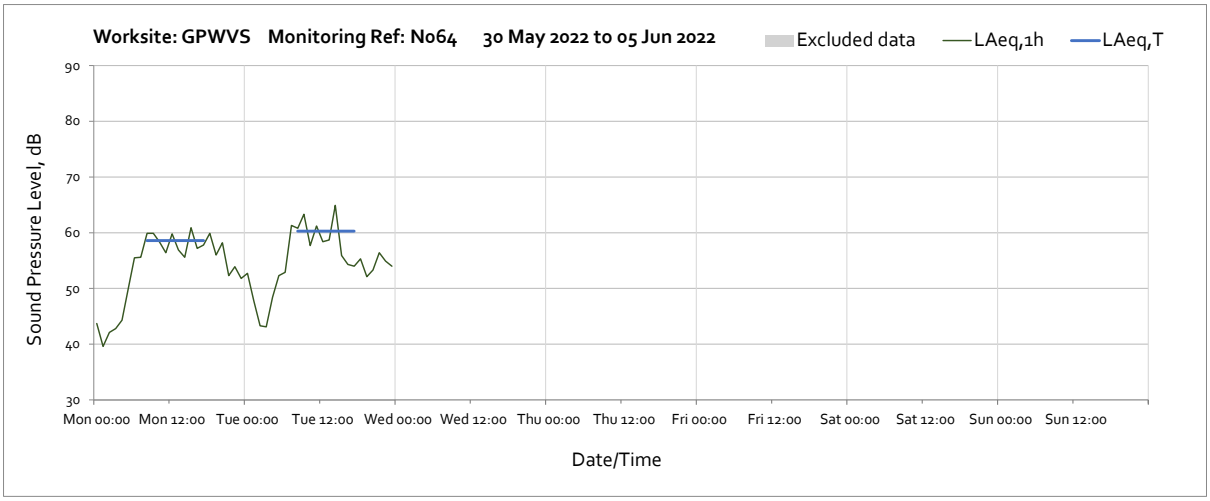
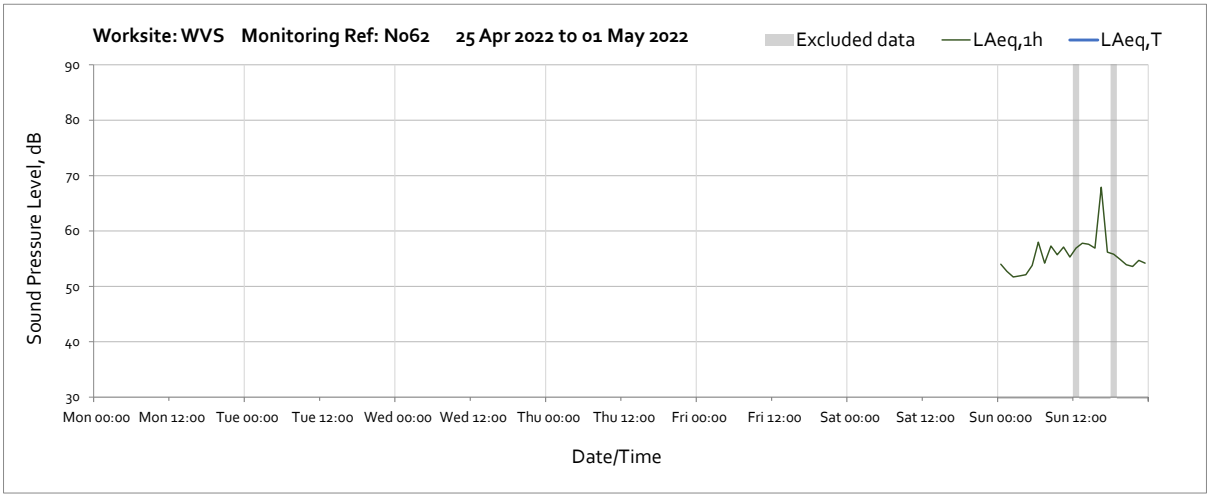
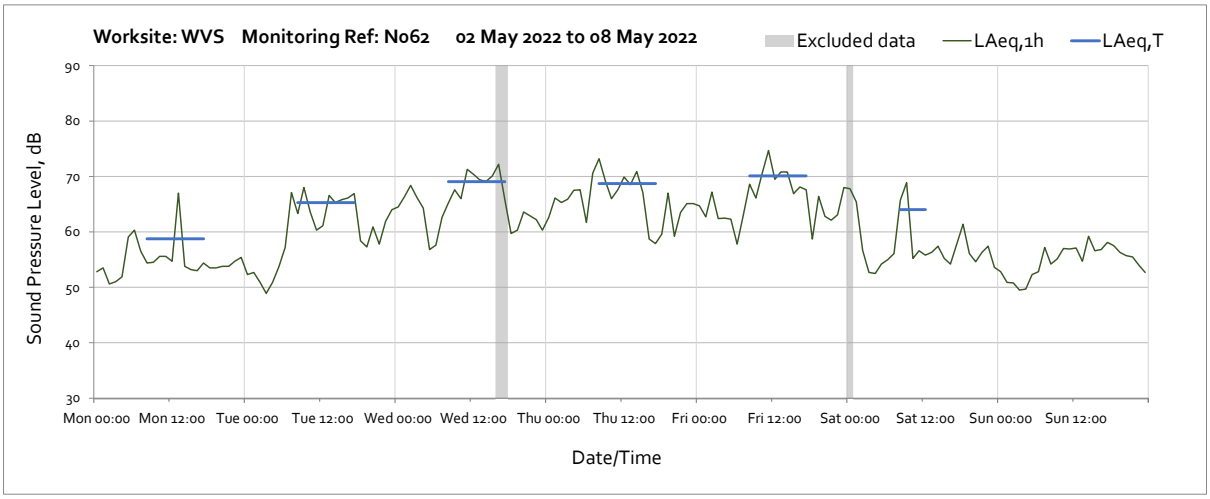
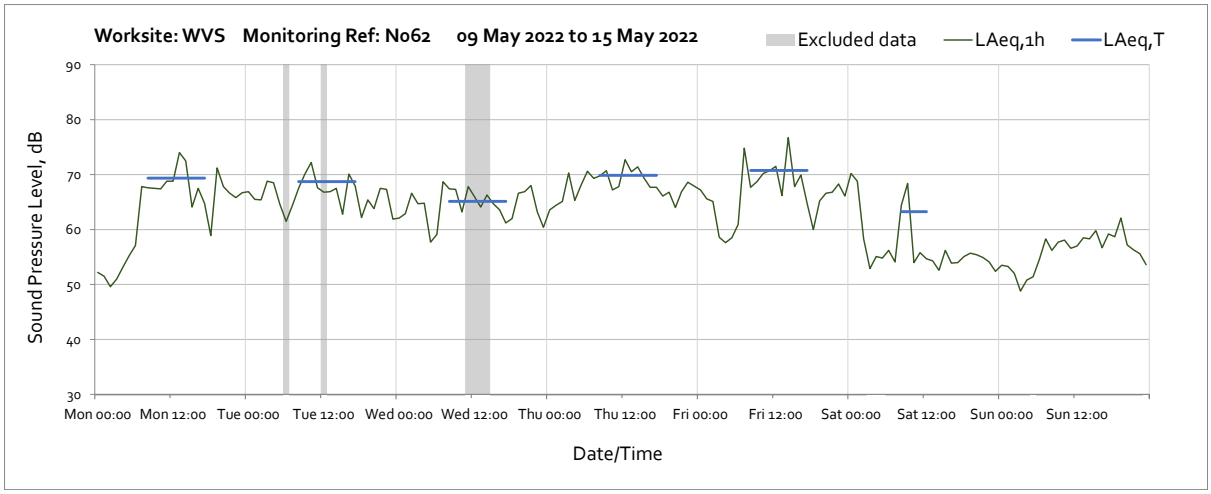
40
30
Mon 00:00 Mon 12:00 Tue 00:00 Tue 12:00 Wed 00:00 Wed 12:00 Thu 00:00 Thu 12:00 Fri 00:00 Fri 12:00 Sat 00:00 Sat 12:00 Sun 00:00 Sun 12:00
Date/Time

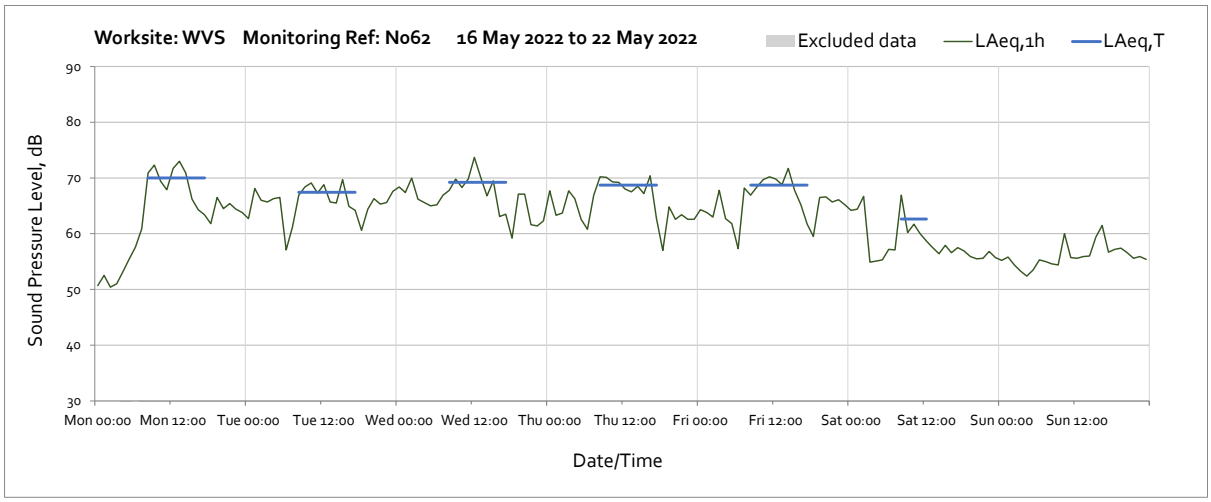


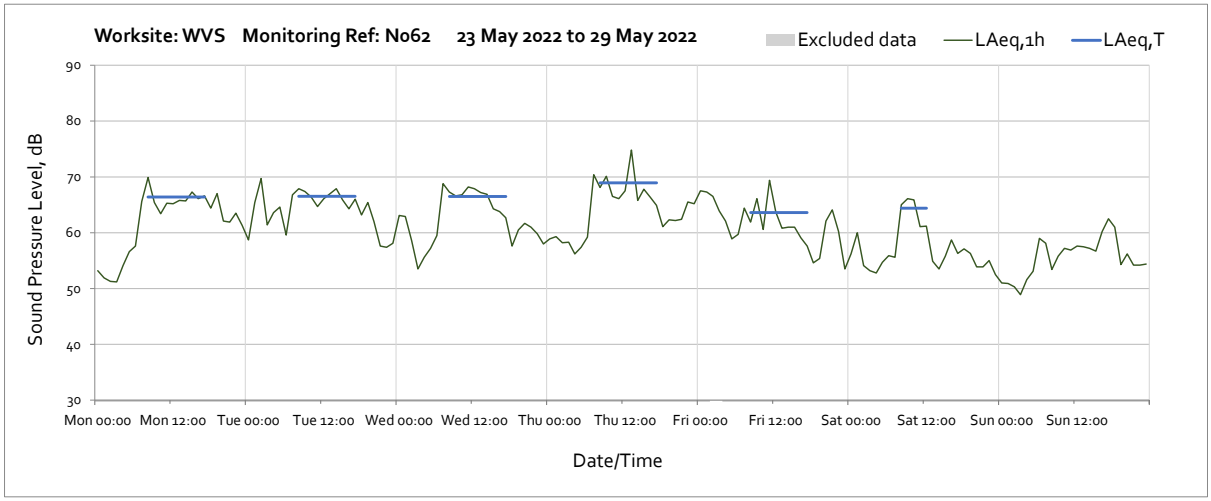
Worksite: Westgate Ventilation Shaft (WVS) – Monitoring Ref: N062

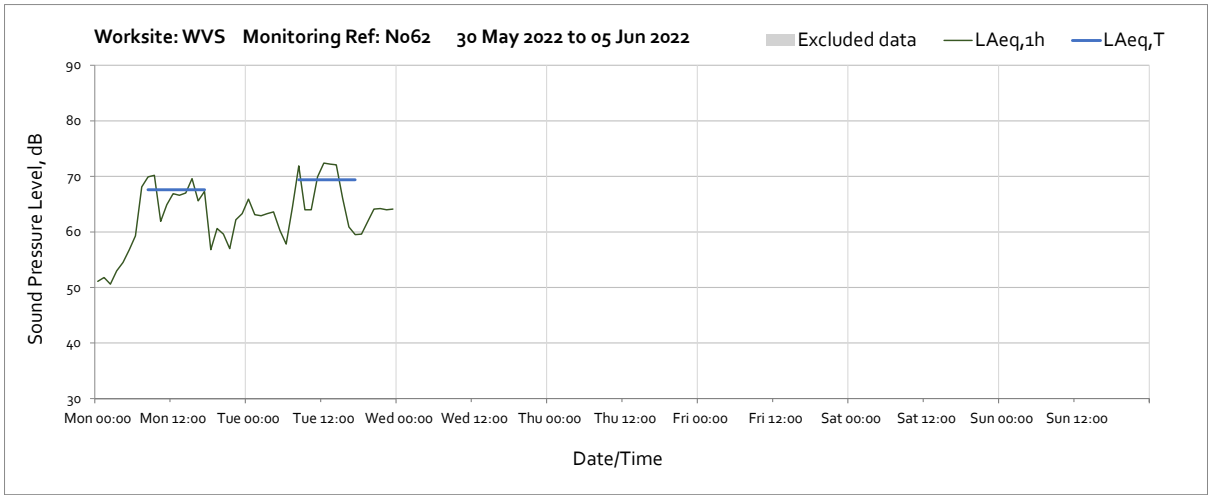





Worksite: WVS Monitoring Ref: No62 09 May 2022 to 15 May 2022
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
90
80
70
60
50
40
30
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
Wed 12:00
Thu 00:00
Thu 12:00
Fri 00:00
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time


Worksite: WVS Monitoring Ref: No62 16 May 2022 to 22 May 2022
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
90
80
70
60
50
40
30
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

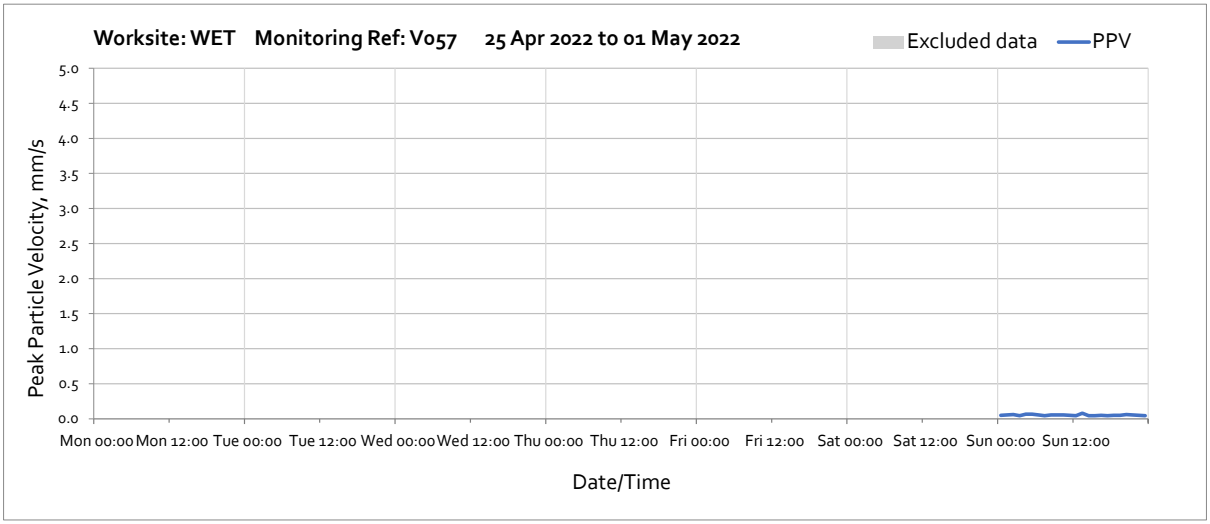

Worksite: WVS Monitoring Ref: No62 23 May 2022 to 29 May 2022
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
90
80
70
60
50
40
30
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
Wed 12:00
Thu 00:00
Thu 12:00
Fri 00:00
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time

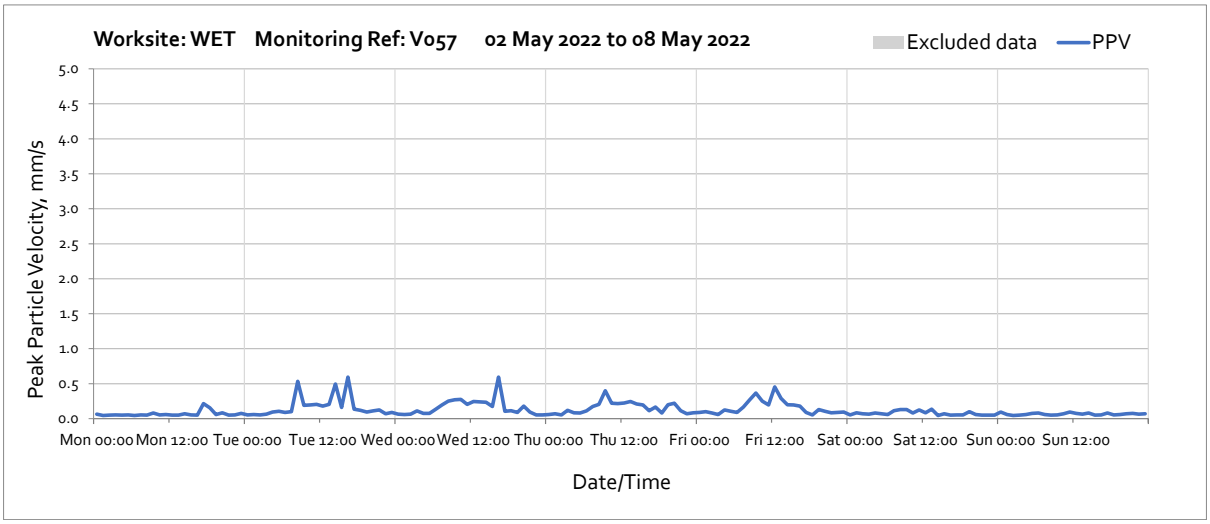

Worksite: WVS Monitoring Ref: No62 30 May 2022 to 05 Jun 2022
Excluded data
LAeq,1h
LAeq,T
Sound Pressure Level, dB
90
80
70
60
50
40
30
Mon 00:00
Mon 12:00
Tue 00:00
Tue 12:00
Wed 00:00
Wed 12:00
Thu 00:00
Thu 12:00
Fri 00:00
Fri 12:00
Sat 00:00
Sat 12:00
Sun 00:00
Sun 12:00
Date/Time

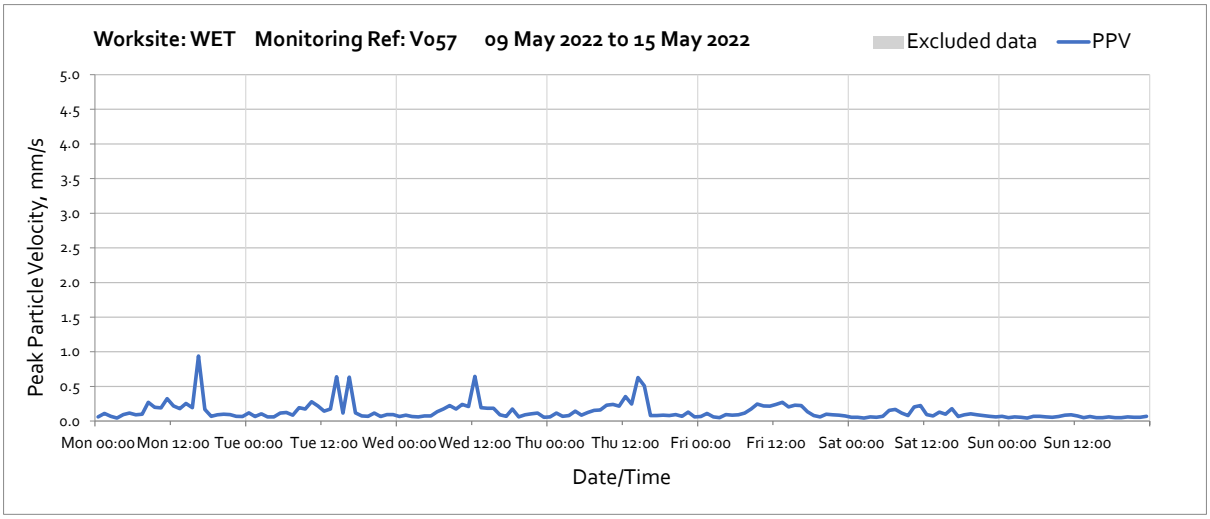
Vibration

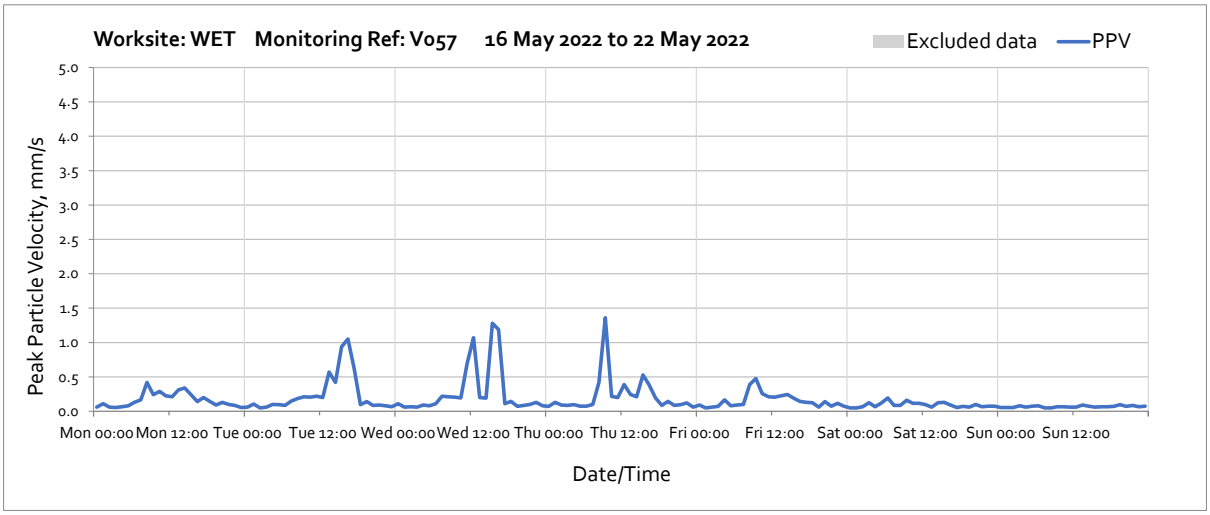
The following graphs show the hourly measured peak particle velocity PPV recorded during the monitoring period. The graphs show the highest PPV of the three orthogonal axis x, y and z. Where high values of PPV were caused by local interference with the vibration monitor, which are not representative 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

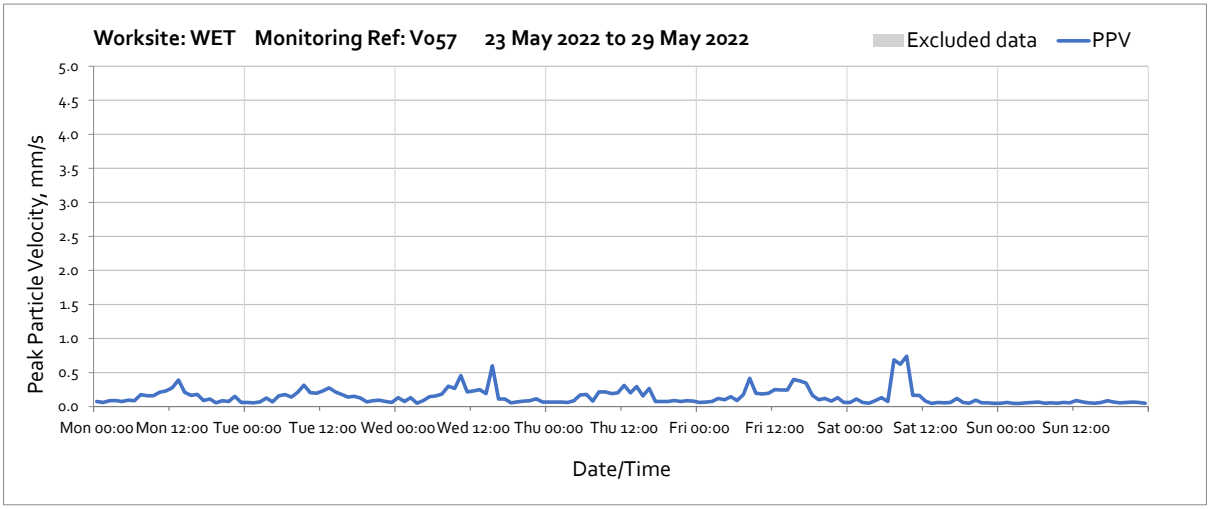


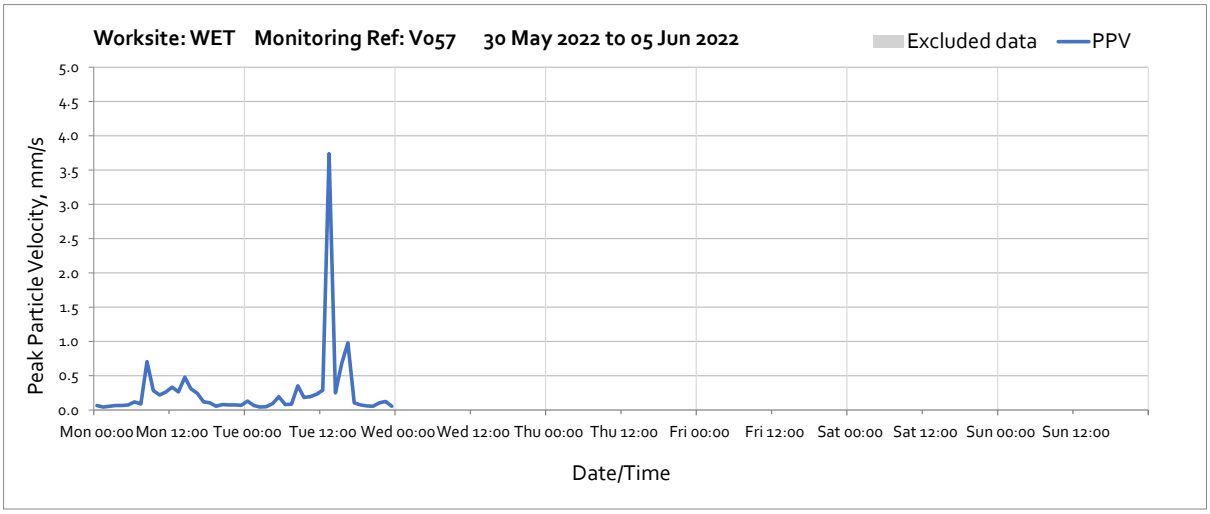






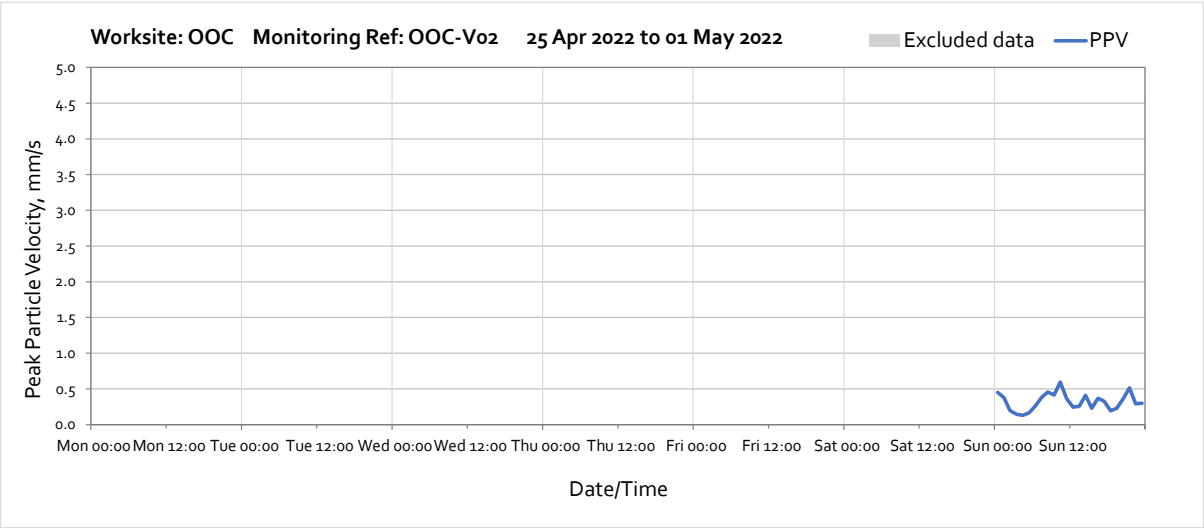
Note: High vibration levels measured during Wednesday and Thursday were due to floor sawing/breaking out works undertaken next to the monitoring station. The nearest sensitive receptor is 10m further away compared to the monitor and therefore HS2 vibration levels will be lower at the receptor

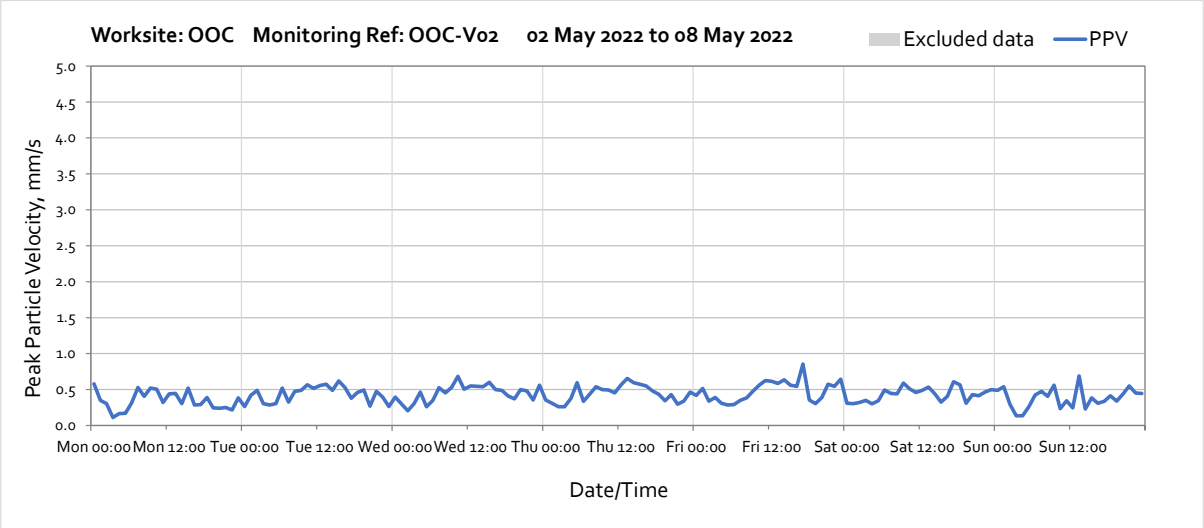


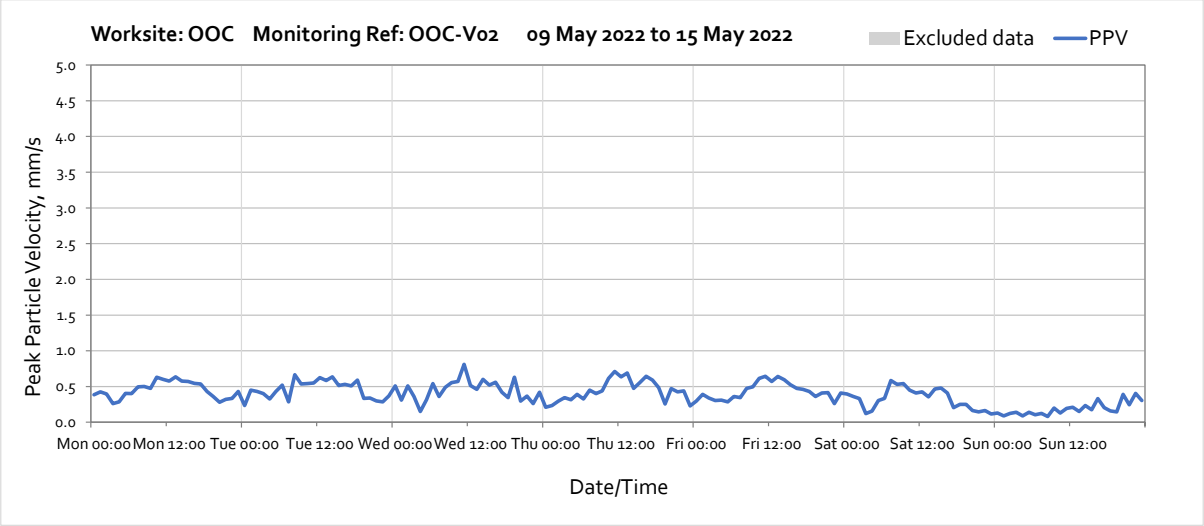


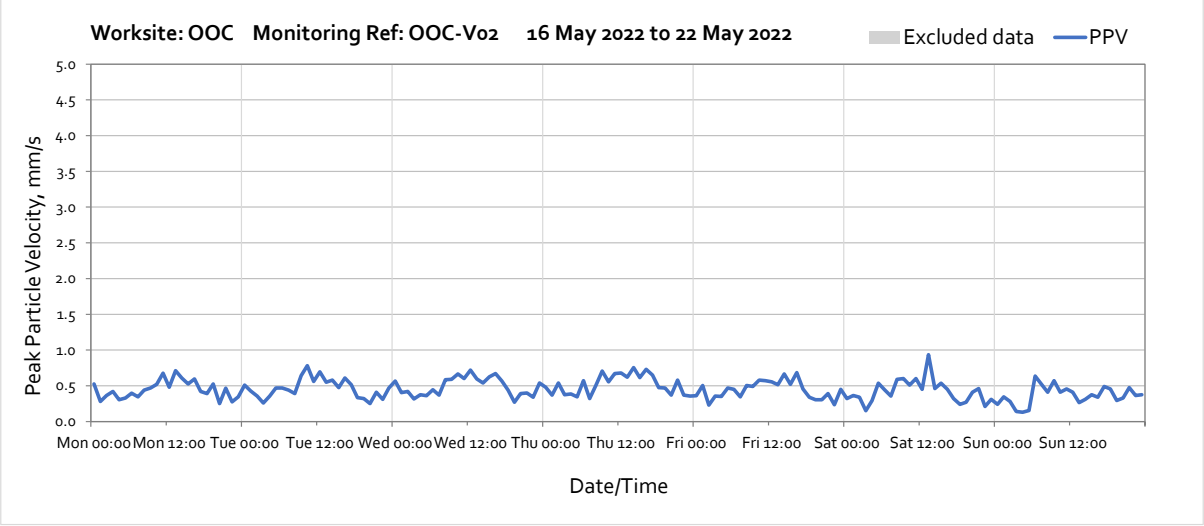
Note: High vibration levels measured at 13:00 and 16:00 on Tuesday 31st May were due to floor sawing/breaking out works undertaken next to the monitoring station. The nearest sensitive receptor is 10m further away compared to the monitor and therefore HS2 vibration levels will be lower at the receptor.

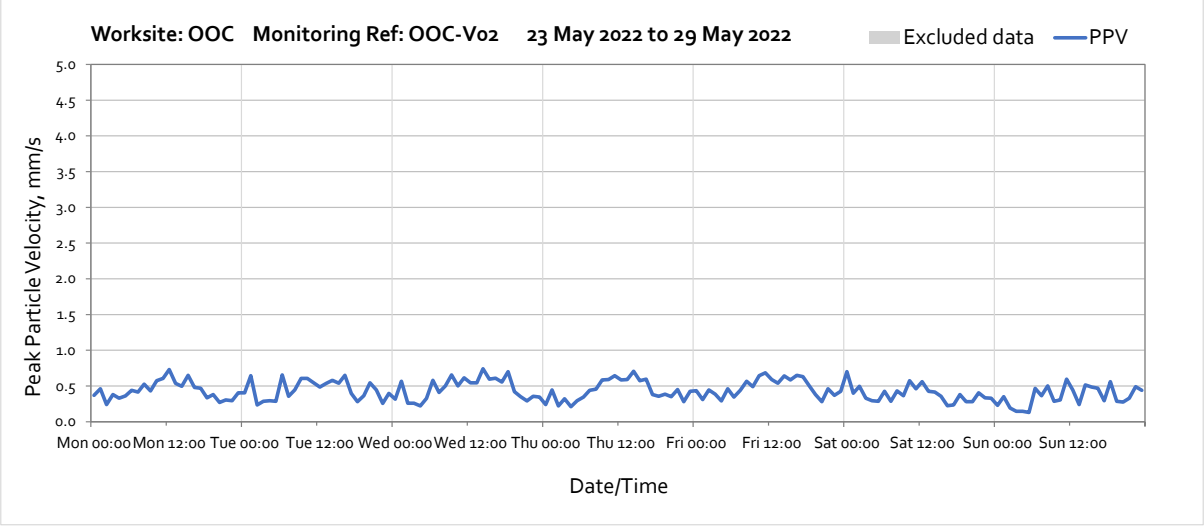
Worksite: Old Oak Common (OOC) – Monitoring Ref: OOC-V02

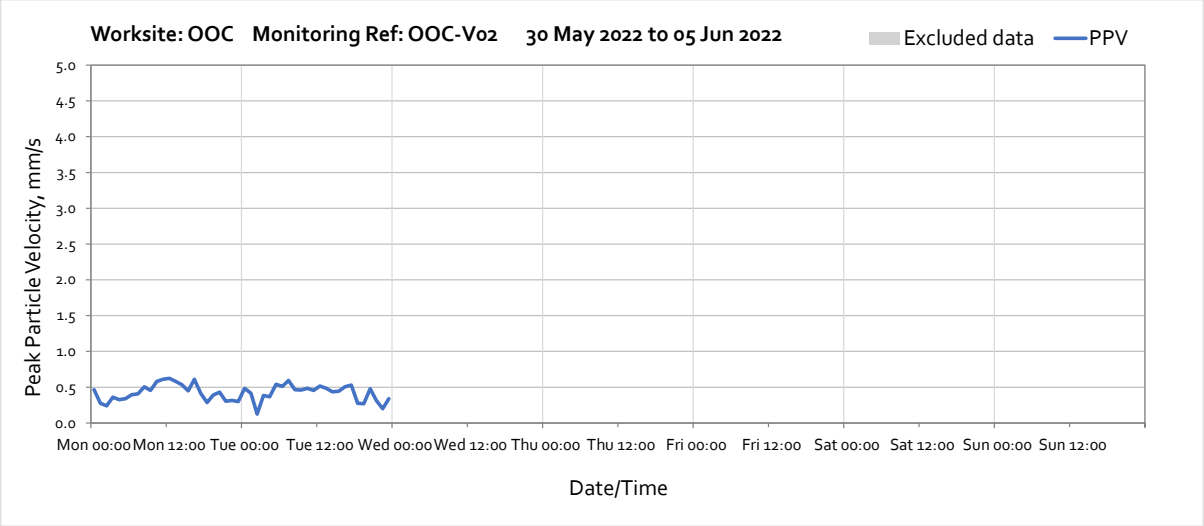




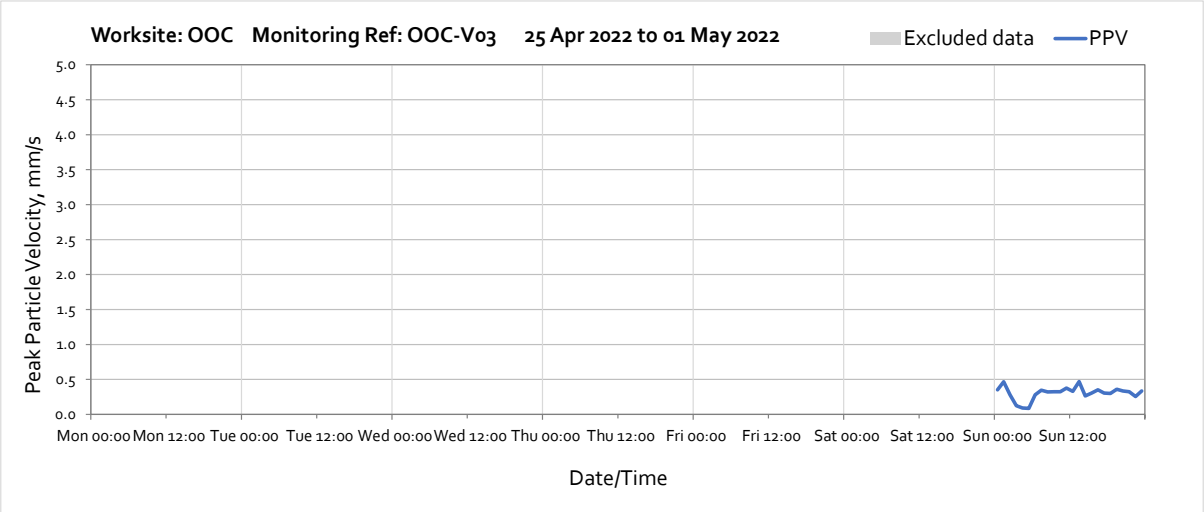

Worksite: OOC Monitoring Ref: OOC-V02 09 May 2022 to 15 May 2022
Excluded data
PPV
Peak Particle Velocity, mm/s
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Mon 00:00 Mon 12:00 Tue 00:00 Tue 12:00 Wed 00:00 Wed 12:00 Thu 00:00 Thu 12:00 Fri 00:00 Fri 12:00 Sat 00:00 Sat 12:00 Sun 00:00 Sun 12:00
Date/Time

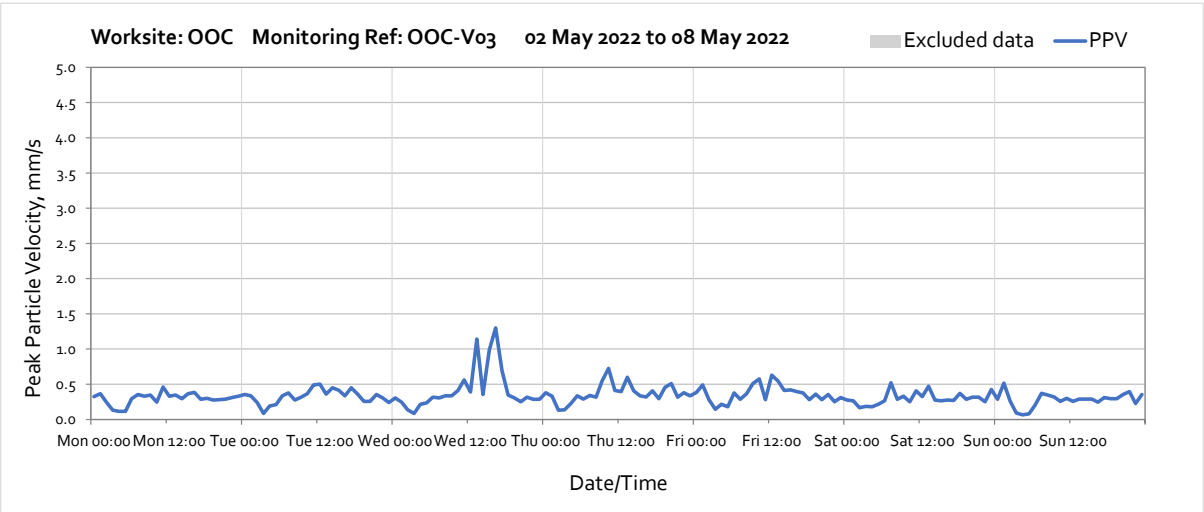

Worksite: OOC Monitoring Ref: OOC-V02 16 May 2022 to 22 May 2022
Excluded data
PPV
Peak Particle Velocity, mm/s
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Mon 00:00 Mon 12:00 Tue 00:00 Tue 12:00 Wed 00:00 Wed 12:00 Thu 00:00 Thu 12:00 Fri 00:00 Fri 12:00 Sat 00:00 Sat 12:00 Sun 00:00 Sun 12:00
Date/Time

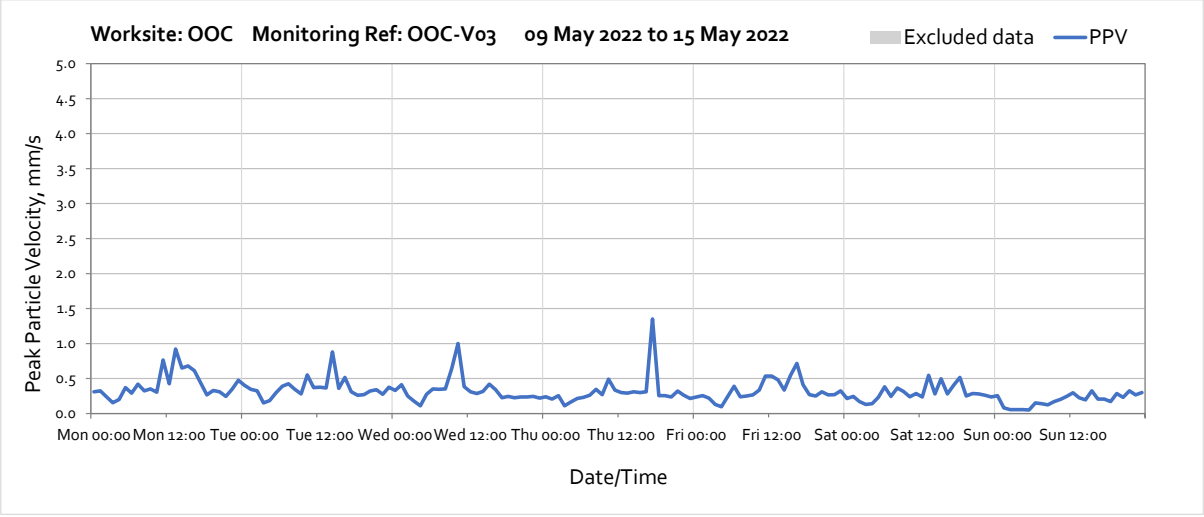

Worksite: OOC Monitoring Ref: OOC-V02 23 May 2022 to 29 May 2022
Excluded data
PPV
Peak Particle Velocity, mm/s
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Mon 00:00 Mon 12:00 Tue 00:00 Tue 12:00 Wed 00:00 Wed 12:00 Thu 00:00 Thu 12:00 Fri 00:00 Fri 12:00 Sat 00:00 Sat 12:00 Sun 00:00 Sun 12:00
Date/Time

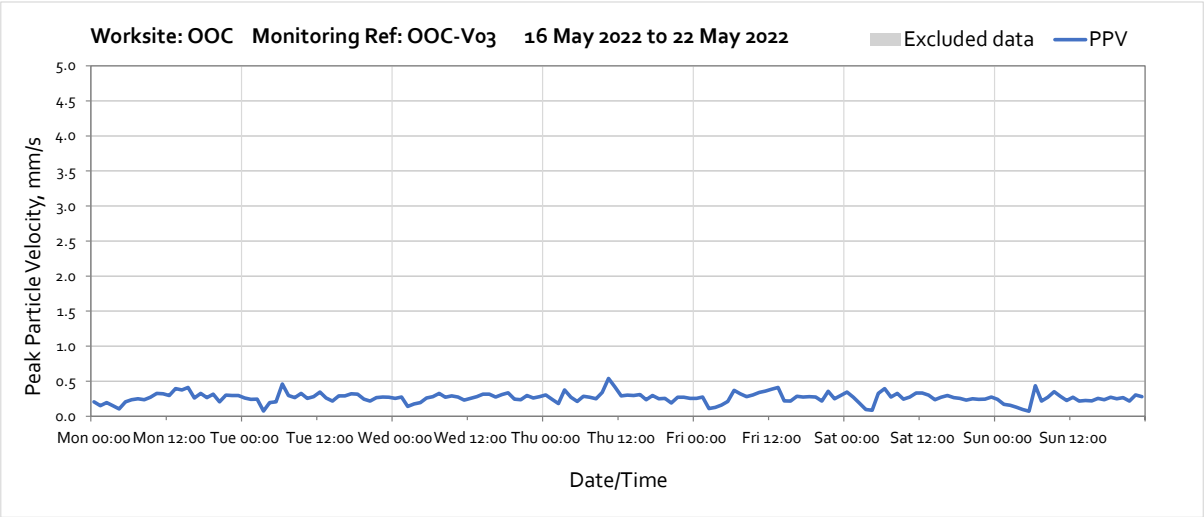


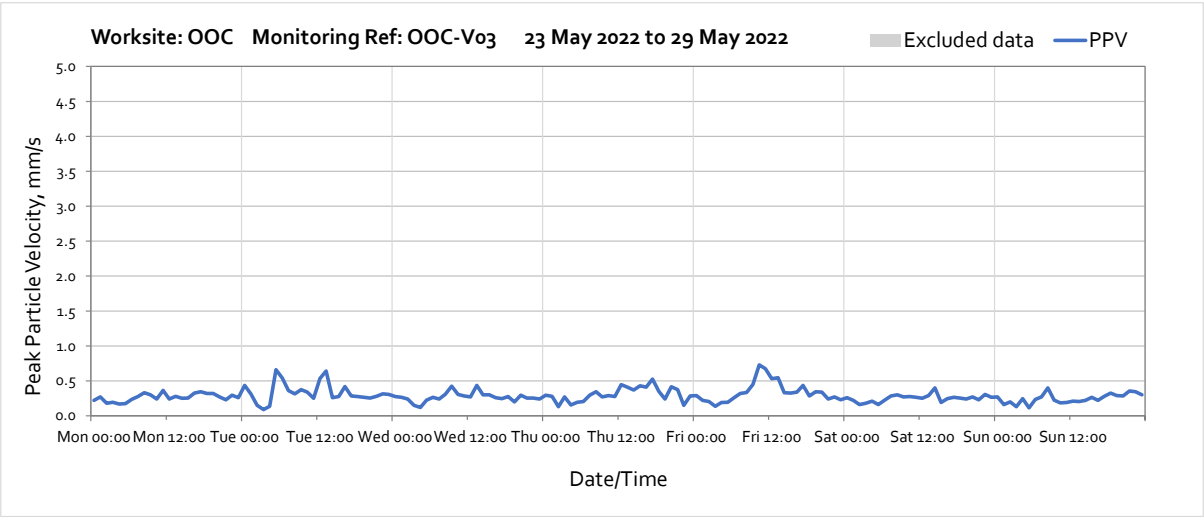
Worksite: Old Oak Common (OOC) – Monitoring Ref: OOC-V03

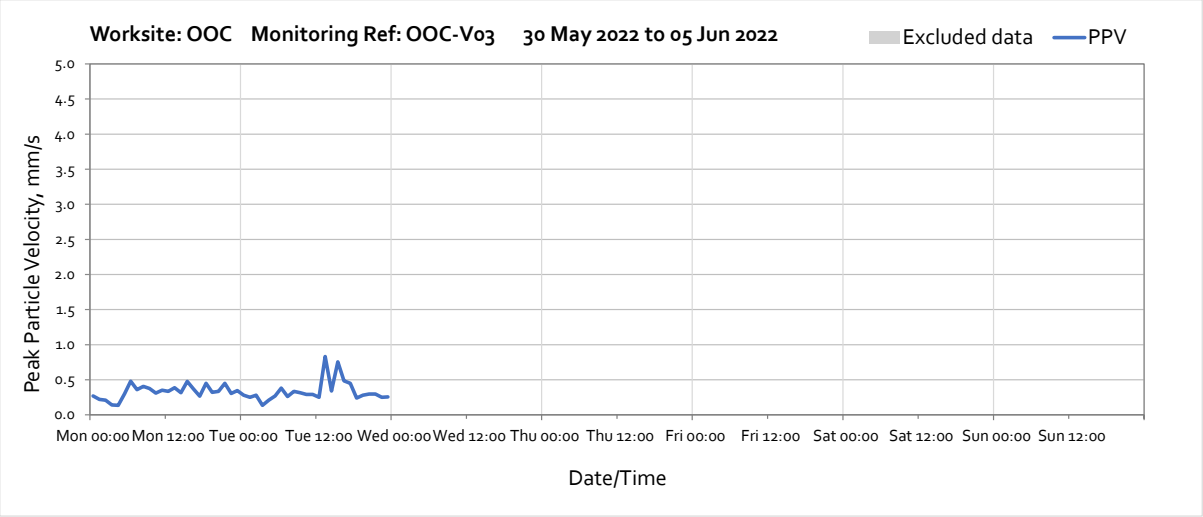




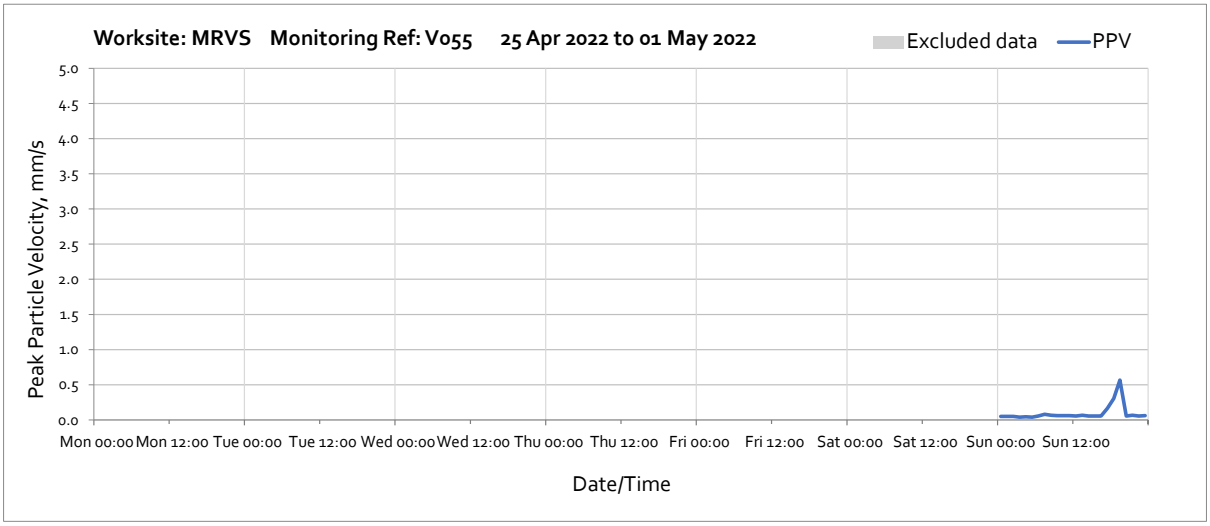

Worksite: OOC Monitoring Ref: OOC-V03 09 May 2022 to 15 May 2022
Excluded data
PPV
Peak Particle Velocity, mm/s
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Mon 00:00 Mon 12:00 Tue 00:00 Tue 12:00 Wed 00:00 Wed 12:00 Thu 00:00 Thu 12:00 Fri 00:00 Fri 12:00 Sat 00:00 Sat 12:00 Sun 00:00 Sun 12:00
Date/Time

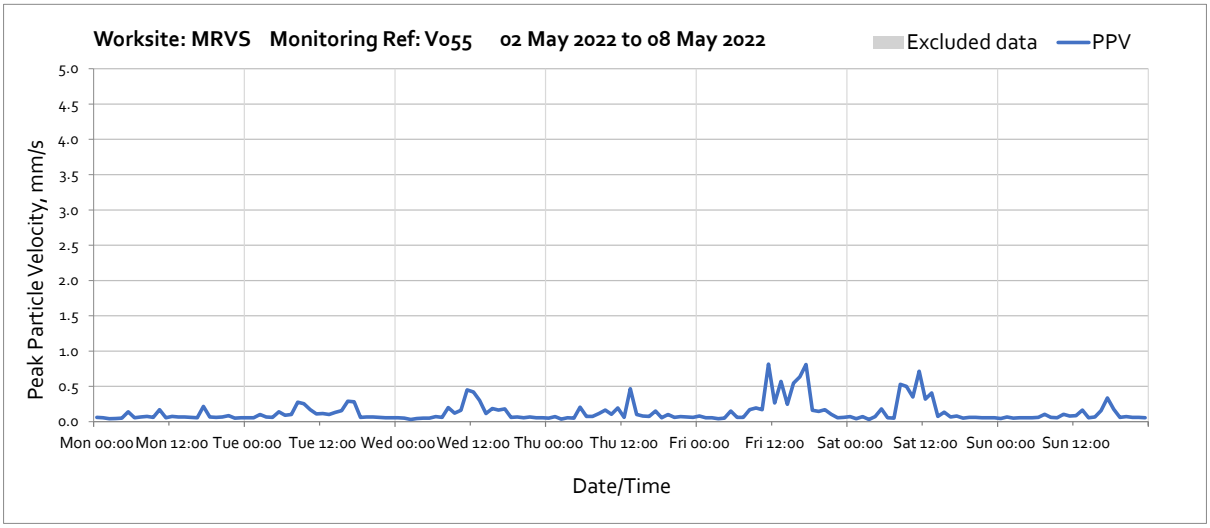

Worksite: OOC Monitoring Ref: OOC-V03 16 May 2022 to 22 May 2022
Excluded data
PPV
Peak Particle Velocity, mm/s
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Mon 00:00 Mon 12:00 Tue 00:00 Tue 12:00 Wed 00:00 Wed 12:00 Thu 00:00 Thu 12:00 Fri 00:00 Fri 12:00 Sat 00:00 Sat 12:00 Sun 00:00 Sun 12:00
Date/Time

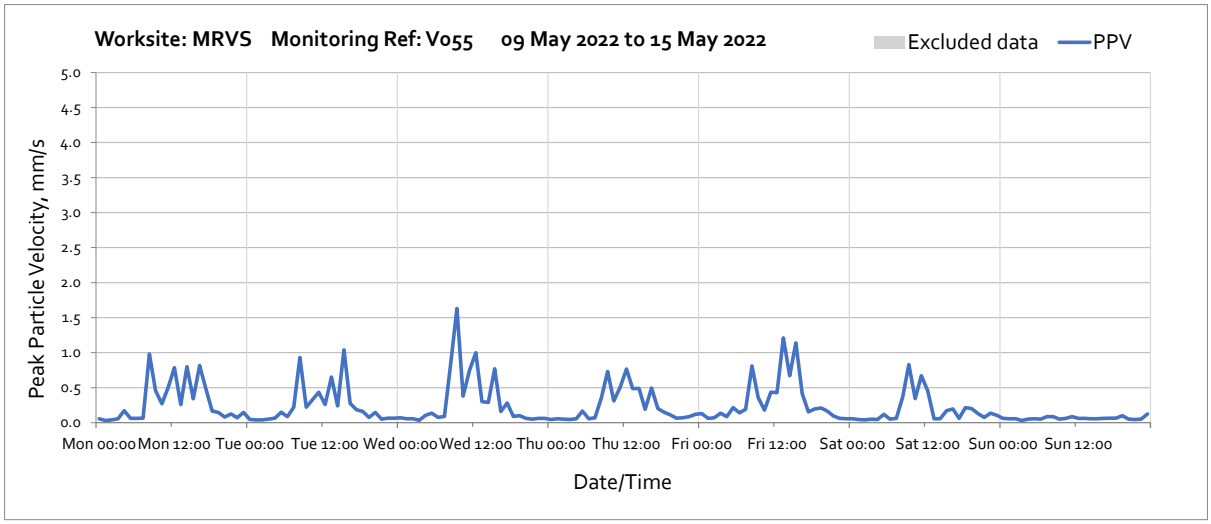

Worksite: OOC Monitoring Ref: OOC-V03 23 May 2022 to 29 May 2022
Excluded data
PPV
Peak Particle Velocity, mm/s
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Mon 00:00 Mon 12:00 Tue 00:00 Tue 12:00 Wed 00:00 Wed 12:00 Thu 00:00 Thu 12:00 Fri 00:00 Fri 12:00 Sat 00:00 Sat 12:00 Sun 00:00 Sun 12:00
Date/Time

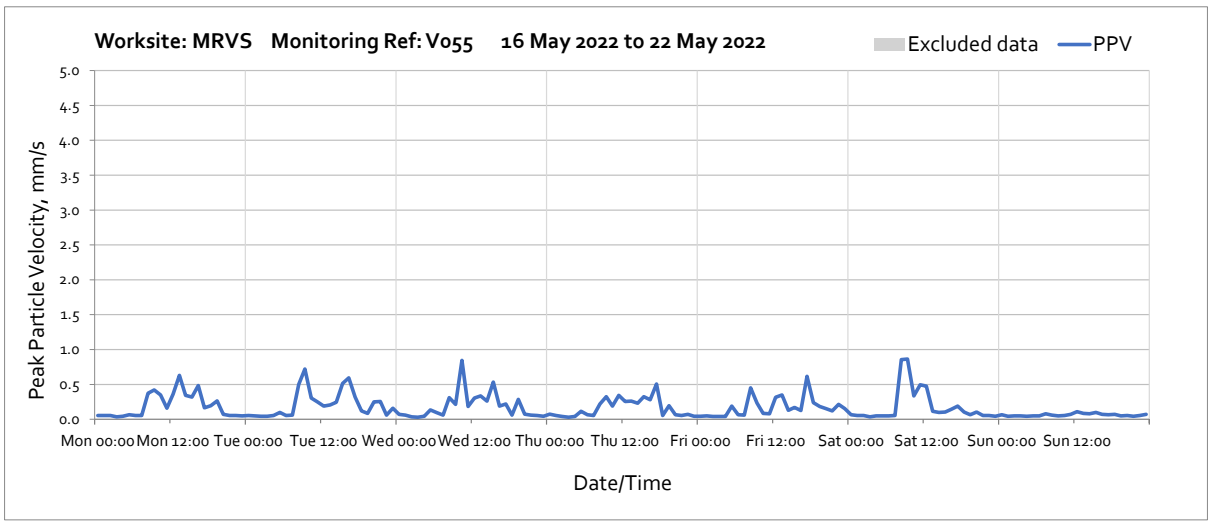


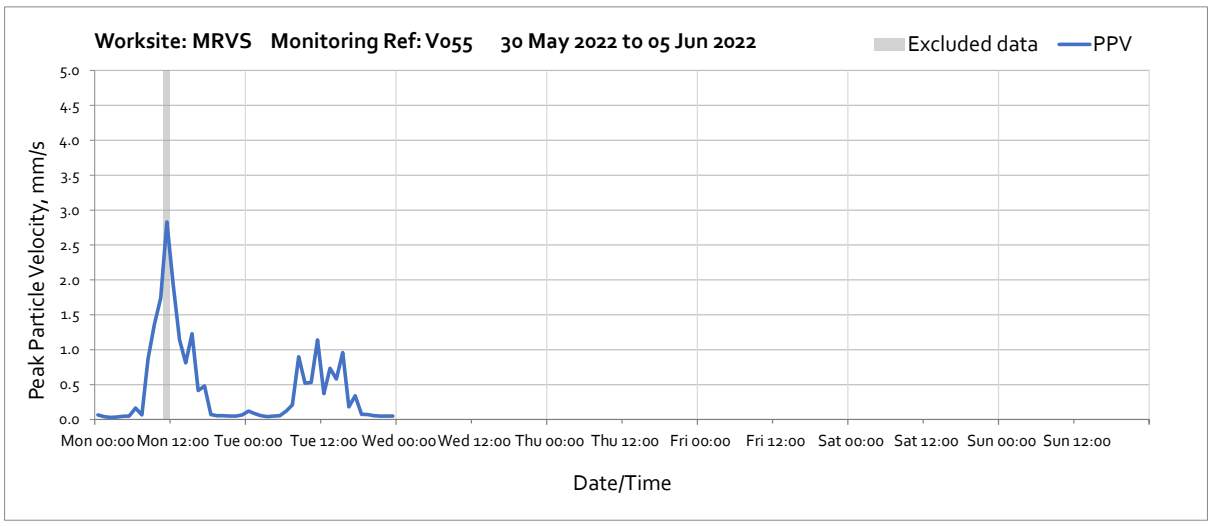
Worksite: Mandeville Road Vent Shaft (MRVS) – Monitoring Ref: V055





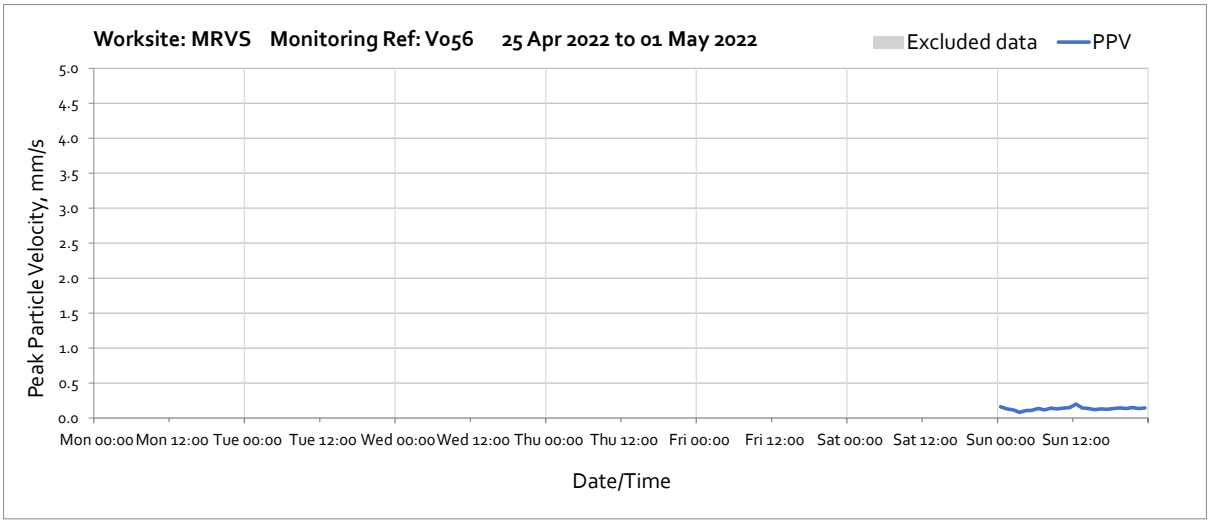


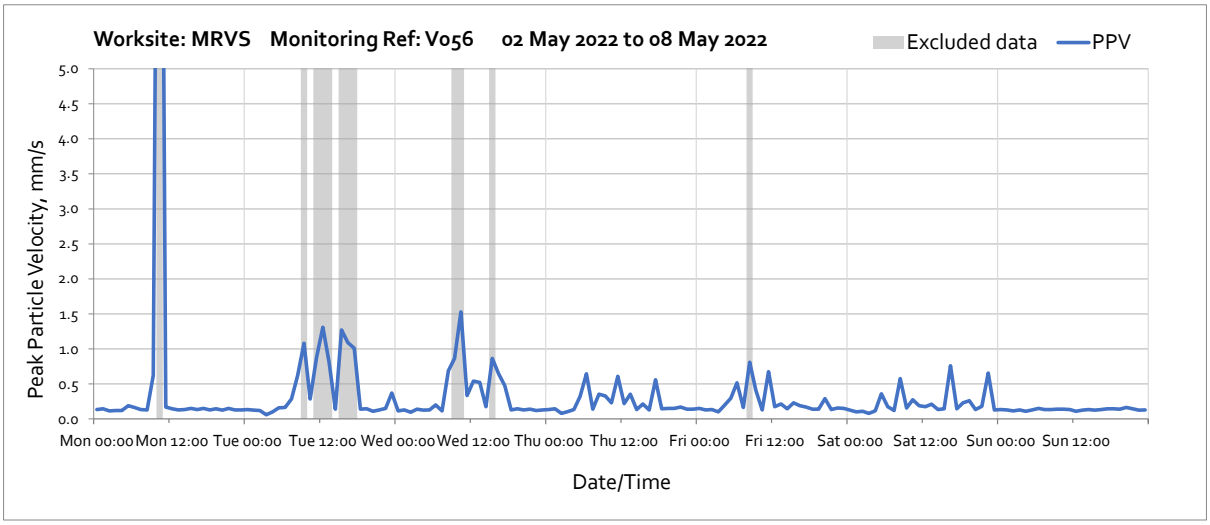




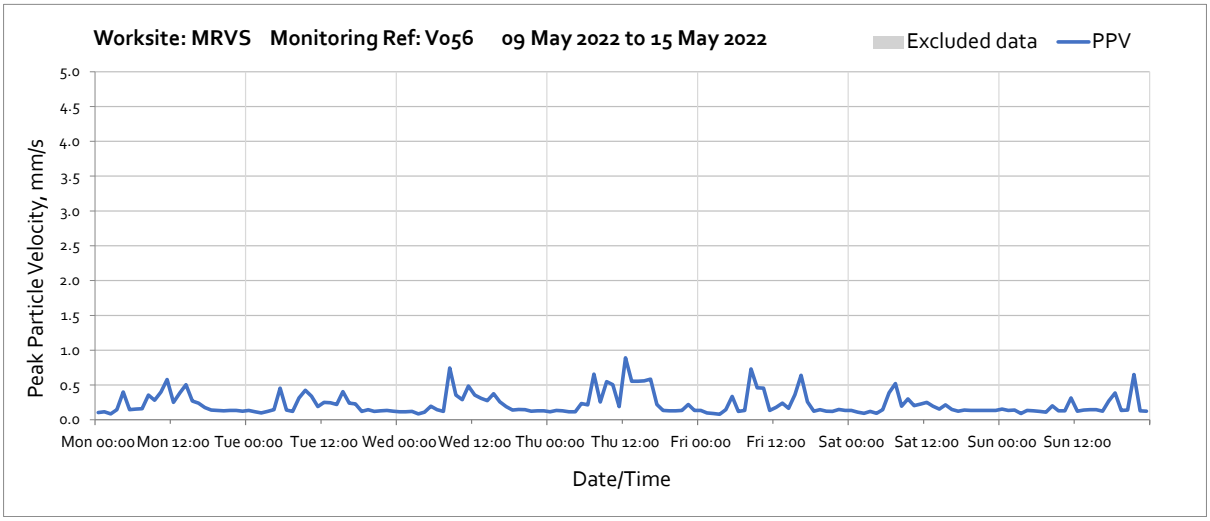
Note: High vibration levels measured at 11:00 on Monday 30th May 2022 were due to local disturbance at the monitoring location and not representative of HS2 vibration levels at the receptor.

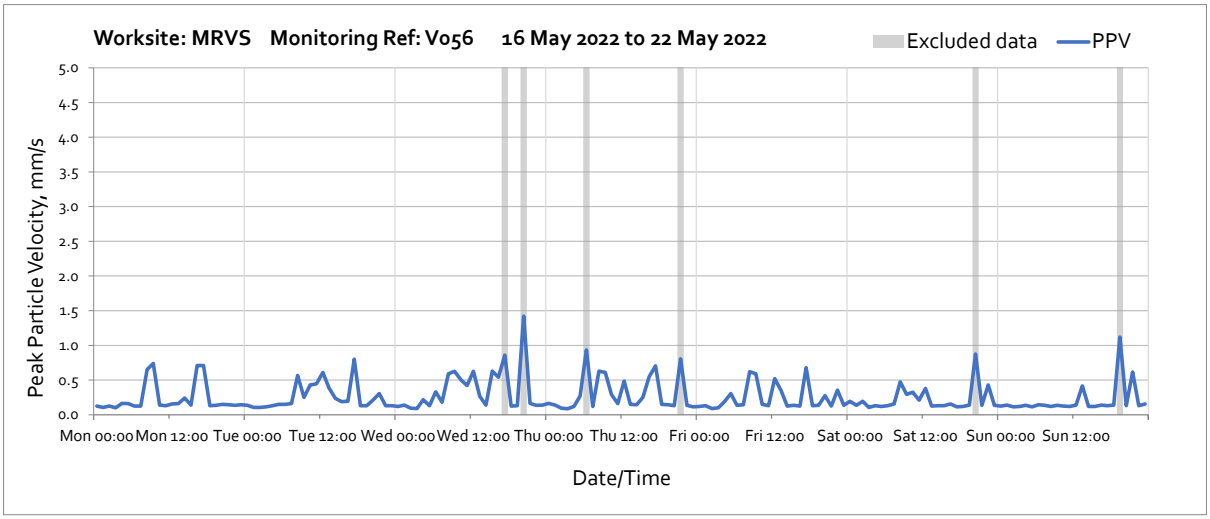
Worksite: Mandeville Road Vent Shaft (MRVS) – Monitoring Ref: V056



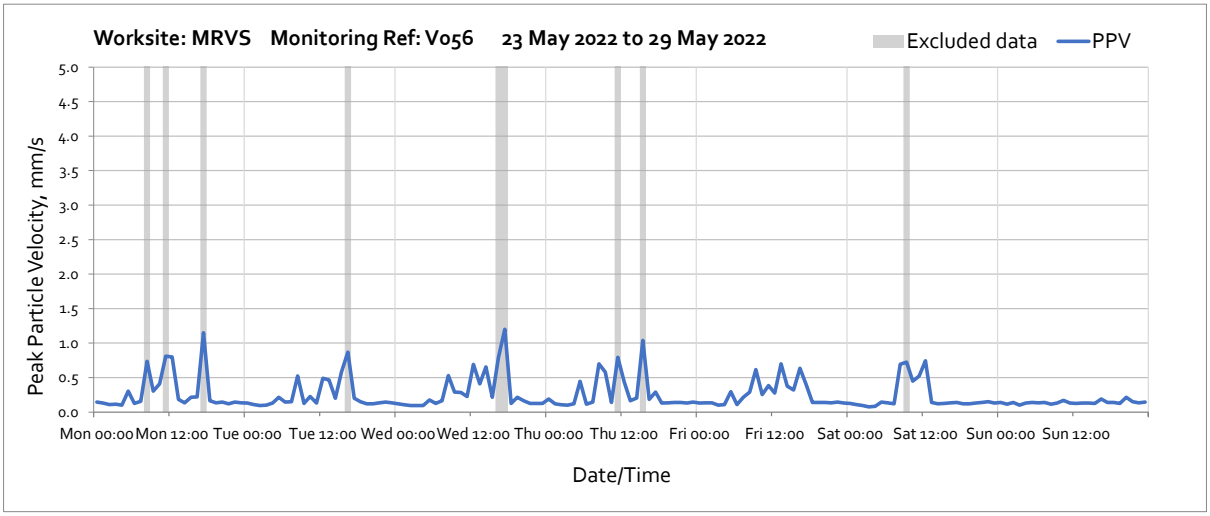


Note: High vibration levels measured throughout the week were due to local disturbance at the monitoring location and not representative of HS2 vibration levels at the receptor.

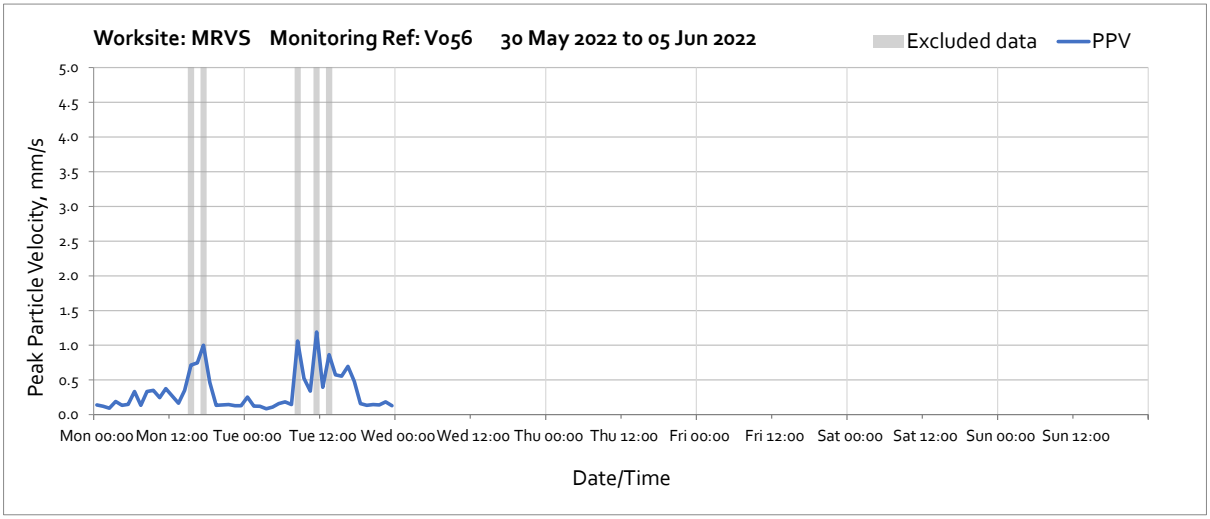




Note: High vibration levels measured throughout the week were due to local disturbance at the monitoring location and not representative of HS2 vibration levels at the receptor.

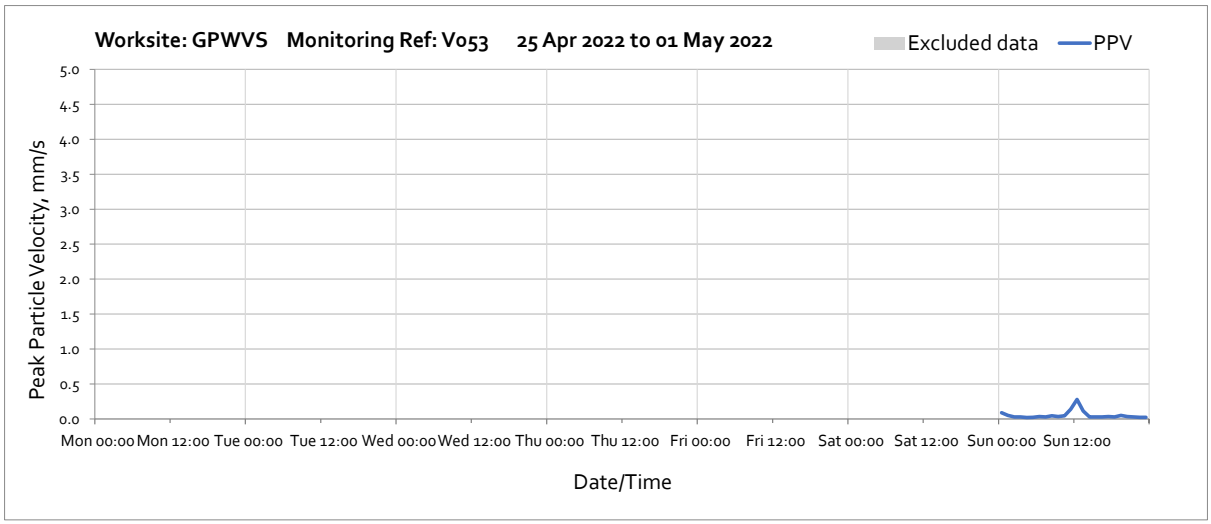


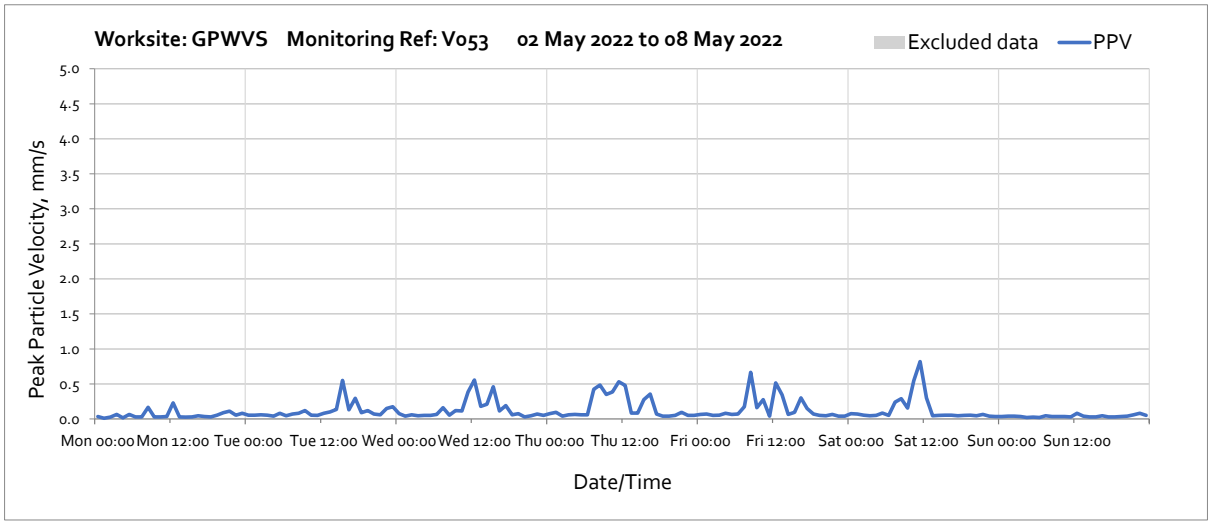
Note: High vibration levels measured throughout the week were due to local disturbance at the monitoring location and not representative of HS2 vibration levels at the receptor.

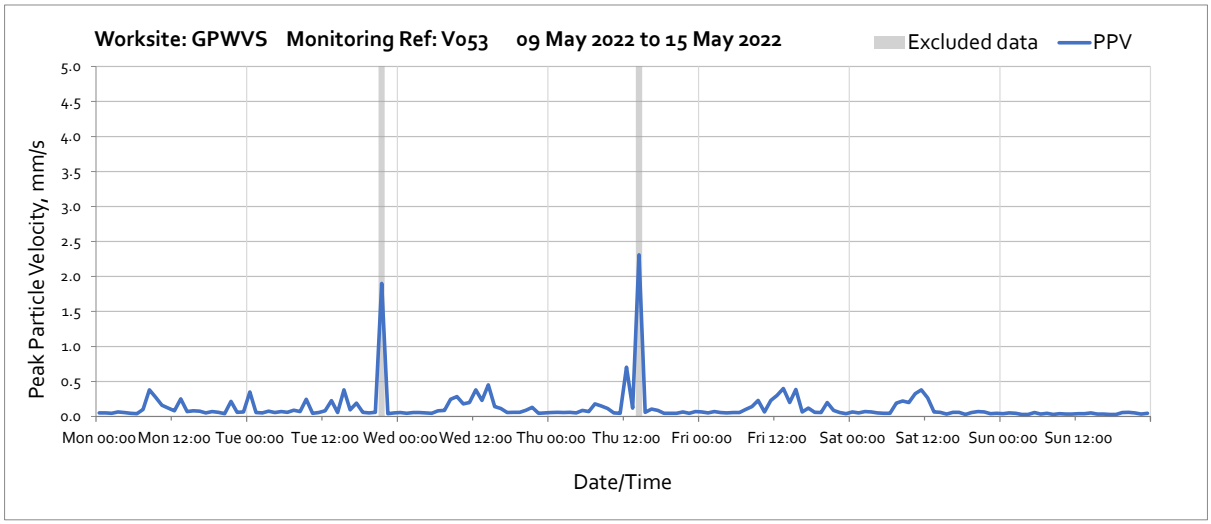


Note: High vibration levels measured throughout the week were due to local disturbance at the monitoring location and not representative of HS2 vibration levels at the receptor.

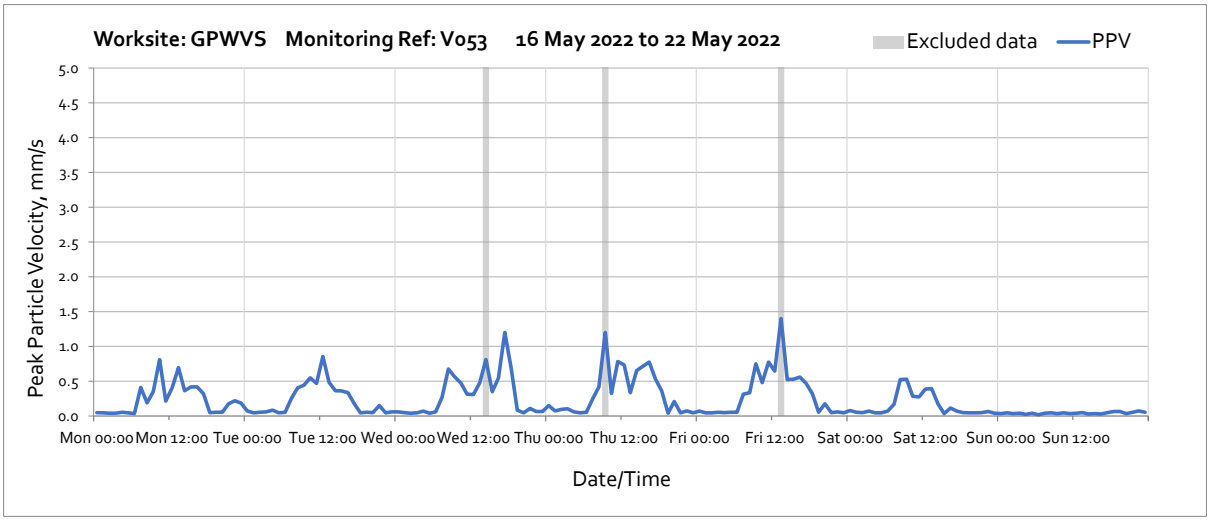
Worksite: Green Park Way Vent Shaft (GPWVS) – Monitoring Ref: V053



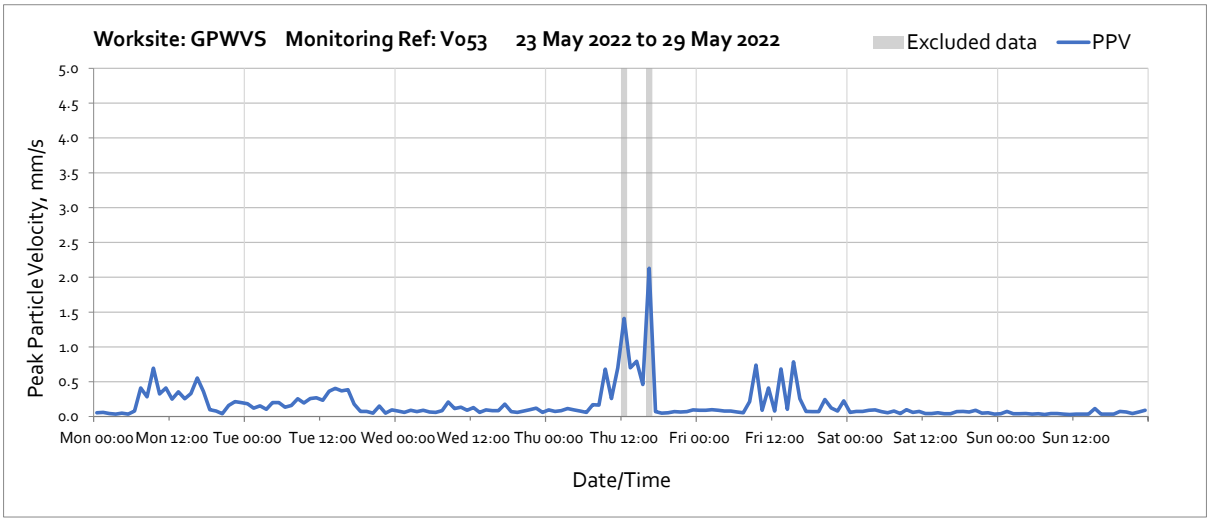




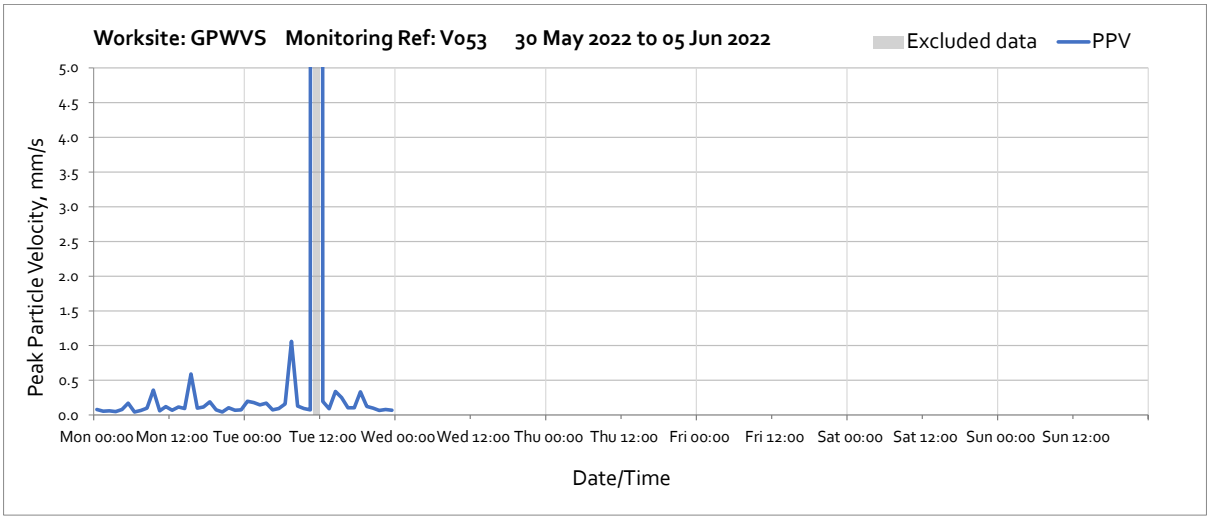
Note: High vibration levels measured at 21:00 on Tuesday 10th May and at 14:00 on Thursday 12th May were due to local disturbance at the monitoring location and not representative of HS2 vibration levels at the receptor.



Note: High vibration levels measured throughout the week were due to local disturbance at the monitoring location and not representative of HS2 vibration levels at the receptor.

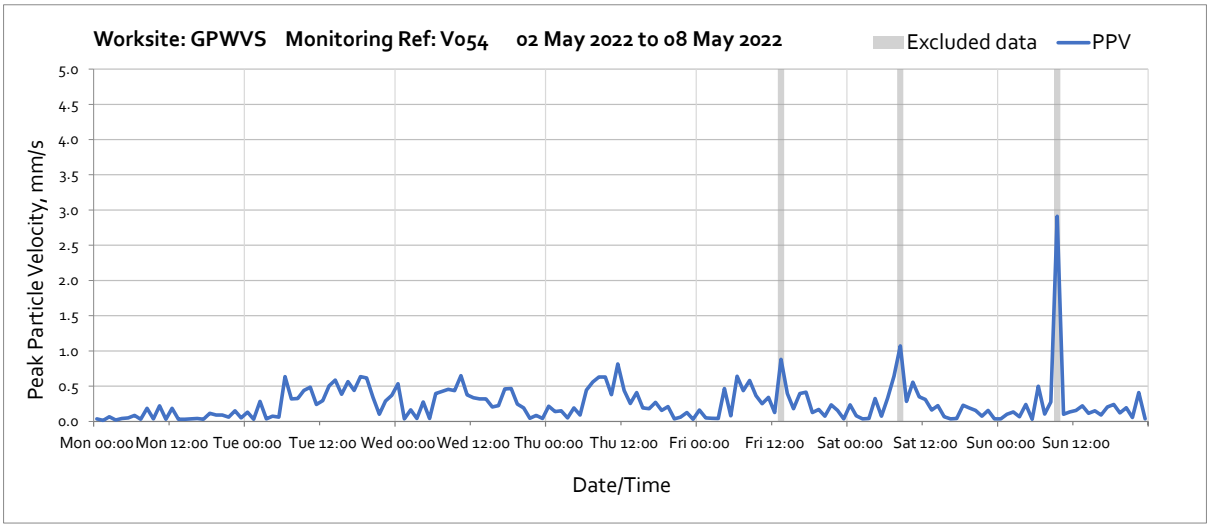


Note: High vibration levels measured at 12:00 and 16:00 on Thursday 26th May were due to local disturbance at the monitoring location and not representative of HS2 vibration levels at the receptor.

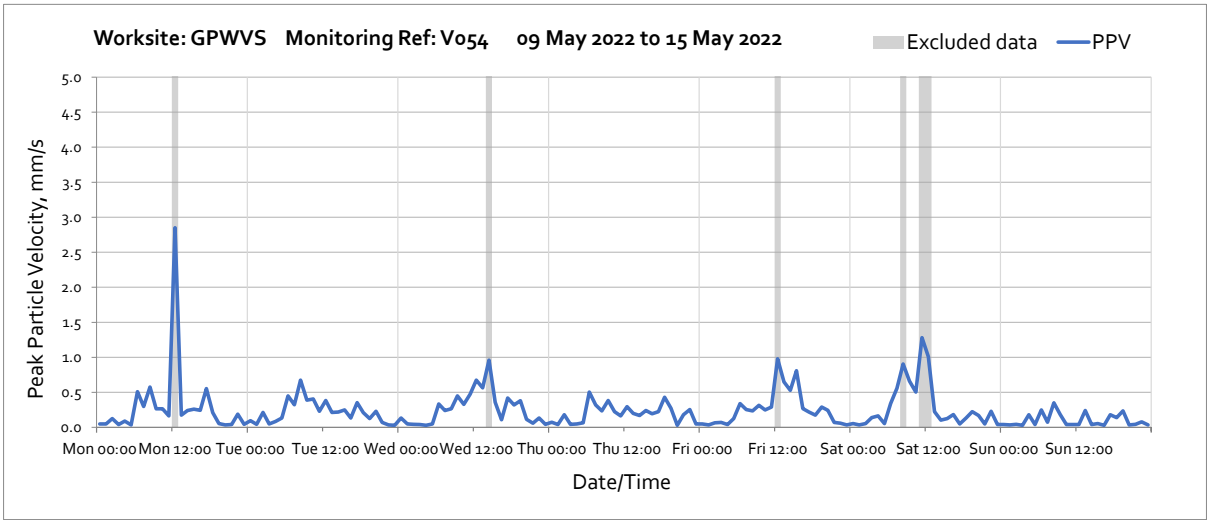


Note: High vibration levels measured at 11:00 on Tuesday 31st May were due to local disturbance at the monitoring location and not representative of HS2 vibration levels at the receptor.

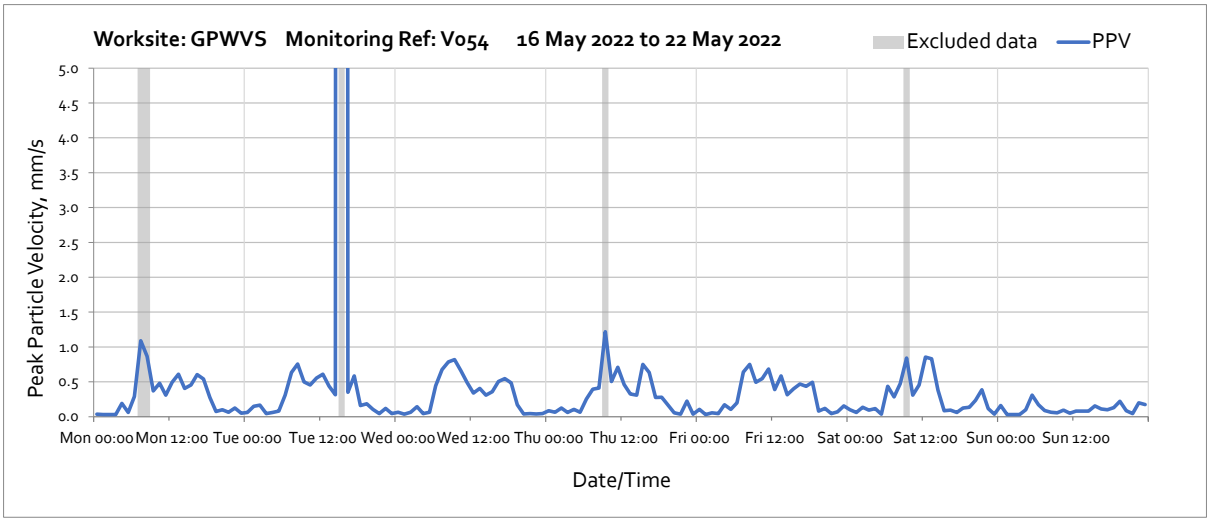
Worksite: Green Park Way Vent Shaft (GPWVS) – Monitoring Ref: V054



Note: High vibration levels measured throughout the week were due to local disturbance at the monitoring location and not representative of HS2 vibration levels at the receptor.



Note: High vibration levels measured throughout the week were due to local disturbance at the monitoring location and not representative of HS2 vibration levels at the receptor.



Note: High vibration levels measured throughout the week were due to local disturbance at the monitoring location and not representative of HS2 vibration levels at the receptor.

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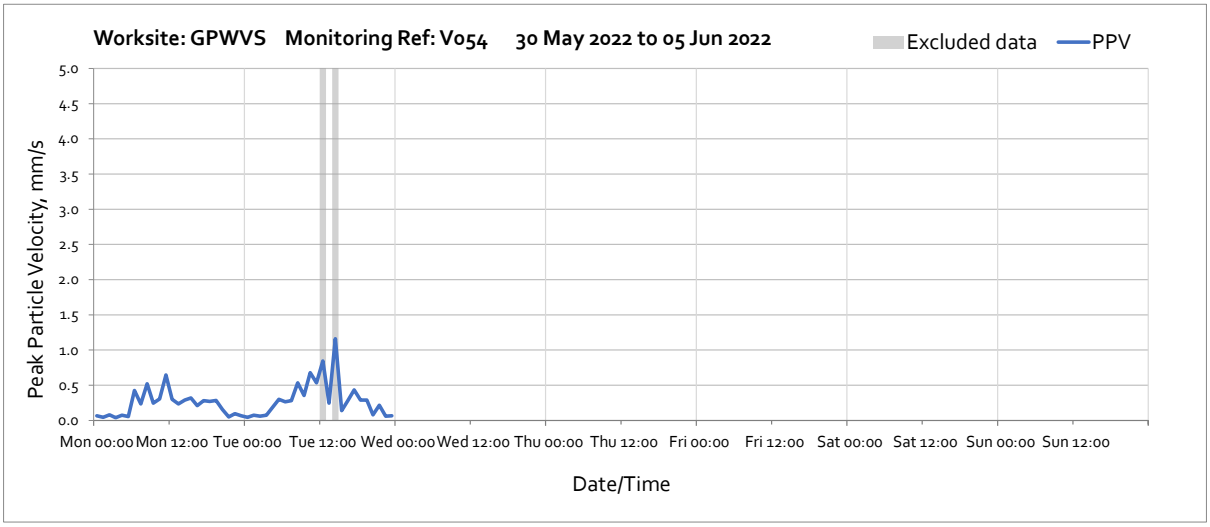

Note: High vibration levels measured at 12:00 and 14:00 on Tuesday 31st May were due to local disturbance at the monitoring location and not representative of HS2 vibration levels at the receptor.