

Construction noise and vibration Monthly Report – September 2021

Buckinghamshire

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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 monitoring carried out within Buckinghamshire (BS) during the month of September 2021.

Within this period monitoring was undertaken at the following worksites:

- Noise monitoring was undertaken in the vicinity of School End worksite (ref.: SE) where vegetation clearance, fencing works, construction of access road, stockpiling, excavation and drainage of attenuation pond and highway works were undertaken.
- Noise monitoring was undertaken in the vicinity of Chetwode Hermitage worksite (ref.: CH) where vegetation clearance, fencing works, construction of access road, stockpiling and excavation and drainage of attenuation pond were undertaken.
- Noise monitoring was undertaken in the vicinity of Rosehill Farm worksite (ref.: RF) where vegetation clearance, fencing works, construction of access road, stockpiling and excavation and drainage of attenuation pond were undertaken.
- Noise monitoring was undertaken in the vicinity of School Hill Compound worksite (ref.: SHC) where construction of civil structures within the site compound, utility works, construction of compound foundations and testing of batching plant were underway.
- Noise monitoring was undertaken in the vicinity of the School Hill UTX worksite (ref.: SHU) where horizontal drilling and utility diversion works were underway.
- Noise monitoring was undertaken in the vicinity of the Calvert South worksite reference (ref: CALS) where aggregate deliveries by train, vegetation clearance, topsoil stripping, installations of crossings, laying of stone causeway, stockpiling, drainage works, laying of subbase material and installation of concrete protection slabs were underway.
- Noise monitoring was undertaken in the vicinity of Quainton Access Road (ref: QAR), where construction of drainage and hardstanding at the Station Road satellite compound, installation of geogrid and aggregates, ground investigations, bearing testing, installation of culvert and construction of concrete slabs were underway.
- Noise monitoring was undertaken in the vicinity of Hall Farm, Bicester Road worksite (ref: HF) where excavation works, concrete pouring, installation of drainage and replacing of existing kerbs with new kerbs were undertaken.
- Noise monitoring was undertaken in the vicinity of Medoway, Aylesbury worksite (ref: MW) where construction of the A418 Oxford Road Main Compound, vegetation clearance, drainage works and installation of attenuation pond were undertaken.

- Noise monitoring was undertaken in the vicinity of Rocky Lane Embankment worksite (ref: RLE) where installation of the watermain protection slab and road crossing works were undertaken.
- Noise monitoring was undertaken in the vicinity of Leather Lane worksite (ref: LL) where construction of haul road and attenuation pond were undertaken.
- Noise monitoring was undertaken in the vicinity of South Heath Cutting worksite (ref: SHCW) where construction of haul road, demolition and site clearance works, laying tarmac and installation of attenuation pond were undertaken.
- Noise monitoring was undertaken in the vicinity of Little Missenden Vent Shaft worksite (ref.: CVV-LM) where general plant operation, earthworks, diaphragm wall construction and water treatment were underway.
- Noise monitoring was undertaken in the vicinity of Amersham Vent Shaft worksite (ref.: CVV-AM), where general plant operation, earthworks, ground post treatment and water treatment were underway.
- Noise and vibration monitoring were undertaken in the vicinity of Bottom House Farm Lane worksite (ref.: BHFL), where removal of track mat and soil along temporary access road, stockpiling, digging of trial holes, fencing works, vegetation clearance, ground compaction, installation of membranes and junction road works were underway.
- Noise monitoring was undertaken in the vicinity of Chalfont St Giles Vent Shaft worksite (ref.: CSG) where operation of general plant, earthworks, ground and water treatment works, dewatering and piling works were underway.
- Noise monitoring was undertaken in the vicinity of Chalfont St Peter Vent Shaft worksite (ref.: CSP), where stockpile management, piling, shaft dewatering and excavation, preparatory works for shaft base slab, operation of general and auxiliary plant, road maintenance and shaft dewatering works were underway.
- Noise monitoring was undertaken in the vicinity of Load Test Pile 1 worksite (ref.: LTP #1), where compound operation, civil works, earthworks, drainage works, ground investigation works, piling, abutment works, construction of retaining walls, integrity test of concrete piles, dewatering, emergency dismantling of gas crossings, pontoon installation, survey of canal, attenuation pond, fencing, environmental maintenance works, utility works, River Colne realignment and diversion utilities were underway.

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

- Amersham and Aylesbury, as part of water utility works.
- Colne Valley viaduct where power line diversion works was underway.

- Turweston, as part of power utility works.
- Claydon Junction where recovery of track assets was underway.
- West Street Compound, Calvert where expansion of car park was underway.
- Addison Road Overbridge Worksite, Calvert where temporary drainage works were underway.
- East West Rail overbridge, Calvert where preparatory works for abutment foundation were underway.
- Charndon Lodge underbridge, Calvert where concrete pouring for eastern abutment and preparatory works for western abutment foundation were underway.
- Perry Hill overbridge, Calvert where temporary drainage and mobilisation for piling works were undertaken.
- Calvert North site access road where at-grade crossing and expansion of the Site Access Road from Perry Hill to Portway watercourse were undertaken.
- Oxford railway line, Calvert where removal of ballast, vegetation clearance, stockpile preparation, temporary drainage installation, removal of the embankment and creation of earthwork screening bunds were underway.
- Fleet Marston where vegetation clearance and archaeological works were undertaken.
- Wendover Dean where archaeological, fencing and translocation were undertaken.
- Frith Hill, Calvert area where vegetation clearance near Leather Lane, Potter Row and Frith Hill were undertaken.
- Hunts Green Farm, Great Missenden where archaeological trenching and fencing works were undertaken.
- Nash Lee where trial trenching, vegetation clearance, fencing and backfilling works were underway.
- North of Ellesborough Road where vegetation clearance and fencing works were undertaken.
- Three Bridge Mill Twyford where boundary fencing, ecology surveys and Historic Environment Research & Delivery Strategy mitigation works were undertaken.
- Bowood Lane where installation of security cabins for badger sett protection was undertaken.
- Waddesdon where installation of boundary fencing, archaeological investigations, vegetation clearance and ecological works in connection with reptile habitat were undertaken.

- Mixbury Area where ecological works in connection with bats was underway.
- Twyford & Padbury where bat mitigation, vegetation clearance, installation of badger and ditch crossing were undertaken.
- West Street Compound, Twyford where stockpiling works and construction of access road were underway.
- A422 south where topsoil stripping, cutting excavation, ditch excavations, stone delivery, ponds excavation and stockpiling works were underway.
- A422 north where utility works, drainage, stone delivery, construction of track access and stockpiling works were underway.
- Ground investigation works including rotary borehole drilling and trial pits were undertaken at various locations along the HS2 route (Westbury, Twyford, Turweston and A422).
- Vegetation clearance at various locations along the HS2 route was undertaken.

There were no exceedances of the HS2 threshold levels for significant noise, which are defined in Information Paper E23 (<https://www.gov.uk/government/publications/hs2-information-papers-environment>), during the reporting period.

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

Seven (7) complaints were received within Buckinghamshire during the monitoring period. A description of complaints, the results of investigations and any action taken are detailed in Table 7 of this report.

Abbreviations and Descriptions

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

Table 1: Table of Abbreviations

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

1 Introduction

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

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

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 Buckinghamshire (BS) Local Authority area for the period 1st to 30th September 2021.

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

- School End worksite reference SE (see Plan 1 in Appendix A), where works activities included:
 - vegetation clearance;
 - fencing works;
 - stockpiling; and
 - construction of access road, attenuation pond and tie-in with highway.
- Chetwode Hermitage (see Plan 1 in Appendix A), where works activities included:
 - vegetation clearance;
 - fencing works;
 - stockpiling; and
 - construction of access road and attenuation pond.

- Rosehill Farm (see Plan 1 in Appendix A), where works activities included:
 - vegetation clearance;
 - fencing works;
 - stockpiling; and
 - construction of access road and attenuation pond.
- School Hill Compound worksite reference SHC (see plan 2 in Appendix A), where works activities included:
 - construction of civil structures within site compound;
 - underground utility works;
 - construction of compound foundations and footings; and
 - testing of batching plant.
- School Hill UTX worksite reference - SHU (see plan 2 in Appendix A), where works activities included:
 - horizontal drilling; and
 - utility diversion works.
- Calvert South Worksite, near Calvert, reference - CALS (see plan 2 in Appendix A), where works activities included:
 - aggregate deliveries by train;
 - vegetation clearance and topsoil stripping;
 - installation of ditch crossings;
 - laying of stone causeway;
 - stockpiling;
 - installation of temporary drainage;
 - replacement of existing culverts;
 - laying and compacting subbase; and
 - installation of concrete protection slabs.
- Quainton Access Road Worksite, reference - QAR (see plan 3 in Appendix A), where works activities included:
 - construction of drainage and hardstanding at Station Road satellite compound;
 - installation of geogrid and aggregates;
 - ground investigation survey;

- bearing testing;
- installation of culvert; and
- construction of concrete slabs.
- Hall Farm, Bicester Road Worksite, reference – HF (see plan 4 in Appendix A), where works activities included:
 - excavation works;
 - Concrete pouring
 - installation of drainage; and
 - removal of existing kerbs and installation of new kerbs;
- Medoway, Aylesbury Worksite, reference – MW (see plan 5 in Appendix A), where works activities included:
 - construction of the A418 Oxford Road Main Compound;
 - vegetation clearance along the A418 Oxford Road;
 - earthworks for drainage; and
 - installation of drainage and attenuation pond.
- Rocky Lane Embankment Worksite, reference – RLE (see plan 6 in Appendix A), where works activities included:
 - installation of the watermain protection slab; and
 - road crossing works.
- Leather Lane Worksite, reference – LL (see plan 7 in Appendix A), where works activities included:
 - construction of haul road and attenuation pond.
- South Heath Cutting Worksite, reference – SHCW (see plan 7 in Appendix A), where works activities included:
 - construction of haul road;
 - demolition of mulberry park;
 - site clearance;
 - installation of attenuation pond; and
 - tarmac at the security gatehouse.
- Colne Valley Viaduct - Little Missenden Vent Shaft worksite reference – CVV-LM (see plan 8 in Appendix A), where works activities included:
 - operation of general plant at site;

- earthworks including stockpile management;
 - diaphragm wall construction; and
 - water treatment.
- Colne Valley Viaduct - Amersham Vent Shaft Worksite, reference – CVV - AM (see plan 9 in Appendix A), where works activities included:
 - operation of general plant at site;
 - earthworks including stockpile management;
 - ground post treatment (drilling and grouting); and
 - water treatment.
- Bottom House Farm Lane Worksite, reference - BHFL (see plan 10 in Appendix A), where work activities included:
 - removal of track mat and soil along temporary access road;
 - stockpiling;
 - digging of trial holes;
 - fencing works;
 - vegetation clearance;
 - compaction of ground and installation of membrane; and
 - junction road works.
- Colne Valley Viaduct - Chalfont St Giles Vent Shaft Worksite, reference - CVV-CSG (see plan 10 in Appendix A), where works activities included:
 - operation of general plant at site;
 - earthworks (stockpile management);
 - ground post treatment (drilling and grouting);
 - dewatering; and
 - secant piling works.
- Colne Valley Viaduct - Chalfont St Peter Vent Shaft Worksite, reference – CVV-CSP (see plan 11 in Appendix A), where works activities included:
 - operation of general plant at site;
 - construction of shaft base slab (preparation works and concrete pour);
 - stockpile management;

- basement secant piling works (including construction of shallow box retaining wall, contiguous and secant piles, excavation, cutting of contiguous and secant piles)
- preparatory works for shaft base slab;
- shaft dewatering;
- collar construction; and
- road maintenance works;
- Colne Valley Viaduct - Load Test Pile 1 Worksite, reference – CVV-LTP #1 (see plan 12 in Appendix A), where works activities included:
 - piling for the construction of the jetty;
 - construction of a cofferdam (including piling and support plant);
 - main piling works including boring pile, de-sanding, installation of reinforcement cage and concrete pile, break-out of bored pile to prepare pile cap and installation of grout curtain around viaduct pile;
 - construction of retaining wall;
 - Denham Water Ski Club and North Embankment compound operation and de-sanding;
 - civil works, earthworks and drainage works on haul road;
 - north abutment works (including construction of slab, wall, masking walls, staircases and apron slab);
 - integrity test of concrete piles;
 - dewatering and installation of waling beams and concrete plugs;
 - emergency dismantling of A412 gas crossing;
 - pontoon installation and condition survey at Grand Union Canal;
 - construction of compensation pond at Harefield Lake No. 2;
 - storage of material;
 - fencing works;
 - environmental maintenance works;
 - construction of base slab, finishing of upstand walls and installation of equipment at Bentonite Farm;
 - utility works;

- ground investigation works;
- realignment of River Colne; and
- diversion of Thames water.

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

- Amersham and Aylesbury, as part of water utility works.
- Colne Valley viaduct where power line diversion works was underway.
- Turweston, as part of power utility works.
- Claydon Junction where recovery of track assets was underway.
- West Street Compound, Calvert where expansion of car park was underway.
- Addison Road Overbridge Worksite, Calvert where temporary drainage works were underway.
- East West Rail overbridge, Calvert where preparatory works for abutment foundation were underway.
- Charndon Lodge underbridge, Calvert where concrete pouring for eastern abutment and preparatory works for western abutment foundation were underway.
- Perry Hill overbridge, Calvert where temporary drainage and mobilisation for piling works were undertaken.
- Calvert North site access road where at-grade crossing and expansion of the Site Access Road from Perry Hill to Portway watercourse were undertaken.
- Oxford railway line, Calvert where removal of ballast, vegetation clearance, stockpile preparation, temporary drainage installation, removal of the embankment and creation of earthwork screening bunds were underway.
- Fleet Marston where vegetation clearance and archaeological works were undertaken.
- Wendover Dean where archaeological, fencing and translocation were undertaken.
- Frith Hill, Calvert area where vegetation clearance near Leather Lane, Potter Row and Frith Hill were undertaken.
- Hunts Green Farm, Great Missenden where archaeological trenching and fencing works were undertaken.
- Nash Lee where trial trenching, vegetation clearance, fencing and backfilling works were underway.

- North of Ellesborough Road where vegetation clearance and fencing works were undertaken.
- Three Bridge Mill Twyford where boundary fencing, ecology surveys and Historic Environment Research & Delivery Strategy mitigation works were undertaken.
- Bowood Lane where installation of security cabins for badger sett protection was undertaken.
- Waddesdon where installation of boundary fencing, archaeological investigations, vegetation clearance and ecological works in connection with reptile habitat were undertaken.
- Mixbury Area where ecological works in connection with bats and was underway.
- Twyford & Padbury where bat mitigation, vegetation clearance, installation of badger and ditch crossing were undertaken.
- West Street Compound, Twyford where stockpiling works and construction of access road were underway.
- A422 south where topsoil stripping, cutting excavation, ditch excavations, stone delivery, ponds excavation and stockpiling works were underway.
- A422 north where utility works, drainage, stone delivery, construction of track access, stockpiling works.
- Ground investigation works including rotary borehole drilling and trial pits were undertaken at various locations along the HS2 route (Westbury, Twyford, Turweston and A422).
- Vegetation clearance at various locations along the HS2 route was undertaken.

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

1.2 Measurement Locations

- 1.2.1 Twenty-Eight (28) noise and three (3) vibration monitoring installations were active in September in the BS area. Table 2 summarises the positions of noise and vibration monitoring installations within the BS area in September 2021.
- 1.2.2 An additional noise monitor (ref.: MW-NMP1) was installed at Medoway, in proximity to the Medoway worksite, ref.: MW, on the 24th of September.

- 1.2.3 An additional vibration monitor (ref.: SE-Vib1) was installed at School End, Chetwode in proximity to the School End worksite, ref.: SE, on the 1st of September.
- 1.2.4 The vibration monitor (ref.: BHFL-Vib1) at worksite BHFL was reinstalled on 13th of September 2021.
- 1.2.5 An additional noise monitor (ref.: WRC-NMP1) was installed at Weir Cottage, Denham, in proximity to the Colne Valley LTP#1 worksite, ref.: CVV-LTP #1, on the 3rd of September.
- 1.2.6 Maps showing the positions of noise and vibration monitoring installations are presented in Appendix B.

Table 2: Monitoring Locations

Worksite Reference	Measurement Reference	Address
SE	SE-NMP1	School End, Chetwode
	SE-Vib1	School End, Chetwode
CH	CH-NMP1	Hermitage, Chetwode
RF	RF-NMP1	Old Stable Cottage, Rosehill Farm, Chetwode
	RF-Vib1	Old Stable Cottage, Rosehill Farm, Chetwode
SHC	SHC-NMP1	School Hill Compound, Calvert
SHU	SHU-NMP1	70 Cotswold Way, Calvert
CALS	CALS-NMP1	Site boundary adjacent to Red Kite View, Calvert
QAR	QAR-NMP1	Woodlands Barn, Quainton
HF	HF-NMP1	Hall Farm, Bicester Road, Waddesdon
MW	MW-NMP1	Aylesbury, Buckinghamshire
RLE	SDVC-NMP1	Rocky Lane, Wendover
	NCAS6-NMP1	Chesham Lane, The Lee, Wendover
	NCAS5-NMP1	Chesham Lane, The Lee, Wendover
LL	HG-NMP1	Hunts Green, Leather Lane, The Lee, South Heath
	GD-NMP1	Grimms Ditch, The Lee, South Heath
SHCW	PR-NMP1	Potters Row, South Heath
	SH-NMP1	Bury Farm, South Heath
CVV-AM	CVV-AM-NMP1	Amersham Vent Shaft Worksite, Whielden Lane, Amersham
CVV-LM	CVV-LM-NMP1	Little Missenden Vent Shaft Worksite, Amersham

Worksite Reference	Measurement Reference	Address
BHFL	BHFL-NMP1	Elm Tree Cottage, Bottom House Farm Lane
	BHFL-Vib 1	The Granary, Bottom House Farm Lane
CVV-CSG	CVV-CSG-NMP1	Chalfont St Giles Vent Shaft Worksite, Bottom House Farm Lane
	CVV-CSG-NMP2	Chalfont St Giles Vent Shaft Worksite, Bottom House Farm Lane
CVV-CSP	CVV-CSP-NMP1	Chalfont St Peter Vent Shaft Worksite, Chesham Lane, Chalfont St. Peter
	CVV-CSP-NMP2	Chalfont St Peter Vent Shaft Worksite, Chesham Lane, Chalfont St. Peter
	CVV-CSP-NMP3	Chalfont St Peter Vent Shaft Worksite, Chesham Lane, Chalfont St. Peter
CVV-LTP #1	CVV-LTP #1-NMP1	Northern boundary, Load Test Pile 1 Worksite, Denham Water Ski Club
	CVV-WYC-NMP1	Wyatt's Covert, Tilehouse Lane, Denham, Denham Garden Village
	CVV-DFS-NMP1	Denham Film Studio, Uxbridge
	CVV-WRC-NMP1	Weir Cottage, Denham Garden Village, Denham, Buckinghamshire

2 Summary of Results

2.1 Summary of Measured Noise 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	Weekly Average L _{Aeq,T} (Highest Day L _{Aeq,T})					Saturday Average L _{Aeq,T} (highest day L _{Aeq,T})					Sunday / Public Holiday Average L _{Aeq,T} (highest day L _{Aeq,T})	
				0700 - 0800	0800 - 1800	1800 - 1900	1900 - 2200	2200 - 0700	0700 - 0800	0800 - 1300	1300 - 1400	1400 - 2200	2200 - 0700	0700 - 2200	2200 - 0700
SE	SE-NMP1	School End, Chetwode	Free-field	46.7 (51.0)	51.6 (63.9)	42.6 (52.2)	40.0 (53.3)	38.7 (49.6)	42.4 (43.8)	47.1 (49.7)	45.9 (47.4)	41.9 (47.5)	36.0 (45.1)	46.1 (55.0)	40.7 (50.1)
CH	CH-NMP1	Hermitage, Chetwode	Free-field	41.5 (44.0)	49.6 (67.2)	43.2 (54.1)	40.5 (49.6)	37.7 (44.1)	40.4 (40.7)	44.7 (45.0)	45.3 (46.0)	42.2 (45.5)	38.8 (45.5)	42.3 (47.2)	39.6 (47.1)
RF	RF-NMP1	Old Stable Cottage, Rosehill Farm, Chetwode	Free-field	47.6 (52.6)	50.4 (61.2)	46.7 (63.4)	44.4 (56.2)	41.9 (51.8)	45.3 (48.7)	48.5 (51.2)	47.8 (49.6)	46.8 (60.0)	41.6 (49.7)	46.5 (51.7)	42.2 (49.6)
SHC	SHC-NMP1	School Hill Compound, Calvert	Free-field	49.8 (53.2)	57.5 (62.7)	46.4 (50.0)	44.1 (53.5)	41.2 (51.4)	43.1 (44.9)	45.0 (45.9)	45.5 (46.3)	44.0 (48.2)	40.0 (42.4)	45.5 (49.7)	41.7 (47.9)
SHU	SHU-NMP1	70 Cotswold Way, Calvert	Free-field	51.7 (54.7)	56.1 (61.3)	49.3 (53.1)	46.3 (51.3)	42.2 (54.9)	48.4 (50.8)	50.8 (54.2)	48.2 (49.1)	50.3 (63.7)	39.5 (49.5)	50.5 (60.4)	42.1 (50.9)
CALS	CALS-NMP1	Site boundary adjacent to Red Kite View, Calvert	Free-field	56.8 (60.9)	57.8 (59.7)	49.7 (54.1)	44.5 (54.1)	43.4 (53.7)	45.5 (45.5)	47.8 (47.8)	45.4 (45.4)	44.8 (47.2)	35.1 (41.3)	45.1 (49.5)	41.6 (50.0)
QAR	QAR-NMP1	1 Woodlands Farm Cottages, Quainton	Free-field	47.0 (52.1)	51.6 (60.1)	45.0 (68.0)	43.9 (61.5)	41.6 (51.5)	45.5 (51.1)	46.7 (52.4)	47.3 (54.3)	44.3 (54.3)	39.8 (50.4)	46.4 (52.6)	40.9 (50.4)
HF	HF-NMP1	Hall Farm, Bicester Road, Waddesdon	Free-field	60.7 (62.6)	62.3 (65.2)	61.5 (64.0)	58.8 (62.6)	54.3 (60.1)	57.4 (58.3)	59.8 (60.8)	60.4 (62.0)	59.4 (62.3)	53.2 (58.2)	58.4 (62.0)	54.1 (59.0)

OFFICIAL

Worksite Reference	Measurement Reference	Site Address	Free-field or Façade Measurement	Weekly Average $L_{Aeq,T}$ (Highest Day $L_{Aeq,T}$)					Saturday Average $L_{Aeq,T}$ (highest day $L_{Aeq,T}$)					Sunday / Public Holiday Average $L_{Aeq,T}$ (highest day $L_{Aeq,T}$)	
				0700 - 0800	0800 - 1800	1800 - 1900	1900 - 2200	2200 - 0700	0700 - 0800	0800 - 1300	1300 - 1400	1400 - 2200	2200 - 0700	0700 - 2200	2200 - 0700
MW	MW-NMP1	Aylesbury, Buckinghamshire	Free-field	63.2 (63.8)	62.3 (63.0)	62.5 (62.9)	60.1 (62.6)	55.9 (61.7)	59.7 (59.7)	61.5 (61.5)	61.4 (61.4)	60.2 (61.5)	53.8 (56.5)	60.2 (61.4)	54.8 (60.4)
RLE	SDVC-NMP1	Rocky Lane, Wendover	Free-field	61.4 (63.6)	60.7 (62.1)	60.9 (62.3)	58.2 (61.7)	54.6 (61.6)	58.8 (59.7)	59.4 (60.7)	60.3 (60.7)	58.5 (60.4)	52.8 (56.5)	58.8 (60.8)	53.7 (61.0)
	NCAS6-NMP1	Chesham Lane, The Lee, Wendover	Free-field	56.6 (59.0)	56.0 (58.3)	55.1 (58.2)	52.5 (58.1)	48.9 (56.6)	53.4 (55.2)	53.7 (54.8)	53.8 (55.7)	52.9 (54.9)	47.5 (51.0)	52.6 (56.2)	48.2 (55.8)
	NCAS5-NMP1	Chesham Lane, The Lee, Wendover	Free-field	50.2 (55.5)	50.6 (54.2)	49.2 (55.2)	47.5 (56.0)	45.1 (52.3)	47.8 (51.0)	47.3 (49.2)	47.3 (49.2)	48.1 (55.3)	43.1 (46.9)	47.4 (52.6)	45.0 (51.8)
LL	HG-NMP1	Hunts Green, Leather Lane, The Lee, South Heath	Free-field	49.5 (61.5)	49.9 (55.3)	47.6 (55.7)	46.8 (60.7)	46.7 (59.5)	46.0 (49.8)	46.2 (48.3)	46.6 (48.0)	45.9 (49.7)	44.5 (52.3)	48.2 (56.1)	45.4 (58.0)
	GD-NMP1	Grimms Ditch, The Lee, South Heath	Free-field	48.4 (53.5)	51.0 (56.7)	48.7 (53.4)	46.0 (54.4)	45.2 (54.2)	47.1 (48.5)	48.0 (49.3)	48.9 (53.0)	47.8 (53.1)	45.0 (50.9)	48.3 (57.9)	46.1 (52.5)
SHCW	PR-NMP1	Potters Row, South Heath	Free-field	49.6 (52.9)	52.8 (69.3)	47.8 (56.0)	45.7 (53.9)	44.8 (50.1)	47.8 (48.8)	48.6 (50.3)	47.5 (47.8)	47.2 (51.4)	45.6 (51.5)	47.7 (51.5)	45.1 (50.2)
	SH-NMP1	Bury Farm, South Heath	Free-field	47.0 (54.0)	54.5 (70.8)	46.4 (51.7)	45.2 (53.6)	43.5 (50.2)	44.8 (47.0)	47.3 (49.0)	46.3 (48.0)	46.4 (51.6)	43.0 (46.2)	46.5 (52.5)	43.5 (50.7)
CVV-AM	CVV-AM-NMP1	Whielden Lane, Amersham	Free-field	63.8 (68.6)	65.2 (69.9)	60.3 (68.1)	57.0 (67.4)	53.3 (66.4)	61.8 (64.0)	63.3 (66.6)	58.2 (58.6)	56.9 (60.7)	51.0 (55.6)	56.8 (59.2)	51.4 (58.2)
CVV-LM	CVV-LM-NMP1	Little Missenden Vent Shaft Worksite	Free-field	63.2 (66.0)	62.3 (63.8)	62.6 (64.6)	59.3 (62.3)	55.0 (62.7)	58.8 (59.3)	60.9 (61.1)	61.8 (62.9)	60.5 (63.2)	53.7 (57.5)	60.1 (61.9)	54.3 (61.5)

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Worksite Reference	Measurement Reference	Site Address	Free-field or Façade Measurement	Weekly Average $L_{Aeq,T}$ (Highest Day $L_{Aeq,T}$)					Saturday Average $L_{Aeq,T}$ (highest day $L_{Aeq,T}$)					Sunday / Public Holiday Average $L_{Aeq,T}$ (highest day $L_{Aeq,T}$)	
				0700 - 0800	0800 - 1800	1800 - 1900	1900 - 2200	2200 - 0700	0700 - 0800	0800 - 1300	1300 - 1400	1400 - 2200	2200 - 0700	0700 - 2200	2200 - 0700
BHFL	BHFL-NMP1	Elm Tree Cottage, Bottom House Farm Lane	Free-field	54.9 (59.1)	56.7 (60.7)	53.9 (59.2)	50.6 (54.4)	46.7 (56.0)	51.1 (52.8)	54.2 (56.1)	53.2 (55.4)	51.4 (57.3)	44.5 (49.3)	53.5 (63.6)	46.2 (54.1)
CVV-CSG	CVV-CSG-NMP1	Chalfont St Giles Vent Shaft Worksite, Bottom House Farm Lane	Free-field	54.0 (65.0)	58.5 (63.5)	48.9 (54.8)	45.3 (60.7)	42.9 (56.5)	49.2 (51.3)	51.6 (53.5)	49.9 (56.0)	48.6 (58.5)	44.5 (57.6)	49.1 (59.5)	44.5 (57.2)
	CVV-CSG-NMP2	Chalfont St Giles Vent Shaft Worksite, Bottom House Farm Lane	Free-field	56.1 (64.3)	62.1 (72.6)	48.8 (56.4)	45.2 (57.2)	43.5 (57.7)	52.3 (57.9)	54.8 (60.7)	49.1 (50.5)	46.1 (52.1)	42.4 (49.5)	48.0 (60.0)	43.7 (54.8)
CVV-CSP	CVV-CSP-NMP1	Chalfont St Peter Vent Shaft Worksite	Free-field	63.8 (67.7)	70.3 (74.9)	64.8 (77.5)	58.7 (77.1)	51.2 (60.2)	58.0 (59.0)	64.1 (68.3)	61.3 (62.7)	58.8 (62.1)	50.5 (55.0)	57.7 (62.0)	50.1 (57.0)
	CVV-CSP-NMP2	Chalfont St Peter Vent Shaft Worksite	Free-field	46.5 (53.2)	55.6 (70.5)	48.4 (55.4)	44.8 (53.7)	38.6 (48.0)	42.4 (44.7)	47.5 (49.0)	46.8 (49.2)	45.8 (50.1)	37.5 (45.3)	47.1 (52.6)	40.2 (48.3)
	CVV-CSP-NMP3	Chalfont St Peter Vent Shaft Worksite	Free-field	57.1 (59.2)	56.5 (58.7)	56.2 (57.9)	53.7 (56.4)	49.0 (56.1)	53.6 (54.0)	56.0 (56.8)	56.2 (57.0)	54.6 (57.1)	47.9 (51.9)	54.7 (57.0)	48.8 (55.0)
CVV-LTP #1	CVV-LTP #1-NMP1	Northern boundary, Load Test Pile 1 Worksite	Free-field	61.4 (64.5)	61.2 (62.8)	59.9 (62.7)	57.1 (63.7)	54.7 (69.7)	57.1 (58.0)	59.0 (60.6)	58.4 (59.7)	58.3 (65.0)	51.0 (55.1)	57.3 (60.5)	52.5 (60.0)
	CVV-WYC-NMP1	Wyatt's Covert, Tilehouse Lane, Denham	Free-field	56.4 (59.1)	57.3 (59.4)	55.7 (57.4)	52.6 (64.3)	49.2 (59.0)	54.4 (59.6)	55.7 (58.4)	55.4 (56.5)	54.1 (59.0)	47.6 (55.8)	54.6 (59.2)	48.6 (56.1)
	CVV-DFS-NMP1	Denham Film Studio, Uxbridge	Free-field	50.0 (58.3)	50.1 (53.8)	47.4 (55.7)	47.0 (64.2)	44.4 (59.0)	46.9 (49.8)	46.1 (48.8)	46.7 (47.4)	51.3 (65.9)	43.3 (55.3)	47.2 (57.5)	44.9 (58.6)

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Worksite Reference	Measurement Reference	Site Address	Free-field or Façade Measurement	Weekly Average $L_{Aeq,T}$ (Highest Day $L_{Aeq,T}$)					Saturday Average $L_{Aeq,T}$ (highest day $L_{Aeq,T}$)					Sunday / Public Holiday Average $L_{Aeq,T}$ (highest day $L_{Aeq,T}$)	
				0700 - 0800	0800 - 1800	1800 - 1900	1900 - 2200	2200 - 0700	0700 - 0800	0800 - 1300	1300 - 1400	1400 - 2200	2200 - 0700	0700 - 2200	2200 - 0700
CVV-LTP #1	CVV-WRC-NMP1	Weir Cottage, Denham Garden Village, Denham, Buckinghamshire	Free-field	53.0 (56.3)	57.3 (66.1)	51.5 (62.6)	48.6 (61.1)	45.4 (56.8)	50.1 (51.3)	50.5 (50.9)	49.9 (50.7)	48.7 (52.0)	44.5 (49.8)	49.0 (52.1)	45.3 (52.5)

2.1.2 Table 4 presents a summary of the measured vibration levels at the 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
SE	SE-Vib 1	School End, Chetwode	5.19 (Y-axis)
RF	RF-Vib 1	Old Stable Cottage, Rosehill Farm, Chetwode	0.96 (Y-axis)
BHFL	BHFL-Vib 1	Pine Cottage, Bottom House Farm Lane	4.97* (Z-axis)

*High vibration levels are due to the proximity of the construction activities to the vibration monitor. The nearest residential receptors are further away from the works and vibration levels at the receptor will therefore be lower.

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 LOAEL and SOAEL

2.2.1 The lowest observed adverse effect level (LOAEL) is defined in the Planning Practice Guidance – Noise (PPG) as the level above which "noise starts to cause small changes in behaviour and/or attitude, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a perceived change in the quality of life".

2.2.2 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."

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

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

2.2.5 Table 5 presents a summary of recorded exceedances of the LOAEL and SOAEL over the reporting period, including the number of exceedances during each time period.

Table 5: Summary of Exceedances of LOAEL and SOAEL

Worksite Reference	Measurement Reference	Address	Day (Weekday, Saturday, Sunday, Night)	Time period	Number of exceedances of LOAEL	Number of exceedances of SOAEL
SE	SE-NMP1	School End, Chetwode	Weekday	08:00-18:00	2	No exceedance
CH	CH-NMP1	Hermitage, Chetwode	All days	08:00-18:00	1	No exceedance
RF	RF-NMP1	Old Stable Cottage, Rosehill Farm, Chetwode	All days	All periods	No exceedance	No exceedance
SHC	SHC-NMP1*	School Hill Compound, Calvert	All days	All periods	No exceedance	No exceedance
SHU	SHU-NMP1	70 Cotswold Way, Calvert	All days	All periods	No exceedance	No exceedance
CALS	CALS-NMP1	Site boundary adjacent to Red Kite View, Calvert	All days	All periods	No exceedance	No exceedance
QAR	QAR-NMP1	Woodlands Barn, Quainton	All days	All periods	No exceedance	No exceedance
HF	HF-NMP1	Hall Farm, Bicester Road, Waddesdon	All days	All periods	No exceedance	No exceedance
MW	MW-NMP1	Aylesbury, Buckinghamshire	Weekday	08:00-18:00	3	No exceedance
RLE	SDVC-NMP1	Rocky Lane, Wendover	Weekday	08:00-18:00	1	No exceedance
	NCAS6-NMP1	Chesham Lane, The Lee, Wendover	All days	All periods	No exceedance	No exceedance

Worksite Reference	Measurement Reference	Address	Day (Weekday, Saturday, Sunday, Night)	Time period	Number of exceedances of LOAEL	Number of exceedances of SOAEL
	NCAS5-NMP1	Chesham Lane, The Lee, Wendover	All days	All periods	No exceedance	No exceedance
LL	HG-NMP1	Hunts Green, Leather Lane, The Lee, South Heath	All days	All periods	No exceedance	No exceedance
	GD-NMP1	Grimms Ditch, The Lee, South Heath	All days	All periods	No exceedance	No exceedance
SHCW	PR-NMP1	Potters Row, South Heath	All days	08:00-18:00	3	No exceedance
	SH-NMP1	Bury Farm, South Heath	All days	08:00-18:00	1	No exceedance
CVW-AM	CVW-AM-NMP1*	Whielden Lane, Amersham	All days	All periods	No exceedance	No exceedance
CVW-LM	CVW-LM-NMP1*	Little Missenden Vent Shaft Worksite	All days	All periods	No exceedance	No exceedance
BHFL	BHFL-NMP1	Elm Tree Cottage, Bottom House Farm Lane	All days	22:00-07:00	1	No exceedance
CVW-CSG	CVW-CSG-NMP1*	Chalfont St Giles Vent Shaft	All days	All periods	No exceedance	No exceedance
	CVW-CSG-NMP2*	Chalfont St Giles Vent Shaft	All days	All periods	No exceedance	No exceedance
CVW-CSP	CVW-CSP-NMP1*	Chalfont St Peter Vent Shaft Worksite	All days	All periods	No exceedance	No exceedance
	CVW-CSP-NMP2*	Chalfont St Peter Vent Shaft Worksite	All days	All periods	No exceedance	No exceedance
	CVW-CSP-NMP3*	Chalfont St Peter Vent Shaft Worksite	All days	All periods	No exceedance	No exceedance
CVW-LTP #1	CVW-LTP #1-NMP1*	Northern boundary, Load Test Pile 1 Worksite	All days	All periods	No exceedance	No exceedance

Worksite Reference	Measurement Reference	Address	Day (Weekday, Saturday, Sunday, Night)	Time period	Number of exceedances of LOAEL	Number of exceedances of SOAEL
	CVW-WYC-NMP1	Wyatt's Covert, Tilehouse Lane, Denham	All days	All periods	No exceedance	No exceedance
	CVW-DFS-NMP1	Denham Film Studio, Uxbridge	All days	All periods	No exceedance	No exceedance
	CVW-WRC-NMP1	Weir Cottage, Denham Garden Village, Denham, Buckinghamshire	Weekday Weekday Weekday	0800-1800 1800-1900 1900-2200	2 2 3	No exceedance

* A distance correction has been applied when calculating exceedances of the LOAEL and SOAEL.

2.2.6 No exceedance of the SOAEL were recorded due to HS2 construction during September 2021. Exceedances of the LOAEL were recorded at SE-NMP1, CH-NMP1, SDVC-NMP1, PR-NMP1, SH-NMP1, BHFL-NMP1 and CVW-WRC-NMP1.

2.3 Exceedances of Trigger Level

2.3.1 Table 6 provides a summary of exceedances of the S61 trigger noise levels determined to be due to HS2 related construction noise measured during the reporting period, along with the findings of any investigation.

Table 6: Summary of Exceedances of Trigger Levels

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

2.4 Complaints

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

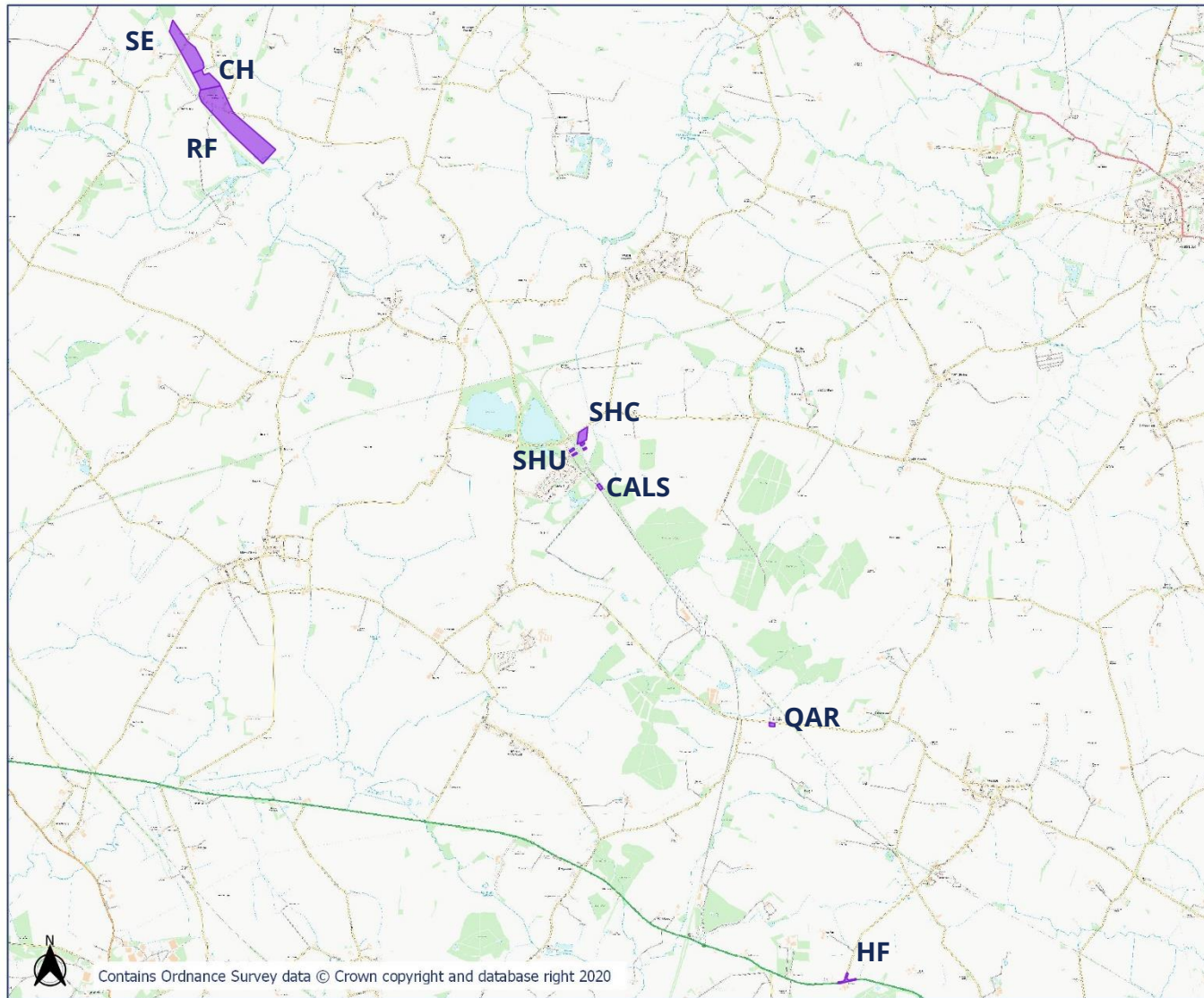
Table 7: Summary of Complaints

Complaint Reference Number	Worksite Reference	Description of Complaint	Results of Investigation	Actions Taken
HS2-21-42503-C	CVV-LTP #1	Complaint regarding night-time noise.	The noise was confirmed to be from ongoing HS2 related overnight road resurfacing works. Night-time works were necessary to ease traffic due to road closures. Monitoring demonstrates compliance with Section 61 requirements.	The complainant has been contacted and was presented with the outcomes of investigation. The last date of works were confirmed to be 4 th of September.
HS2-21-42530-C	QAR	Complaint regarding noise from construction activity occurring close to property.	The noise was confirmed to be from ongoing HS2 related construction works. Monitoring demonstrates compliance with Section 61 requirements.	Working hours to be restricted to one hour either side of core work hours. Staff to be reminded of these restrictions on site.
HS2-21-42573-C	MW	Complaint regarding noise from night-time HGV deliveries.	Contractor has no night works in the area. Last HS2 delivery was at 4pm on the previous day.	Outcome of the investigation was communicated to the stakeholder.
HS2-21-42586-C	CVV-LTP #1	Complaint regarding noise from construction works.	The communication with the stakeholder has been longstanding and is ongoing. Stakeholder's allegation of non-compliance of undertakings has been found to be incorrect.	Contractor has been engaged with the stakeholder to discuss ongoing dissatisfaction.
HS2-21-42615-C	CVV-LTP #1	Complaint regarding noise from vibratory roller operating 800m away from the property.	Stakeholder operates a recording studio. Some works may be impacting stakeholder.	Discussions to be held regarding booking the studio out on days where noise is to be prevalent.
HS2-21-42625-C	MW	Complaint regarding noise disturbance from night-time drain cleaning works.	The noise was confirmed to be from HS2 related essential drainage work that had to be completed out of hours to minimise potential impact to traffic during day. Monitoring demonstrates compliance with Section 61 requirements.	The works were undertaken with the consent of local authority Works ended early after visit to site by stakeholder.
HS2-21-42627-C	SHCW	Complaint regarding noise disturbance	The earthworks are ongoing for the	Noise monitors are in place to monitor the noise

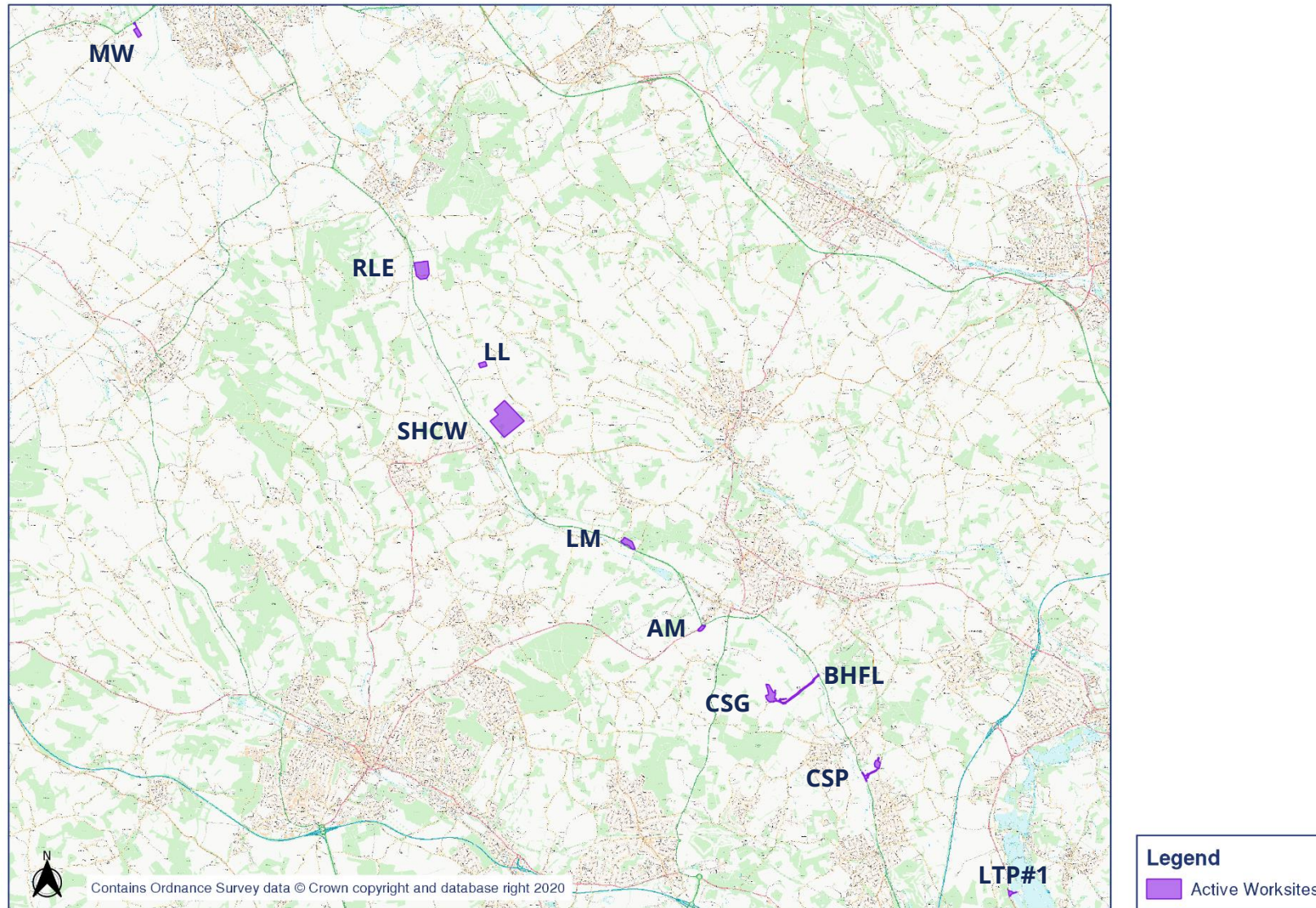
Complaint Reference Number	Worksite Reference	Description of Complaint	Results of Investigation	Actions Taken
		from construction vehicles close to premises.	construction of site access roads and drainage ponds. Work will continue for few more weeks in the dry weather. Monitoring demonstrates compliance with Section 61 requirements.	exceedances; however, no limits have been breached.

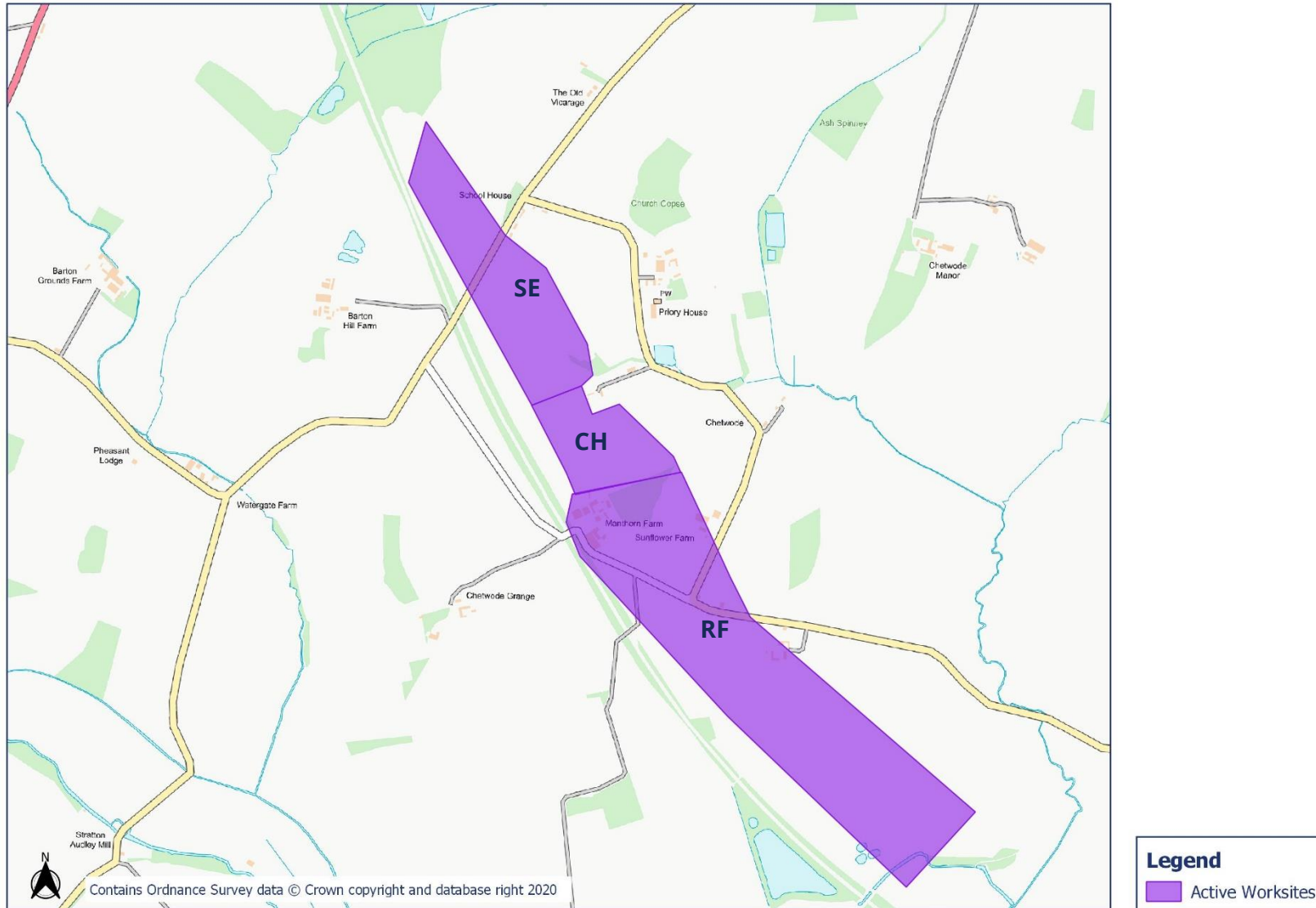
Appendix A Site Locations

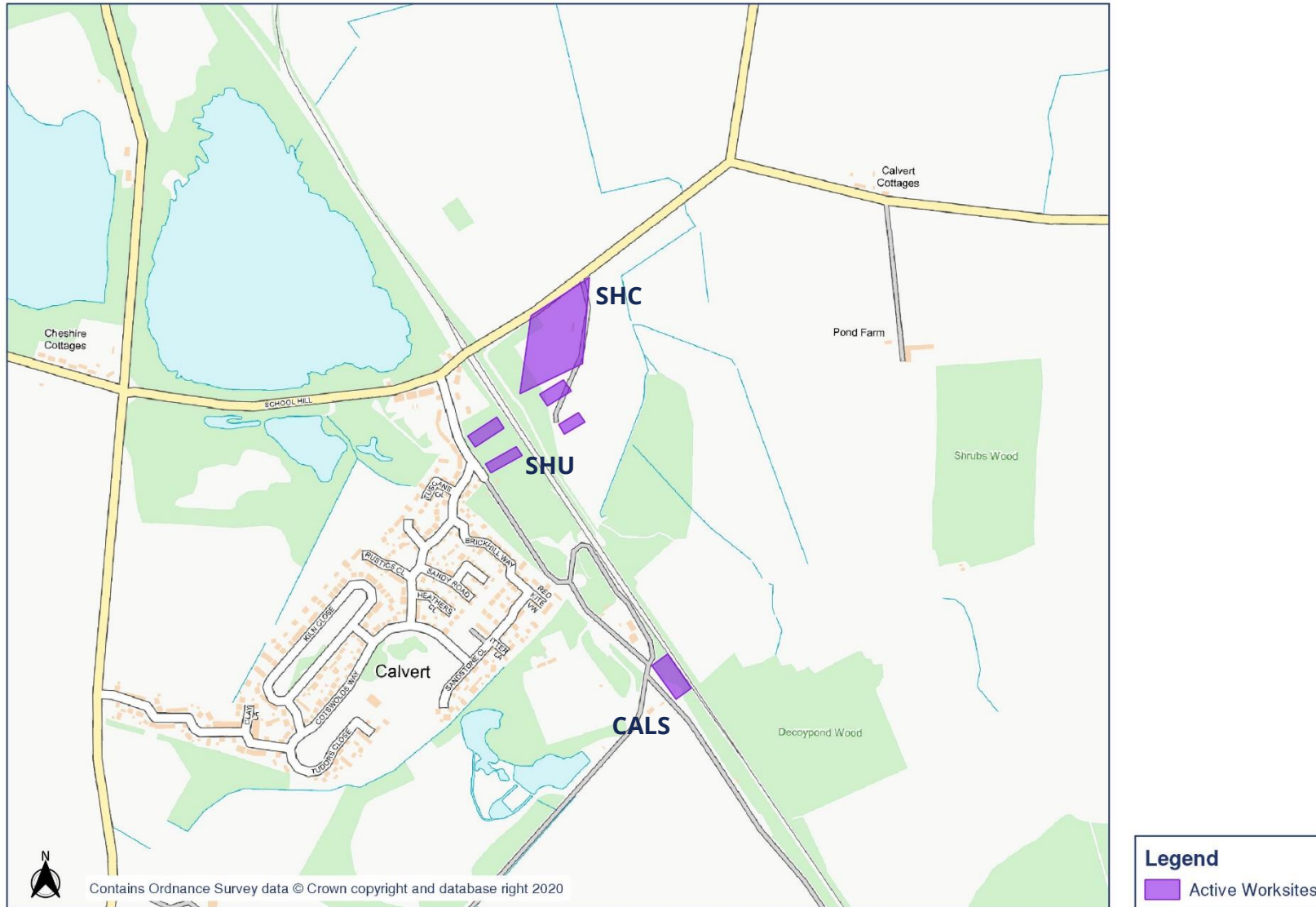
HS2 Worksite Identification Plan - Overview 1



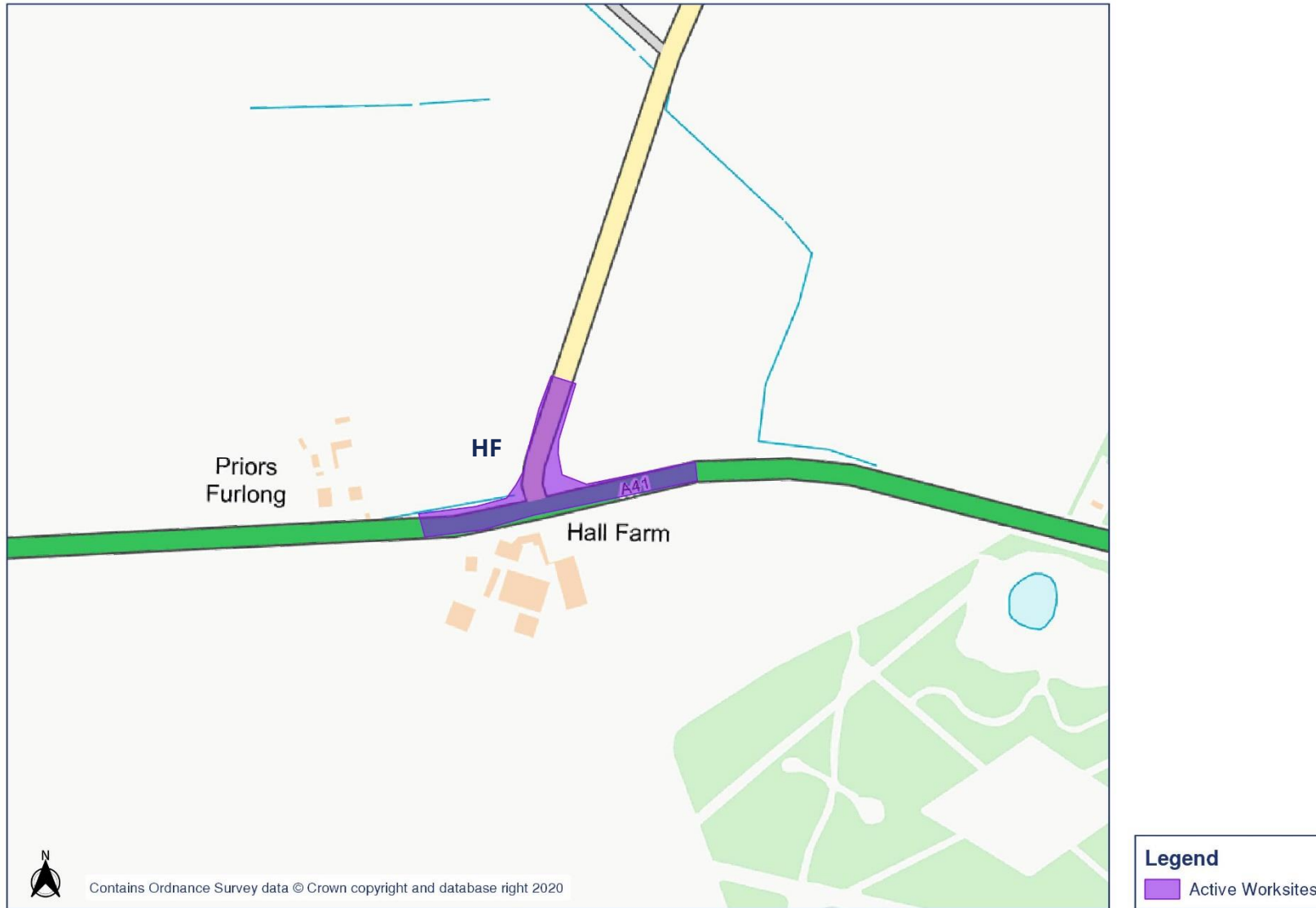
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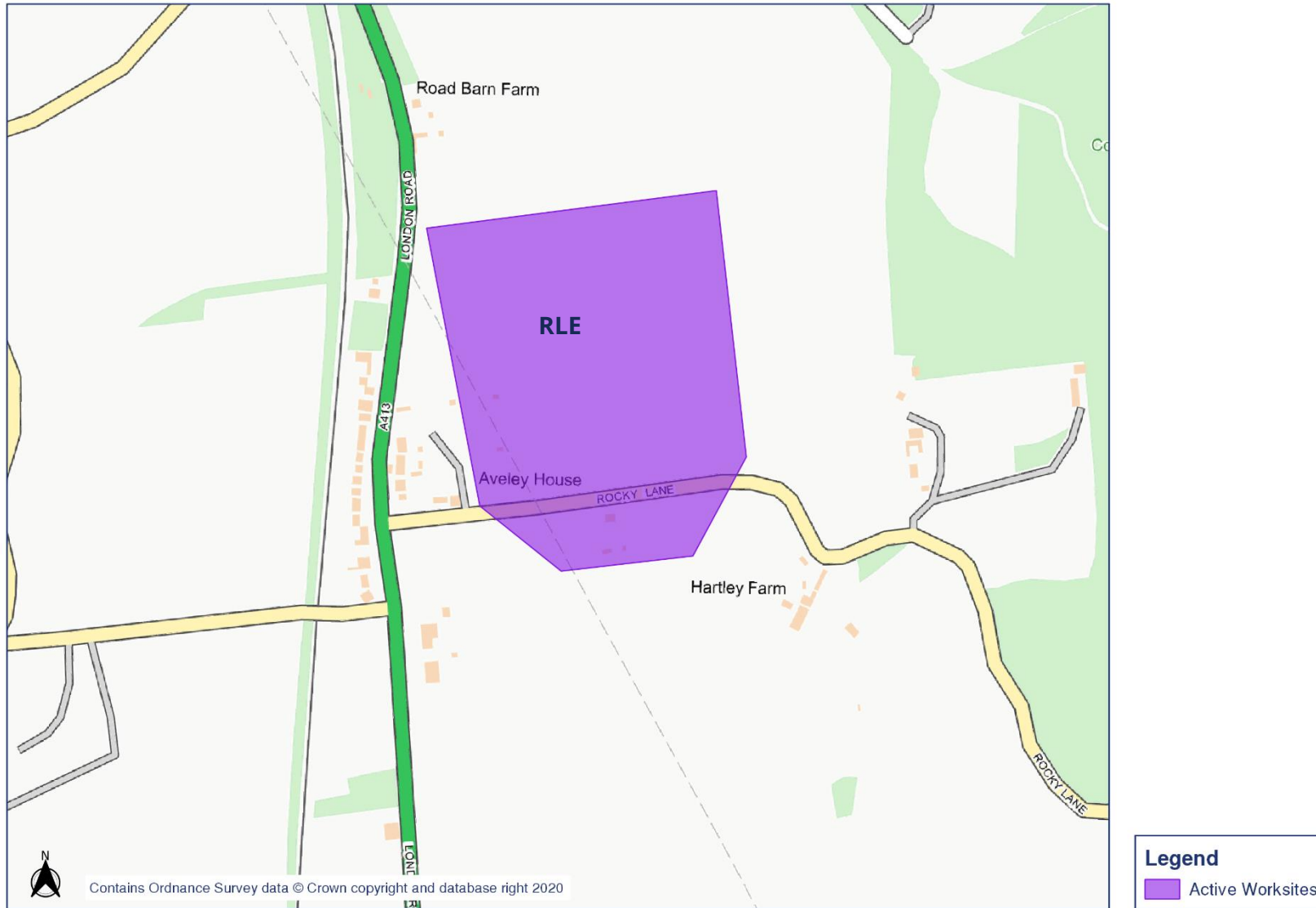


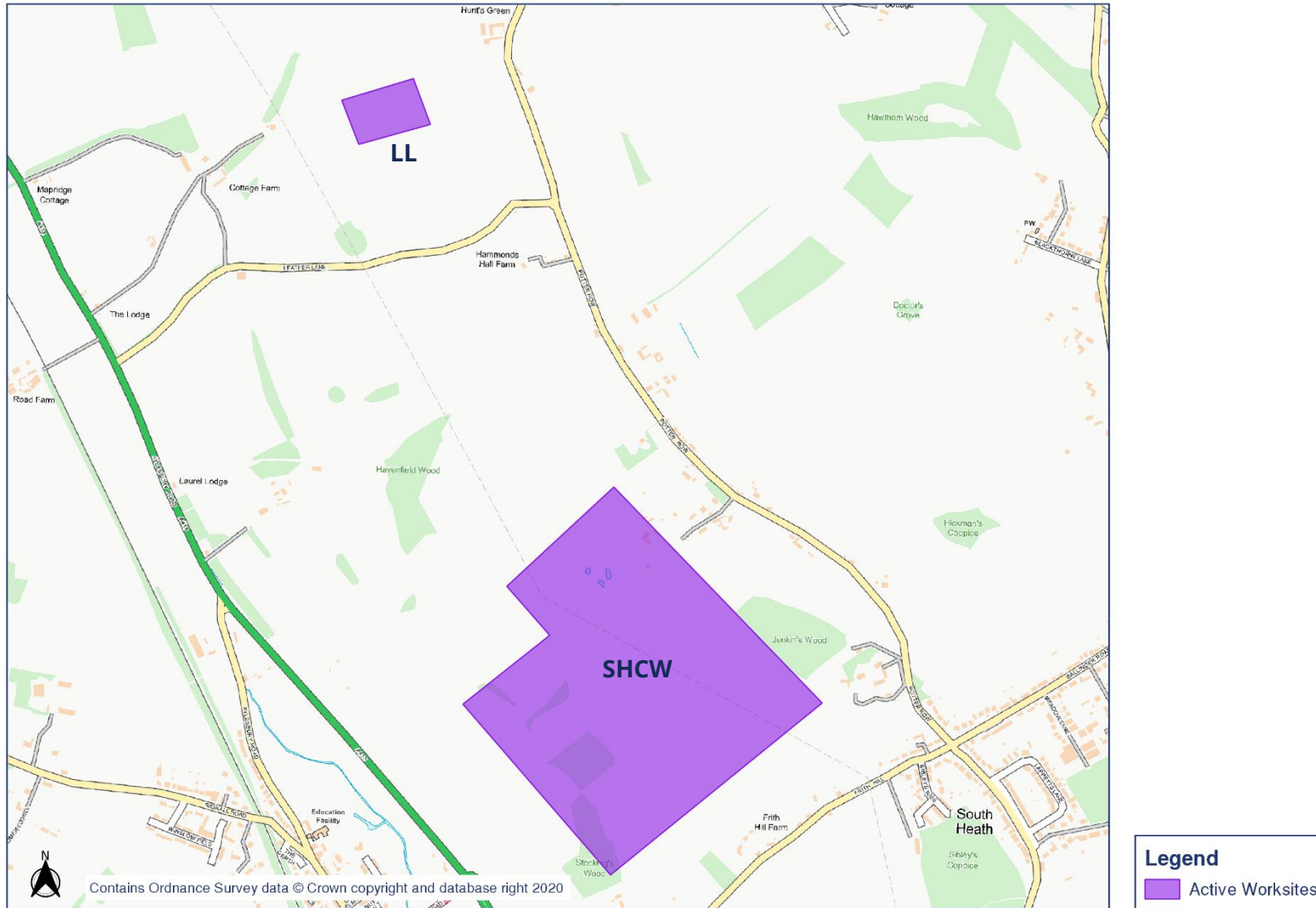




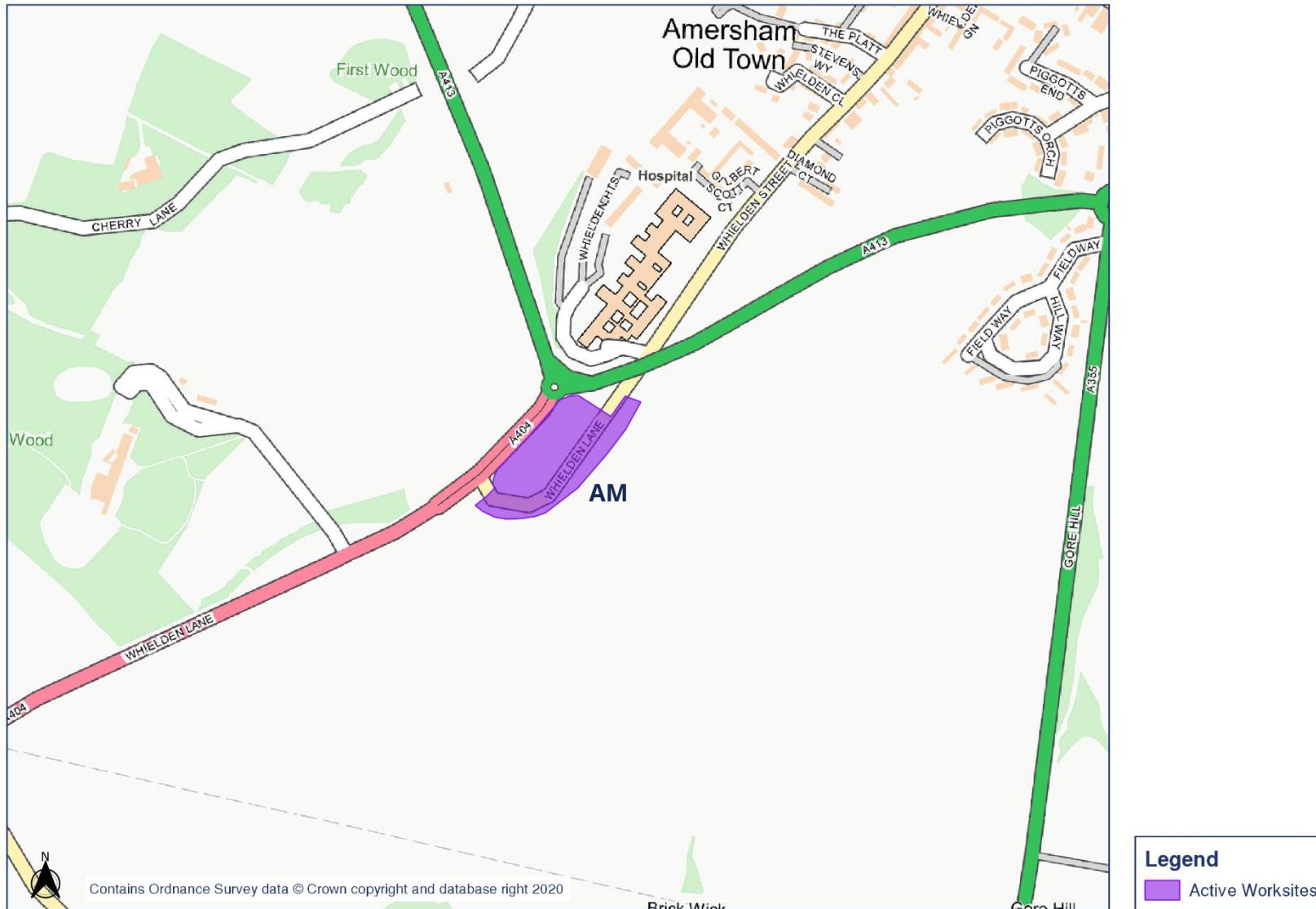


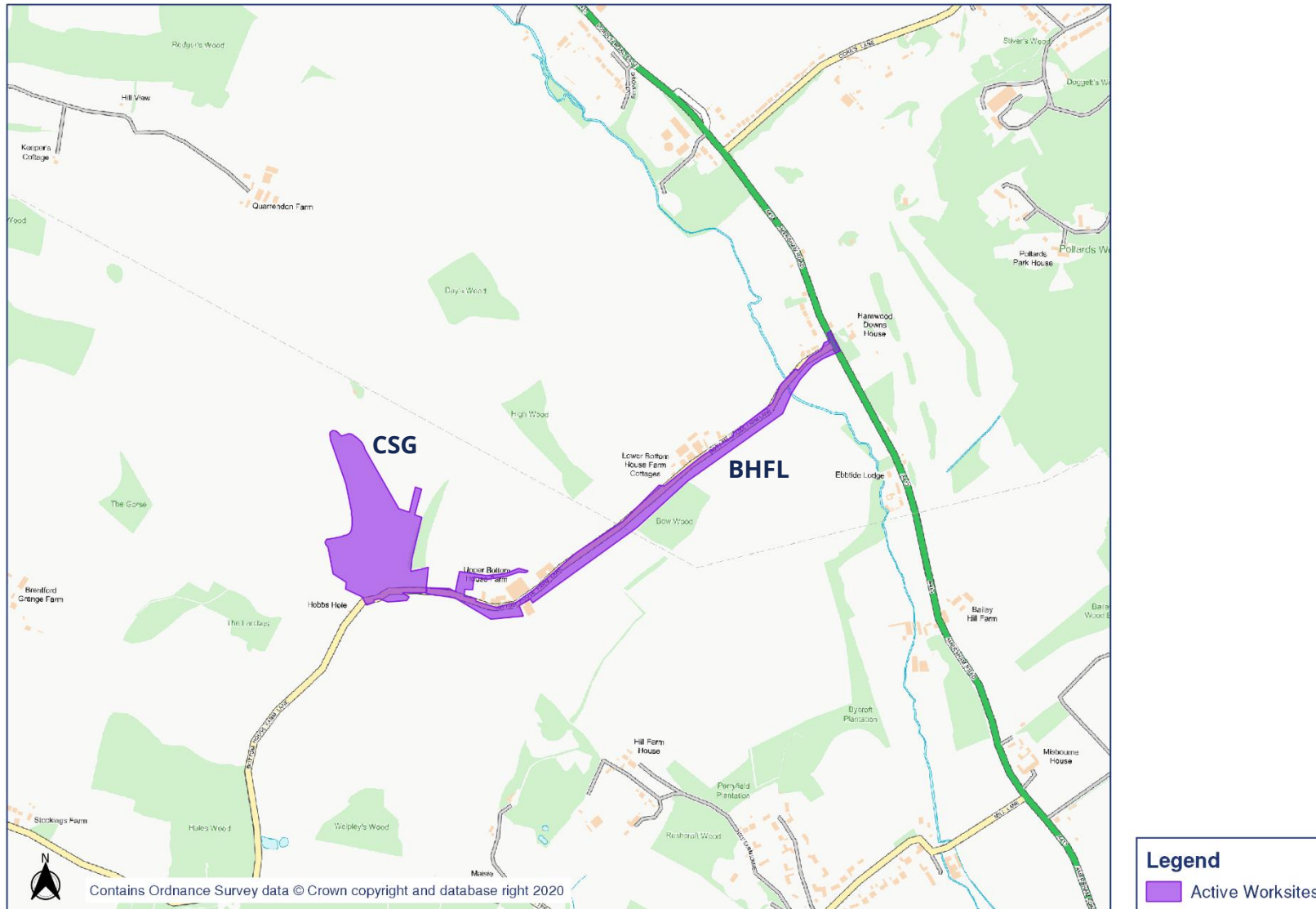


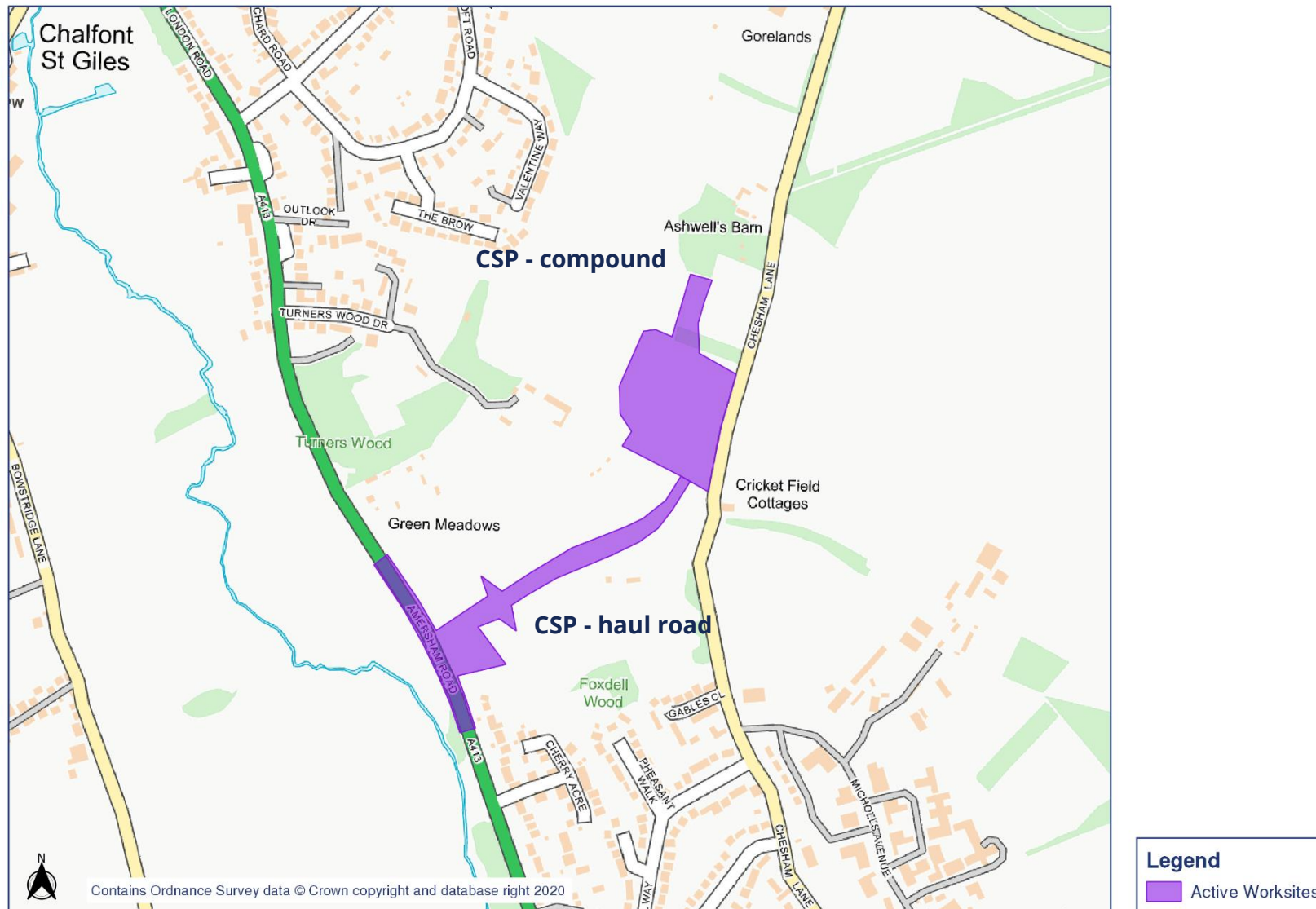


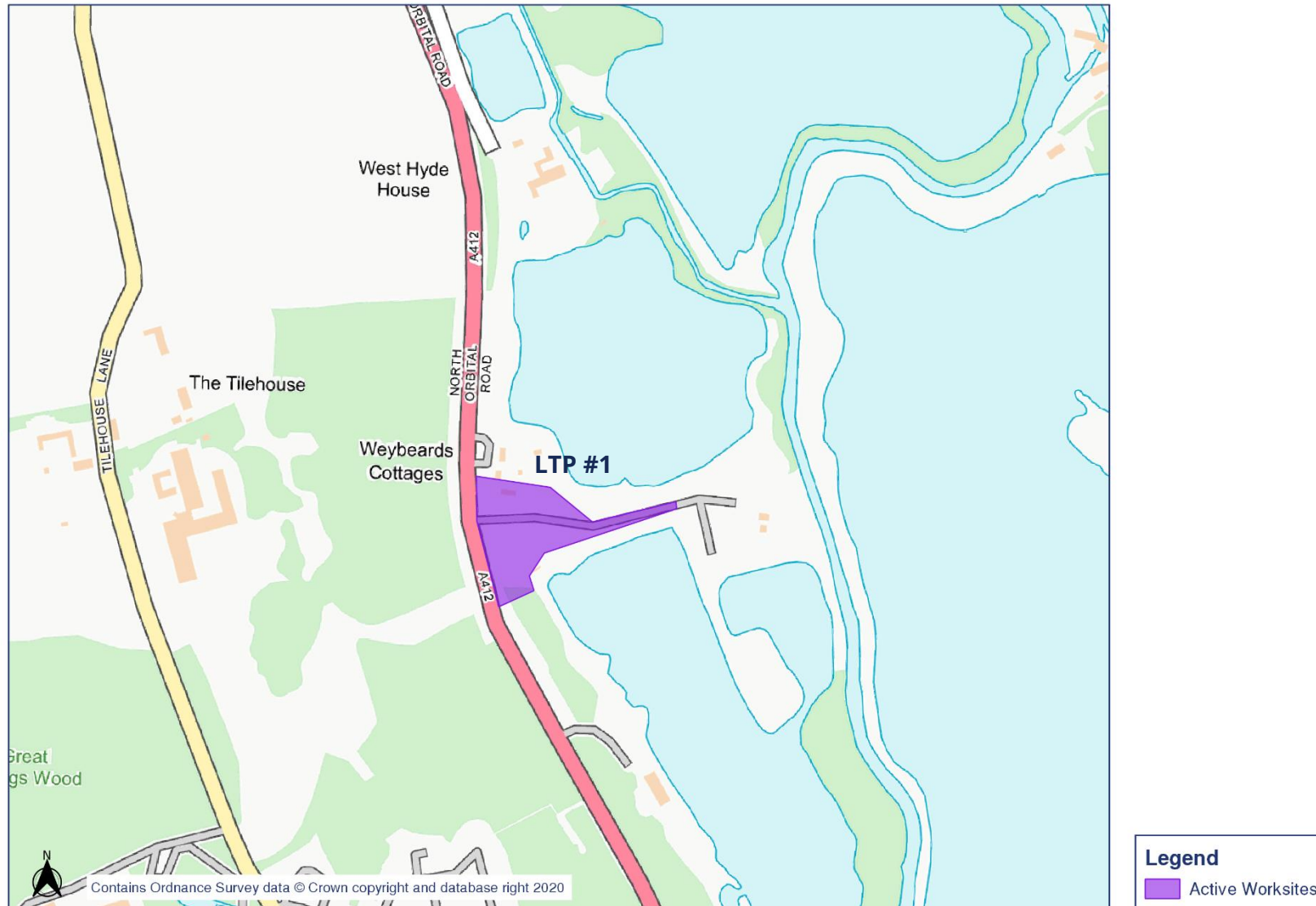




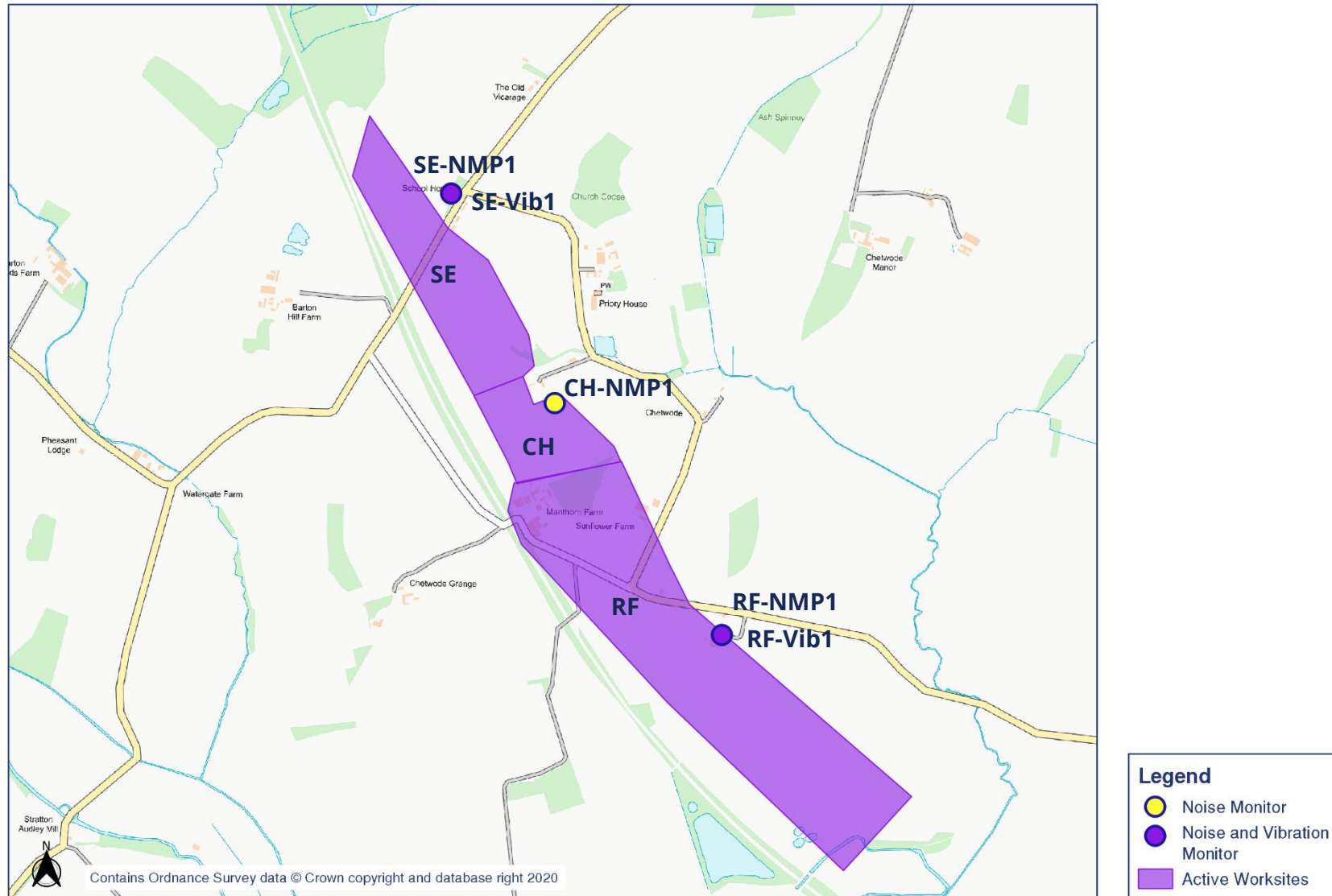


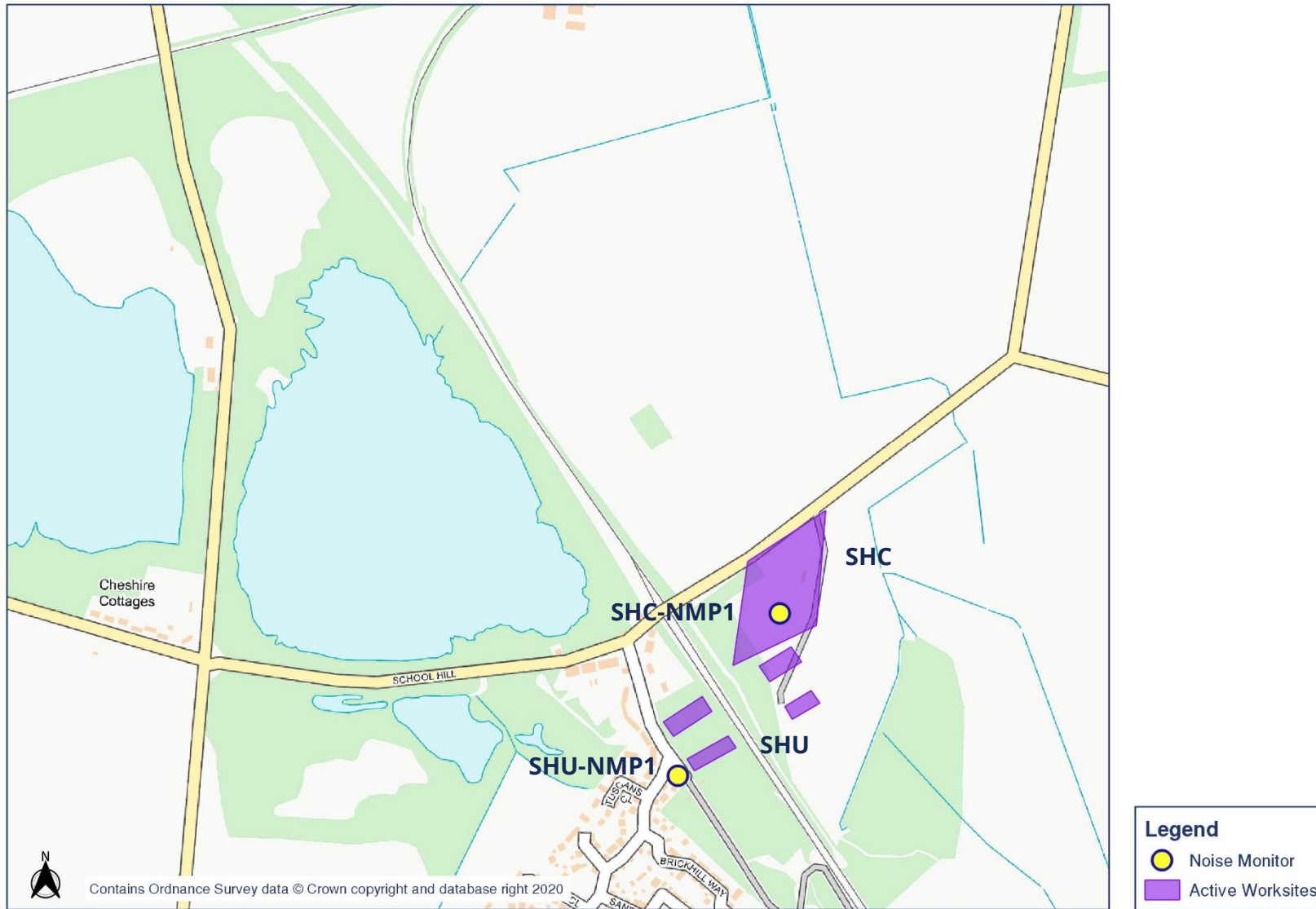


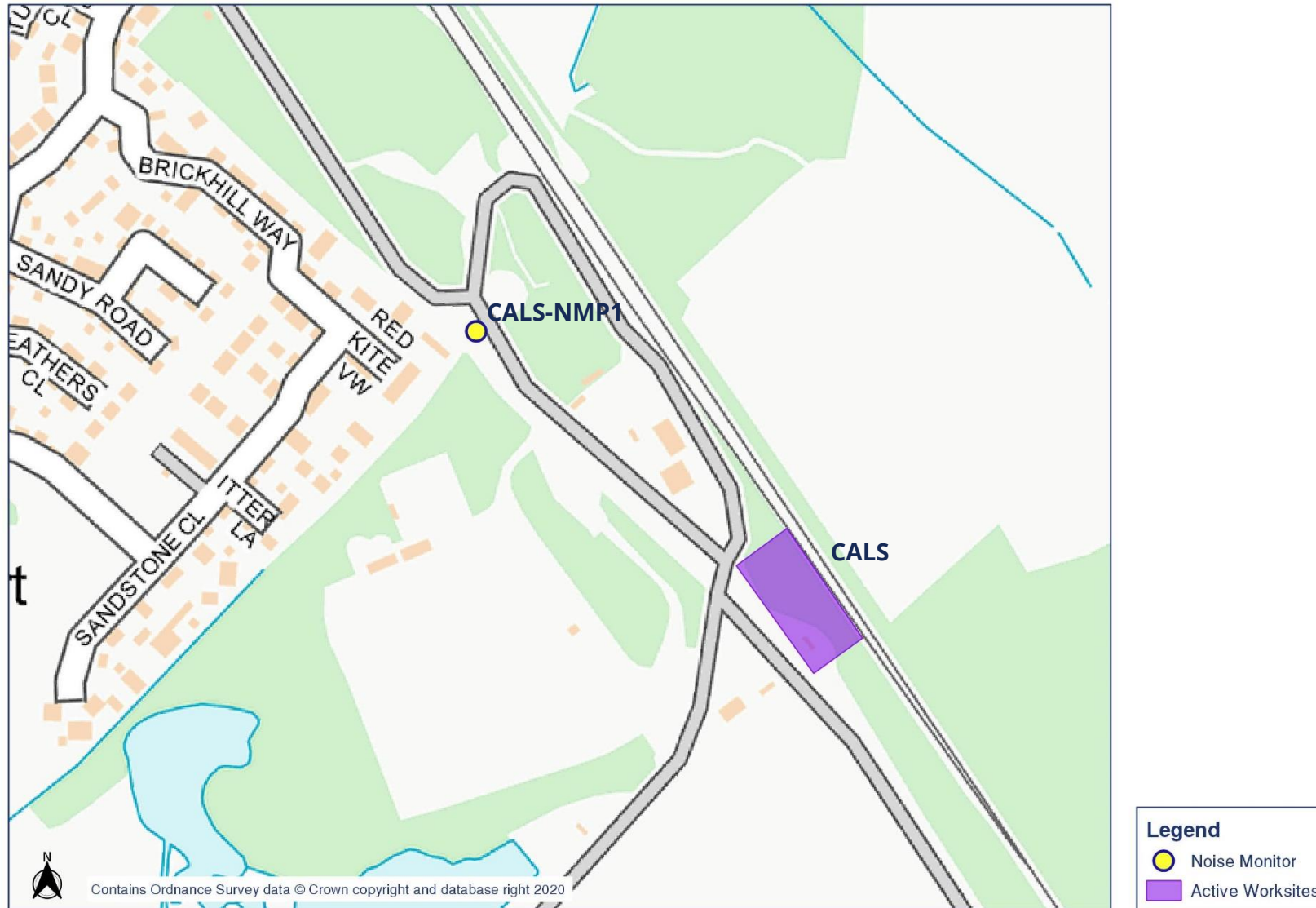




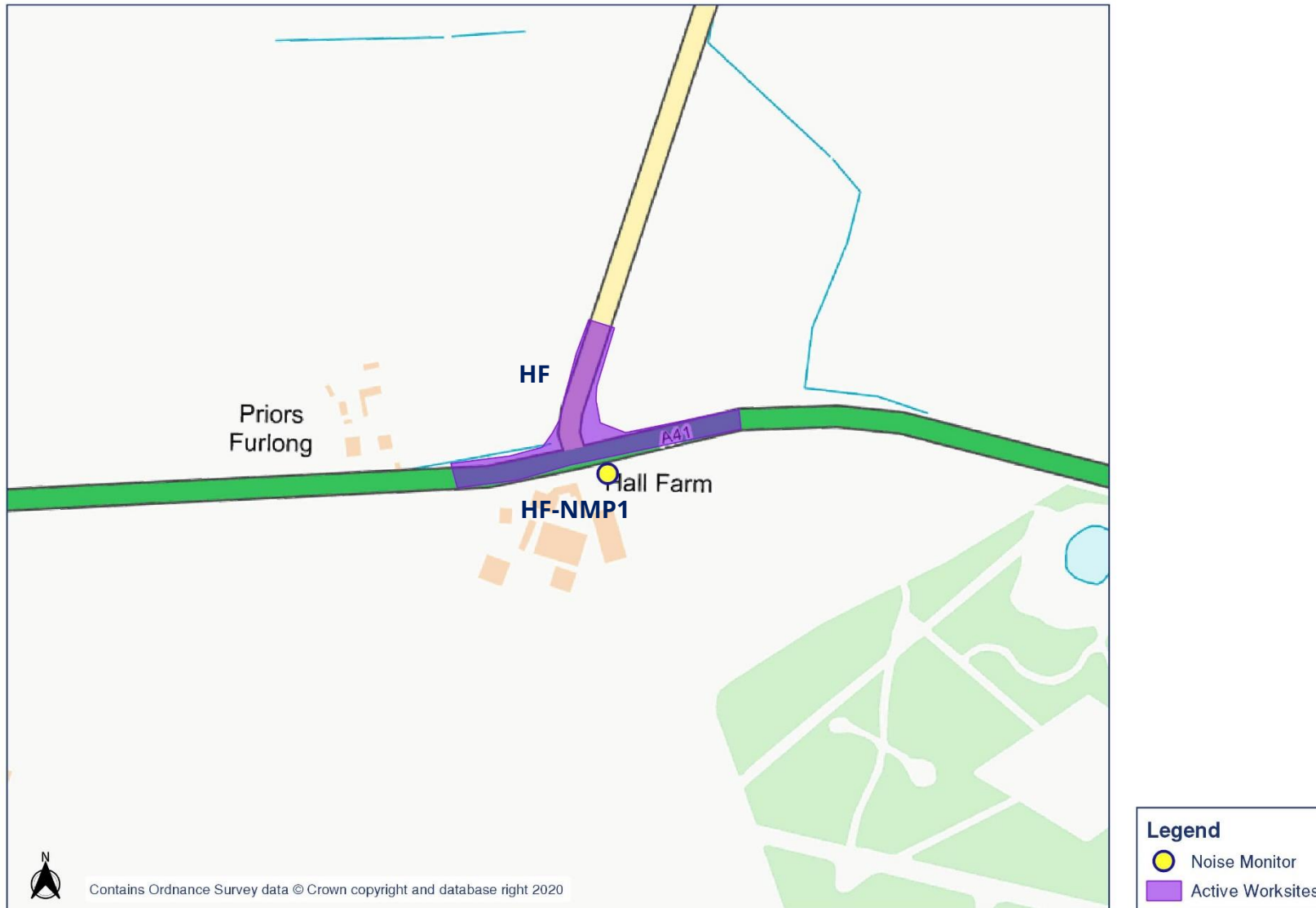
Appendix B Monitoring Locations

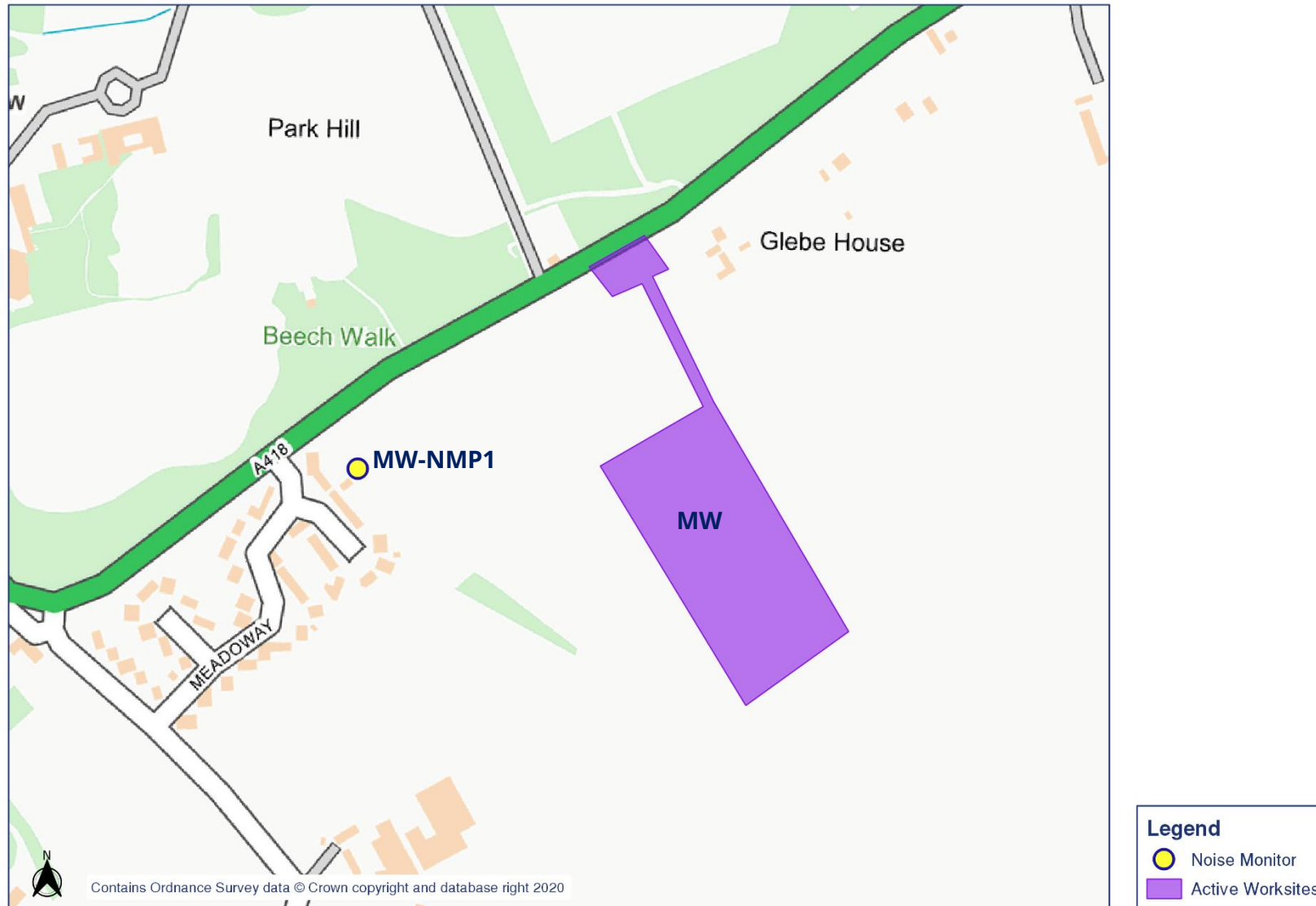


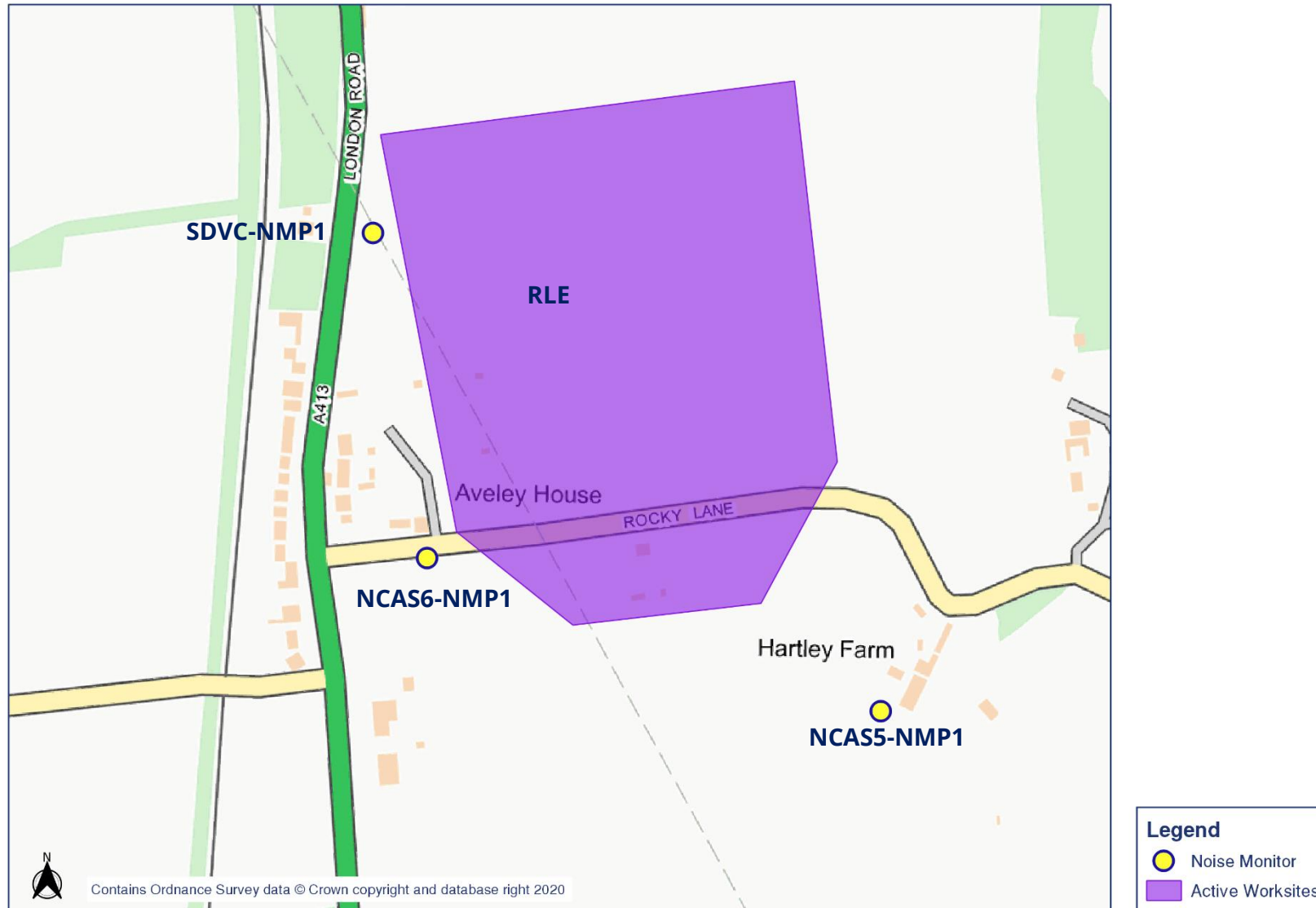




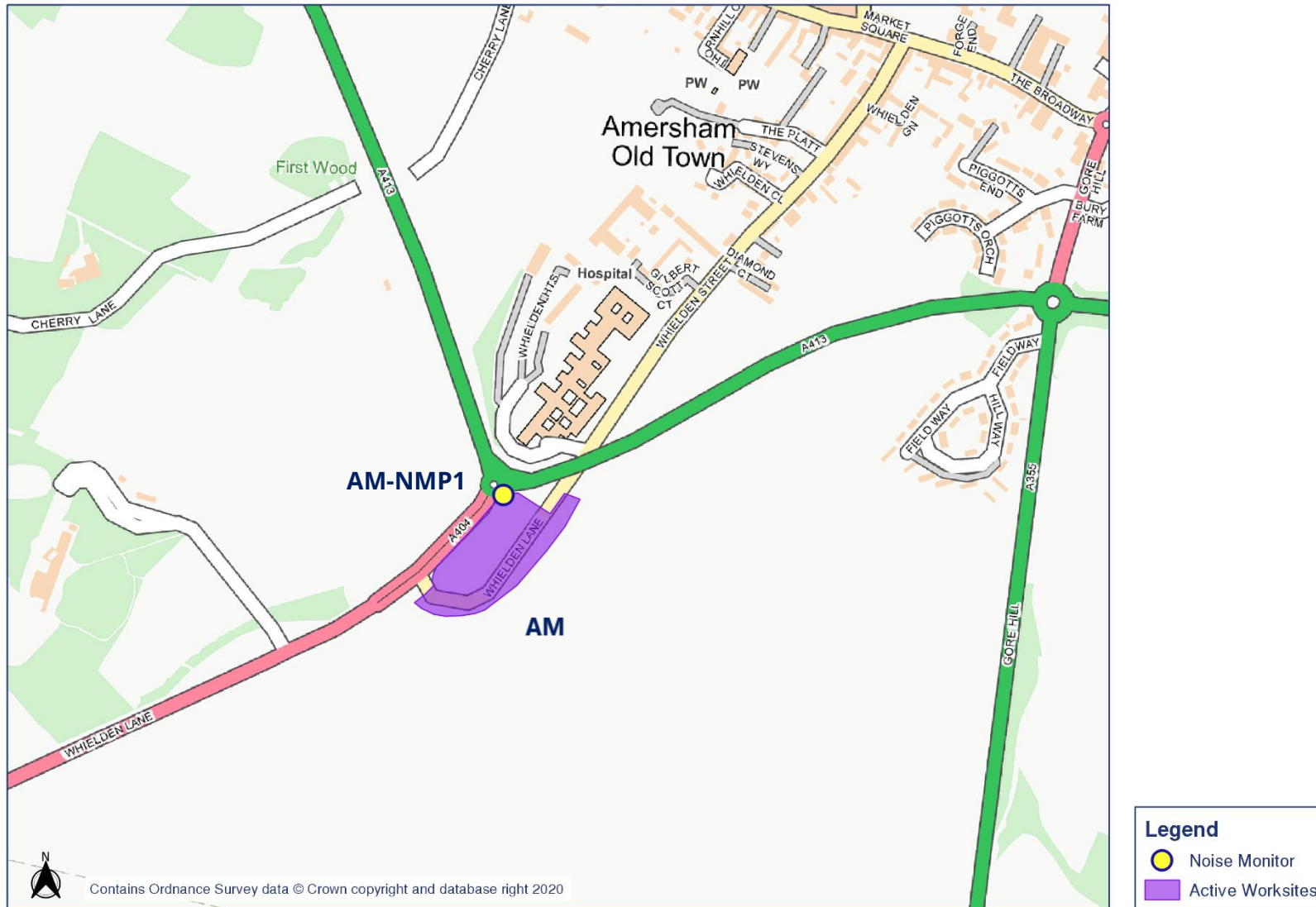


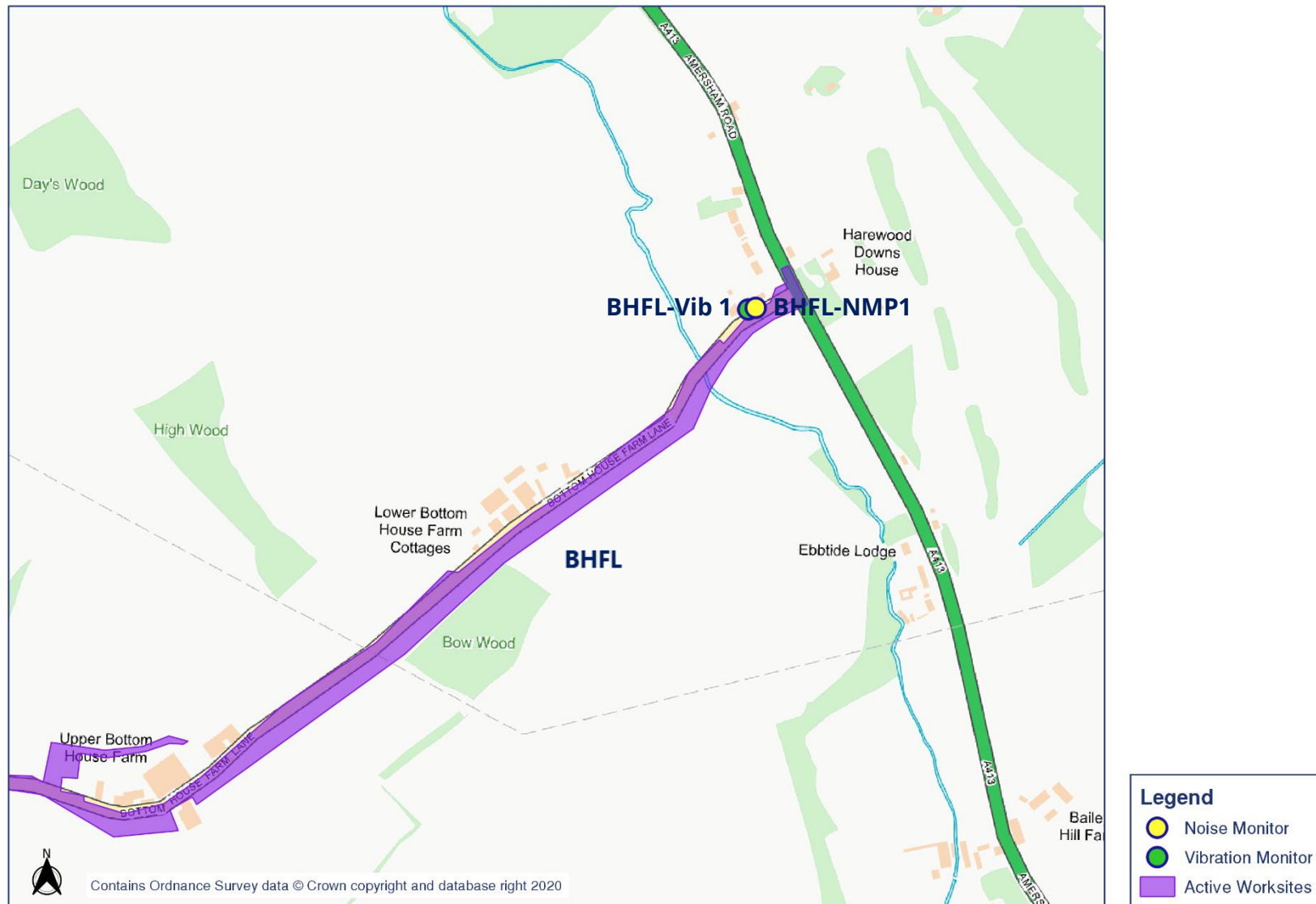


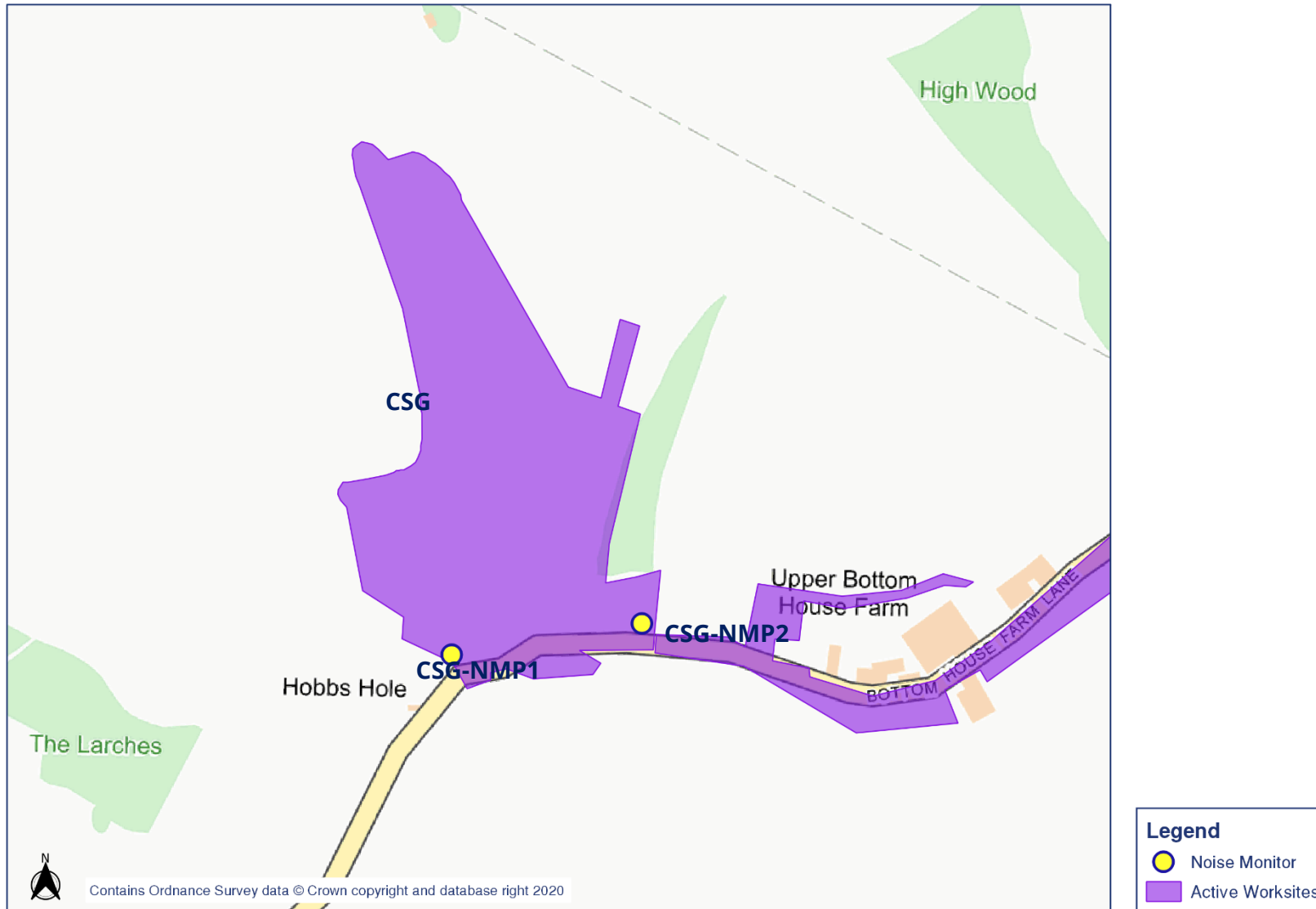


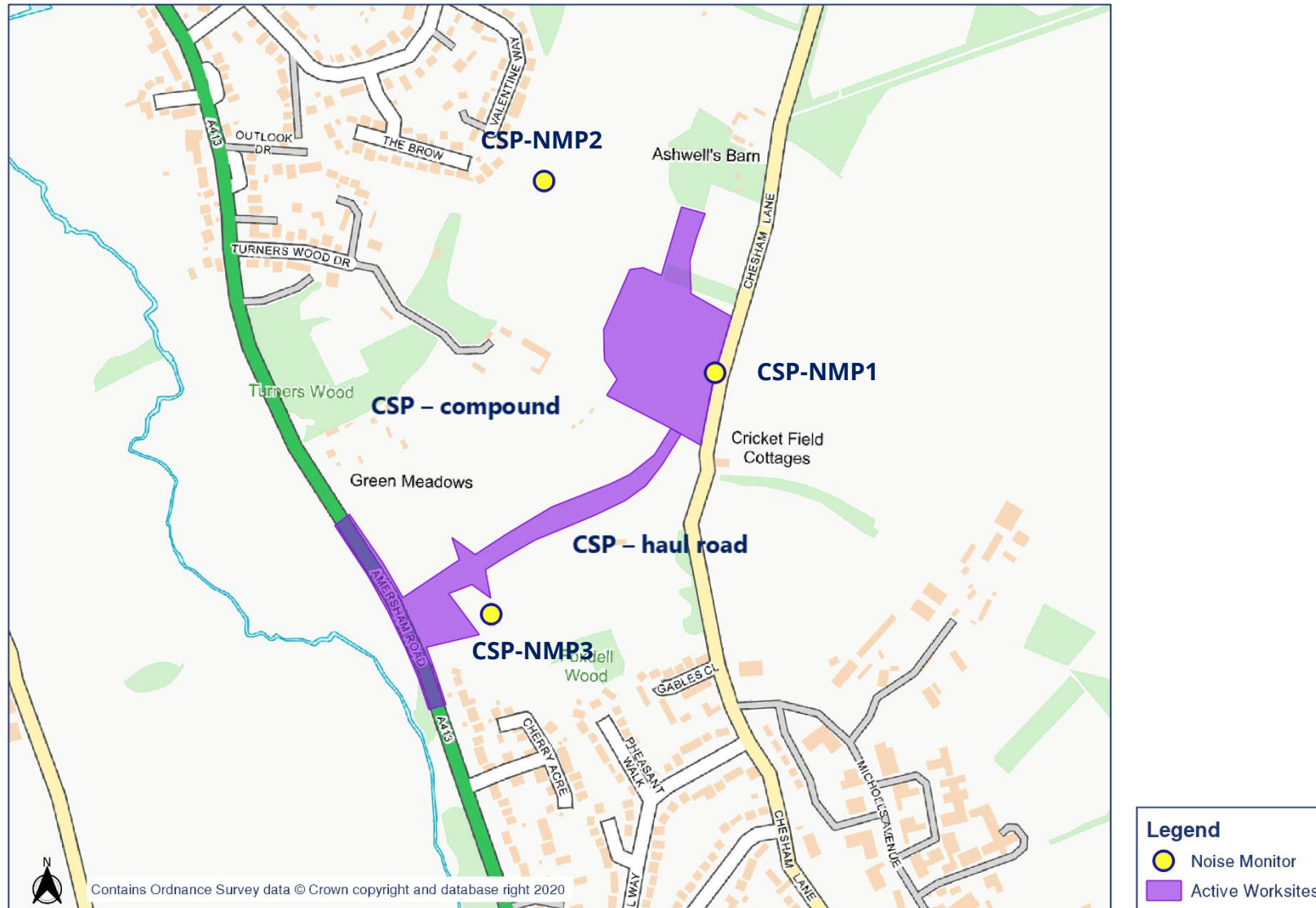












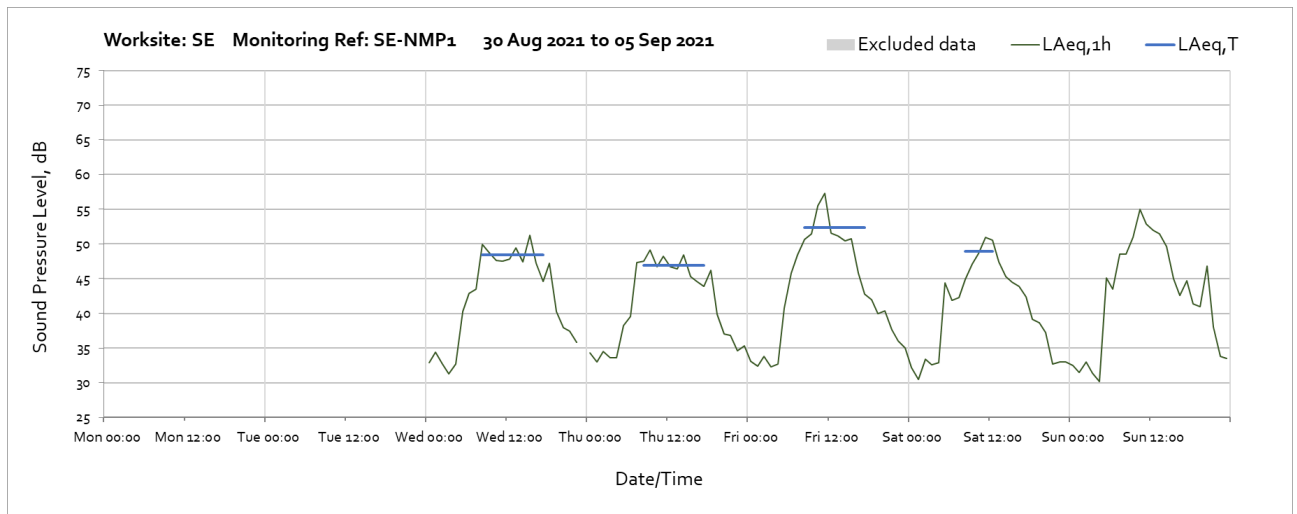


Appendix C Data

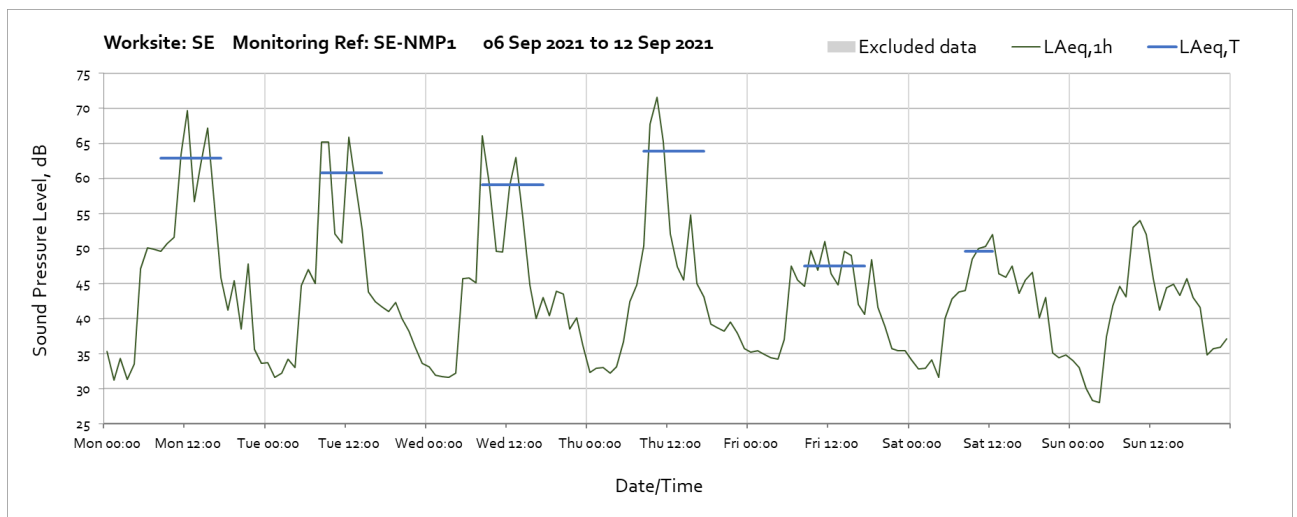
Noise

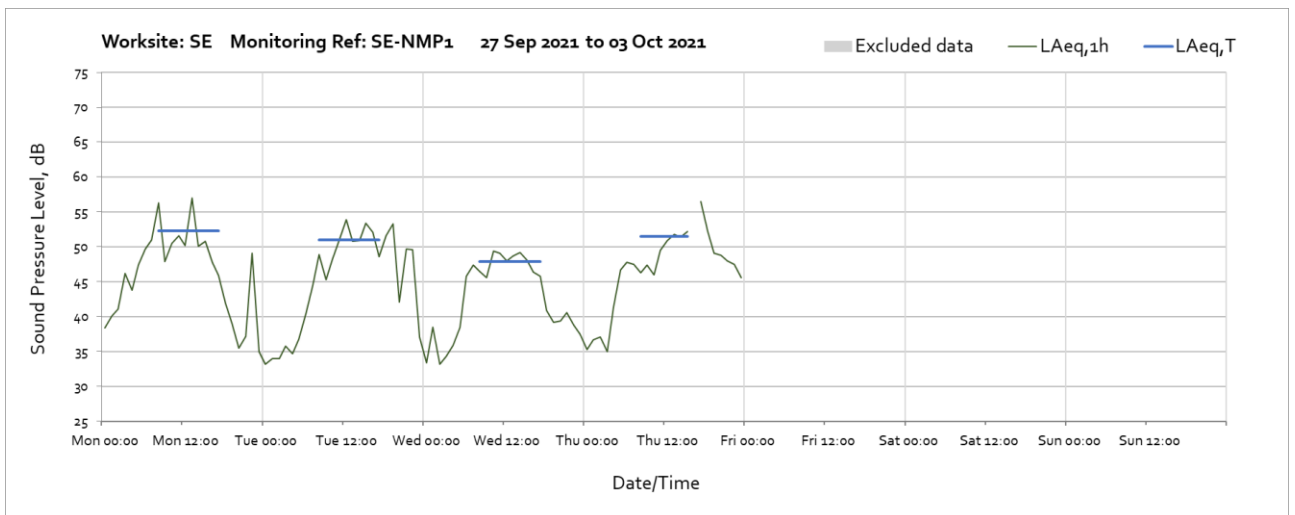
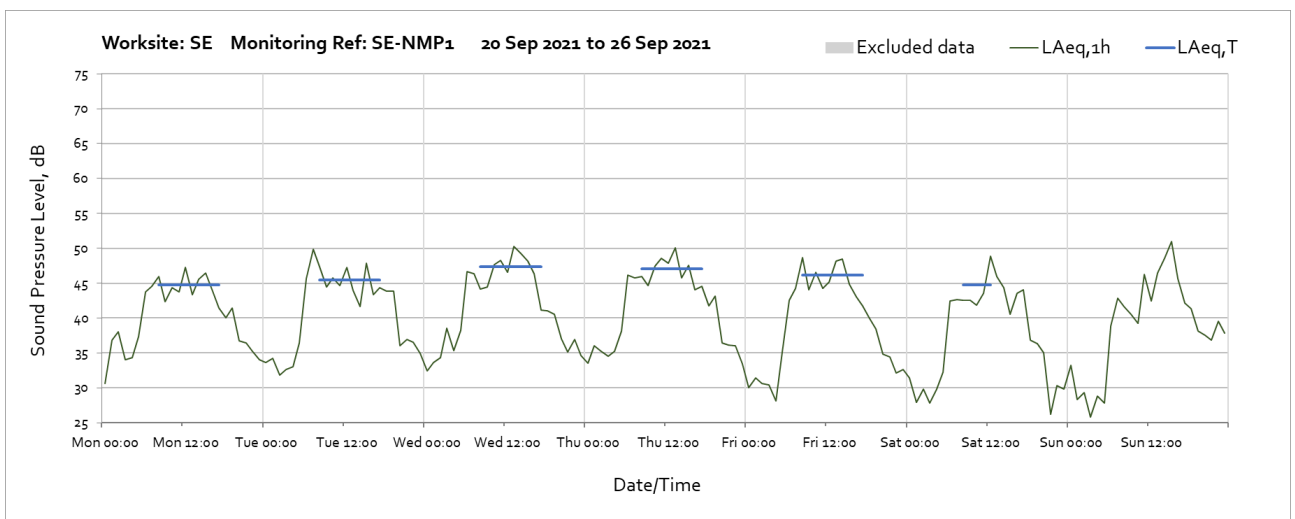
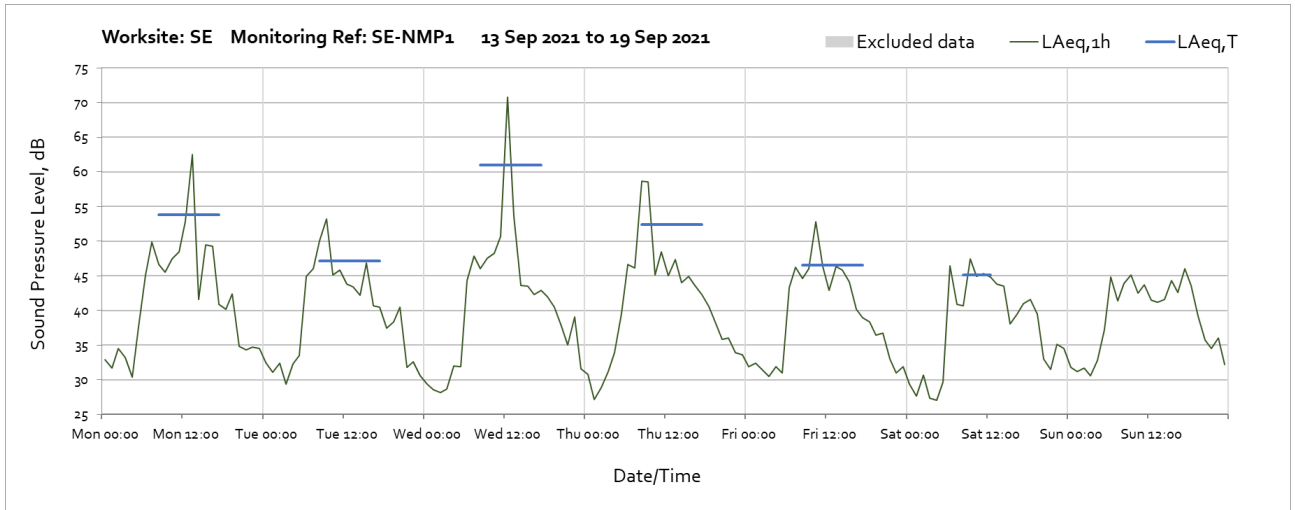
The following graphs show the hourly measured ambient noise level $L_{Aeq,1h}$ and, where relevant, the averaged noise level $L_{Aeq,T}$ values, where the time period T is as specified in Table 1 of HS2 Information Paper E23. Periods with adversely weather affected noise levels are greyed out and have been excluded from the calculation of the $L_{Aeq,T}$ values in **Error! Reference source not found.** of the main report.

Worksite: SE – Monitoring Ref: SE-NMP1



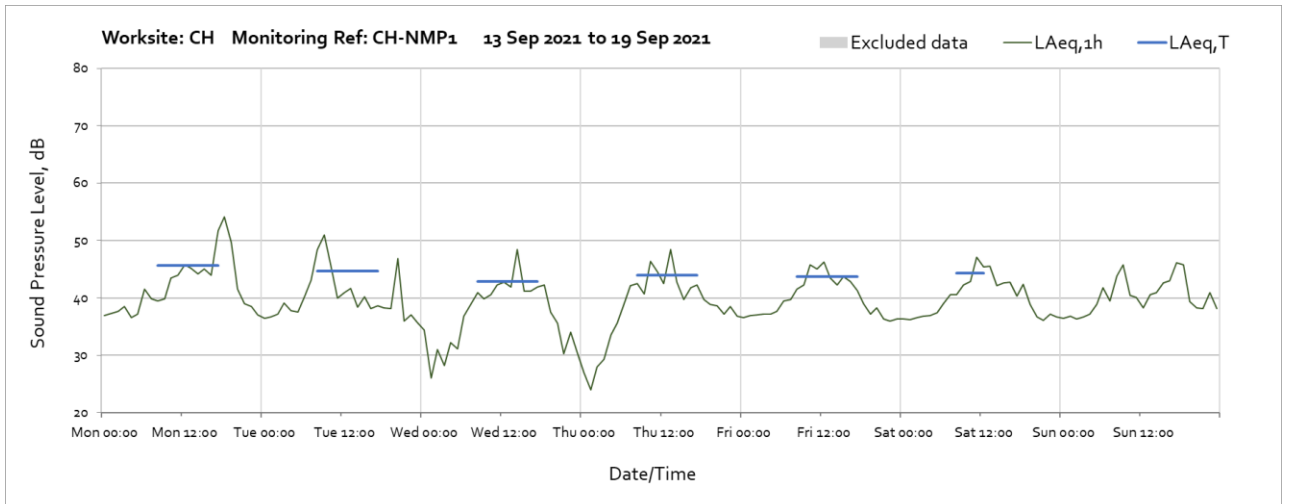
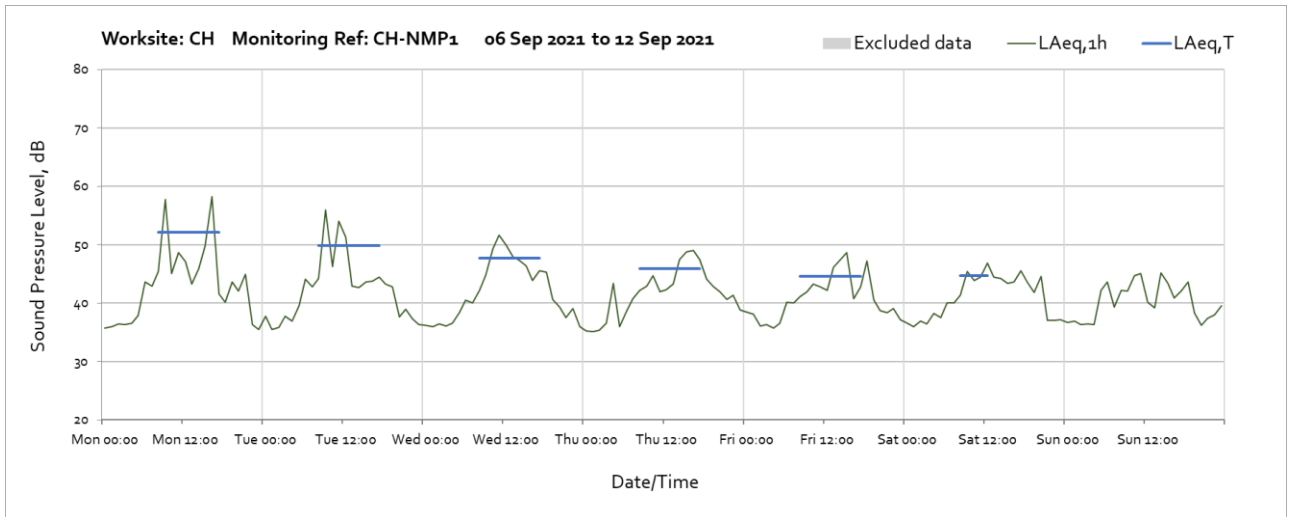
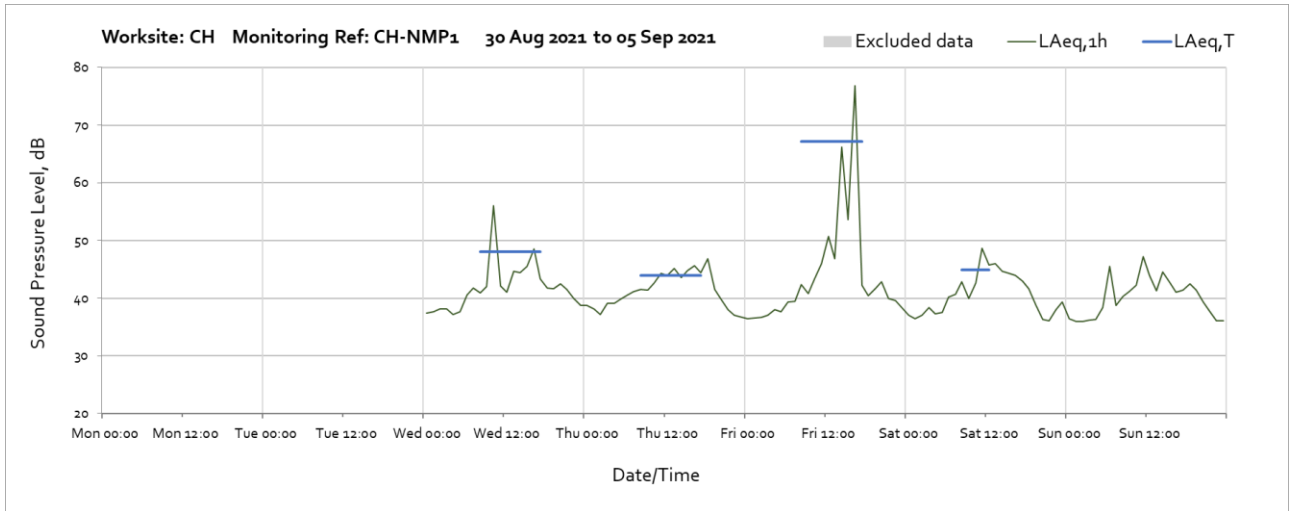
Note: Missing data between 23:00 on Wednesday 1st and 00:00 on Thursday 2nd September was due to loss of continuous site power to the monitor.



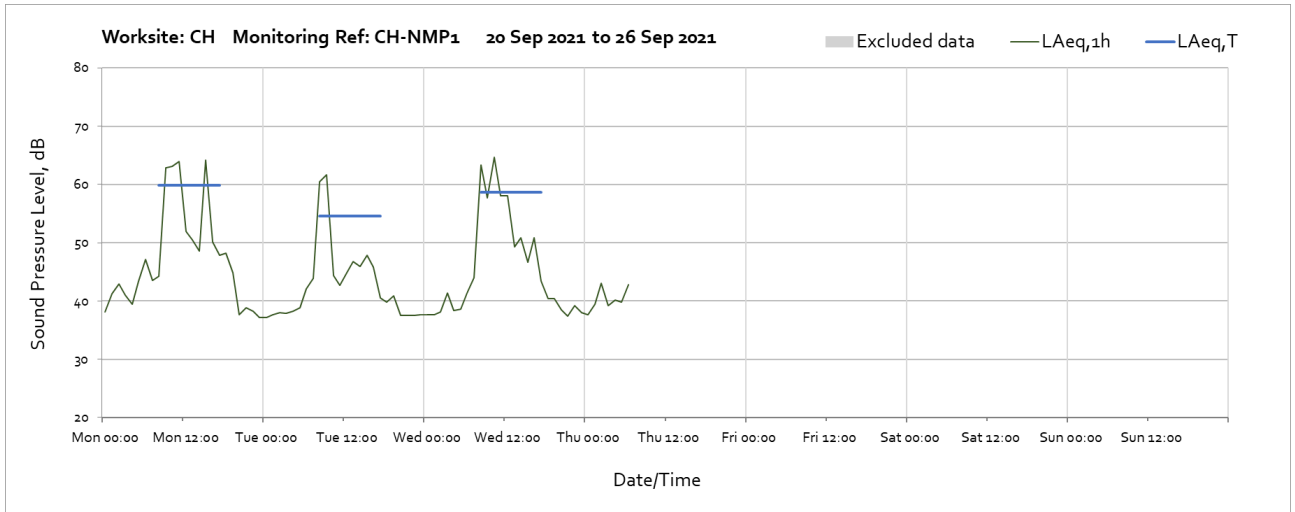


Note: Missing data between 16:00 and 17:00 on Thursday 30th September was due to loss of continuous site power to the monitor.

Worksite: CH – Monitoring Ref: CH-NMP1

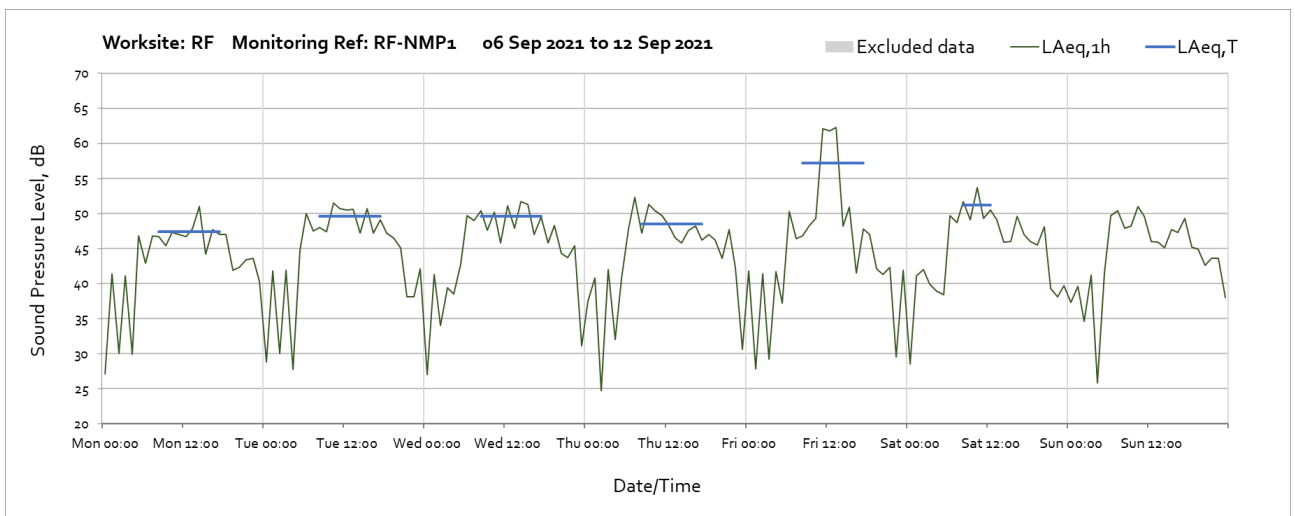
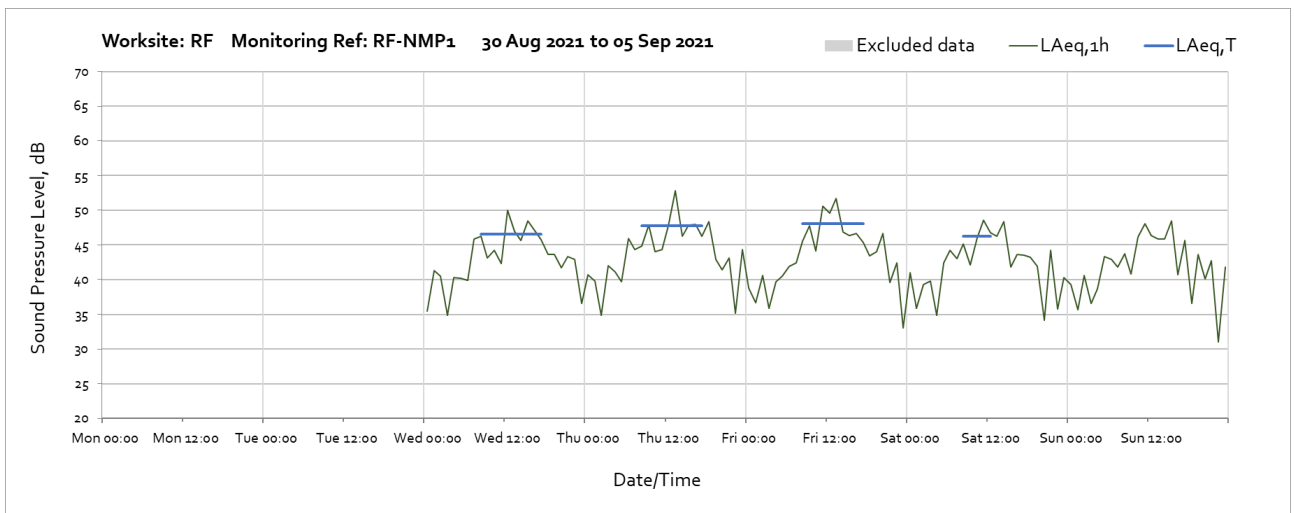


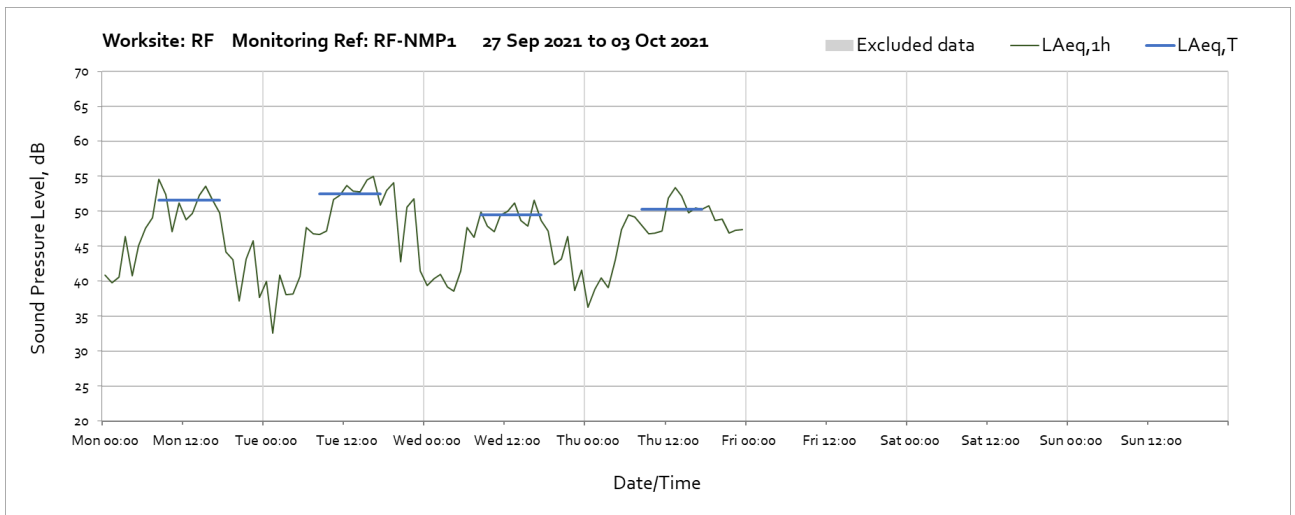
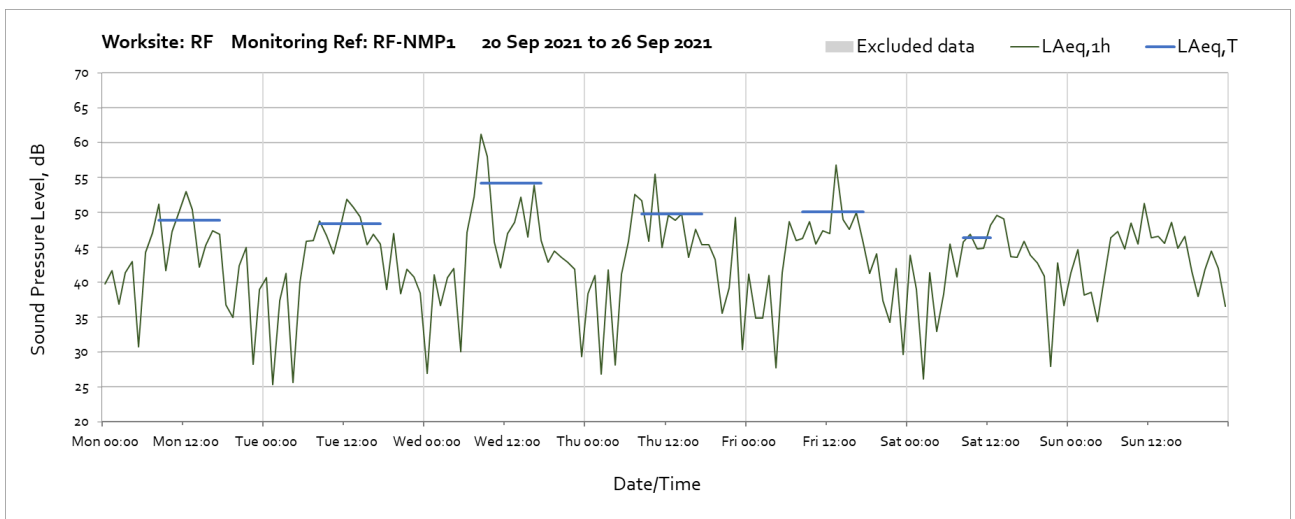
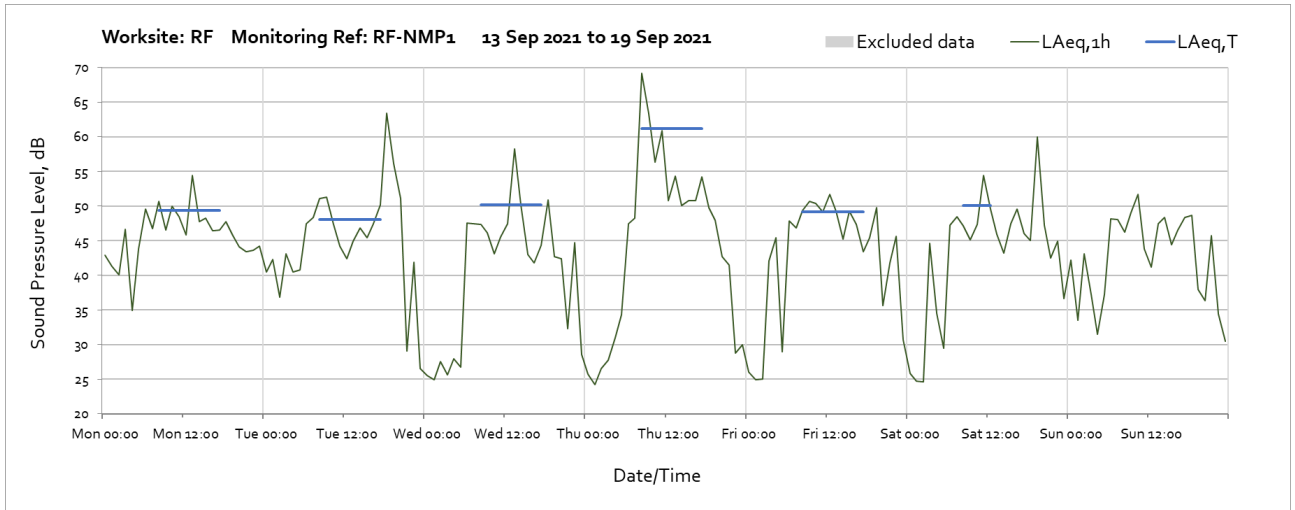
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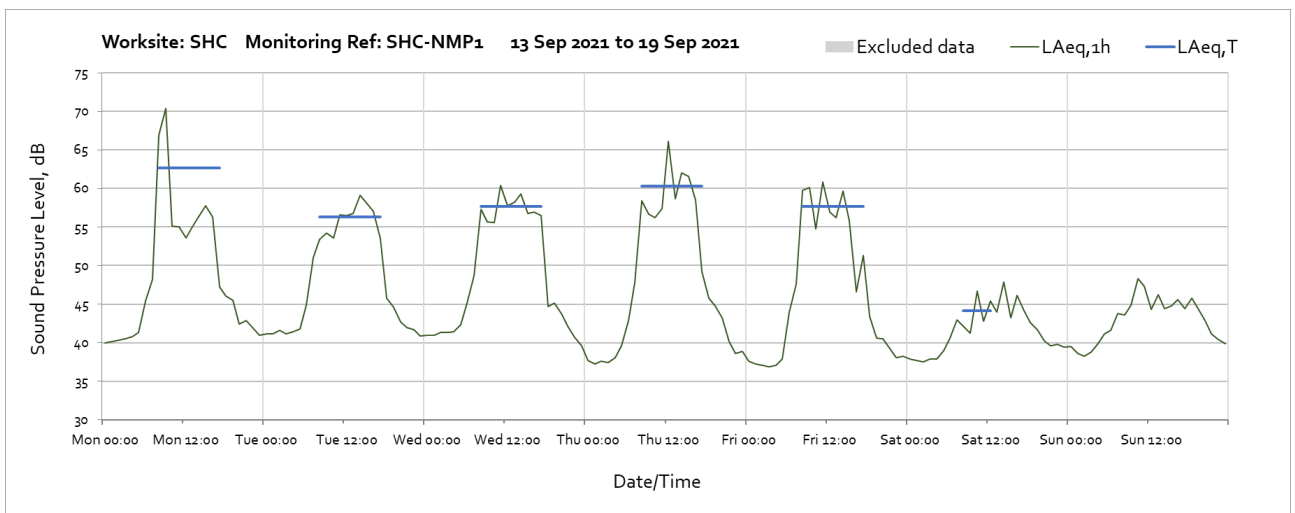
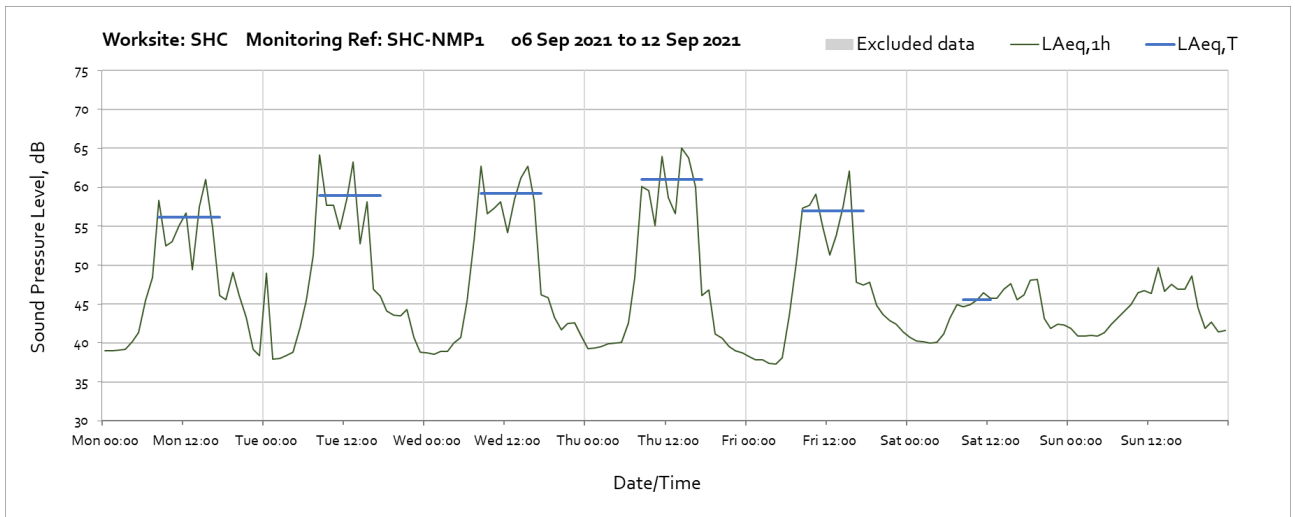
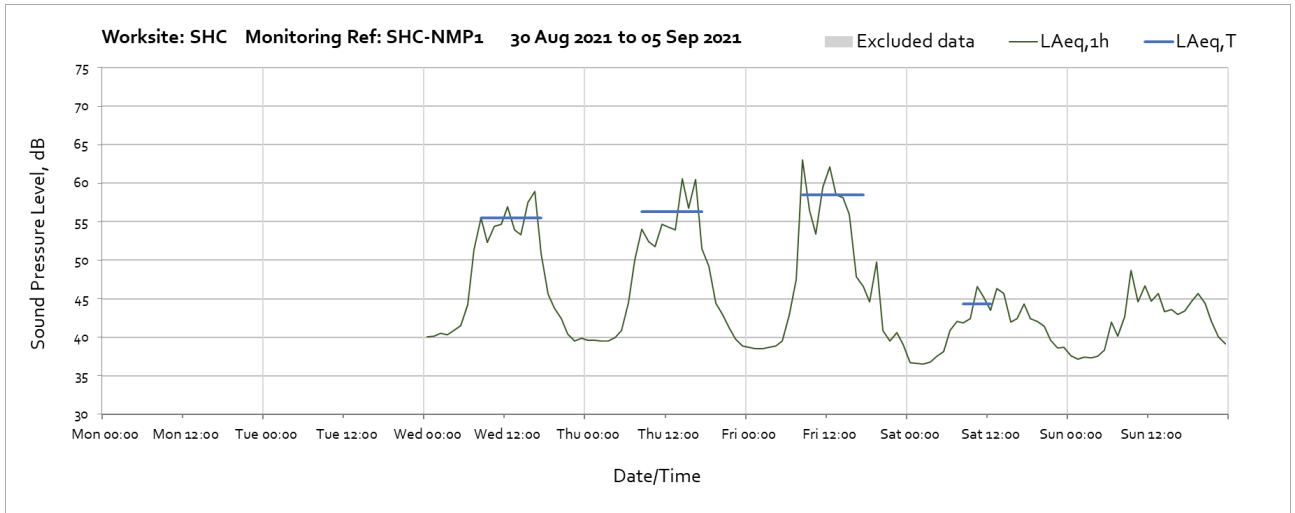
Note: Missing data between 07:00 on Thursday 23rd September and the end of the month was due to a fault with the monitoring equipment.

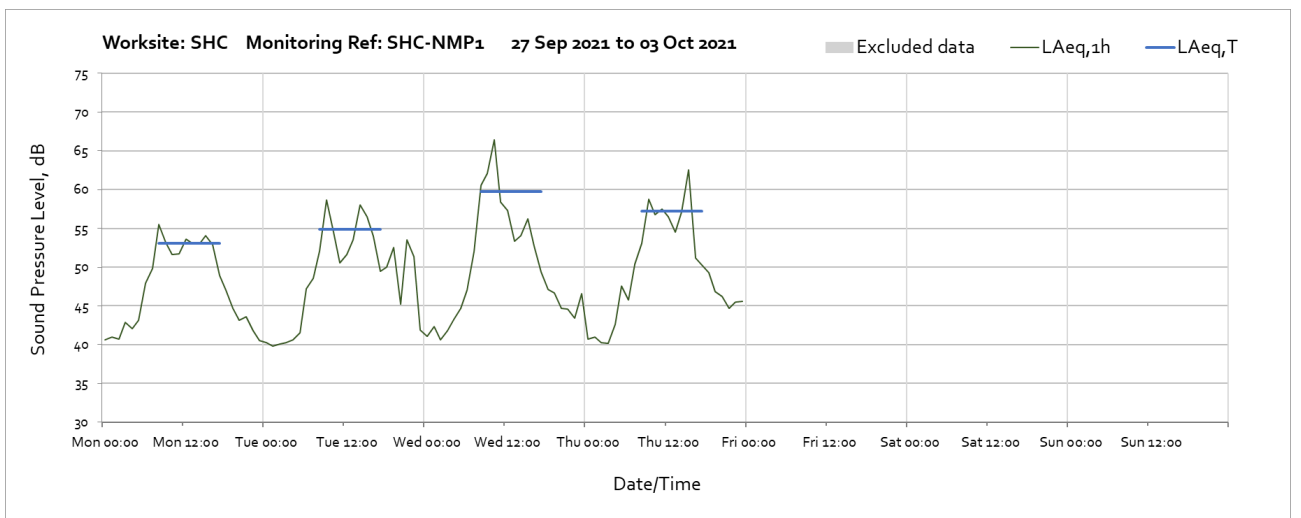
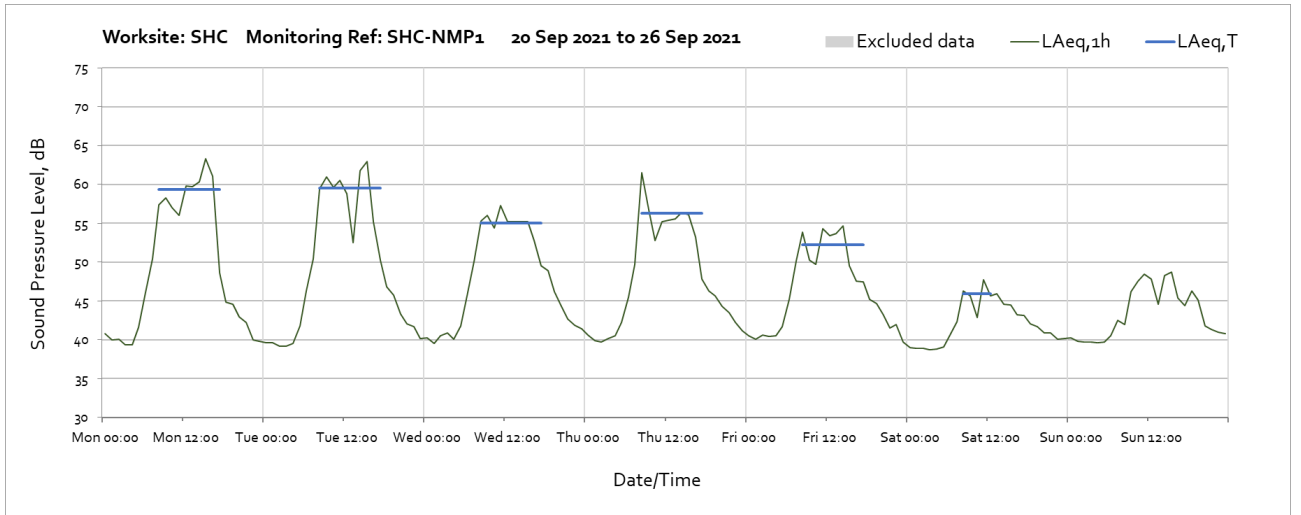
Worksite: RF – Monitoring Ref: RF-NMP1



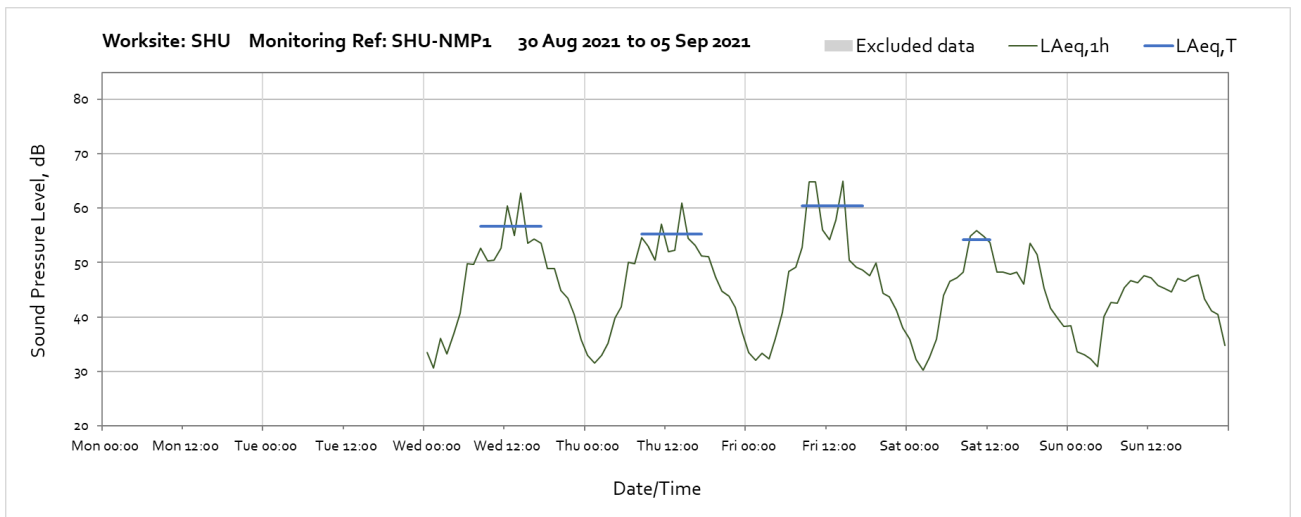


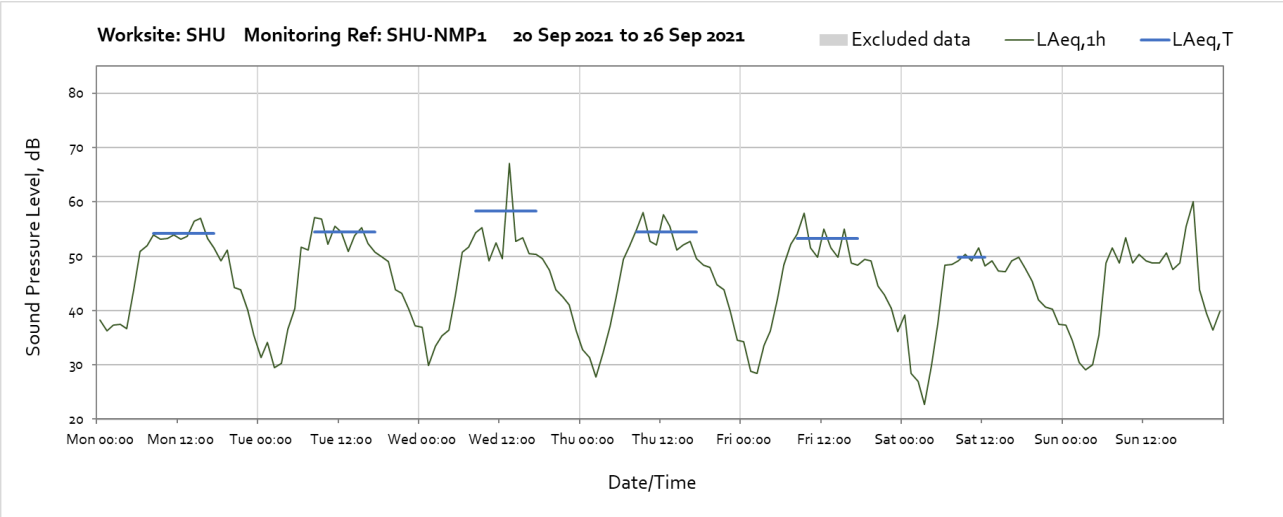
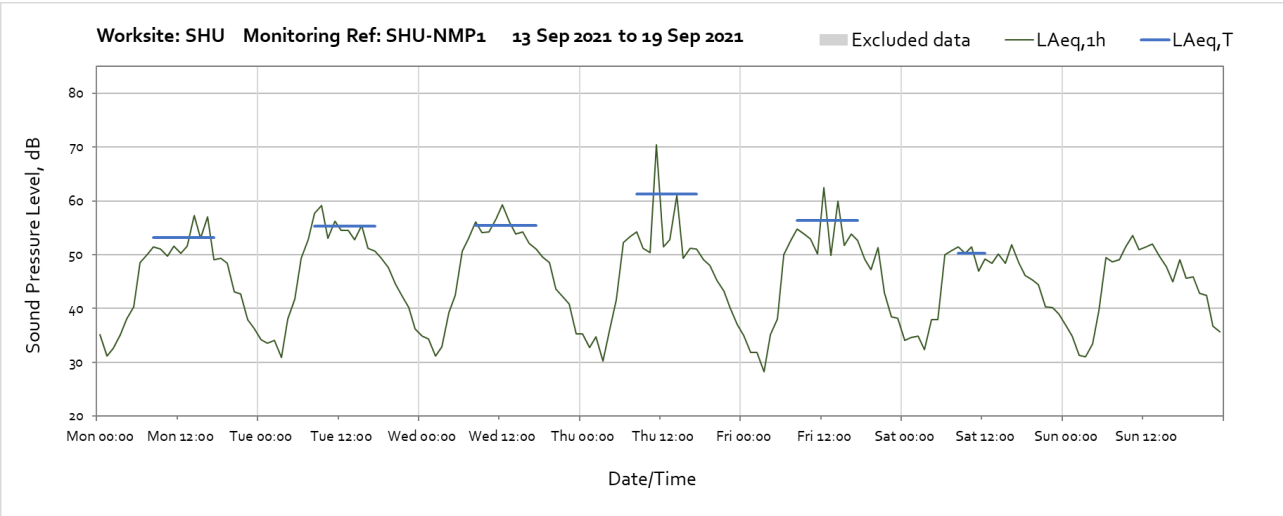
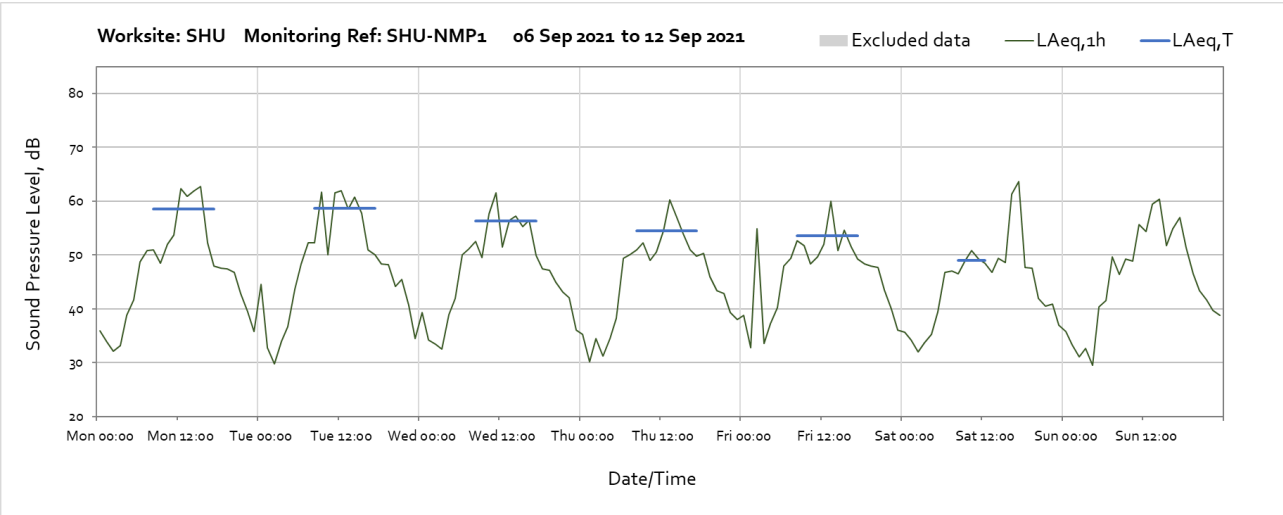
Worksite: SHC – Monitoring Ref: SHC-NMP1

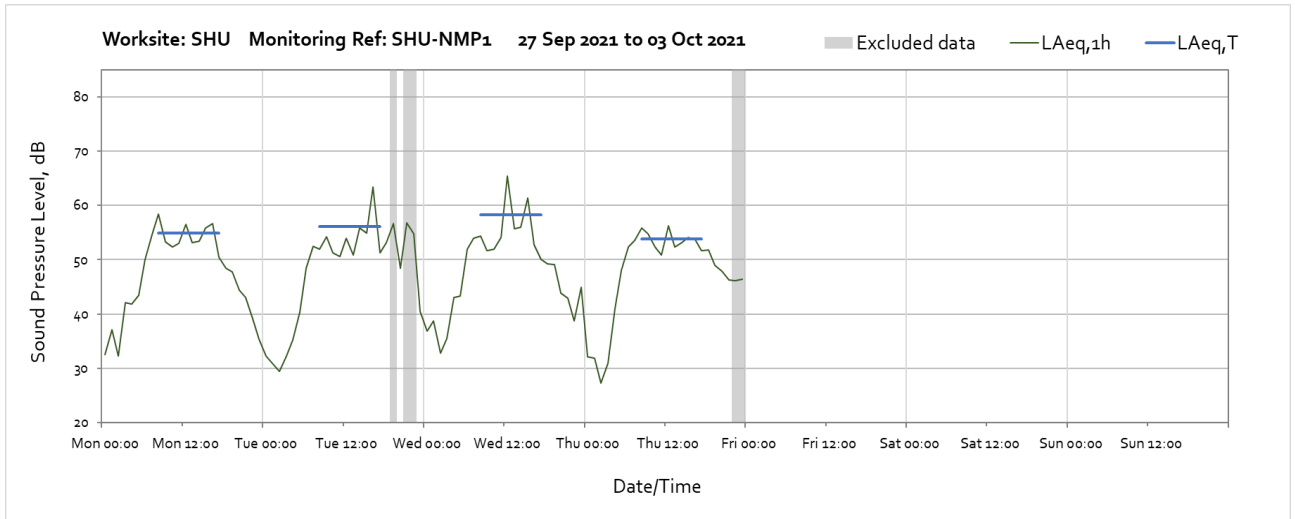




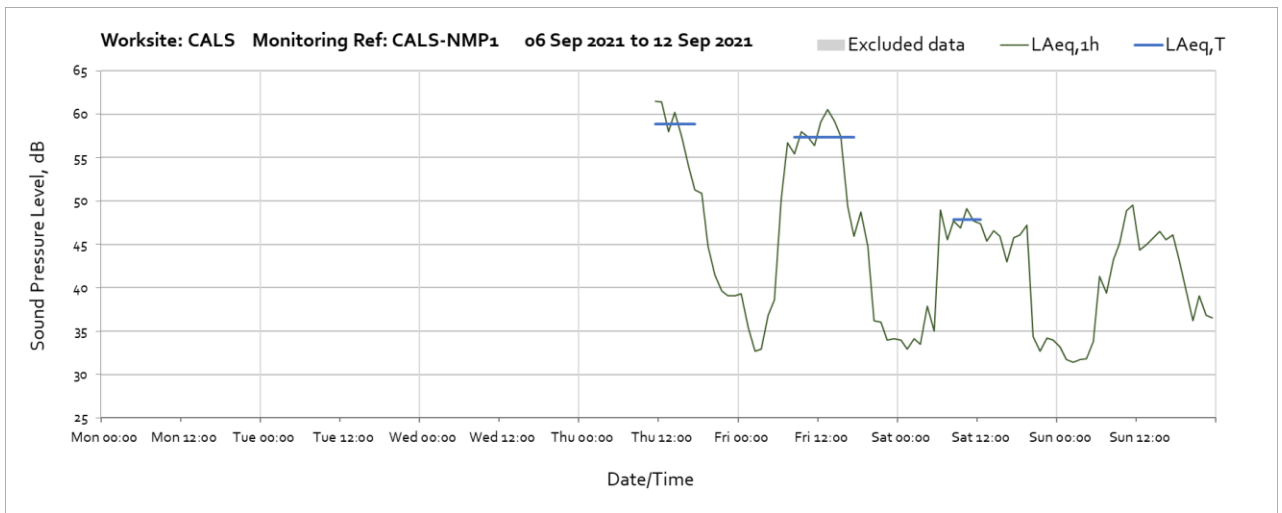
Worksite: SHU – Monitoring Ref: SHU-NMP1



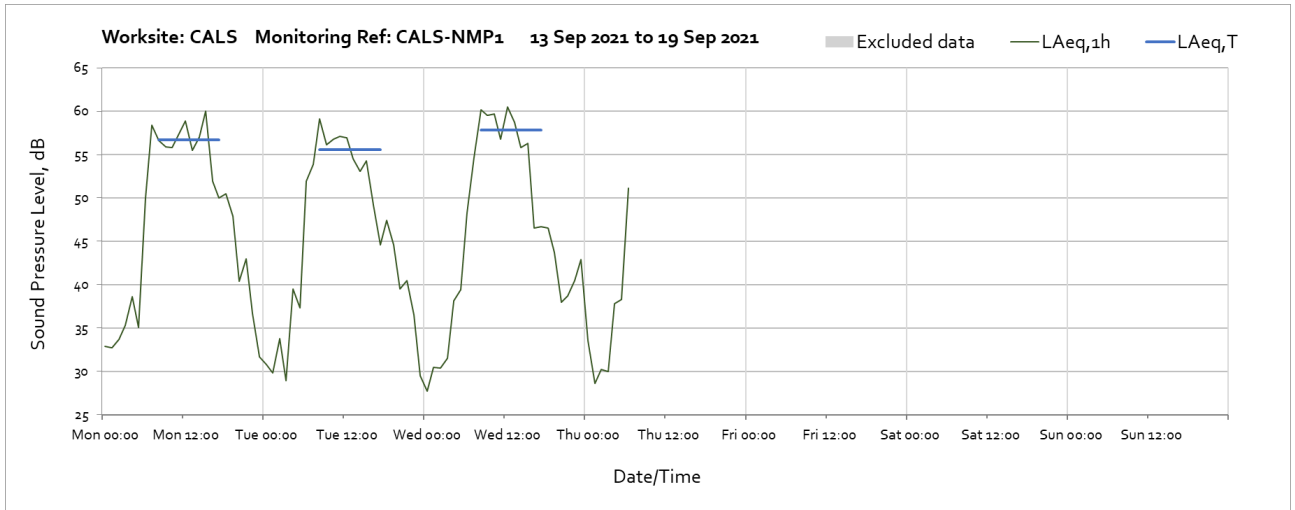




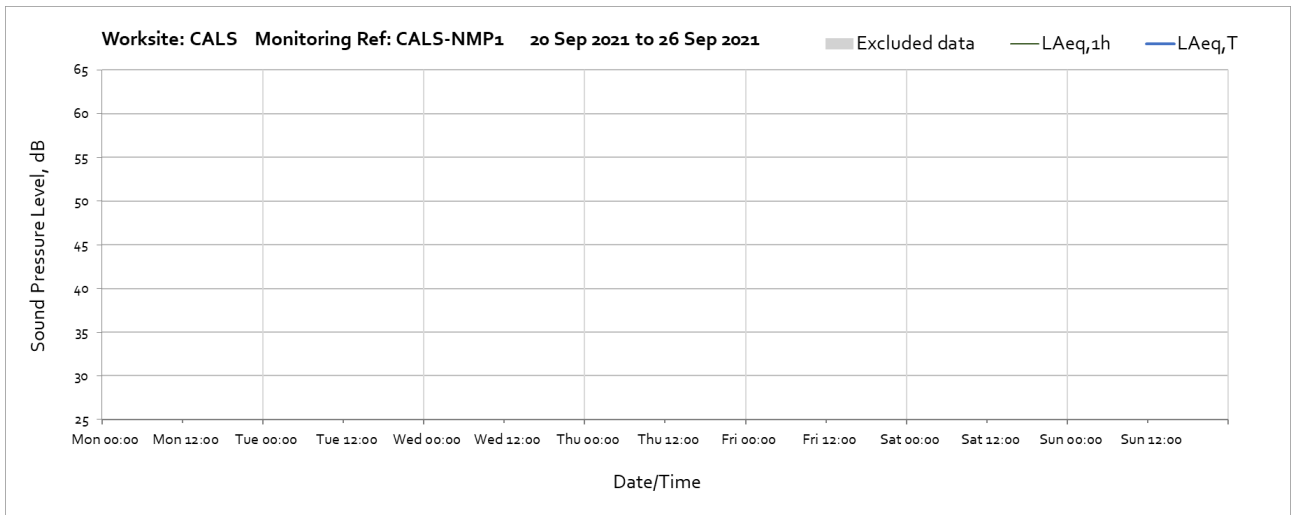
Worksite: CALS – Monitoring Ref: CALS-NMP1



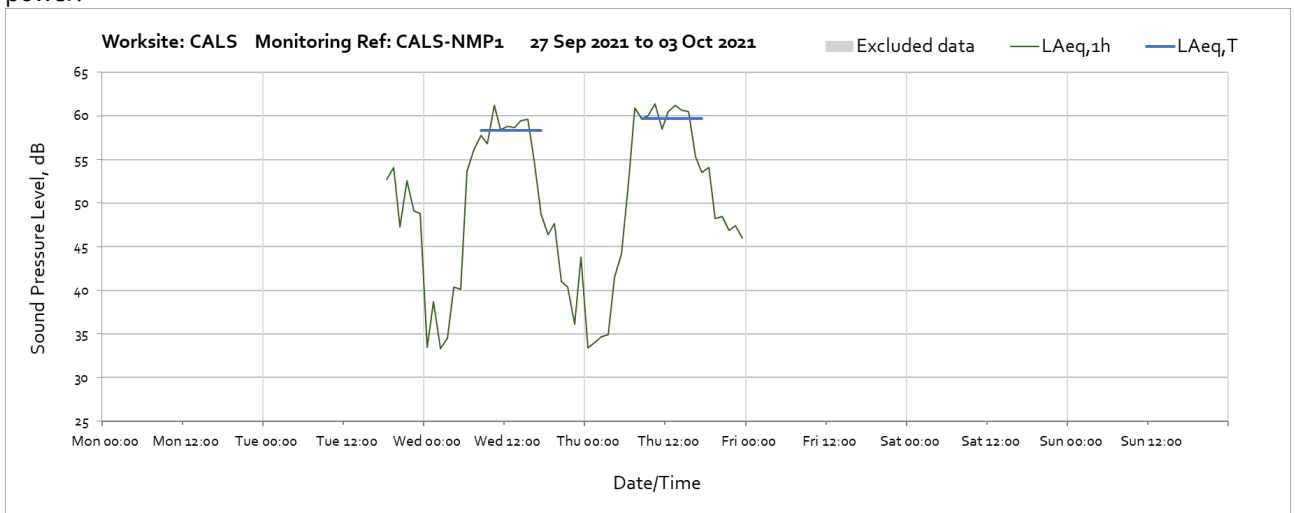
Note: Missing data until 11:00 on Thursday 9th September was due to poor solar coverage and backup battery being out of power.



Note: Missing data between 06:00 on Thursday 16th September and the end of the week was due to poor solar coverage and backup battery being out of power.



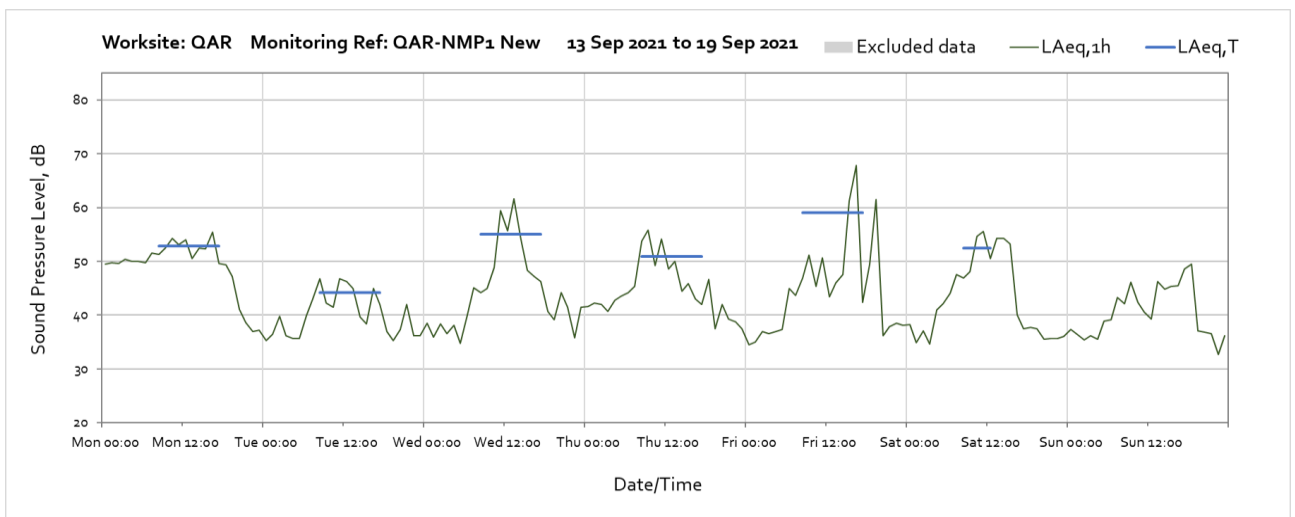
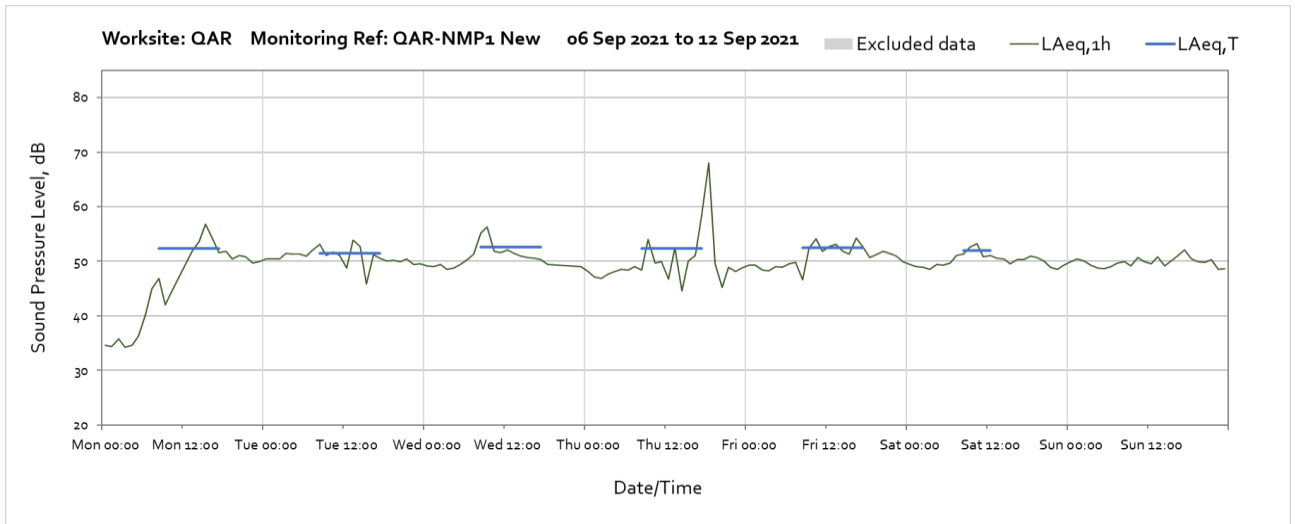
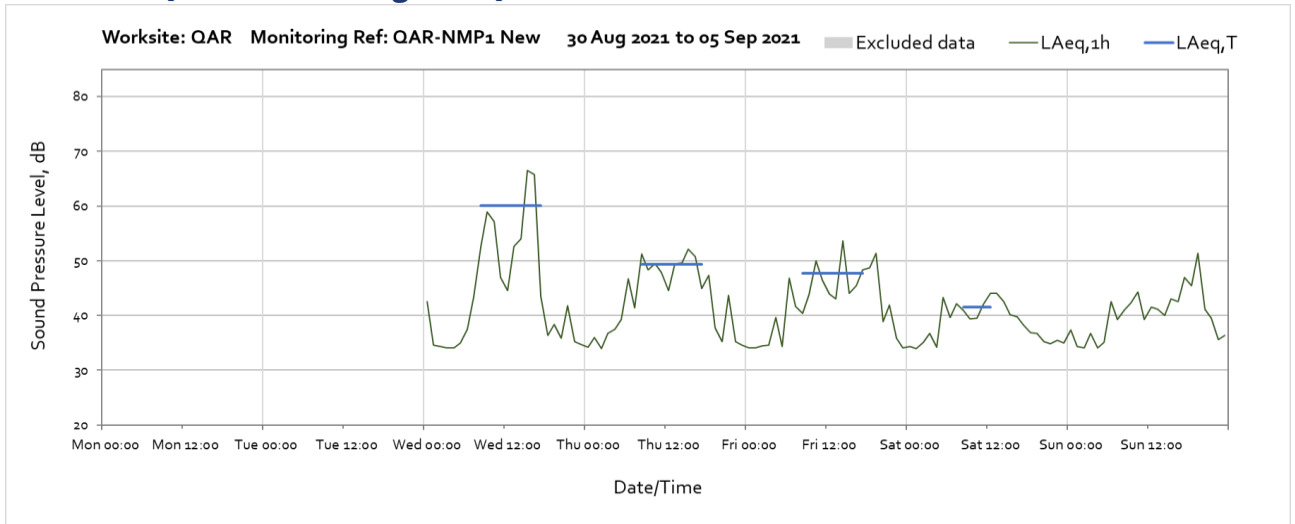
Note: Missing data through out the week was due to poor solar coverage and backup battery being out of power.

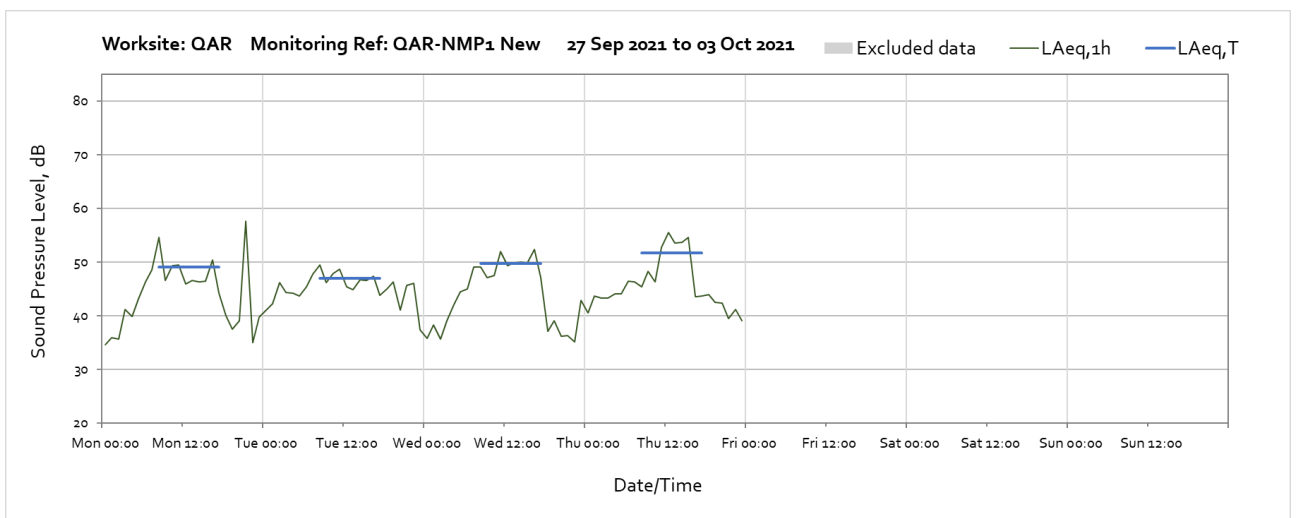
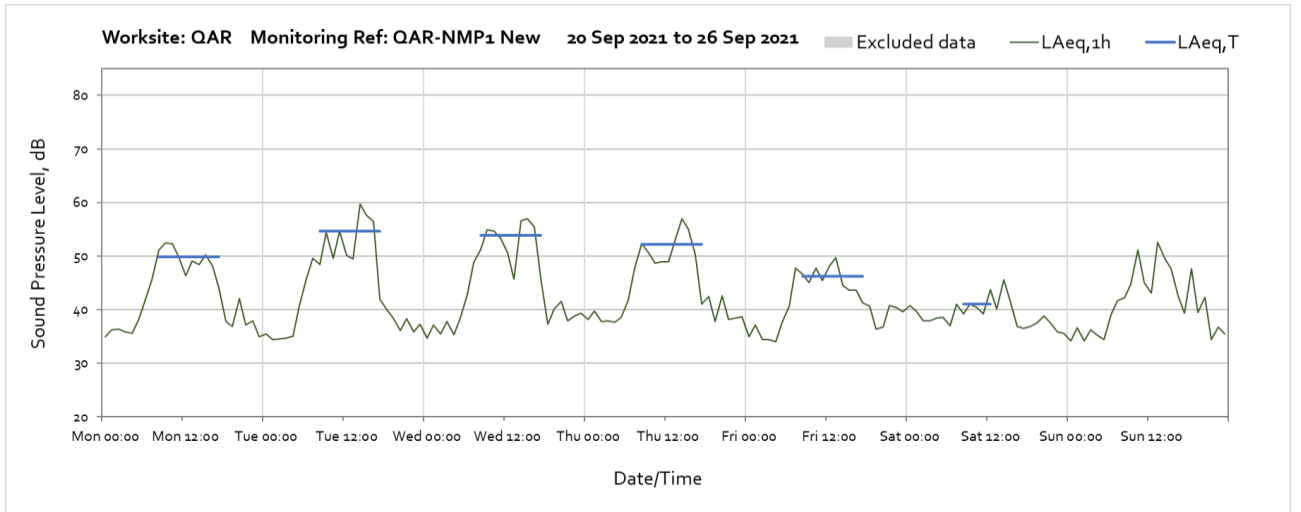


Note: Missing data until 18:00 on Thursday 28th September was due to poor solar coverage and backup battery being out of power.

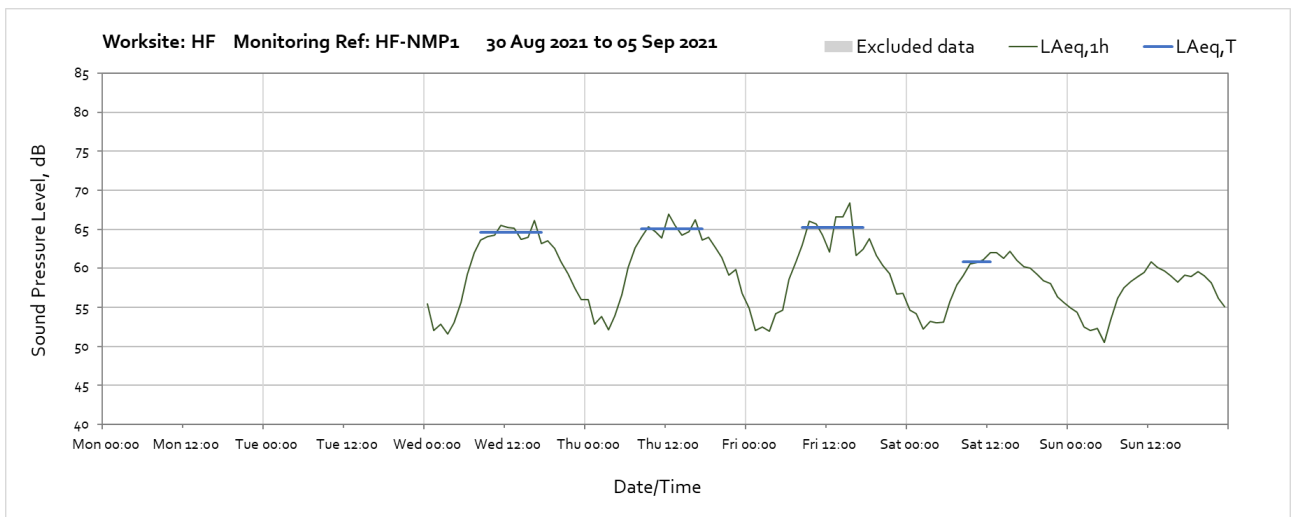
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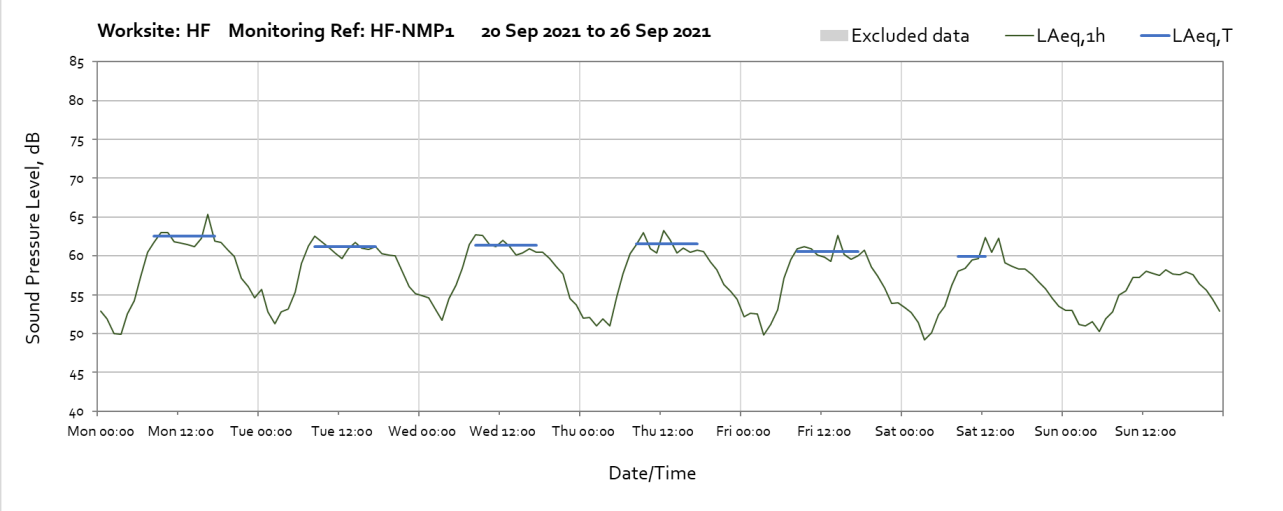
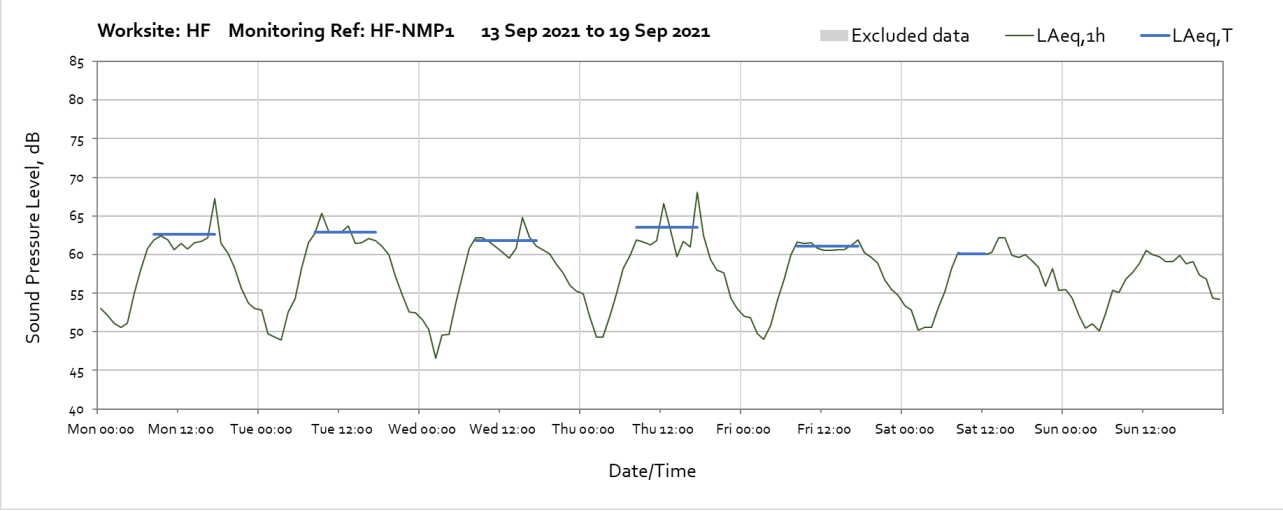
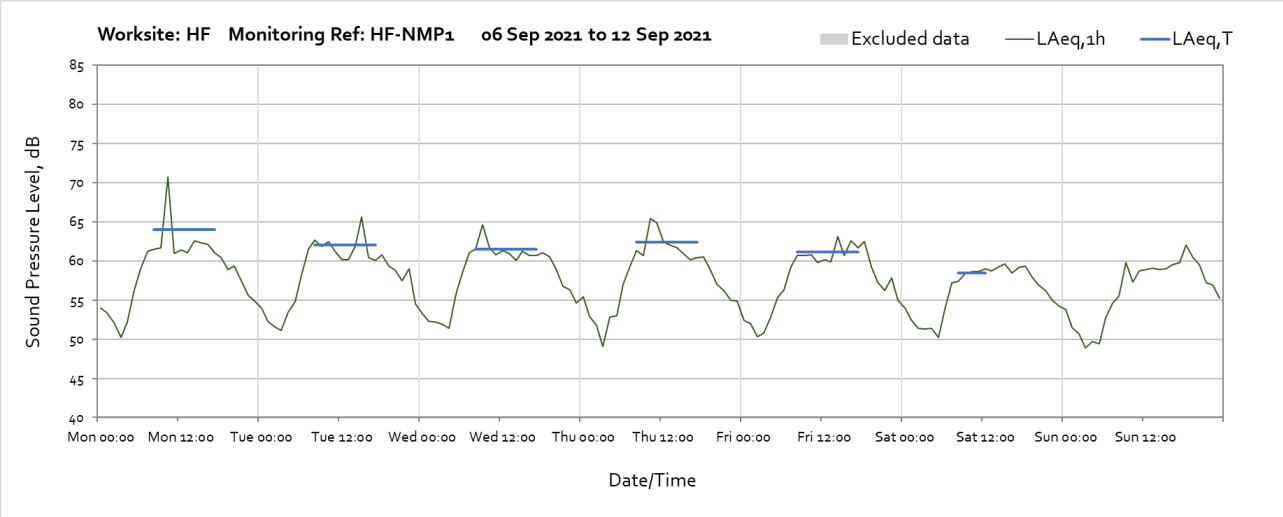
Worksite: QAR – Monitoring Ref: QAR-NMP1

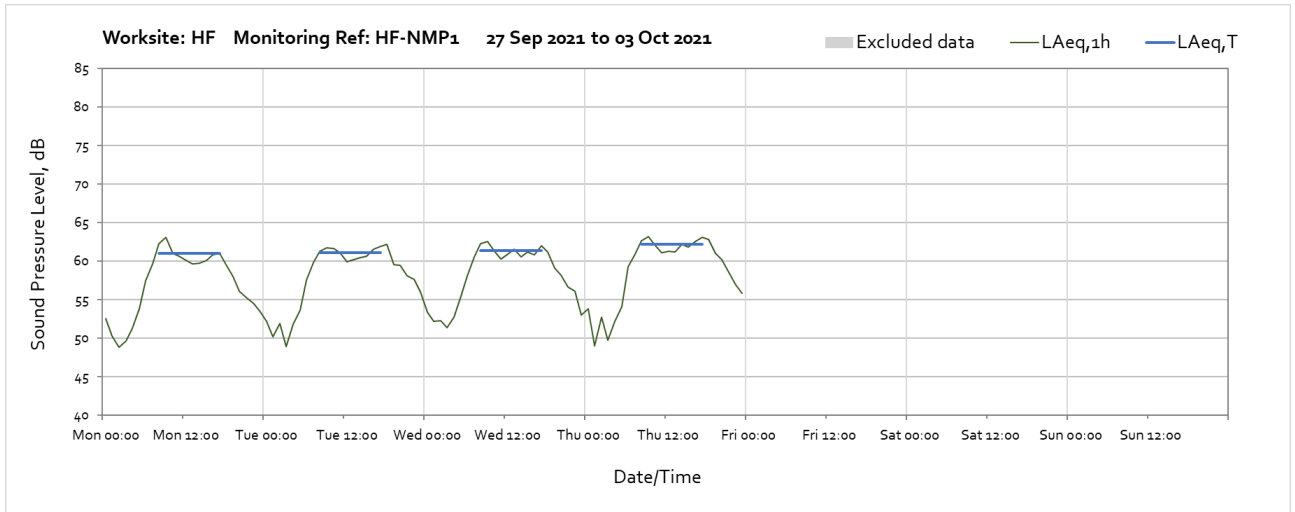




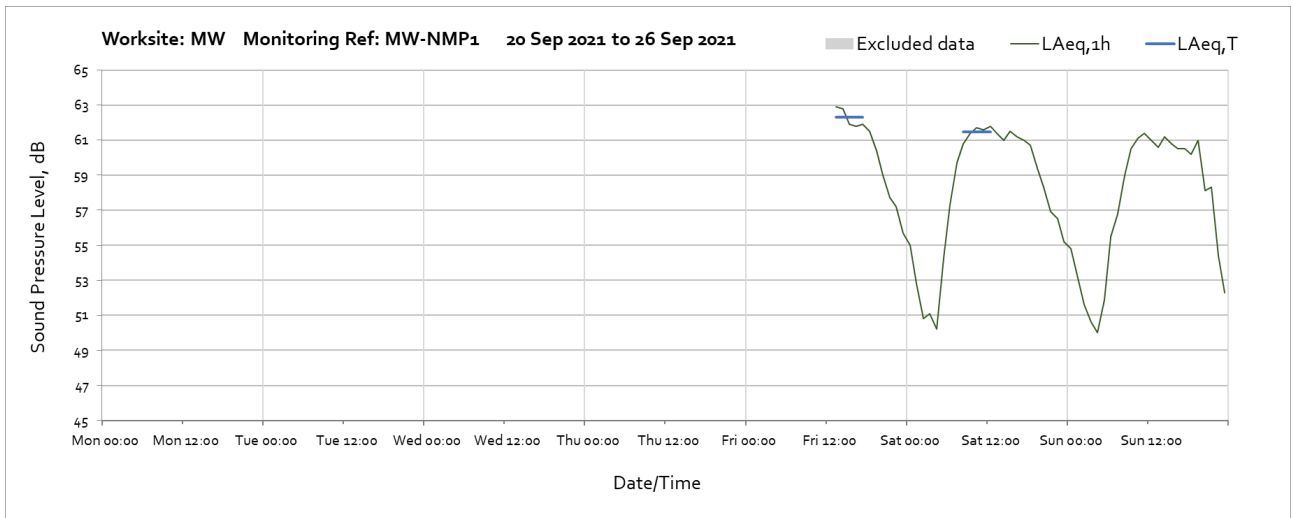
Worksite: HF - Monitoring Ref: HF-NMP1



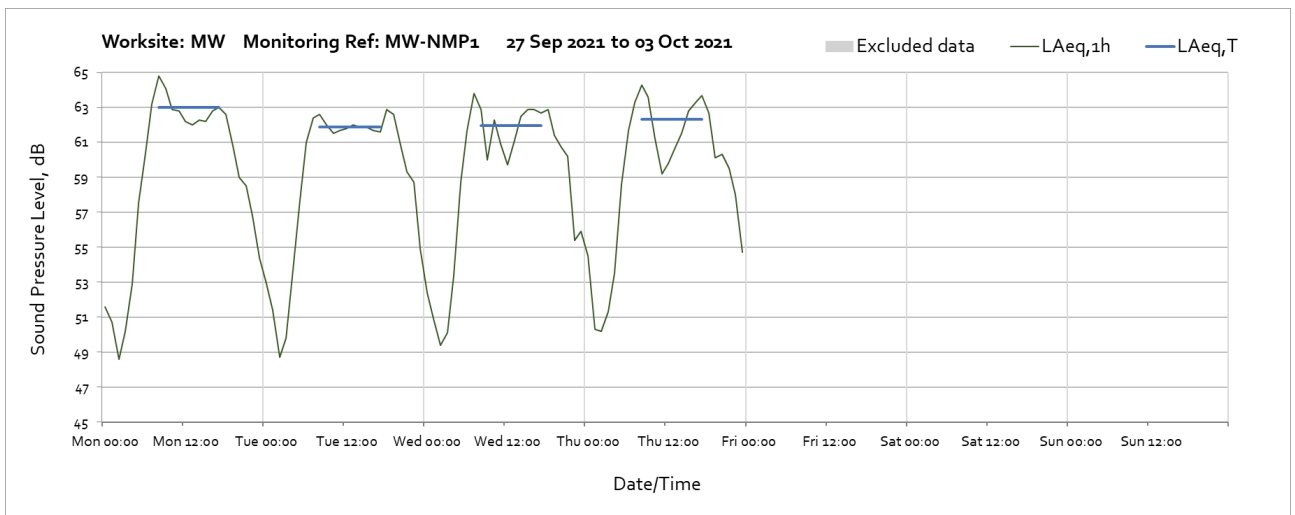




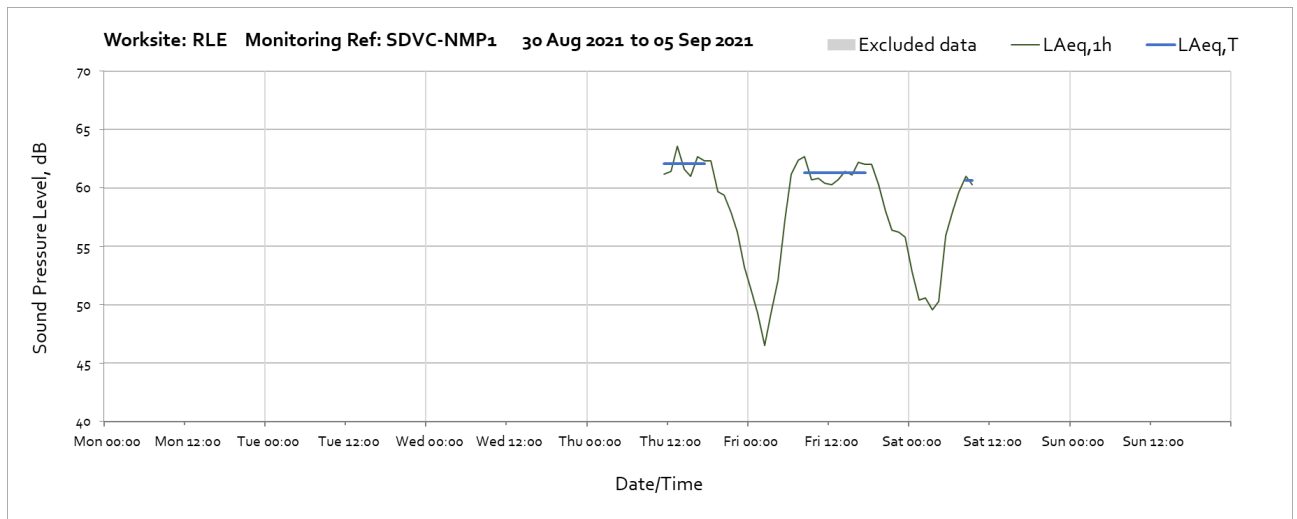
Worksite: MW - Monitoring Ref: MW-NMP1



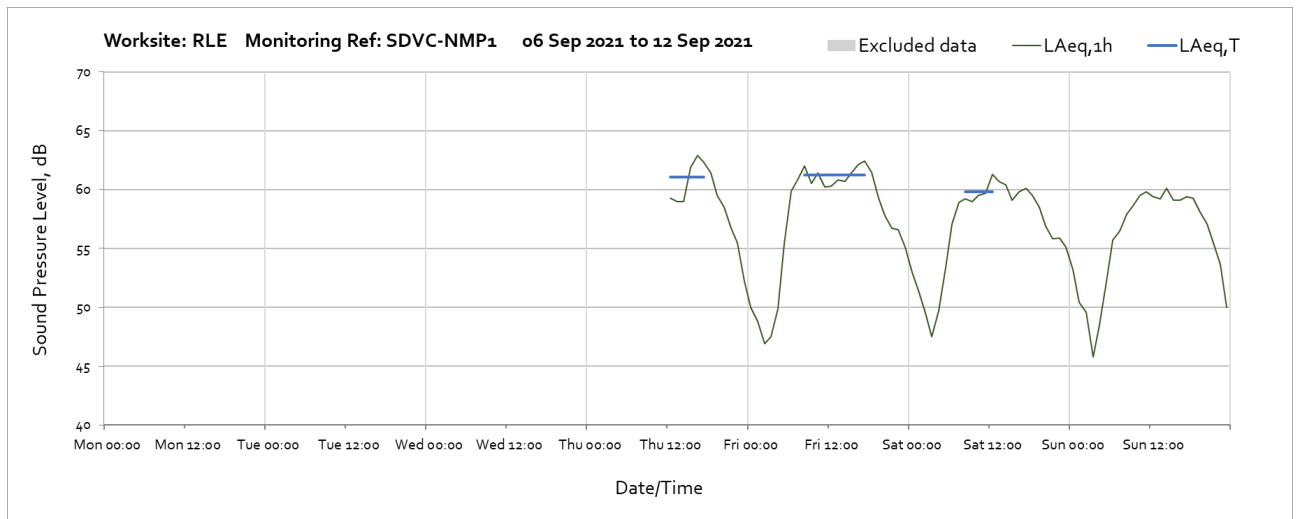
Note: The noise monitor was installed on 24th September 2021.



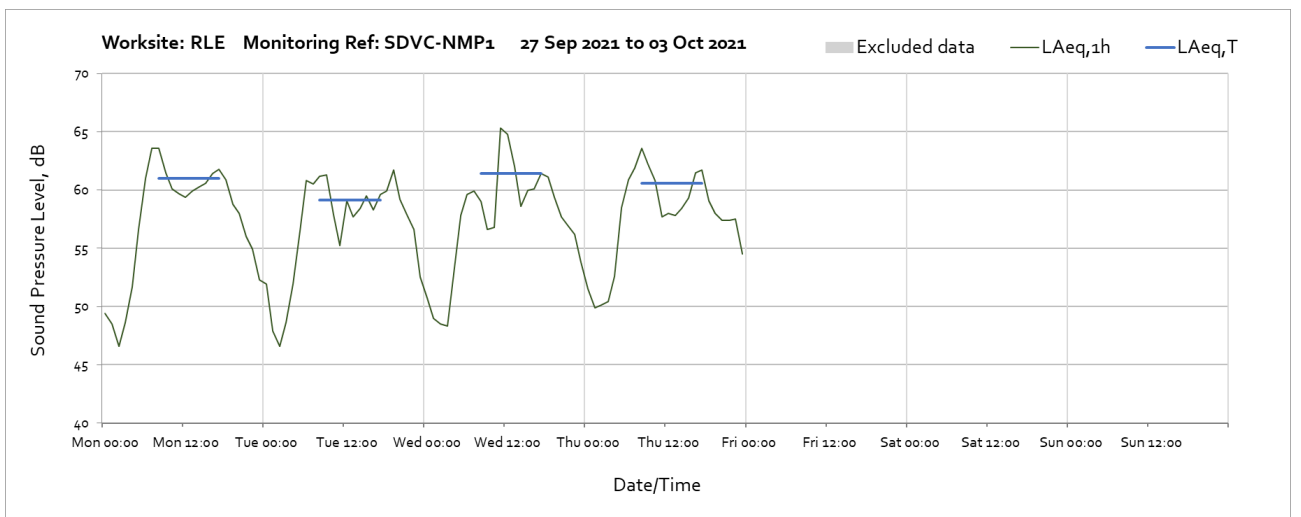
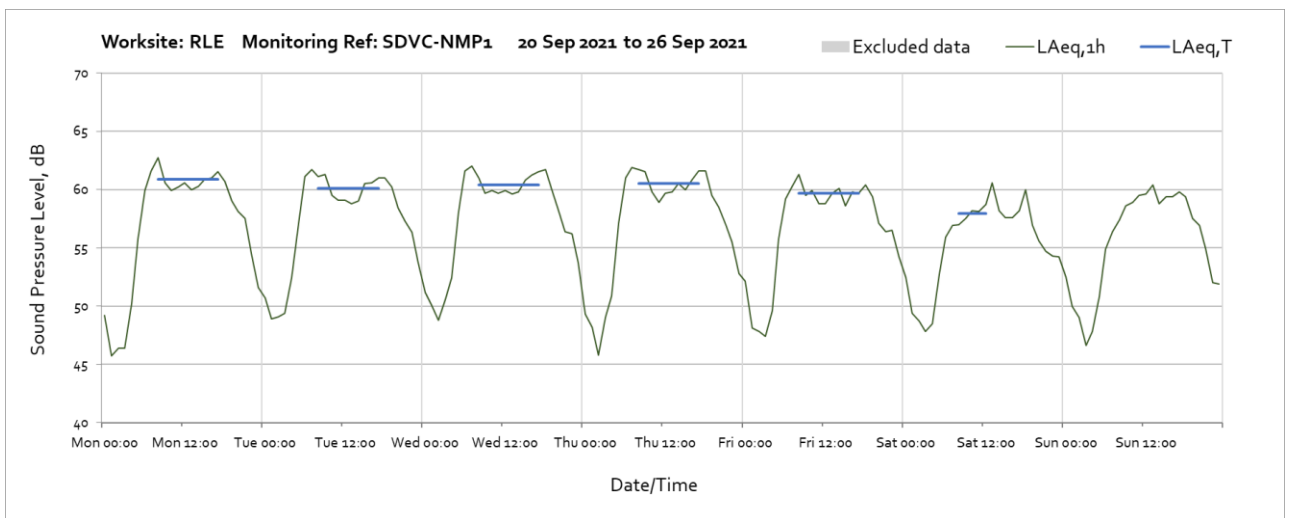
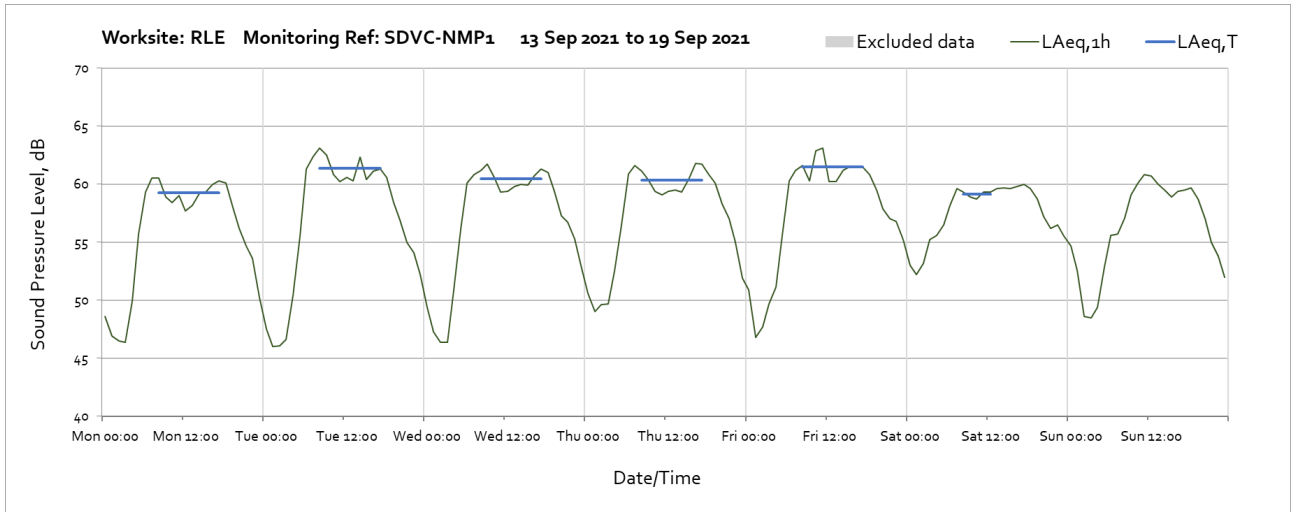
Worksite: RLE – Monitoring Ref: SDVC-NMP1



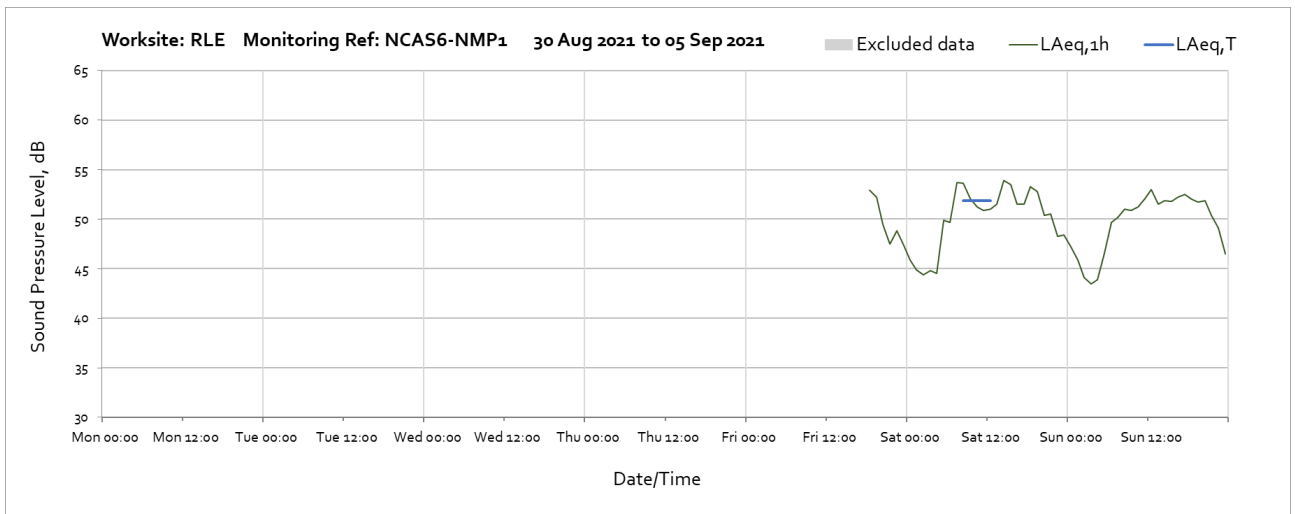
Note: Missing data between the beginning of the month and 12:00 on Thursday 2nd September, and between 10:00 on Saturday 4th September and the end of the week was due to a fault with the noise monitor system.



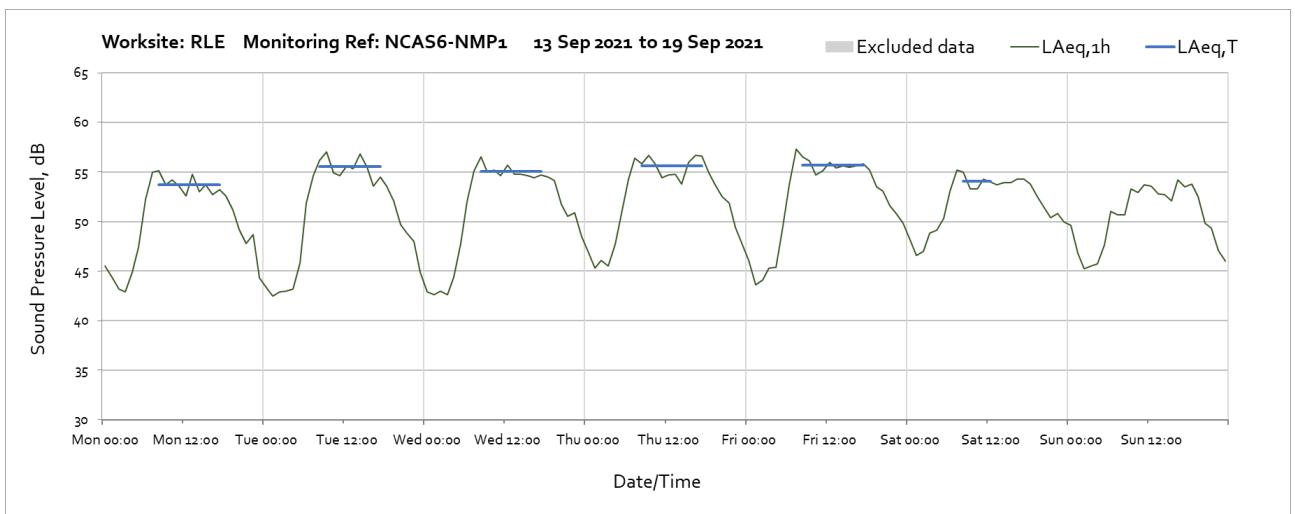
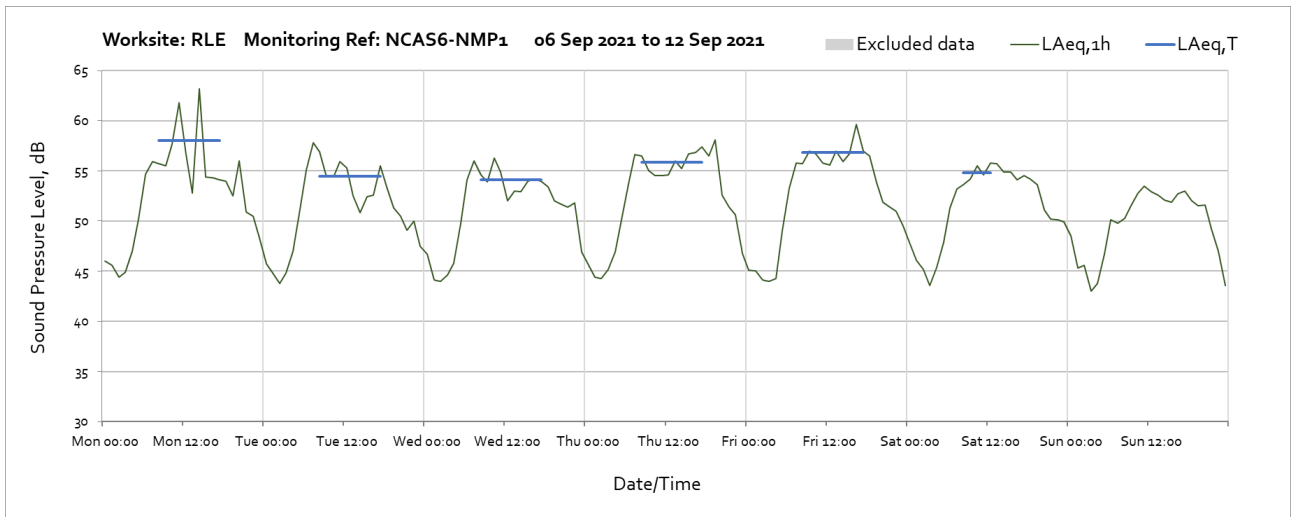
Note: Missing data between the beginning of the week and 12:00 on Thursday 9th September was due to a fault with the noise monitor system.

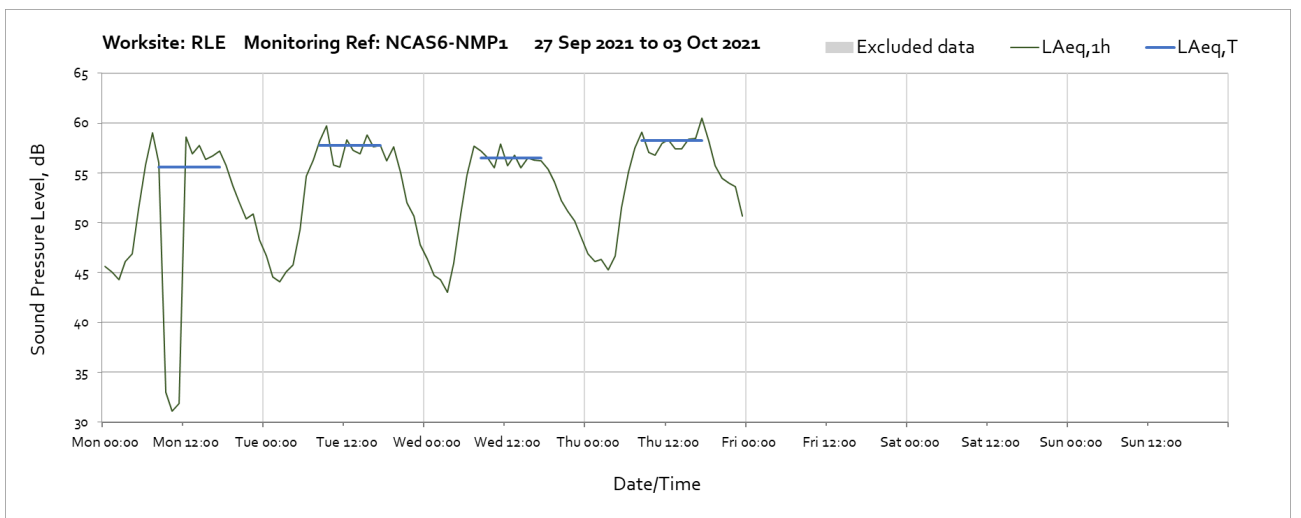
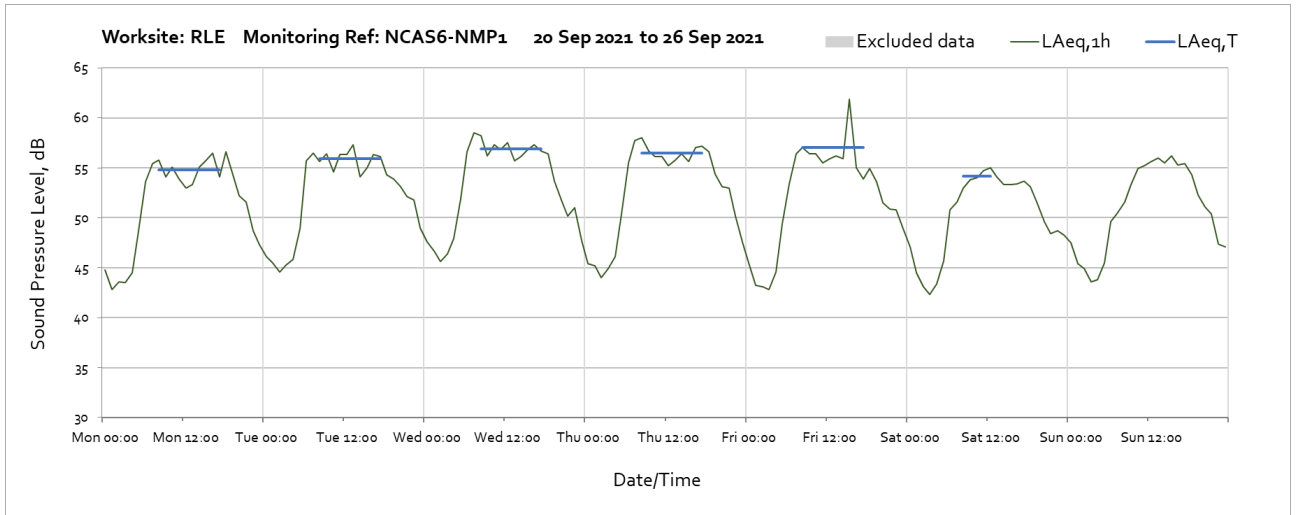


Worksite: RLE – Monitoring Ref: NCAS6-NMP1

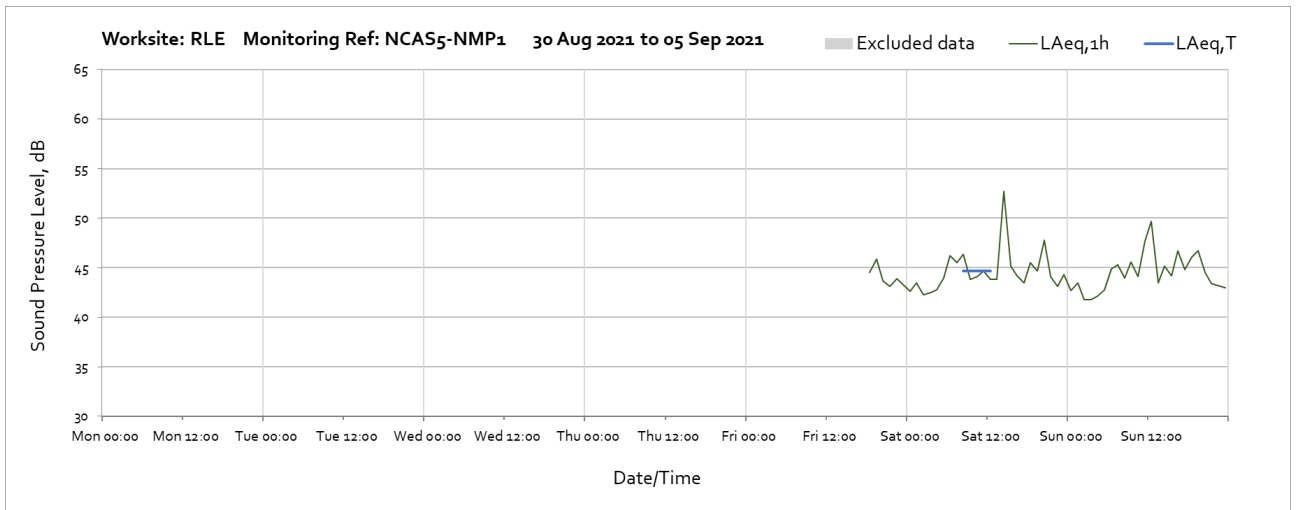


Note: Missing data between the beginning of the week and 18:00 on Friday 3rd September was due to a fault with the noise monitor system.

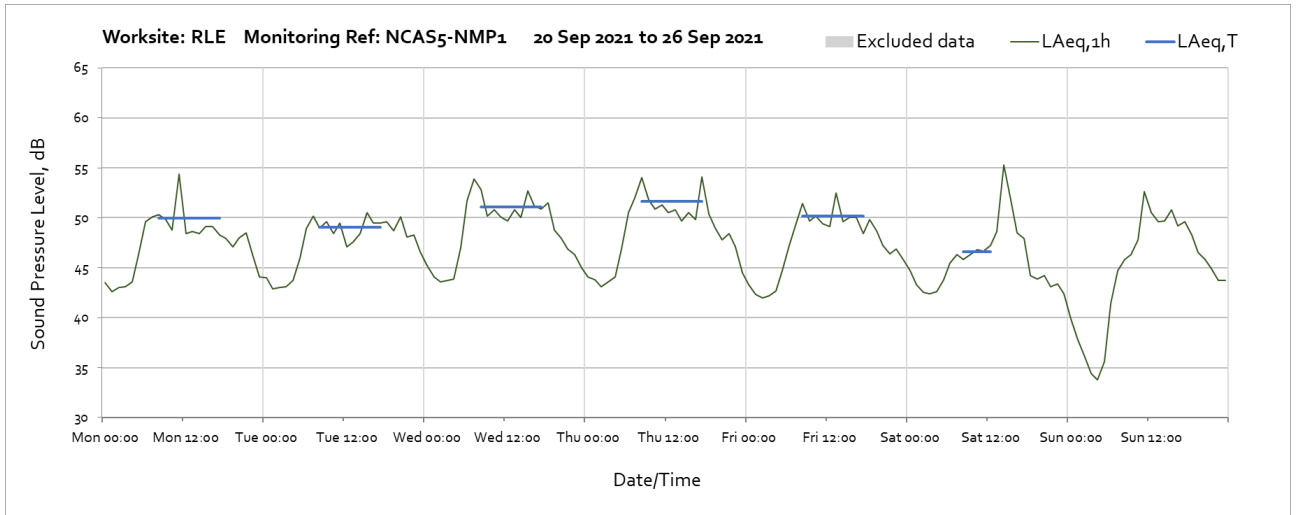
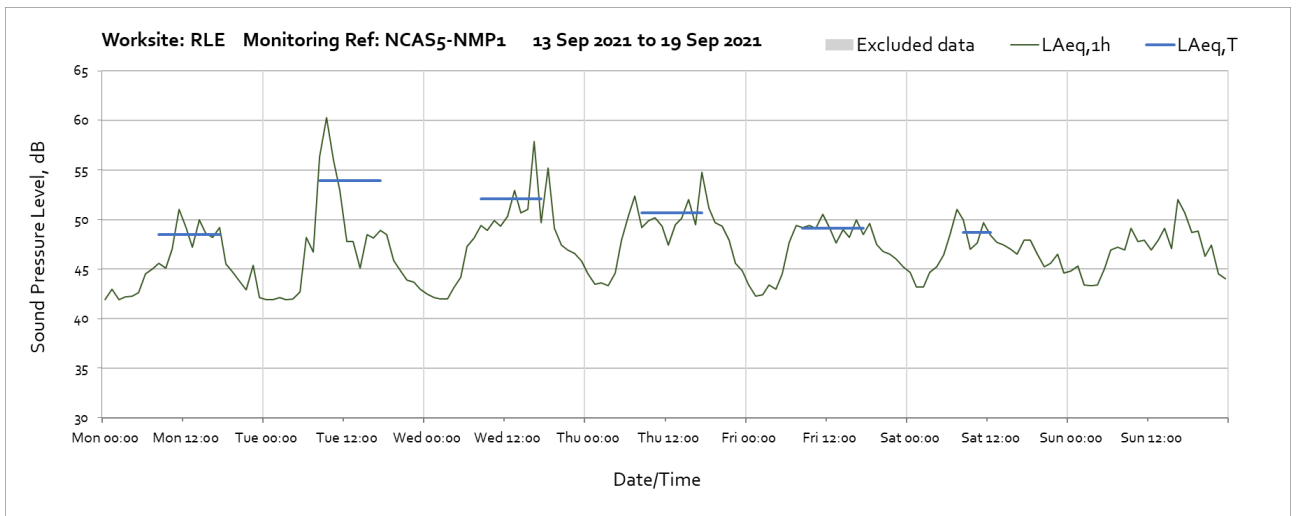
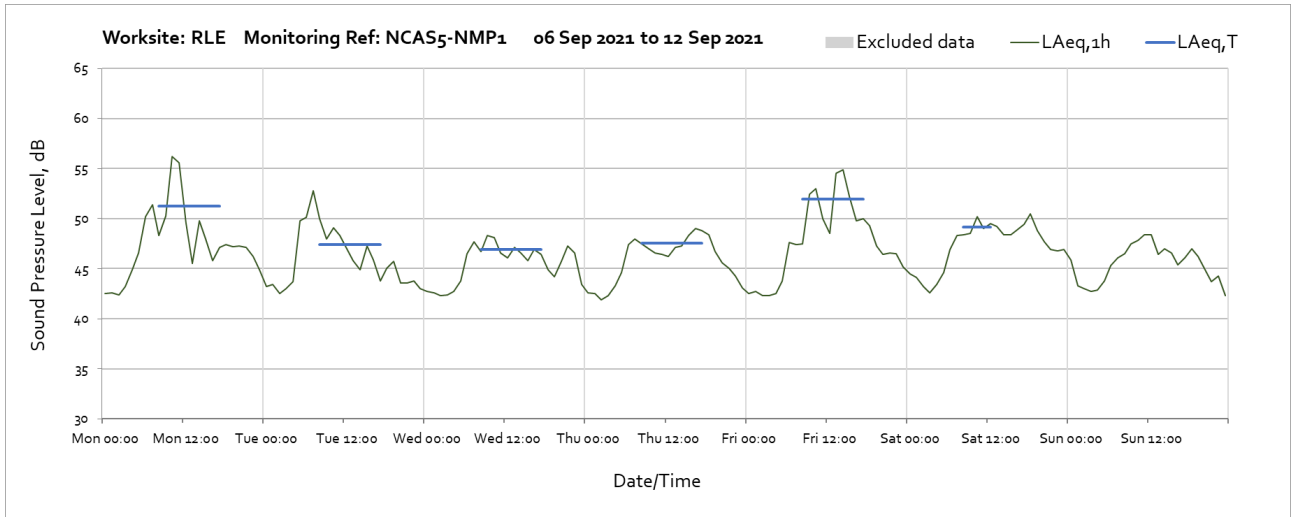


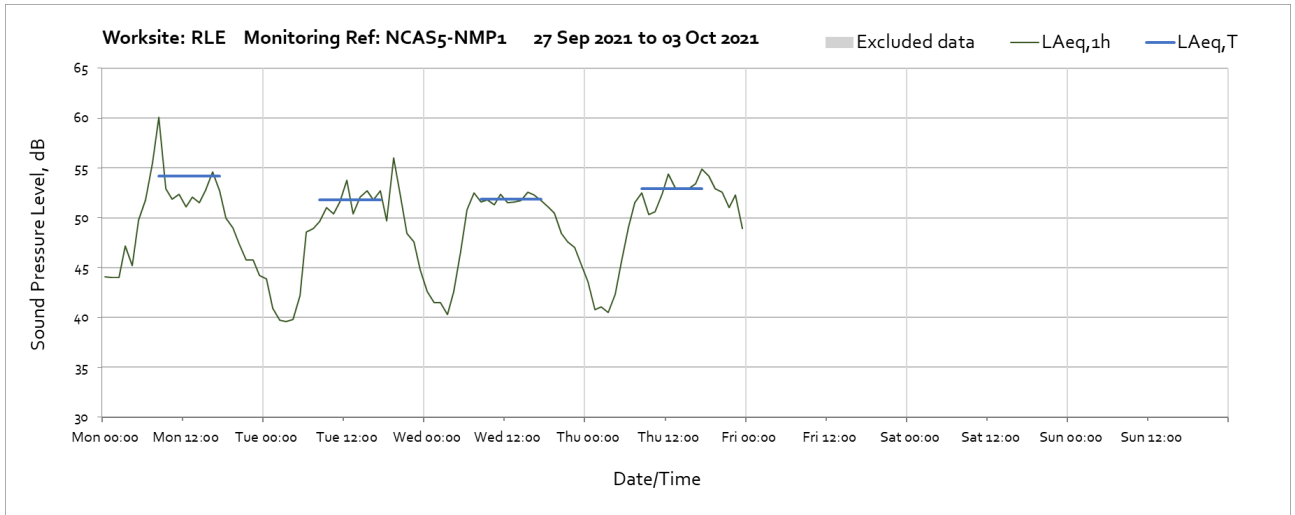


Worksite: RLE – Monitoring Ref: NCAS5-NMP1

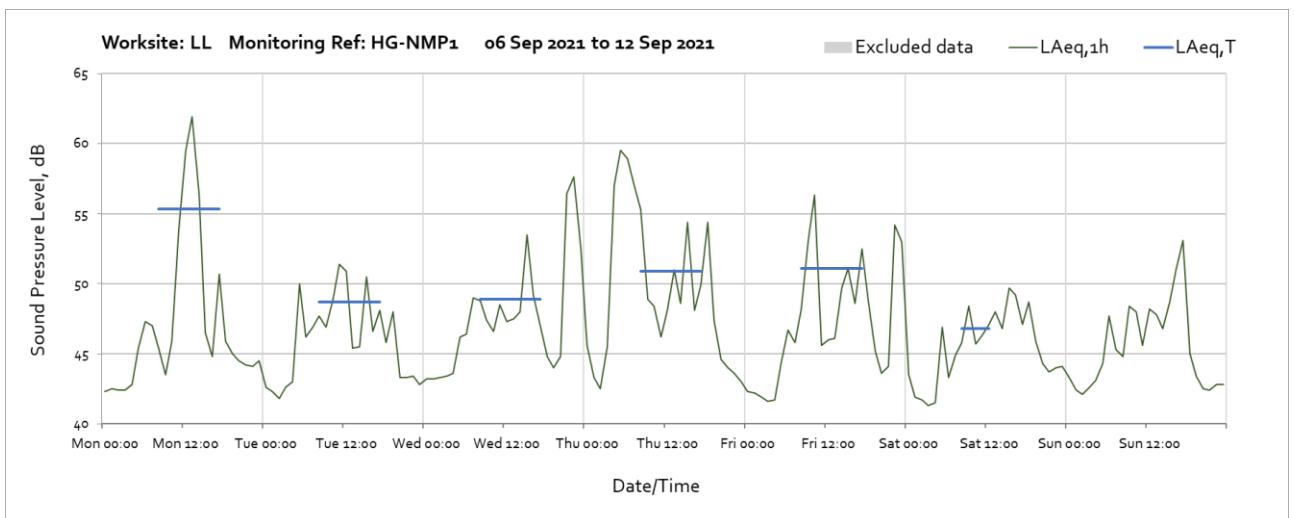
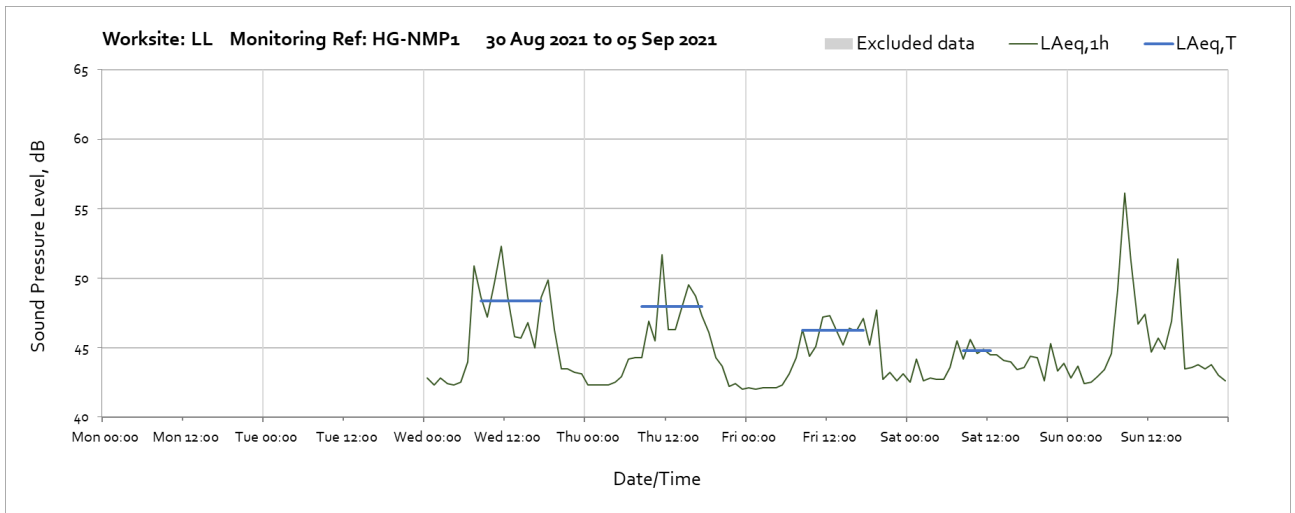


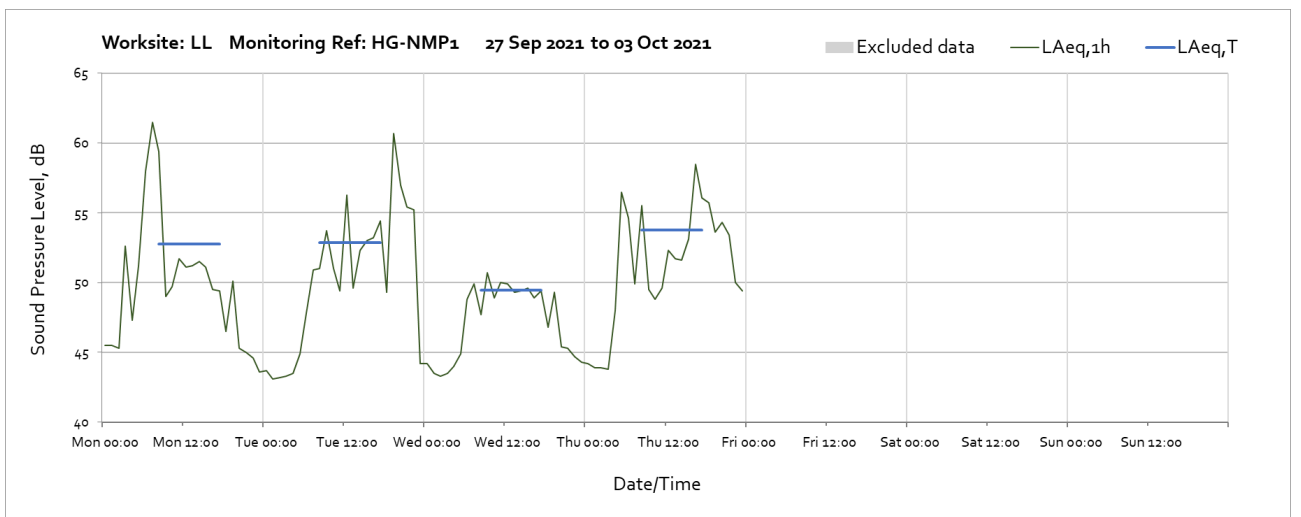
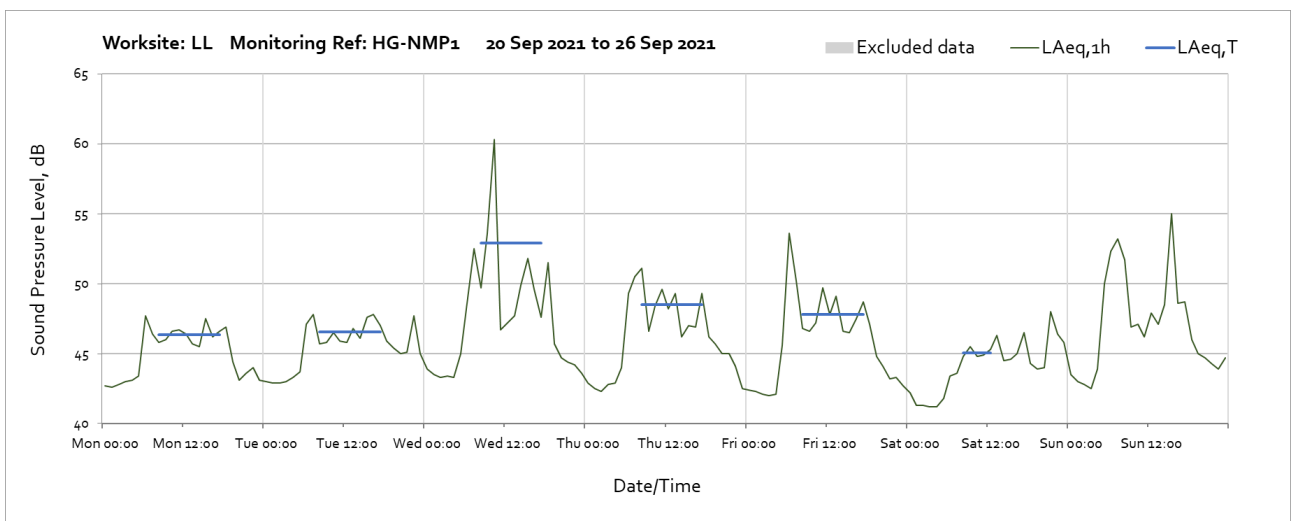
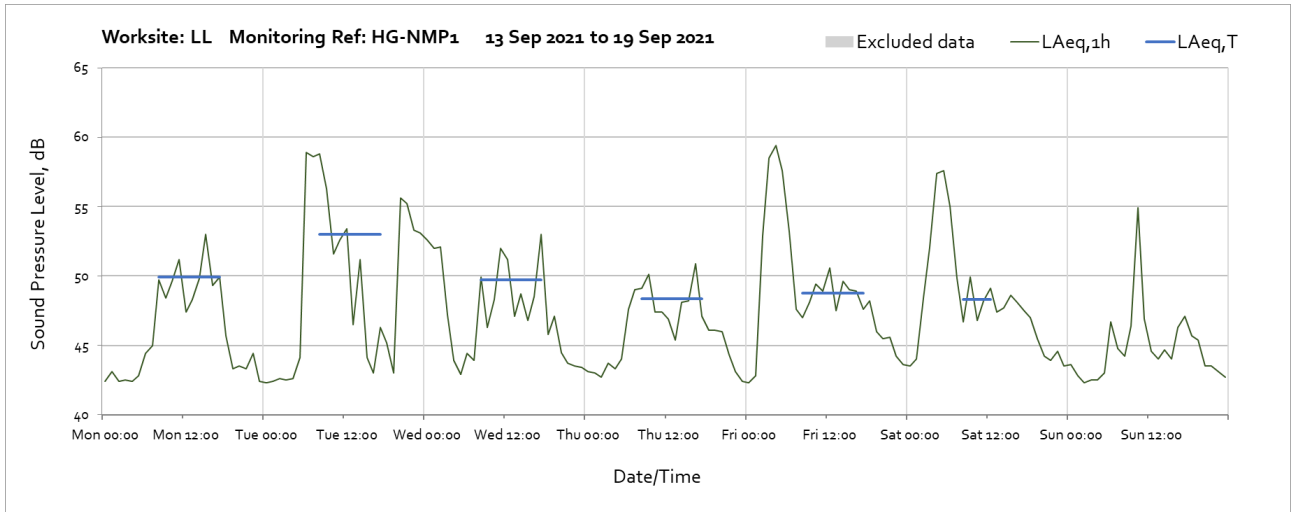
Note: Missing data between the beginning of the week and 18:00 on Friday 3rd September was due to a fault with the noise monitor system.



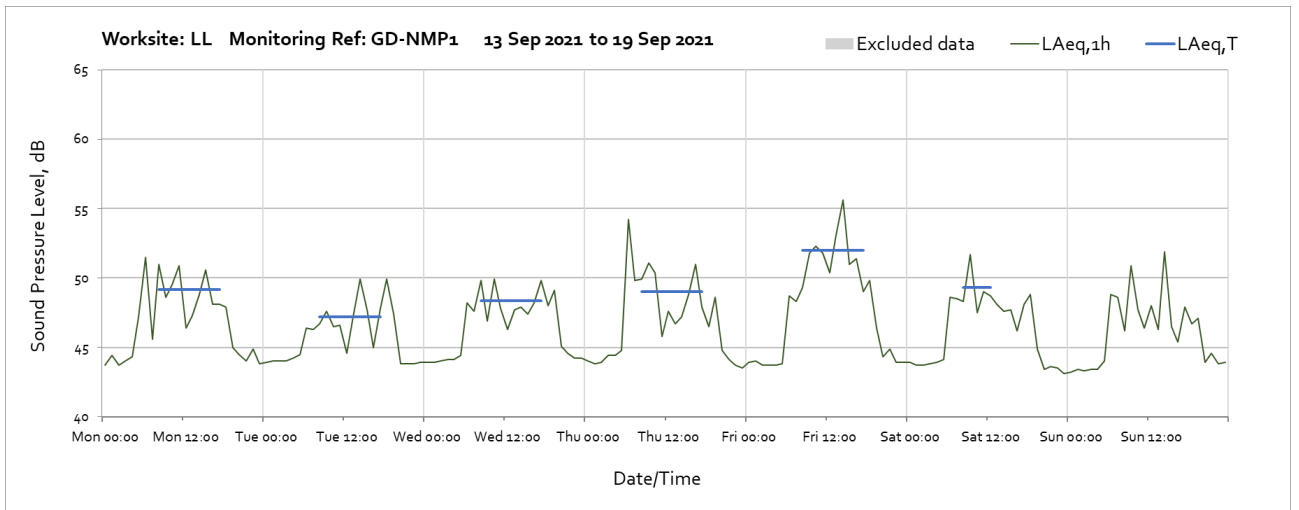
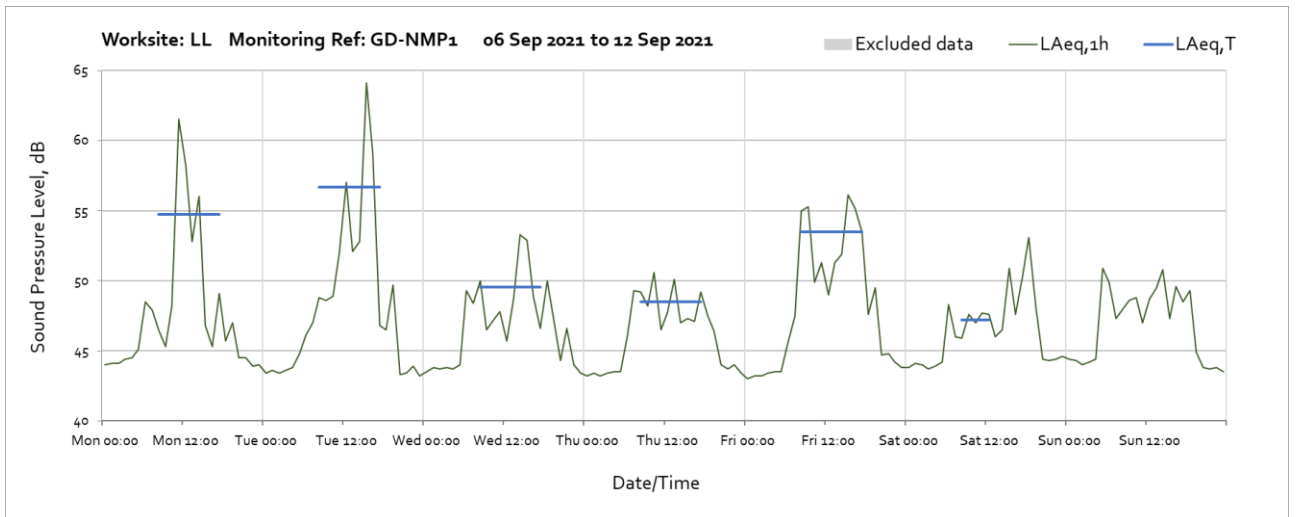
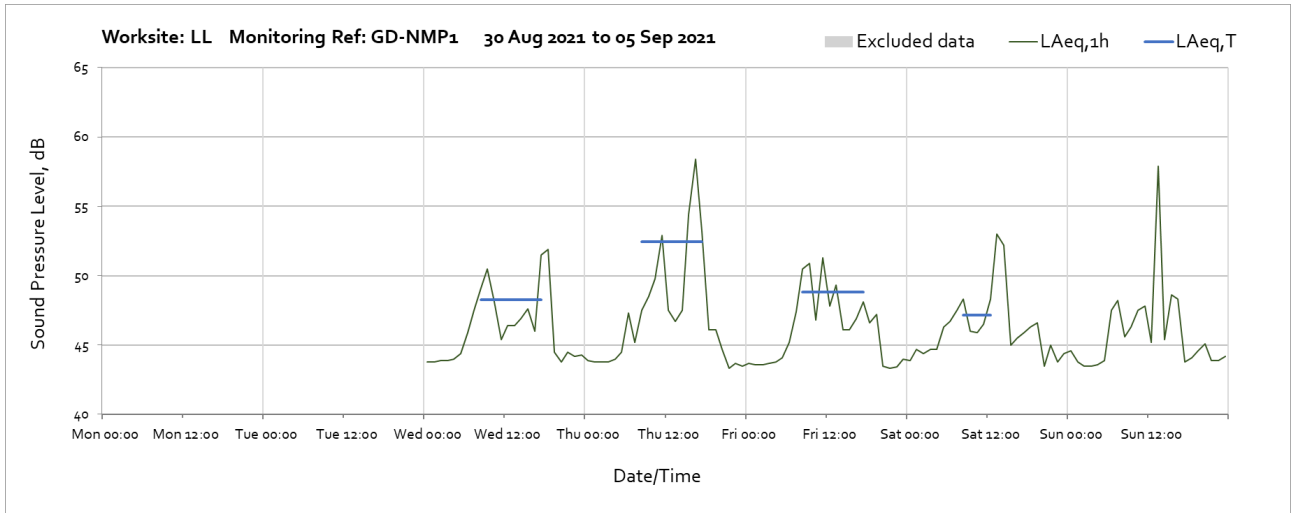


Worksite: LL - Monitoring Ref: HG -NMP1

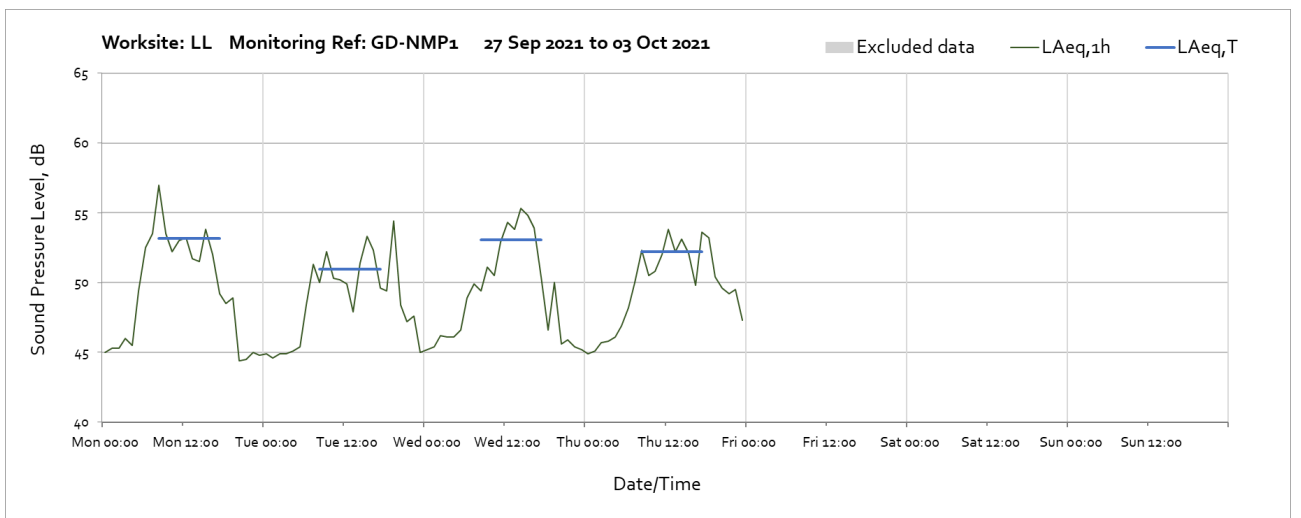
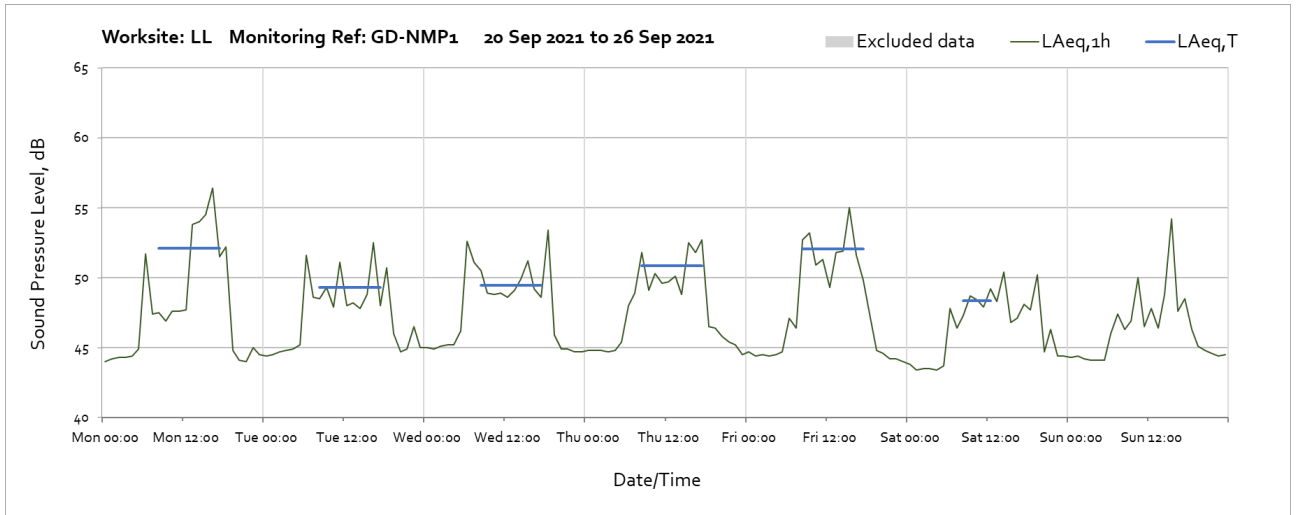




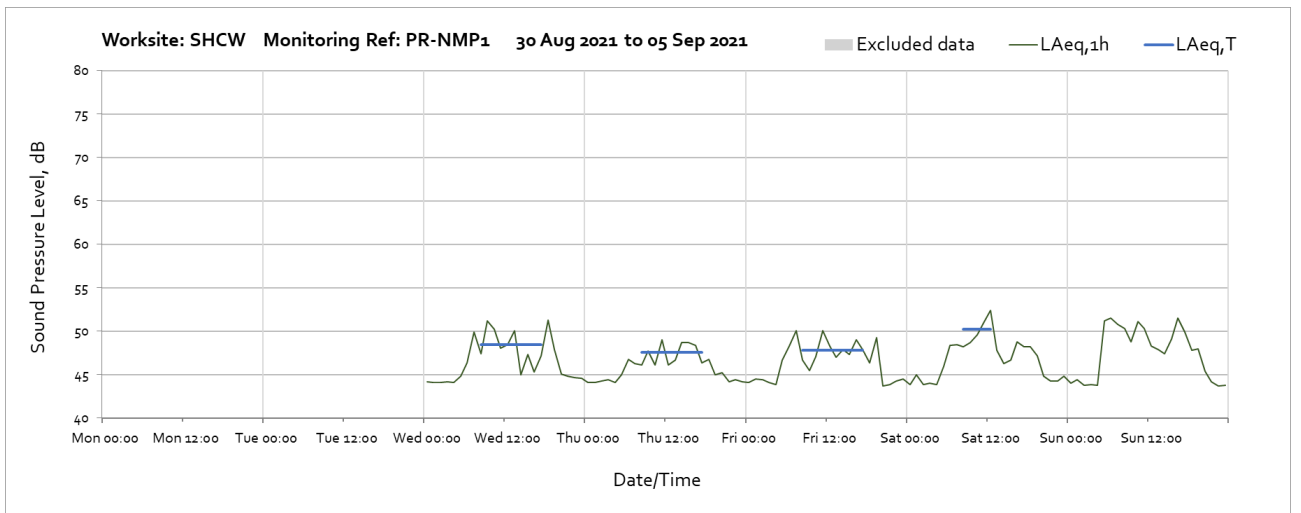
Worksite: LL – Monitoring Ref: GD-NMP1

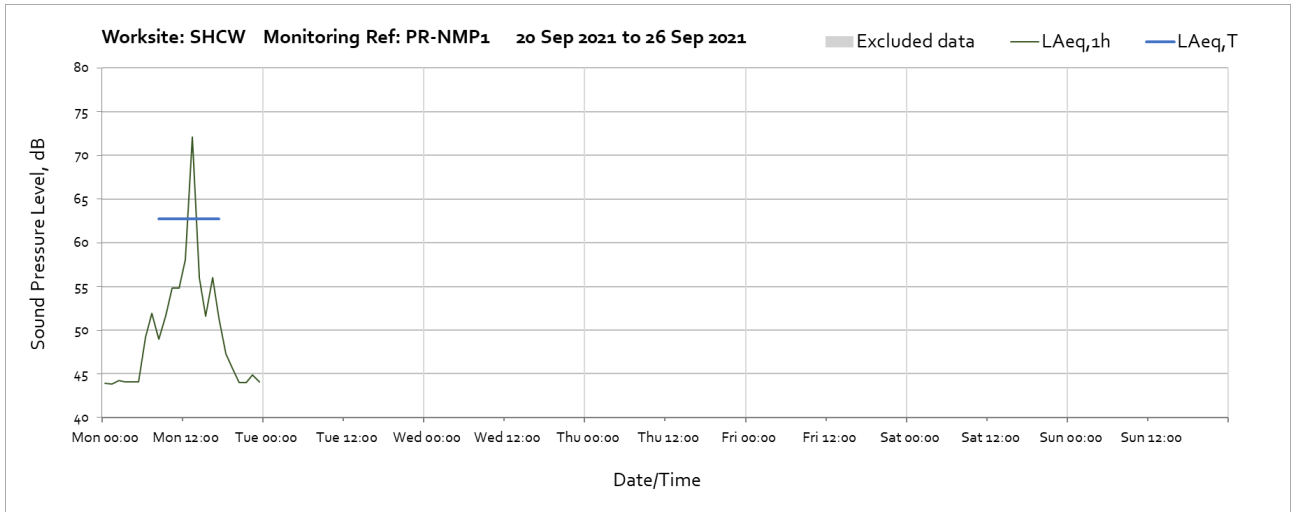
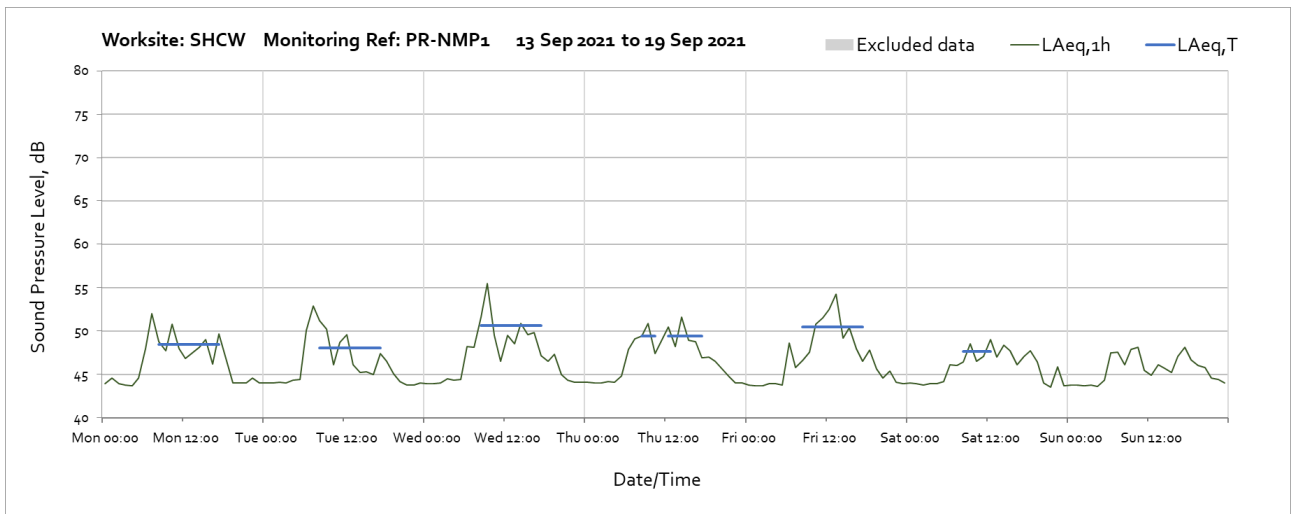
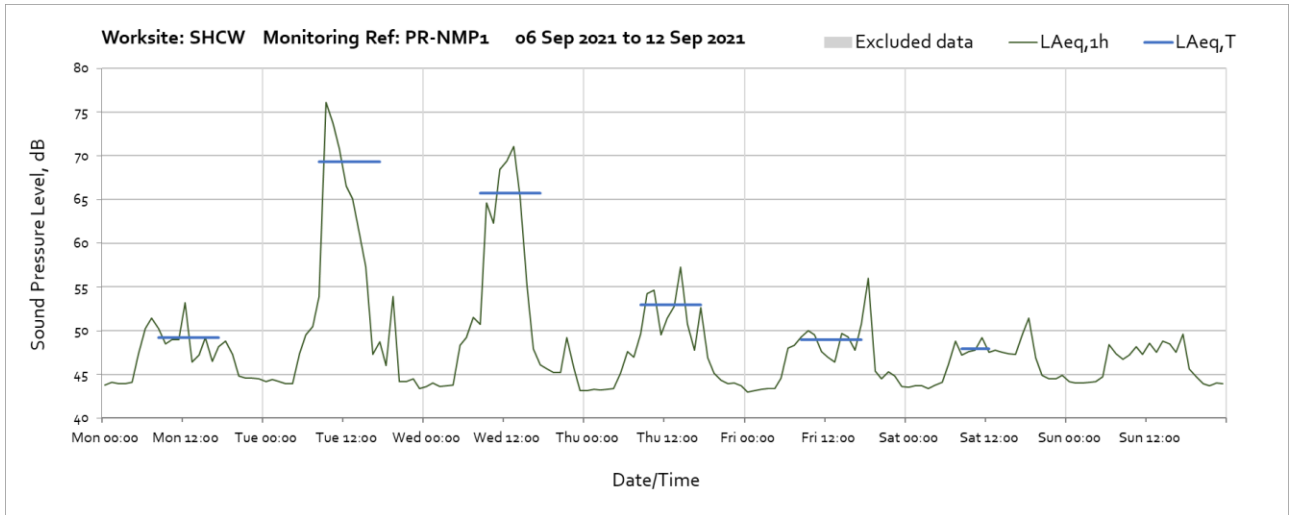


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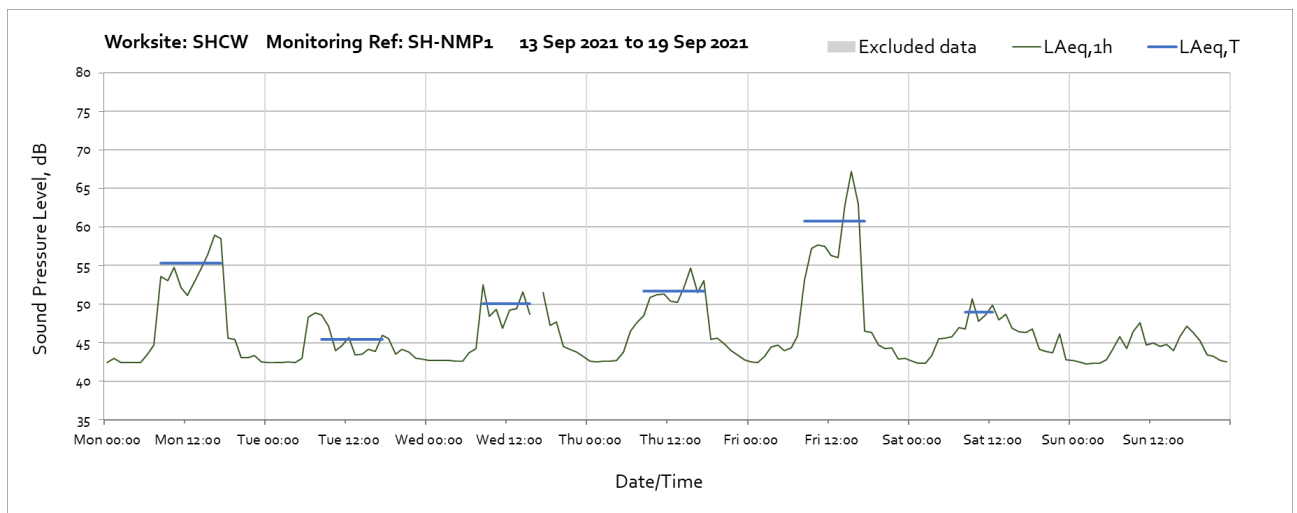
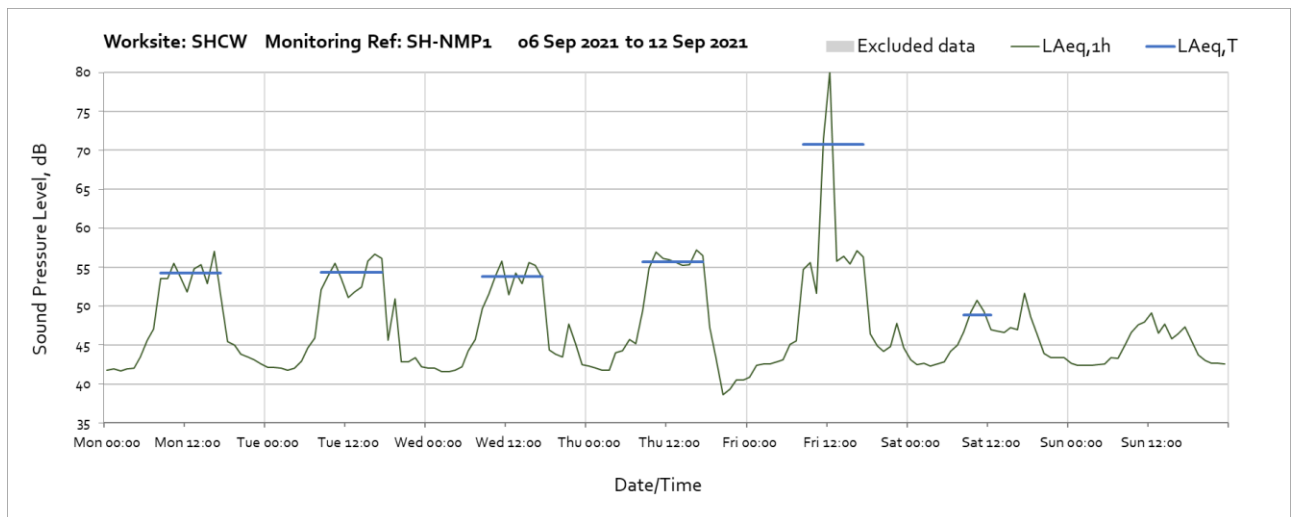
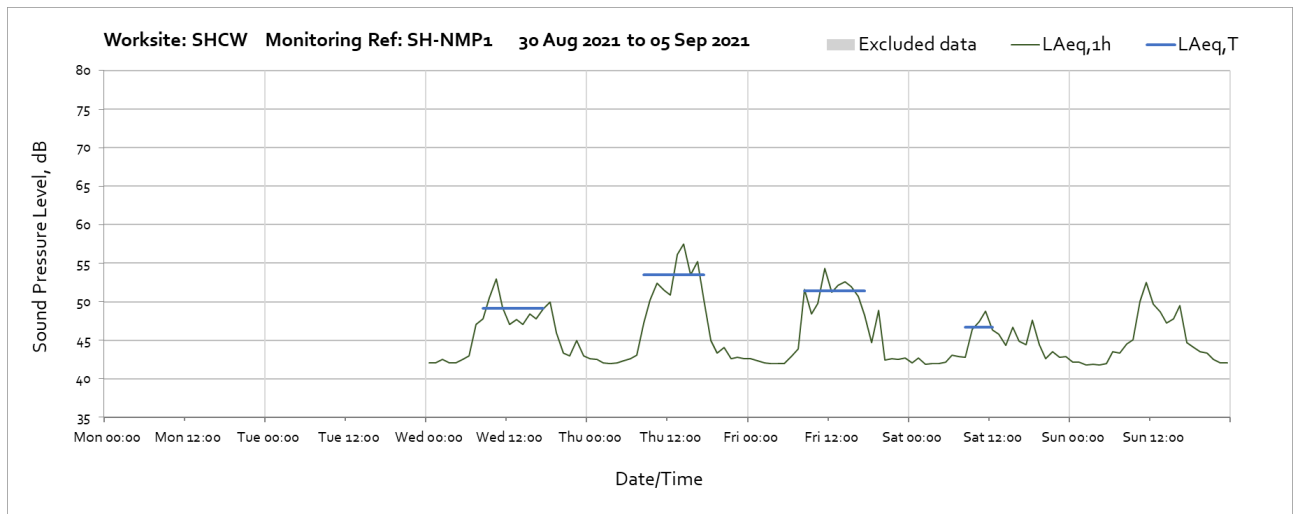
Worksite: SHCW - Monitoring Ref: PR-NMP1

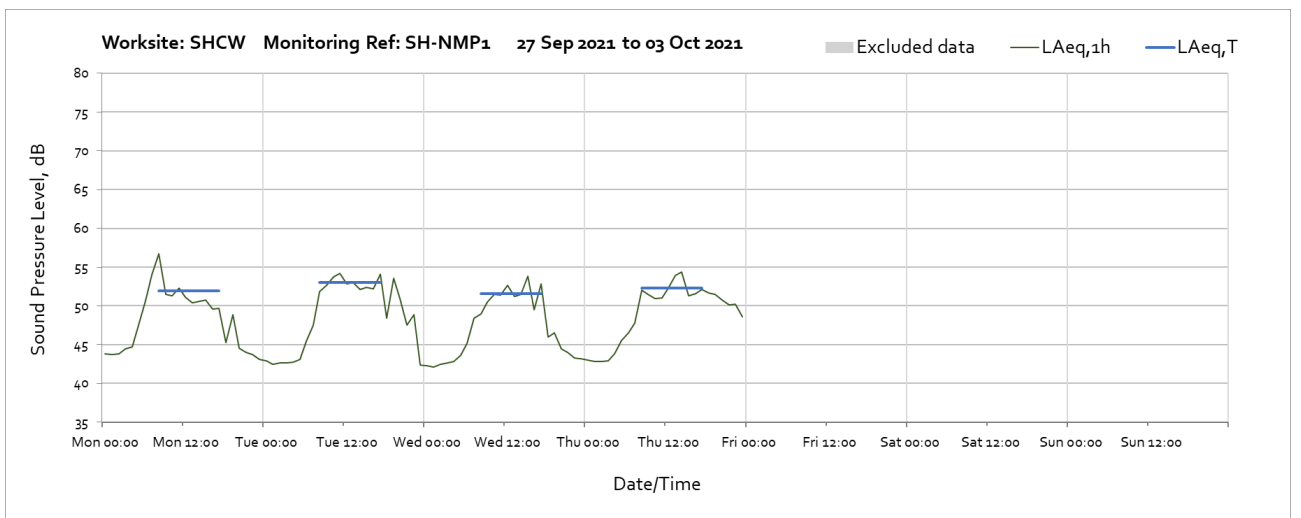
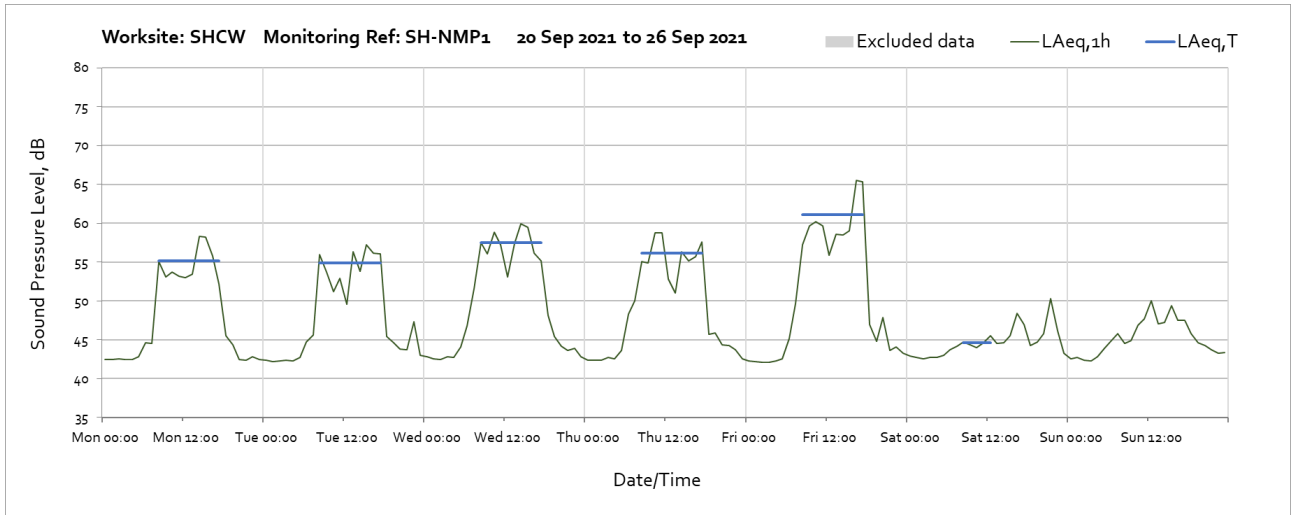




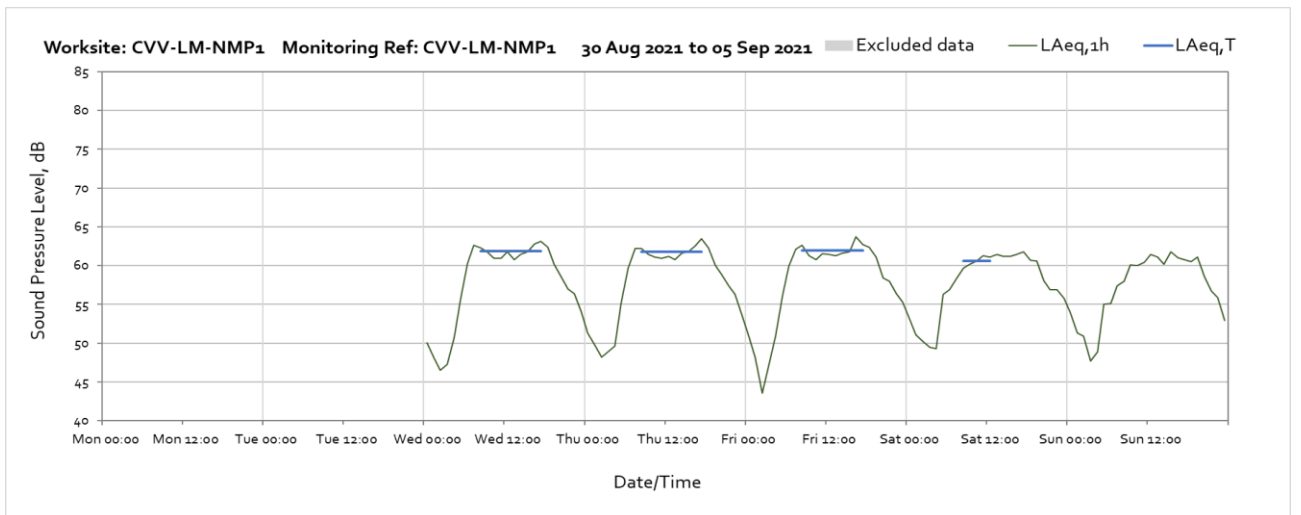
Note: Missing data between 00:00 on Tuesday 21st September and the end of the month was due to a SIM card error.

Worksite: SHCW – Monitoring Ref: SH-NMP1

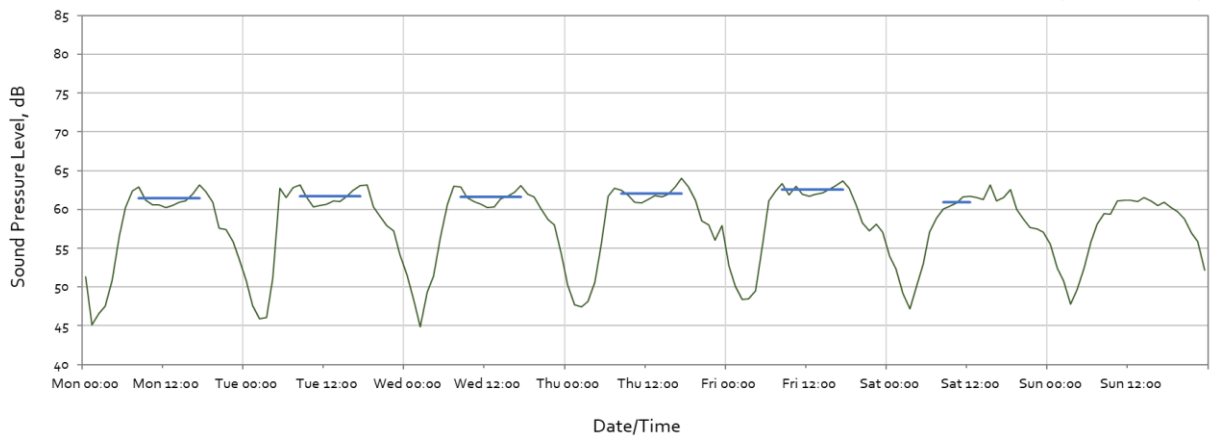




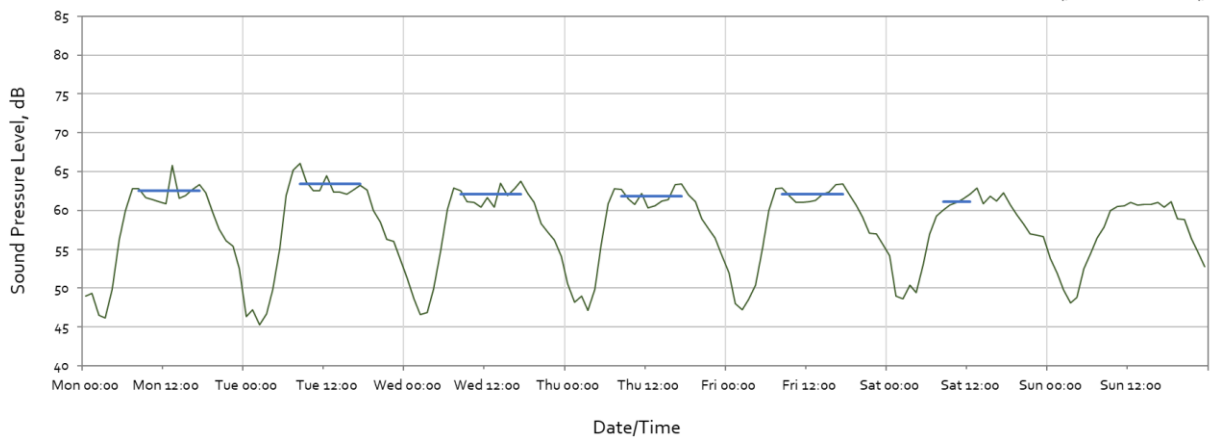
Worksite: CVV-LM - Monitoring Ref: CVV-LM-NMP1



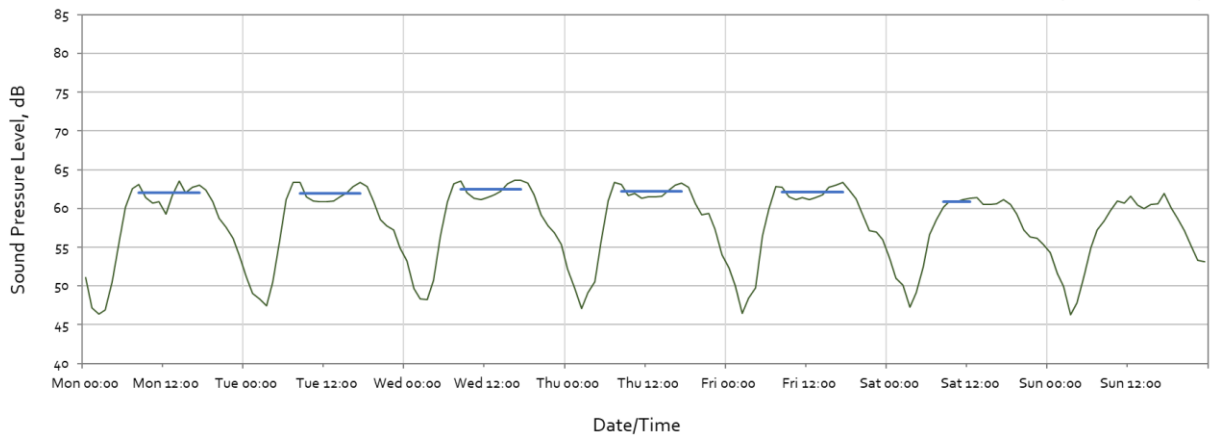
Worksite: CVV-LM-NMP1 Monitoring Ref: CVV-LM-NMP1 06 Sep 2021 to 12 Sep 2021 Excluded data LAeq,1h LAeq,T

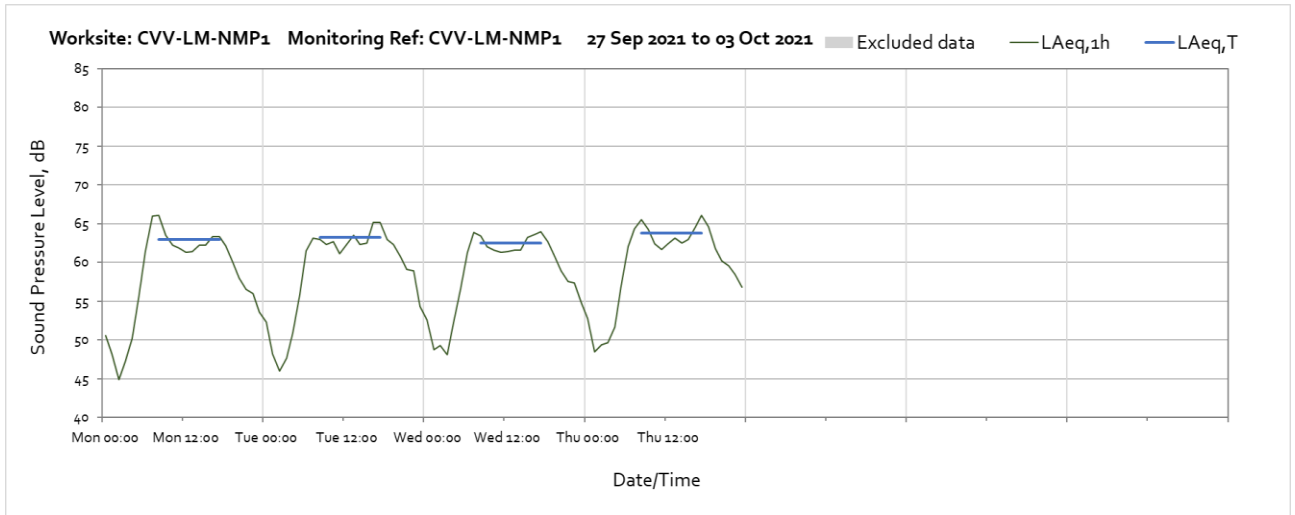


Worksite: CVV-LM-NMP1 Monitoring Ref: CVV-LM-NMP1 13 Sep 2021 to 19 Sep 2021 Excluded data LAeq,1h LAeq,T

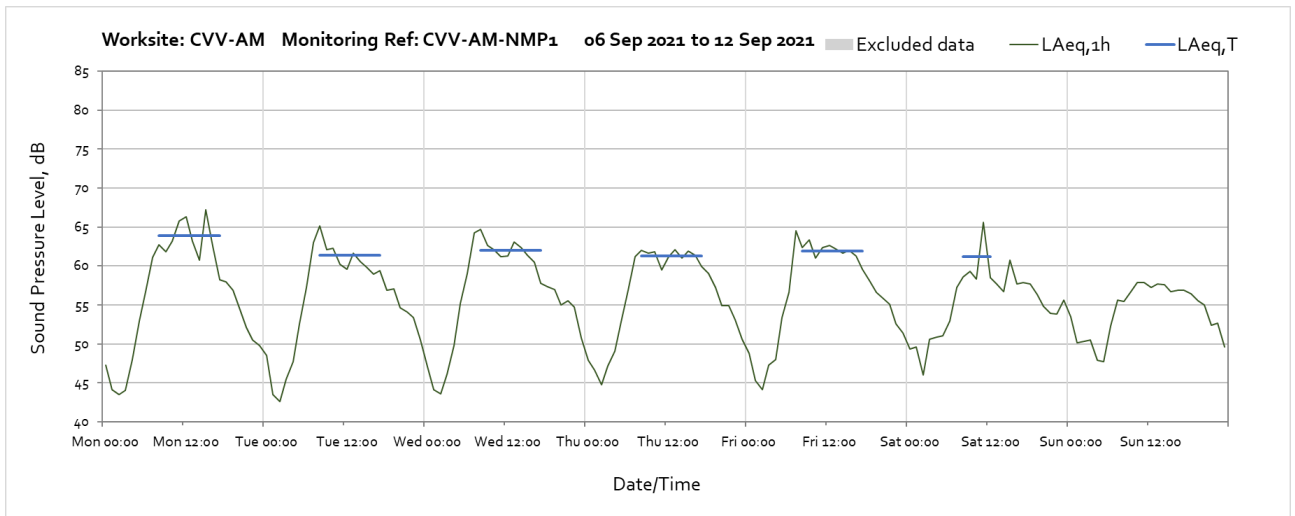
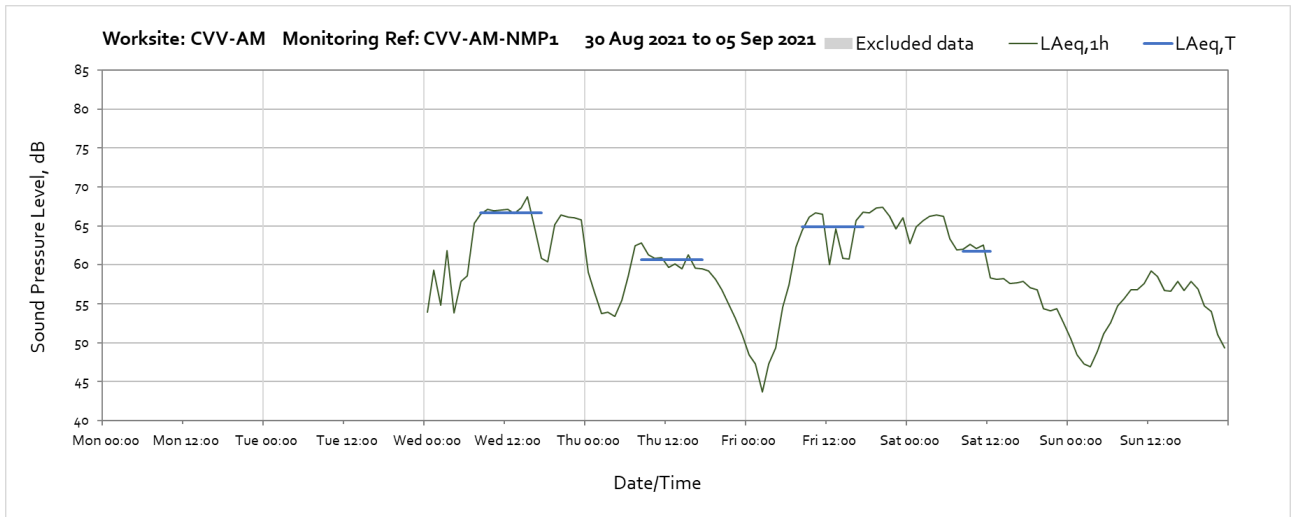


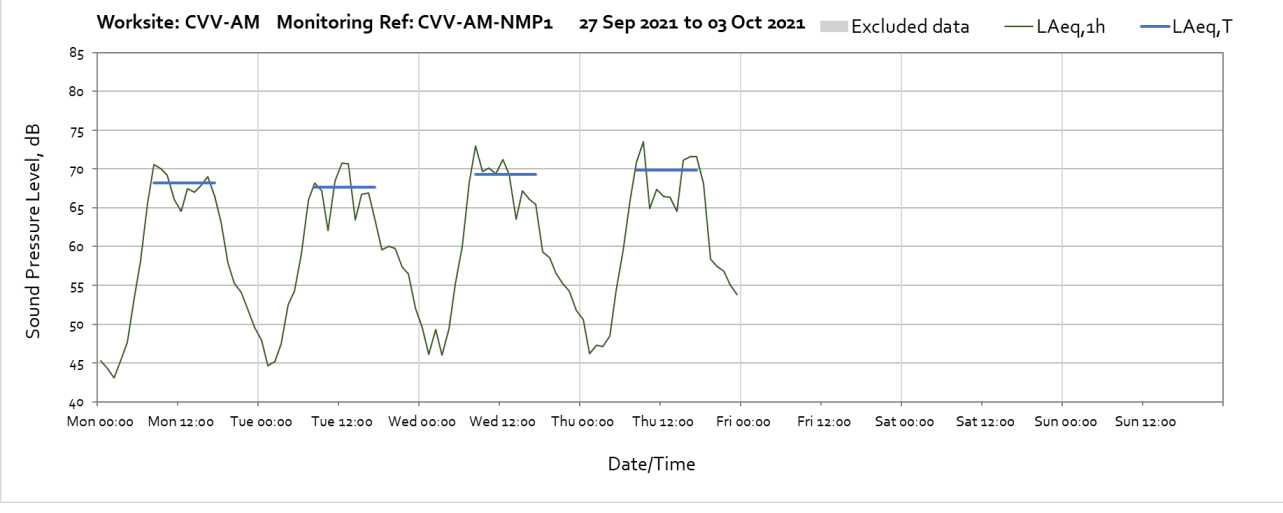
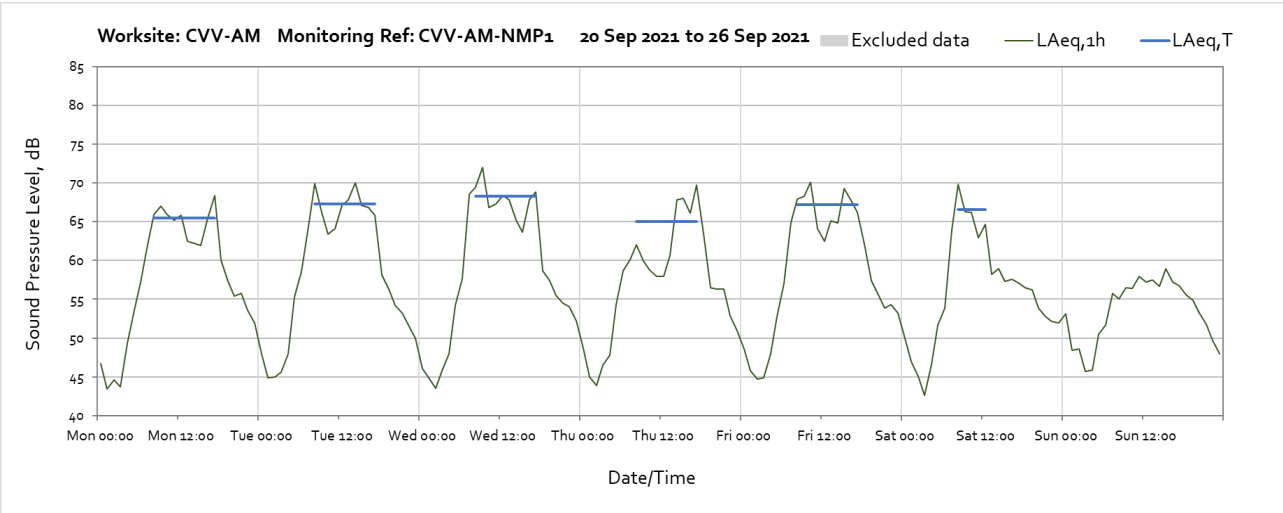
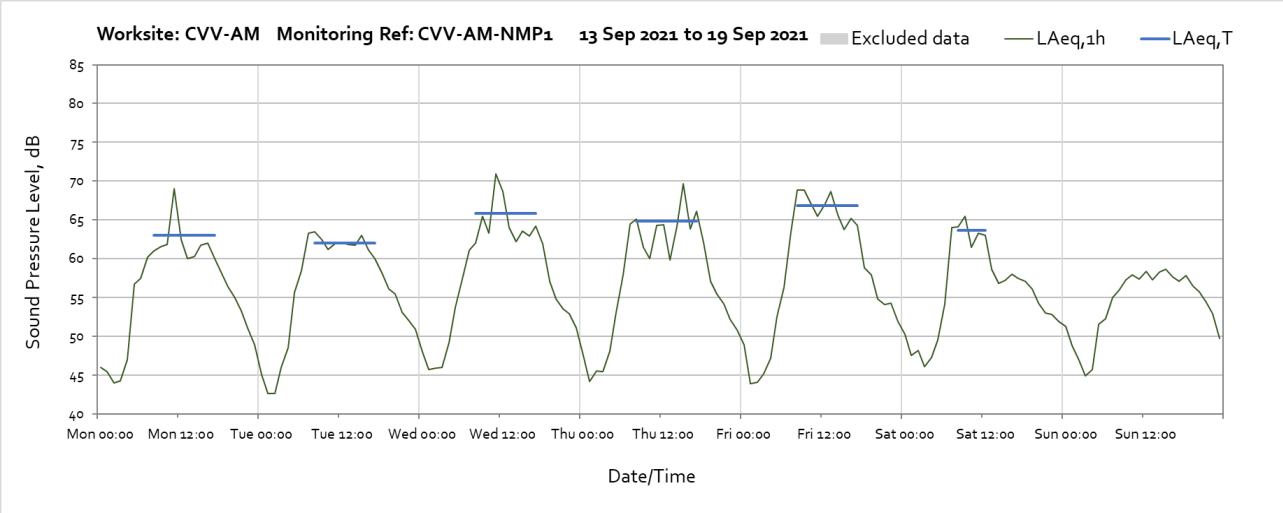
Worksite: CVV-LM-NMP1 Monitoring Ref: CVV-LM-NMP1 20 Sep 2021 to 26 Sep 2021 Excluded data LAeq,1h LAeq,T



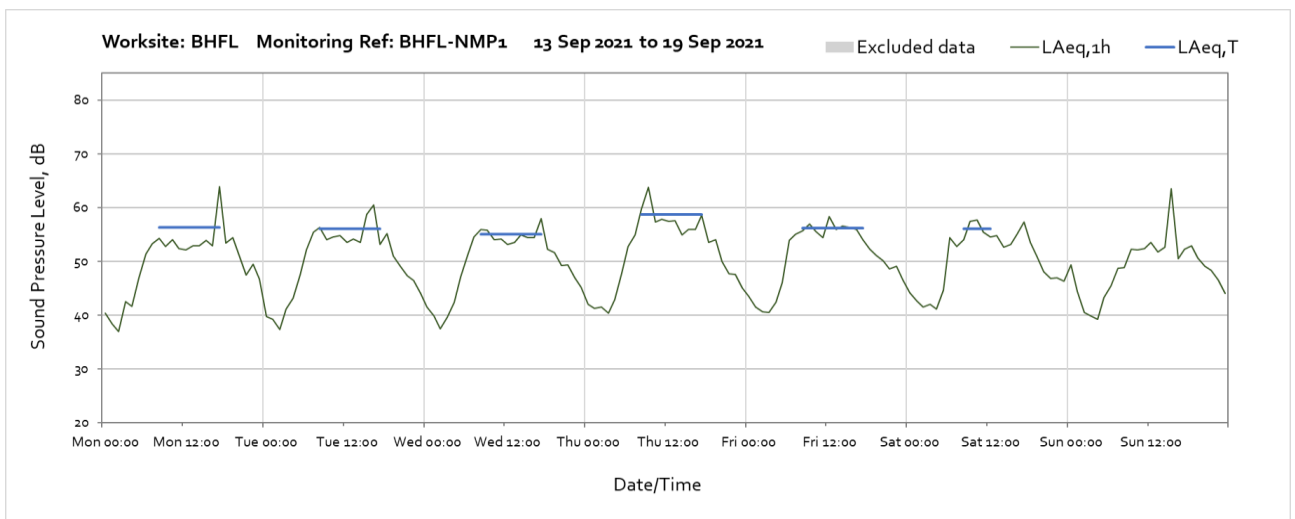
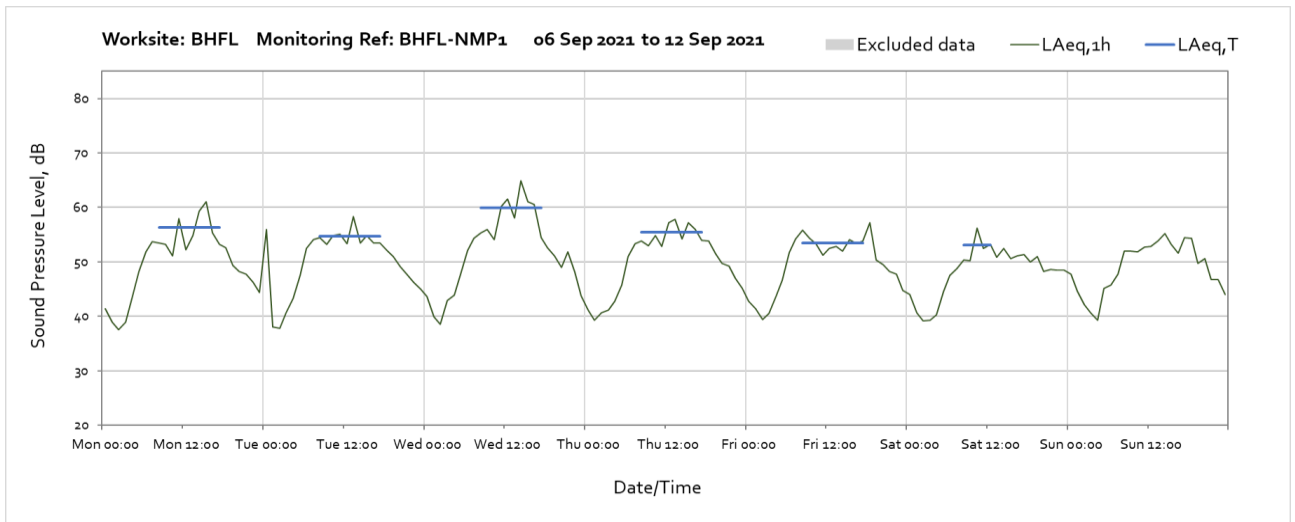
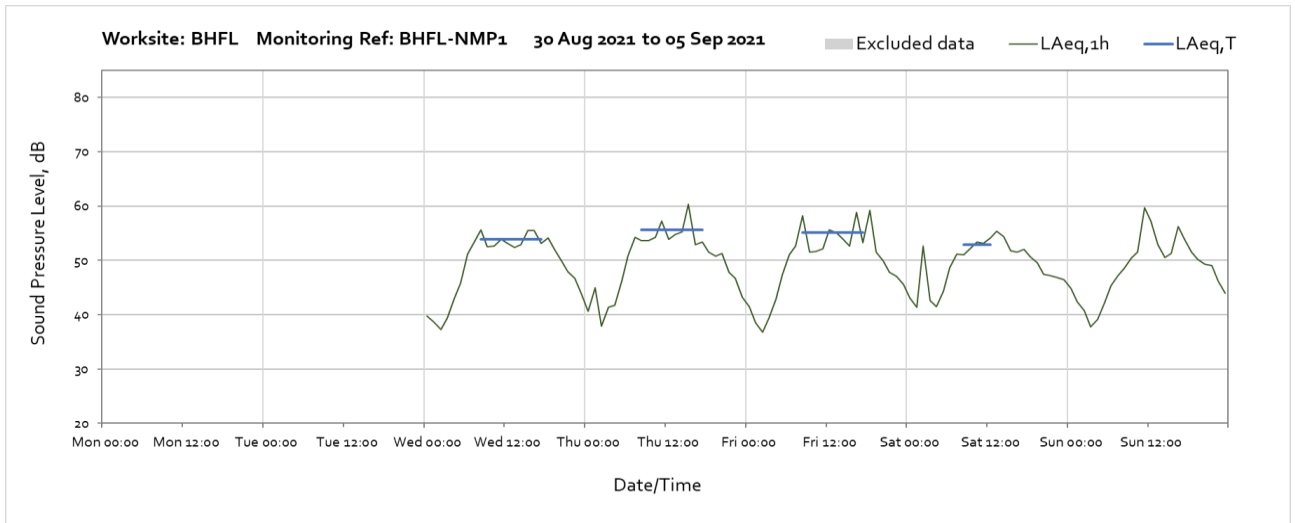


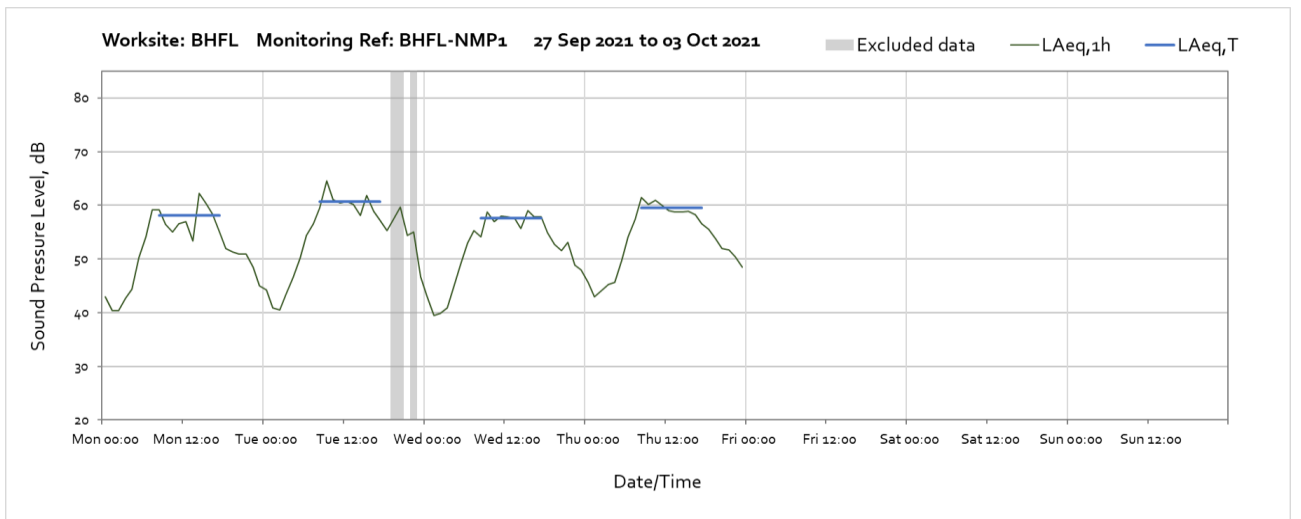
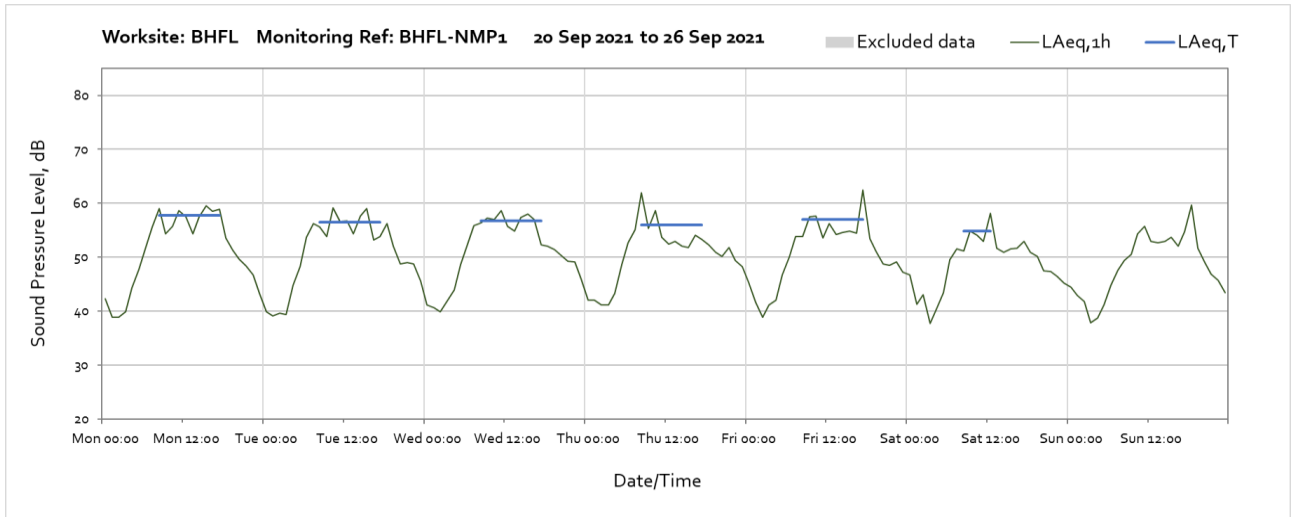
Worksite: CVV-AM - Monitoring Ref: CVV-AM-NMP1



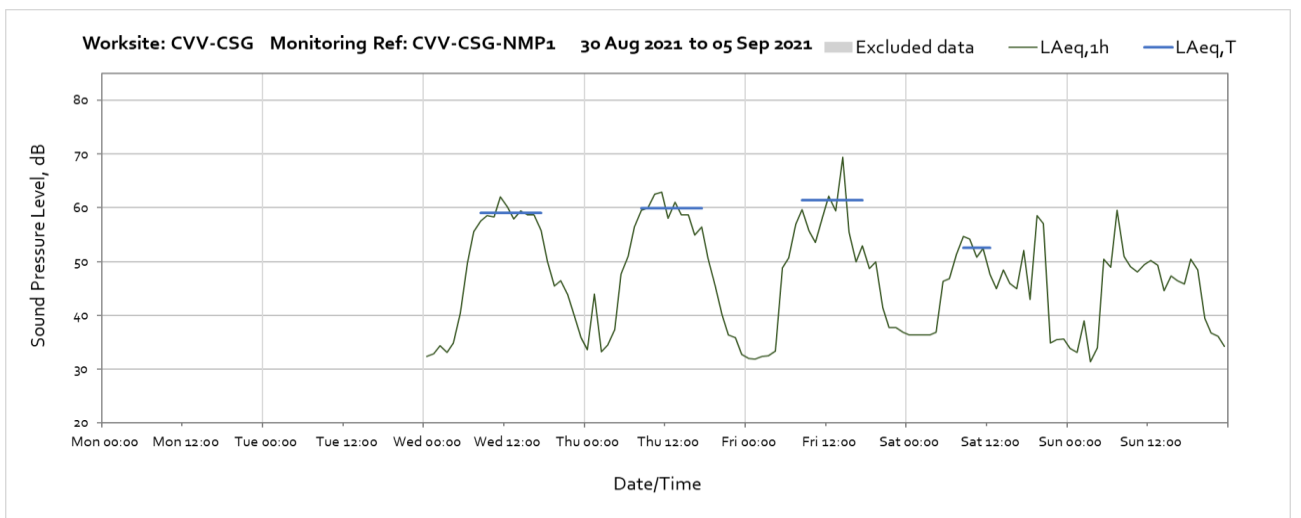


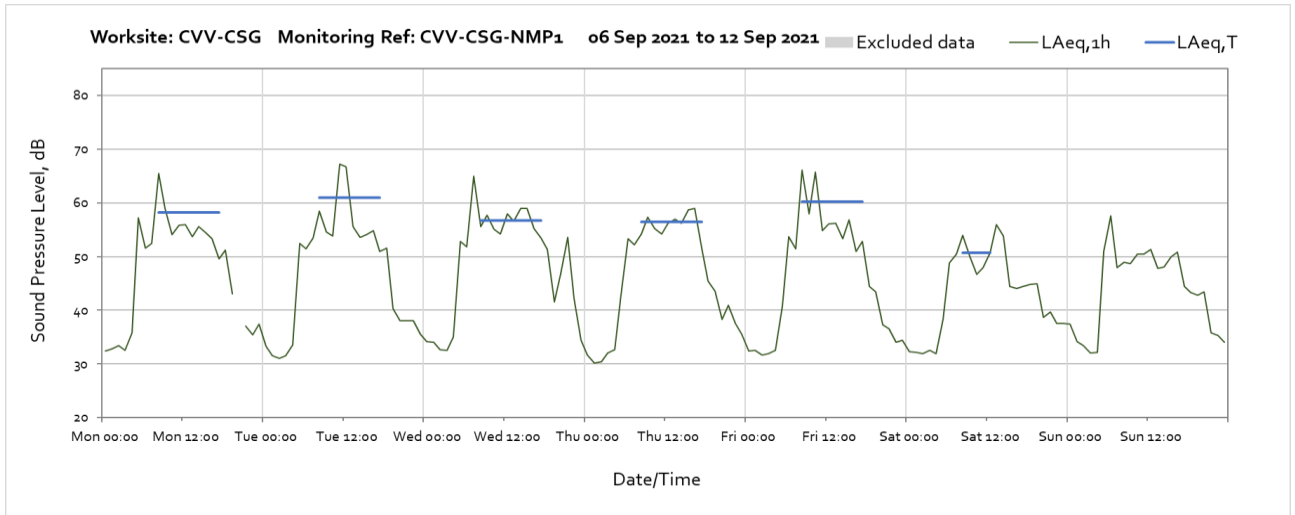
Worksite: BHFL - Monitoring Ref: BHFL-NMP1



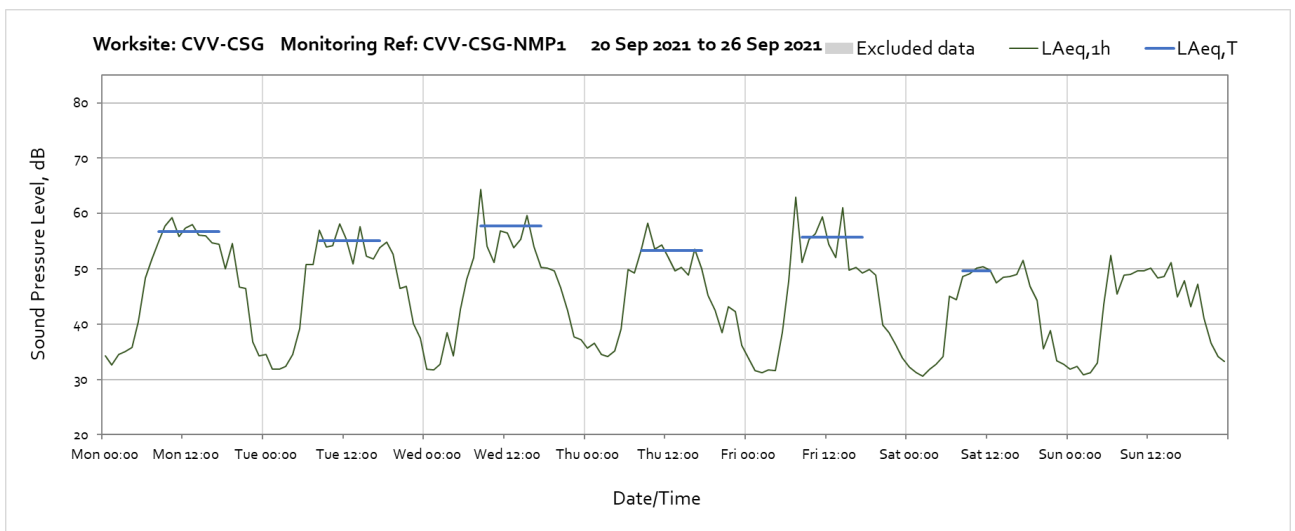
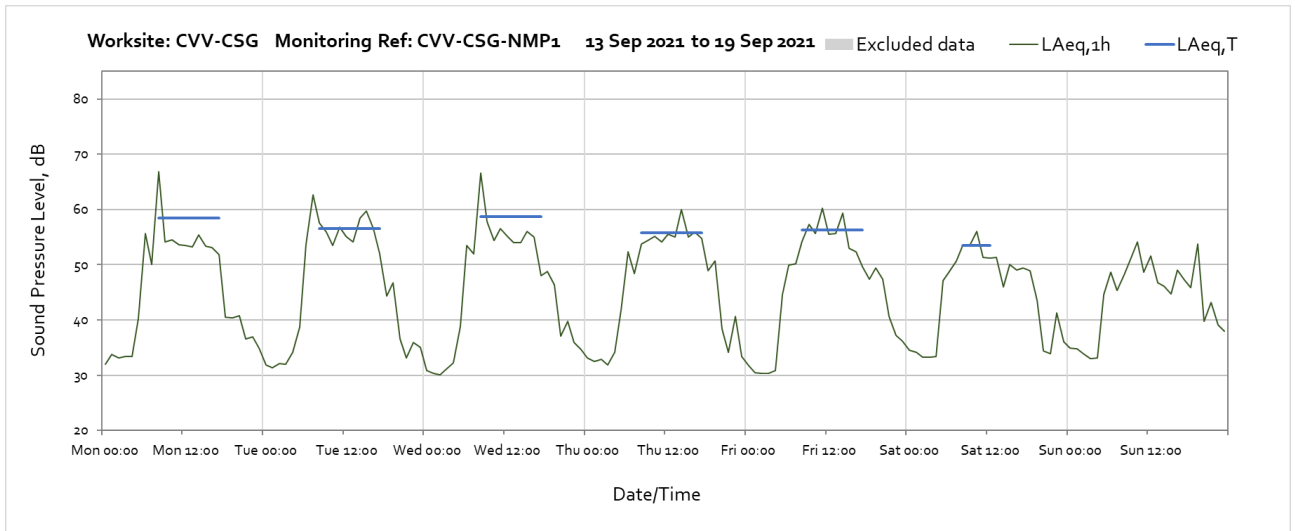


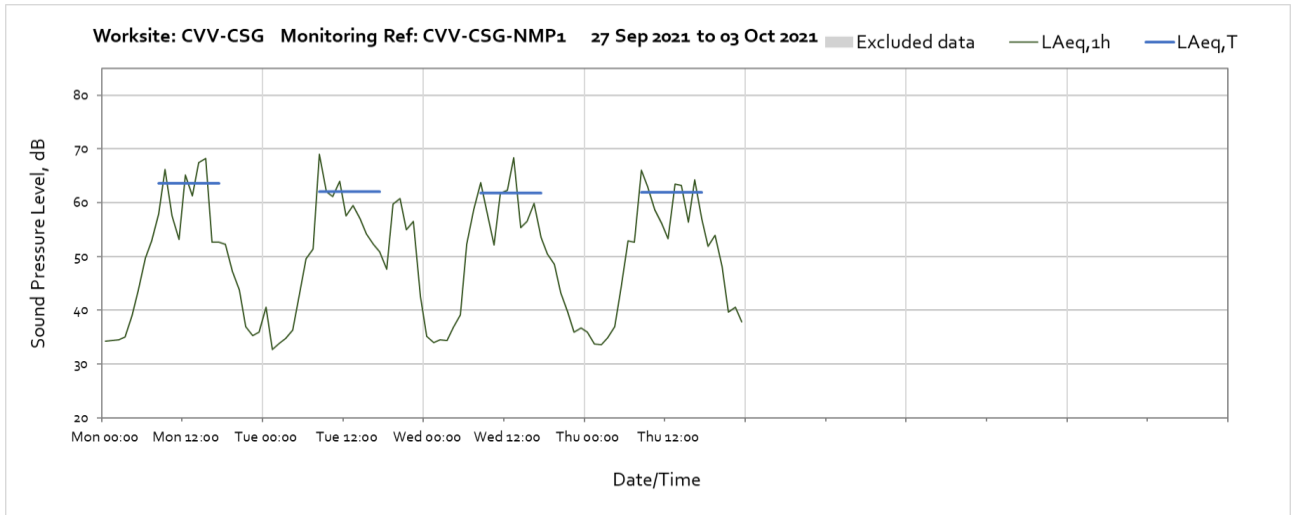
Worksite: CVV-CSG – Monitoring Ref: CVV-CSG-NMP1



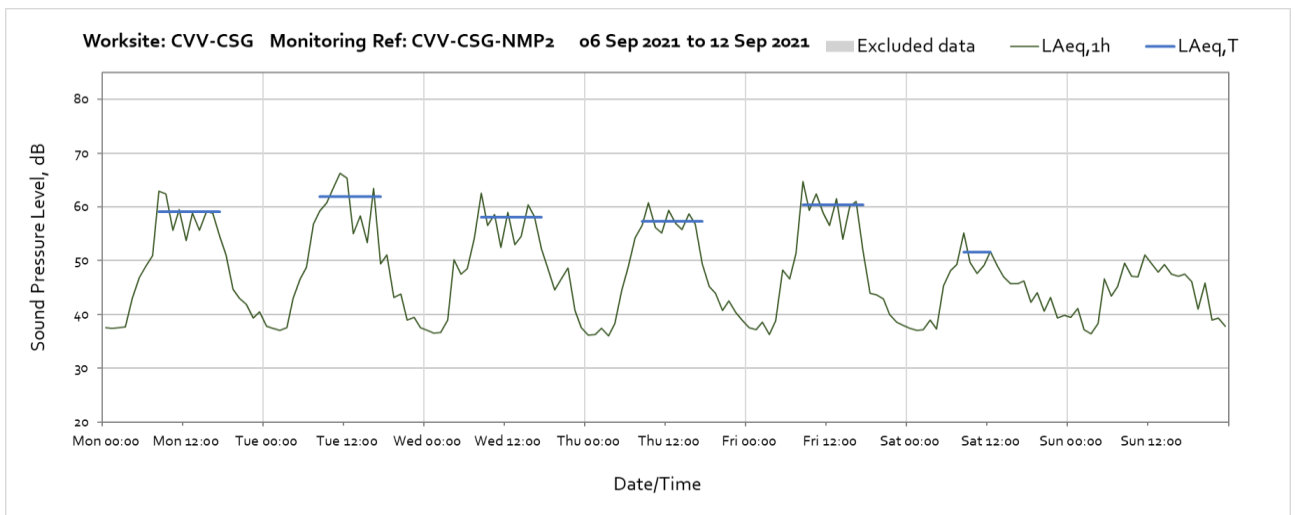
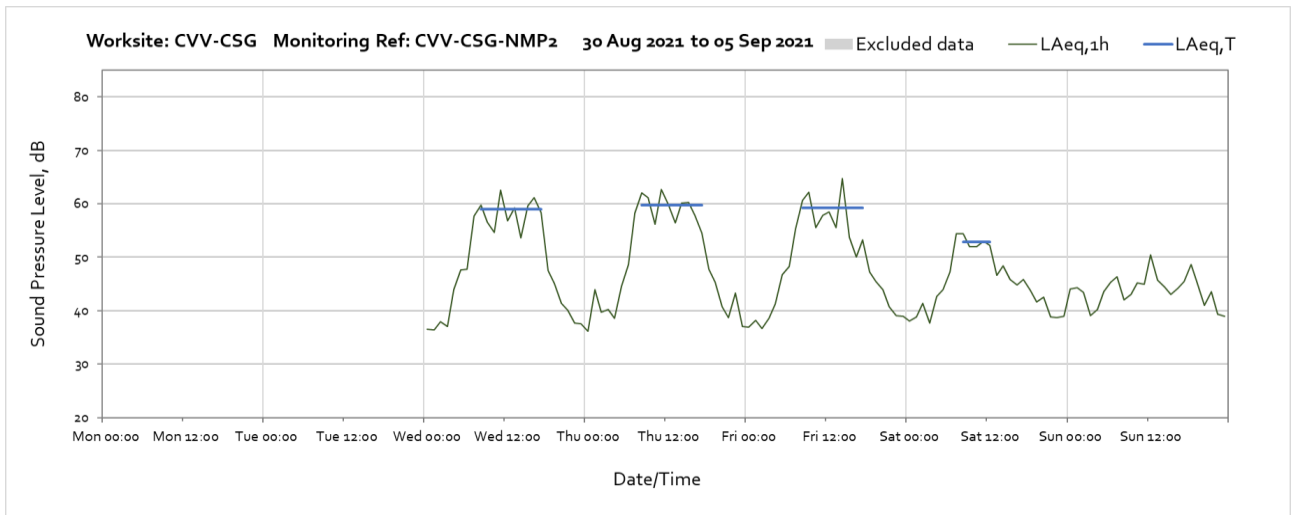


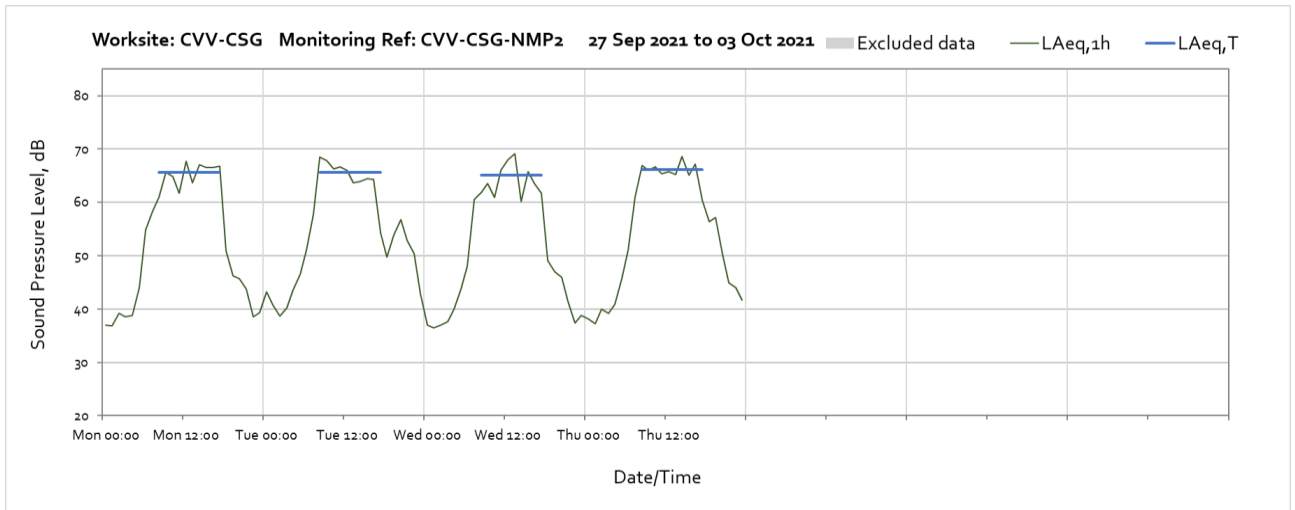
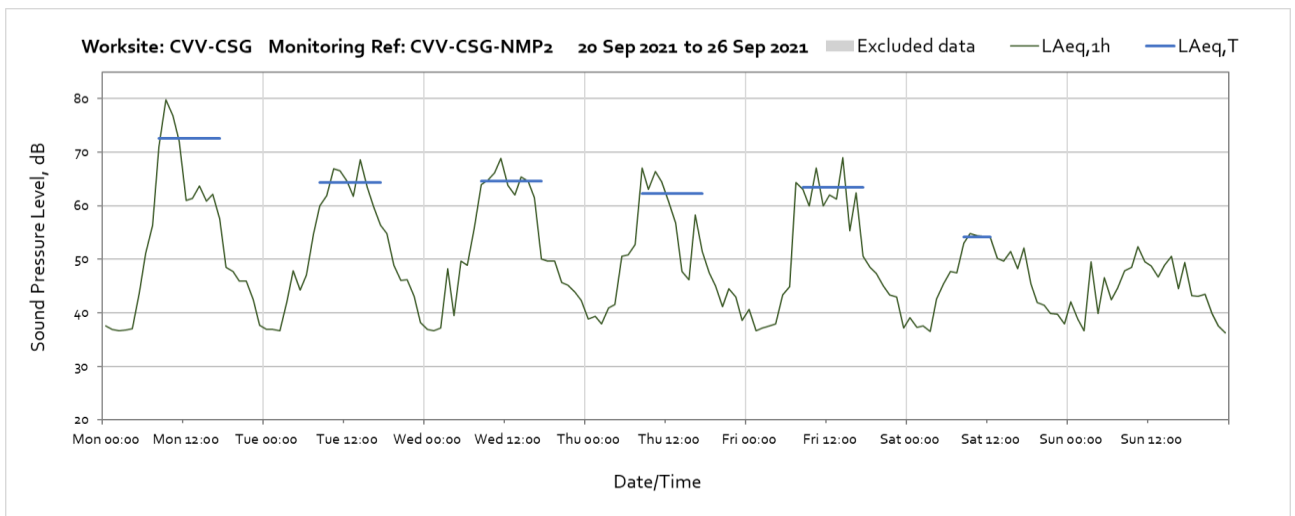
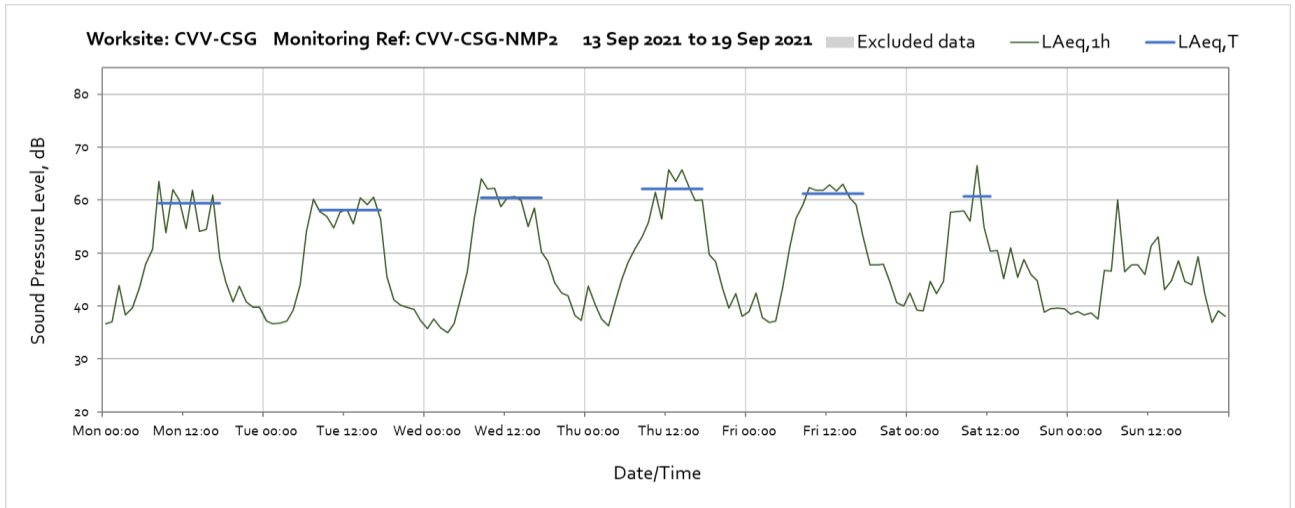
Note: Missing data between 20:00 on Monday 6th September was due to update of the monitor settings.



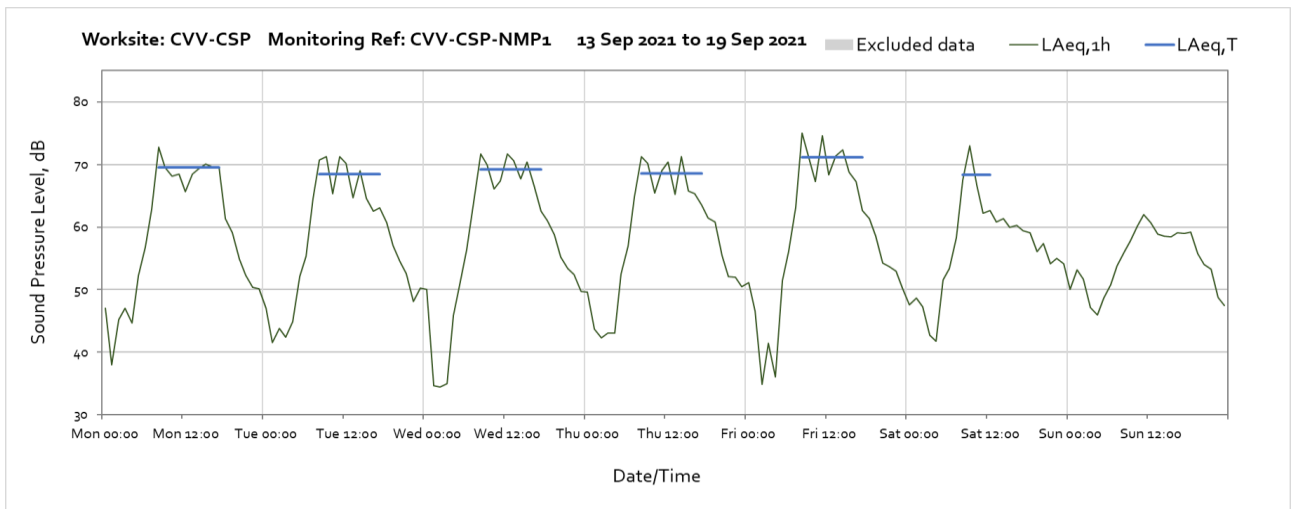
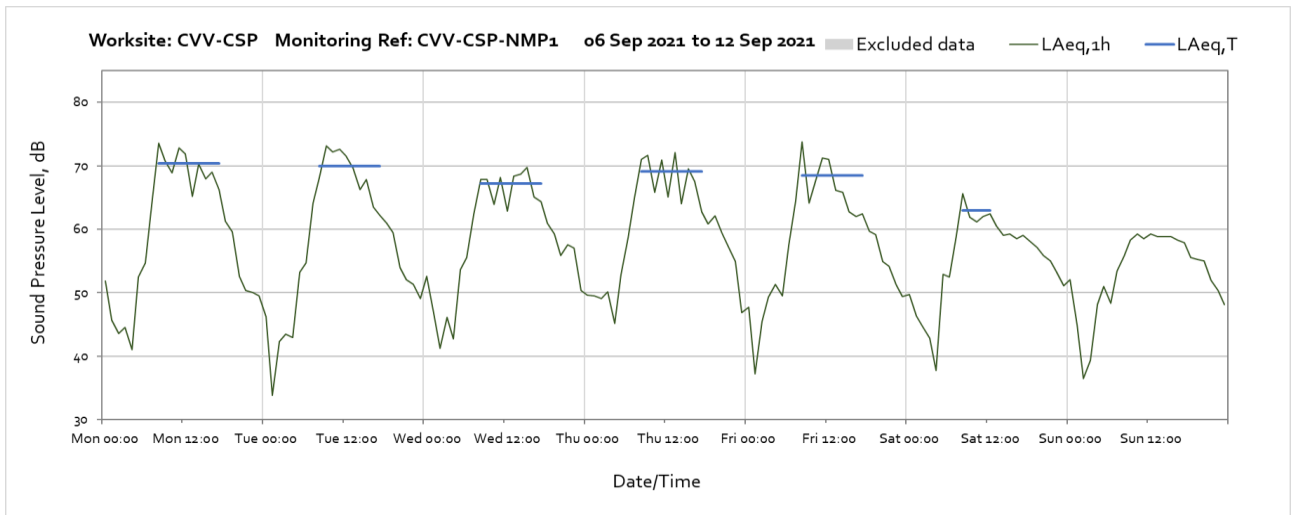
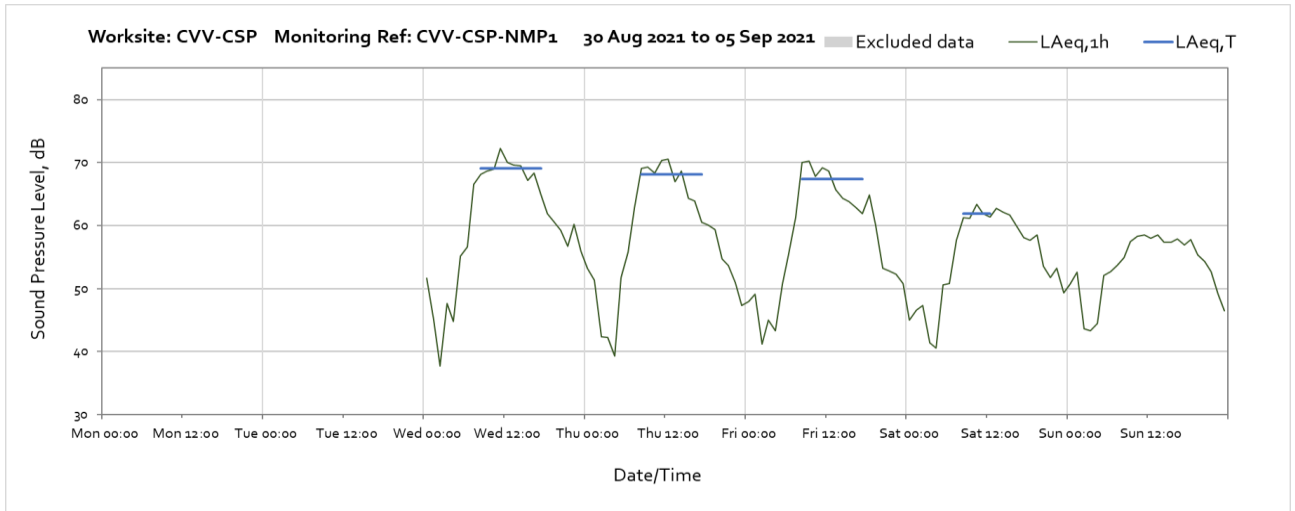


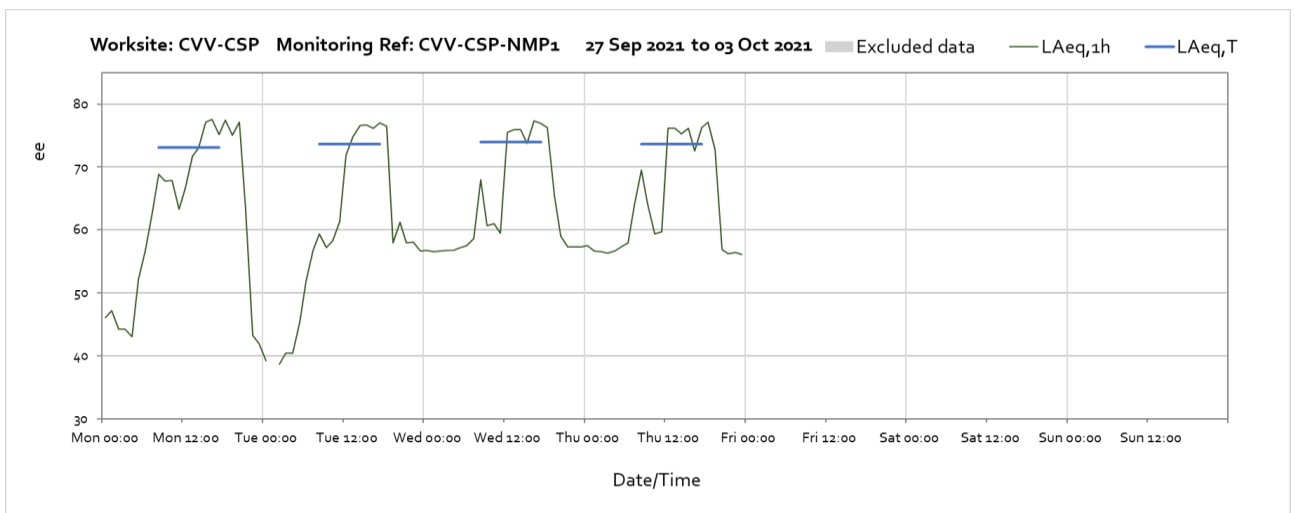
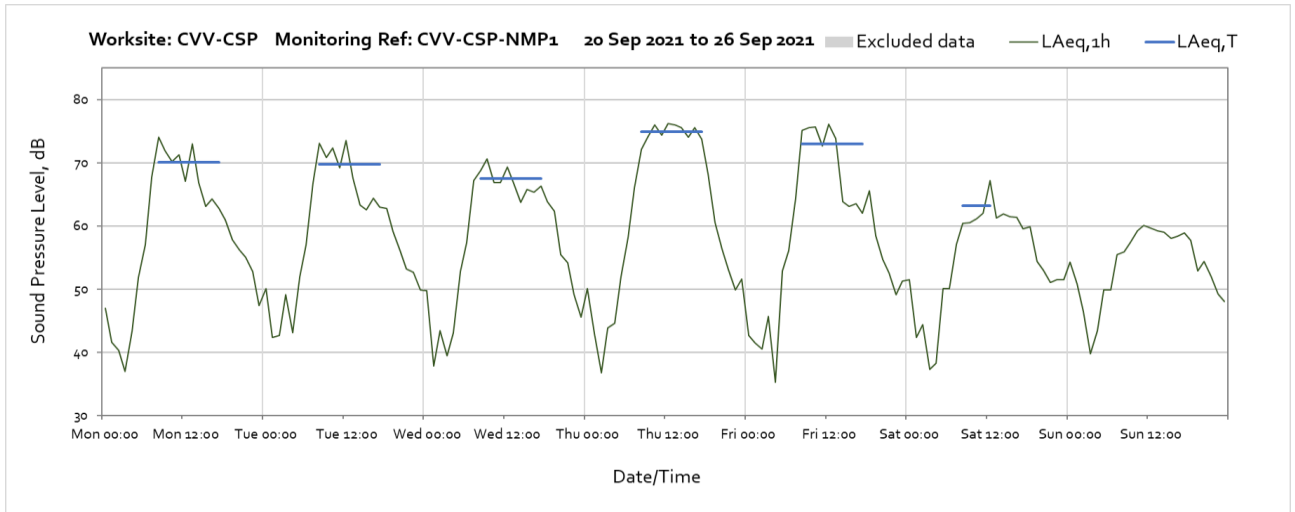
Worksite: CVV-CSG – Monitoring Ref: CVV-CSG-NMP2





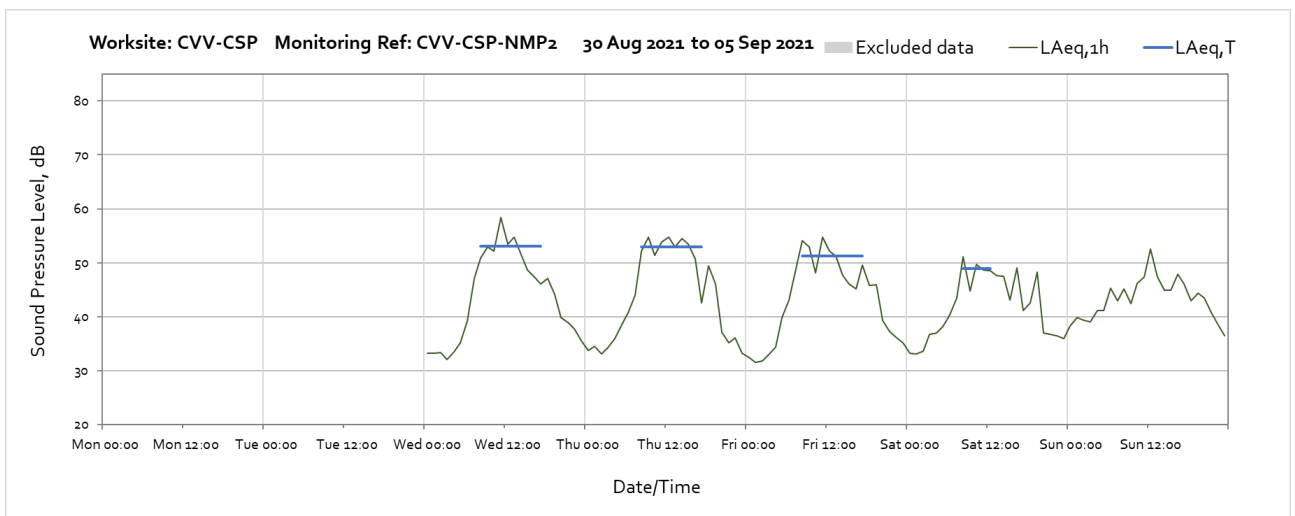
Worksite: CVV-CSP – Monitoring Ref: CVV-CSP-NMP1



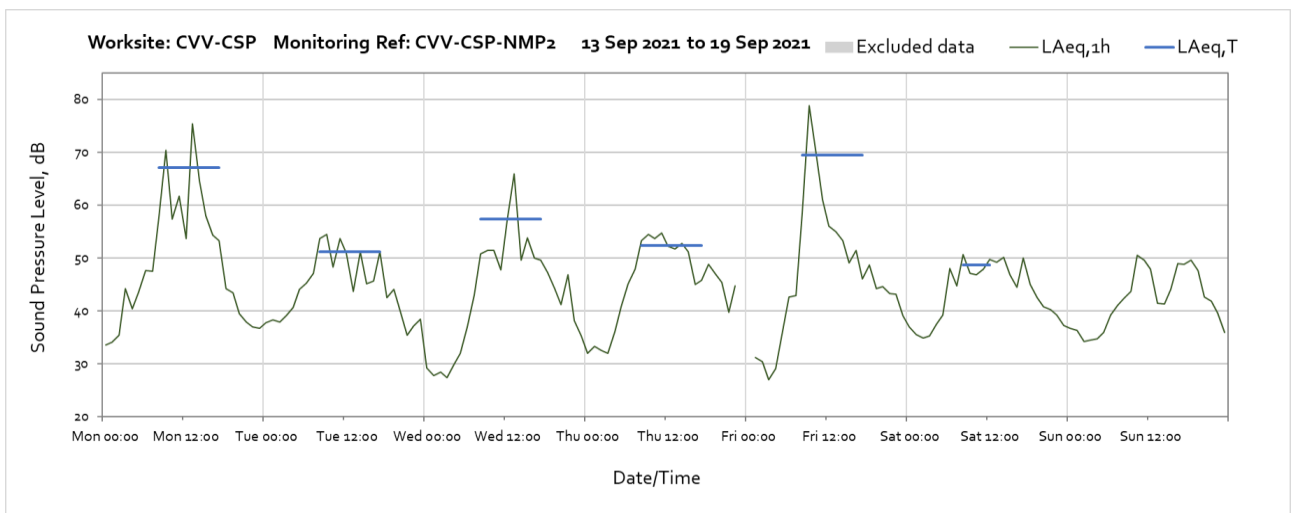
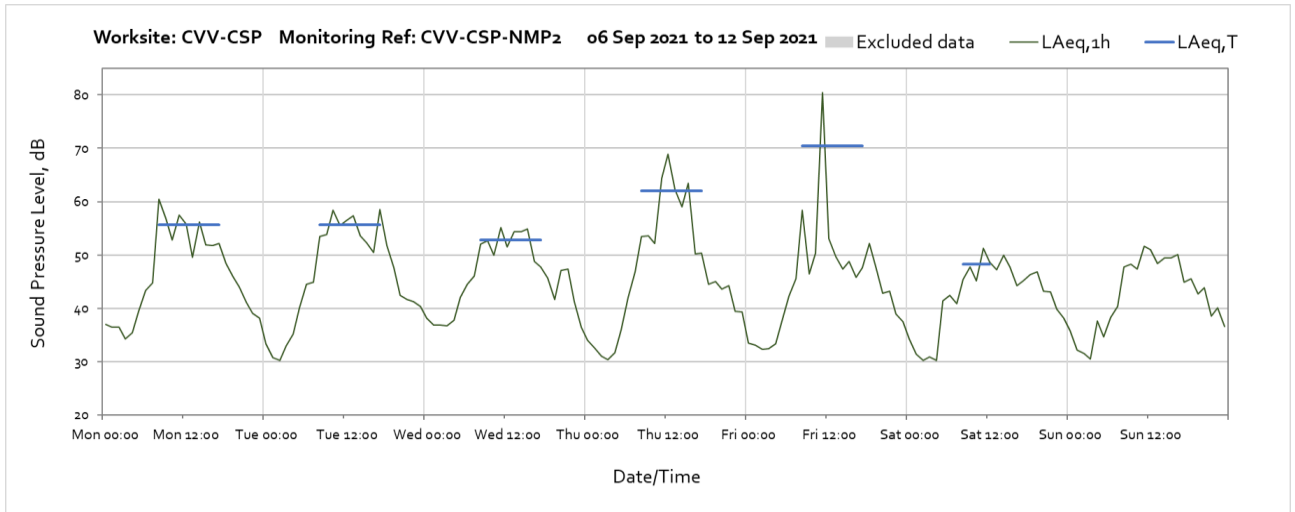


Note: Missing data between 01:00 on Tuesday 28th September was due to loss of monitor connection to the data server.

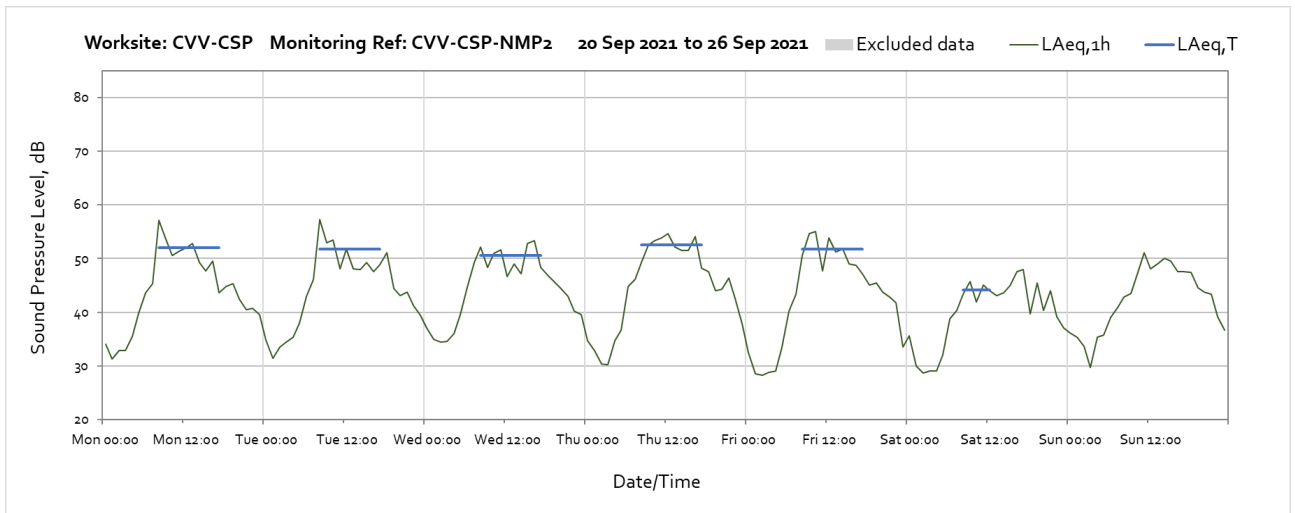
Worksite: CVV-CSP – Monitoring Ref: CVV-CSP-NMP2

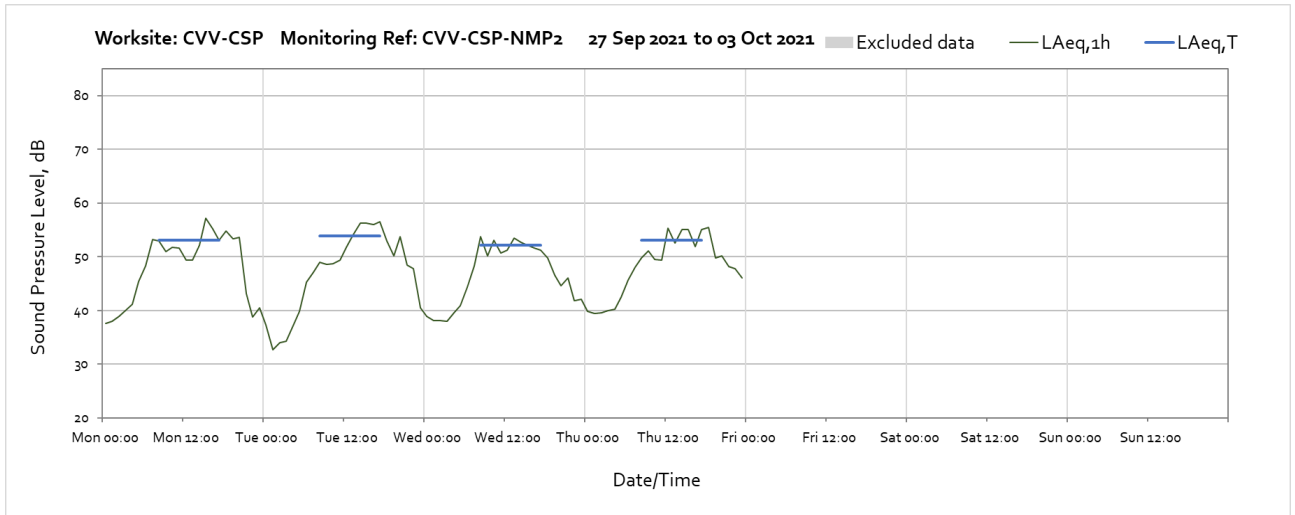


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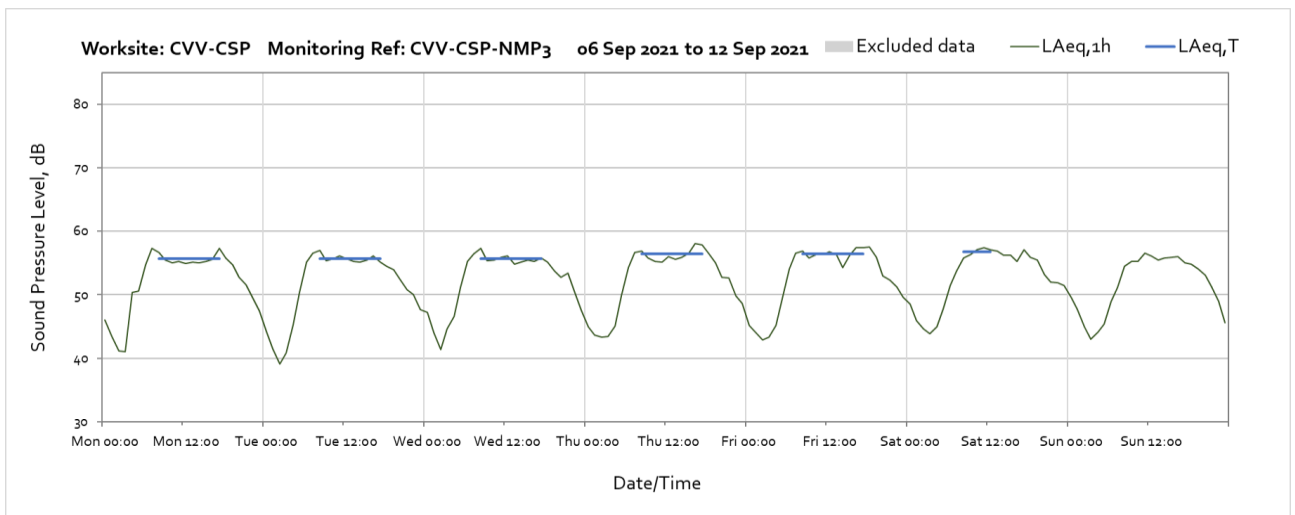
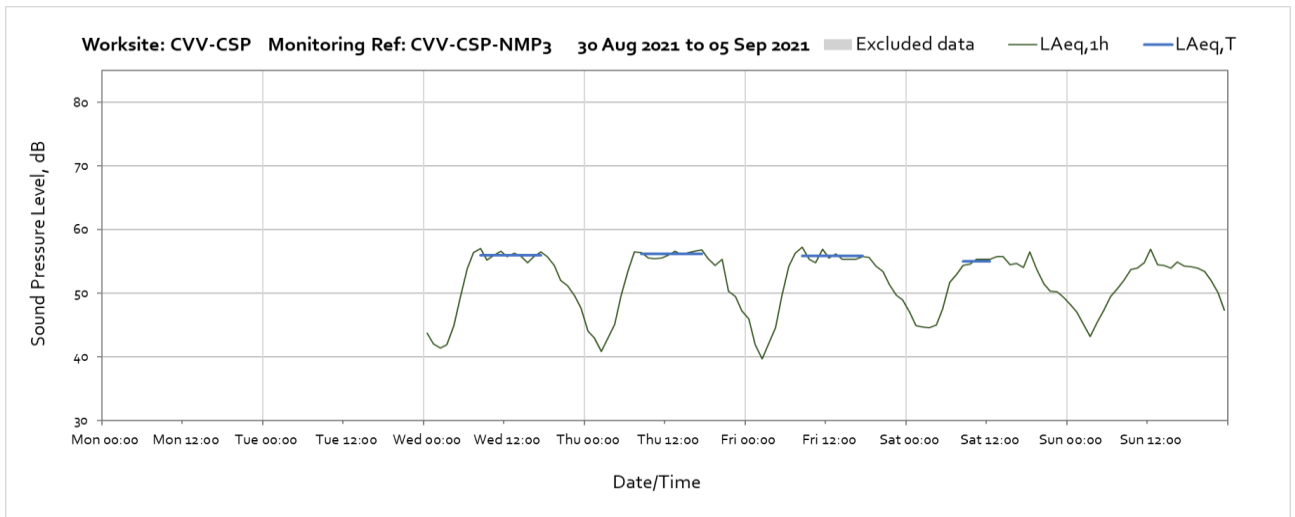


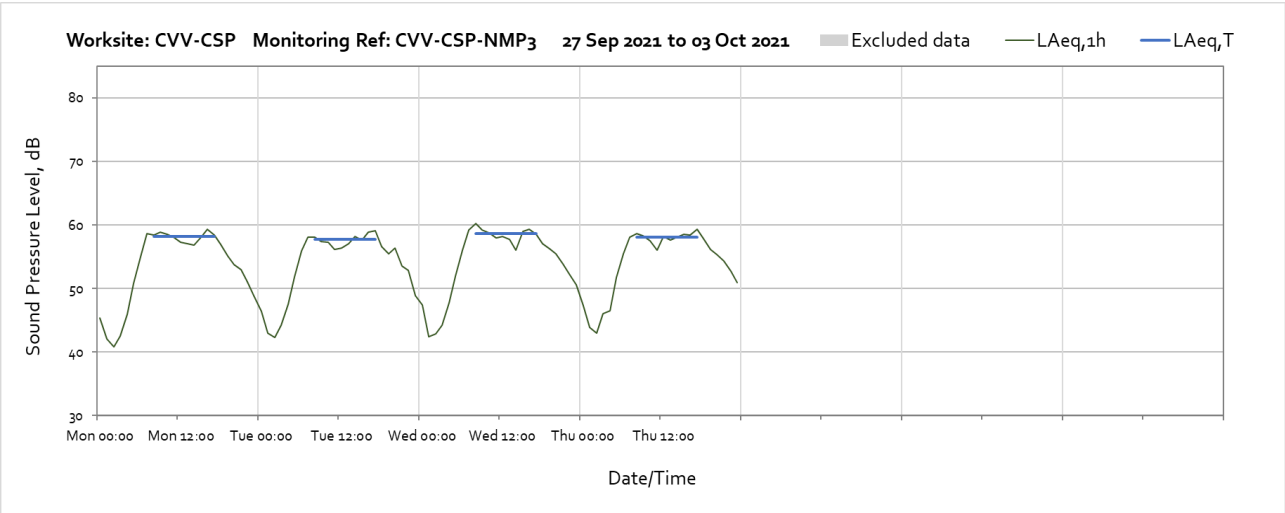
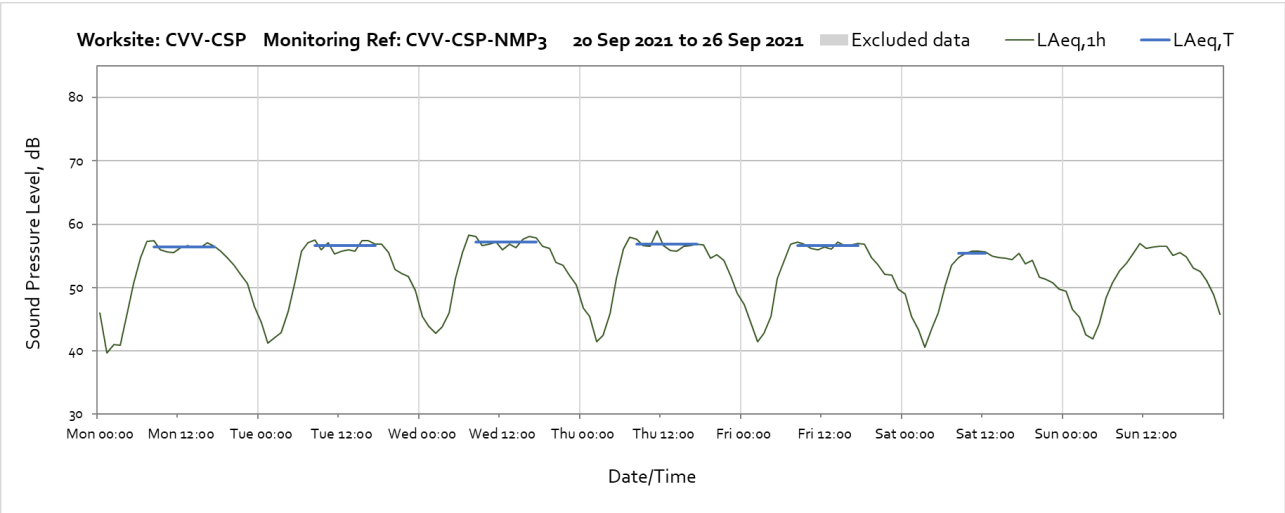
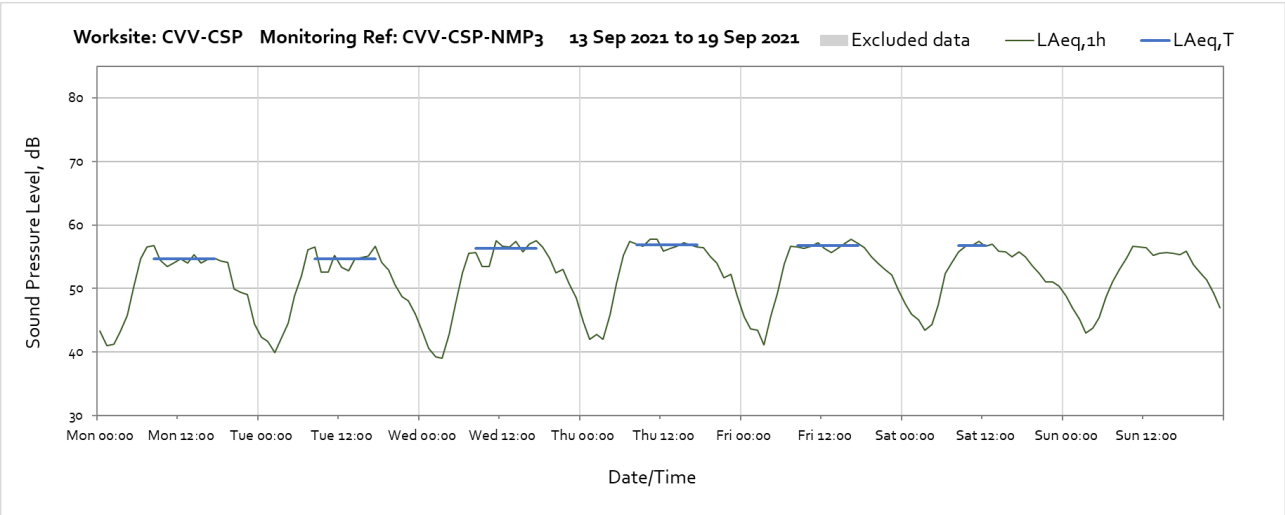
Note: Note: Missing data between 23:00 on Thursday 16th September and 00:00 on Friday 17th September was due to an update of the monitor settings.



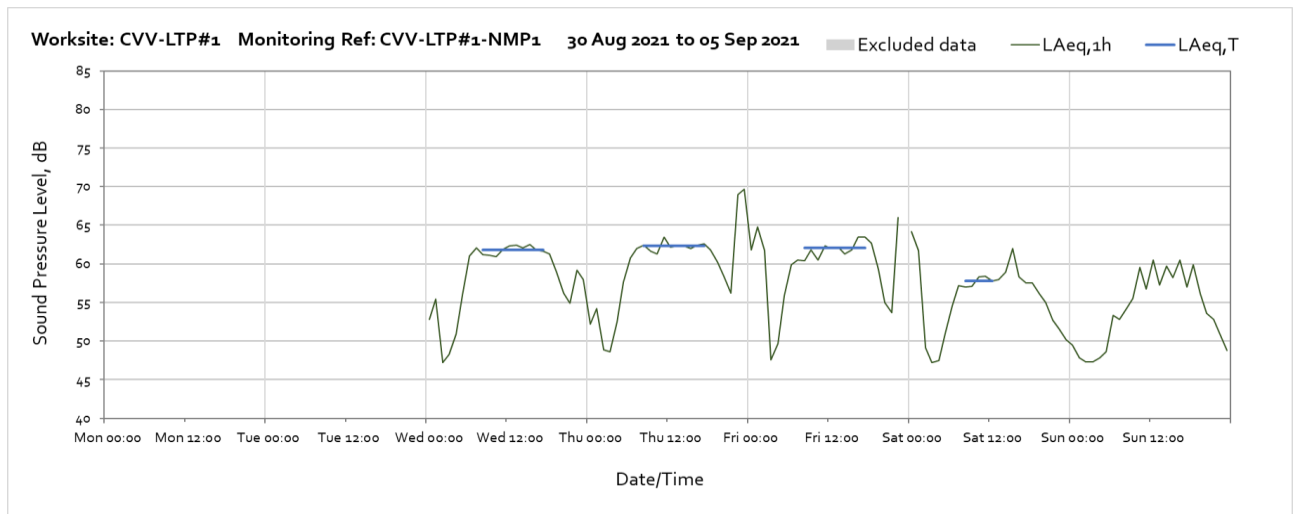


Worksite: CVV-CSP – Monitoring Ref: CVV-CSP-NMP3

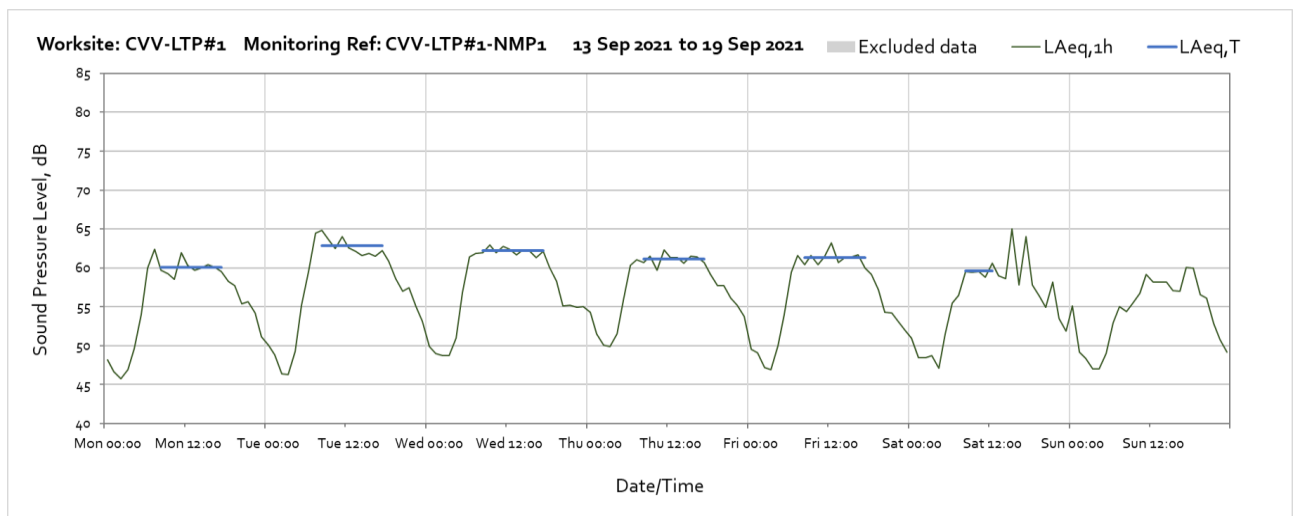
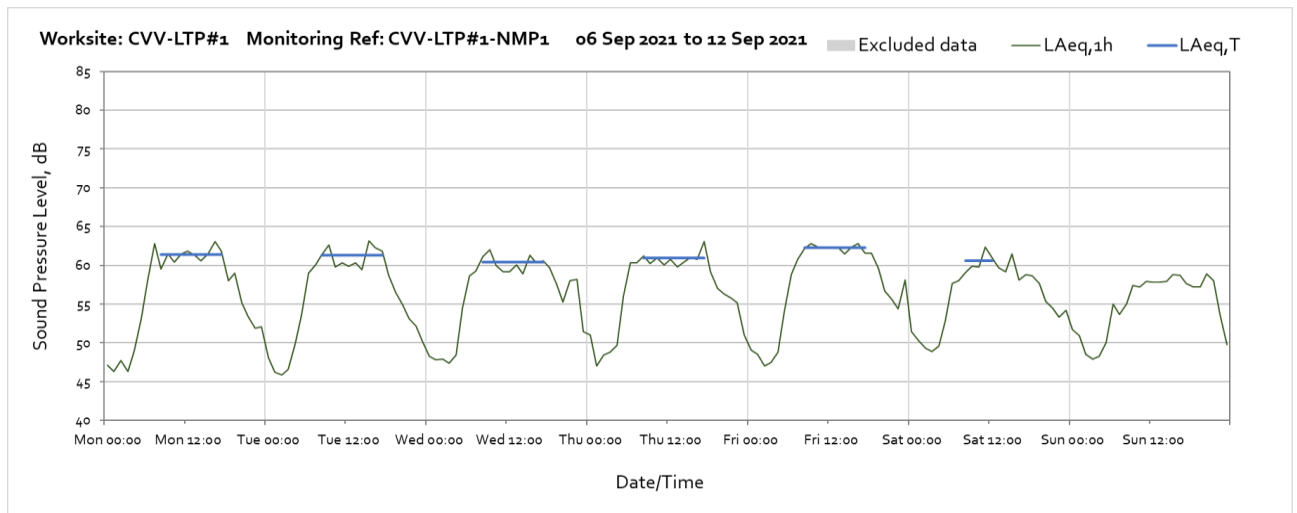




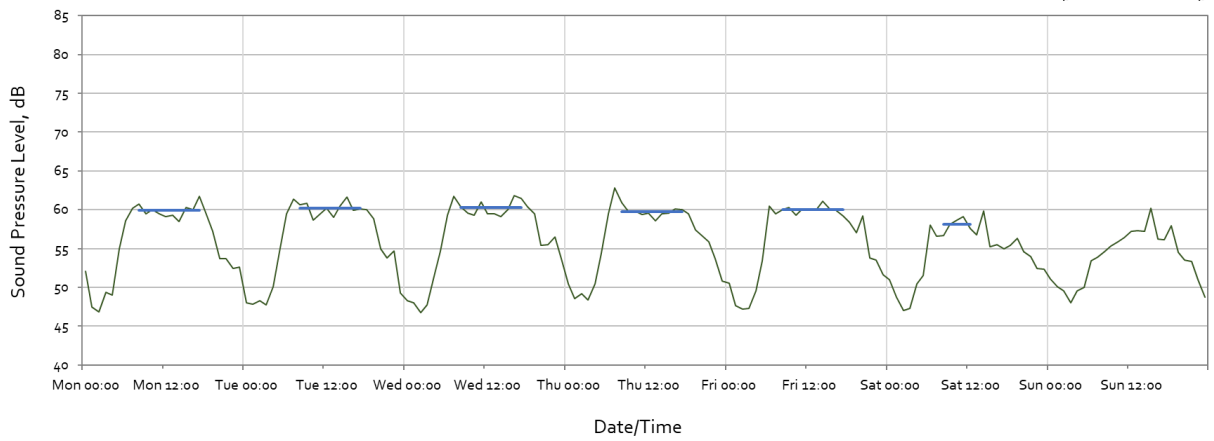
Worksite: CVV-LTP#1 – Monitoring Ref: CVV-LTP#1-NMP1



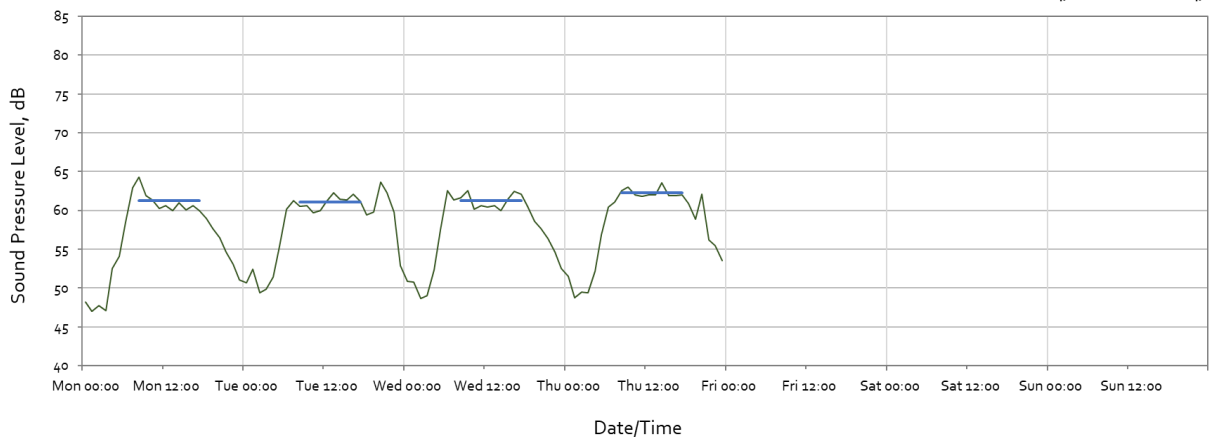
Note: Missing data between 03:00 on Friday 3rd September was due to loss of monitor connection to the data server.



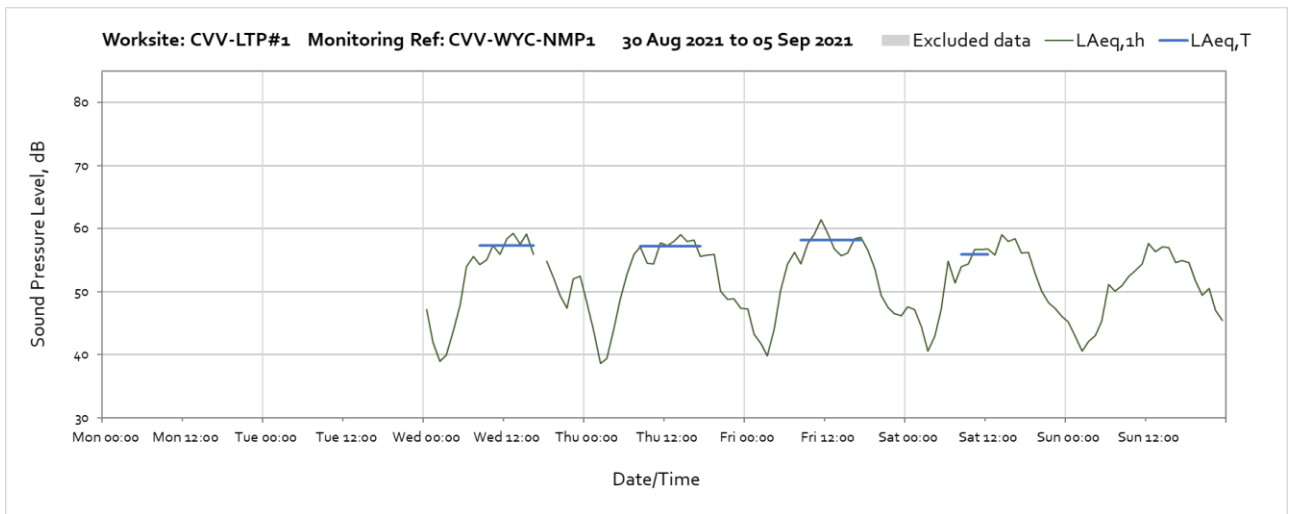
Worksite: CVV-LTP#1 Monitoring Ref: CVV-LTP#1-NMP1 20 Sep 2021 to 26 Sep 2021 Excluded data LAeq,1h LAeq,T



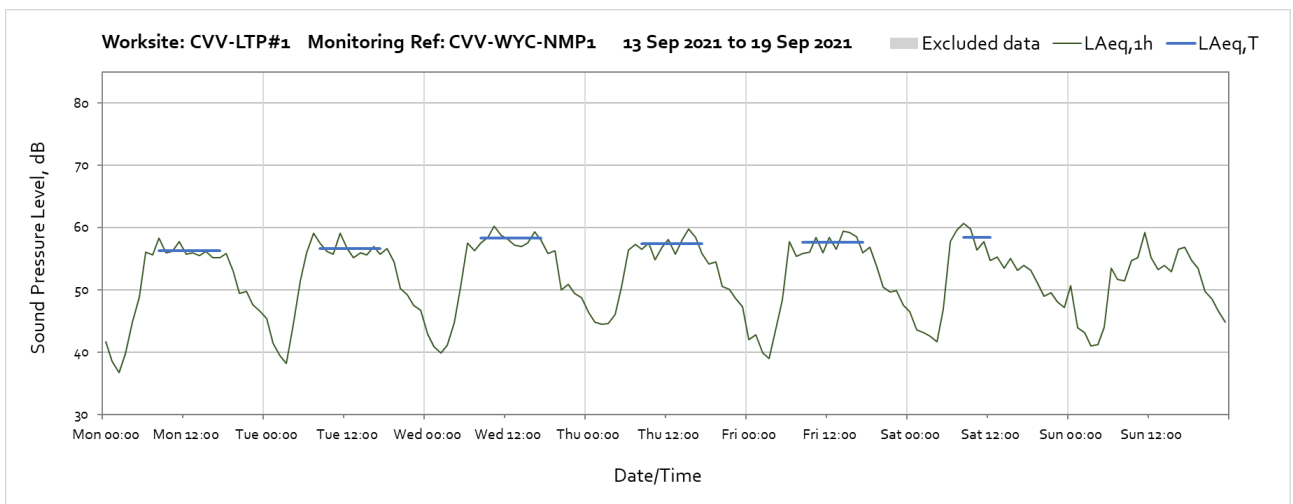
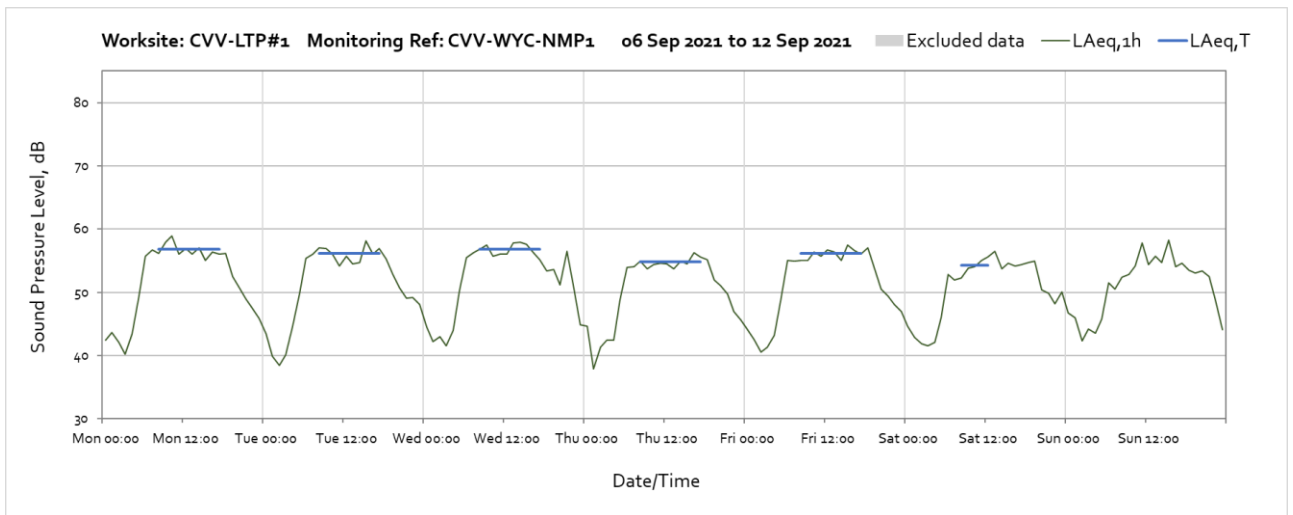
Worksite: CVV-LTP#1 Monitoring Ref: CVV-LTP#1-NMP1 27 Sep 2021 to 03 Oct 2021 Excluded data LAeq,1h LAeq,T

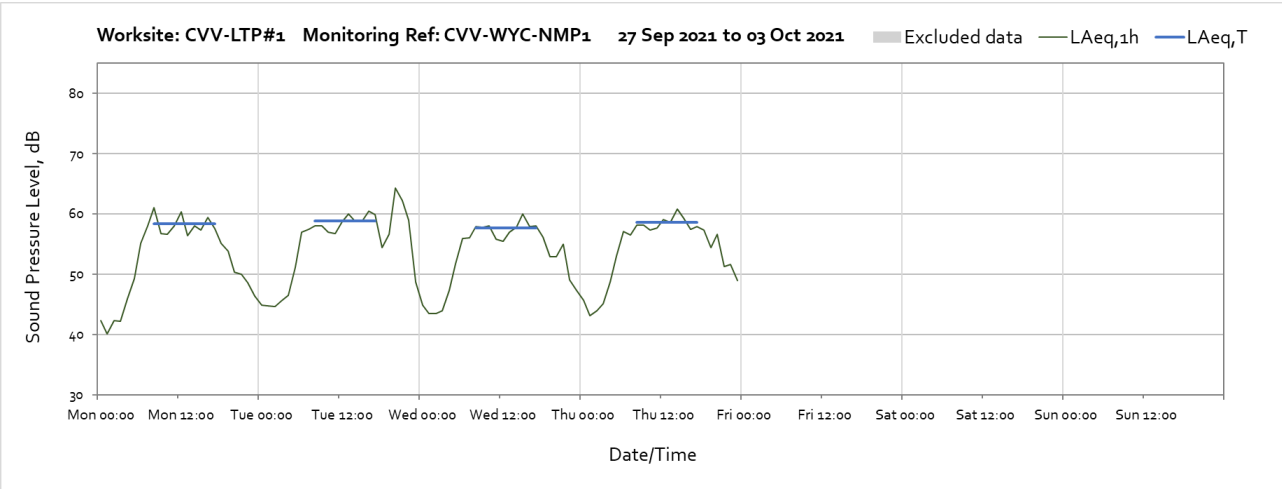
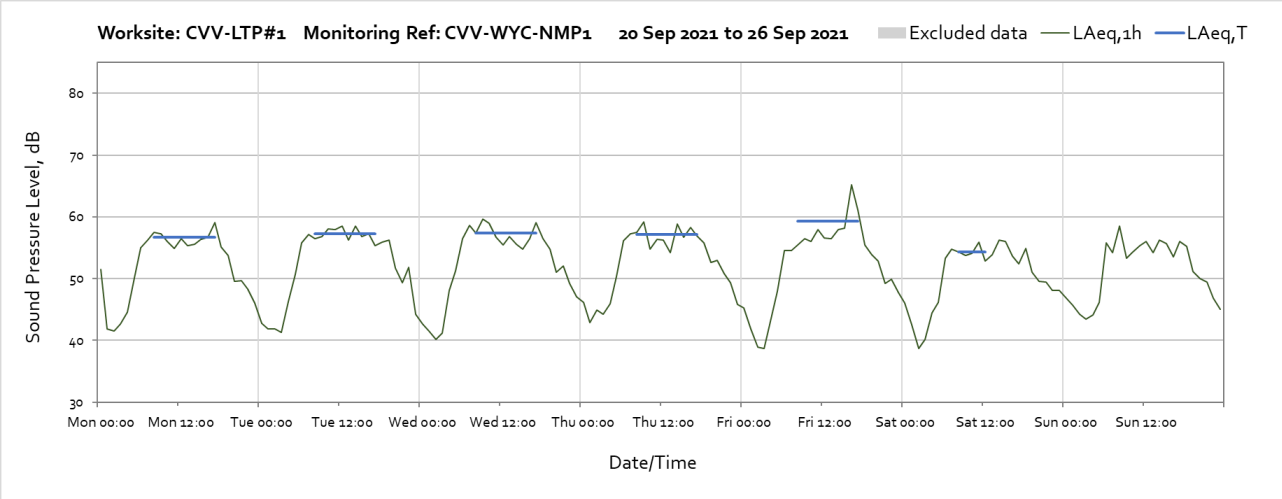


Worksite: CVV-LTP#1 – Monitoring Ref: CVV-WYC-NMP1

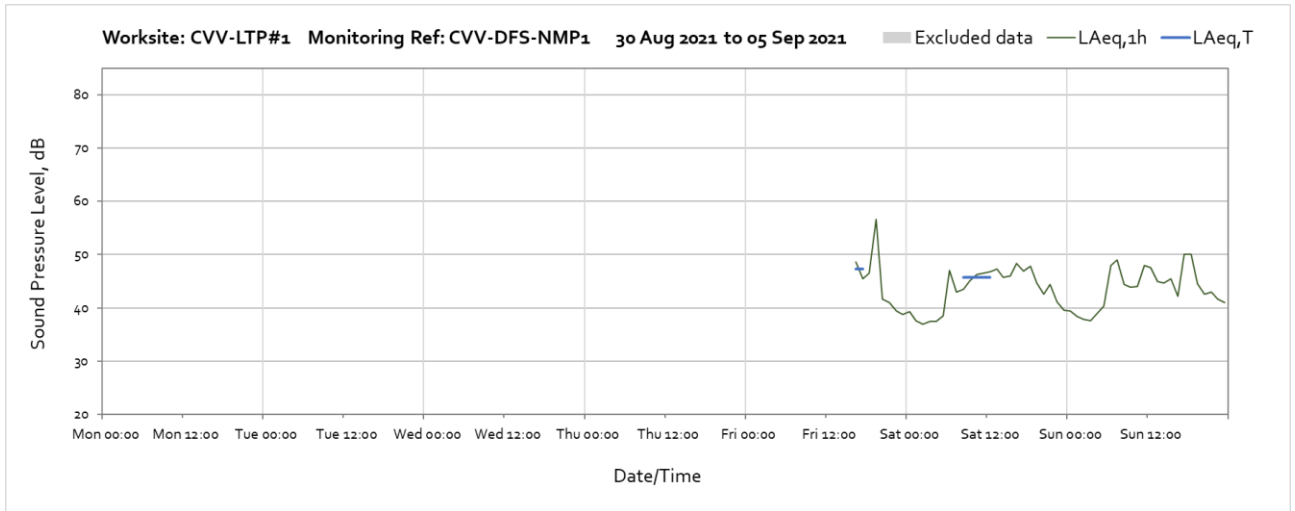


Note: Missing data between 17:00 on Wednesday 1st September was due to an update of monitor settings.

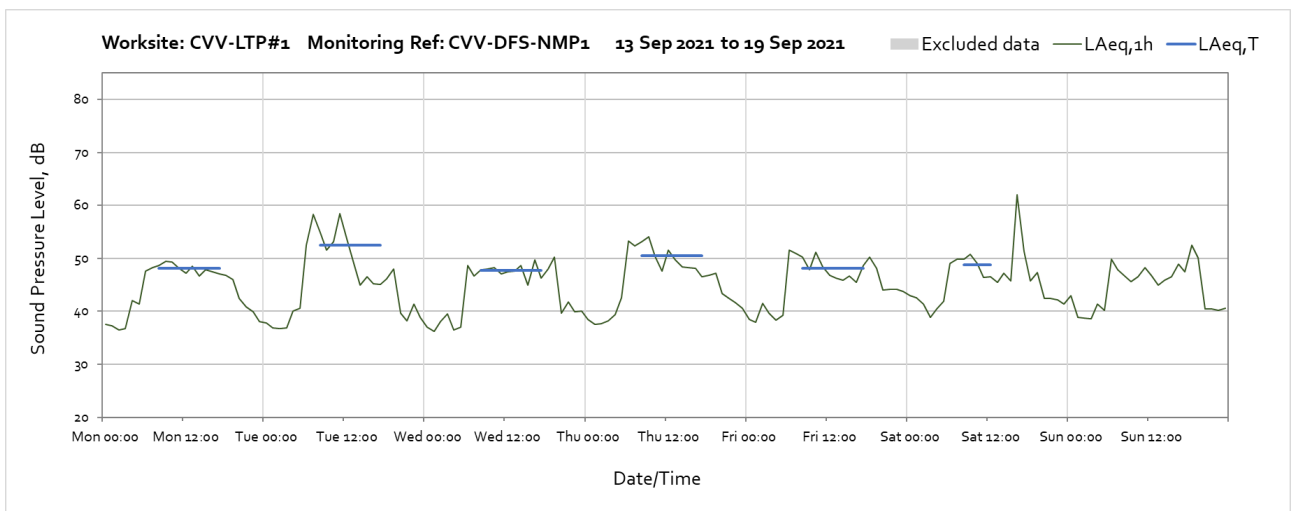
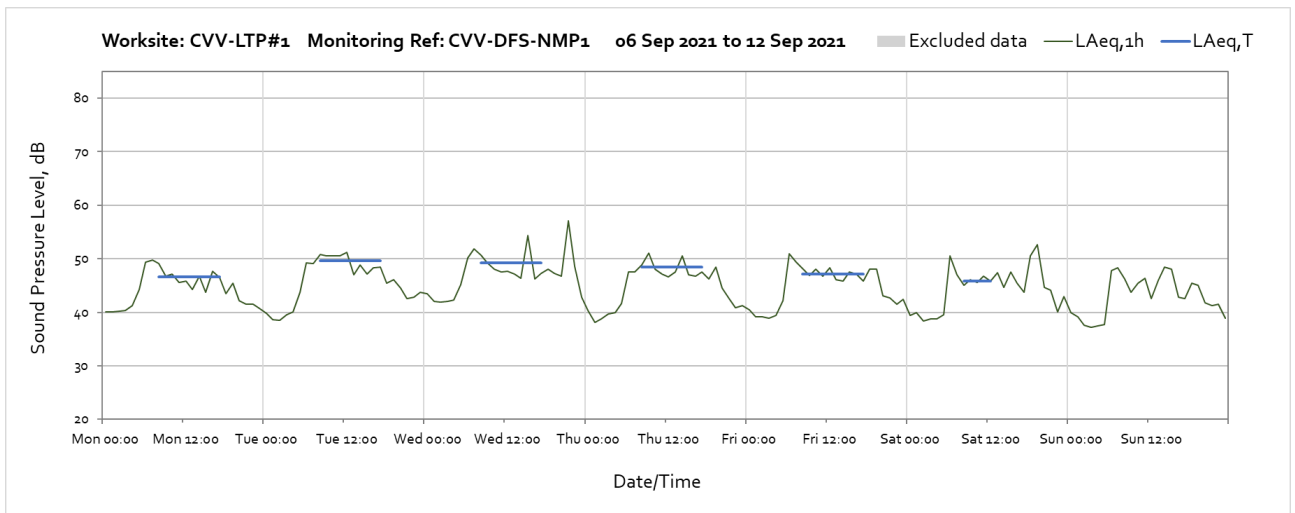


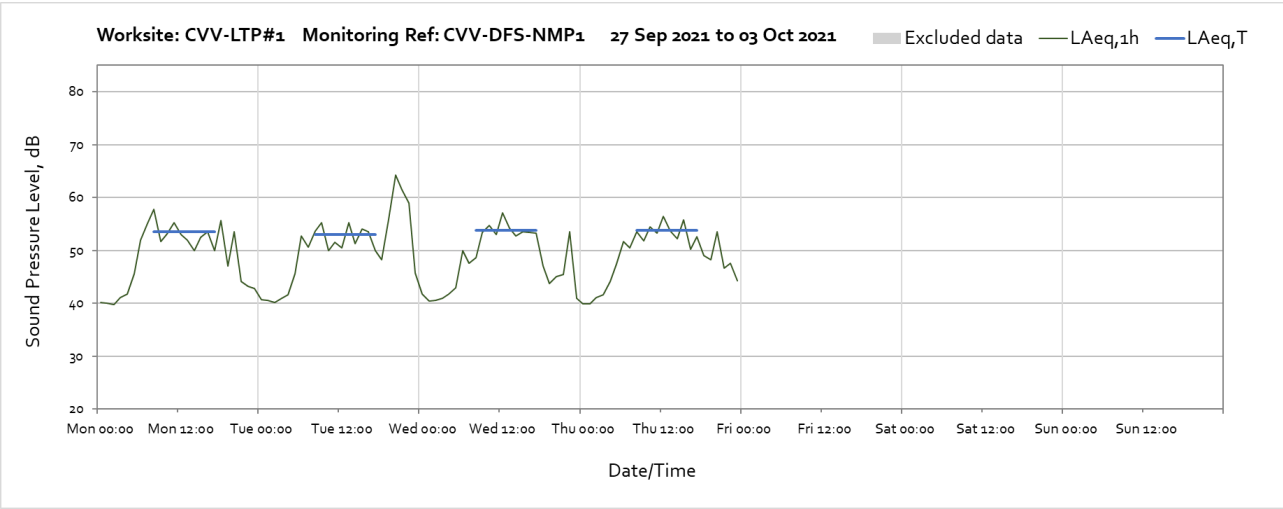
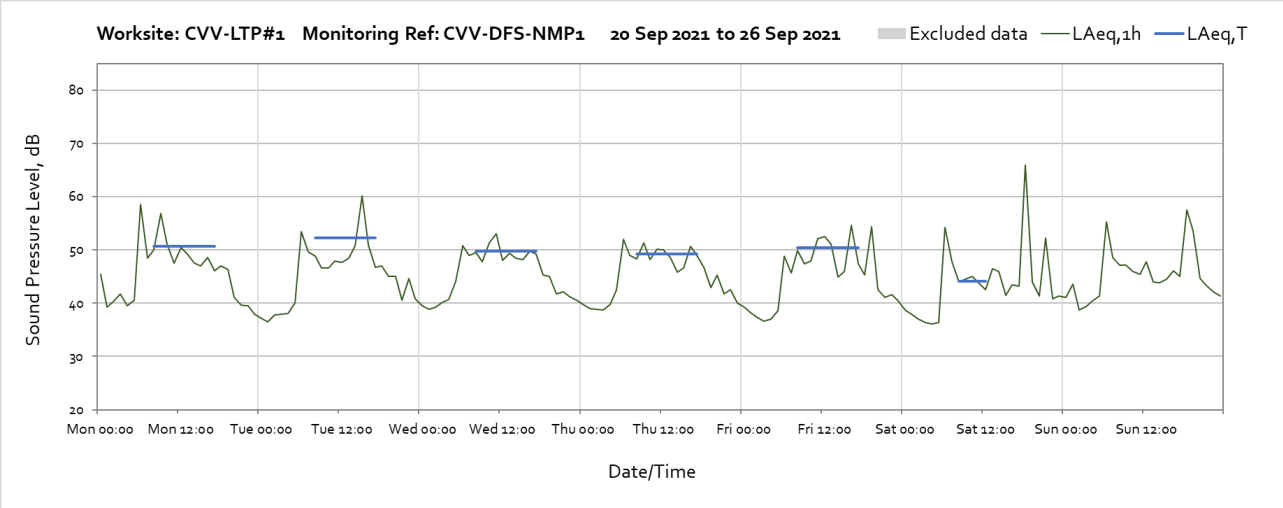


Worksite: CVV-LTP#1 – Monitoring Ref: CVV-DFS-NMP1

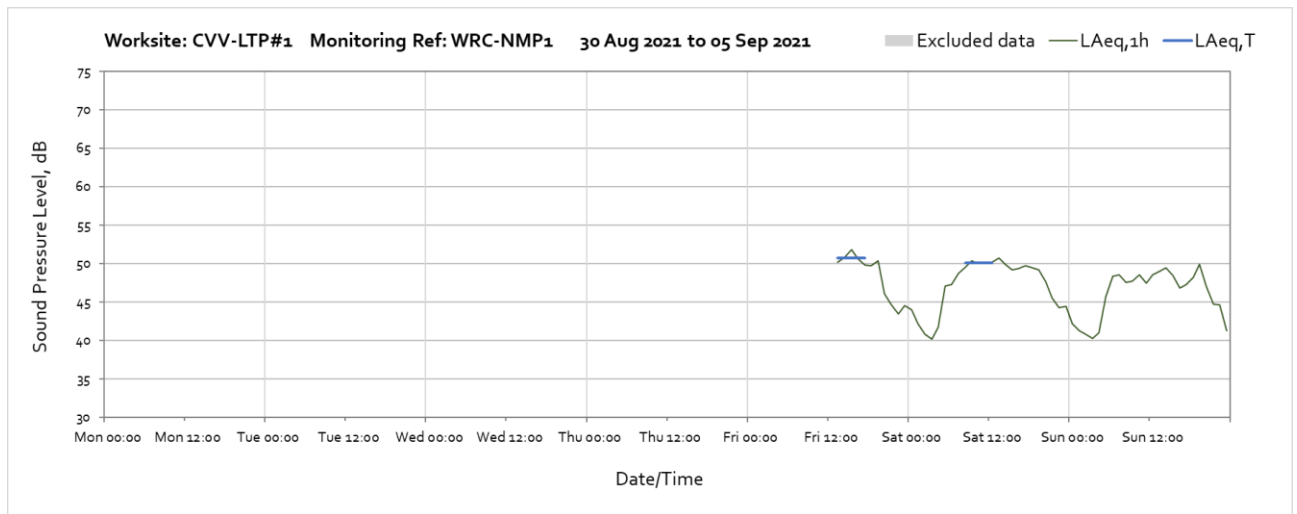


Note: Missing data between 00:00 on Wednesday 1st September and 15:00 on Friday 3rd September was due to a loss of battery power to the monitor.

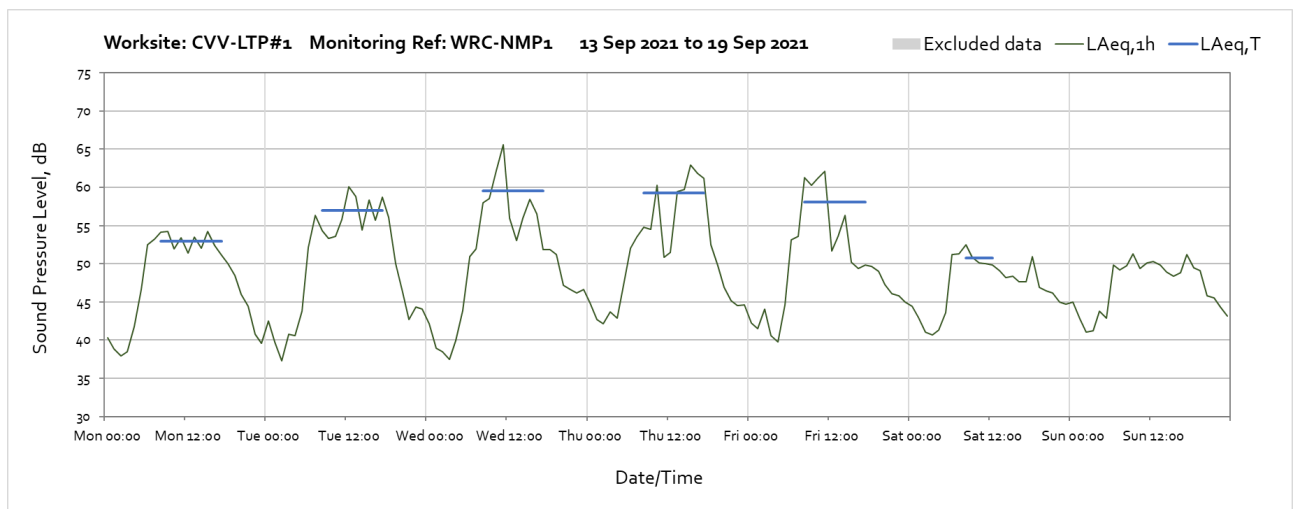
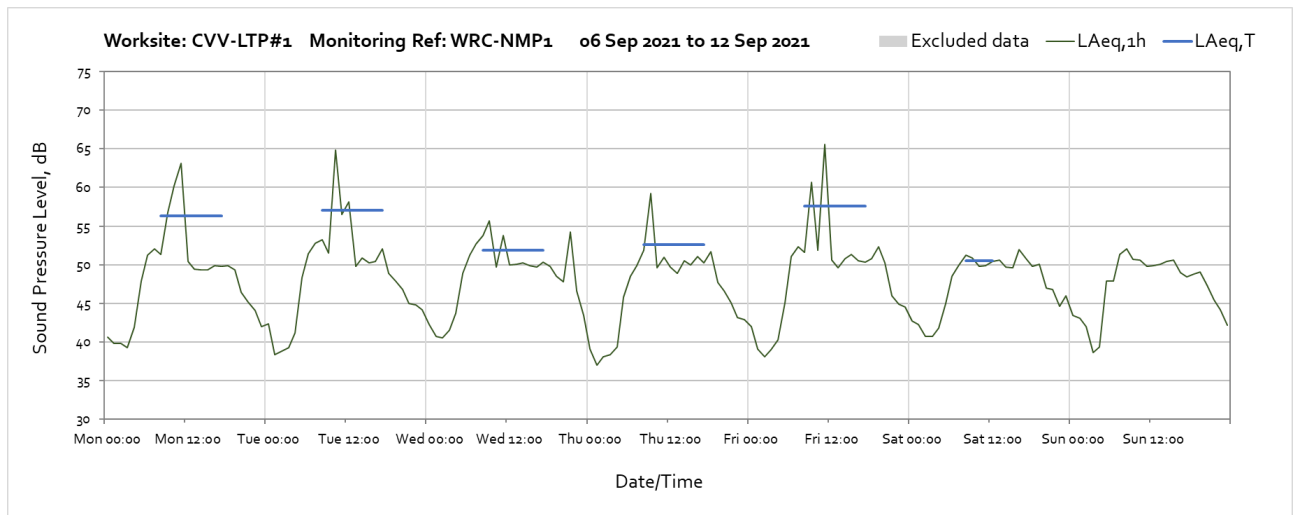




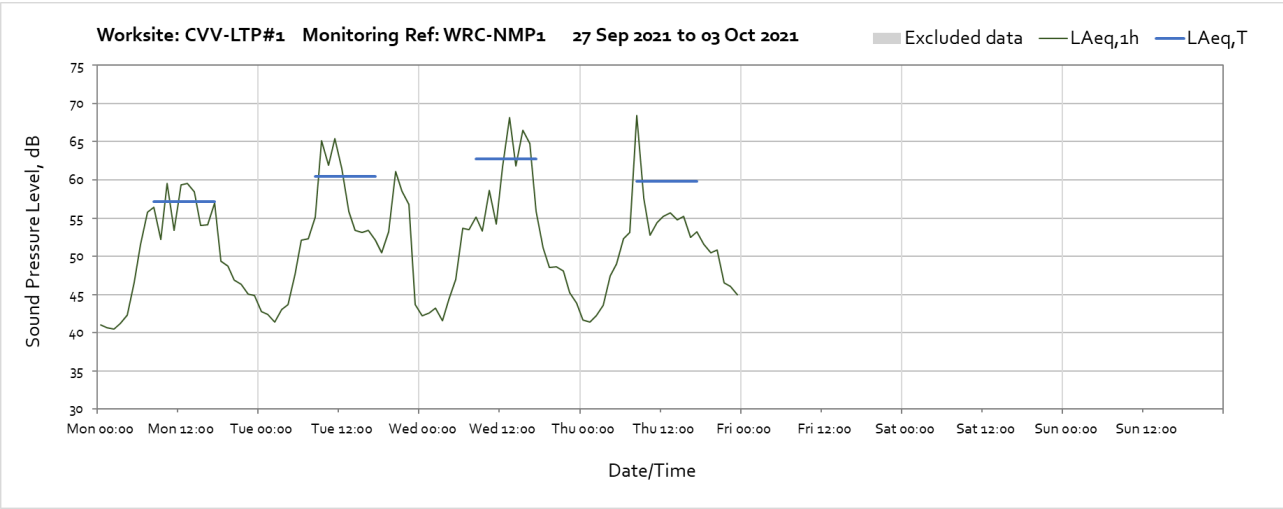
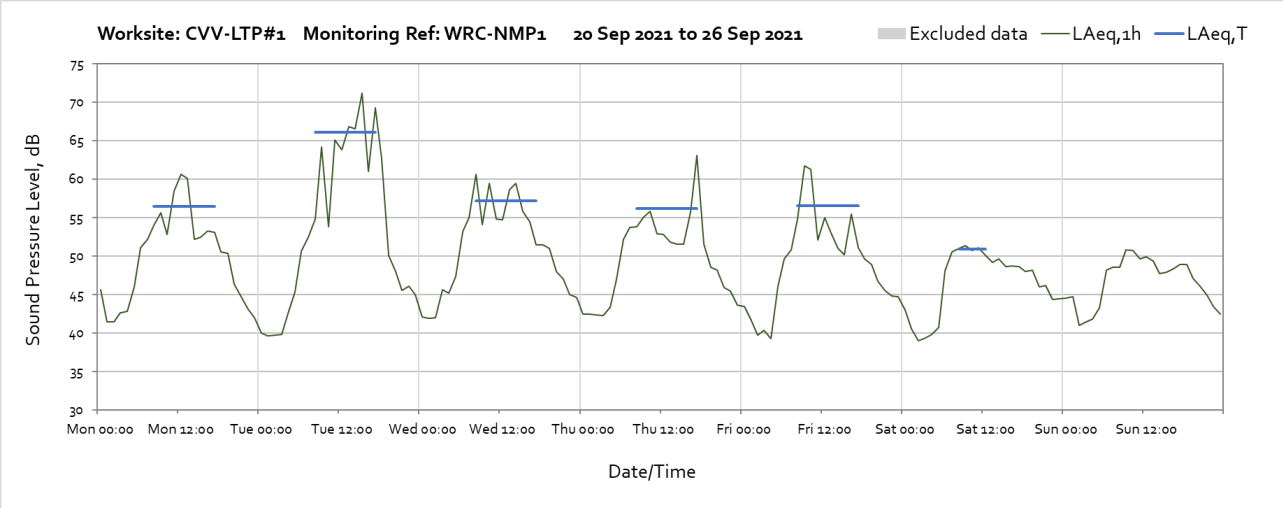
Worksite: CVV-LTP#1 – Monitoring Ref: CVV-WRC-NMP1



Note: The monitor was installed on 3rd September 2021.



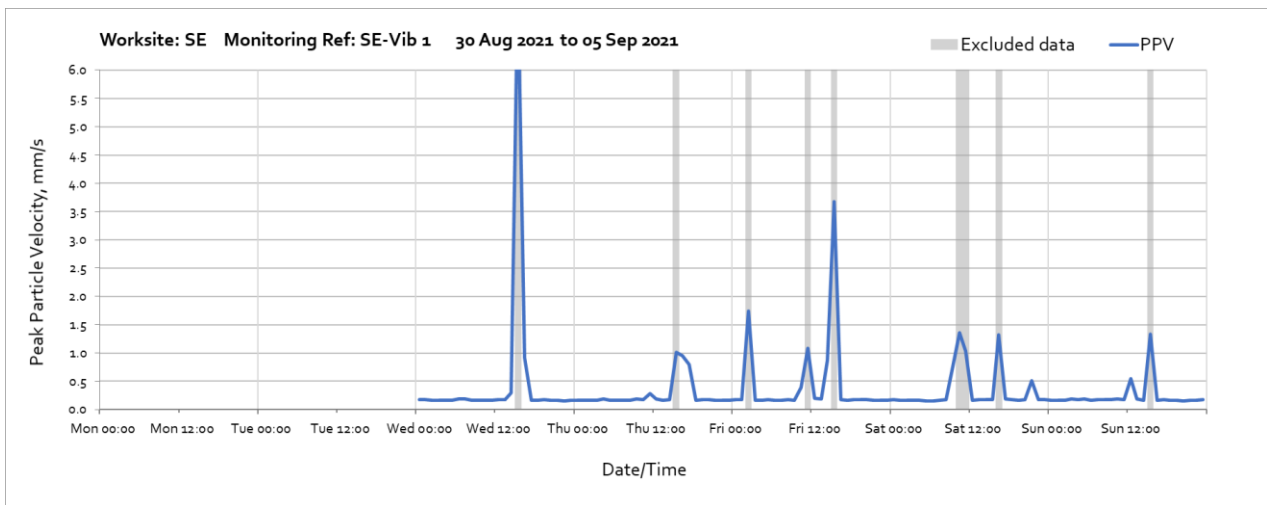
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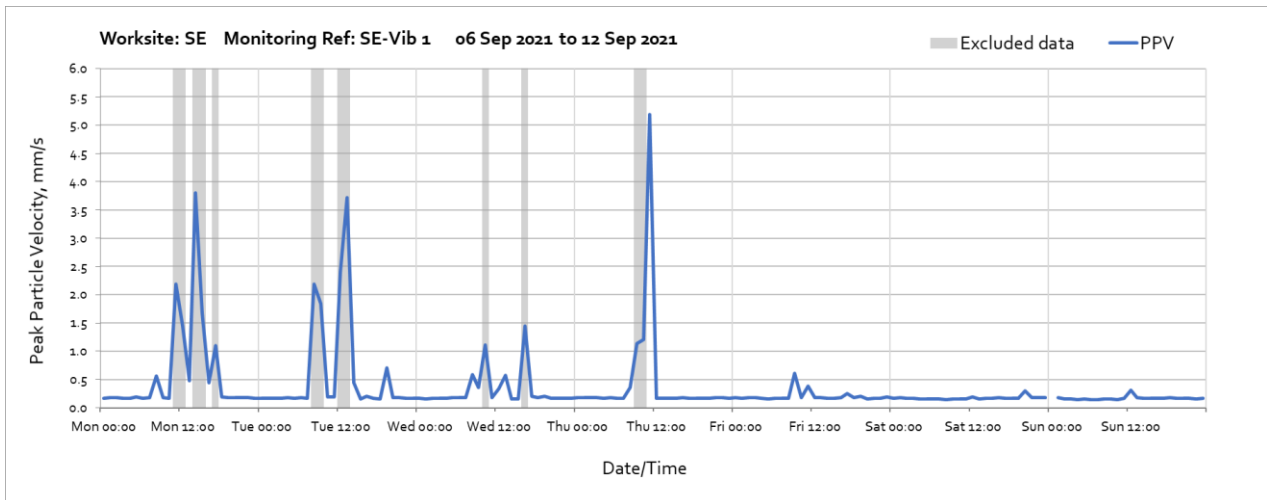
Vibration

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 axes 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.

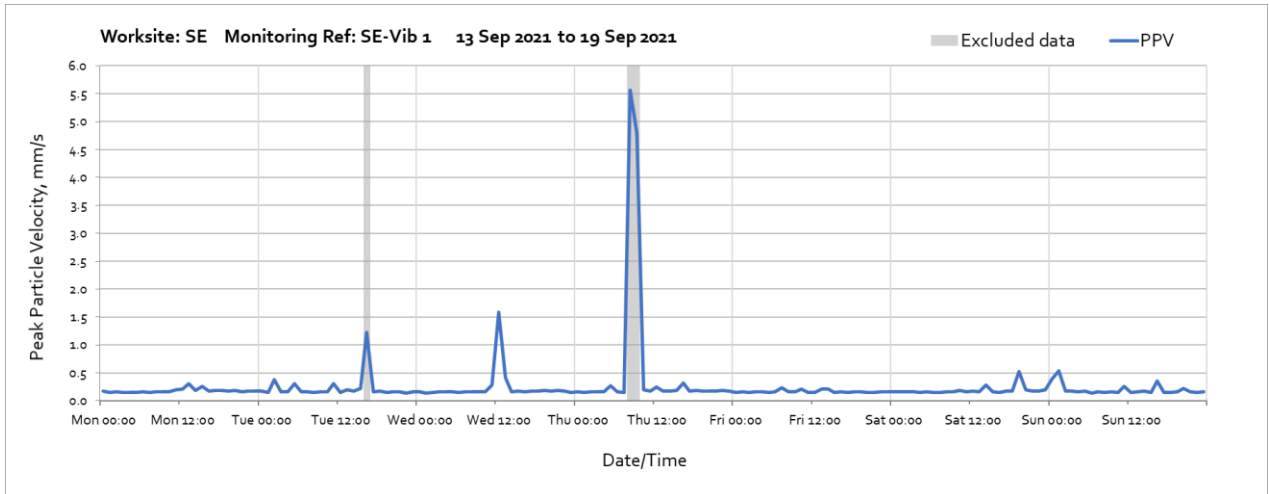
Worksite: SE – Monitoring Ref: SE-Vib 1



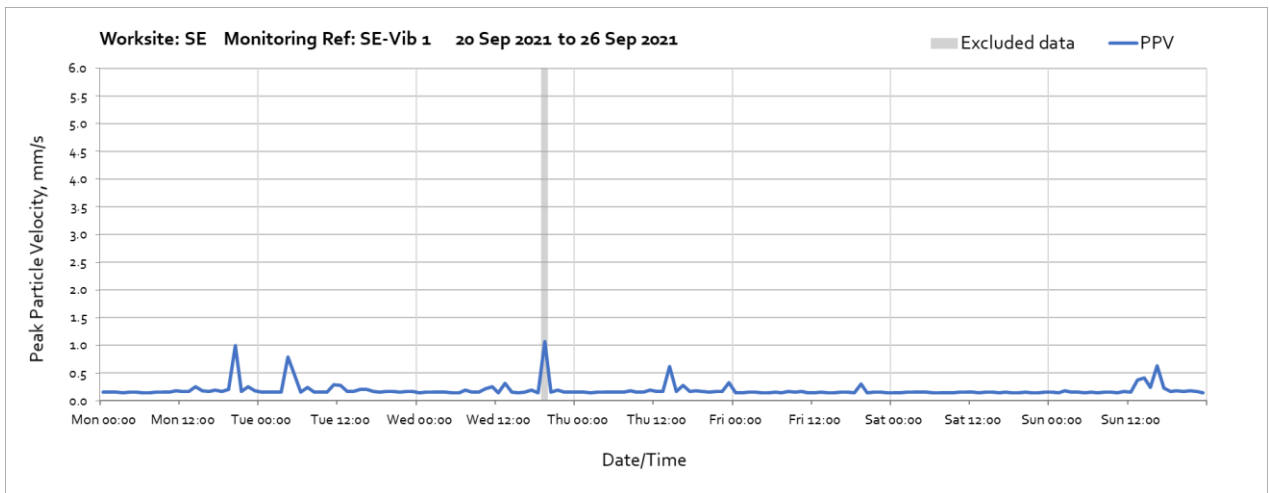
Note: The vibration monitor was installed on 1st September 2021. High levels of vibration measured throughout the week were due to local disturbance of the monitor and are not representative of HS2 construction vibration levels at the nearest receptors.



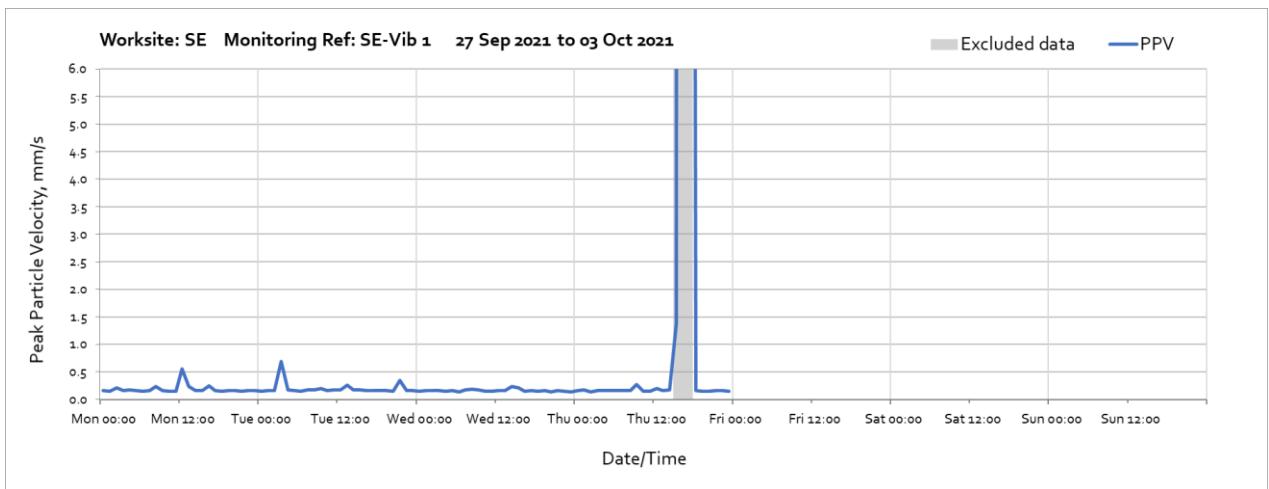
Note: High levels of vibration measured throughout the week were due to local disturbance of the monitor and are not representative of HS2 construction vibration levels at the nearest receptors. Missing data at 00:00 on Sunday 12th September was due to a fault with the monitoring system.



Note: High levels of vibration measured at 16:00 on Tuesday 14th September and between 08:00 and 09:00 on Thursday 16th September 2021 were due to local disturbance of the monitor and are not representative of HS2 construction vibration levels at the nearest receptors.



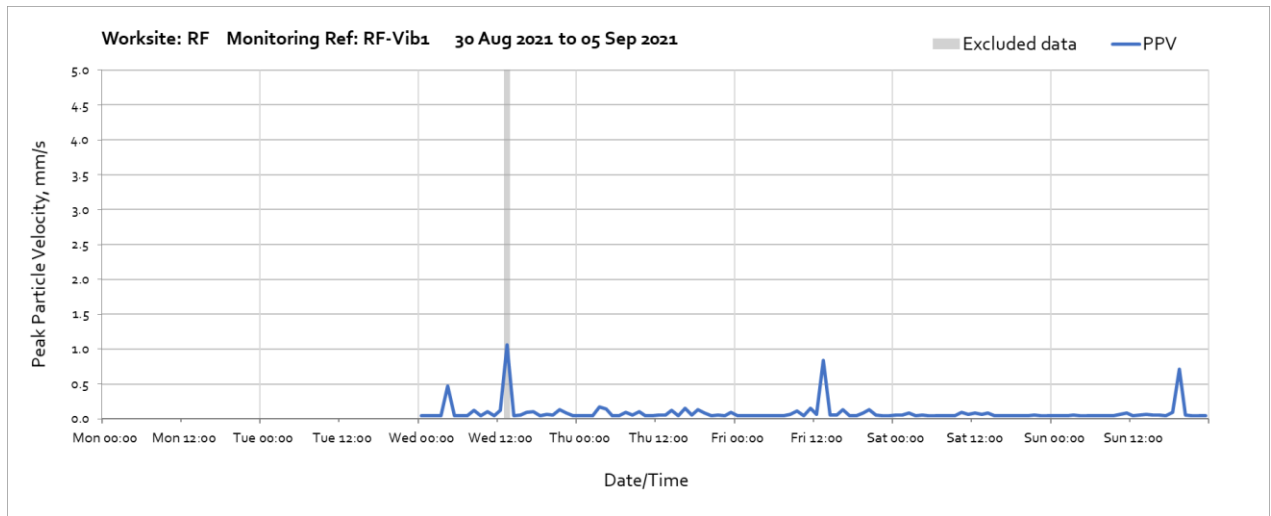
Note: High levels of vibration measured at 19:00 on Wednesday 22nd September 2021 were due to local disturbance of the monitor and are not representative of HS2 construction vibration levels at the nearest receptors.



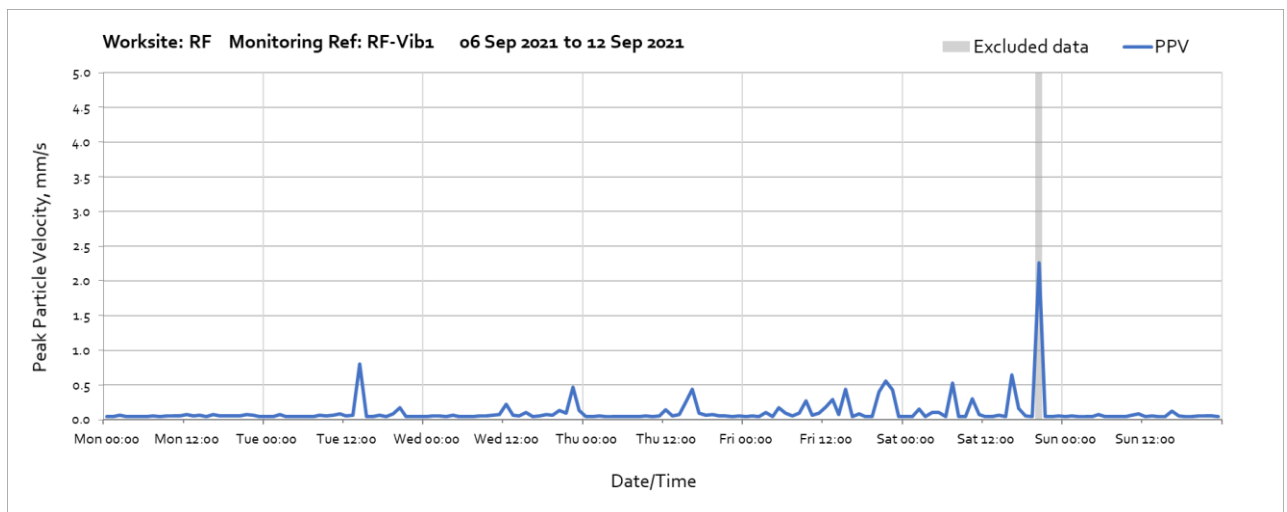
Note: High levels of vibration measured between 15:00 and 17:00 on Thursday 30th September 2021 were

due to local disturbance of the monitor and are not representative of HS2 construction vibration levels at the nearest receptors.

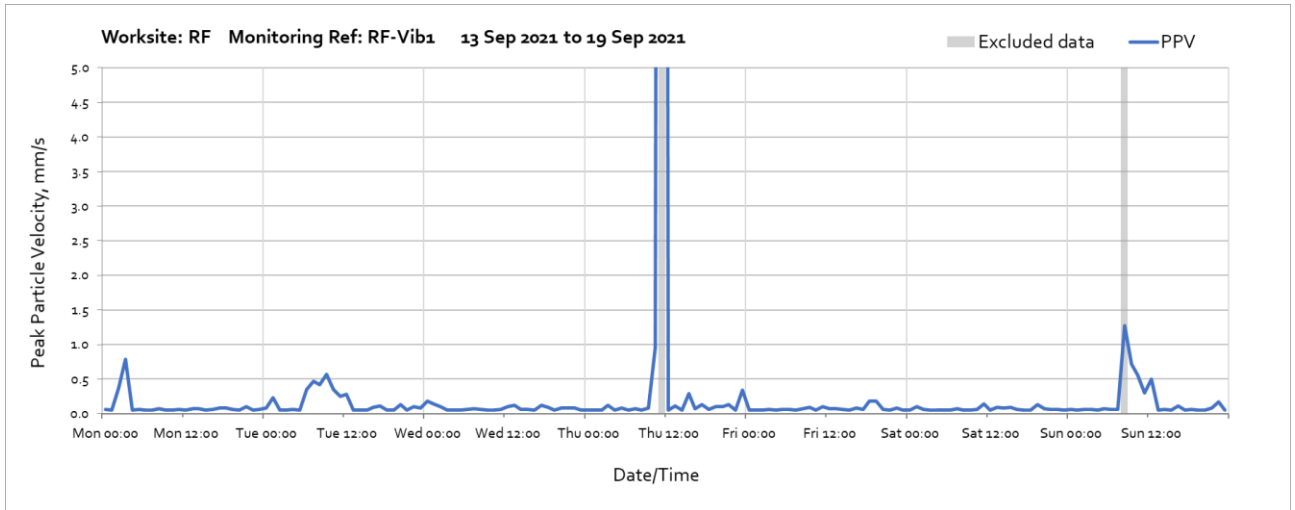
Worksite: RF – Monitoring Ref: RF-Vib 1



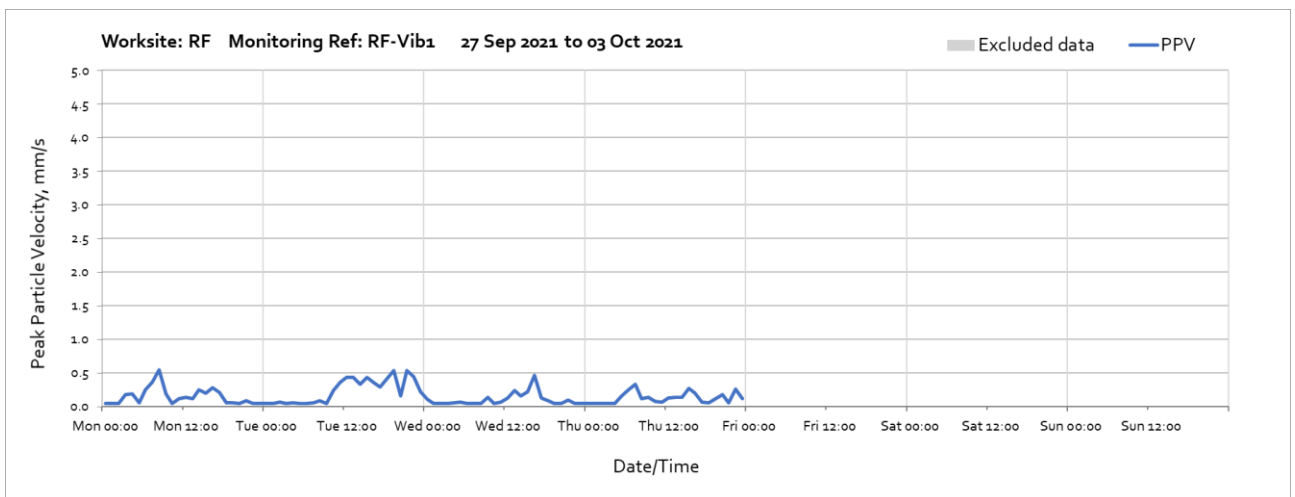
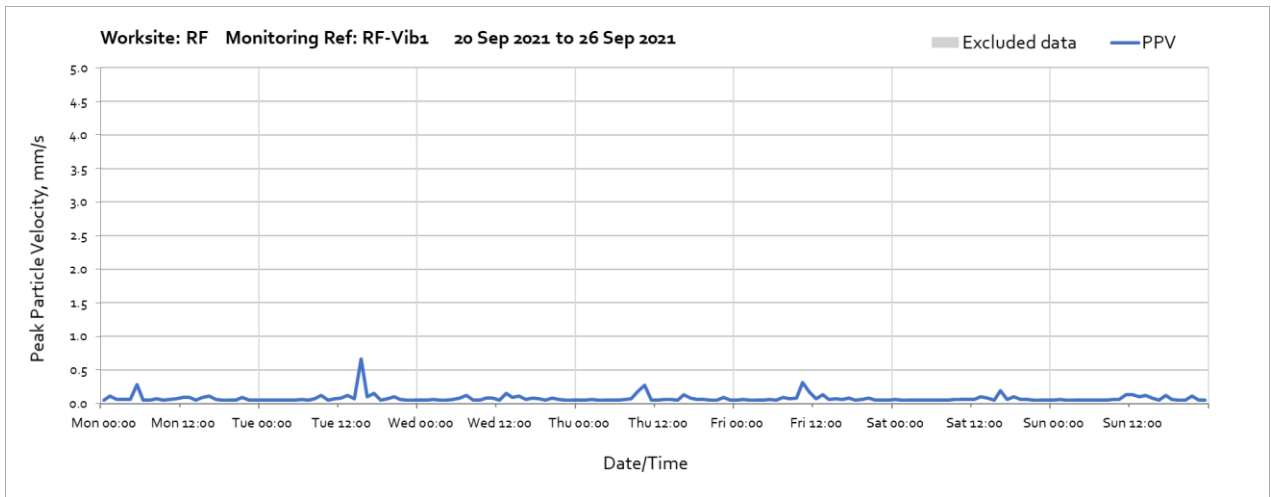
Note: High levels of vibration measured throughout the week were due to local disturbance of the monitor and are not representative of HS2 construction vibration levels at the nearest receptors.



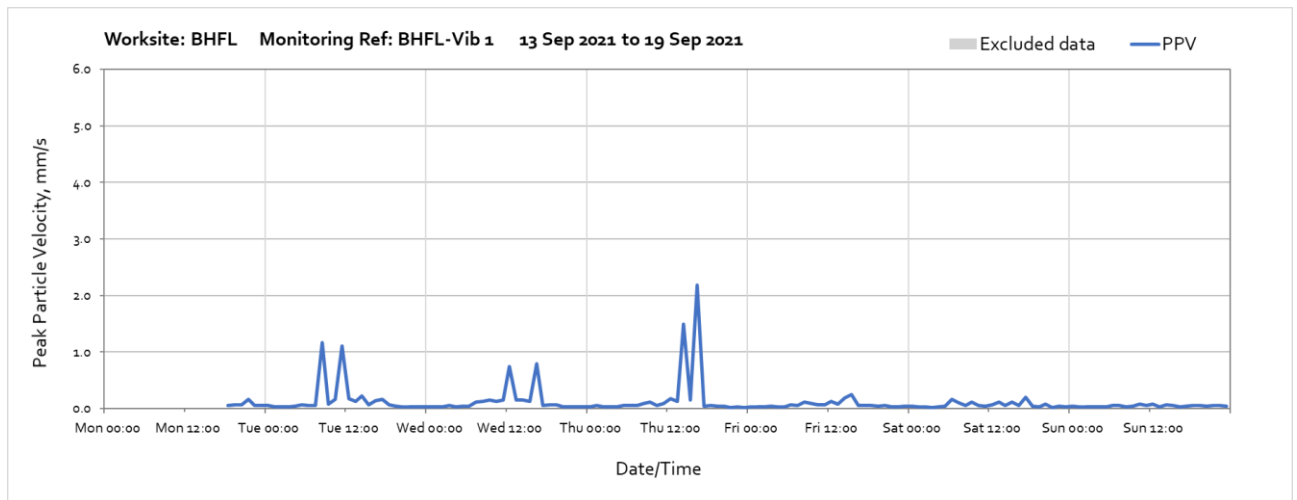
Note: High levels of vibration measured throughout the week were due to local disturbance of the monitor and are not representative of HS2 construction vibration levels at the nearest receptors.



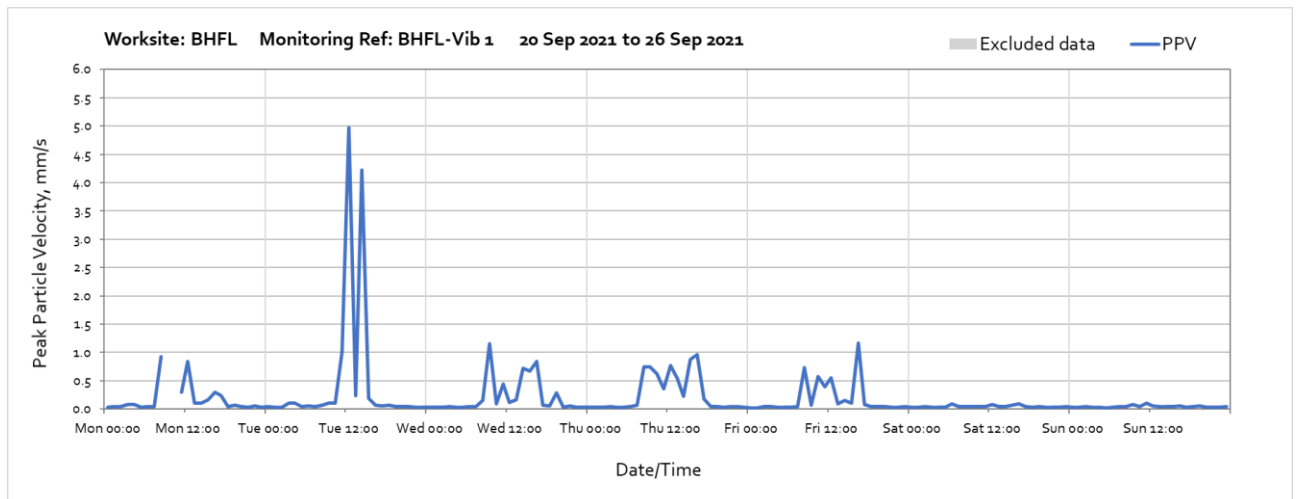
Note: High levels of vibration measured throughout the week were due local disturbance of the monitor and are not representative of HS2 construction vibration levels at the nearest receptors .



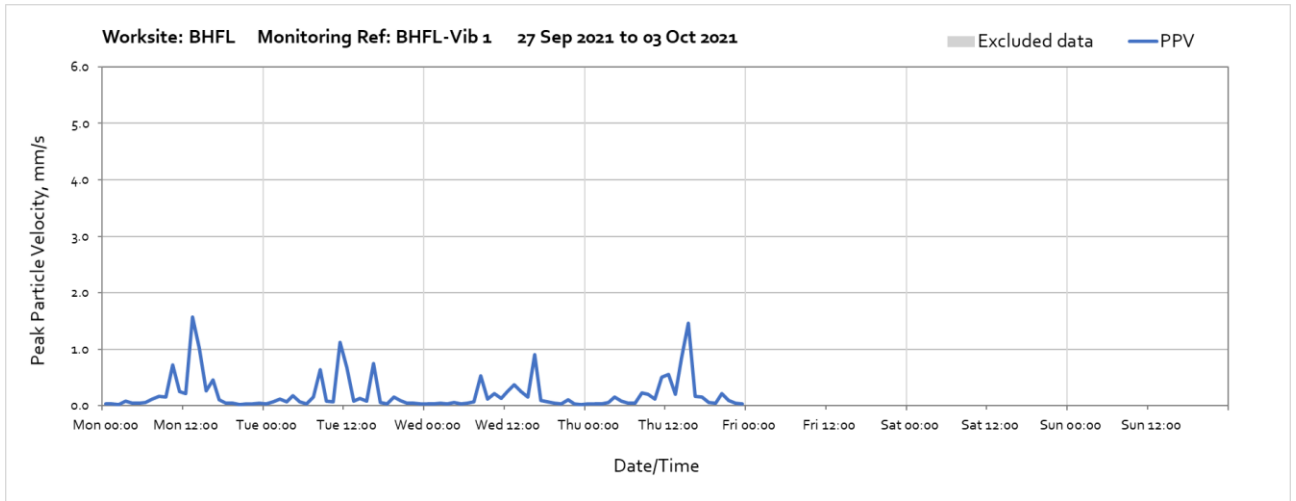
Worksite: BHFL – Monitoring Ref: BHFL-Vib 1



Note: The vibration monitor was reinstalled on 13th September 2021. High levels of vibration measured throughout the week were due to HS2 related plate compaction works taking place at close proximity to the monitor.



Note: High levels of vibration measured throughout the week were due to HS2 related plate compaction works taking place at close proximity to the monitor.



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