

Construction Noise and Vibration Monthly Report – August 2022

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 August 2022.

Within this period monitoring was undertaken at the following worksites:

- Noise monitoring was undertaken in the vicinity of the A422 Turweston North Worksite (ref.: A422 TN) where construction of the access road, topsoil stripping, compound maintenance works, drainage works, excavation and stockpiling were undertaken.
- Noise monitoring was undertaken in the vicinity of School End (ref.: SE), Rosehill Farm (ref.: RF), and Hermitage Chetwode (ref.: HC) worksites where compound development works, bulk excavation, topsoil stripping, drainage works, vehicle movements and stockpiling were undertaken.
- Noise monitoring was undertaken in the vicinity of Twyford worksite (ref.: TW), formally part of West Street Overbridge worksite, where road maintenance works, haul road construction, drainage works, topsoil stripping, stockpiling, instrumentation and monitoring works, culvert installation and vehicle movements were underway.
- Noise monitoring was undertaken in the vicinity of West Street Overbridge worksite (ref.: WSO), where utility diversion works, temporary road diversions, concrete works and piling were underway.
- Noise monitoring was undertaken in the vicinity of Addison Road worksite (ref.: AR) where construction of embankments, drainage works and pipeline diversion works were underway.
- Noise monitoring was undertaken in the vicinity of School Hill Compound worksite (ref.: SHC) where construction of access ramps and operation of concrete batching plant were underway.
- Noise monitoring was undertaken in the vicinity of the Quainton worksite (ref.: QAR) where utility diversion works were underway.
- Noise monitoring was undertaken in the vicinity of the FCC Sidings worksite reference (ref: FCC) where no work activities were undertaken during the reporting period.
- Noise monitoring was undertaken in the vicinity of Meadoway and Glebe House, Aylesbury worksite (ref: MW&GH) where access road construction,

earthworks, stockpiling, piling platform construction, and haul road construction were underway.

- Noise monitoring was undertaken in the vicinity of Oat Close Worksite (ref: OC) where earthworks, stockpiling, haul road construction, piling works, overhead utility diversions, and rail deliveries were underway.
- Noise monitoring was undertaken in the vicinity of Nash Lee Lane Worksite (ref.: NLL) where plant works, construction of fuel storage area and plant laydown areas, culvert installation, construction of access road, foundation works were underway.
- Noise monitoring was undertaken in the vicinity of Wendover Green Tunnel (ref.:WGT), formally Ellesborough Road, worksite where topsoil stripping, vacuum excavations, archaeological works, installation of artificial badger setts, embankment construction, backfilling, concrete pours, demolition works, installation of signage, asphaltting and water treatment works were underway.
- Noise monitoring was undertaken in the vicinity of Rocky Lane Embankment worksite (ref: RLE) where fencing, construction of fuel storage area and plant laydown areas, installation of culvert, installation of temporary surface water management plant and installation of security plaza were underway.
- Noise monitoring was undertaken in the vicinity of Leather Lane worksite (ref: LL) where haul road works, stockpiling and water utility diversion works were underway.
- Noise monitoring was undertaken in the vicinity of South Heath Cutting worksite (ref: SHCW) where earthworks and culvert installation works were undertaken.
- Noise monitoring was undertaken in the vicinity of North Portal Worksite (ref: NP) where temporary utility works, barrettes and headwall construction, pre-treatment works, compound activities and piling platform construction works were undertaken.
- Noise monitoring was undertaken in the vicinity of Chesham Road Worksite (ref: CR) where site maintenance and operations and shaft construction works were undertaken.
- Noise monitoring was undertaken in the vicinity of Little Missenden Vent Shaft worksite (ref.: LM) where site operation, basement construction, shaft base slab and collar construction were undertaken.
- Noise monitoring was undertaken in the vicinity of Amersham Vent Shaft worksite (ref.: AM), where general plant operations, waterproofing works,

collar construction, secondary lining works and small basement construction works were undertaken.

- Noise monitoring was undertaken in the vicinity of Chalfont St Giles Vent Shaft worksite (ref.: CSG) where site operation, road maintenance works, reinforced concrete works, stockpile removal and construction of basement works were undertaken.
- Noise monitoring was undertaken in the vicinity of Chalfont St Peter Vent Shaft worksite (ref.: CSP), where general plant operations, road maintenance works, concrete reinforcement and basement construction works were underway.
- Noise monitoring was undertaken in the vicinity of Load Test Pile 1 worksite (ref.: LTP #1), where piling works, construction of a cofferdam, compound operations, satellite welfare construction, installation of generator farms, utility diversion, environmental maintenance, fibre crossing works, pier construction, River Colne re-alignment, ground investigation works, pump water management, maintenance of haul roads, fencing, deck works, core drilling of concrete, base slab construction and gas crossing emergency dismantling works were underway.

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

- Godington where construction of the site access road was underway.
- Grovil Embankment – Westbury where excavations and construction of river crossing were underway.
- North of School End where excavations, vegetation clearance, stockpiling, drainage and pond backfilling were underway.
- Stockpiling works, vehicle movements, topsoil striping and road realignment were underway along the Mass Haul Road.
- East West Rail (EWR) Overbridge and Culvert where foundation works, backfilling, waterproofing installations and assembly of steel deck were underway.
- Infrastructure Maintenance Depot (IMD) East and West Culverts where installation of pre-cast concrete units, waterproofing installations, backfilling, landscaping works and platform construction were underway.
- Grendon Underwood Rail Underbridge where piling works were underway.
- Hills Farm where earthworks, including stone deliveries and stockpiling were underway.

- Edgcott Road Overbridge and Doddershall Culvert where digging and replacement works were undertaken.
- Along Marylebone to Claydon Junction Line where topsoil stripping, drainage installations and removal of embankment were underway.
- Aylesbury Golf Course where construction of site haul road, stockpiling, compound setup and pond construction were underway.
- Thame Valley Viaduct Causeway where temporary bridge construction, piling, aggregate laying and compound setup were underway.
- Fleet Marston where earthworks, stockpiling, drainage works, habitat site maintenance works and pond construction were underway.
- Along A41 where concrete works and road realignment works, including stockpiling and earthworks were underway.
- Waddesdon Embankment and North Cutting where earthworks, stockpiling, compound setup, drainage works, and construction of site haul road were undertaken.
- Wendover Dean Viaduct Launch where piling works were underway.

The HS2 threshold levels for significant noise impacts, which are defined in Information Paper E23 (<https://www.gov.uk/government/publications/hs2-information-papers-environment>), were exceeded two (2) times 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 the Buckinghamshire area during the monitoring period. A description of complaints, the results of investigations and any action taken are detailed in Table 8 of this report.

Abbreviations and Descriptions

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

Table 1: Table of Abbreviations

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

1 Introduction

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

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

1.1.2 Monitoring data and interpretive reports are to be provided to each relevant local authority on a monthly basis and shall include a summary of the construction activities occurring, the data recorded over the monitoring period, any complaints received, any periods in exceedance of agreed trigger levels, the results of any investigations and any actions taken or mitigation measures implemented. This report provides noise data, and interpretation thereof, for monitoring carried out by HS2 within the Buckinghamshire (BS) Local Authority area for the period 1st to 31st August 2022.

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

- A422 Turweston North worksite, reference A422 TN (see Plan 1 in Appendix A), where works activities included:
 - Access road construction.
 - Topsoil stripping.
 - Compound maintenance works.
 - Drainage works and installation of ponds.
 - Excavations.
 - Stockpiling.
- School End worksite reference SE (see Plan 2 in Appendix A), Rosehill Farm worksite reference RF (see Plan 2 in Appendix A), and Hermitage Chetwode Worksite reference – HC (see plan 2 in Appendix A), where works activities included:

- Compound development works.
- Bulk excavation.
- Topsoil stripping.
- Drainage works, including pond maintenance works.
- Vehicle movements.
- Stockpiling.
- Twyford worksite reference TW (see Plan 2 in Appendix A), formally part of West Street Overbridge worksite, where works activities included:
 - Access road maintenance works.
 - Haul road construction.
 - Drainage works.
 - Topsoil stripping.
 - Stockpiling.
 - Instrumentation and monitoring installations.
 - Culvert installation.
 - Vehicle movements.
- West Street Overbridge worksite reference WSO (see Plan 3 in Appendix A), where works activities included:
 - Utility diversion works, including trenching, duct laying, construction of access chambers, backfilling and ground compacting.
 - Temporary road diversion works, including asphaltting works, lining and installation of signage.
 - Concrete works, including concrete pours.
 - Piling works, including excavations.
- Addison Road worksite reference AR (see Plan 3 in Appendix A), where works activities included:
 - Construction of approach embankments, including stone laying and compacting.
 - Drainage works and installation of ponds.
 - Pipeline diversion works, including trenching, duct laying and backfilling.

- School Hill Compound worksite reference SHC (see Plan 3 in Appendix A), where works activities included:
 - Construction of access ramps.
 - Operations of concrete batching plant.
- Quainton worksite, reference – QAR (see Plan 4 in Appendix A) where works activities included:
 - Utility diversion works, including micro tunnelling, trenching, Under Track Crossing works and duct laying .
- FCC Sidings worksite, reference – FCC (see Plan 3 in Appendix A) where no works activities were undertaken during the reporting period.
- Meadoway and Glebe House, Aylesbury Worksite, reference – MW&GH (see Plan 5 in Appendix A), where works activities included:
 - Construction of compound access road.
 - Earthworks.
 - Stockpiling.
 - Construction of piling platform.
 - Haul road construction.
- Oat Close Worksite, reference – OC (see Plan 5 in Appendix A), where works activities included:
 - Earthworks.
 - Stockpiling.
 - Haul road construction.
 - Piling works.
 - Overhead utility diversions.
 - Rail deliveries.
- Nash Lee Lane Worksite, reference – NLL (see Plan 6 in Appendix A), where works activities included:
 - Plant works, including fencing.
 - Construction of fuel storage area and plant laydown areas.
 - Culvert installation.

- Construction of access road.
- Foundation works.
- Wendover Green Tunnel, formally Ellesborough Road, Worksite, reference – WGT (see Plan 6 in Appendix A), where works activities included:
 - Topsoil stripping.
 - Vacuum excavations.
 - Archaeological works.
 - Installation of artificial badger sett.
 - Construction of embankment.
 - Backfilling
 - Concrete pours.
 - Demolitions works at Ellesborough Road residences.
 - Installation of signage at security plaza.
 - Asphaltting works.
 - Wastewater treatment works, including excavations and lifting of treatment units.
- Rocky Lane Embankment Worksite, reference – RLE (see Plan 7 in Appendix A), where works activities included:
 - Fencing.
 - Installation of fuel storage area and plant laydown areas.
 - Culvert installation.
 - Installation of temporary surface water management plant.
 - Installation of security plaza.
- Leather Lane Worksite, reference – LL (see Plan 8 in Appendix A), where works activities included:
 - Haul road works.
 - Stockpiling.
 - Water utility diversion works.
- South Heath Cutting Worksite, reference – SHCW (see Plan 8 in Appendix A), where works activities included:

- Earthworks.
- Culvert installation.
- North Portal Worksite, reference – NP (see Plan 8 in Appendix A), where works activities included:
 - Temporary utility works, including water and IT connection.
 - North Portal barrettes and headwall construction.
 - Pre-treatment works, including drilling and grouting.
 - General compound activities.
 - Piling platform reinstatement and maintenance works, including scraping and hardstanding.
- Chesham Road Worksite reference – CR (see Plan 8 in Appendix A), where works activities included:
 - Site maintenance and operations.
 - Shaft construction, which included grouting, reinforced concrete works, backfilling and sheet pile demolition.
- Little Missenden Vent Shaft worksite reference LM (see Plan 9 in Appendix A), where works activities included:
 - General plant operations.
 - Basement construction.
 - Shaft base slab construction.
 - Collar construction.
- Amersham Vent Shaft Worksite, reference – AM (see Plan 10 in Appendix A), where works activities included:
 - General plant operations.
 - Waterproofing.
 - Collar construction.
 - Secondary lining works.
 - Small basement construction.
- Chalfont St Giles Vent Shaft Worksite, reference - CSG (see Plan 11 in Appendix A), where works activities included:
 - General plant operations.

- Road maintenance works.
- Reinforced concrete works.
- Basement construction, including excavation.
- Stockpile removal.
- Chalfont St Peter Vent Shaft Worksite, reference – CSP (see Plan 12 in Appendix A), where works activities included:
 - General plant operations.
 - Road maintenance works.
 - Concrete reinforcement.
 - Basement construction works.
- Colne Valley Viaduct - Load Test Pile 1 Worksite, reference – CVV-LTP #1 (see Plan 13 in Appendix A), where works activities included:
 - Piling works, including bored piling, de-sanding, installation of reinforcement cage and concrete piling, break-out of bored pile, grout curtain construction around viaduct maintenance plant and clean up around piles.
 - Construction of a cofferdam, including piling, excavation, dewatering and operation of support plant.
 - Compound operations.
 - Satellite welfare construction.
 - Installation of generator farms.
 - Utility diversion.
 - Environmental maintenance.
 - Pier construction.
 - River Colne re-alignment and crossing works.
 - Ground investigation works.
 - Pump water management.
 - Maintenance of haul roads.
 - Fencing works.
 - Core drilling of concrete.
 - Base slab construction.

- Fibre crossing.
- Gas crossing emergency dismantling works.
- Deck works, including span segmental erection, steel structure erection and dismantling, grouting.

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

- Godington where construction of the site access road was underway.
- Grovil Embankment – Westbury where excavations and construction of river crossing were underway.
- North of School End where excavations, vegetation clearance, stockpiling, drainage and pond backfilling were underway.
- Stockpiling works, vehicle movements, topsoil stripping and road realignment were underway along the Mass Haul Road.
- East West Rail (EWR) Overbridge and Culvert where foundation works, backfilling, waterproofing installations and assembly of steel deck were underway.
- Infrastructure Maintenance Depot (IMD) East and West Culverts where installation of pre-cast concrete units, waterproofing installations, backfilling, landscaping works and platform construction were underway.
- Grendon Underwood Rail Underbridge where piling works were underway.
- Hills Farm where earthworks, including stone deliveries and stockpiling were underway.
- Edgcott Road Overbridge and Doddershall Culvert where digging and replacement works were undertaken.
- Along Marylebone to Claydon Junction Line where topsoil stripping, drainage installations and removal of embankment were underway.
- Aylesbury Golf Course where construction of site haul road, stockpiling, compound setup and pond construction were underway.
- Thame Valley Viaduct Causeway where temporary bridge construction, piling, aggregate laying and compound setup were underway.
- Fleet Marston where earthworks, stockpiling, drainage works, habitat site maintenance works, pond construction were underway.
- Along A41 where concrete works and road realignment works, including stockpiling and earthworks were underway.

- Waddesdon Embankment and North Cutting where earthworks, stockpiling, compound setup, drainage works, and construction of site haul road were undertaken.
- Wendover Dean Viaduct Launch where piling works were underway.

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

1.2 Measurement Locations

1.2.1 Forty-two (42) noise and three (3) vibration monitoring installations were active in August in the BS area. Table 2 summarises the positions of noise and vibration monitoring installations within the BS area in August 2022.

1.2.2 The noise monitor formally called WSO-NMP2 located in the vicinity of Twyford worksite (ref.:TW) has been renamed TW-NMP1.

1.2.3 The noise monitor MF-NMP1, located in the vicinity of Oat Close worksite (ref.:OC), is currently being repaired and therefore no noise data were recorded at this monitor location during the reporting period.

1.2.4 Maps showing the positions of noise and vibration monitoring installations are presented in Appendix B.

Table 2: Monitoring Locations

Worksite Reference	Measurement Reference	Address
A422 TN	TN-NMP1	Turweston, Brackley
SE	SE-NMP1	School End, Chetwode
	SE-Vib1	School End, Chetwode
RF	RF-NMP1	Old Stable Cottage, Rosehill Farm, Chetwode
	RF-Vib1	Old Stable Cottage, Rosehill Farm, Chetwode
HC	HC-NMP1	Hermitage, Chetwode
TW	TW-NMP1	Twyford, Buckinghamshire
WSO	WSO-NMP1	West Street, Twyford
AR	AR-NMP1	Addison Road, Rosehill Farm
SHC	SHC-NMP1	School Hill Compound, Calvert

Worksite Reference	Measurement Reference	Address
QAR	QAR-NMP2	Station Rd, Quainton
FCC	FCC-NMP1	Calvert South
MW&GH	GH-NMP1	Glebe House, A418, Aylesbury
	MW-NMP1	Aylesbury, Buckinghamshire
OC	OC-NMP1	Oat Close, Bishopstone, Aylesbury
	WES-NMP1	Westfield, Stoke Mandeville, Aylesbury
NLL	NLL-NMP1	Nash Lee Lane, Nash Lee
	NLL-NMP2	Nash Lee Lane, Nash Lee
WGT	ER-NMP1	Ellesborough Rd, Wendover
	ER-Vib1	Ellesborough Rd, Wendover
	BL-NMP1	Bacombe Lane, Wendover
	WT-NMP1	A413, Wendover
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
NP	ORC-NMP1	Orchard Cottage, Ballinger Road, South Heath
	BLH-NMP1	Bayleys Hatch, South Heat, Great Missinden
CR	MDL-NMP1	Meadow Leigh Cottage, Firth Hill, South Heath
AM	AM-NMP1	Amersham Vent Shaft Worksite, Whielden Lane, Amersham
LM	LM-NMP1	Little Missenden, A413, Amersham
	PWC-NMP1	Patricia Holmes, Little Missenden Vent Shaft Worksite, Amersham
CSG	CSG-NMP1	Chalfont St Giles Vent Shaft Worksite, Bottom House Farm Lane
	CSG-NMP2	Chalfont St Giles Vent Shaft Worksite, Bottom House Farm Lane
	PIC-NMP1	Bottom House Farm Lane, Chalfont St Giles
CSP	CSP-NMP1	Chalfont St Peter Vent Shaft Worksite, Chesham Lane, Chalfont St. Peter
	CSP-NMP2	Chalfont St Peter Vent Shaft Worksite, Chesham Lane, Chalfont St. Peter
	CSP-NMP3	Chalfont St Peter Vent Shaft Worksite, Chesham Lane, Chalfont St. Peter

Worksite Reference	Measurement Reference	Address
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-MR*	CVV-SVF-NMP1	Savay Farm, Denham Garden Village, Denham, Buckinghamshire

* This worksite is within the London Borough of Hillingdon, for more details on the works taking place please refer to the London Borough of Hillingdon Noise and Vibration Report available at:

<https://www.gov.uk/government/collections/monitoring-the-environmental-effects-of-hs2>

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	Weekday Average L _{Aeq,T} (Highest Day L _{Aeq,T})					Saturday Average L _{Aeq,T} (Highest Day L _{Aeq,T})					Sunday / Public Holiday Average L _{Aeq,T} (Highest Day L _{Aeq,T})	
				0700 - 0800	0800 - 1800	1800 - 1900	1900 - 2200	2200 - 0700	0700 - 0800	0800 - 1300	1300 - 1400	1400 - 2200	2200 - 0700	0700 - 2200	2200 - 0700
A422 TN	TN-NMP1	Turweston, Brackley	Free-field	47.0 (49.5)	50.4 (54.3)	46.2 (48.3)	45.9 (48.2)	45.4 (49.4)	45.9 (46.9)	47.9 (50.2)	47.6 (50.5)	46.4 (50.5)	44.9 (46.1)	46.2 (49.8)	45.6 (49.0)
SE	SE-NMP1	School End, Chetwode	Free-field	48.7 (56.5)	59.2 (63.4)	47.4 (52.9)	42.1 (48.9)	41.1 (53.8)	45.8 (52.4)	52.0 (59.5)	49.7 (58.2)	43.3 (48.2)	39.2 (42.7)	42.5 (48.1)	39.8 (45.1)
RF	RF-NMP1	Old Stable Cottage, Rosehill Farm, Chetwode	Free-field	46.6 (50.7)	51.6 (56.9)	46.9 (52.2)	46.1 (56.0)	45.1 (63.3)	47.5 (53.1)	48.0 (48.9)	49.1 (49.7)	47.6 (54.3)	44.9 (54.5)	47.8 (54.9)	44.6 (48.5)
HC	HC-NMP1	Hermitage, Chetwode	Free-field	44.3 (51.4)	52.6 (55.4)	43.8 (49.0)	42.0 (48.5)	40.0 (56.5)	42.8 (45.4)	48.3 (52.4)	48.2 (53.5)	43.3 (51.0)	38.4 (46.6)	42.3 (49.6)	38.9 (48.3)
TW	TW-NMP1	Twyford	Free-field	46.1 (49.7)	50.9 (55.9)	44.7 (46.3)	44.6 (52.6)	43.8 (67.4)	44.4 (44.6)	51.3 (53.1)	49.4 (52.5)	45.8 (51.9)	42.3 (44.0)	47.9 (54.5)	42.6 (45.0)
WSO	WSO-NMP1	West Street, Twyford	Free-field	46.1 (49.7)	54.2 (63.9)	43.6 (48.0)	41.4 (46.3)	38.5 (56.0)	44.8 (50.3)	48.7 (49.9)	46.6 (49.9)	43.3 (49.2)	37.4 (45.5)	45.0 (50.0)	37.6 (44.7)
AR	AR-NMP1	Addison Road, Rosehill Farm	Free-field	49.3 (52.3)	51.2 (54.0)	48.5 (52.8)	42.1 (52.1)	38.1 (50.6)	46.6 (48.9)	52.9 (56.6)	48.2 (51.2)	45.0 (51.7)	36.9 (46.2)	47.2 (54.4)	38.7 (49.0)
SHC	SHC-NMP1	School Hill Compound, Calvert	Free-field	50.3 (56.5)	53.0 (61.1)	48.3 (52.3)	45.0 (51.8)	41.3 (56.8)	44.8 (46.1)	48.3 (51.5)	47.6 (48.6)	45.3 (49.2)	38.7 (42.0)	44.2 (48.8)	39.6 (47.2)

OFFICIAL

Worksite Reference	Measurement Reference	Site Address	Free-Field or Façade Measurement	Weekday Average $L_{Aeq,T}$ (Highest Day $L_{Aeq,T}$)					Saturday Average $L_{Aeq,T}$ (Highest Day $L_{Aeq,T}$)					Sunday / Public Holiday Average $L_{Aeq,T}$ (Highest Day $L_{Aeq,T}$)	
				0700 - 0800	0800 - 1800	1800 - 1900	1900 - 2200	2200 - 0700	0700 - 0800	0800 - 1300	1300 - 1400	1400 - 2200	2200 - 0700	0700 - 2200	2200 - 0700
QAR	QAR-NMP2	Station Rd, Quainton	Free-field	49.3 (55.5)	55.1 (67.7)	51.4 (65.3)	47.0 (65.6)	42.3 (57.5)	43.3 (45.1)	54.4 (69.0)	53.8 (68.1)	53.3 (64.3)	38.5 (53.3)	47.8 (54.0)	40.5 (48.5)
FCC	FCC-NMP1	Calvert South	Free-field	55.5 (59.7)	55.3 (59.2)	48.6 (53.4)	44.9 (55.4)	42.7 (56.7)	47.9 (53.8)	51.6 (63.3)	46.2 (49.3)	44.3 (49.0)	37.2 (42.2)	43.0 (49.7)	41.7 (53.7)
MW&GH	GH-NMP1	Glebe House, A418, Aylesbury	Free-field	54.0 (60.4)	54.8 (69.7)	53.5 (56.1)	51.9 (57.2)	48.3 (60.5)	51.9 (52.7)	52.8 (53.4)	52.6 (53.8)	51.7 (54.3)	47.1 (49.5)	51.3 (55.7)	47.7 (54.5)
	MW-NMP1	Aylesbury, Buckinghamshire	Free-field	61.6 (62.8)	61.5 (66.0)	61.2 (62.8)	58.9 (62.3)	55.2 (61.3)	59.4 (59.5)	61.0 (61.3)	61.0 (62.1)	59.6 (61.0)	53.7 (56.5)	59.6 (61.2)	54.6 (60.6)
OC	OC-NMP1	Oat Close, Bishopstone, Aylesbury	Free-field	45.3 (54.9)	46.7 (52.5)	44.2 (47.1)	43.6 (62.4)	42.4 (53.6)	43.1 (43.9)	45.4 (46.4)	45.3 (46.7)	43.3 (46.5)	40.7 (43.6)	43.3 (48.5)	40.6 (45.6)
	WES-NMP1	Westfield, Stoke Mandeville, Aylesbury	Free-field	44.2 (48.8)	47.2 (53.7)	44.8 (49.0)	44.3 (51.1)	43.2 (56.5)	44.1 (45.4)	45.8 (47.2)	44.3 (47.7)	44.5 (49.0)	38.8 (47.5)	44.7 (55.5)	42.4 (50.4)
NLL	NLL-NMP1	Nash Lee Lane, Nash Lee	Free-field	55.5 (59.8)	61.3 (67.8)	53.7 (56.5)	51.9 (56.4)	49.5 (54.4)	54.5 (57.9)	53.6 (55.1)	51.9 (53.9)	51.6 (53.4)	49.0 (51.5)	51.3 (55.0)	49.1 (53.8)
	NLL-NMP2	Nash Lee Lane, Nash Lee	Free-field	53.6 (57.1)	55.4 (62.3)	53.3 (56.3)	51.3 (54.9)	48.2 (55.9)	49.8 (52.5)	51.8 (55.4)	50.6 (54.0)	50.9 (54.2)	47.5 (50.5)	50.3 (54.0)	48.1 (54.4)
WGT	ER-NMP1	Ellesborough Rd, Wendover	Free-field	54.7 (57.4)	56.5 (68.3)	53.9 (56.5)	52.3 (55.2)	48.8 (56.1)	51.7 (52.3)	53.3 (54.7)	53.0 (54.3)	52.8 (56.5)	47.6 (50.4)	52.2 (55.1)	48.8 (54.1)
	BL-NMP1	Bacombe Lane, Wendover	Free-field	48.9	48.7	47.9	46.6	45.7	48.1	46.4	46.5	47.4	45.5	47.1	45.5

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Worksite Reference	Measurement Reference	Site Address	Free-Field or Façade Measurement	Weekday Average $L_{Aeq,T}$ (Highest Day $L_{Aeq,T}$)					Saturday Average $L_{Aeq,T}$ (Highest Day $L_{Aeq,T}$)					Sunday / Public Holiday Average $L_{Aeq,T}$ (Highest Day $L_{Aeq,T}$)	
				0700 - 0800	0800 - 1800	1800 - 1900	1900 - 2200	2200 - 0700	0700 - 0800	0800 - 1300	1300 - 1400	1400 - 2200	2200 - 0700	0700 - 2200	2200 - 0700
				(54.5)	(55.8)	(51.4)	(51.8)	(54.5)	(50.8)	(47.2)	(47.8)	(51.4)	(49.7)	(56.6)	(48.5)
	WT-NMP1	A413, Wendover	Free-field	66.1 (68.0)	65.1 (68.4)	65.4 (67.8)	62.3 (67.7)	58.5 (65.8)	62.3 (62.7)	63.6 (64.7)	63.9 (64.8)	63.1 (68.7)	56.3 (60.2)	63.0 (67.4)	59.1 (70.2)
RLE	SDVC-NMP1	Rocky Lane, Wendover	Free-field	63.1 (67.0)	66.0 (72.4)	62.1 (64.5)	59.5 (62.3)	56.7 (64.1)	60.4 (60.6)	61.3 (61.9)	60.9 (62.0)	60.1 (62.4)	55.1 (57.9)	59.6 (61.7)	56.0 (62.8)
	NCAS6-NMP1	Chesham Lane, The Lee, Wendover	Free-field	49.1 (64.8)	54.3 (65.6)	48.5 (66.0)	43.7 (53.7)	41.3 (50.0)	44.8 (48.4)	45.6 (50.3)	46.3 (51.6)	45.0 (52.7)	41.0 (47.7)	44.3 (50.6)	40.5 (47.7)
	NCAS5-NMP1	Chesham Lane, The Lee, Wendover	Free-field	54.9 (57.5)	55.1 (57.6)	54.1 (57.3)	51.8 (55.7)	48.3 (55.5)	51.9 (53.1)	52.5 (55.4)	51.9 (55.6)	51.6 (55.0)	47.7 (51.1)	51.9 (60.3)	48.5 (55.6)
LL	HG-NMP1	Hunts Green, Leather Lane, The Lee	Free-field	45.5 (64.0)	47.8 (52.7)	44.2 (56.4)	42.5 (52.5)	39.4 (53.7)	41.1 (45.1)	47.0 (50.8)	48.1 (54.1)	45.1 (56.2)	39.4 (51.2)	43.7 (51.3)	40.6 (48.8)
	GD-NMP1	Grimms Ditch, The Lee, South Heath	Free-field	51.3 (61.3)	54.6 (71.8)	49.5 (61.2)	48.5 (58.4)	48.0 (63.0)	45.6 (47.5)	50.5 (55.6)	53.1 (61.3)	50.1 (56.0)	46.2 (49.8)	47.4 (51.8)	45.1 (49.4)
SHCW	PR-NMP1	Potters Row, South Heath	Free-field	47.0 (55.2)	49.1 (54.8)	45.9 (56.2)	43.5 (50.1)	42.8 (53.2)	45.0 (46.6)	48.2 (50.2)	45.7 (49.0)	46.1 (58.7)	42.3 (44.9)	46.2 (58.6)	43.0 (48.1)
	SH-NMP1	Bury Farm, South Heath	Free-field	48.1 (51.5)	50.8 (54.7)	49.3 (54.4)	48.1 (53.2)	42.2 (55.8)	44.0 (44.5)	46.9 (48.4)	47.0 (49.0)	44.9 (49.6)	41.8 (44.7)	44.7 (48.4)	42.6 (49.9)
NP	ORC-NMP1		Free-field	53.6	56.6	54.6	53.3	43.6	47.4	50.8	49.9	49.7	42.2	47.8	41.8

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Worksite Reference	Measurement Reference	Site Address	Free-Field or Façade Measurement	Weekday Average $L_{Aeq,T}$ (Highest Day $L_{Aeq,T}$)					Saturday Average $L_{Aeq,T}$ (Highest Day $L_{Aeq,T}$)					Sunday / Public Holiday Average $L_{Aeq,T}$ (Highest Day $L_{Aeq,T}$)	
				0700 - 0800	0800 - 1800	1800 - 1900	1900 - 2200	2200 - 0700	0700 - 0800	0800 - 1300	1300 - 1400	1400 - 2200	2200 - 0700	0700 - 2200	2200 - 0700
		Orchard Cottage, Ballinger Road, South Heath		(62.9)	(59.3)	(57.6)	(59.5)	(56.8)	(50.6)	(52.6)	(52.2)	(56.6)	(44.8)	(51.4)	(46.9)
	BLH-NMP1	Bayleys Hatch, South Heat, Great Missinden	Free-field	47.0 (55.2)	49.8 (53.4)	48.2 (53.7)	46.9 (59.9)	38.7 (49.7)	43.3 (45.5)	47.2 (48.7)	46.8 (47.3)	45.6 (50.6)	37.5 (45.6)	44.8 (48.6)	38.3 (46.0)
CR	MDL-NMP1	Meadow Leigh Cottage, Firth Hill, South Heath	Free-field	54.3 (61.0)	55.1 (58.6)	53.3 (56.1)	50.8 (55.4)	45.5 (55.0)	51.9 (54.9)	55.4 (56.0)	52.7 (53.4)	54.2 (62.4)	45.1 (56.5)	53.4 (62.6)	44.9 (53.1)
AM	AM-NMP1	Whielden Lane, Amersham	Free-field	61.1 (64.3)	62.7 (65.5)	59.6 (62.5)	58.0 (60.4)	55.3 (62.1)	59.0 (59.8)	60.7 (61.8)	60.3 (62.2)	58.7 (60.3)	55.1 (59.6)	58.0 (60.8)	54.0 (58.9)
LM	LM-NMP1	Little Missenden, A413, Amersham	Free-field	58.3 (61.3)	58.2 (59.9)	58.0 (59.1)	55.1 (58.5)	50.5 (58.3)	54.4 (54.7)	55.9 (57.1)	56.9 (58.1)	56.0 (57.7)	49.9 (53.8)	55.3 (58.0)	49.8 (56.7)
	PWC-NMP1	Patricia Holmes, Little Missenden Vent Shaft Worksite, Amersham	Free-field	58.7 (63.3)	57.2 (59.7)	57.7 (59.8)	55.2 (59.6)	51.2 (60.8)	55.7 (56.4)	55.8 (56.9)	56.5 (58.0)	55.6 (58.0)	50.9 (57.6)	55.7 (63.1)	52.6 (69.0)
CSG	CSG-NMP1	Chalfont St Giles Vent Shaft Worksite, Bottom House Farm Lane	Free-field	47.0 (59.0)	51.2 (57.7)	44.1 (49.4)	41.9 (49.8)	40.2 (60.0)	43.1 (44.2)	47.0 (48.0)	47.1 (49.7)	43.1 (47.5)	38.7 (43.3)	45.3 (54.0)	39.7 (46.1)
	CSG-NMP2	Chalfont St Giles Vent Shaft Worksite, Bottom House Farm Lane	Free-field	50.3 (55.0)	58.3 (62.3)	49.1 (56.1)	45.3 (63.6)	45.2 (63.6)	47.5 (51.2)	48.9 (53.2)	49.2 (51.1)	46.3 (54.7)	45.6 (57.3)	47.0 (55.0)	42.9 (52.2)
	PIC-NMP1	Bottom House Farm Lane, Chalfont St Giles, Buckinghamshire	Free-field	52.8 (57.9)	52.5 (54.4)	52.0 (57.5)	49.6 (53.3)	46.1 (57.7)	49.9 (50.7)	51.2 (52.2)	52.2 (54.8)	49.5 (52.5)	44.5 (49.3)	49.9 (53.8)	45.8 (52.2)
CSP	CSP-NMP1		Free-field	54.9	55.7	54.0	50.8	46.0	50.5	54.1	54.0	52.6	45.9	53.0	45.7

OFFICIAL

Worksite Reference	Measurement Reference	Site Address	Free-Field or Façade Measurement	Weekday Average $L_{Aeq,T}$ (Highest Day $L_{Aeq,T}$)					Saturday Average $L_{Aeq,T}$ (Highest Day $L_{Aeq,T}$)					Sunday / Public Holiday Average $L_{Aeq,T}$ (Highest Day $L_{Aeq,T}$)	
				0700 - 0800	0800 - 1800	1800 - 1900	1900 - 2200	2200 - 0700	0700 - 0800	0800 - 1300	1300 - 1400	1400 - 2200	2200 - 0700	0700 - 2200	2200 - 0700
		Chalfont St Peter Vent Shaft Worksite		(58.7)	(58.4)	(55.6)	(55.6)	(55.8)	(51.1)	(54.8)	(55.3)	(58.0)	(53.3)	(65.5)	(52.3)
	CSP-NMP2	Chalfont St Peter Vent Shaft Worksite	Free-field	44.0 (49.8)	47.9 (54.7)	45.4 (58.6)	42.8 (53.3)	38.4 (49.8)	42.7 (44.8)	47.8 (49.4)	47.8 (50.1)	44.6 (49.4)	38.3 (44.6)	45.7 (51.9)	38.4 (45.1)
	CSP-NMP3	Chalfont St Peter Vent Shaft Worksite	Free-field	55.4 (57.9)	55.2 (56.8)	55.1 (56.6)	52.8 (56.7)	48.7 (55.4)	52.5 (52.8)	54.9 (56.1)	55.3 (56.7)	53.6 (56.8)	48.3 (52.5)	53.3 (56.1)	48.4 (54.5)
CVV-LTP #1	CVV-LTP #1-NMP1	Northern boundary, Load Test Pile 1 Worksite	Free-field	61.3 (65.8)	61.1 (63.3)	60.2 (63.0)	58.3 (64.8)	55.0 (64.7)	58.1 (58.8)	60.6 (61.1)	60.9 (61.7)	58.8 (62.0)	52.9 (55.1)	58.1 (64.8)	54.0 (61.7)
	CVV-WYC-NMP1	Wyatt's Covert, Tilehouse Lane, Denham	Free-field	56.3 (62.5)	57.1 (61.7)	55.6 (58.2)	52.5 (63.5)	48.5 (62.2)	52.7 (53.1)	57.2 (58.3)	57.2 (57.9)	54.0 (58.6)	46.0 (51.8)	54.0 (57.4)	48.3 (55.9)
	CVV-DFS-NMP1	Denham Film Studio, Uxbridge	Free-field	46.6 (62.1)	48.6 (55.2)	49.1 (57.0)	47.7 (64.5)	43.4 (62.1)	44.5 (46.2)	48.2 (49.2)	46.8 (48.2)	48.5 (54.9)	43.6 (55.1)	46.9 (54.1)	42.0 (50.0)
CVV-MR	CVV-SVF-NMP1	Savay Farm, Denham Garden Village, Denham, Buckinghamshire	Free-field	47.9 (66.3)	47.7 (52.3)	46.0 (50.4)	44.3 (53.2)	42.1 (54.4)	45.5 (47.2)	45.7 (46.6)	44.2 (46.2)	43.5 (46.2)	41.1 (47.7)	43.7 (47.3)	41.4 (48.3)

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-Vib1	School End, Chetwode	5.25 (Z-axis)*
RF	RF-Vib 1	Old Stable Cottage, Rosehill Farm, Chetwode	1.31 (Z-axis)
WGT	ER-Vib 1	46, Ellesborough Rd, Wendover	2.79 (Y-axis)

*Note: The monitor is installed in close proximity to the worksite boundary. The nearest sensitive receptor is further away and therefore the HS2 vibration levels measured at the receptor will 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
A422 TN	TN-NMP1	Turweston, Brackley	All days	All periods	No exceedance	No exceedance
SE	SE-NMP1	School End, Chetwode	Weekdays	All periods	No exceedance	No exceedance
RF	RF-NMP1	Old Stable Cottage, Rosehill Farm, Chetwode	All days	All periods	No exceedance	No exceedance
HC	HC-NMP1	Hermitage, Chetwode	All days	All periods	No exceedance	No exceedance
TW	TW-NMP1	Twyford	All days	All periods	No exceedance	No exceedance
WSO	WSO-NMP1	West Street, Twyford	All days	All periods	No exceedance	No exceedance
AR	AR-NMP1	Addison Road, Rosehill Farm	All days	All periods	No exceedance	No exceedance
SHC	SHC-NMP1*	School Hill Compound, Calvert	All days	All periods	No exceedance	No exceedance
QAR	QAR-NMP2	Station Rd, Quainton	Weekdays	0800-1800 1800-1900 1900-2200	1 4 2	No exceedance No exceedance No exceedance
			Saturdays	0800-1300 1300-1400 1400-2200	1 1 7	No exceedance No exceedance No exceedance
			Nights	2200-0700	11	No exceedance 1
FCC	FCC-NMP1	Calvert South	All days	All periods	No exceedance	No exceedance
MW&GH	GH-NMP1	Glebe House, A418, Aylesbury	Weekdays	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
	MW-NMP1	Aylesbury, Buckinghamshire	All days	All periods	No exceedance	No exceedance
OC	OC-NMP1	Oat Close, Bishopstone, Aylesbury	All days	All periods	No exceedance	No exceedance
	WES-NMP1	Westfield, Stoke Mandeville, Aylesbury	All days	All periods	No exceedance	No exceedance
NLL	NLL-NMP1	Nash Lee Lane, Nash Lee	Weekdays	0800-1800	2	No exceedance
	NLL-NMP2	Nash Lee Lane, Nash Lee	Weekdays	All periods	No exceedance	No exceedance
WGT	ER-NMP1	Ellesborough Rd, Wendover	All days	0800-1800	1	No exceedance
	BL-NMP1	Bacombe Lane, Wendover	All days	All periods	No exceedance	No exceedance
	WT-NMP1	A413, Wendover	Weekdays Saturdays	0700-0800 0800-1800 1800-1900 1300-1400	22 1 22 2	No exceedance
RLE	SDVC-NMP1	Rocky Lane, Wendover	Weekdays	All periods	No exceedance	No exceedance
	NCAS6-NMP1	Chesham Lane, The Lee, Wendover	Weekdays	0800-1800	1	No exceedance
	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	Weekdays	0700-0800	1	No exceedance
	GD-NMP1	Grimms Ditch, The Lee, South Heath	Weekdays Saturdays	0700-0800 0800-1800 1300-1400	1 1 1	No exceedance 1 No exceedance
SHCW	PR-NMP1	Potters Row, South Heath	All days	All periods	No exceedance	No exceedance
	SH-NMP1	Bury Farm, South Heath	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
NP	ORC-NMP1	Orchard Cottage, Ballinger Road, South Heath	Weekdays	0700-0800	1	No exceedance
	BLH-NMP1	Bayleys Hatch, South Heat, Great Missinden	Weekdays	1800-2200	3	No exceedance
CR	MDL-NMP1	Meadow Leigh Cottage, Firth Hill, South Heath	Weekdays	0800-1800	1	No exceedance
AM	AM-NMP1*	Whielden Lane, Amersham	All days	All periods	No exceedance	No exceedance
LM	LM-NMP1*	Little Missenden Vent Shaft Worksite	All days	All periods	No exceedance	No exceedance
	PWC-NMP1	Patricia Holmes, Little Missenden Vent Shaft Worksite, Amersham	Weekdays Saturdays	1900-2200 1400-2200	16 9	No exceedance No exceedance
CSG	CSG-NMP1*	Chalfont St Giles Vent Shaft	All days	All periods	No exceedance	No exceedance
	CSG-NMP2*	Chalfont St Giles Vent Shaft	All days	All periods	No exceedance	No exceedance
	PIC-NMP1	Bottom House Farm Lane, Chalfont St Giles	All days	All periods	No exceedance	No exceedance
CSP	CSP-NMP1*	Chalfont St Peter Vent Shaft Worksite	All days	All periods	No exceedance	No exceedance
	CSP-NMP2*	Chalfont St Peter Vent Shaft Worksite	All days	All periods	No exceedance	No exceedance
	CSP-NMP3*	Chalfont St Peter Vent Shaft Worksite	All days	All periods	No exceedance	No exceedance
CVV-LTP #1	CVV-LTP #1-NMP1*	Northern boundary, Load Test Pile 1 Worksite	All days	All periods	No exceedance	No exceedance
	CVV-WYC-NMP1**	Wyatt's Covert, Tilehouse Lane, Denham	Weekdays	0700-0800 1800-1900 1900-2200	1 1 5	No exceedance 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
			Saturdays Nights	1400-2200 2200-0700	6 48	No exceedance No exceedance
	CVV-DFS-NMP1**	Denham Film Studio, Uxbridge	Weekdays Saturdays Nights	0700-0800 1900-2200 1400-2200 2200-0700	1 5 2 8	No exceedance No exceedance No exceedance No exceedance
CVV-MR	CVV-SVF-NMP1	Savay Farm, Denham Garden Village, Denham, Buckinghamshire	Weekdays Nights	0700-0800 2200-0700	1 3	No exceedance No exceedance

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

** The ambient noise level is close to the LOAEL and measured LOAEL exceedances are considered to be due to ambient noise levels exceeding the LOAEL and not due to HS2 construction noise.

2.2.6 Exceedances of the LOAEL were recorded at fourteen (14) monitoring locations during the month of August 2022. LOAEL exceedances were recorded during weekdays, nights and Saturdays working hours.

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

Table 6: Summary of Total Exceedances of SOAEL

Worksite Reference	Measurement Reference	Monitor Address	Total of SOAEL exceedances in the month
QAR	QAR-NMP2	Station Rd, Quainton	1
LL	GD-NMP1	Grimms Ditch, The Lee, South Heath	1

2.2.8 Two (2) SOAEL exceedances were recorded due to HS2 construction works during August 2022. One exceedance occurred at monitoring location QAR-NMP2 during night-time and one exceedance occurred at monitoring location GD-NMP1 during normal weekdays working hours.

2.3 Exceedances of Trigger Level

2.3.1 Table 7 provides a summary of exceedances of the S61 trigger noise levels determined to be due to HS2 related construction noise measured during the reporting period, along with the findings of any investigation.

Table 7: Summary of Exceedances of Trigger Levels

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

2.4 Complaints

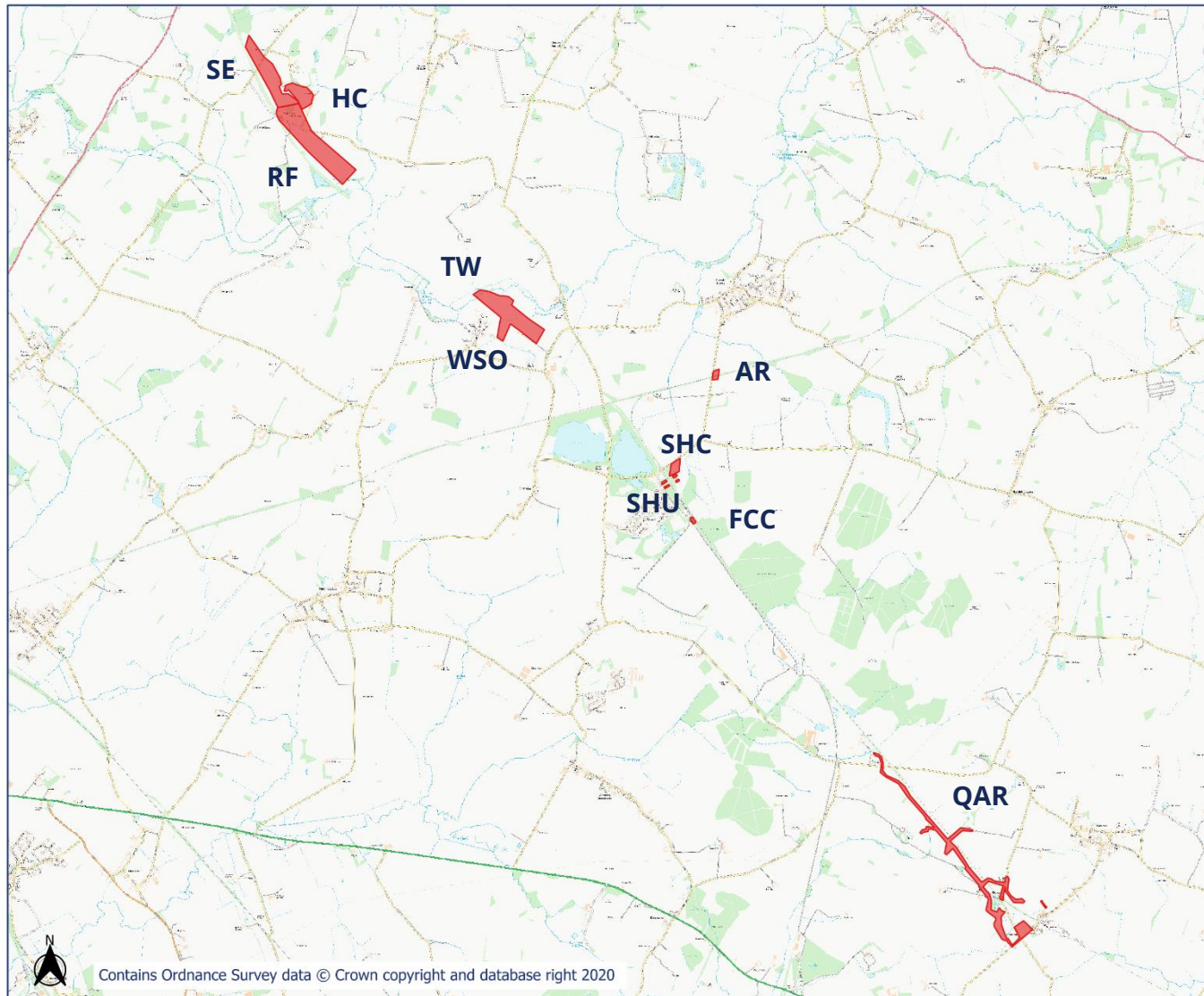
2.4.1 Table 8 provides a summary of complaint information related to noise and vibration received during the reporting period, along with the findings of any investigation.

Table 8: Summary of Complaints

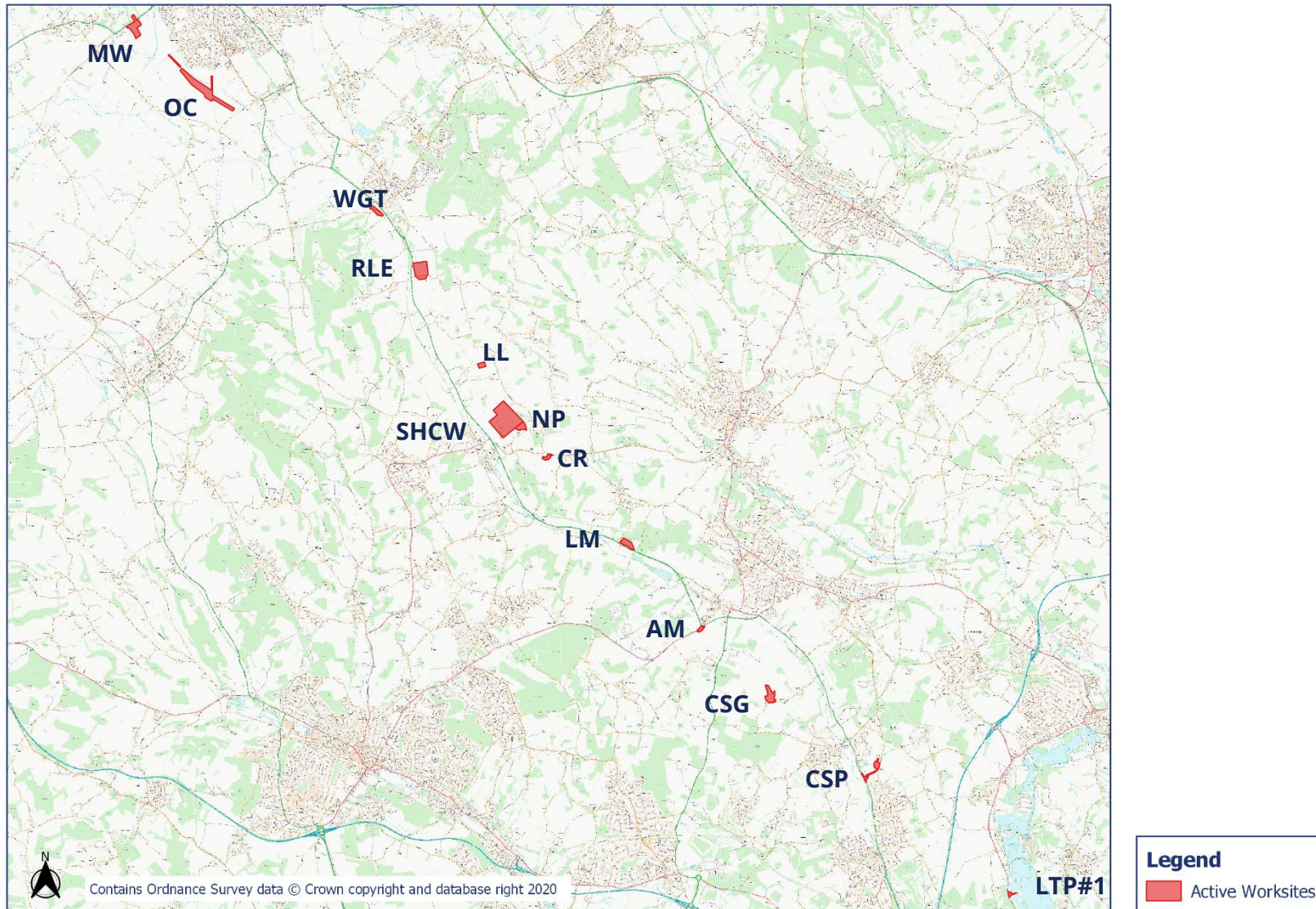
Complaint Reference Number	Worksite Reference	Description of Complaint	Results of Investigation	Actions Taken
HS2-22-43877-C	CVV	Disturbance due to noise from precast factory.	Investigation shows intermittent low frequency noise emitted from precast factory. Noise was perceptible due to precast factory doors being open due to high temperature experienced by the workers during the heatwave. No exceedances were observed.	South facing doors of precast factory to remain closed during extreme heat, north facing doors can be opened. Attended noise monitoring was conducted, noise levels were not in excess of expected levels. Stakeholder updated as to actions taken.
HS2-22-43883-C	OC	Noise from rail deliveries during night.	Investigation shows overnight rail deliveries are only possible when no commuter services are operating. Noise bunds are in place to minimise the noise and no exceedances were recorded at the noise monitor installed on the estate.	Acoustic barriers are in place. Stakeholder has been contacted and information about the results of investigations have been provided.

Complaint Reference Number	Worksite Reference	Description of Complaint	Results of Investigation	Actions Taken
HS2-22-43886-C	QAR	Disturbance across several nights created by guard dogs barking at various times.	Investigation shows security dogs barking throughout night-time.	Stakeholder was issued an apology for disturbance. Dog handlers have been re-briefed to ensure dogs do not bark during night shifts. A review of whether security dogs on site are necessary will be conducted.
HS2-22-43931-C	SHC	Disturbance due to vibratory rolling.	Investigation shows disturbance was due to vibratory roller operating on site near to stakeholder.	The speed of the plant work has been reduced to reduce the overall operating noise level. A new quieter vibratory roller has been ordered and will be delivered soon. Stakeholder has been informed with the results of the investigation.
HS2-22-43933-C	RLE	Noise and vibration from Wendover Dean railway viaduct works.	It was not possible to conduct an investigation into the cause of the disturbance due to lack of specific disturbance dates.	Stakeholder has been contacted and asked to keep log of disturbance so an investigation can be conducted.
HS2-22-43934-C	SHC	Noise and vibration disturbance from works in locality	Investigation shows vibratory roller was operating on an incorrect function.	The correct operating function is now used at all times and site workers have been reminded not to commence work until 0800. Stakeholder has been contacted and information about the results of investigations have been provided. Stakeholder will be provided more information regarding future works.
HS2-22-43940-C	CVV	Disturbance from late night noise from running engines and talking from staff monitoring road closure.	Investigation confirmed that disturbance was due to noise overnight from traffic team workers. No exceedances were recorded at the noise monitor nearby.	Traffic teams relocated from initial position to further away from residential area and re-briefed on appropriate behaviour while on site.

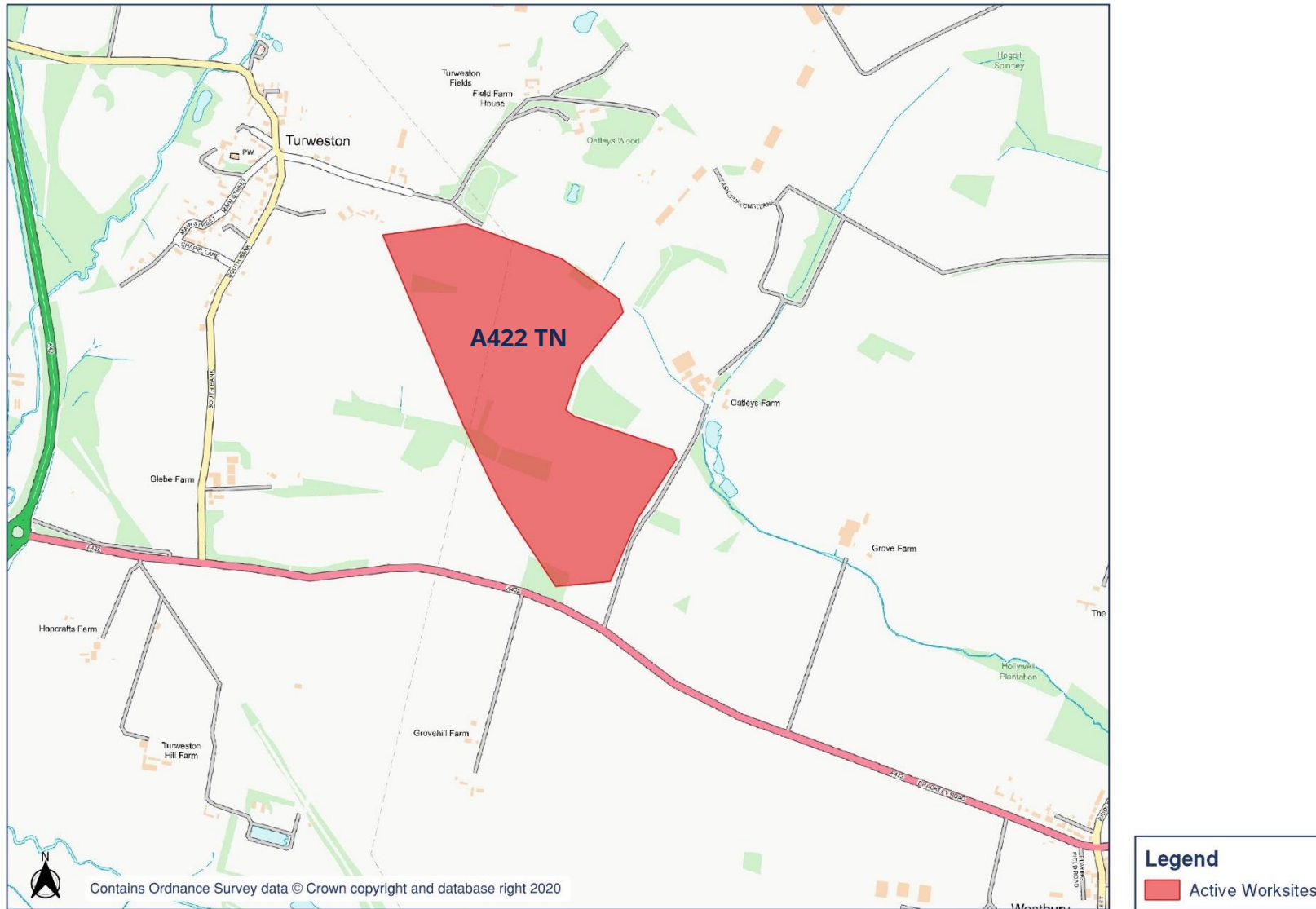
Appendix A Site Locations

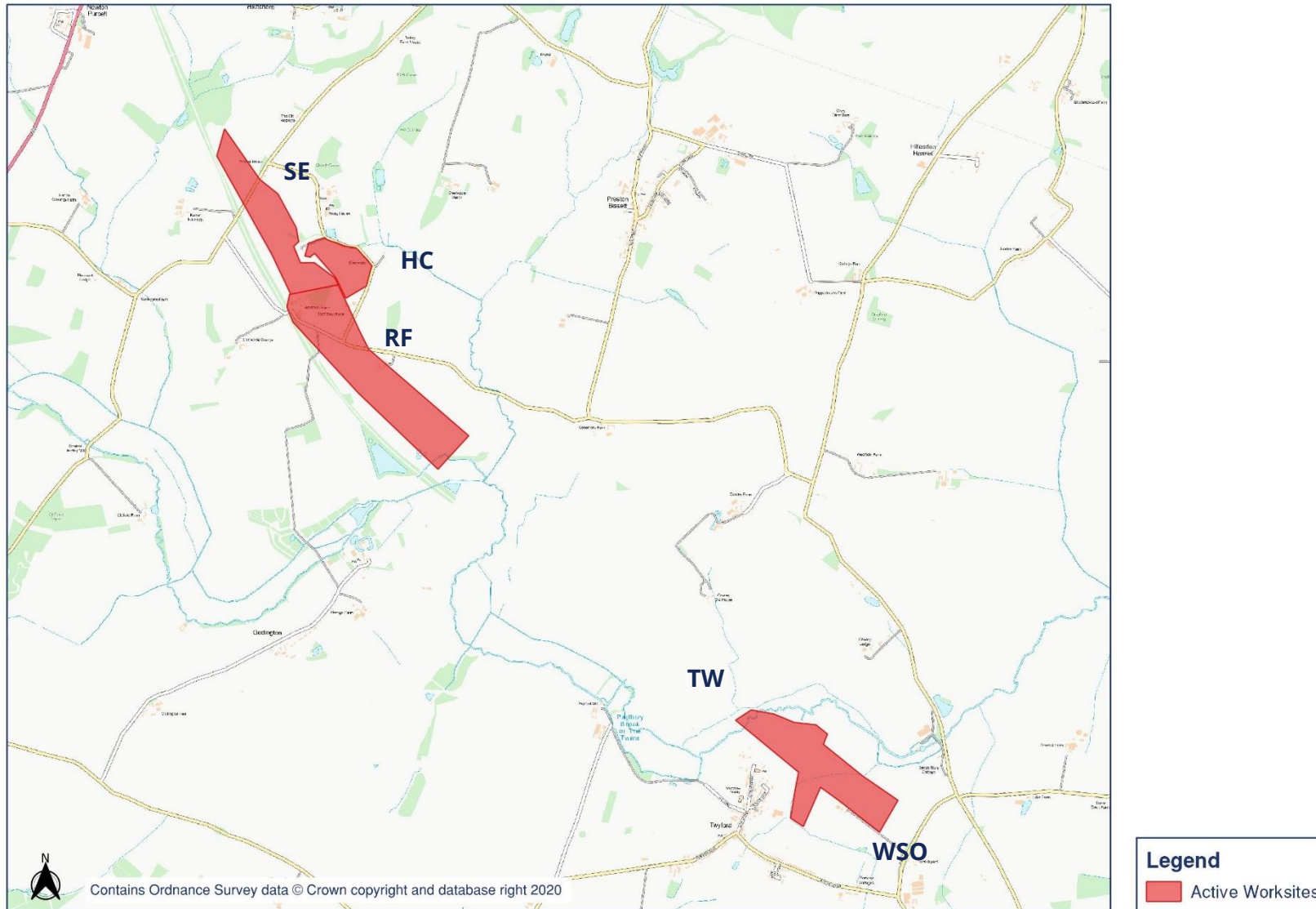


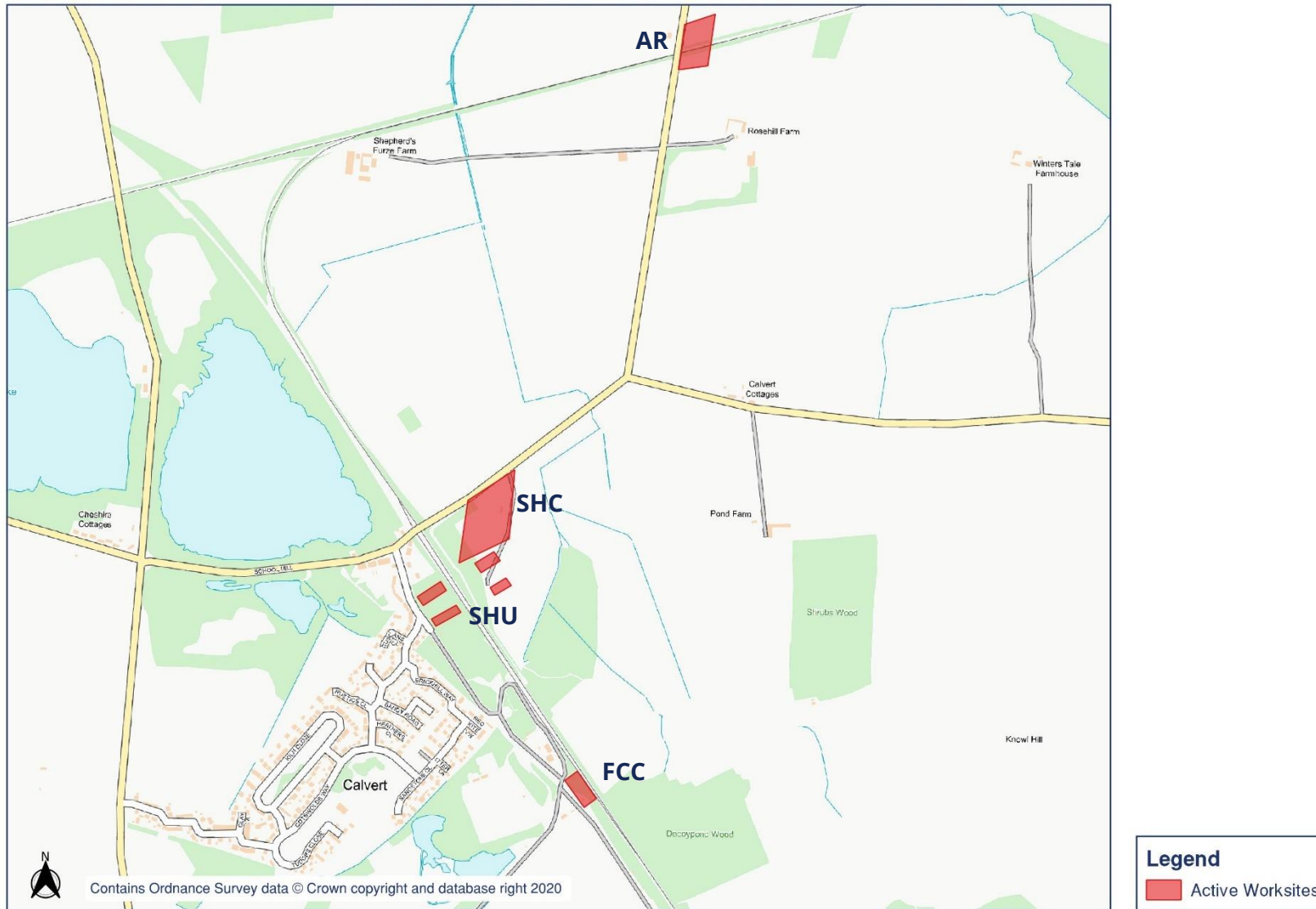
HS2 Worksite Identification Plan - Overview 2

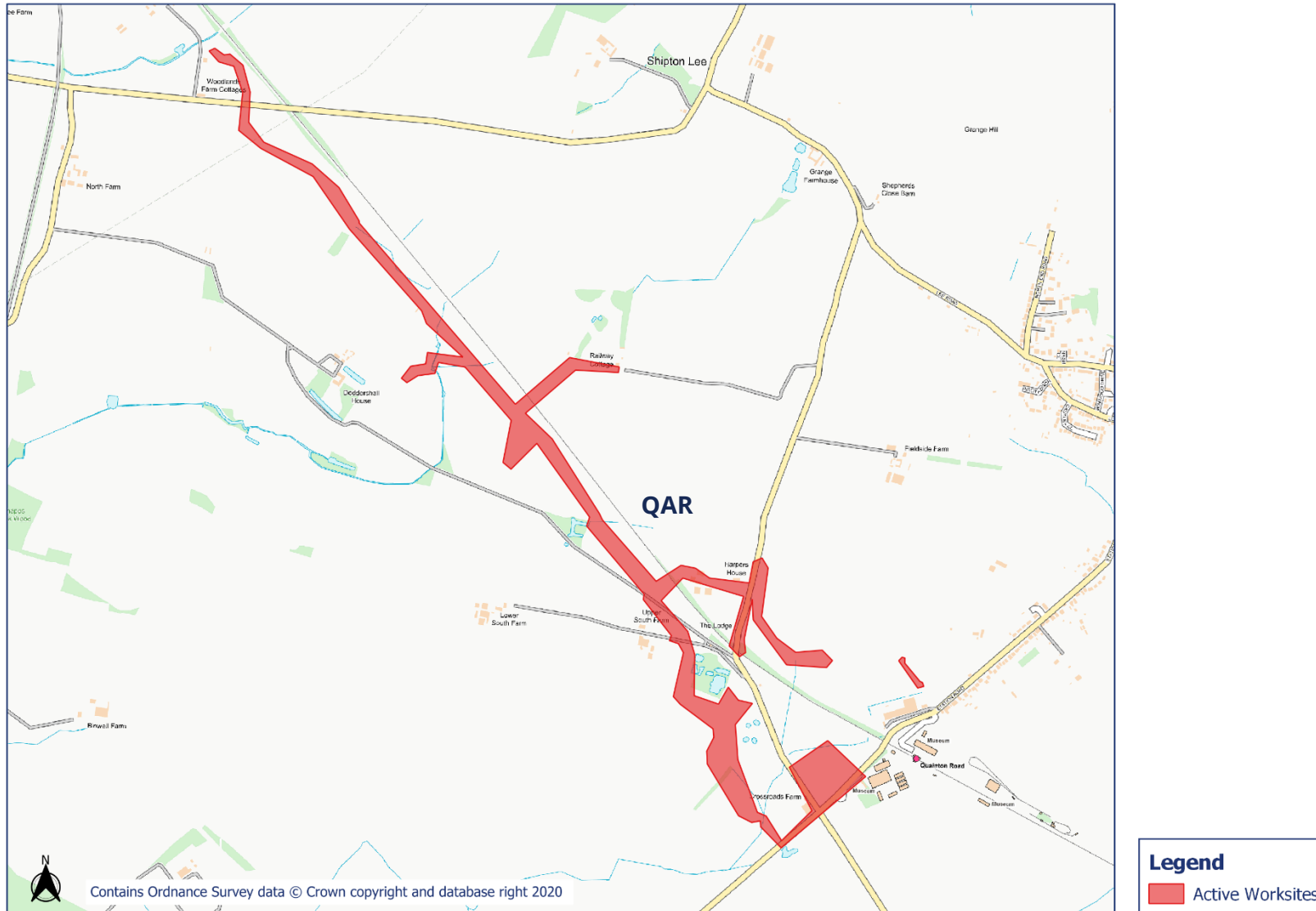


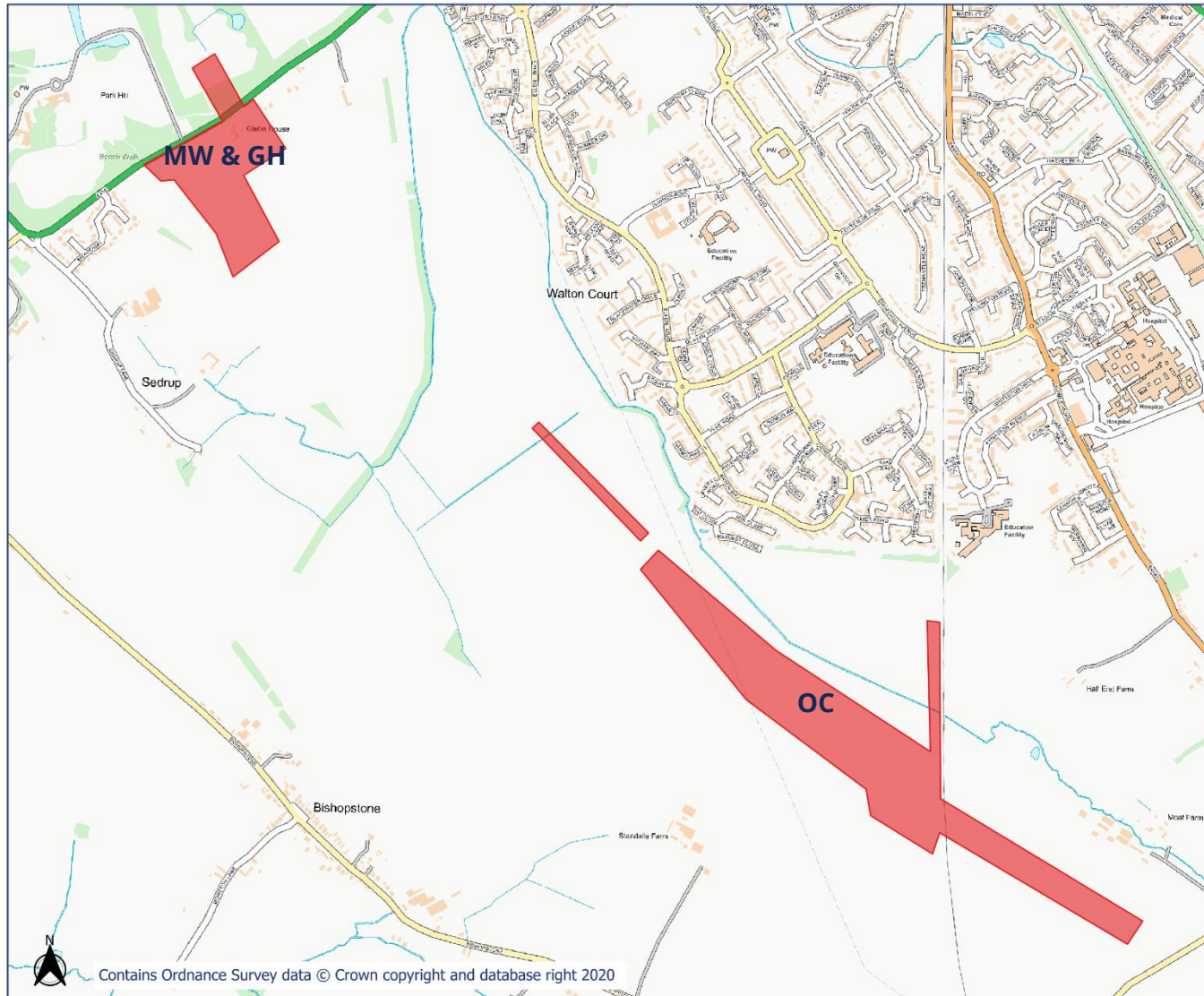
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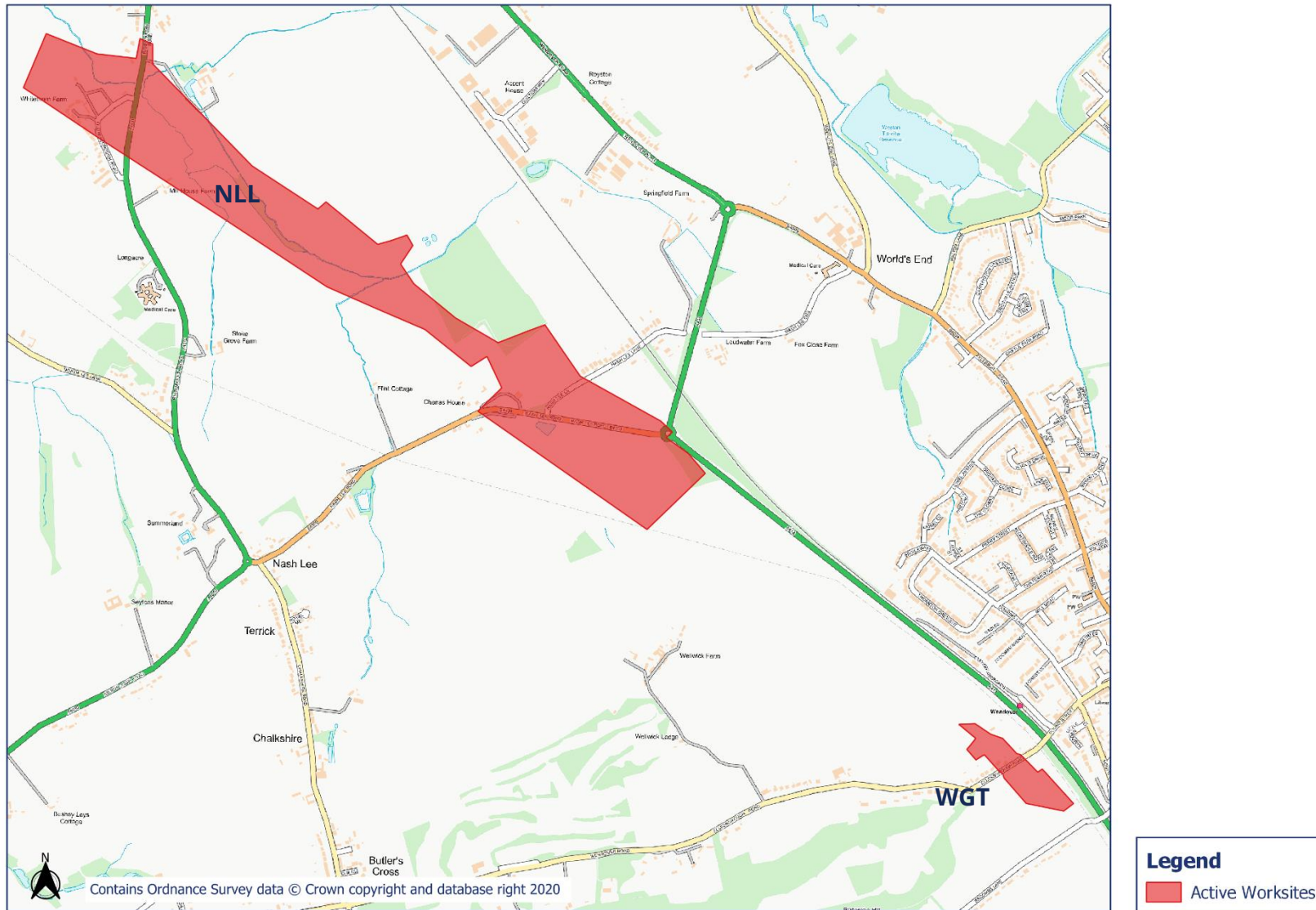


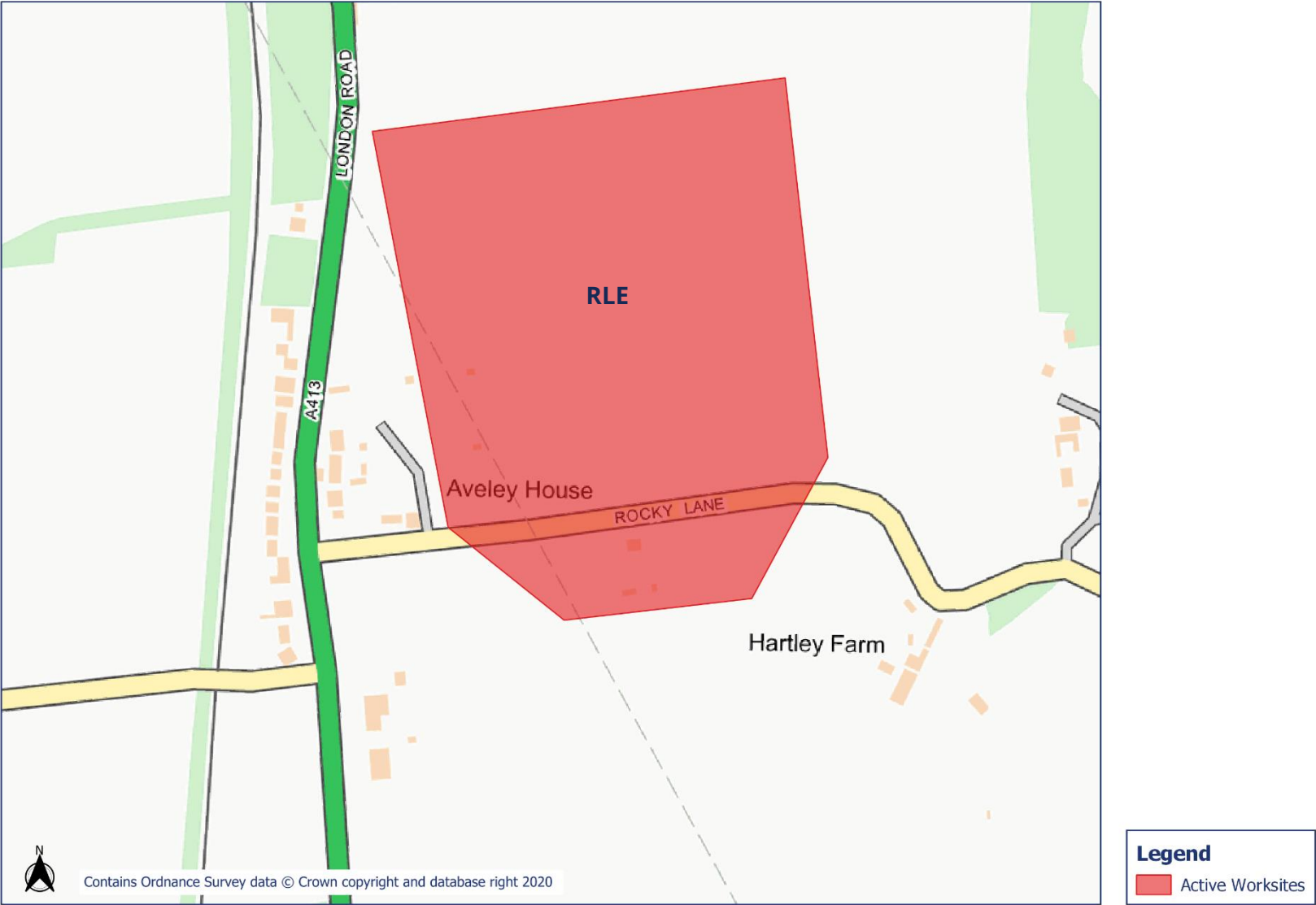


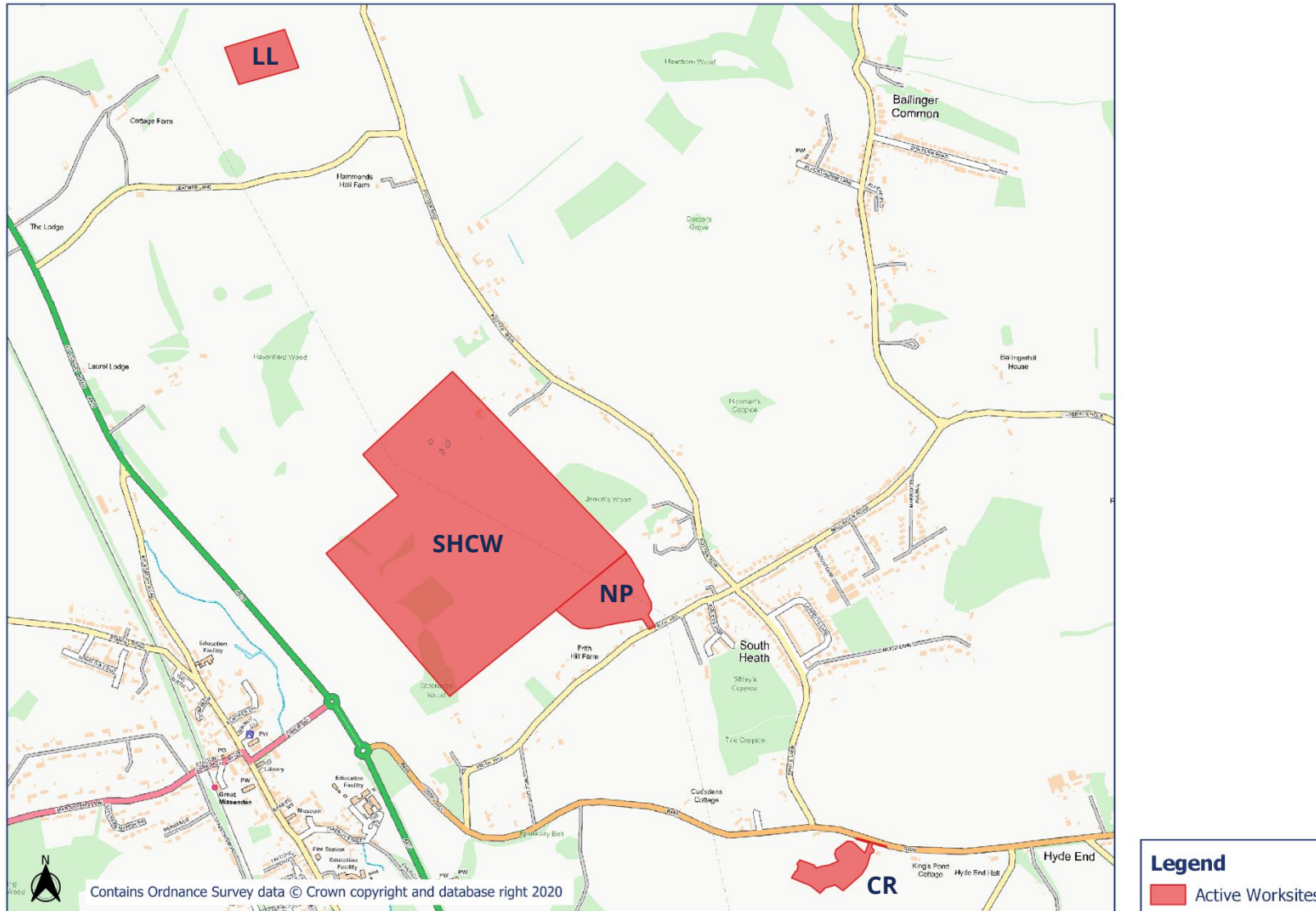




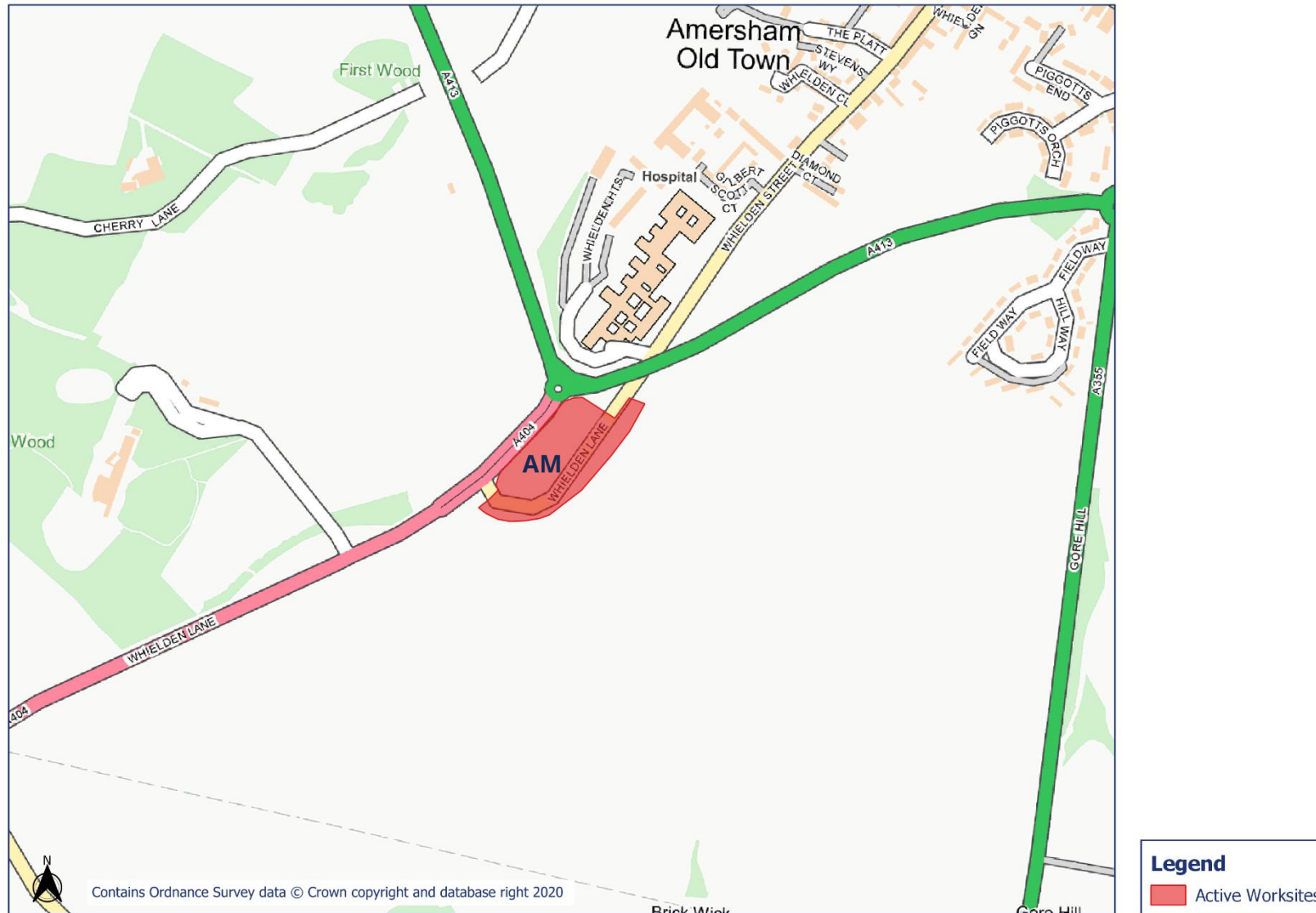
Legend
■ Active Worksites









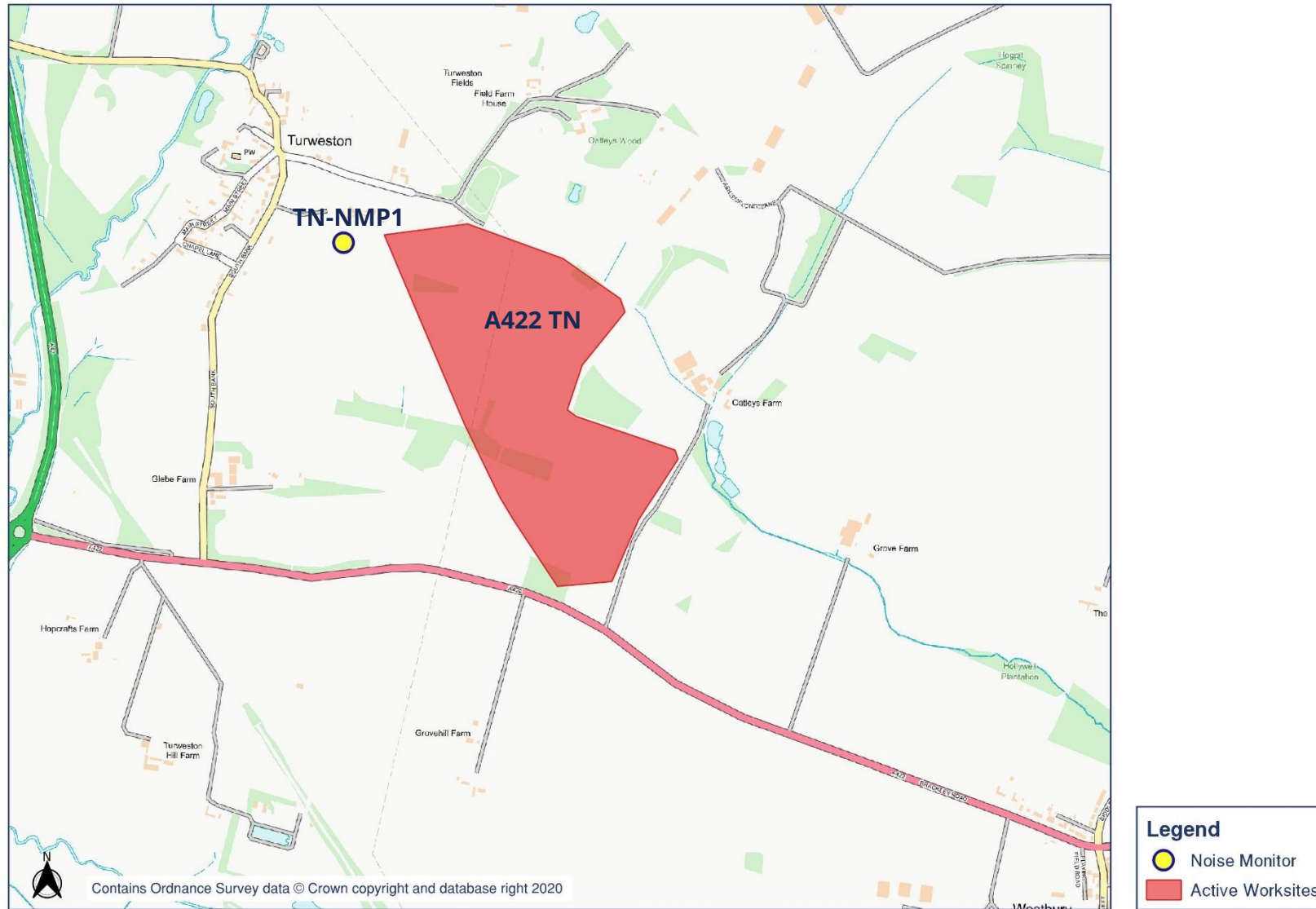


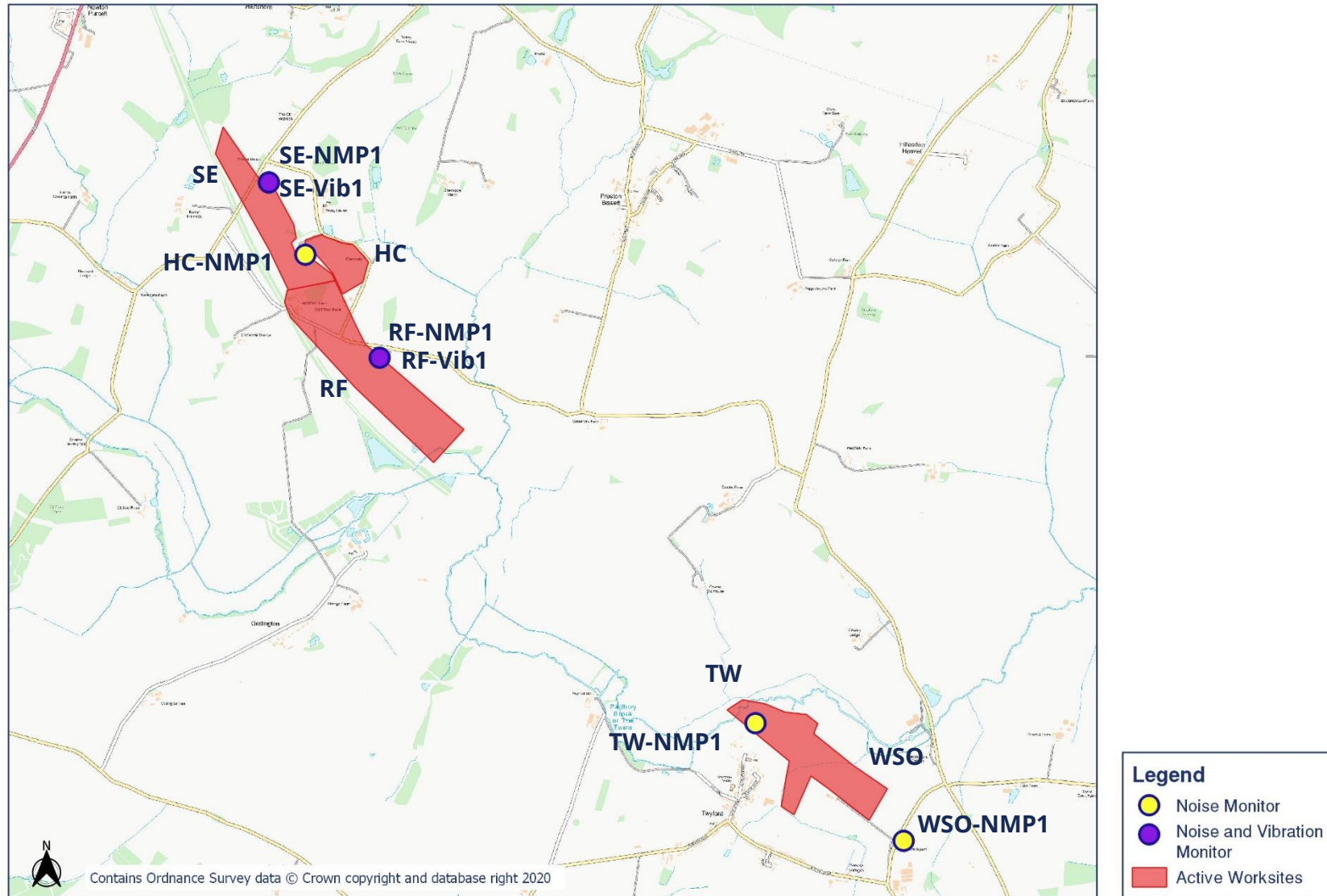


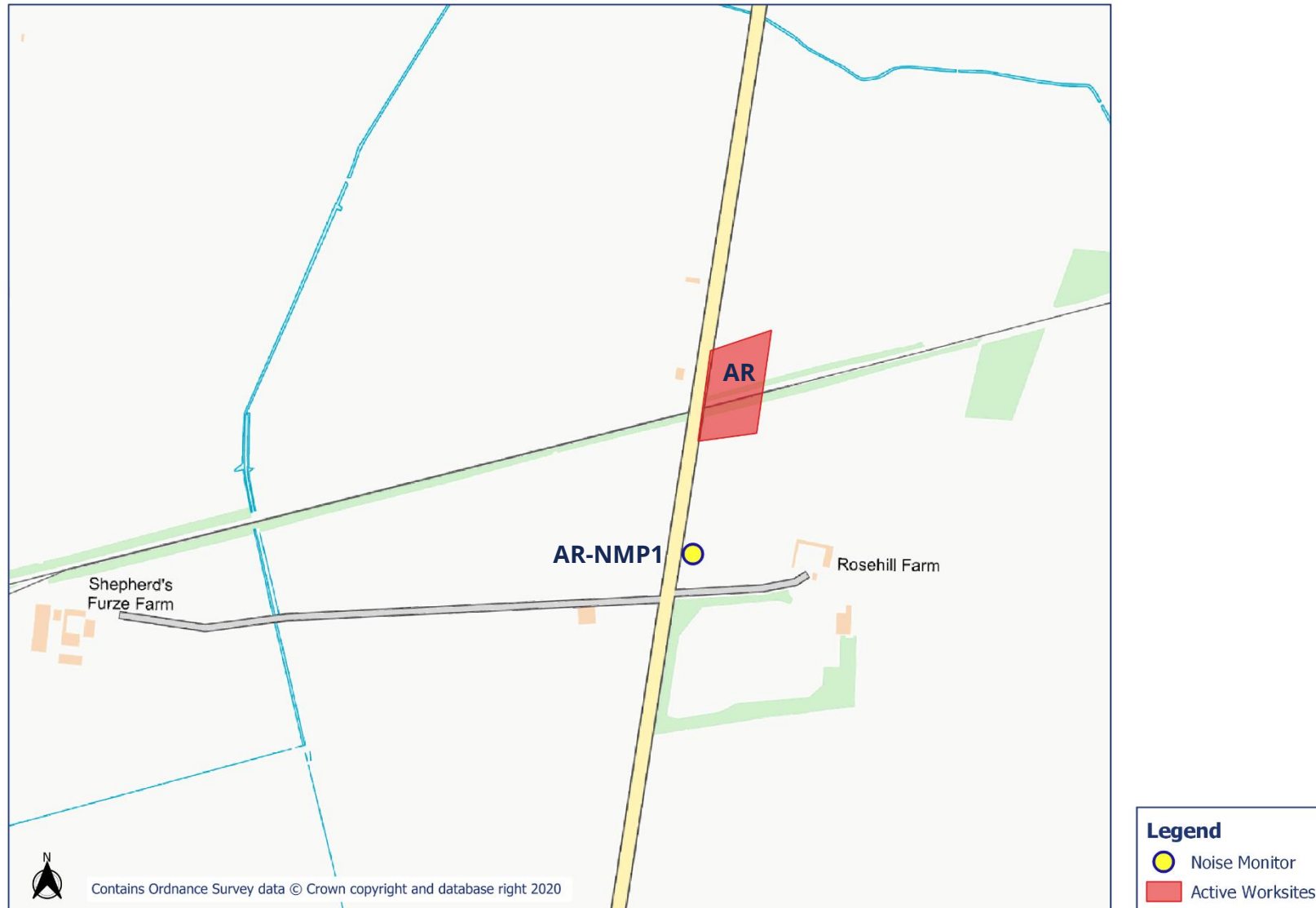


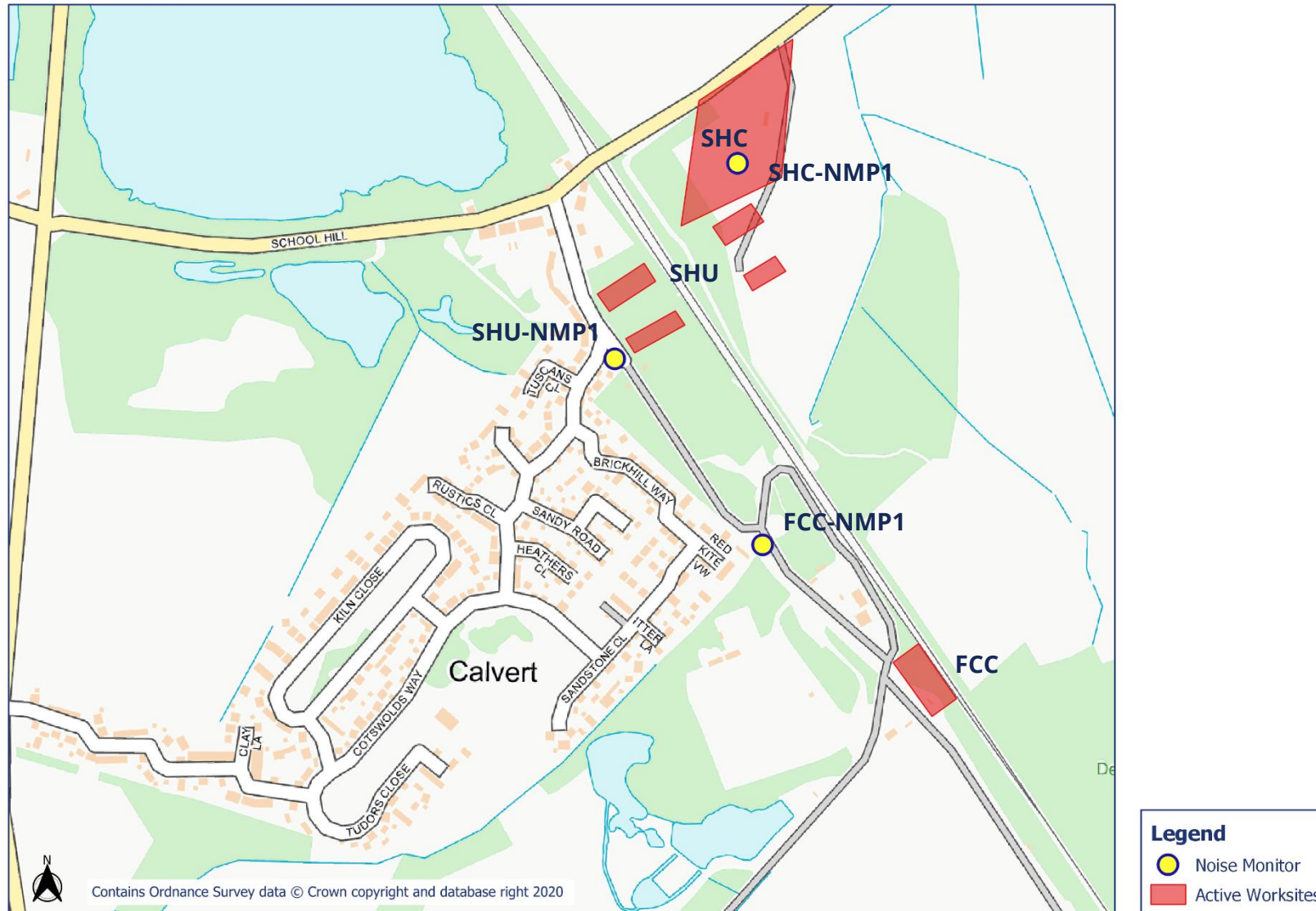


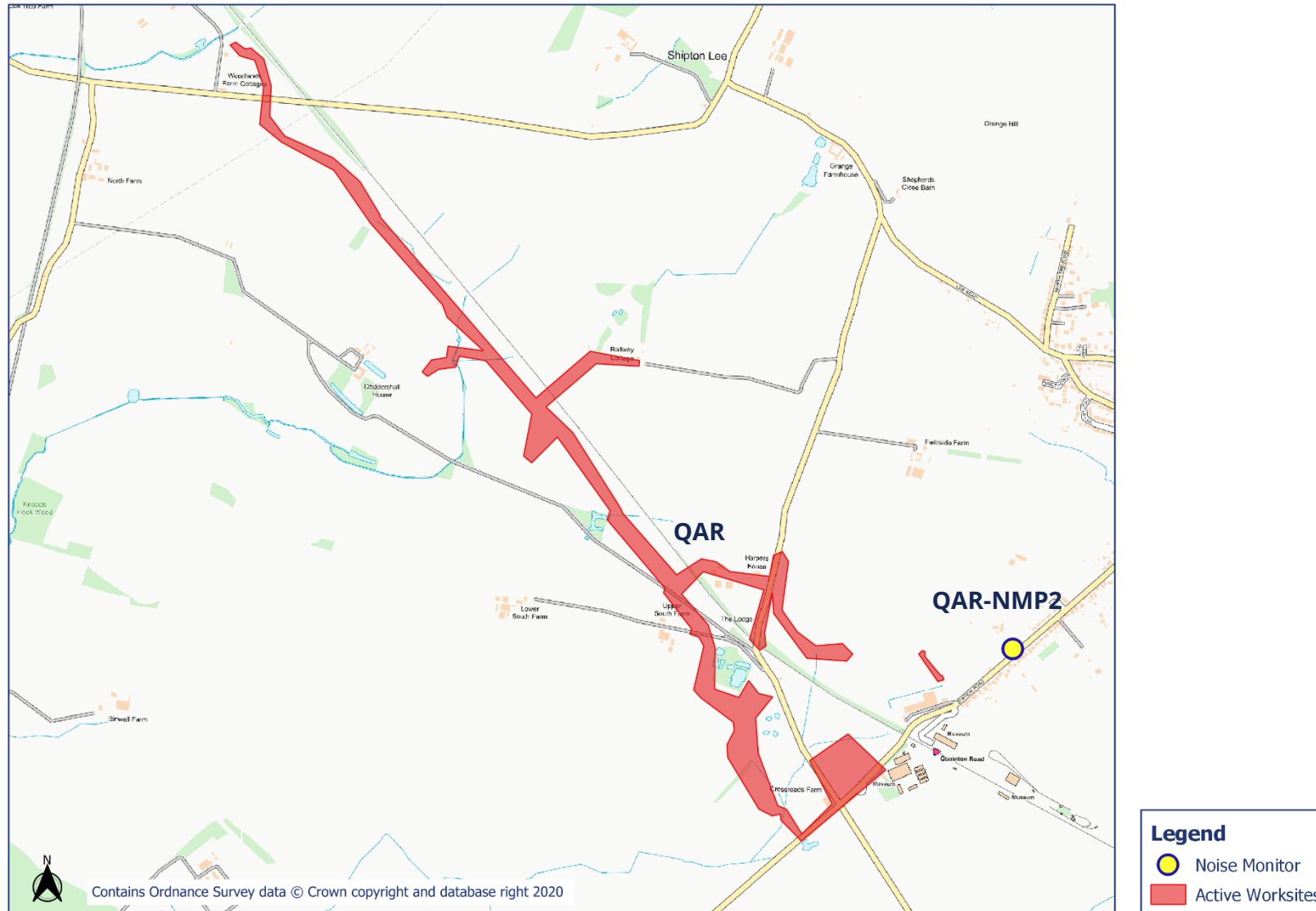
Appendix B Monitoring Locations

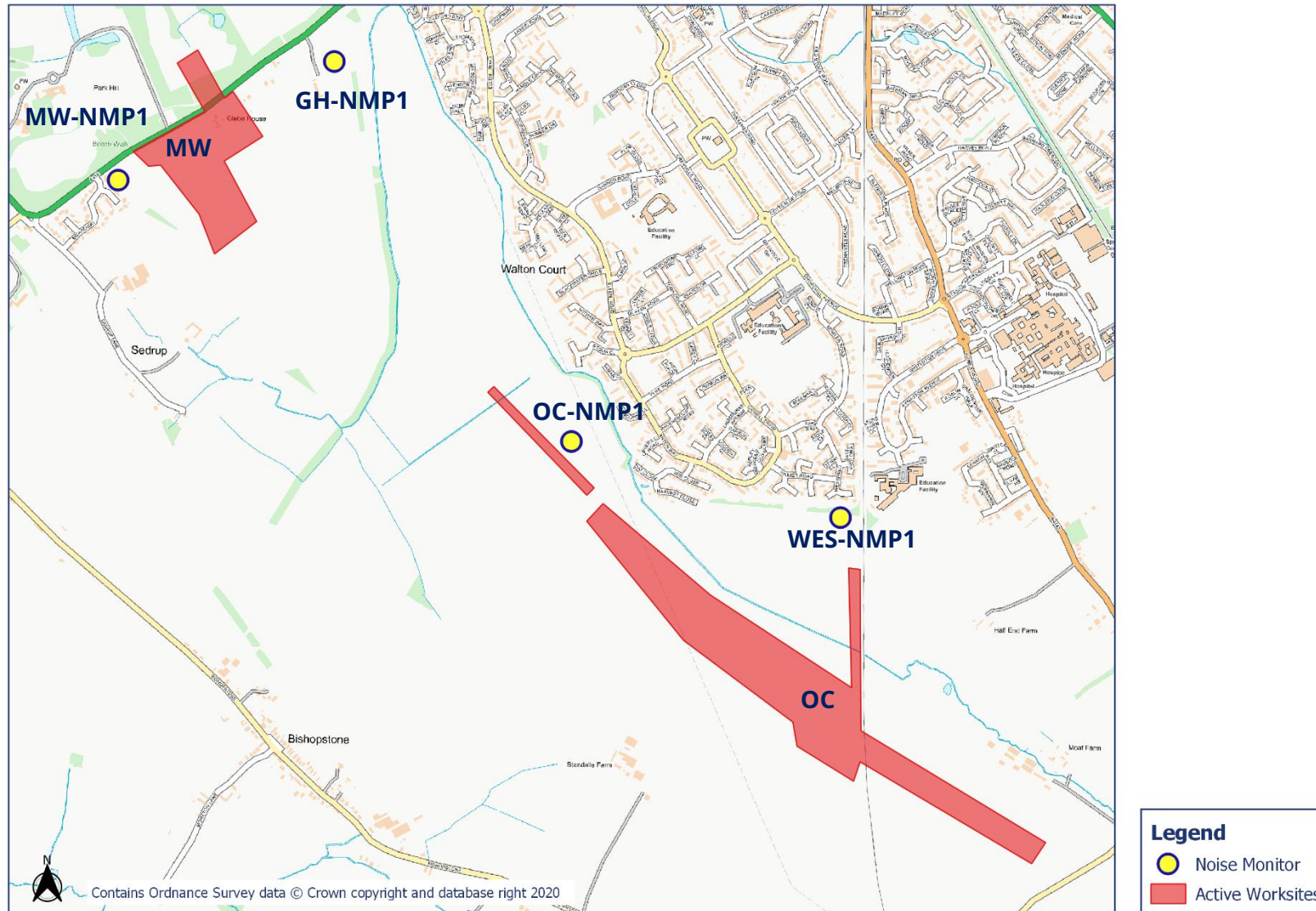


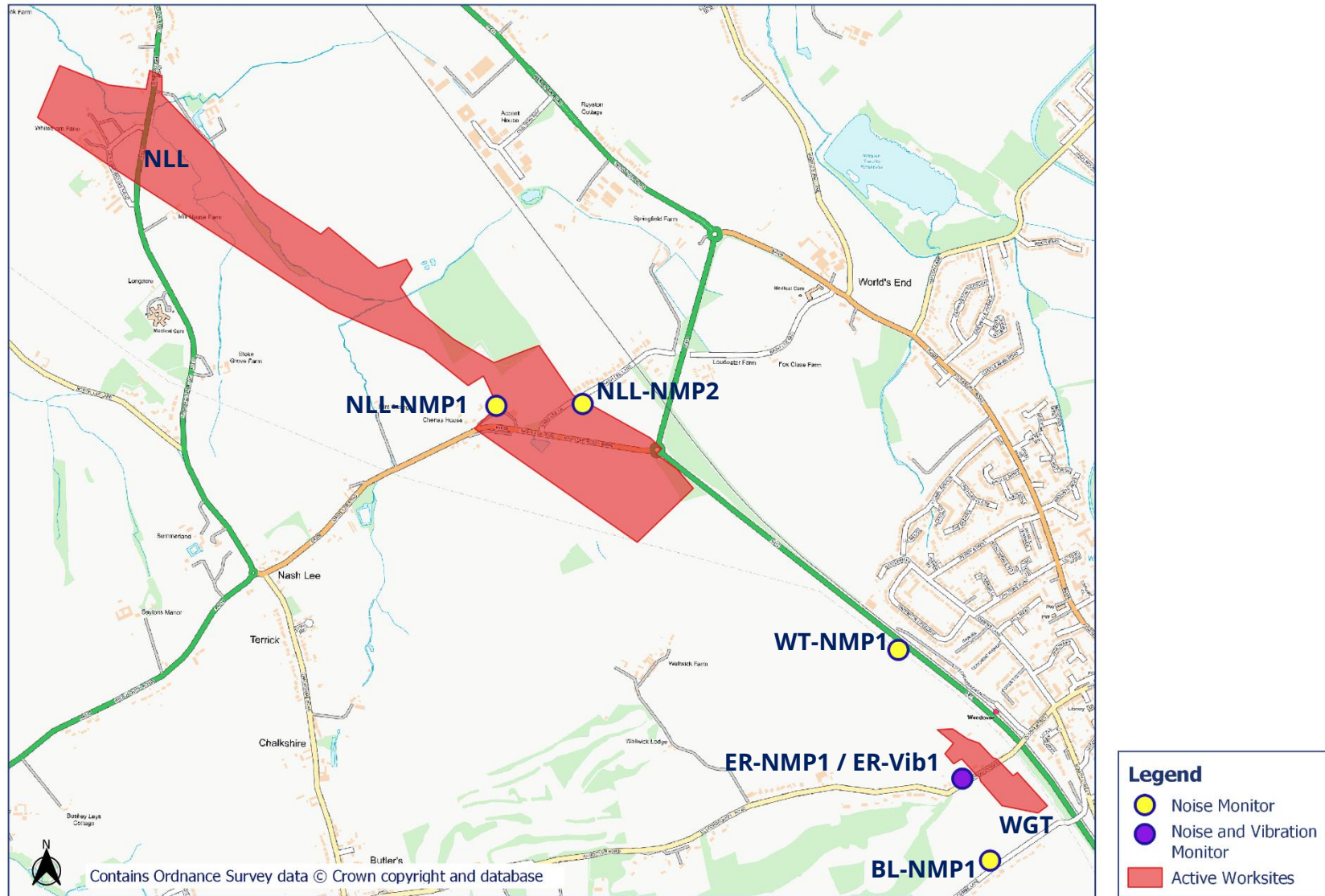


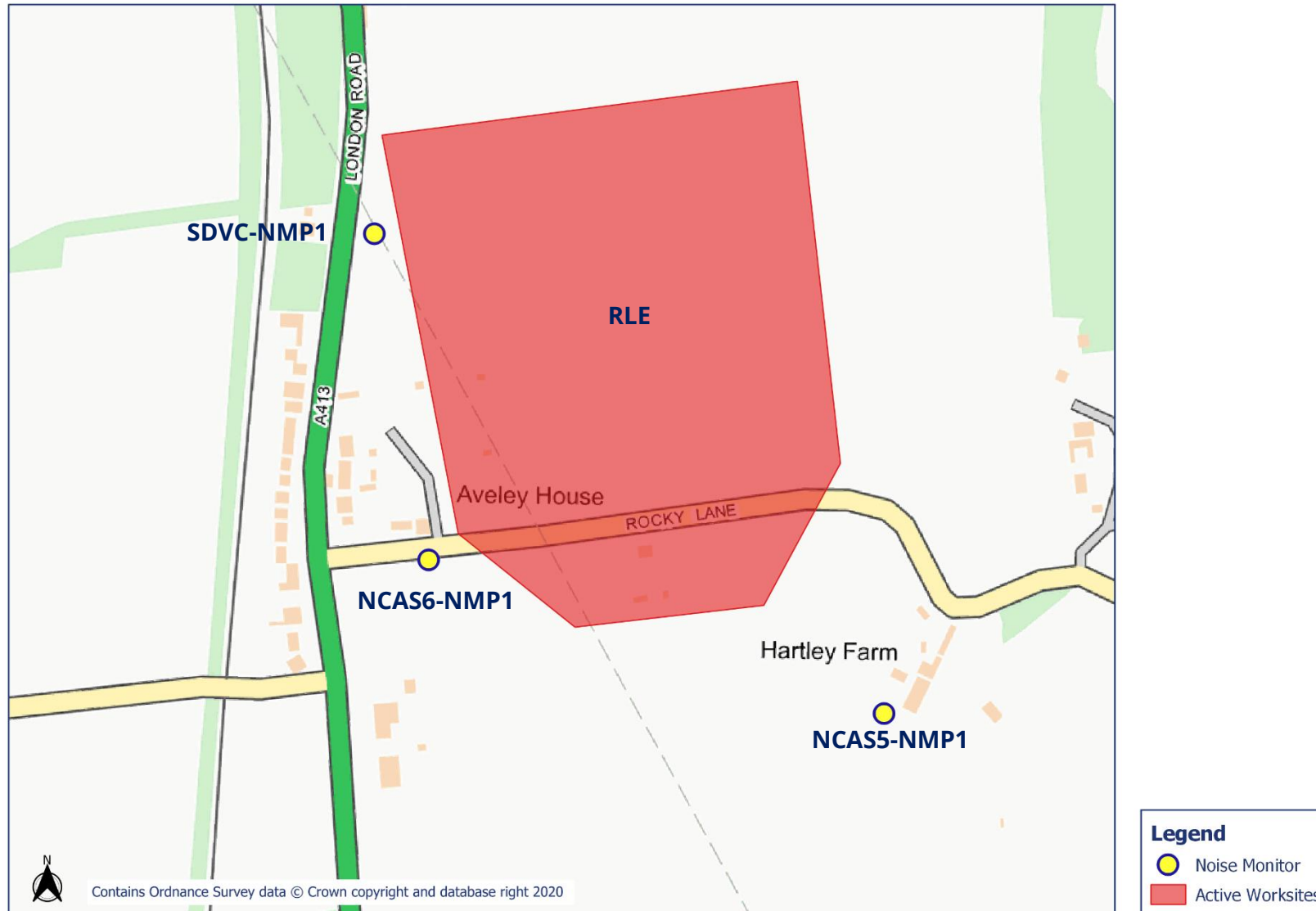


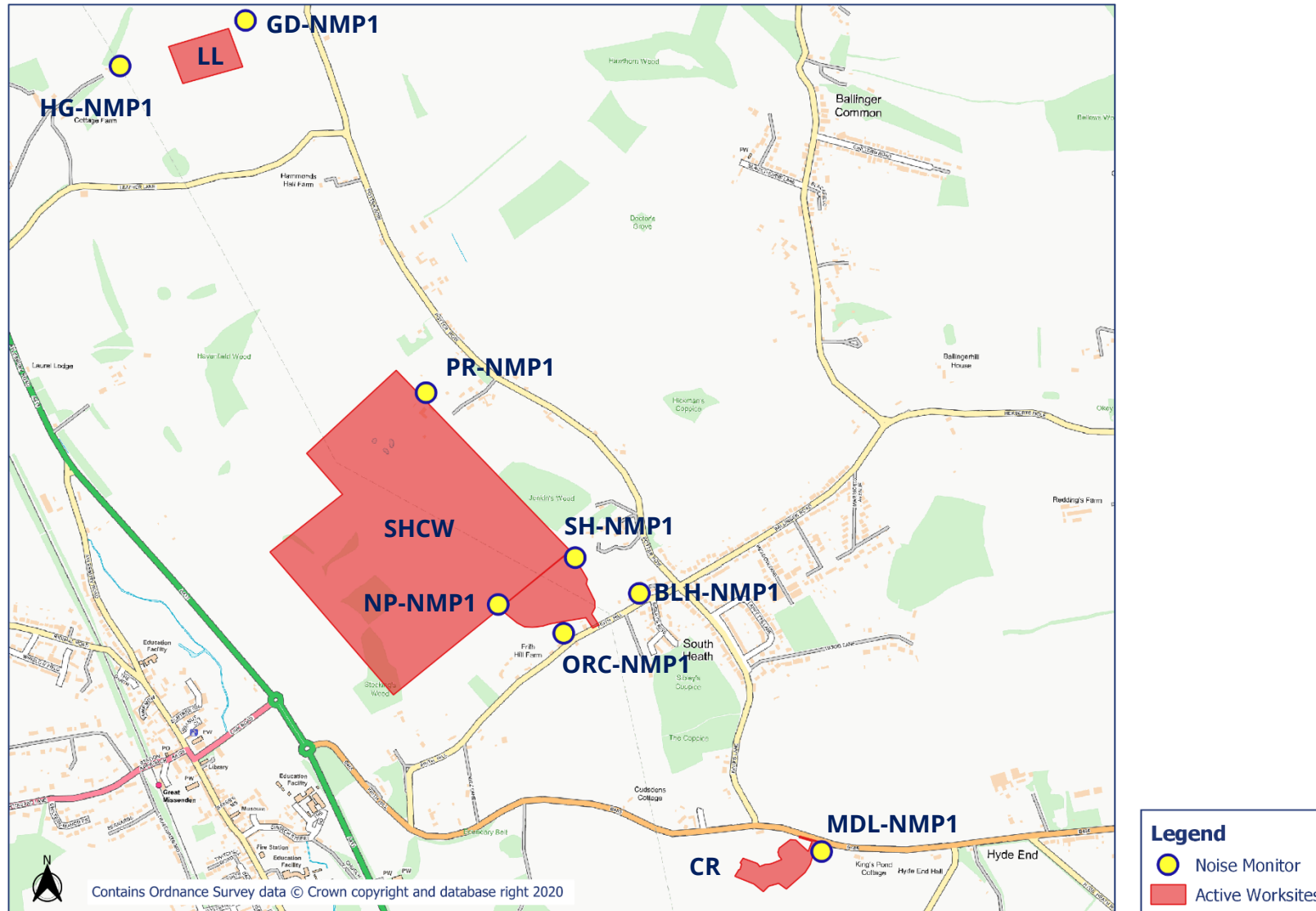






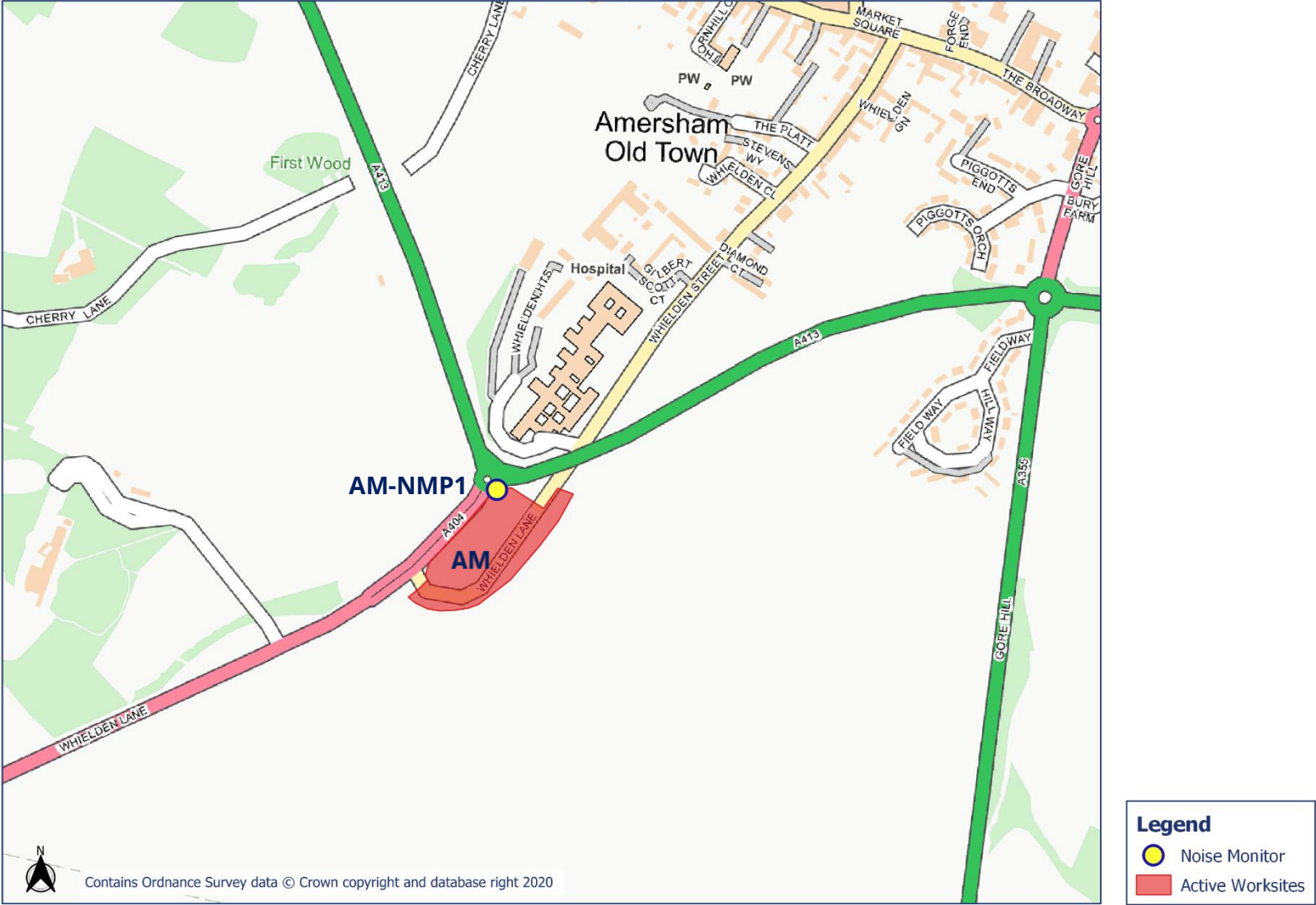


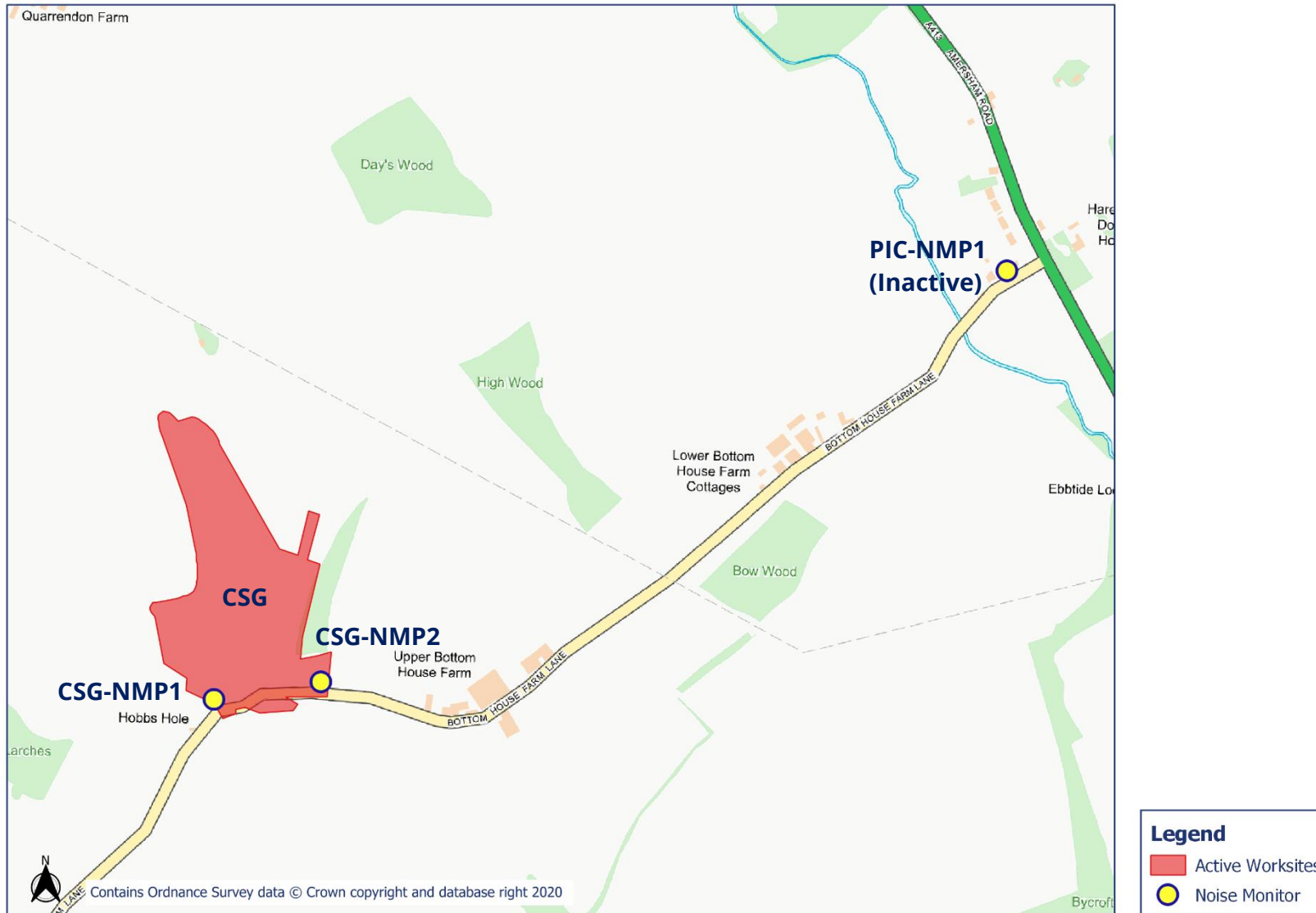




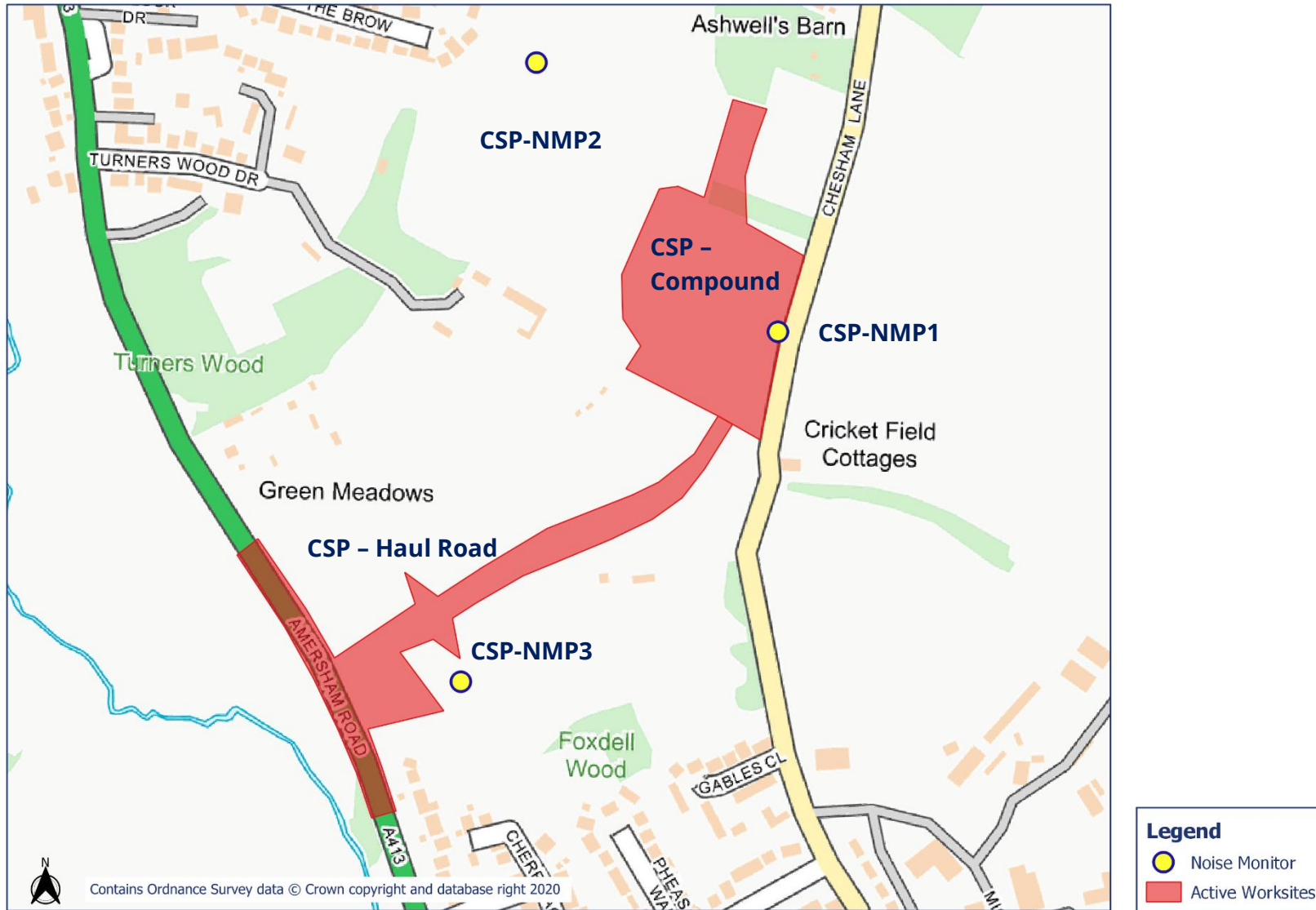


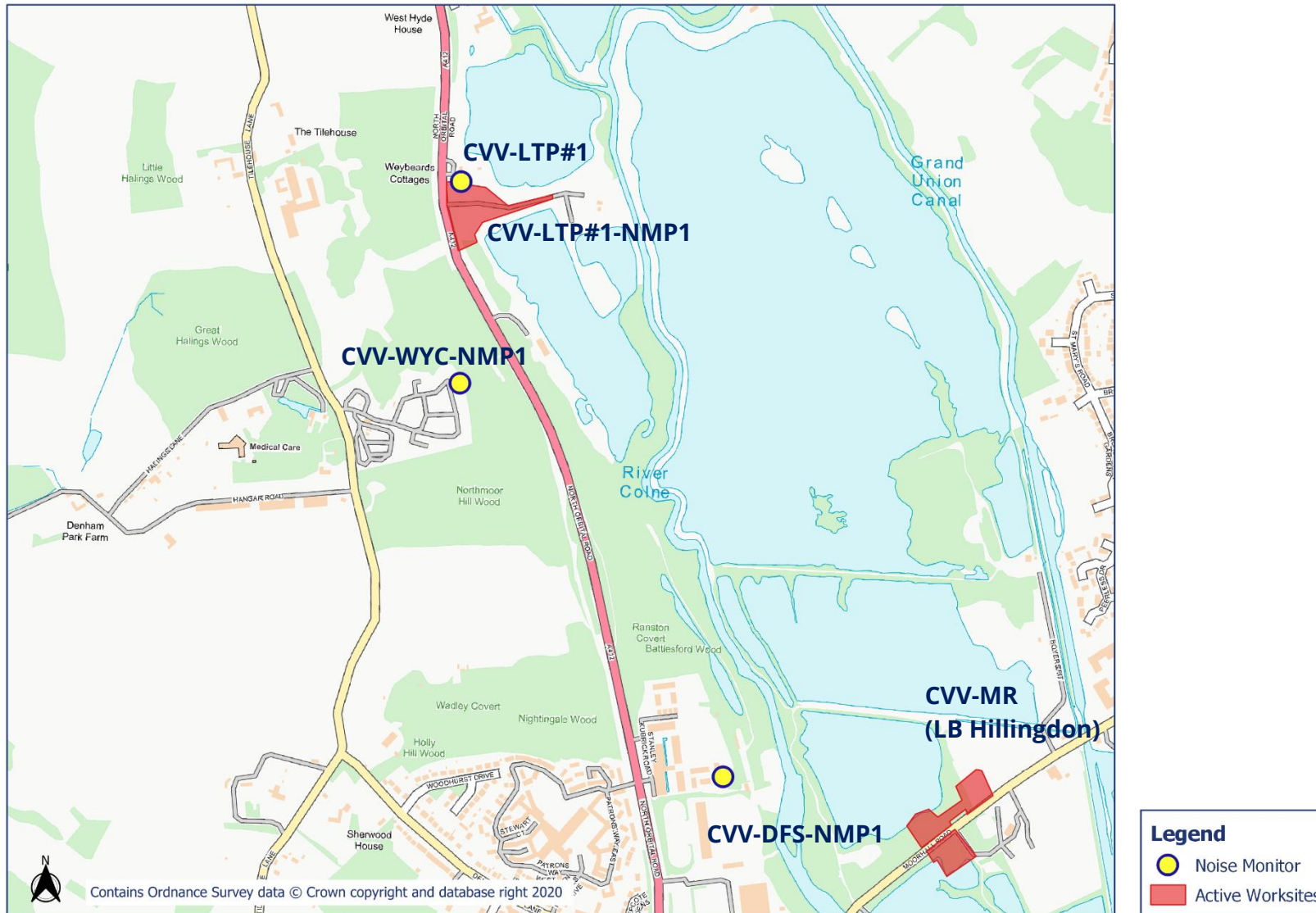
HS2 Noise and Vibration Monitoring Plan - 11

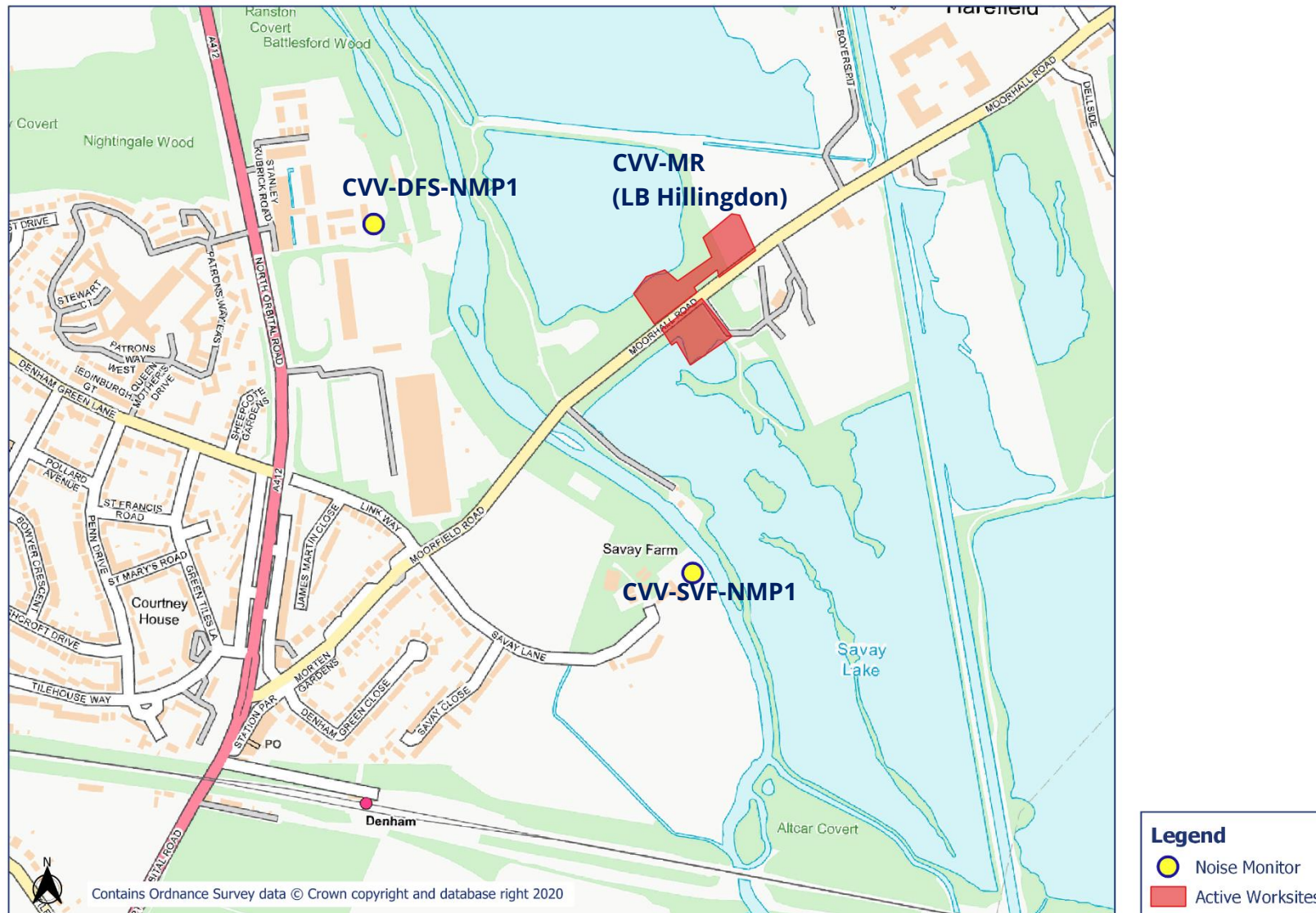




HS2 Noise and Vibration Monitoring Plan - 13





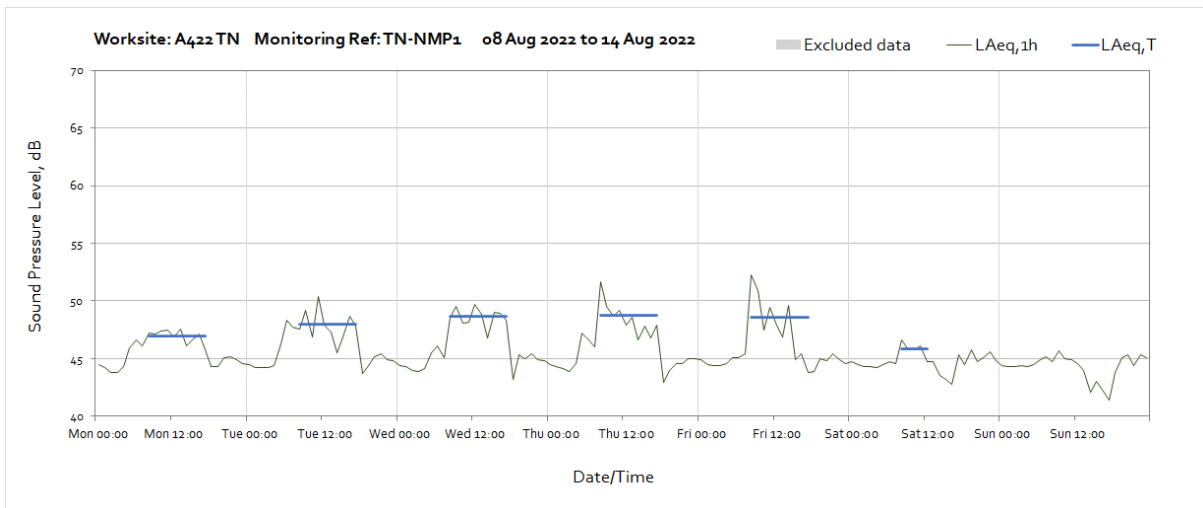
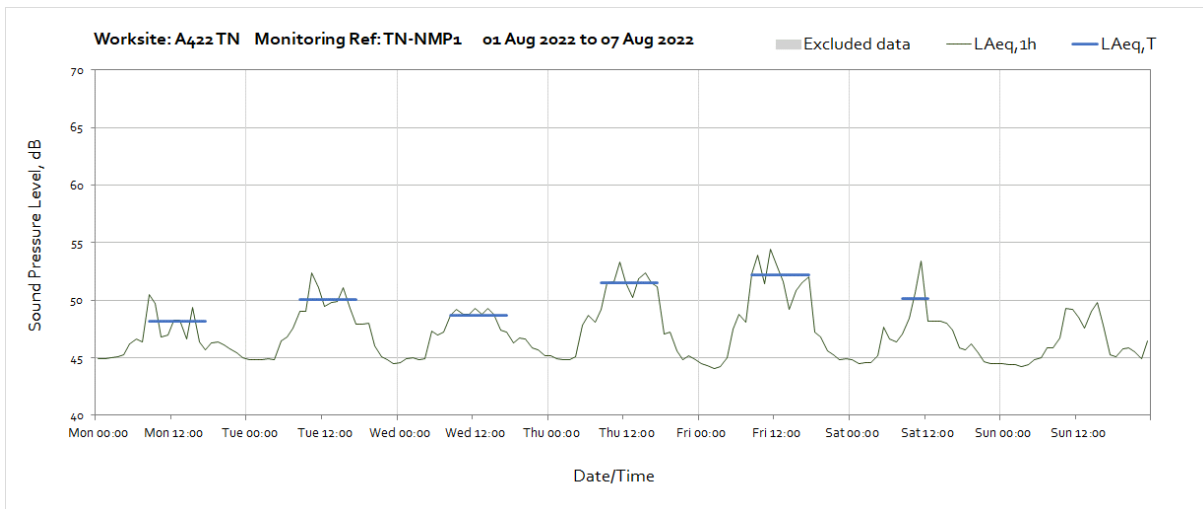


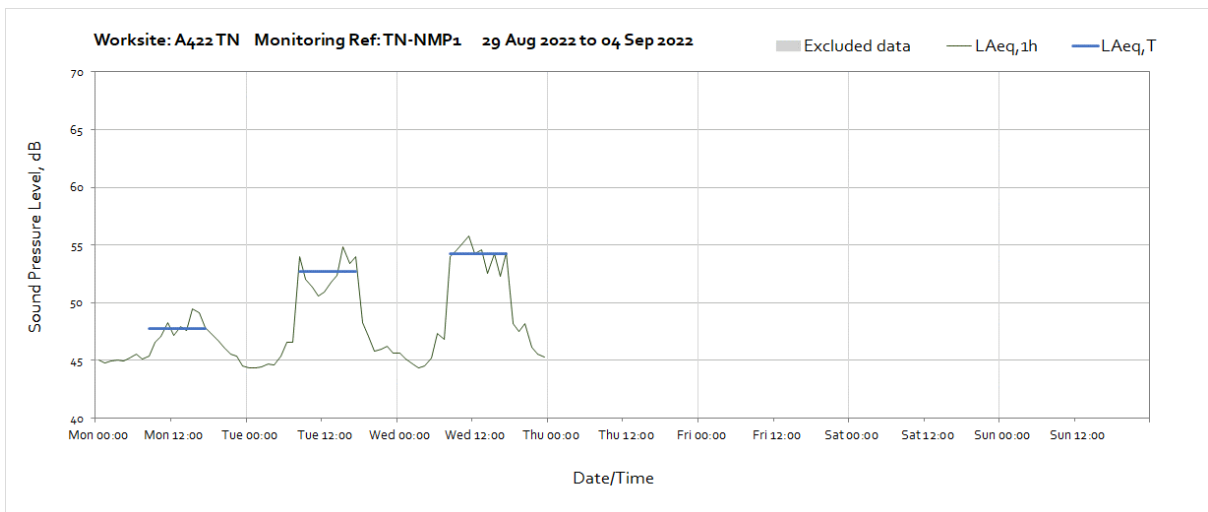
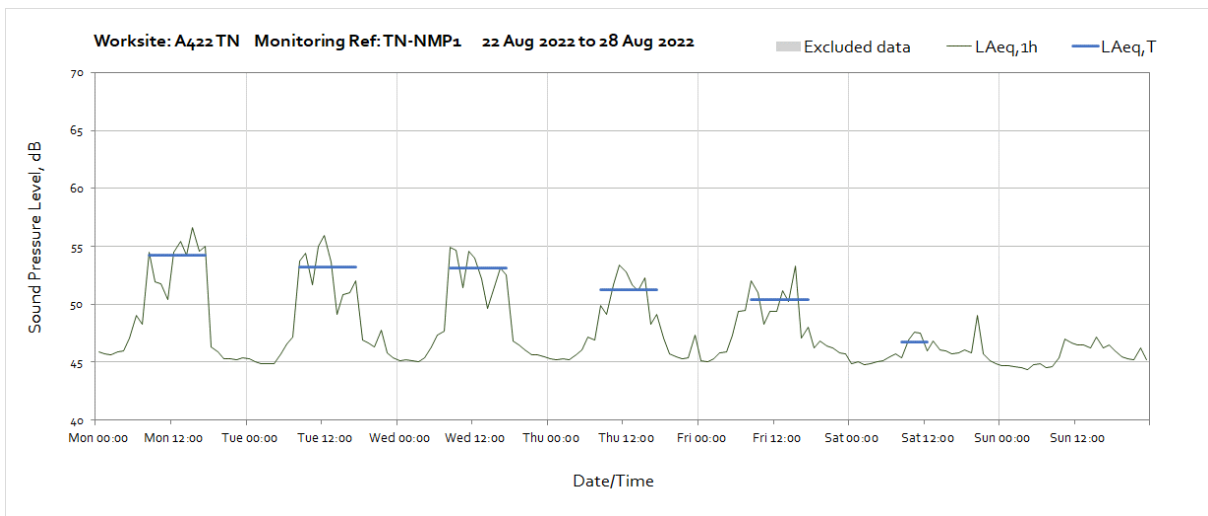
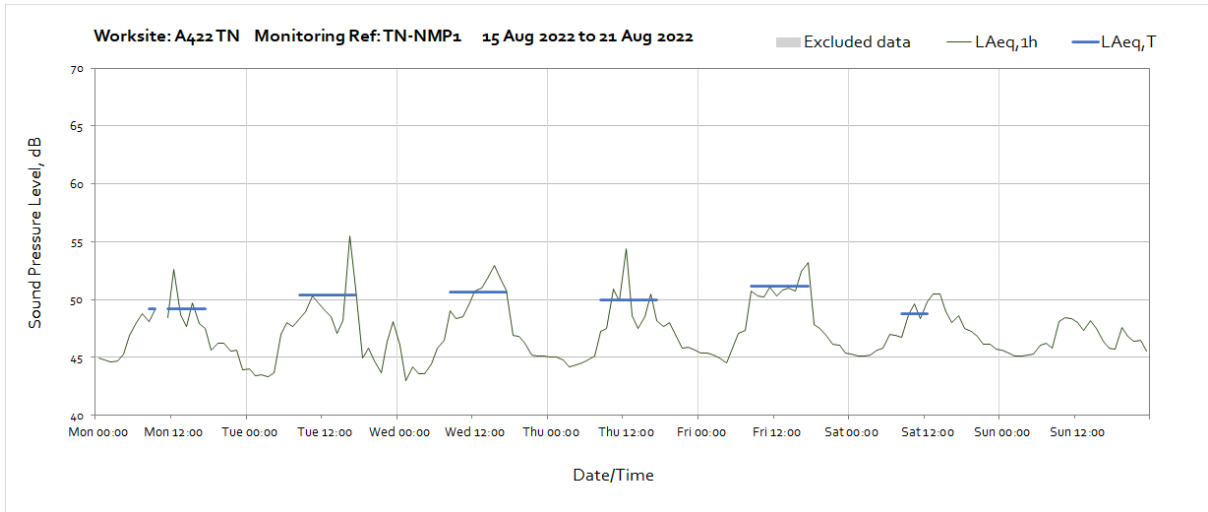
Appendix C Data

Noise

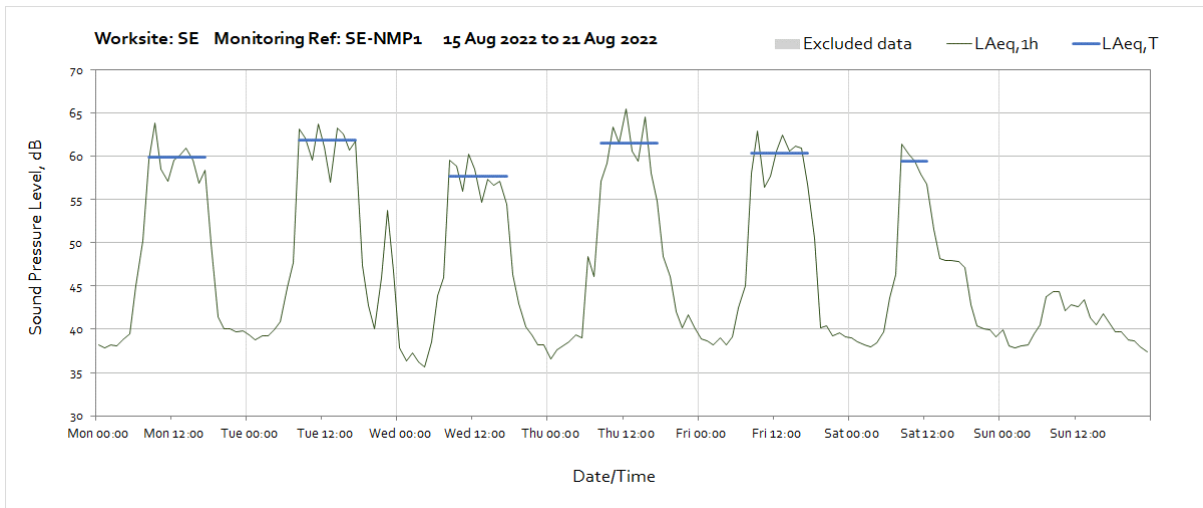
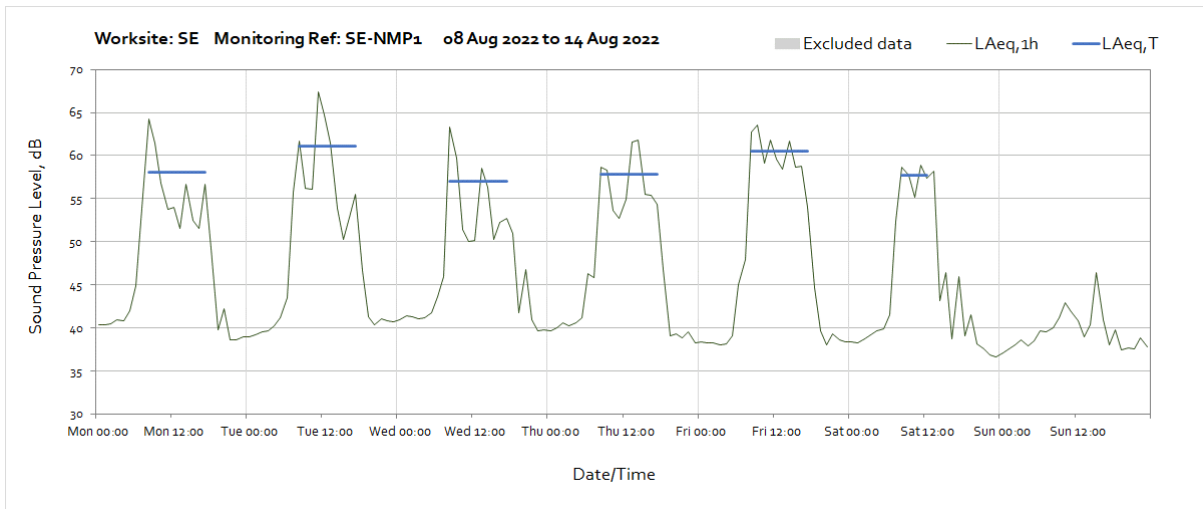
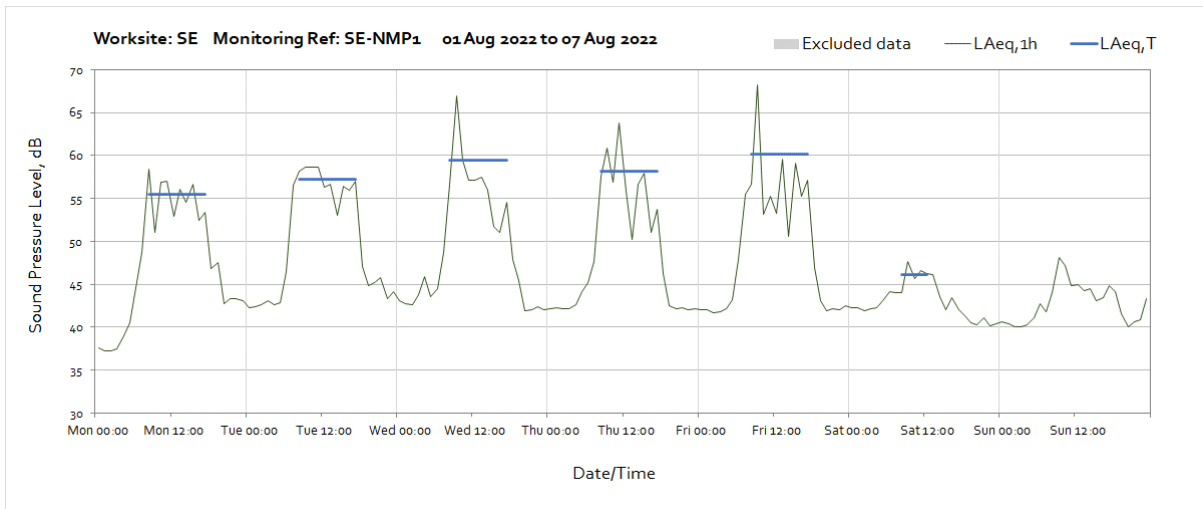
The following graphs show the hourly measured ambient noise level $L_{Aeq,1h}$ and, where relevant, the averaged noise level $L_{Aeq,T}$ values, where the time period T is as specified in Table 1 of HS2 Information Paper E23. Periods with adversely weather affected noise levels are greyed out and have been excluded from the calculation of the $L_{Aeq,T}$ values in Table 3 of the main report.

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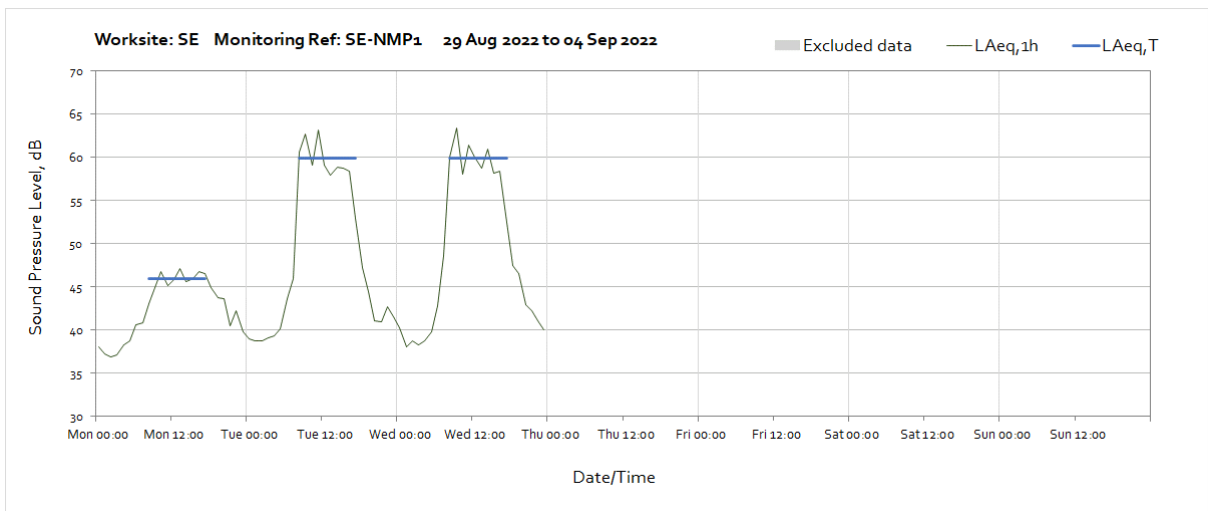
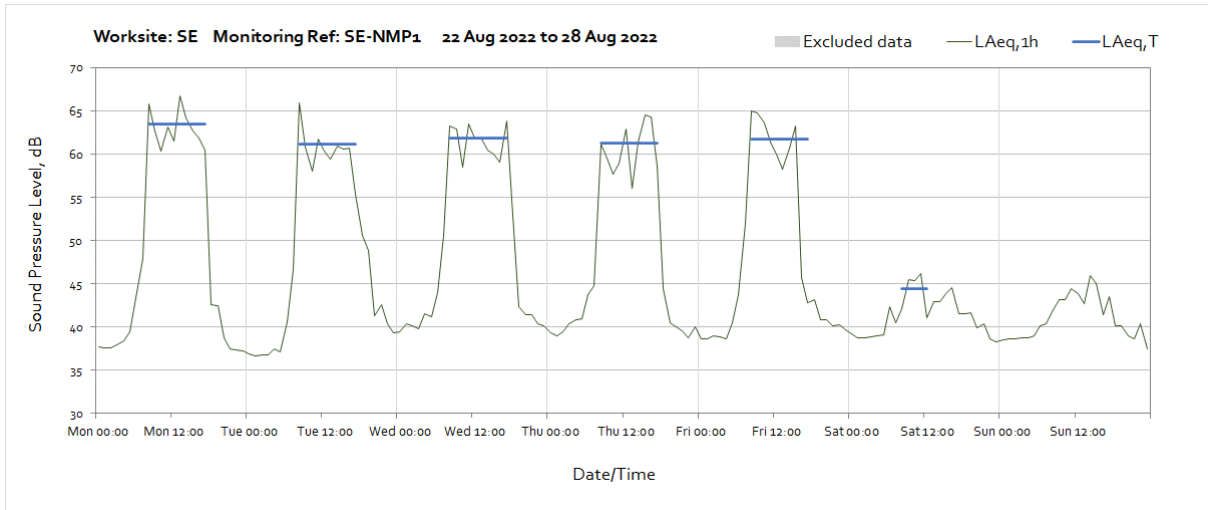




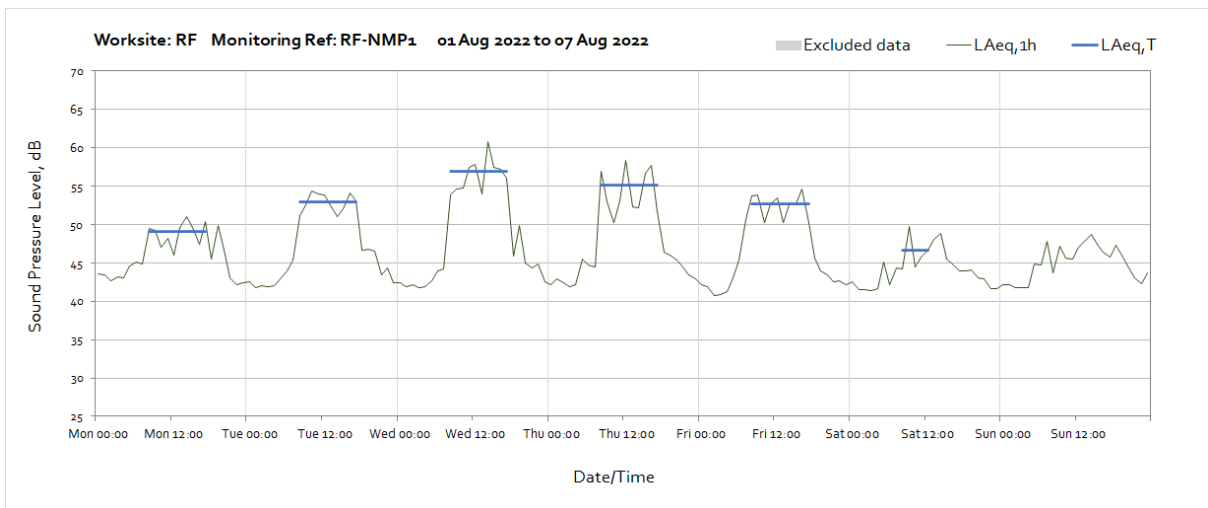
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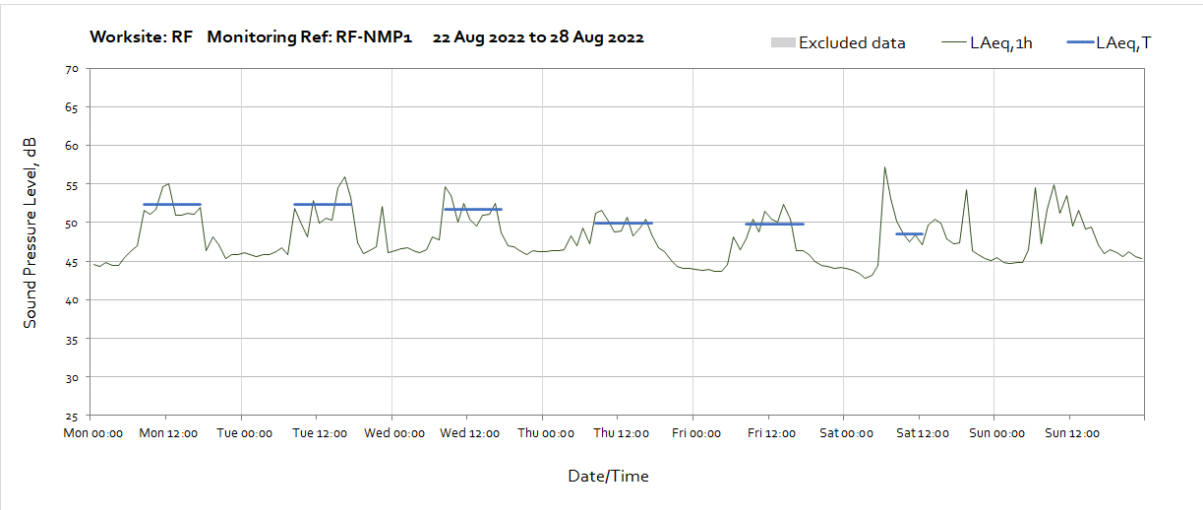
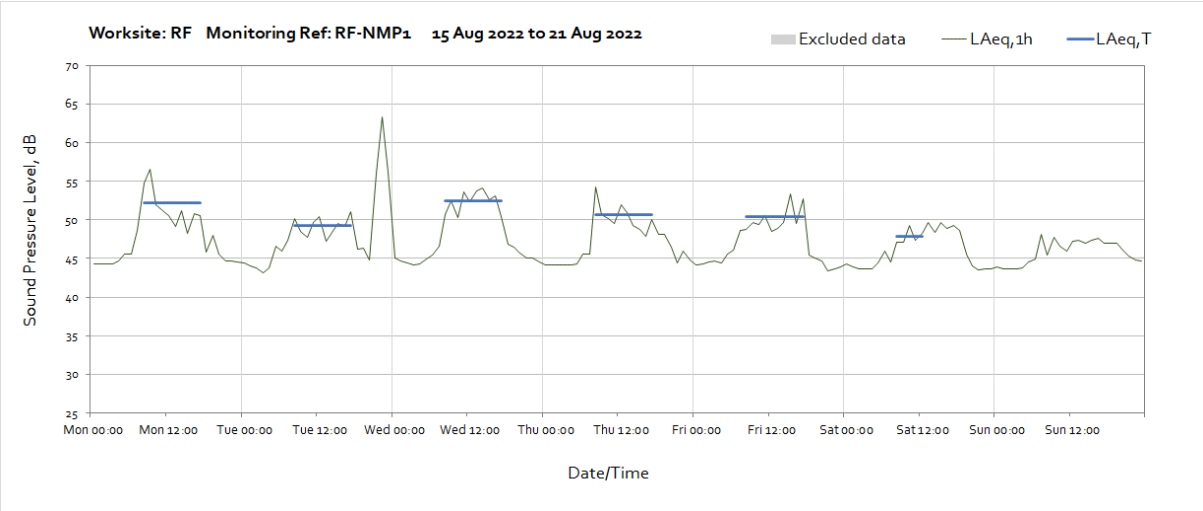
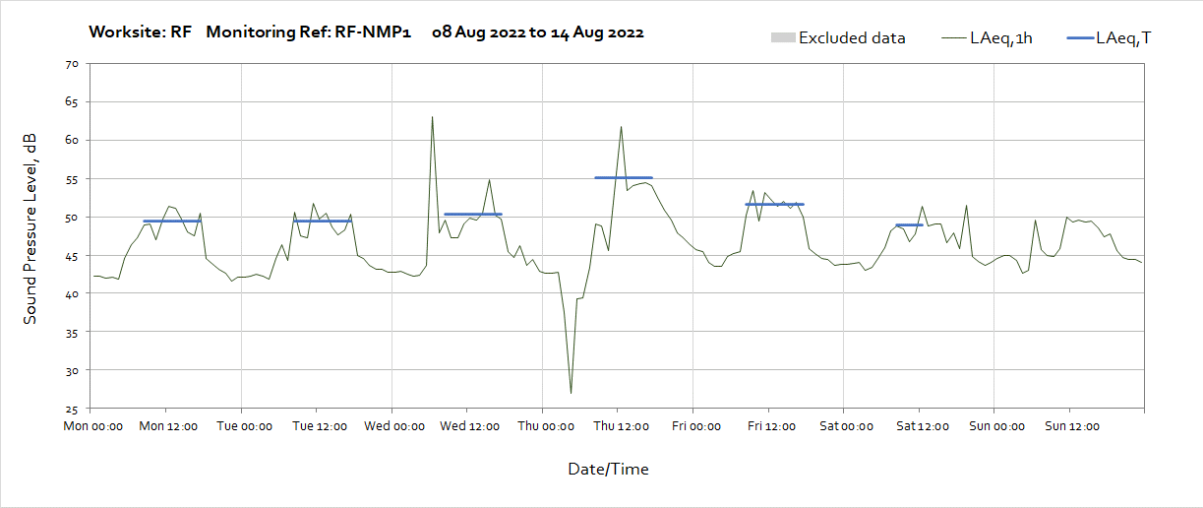


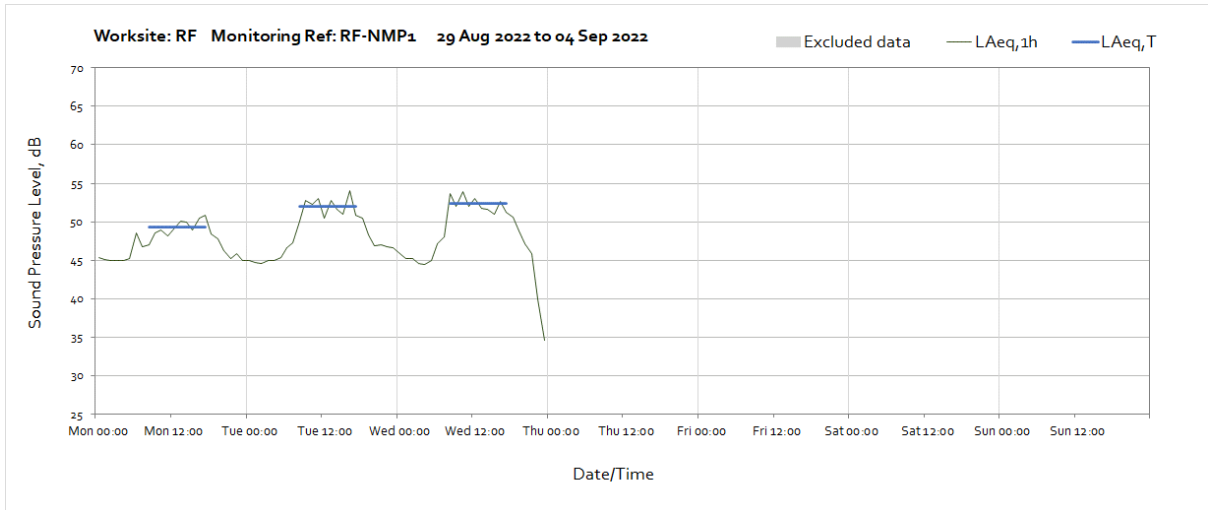
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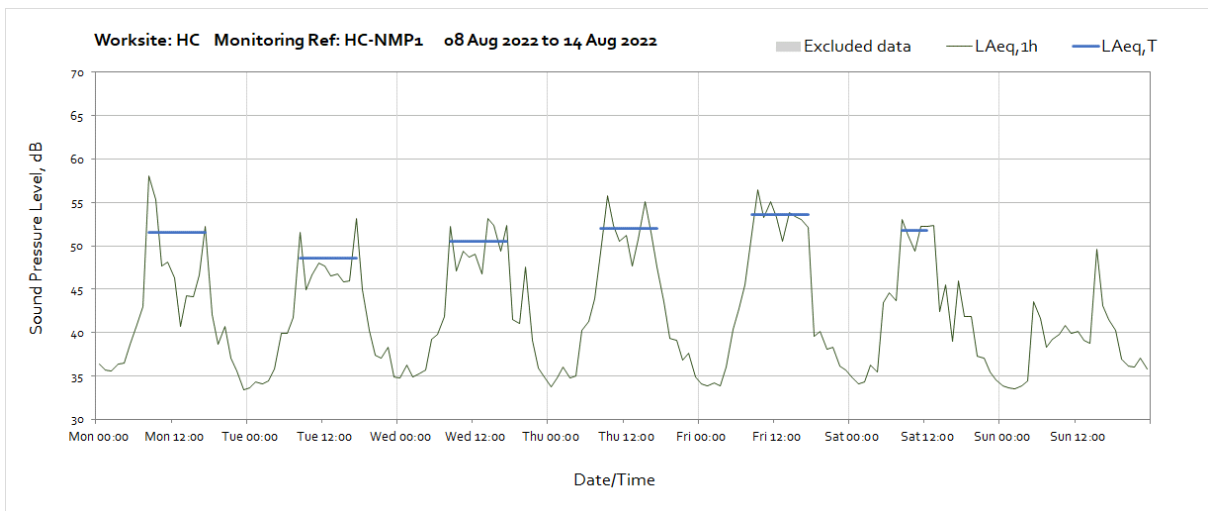
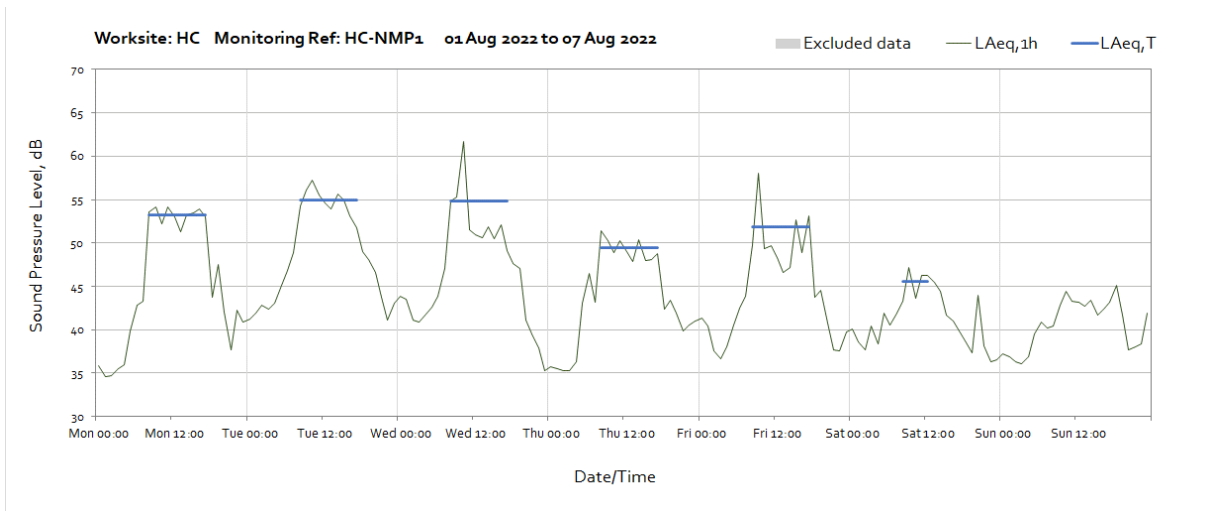
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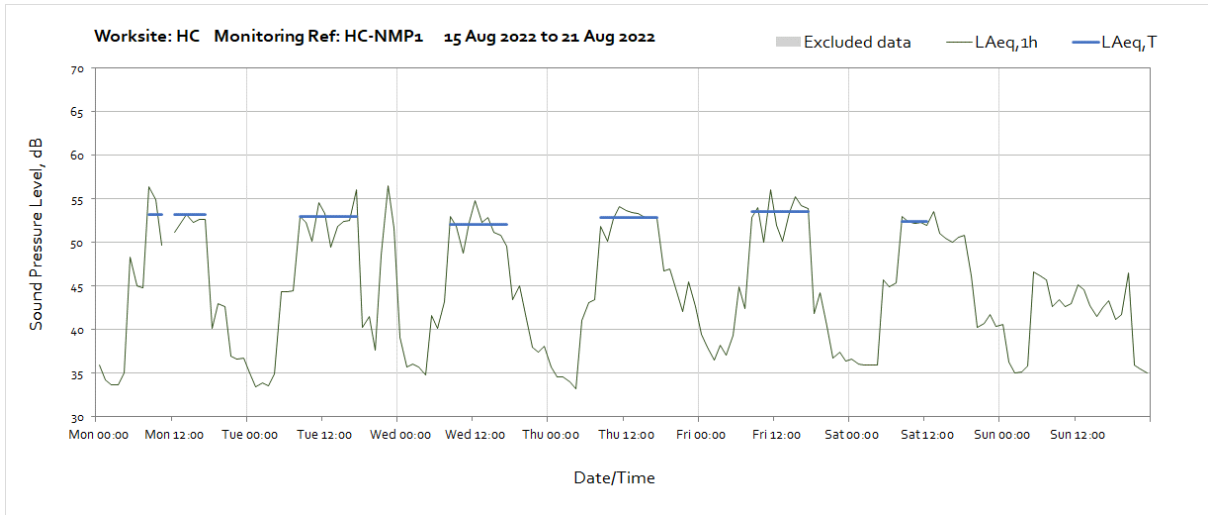




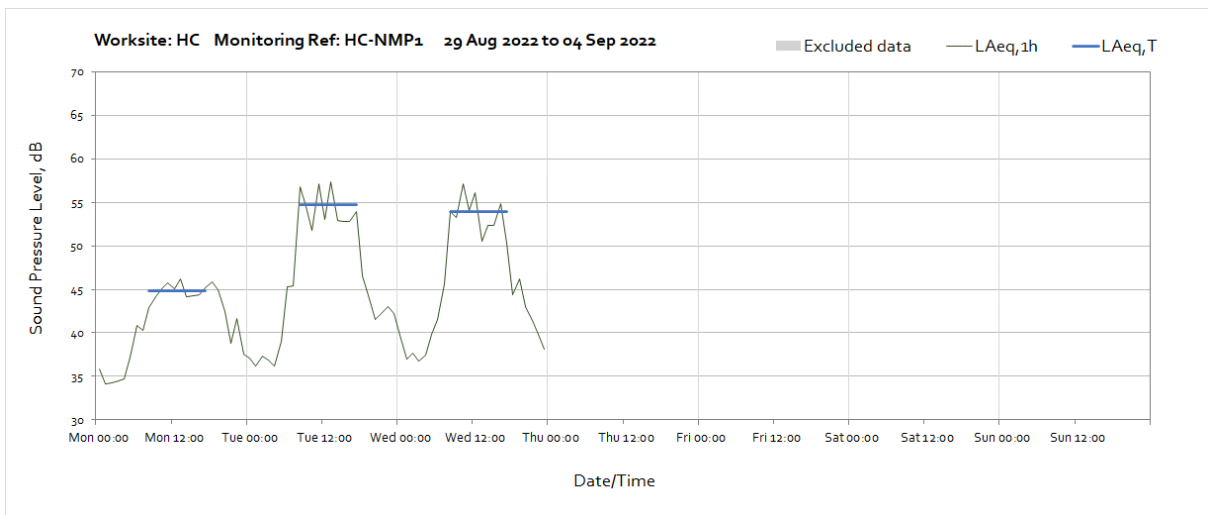
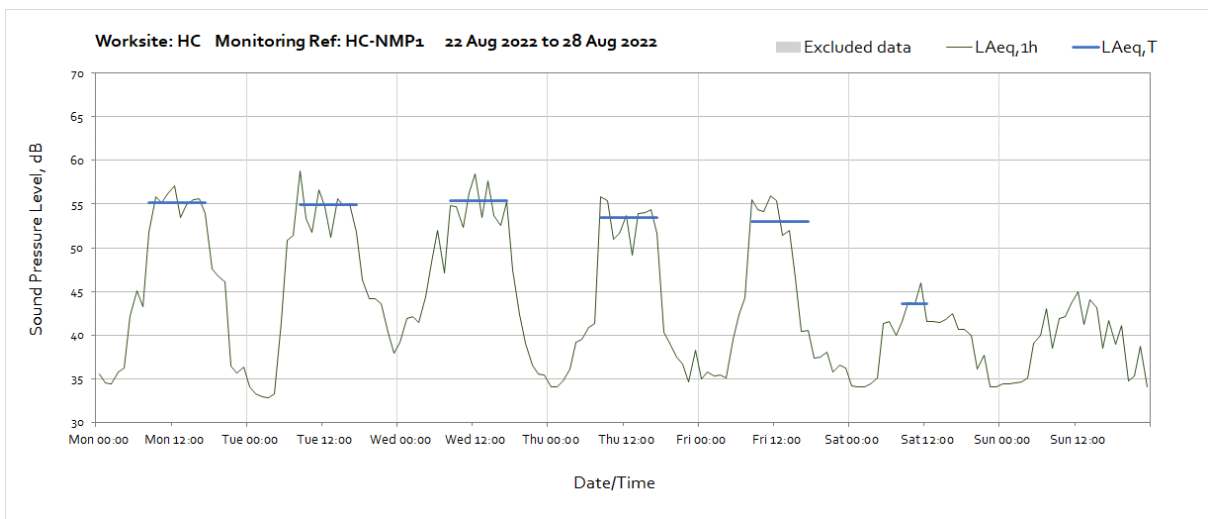


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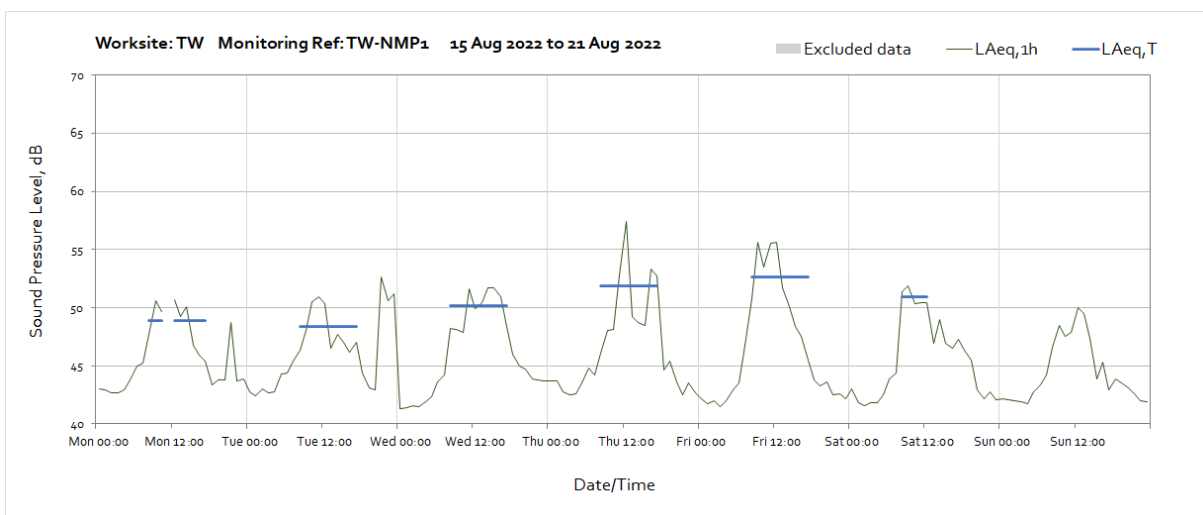
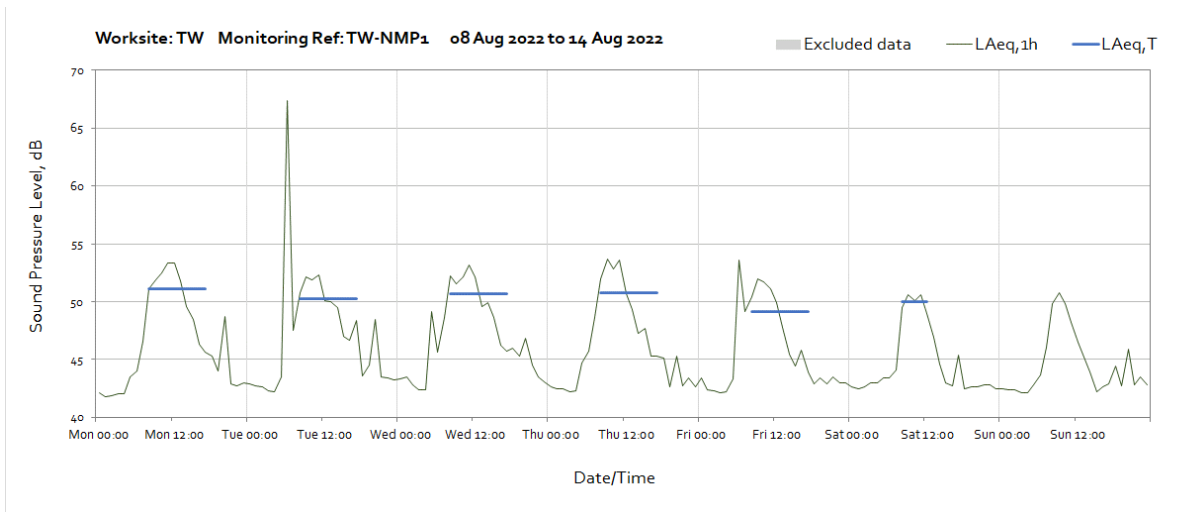
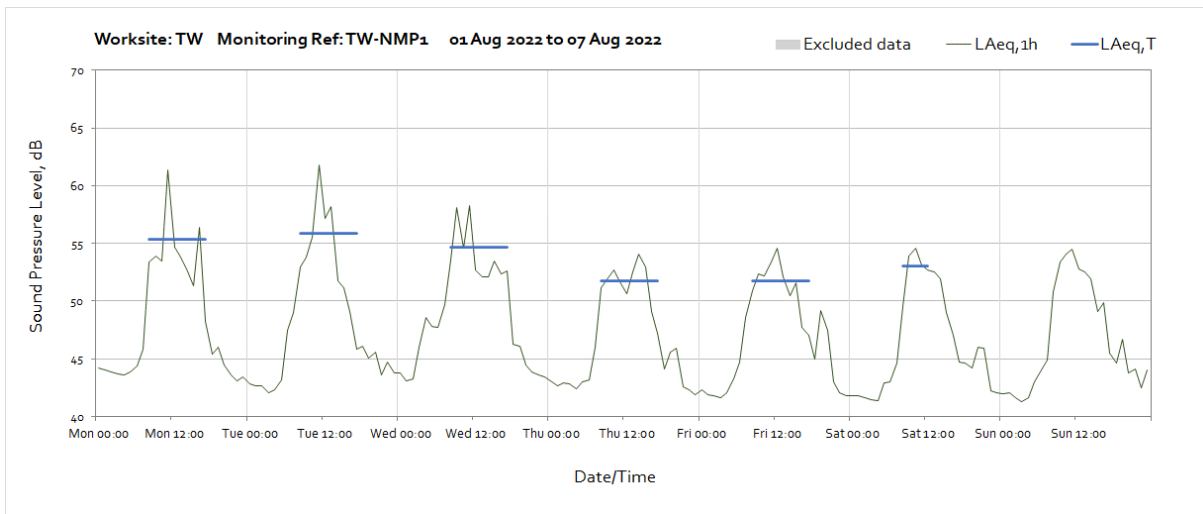




Note: Missing data at 11:00 on Monday 15th August were due to monitor maintenance.

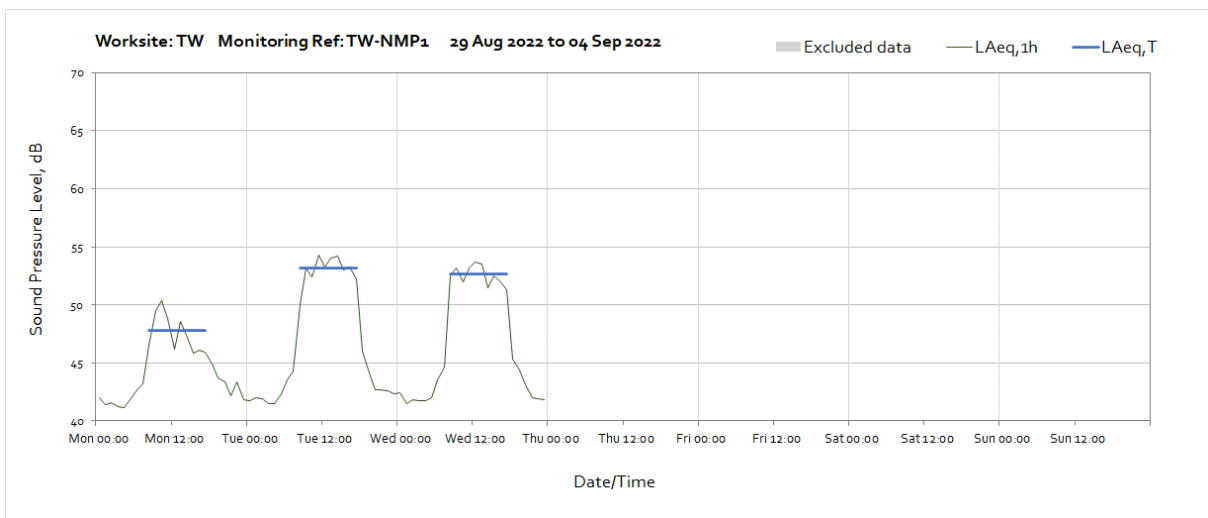
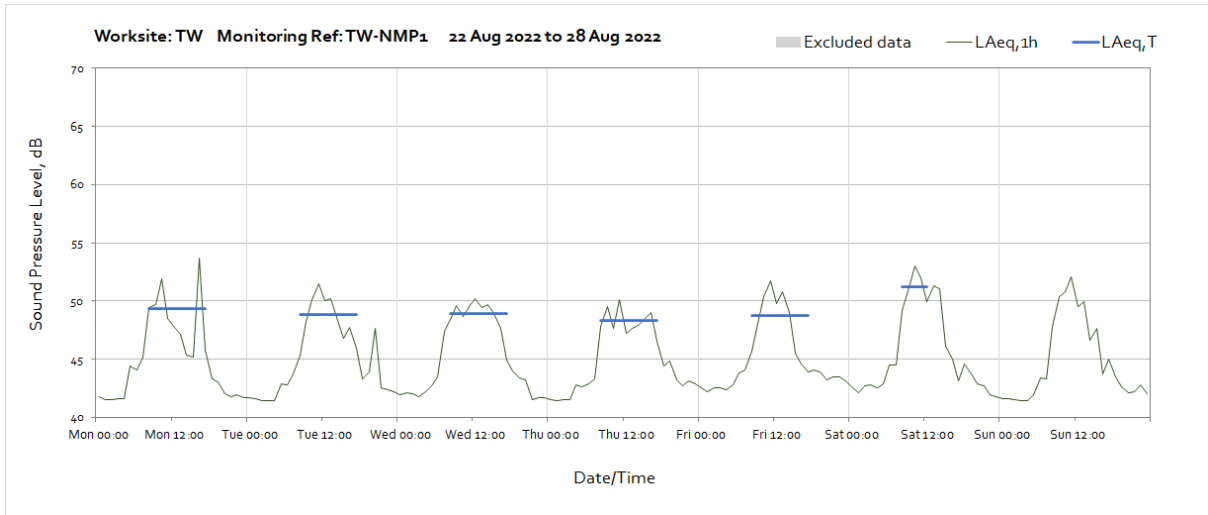


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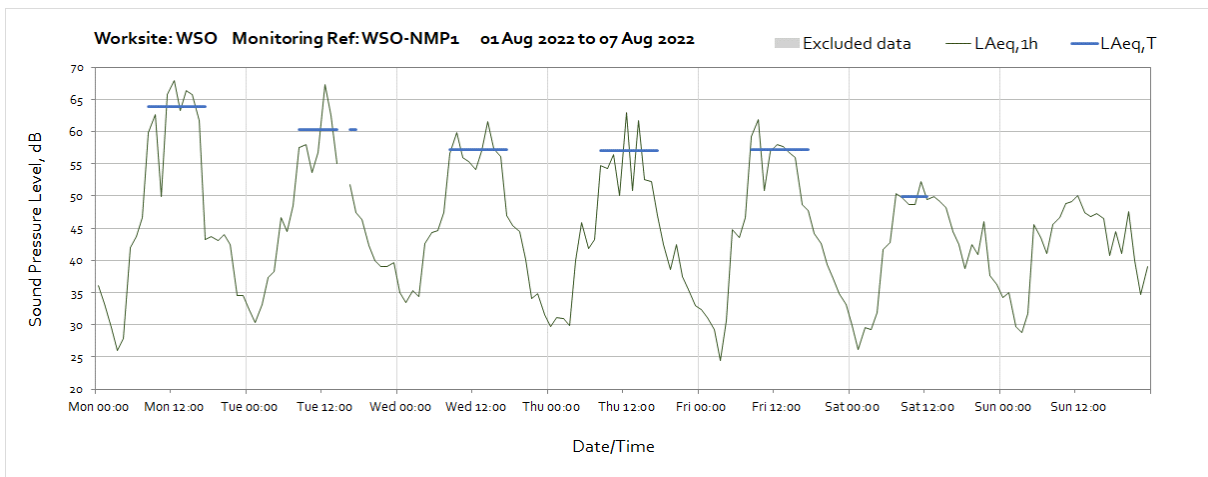


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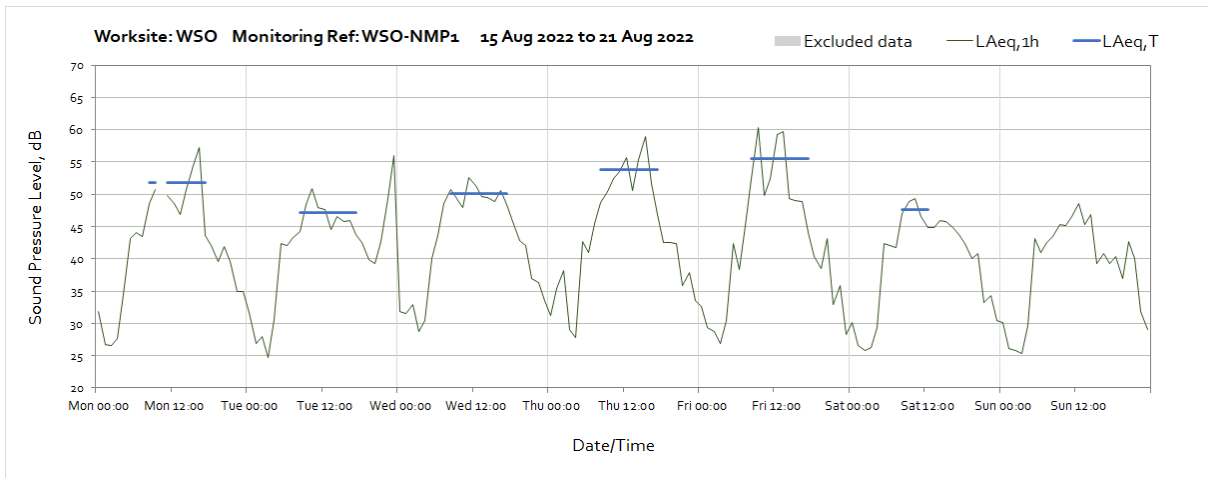
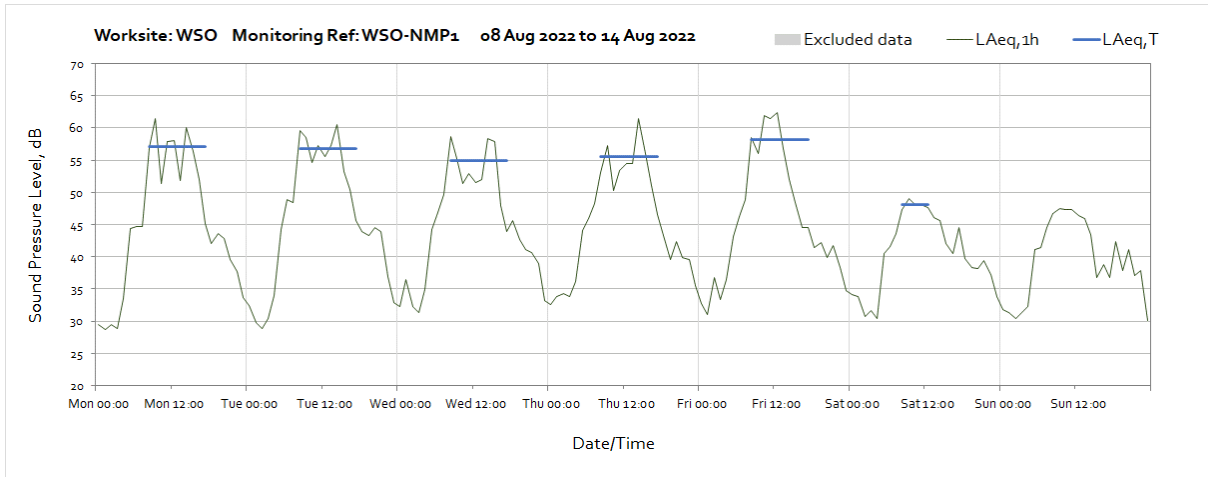
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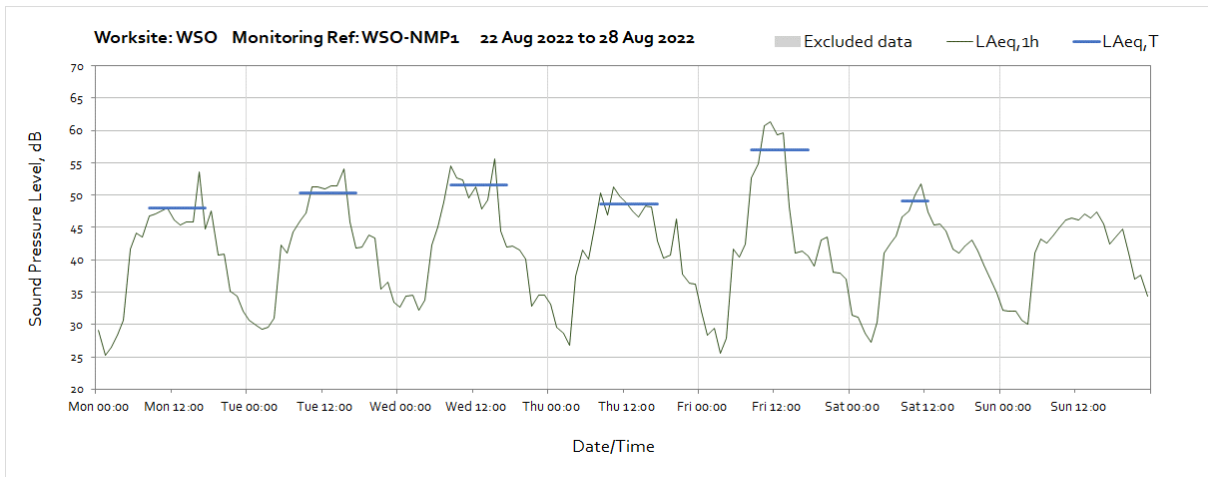
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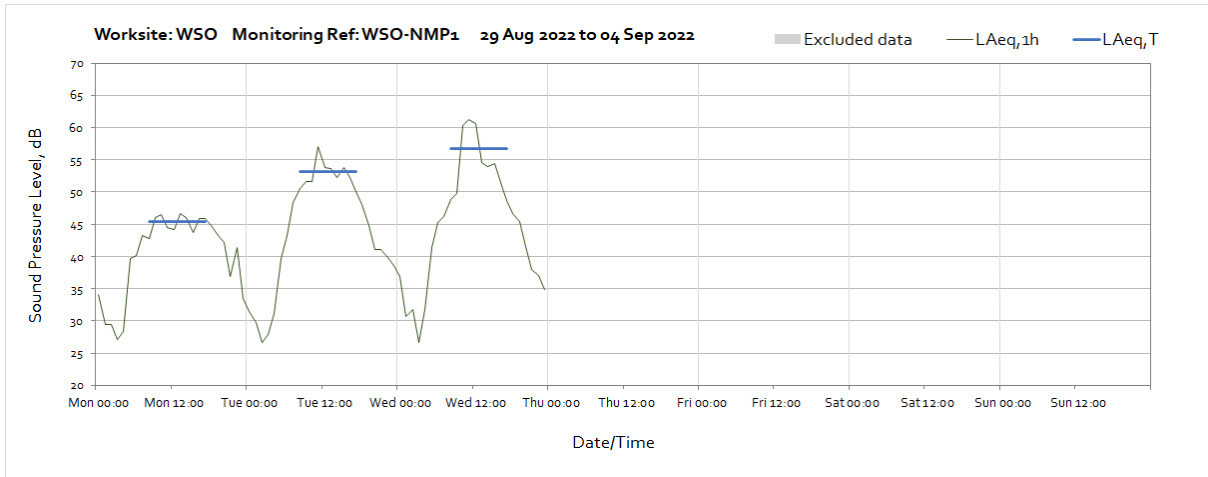


Note: Missing data at 15:00 on Tuesday 2nd August were due to power outage-

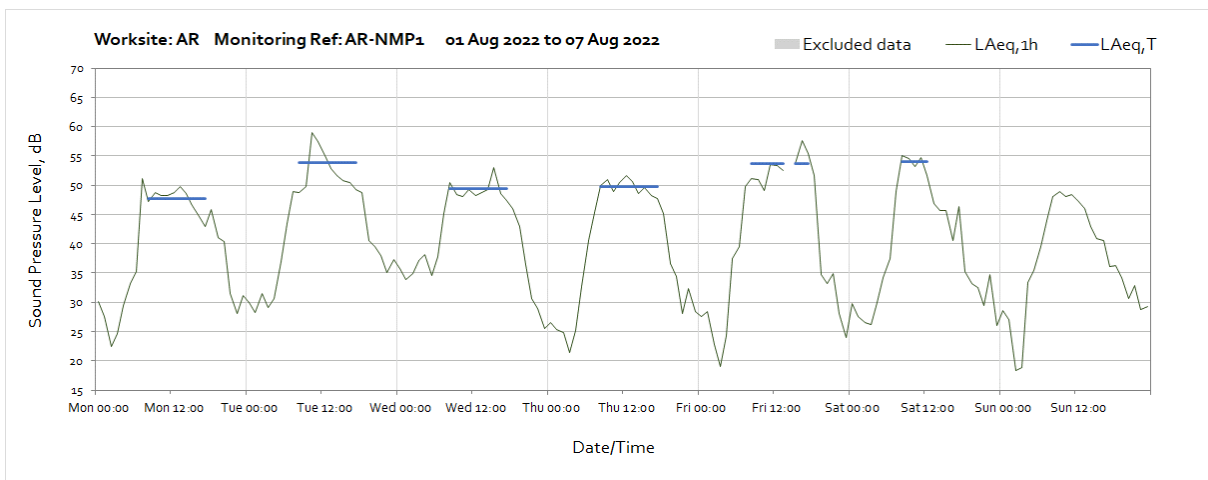


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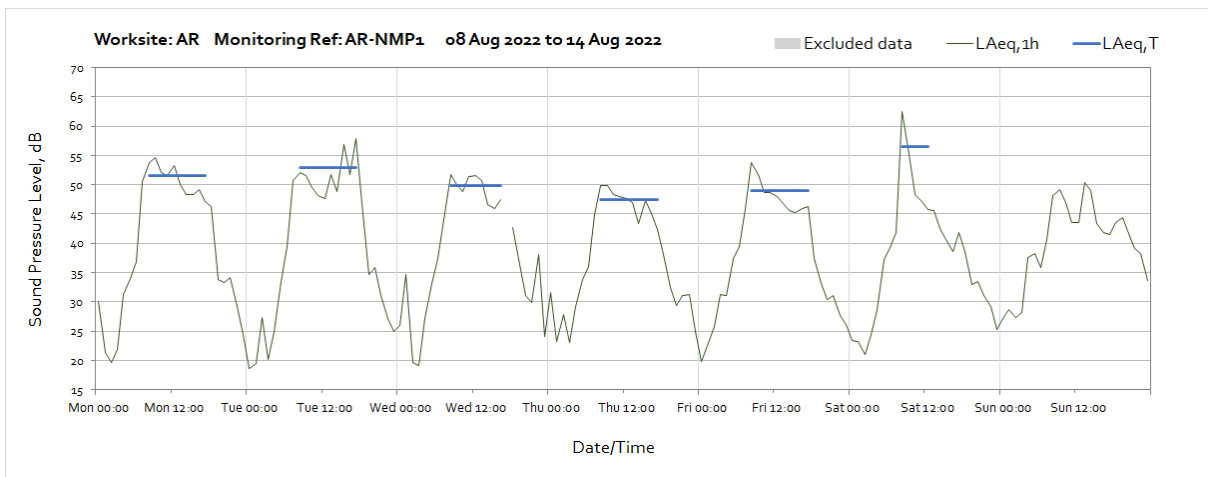




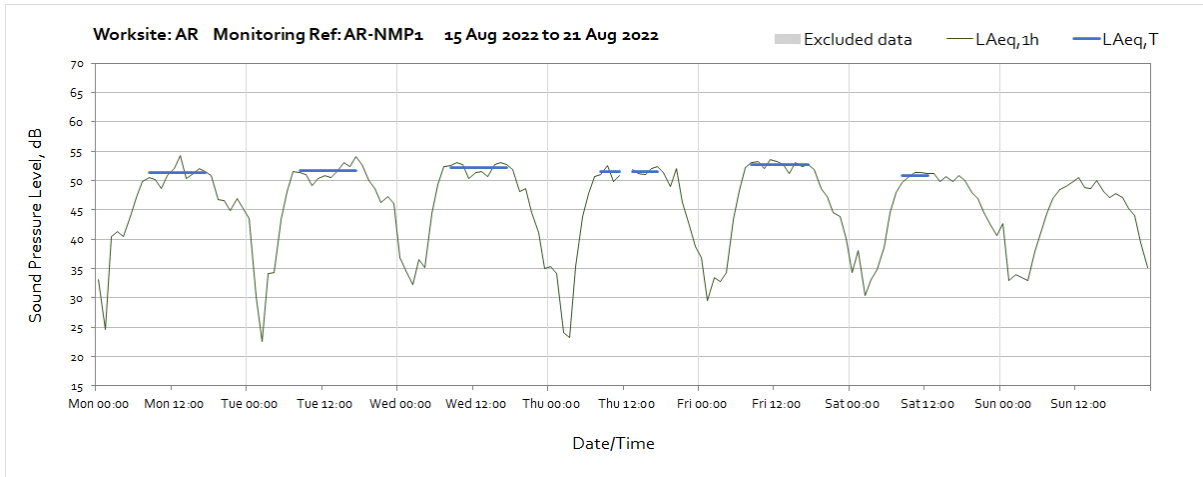
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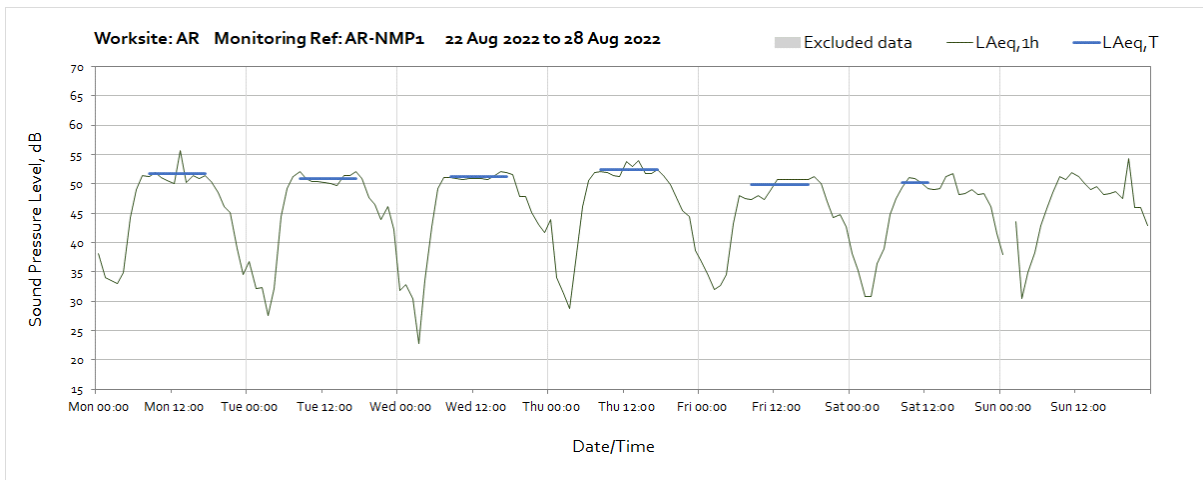
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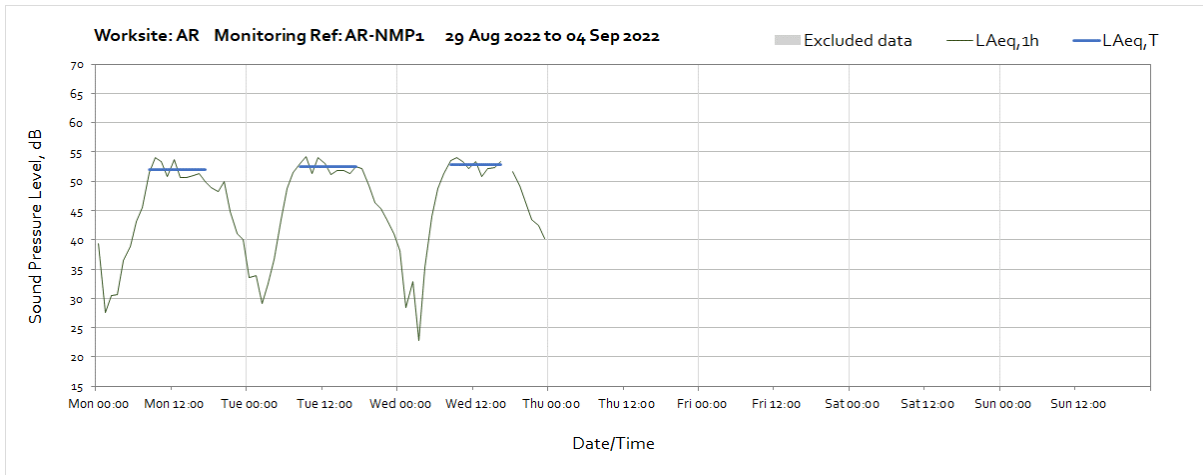
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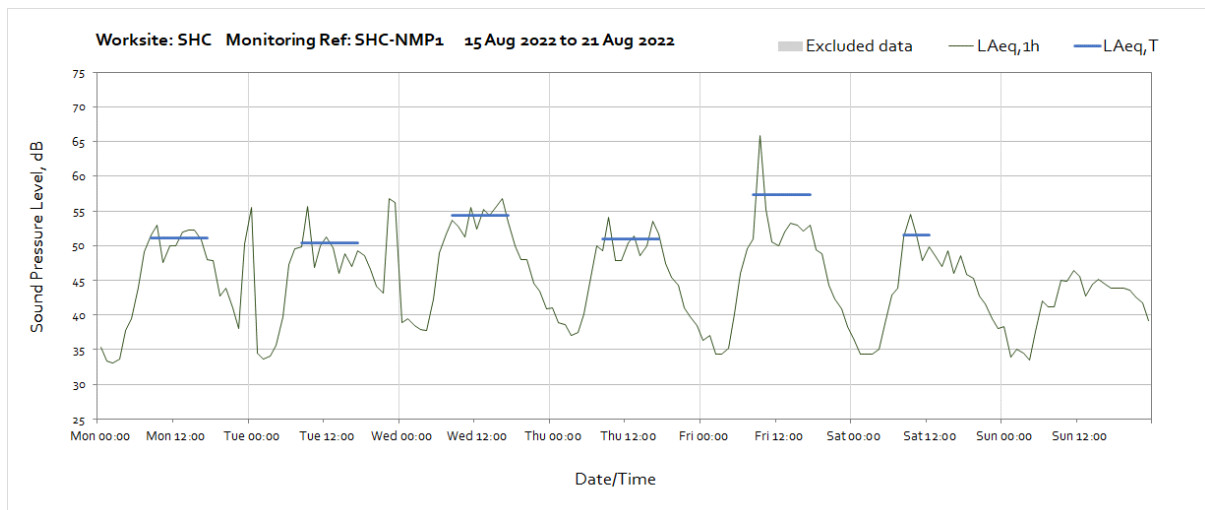
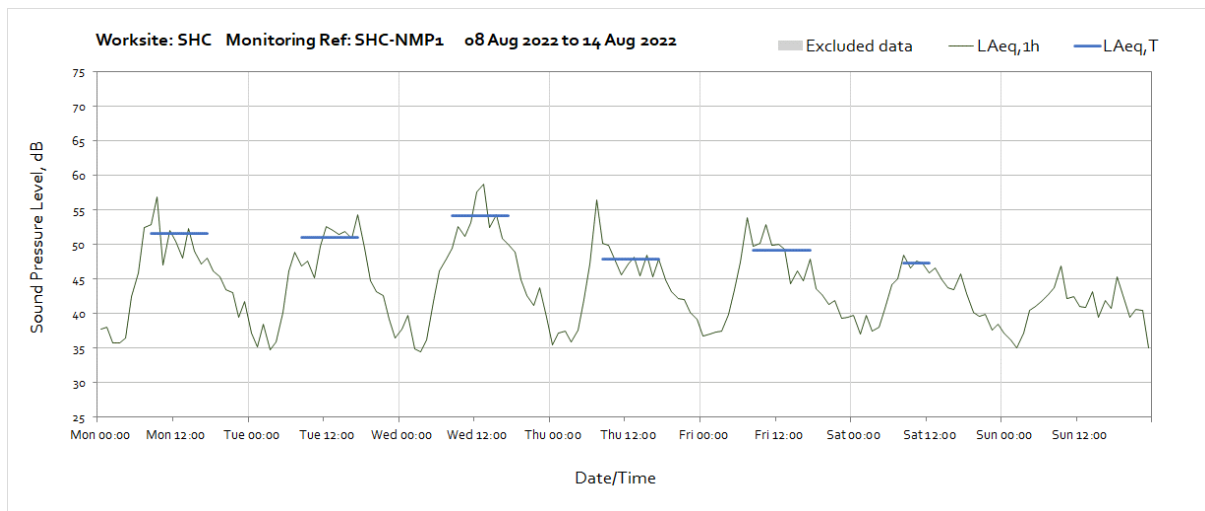
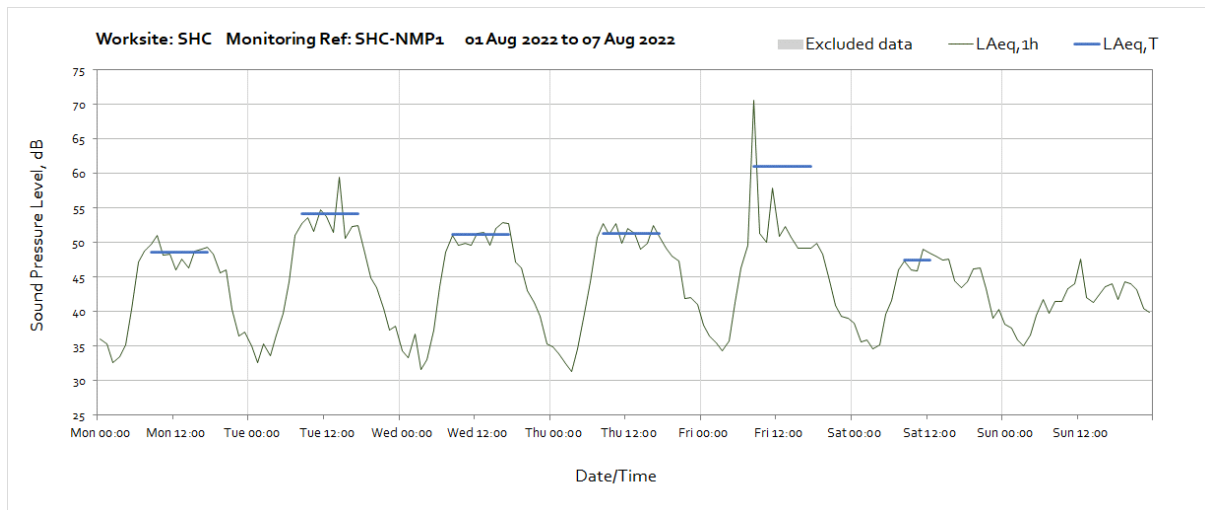


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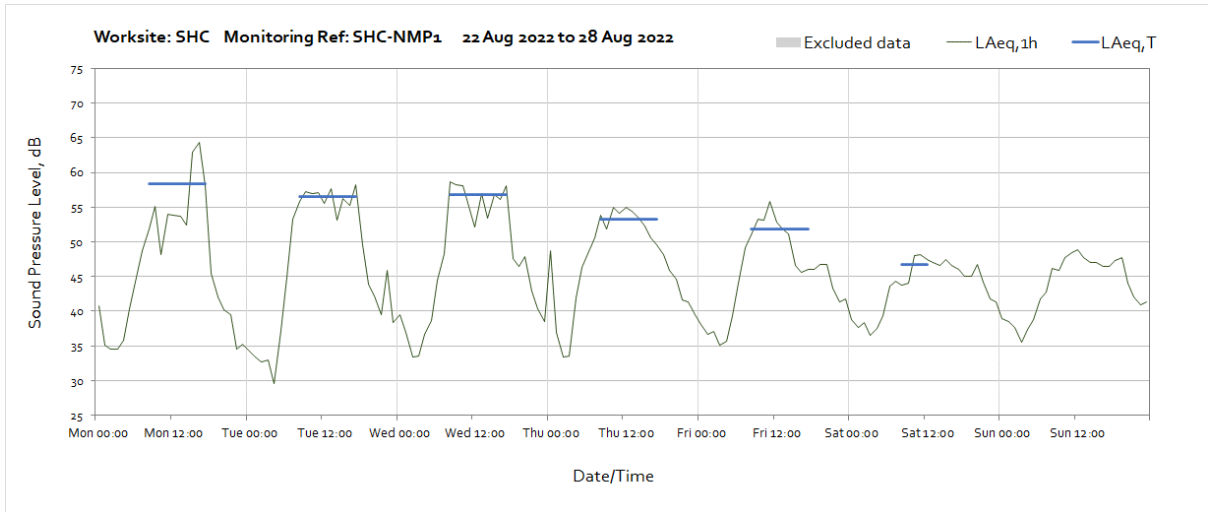


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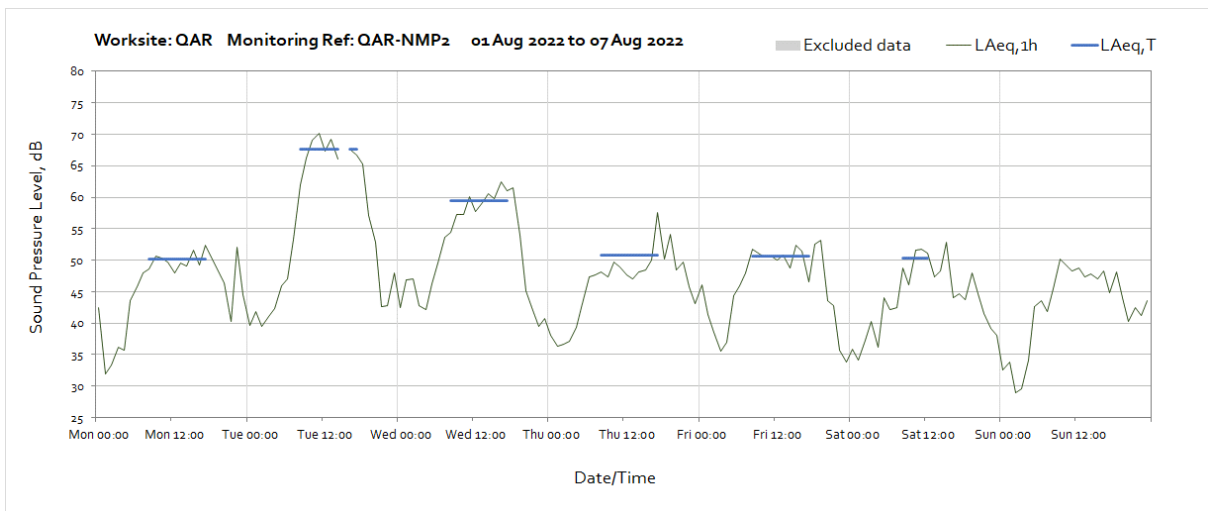
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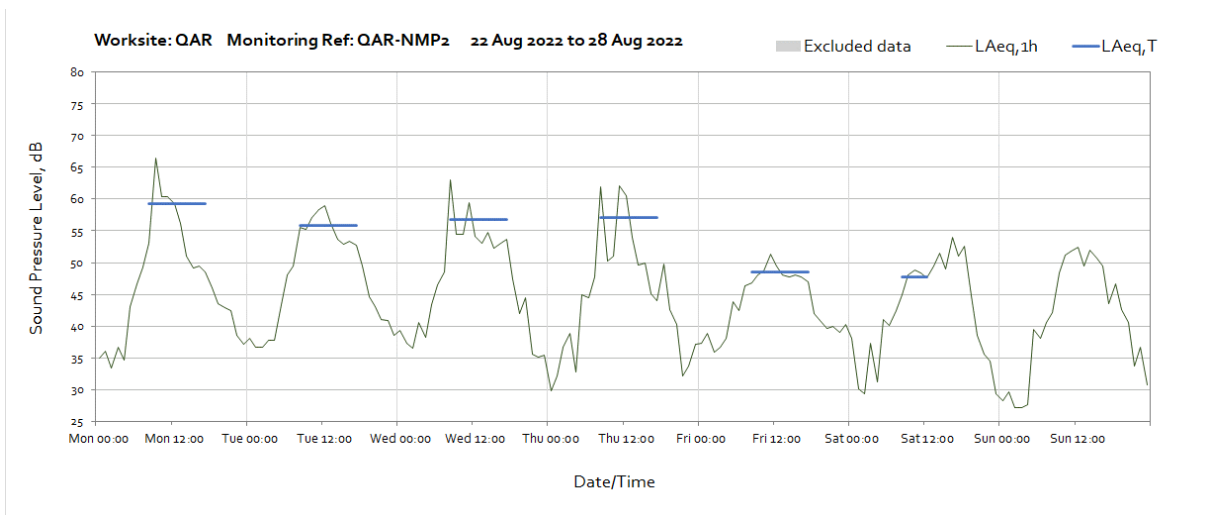
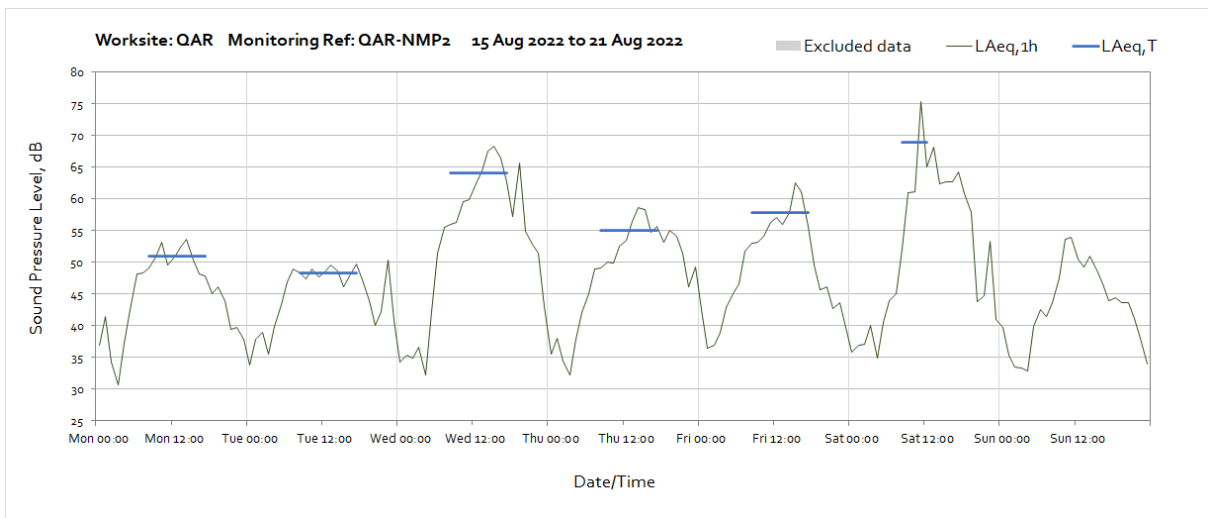
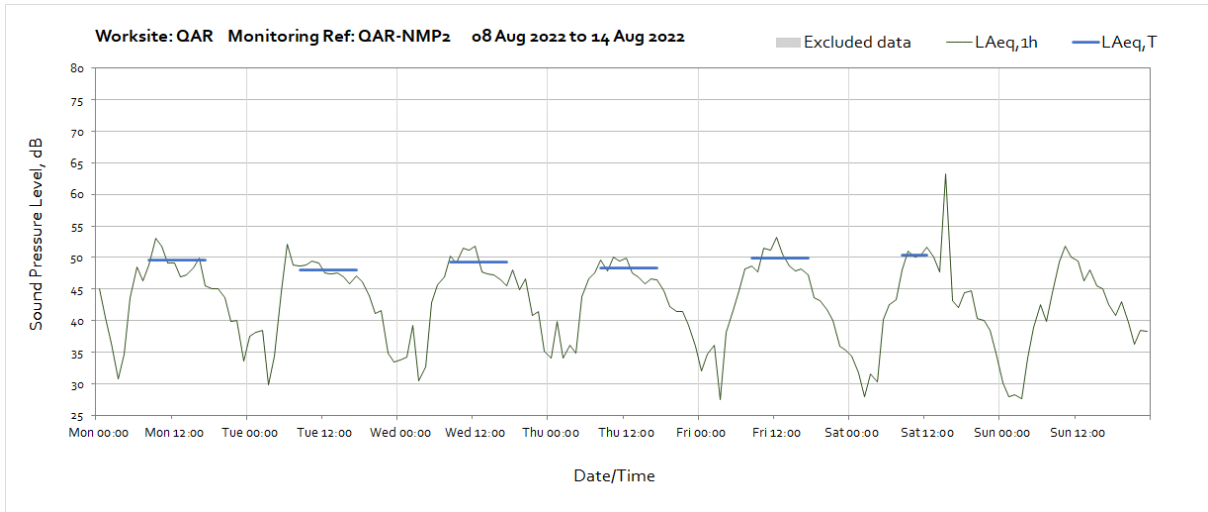
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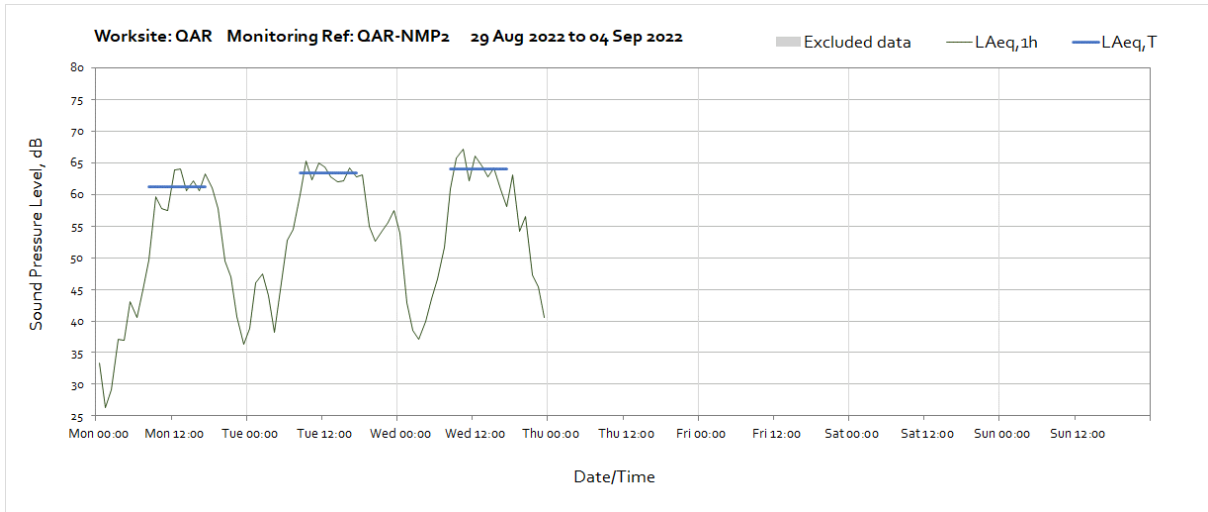


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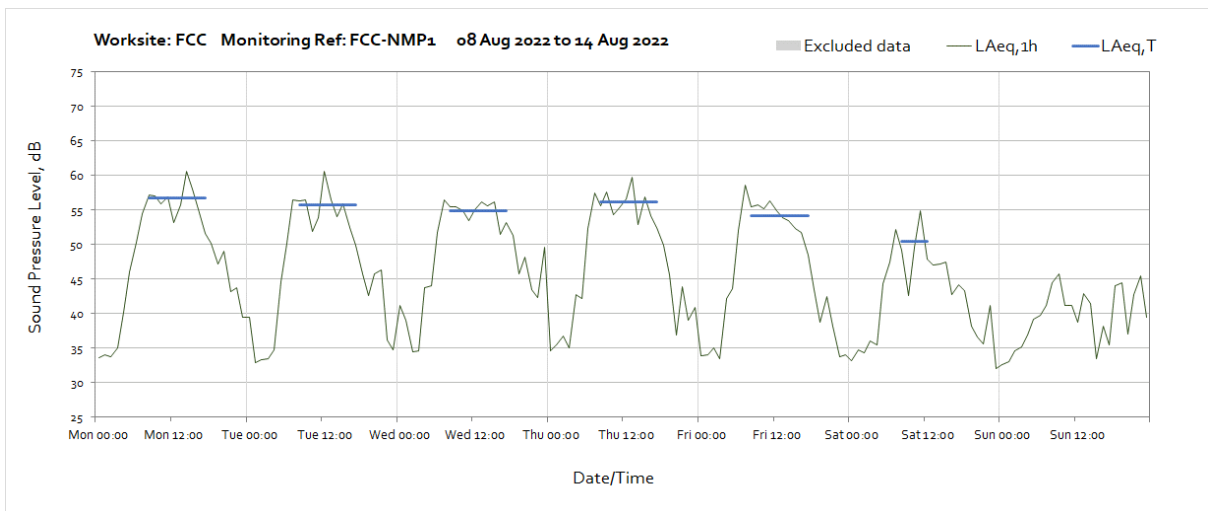
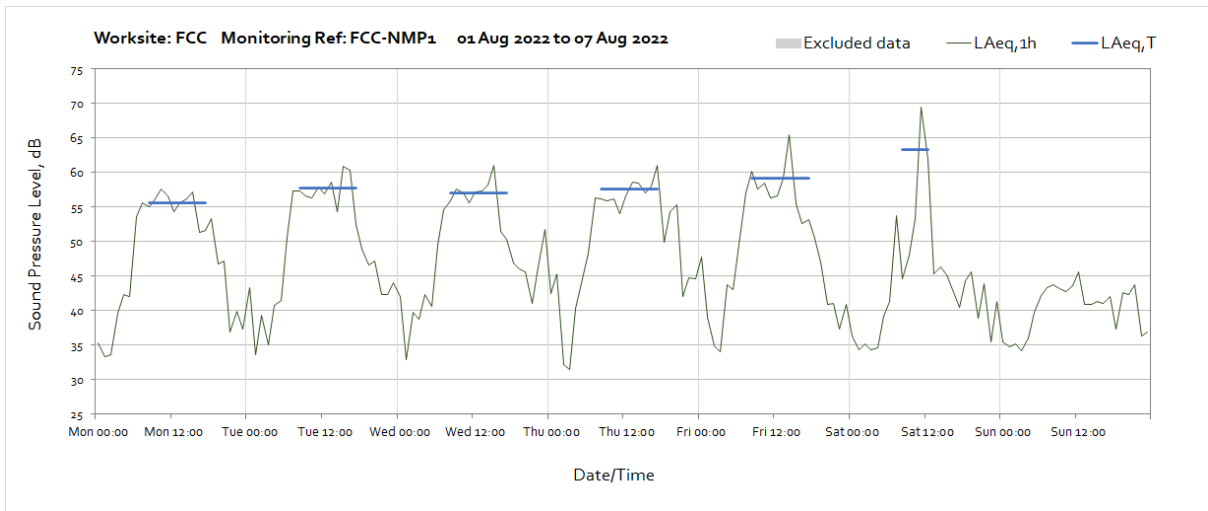


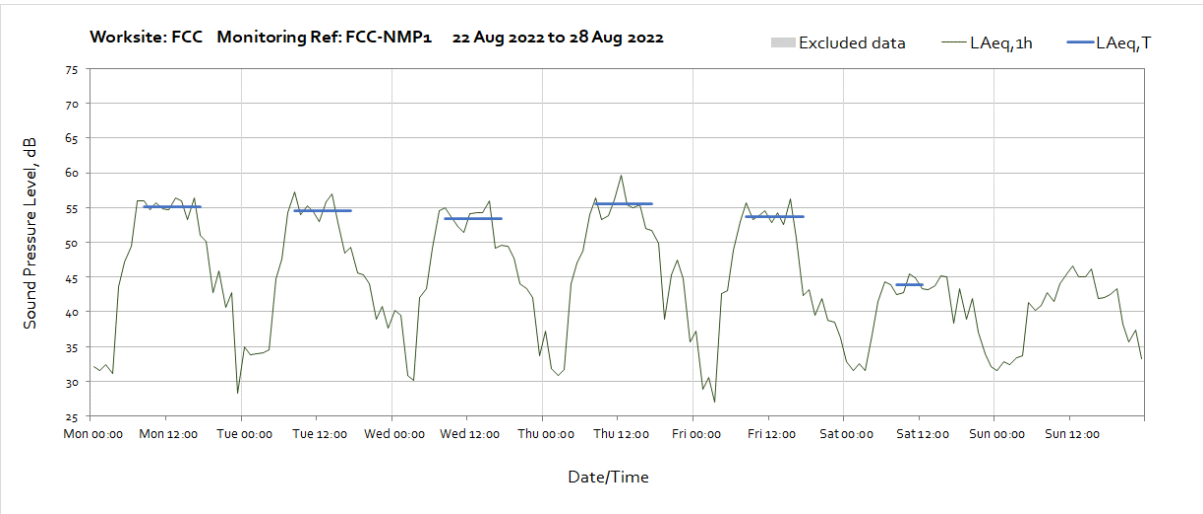
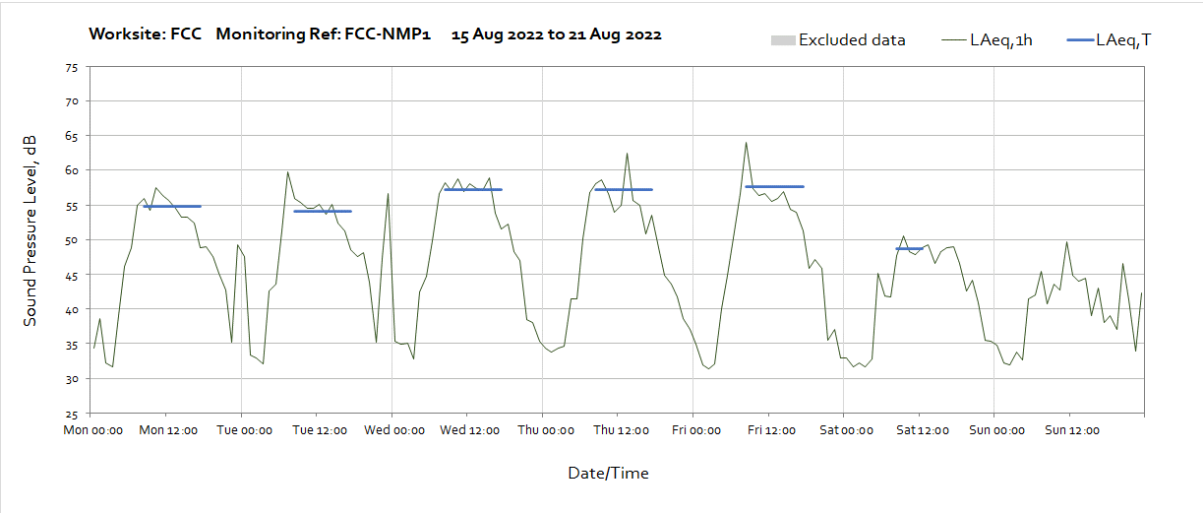
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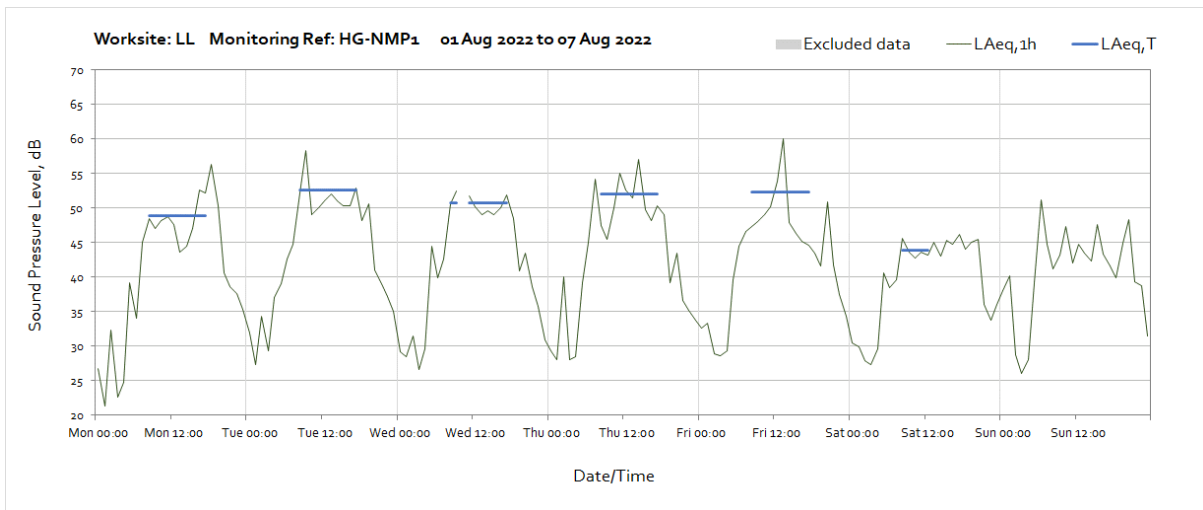


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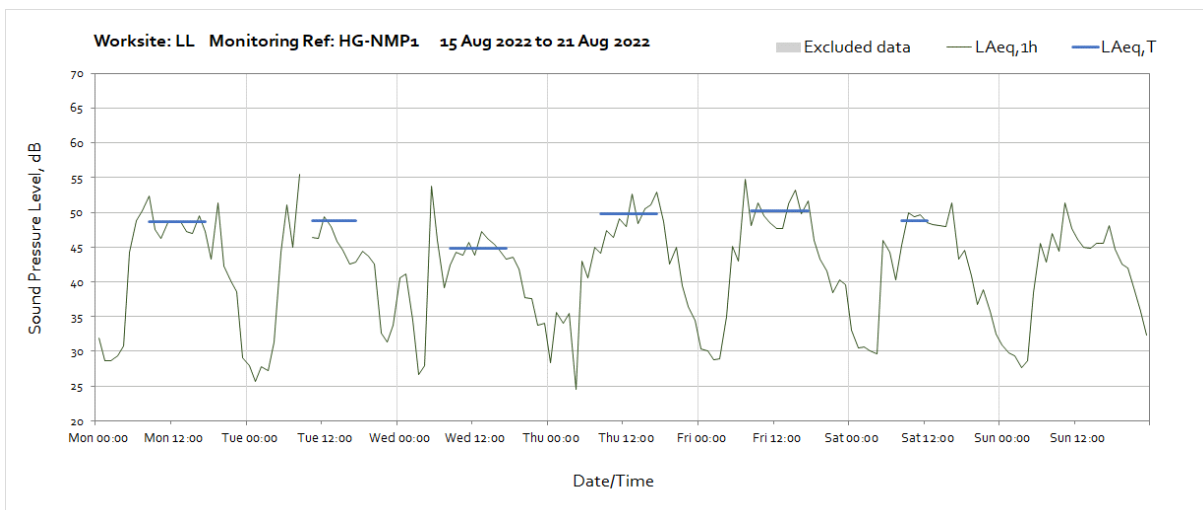
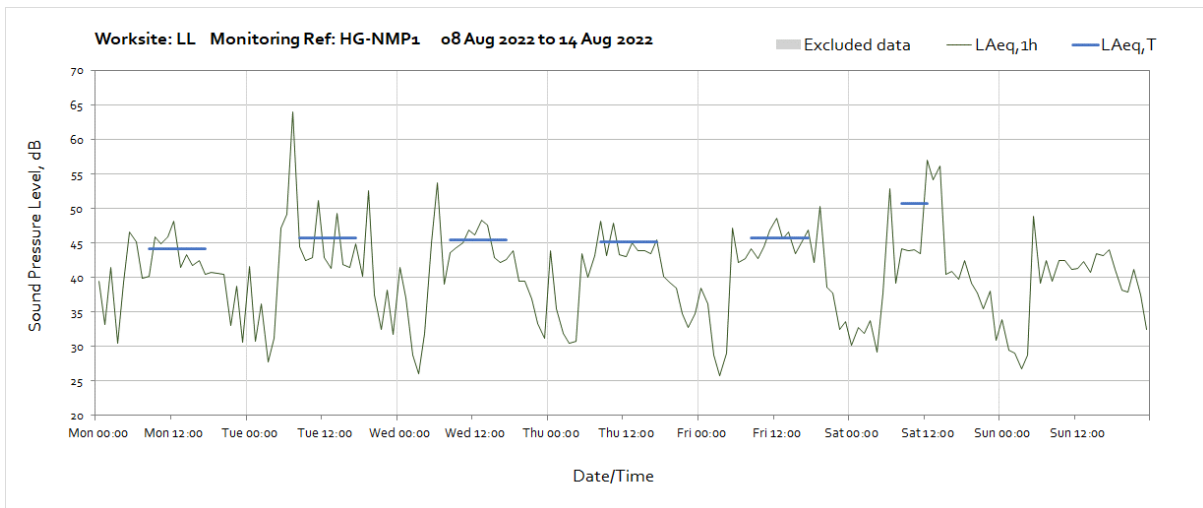




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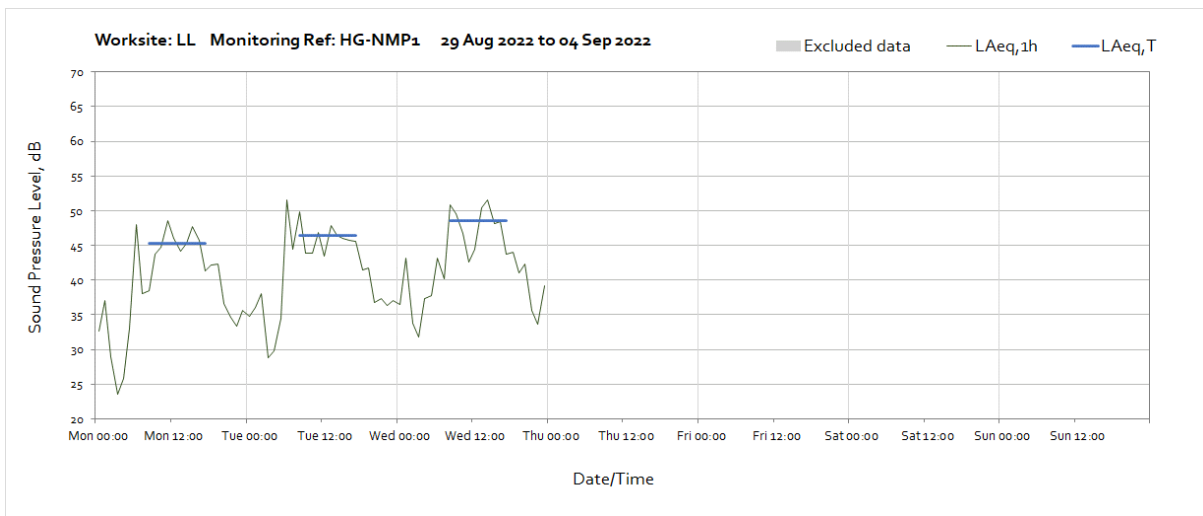
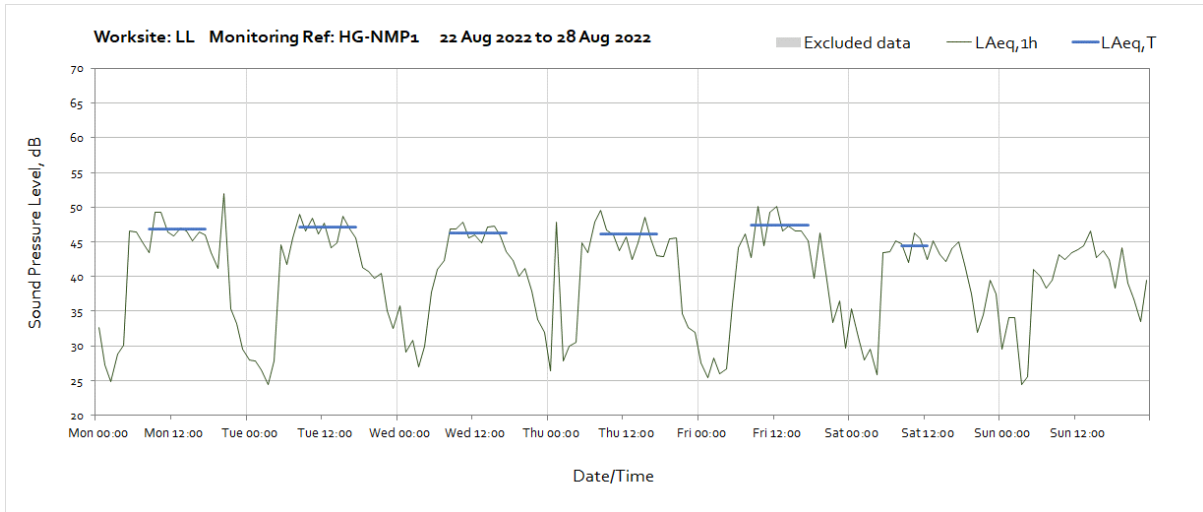


Note: Missing data at 10:00 on Wednesday 3rd August were due to power outage.

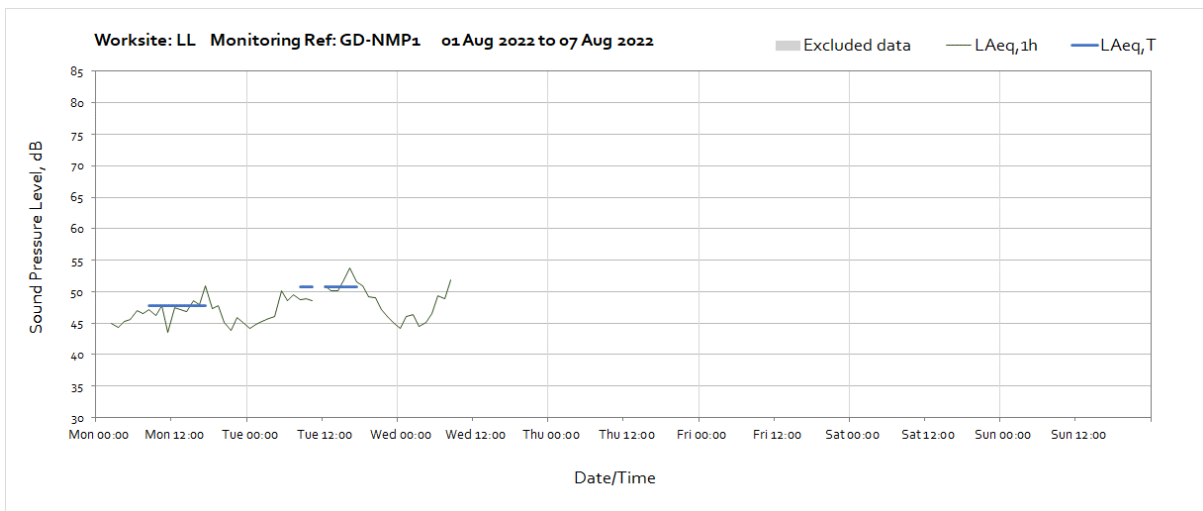


Note: Missing data at 09:00 on Tuesday 16th August were due to power outage.

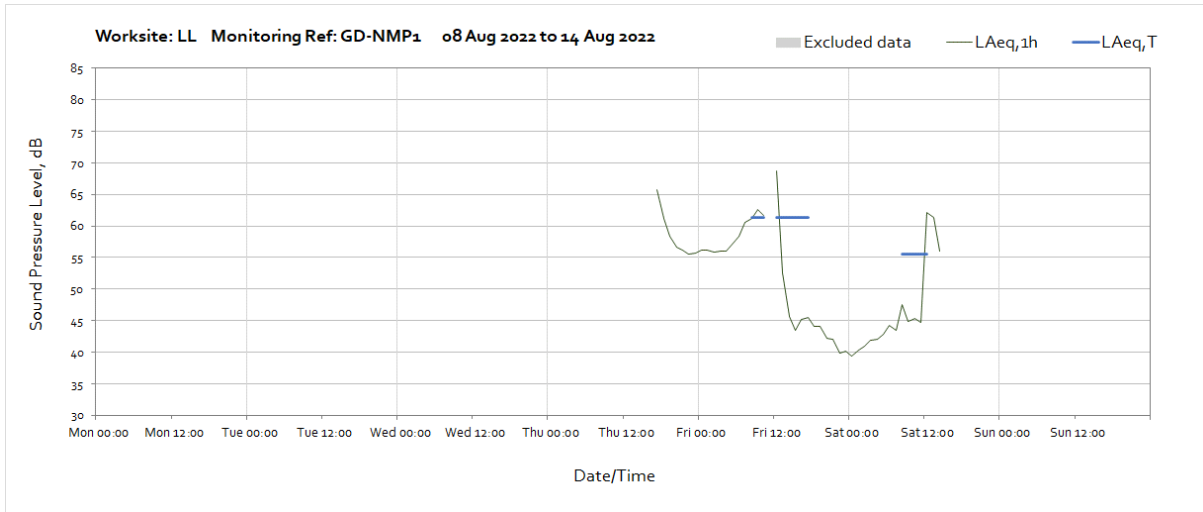
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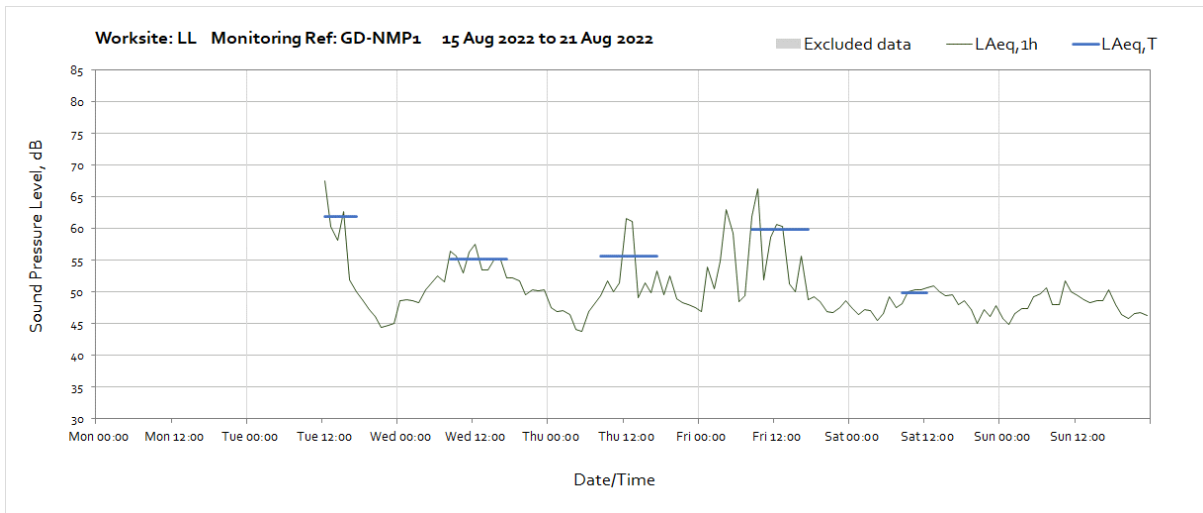
Worksite: LL - Monitoring Ref: GD-NMP1



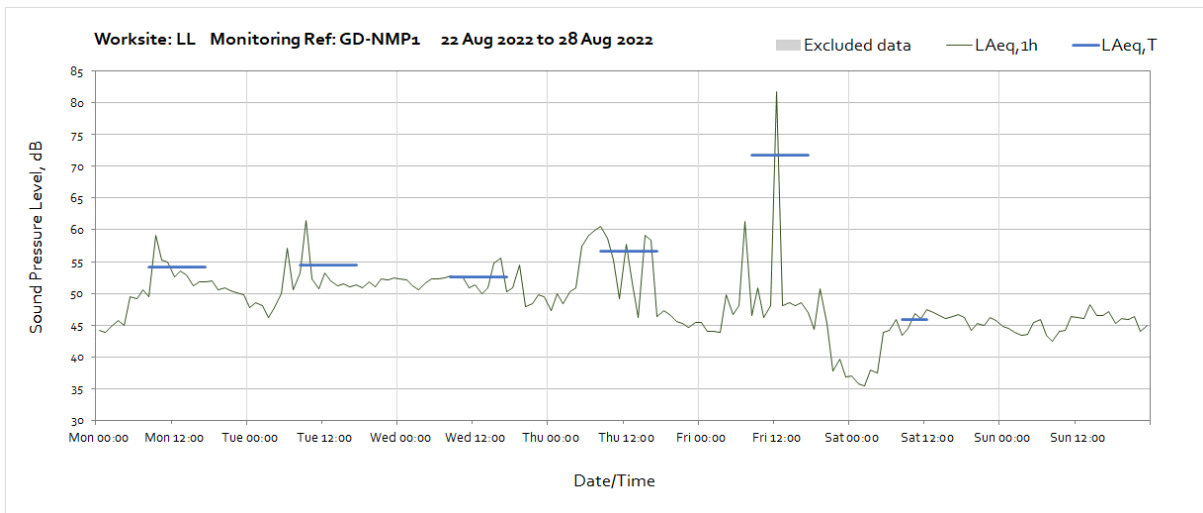
Note: Missing data across the week was due to communication cable failure. The monitor was damaged and has been replaced with a new one on the 11th of August.

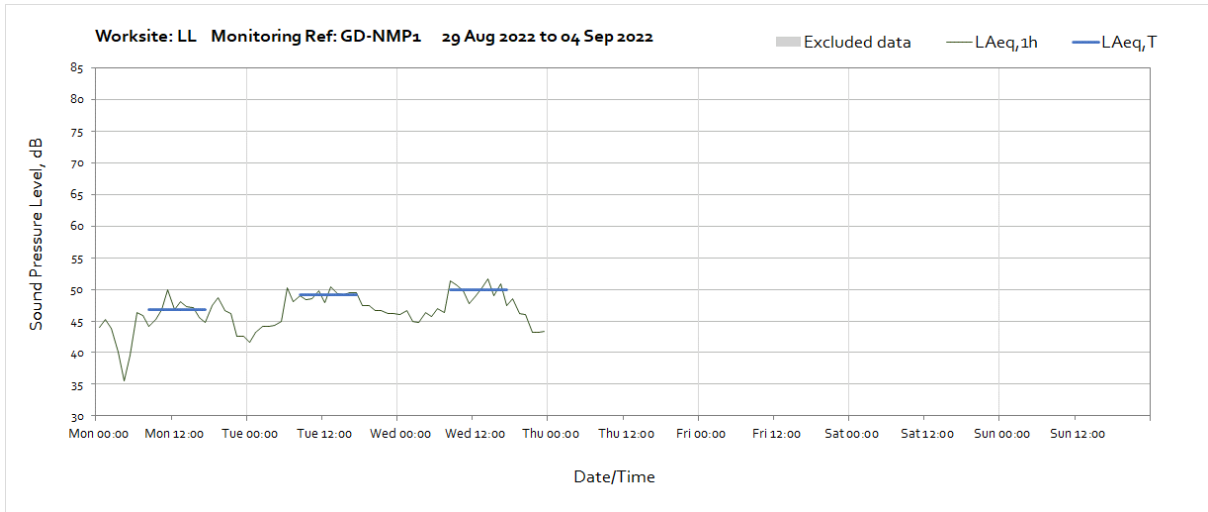


Note: Missing data until the 11th of August was due to communication cable failure. The monitor was damaged and has been replaced with a new one on the 11th of August. Missing data on the 12th at 11:00 and between the 13th of August at 15:00 and the 16th August at 12:00 was due to damage to the power supply. A replacement solar panel has been ordered.

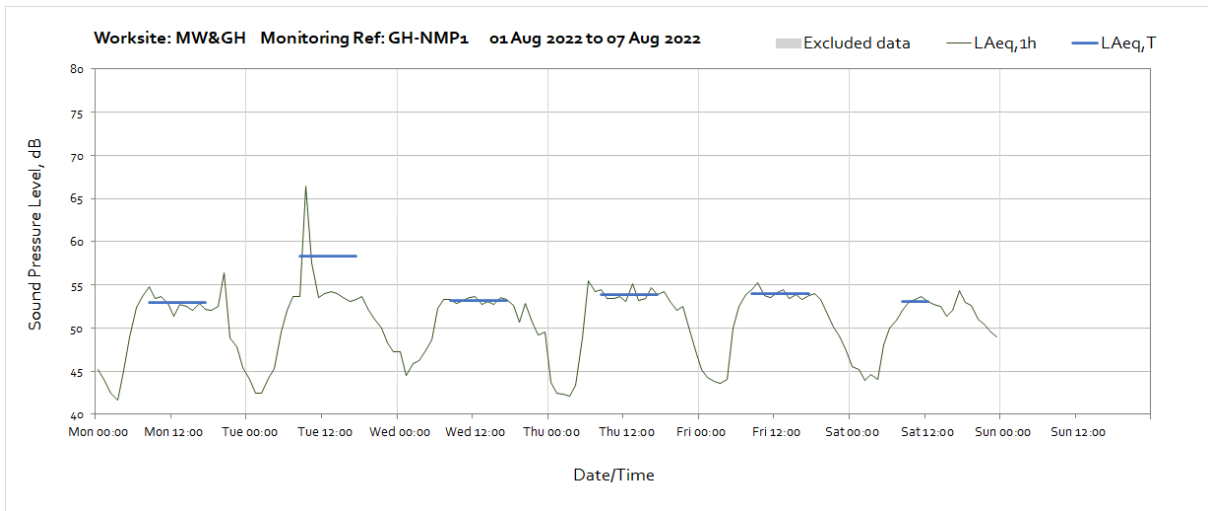


Note: Missing data until 12:00 on Tuesday 16th August was due to power issues. The solar panel has been damaged and will be replaced with a new one.

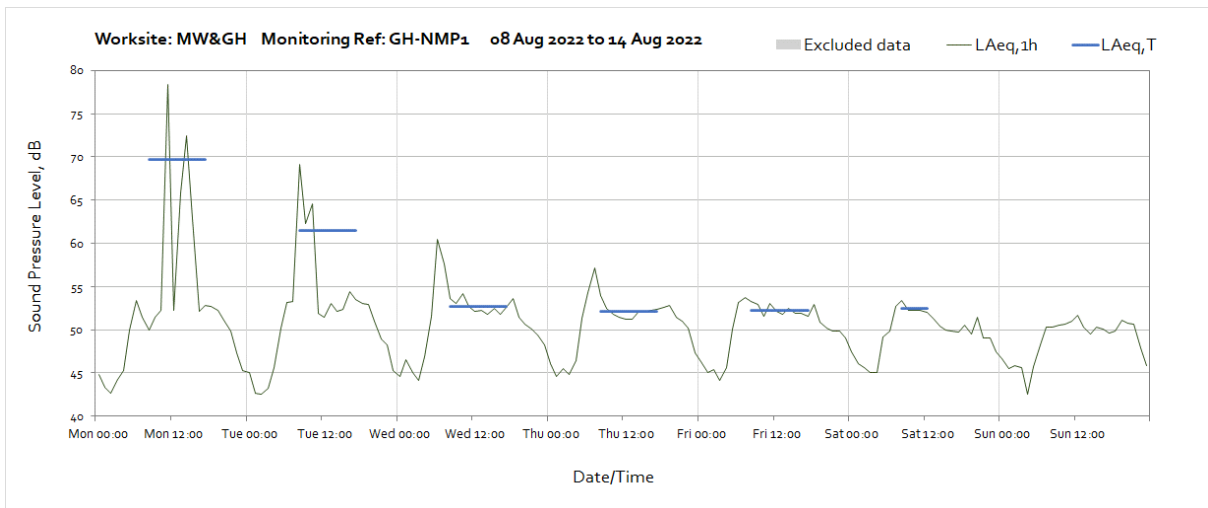


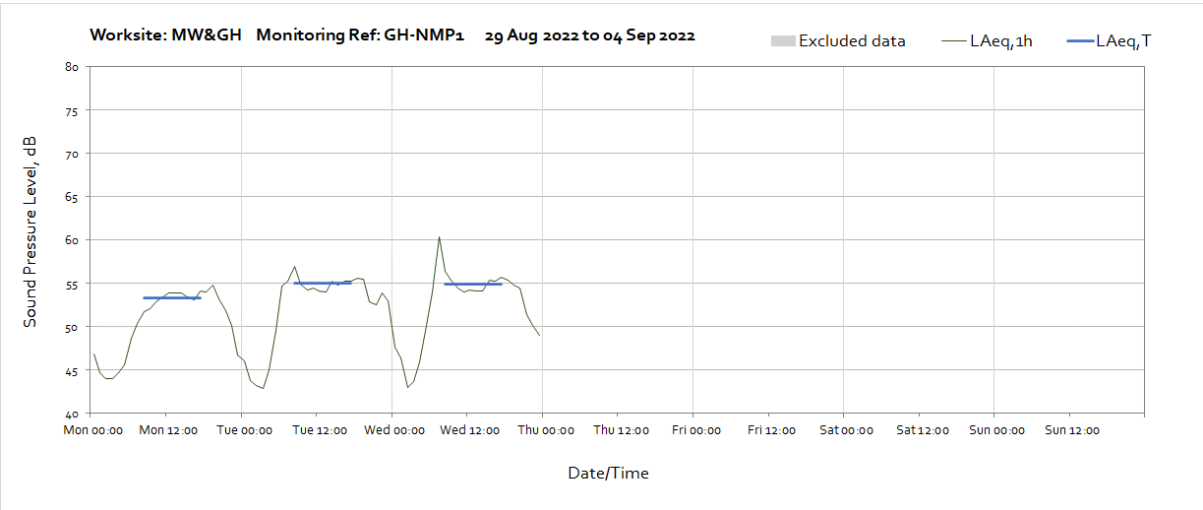
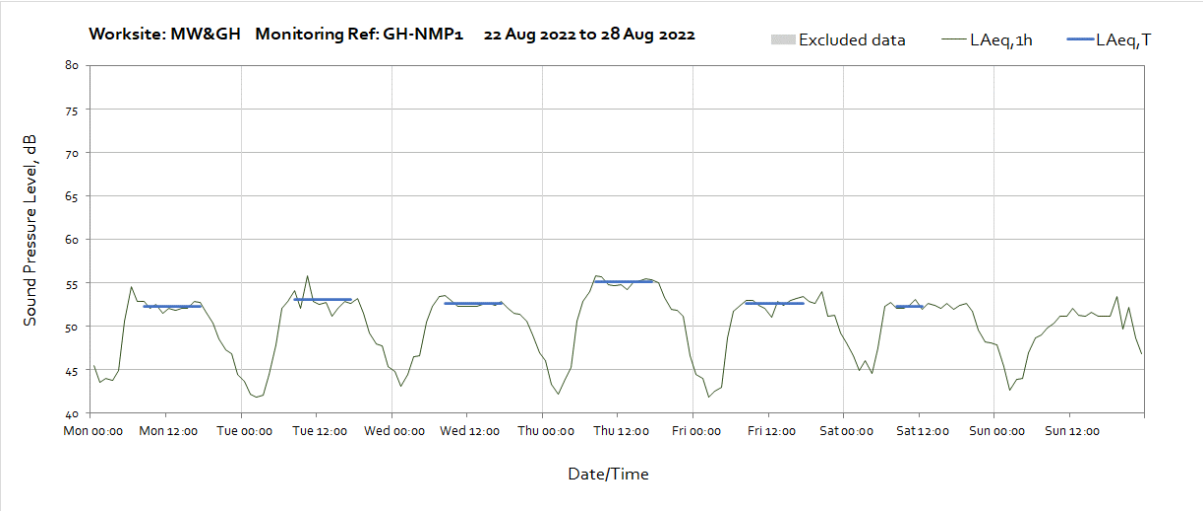
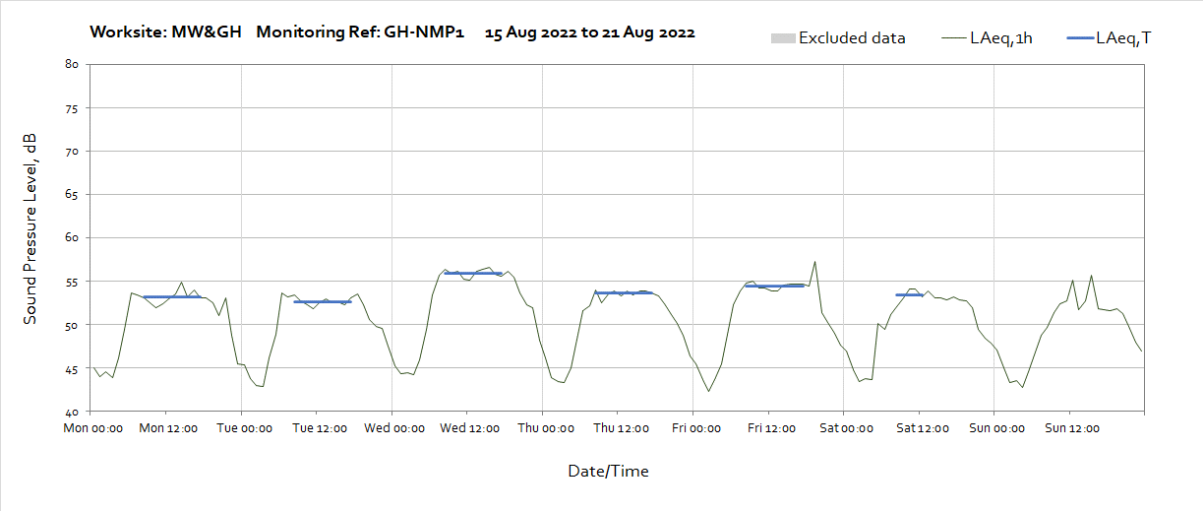


Worksite: MW&GH - Monitoring Ref: GH-NMP1

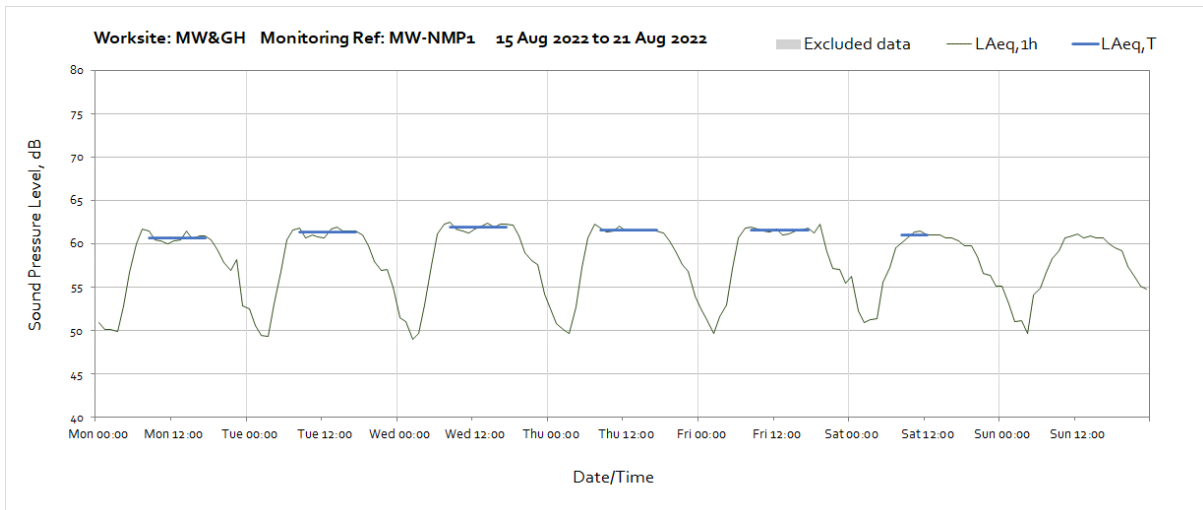
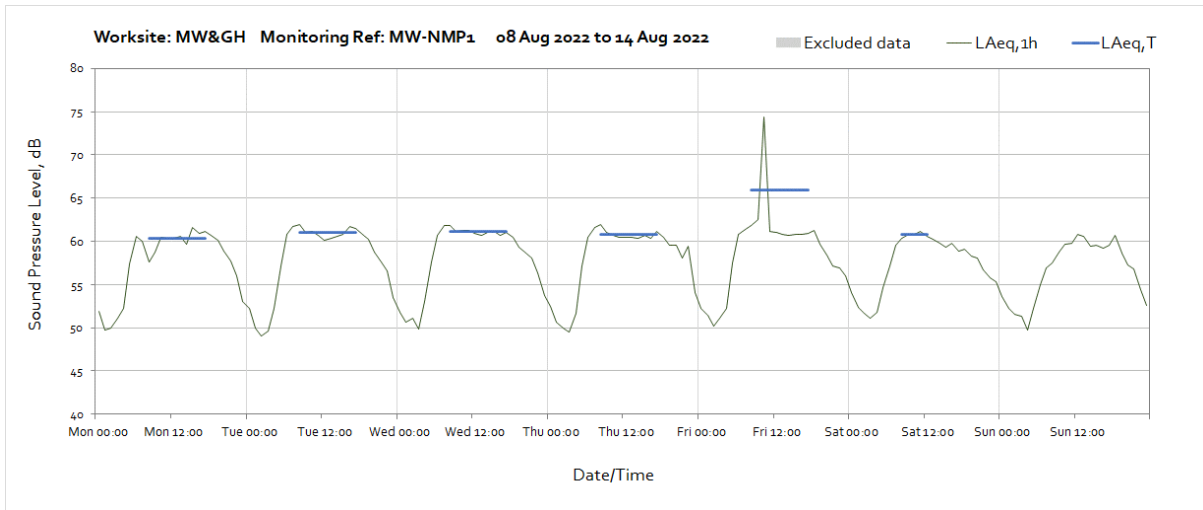
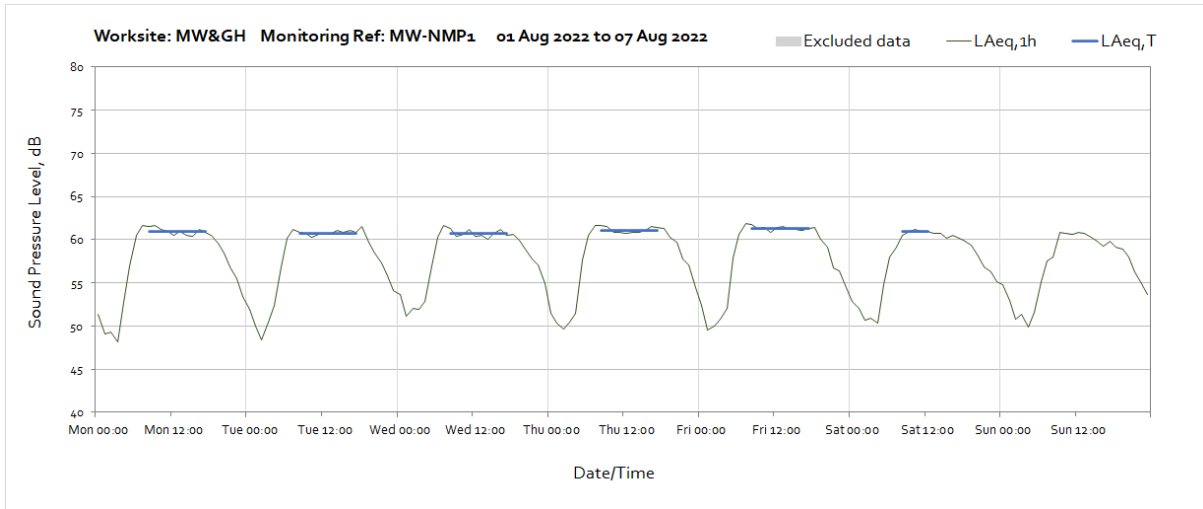


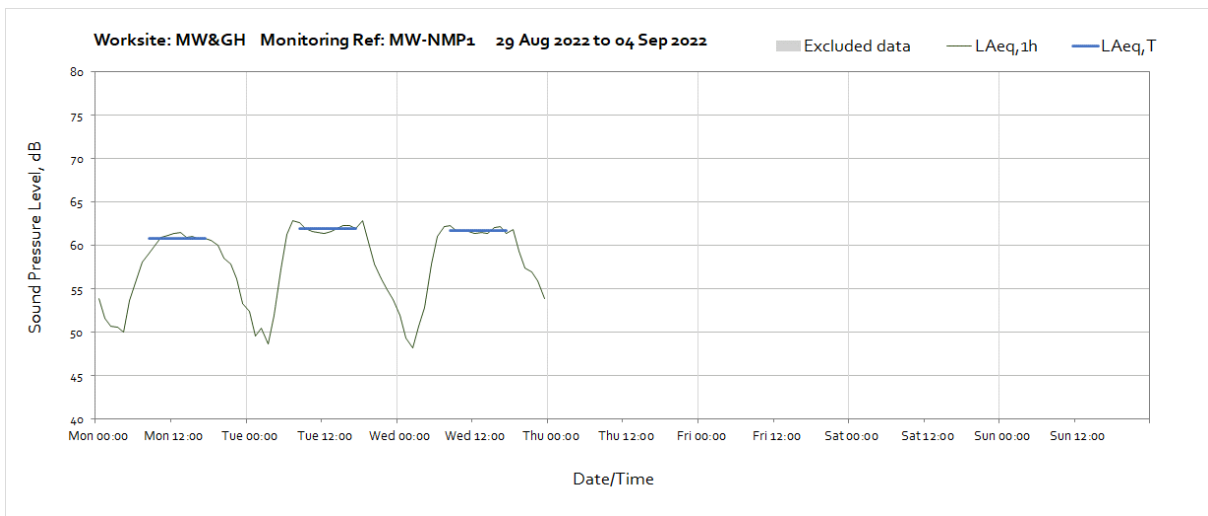
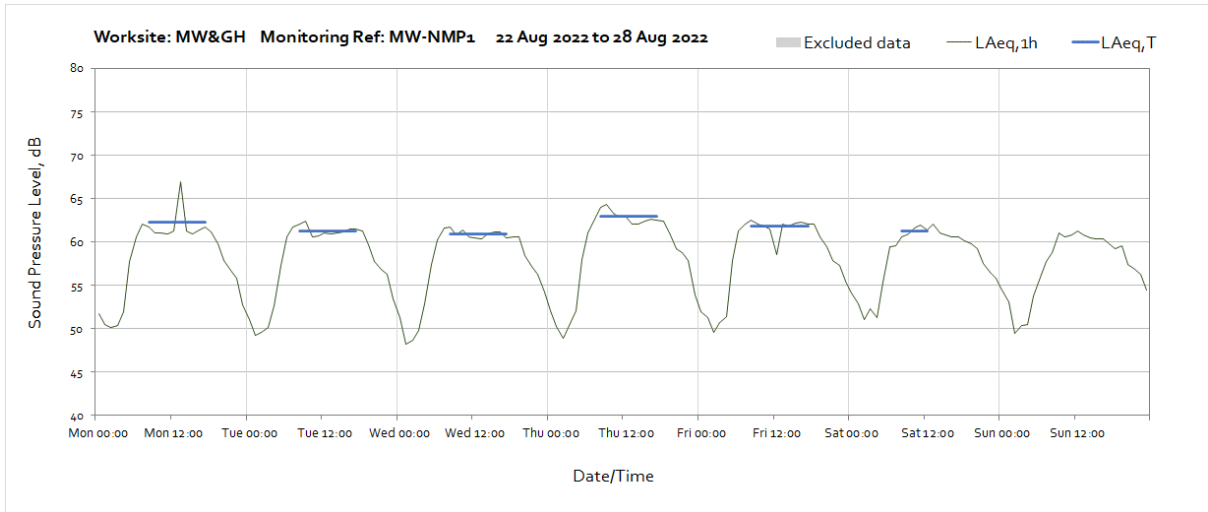
Note: Missing data from 00:00 to 23:00 on Sunday 7th August was due to a signal error.



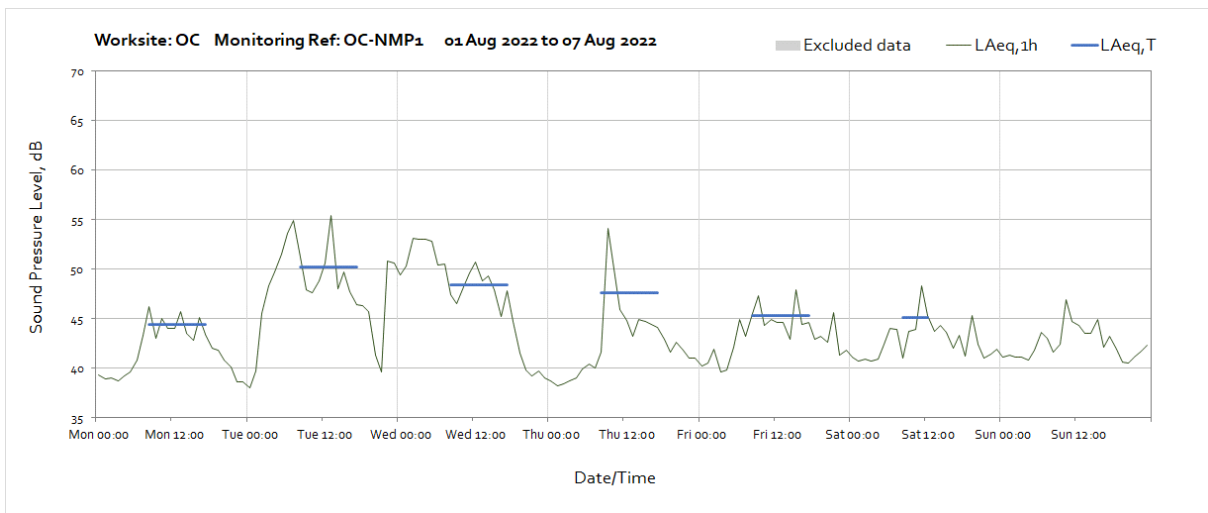


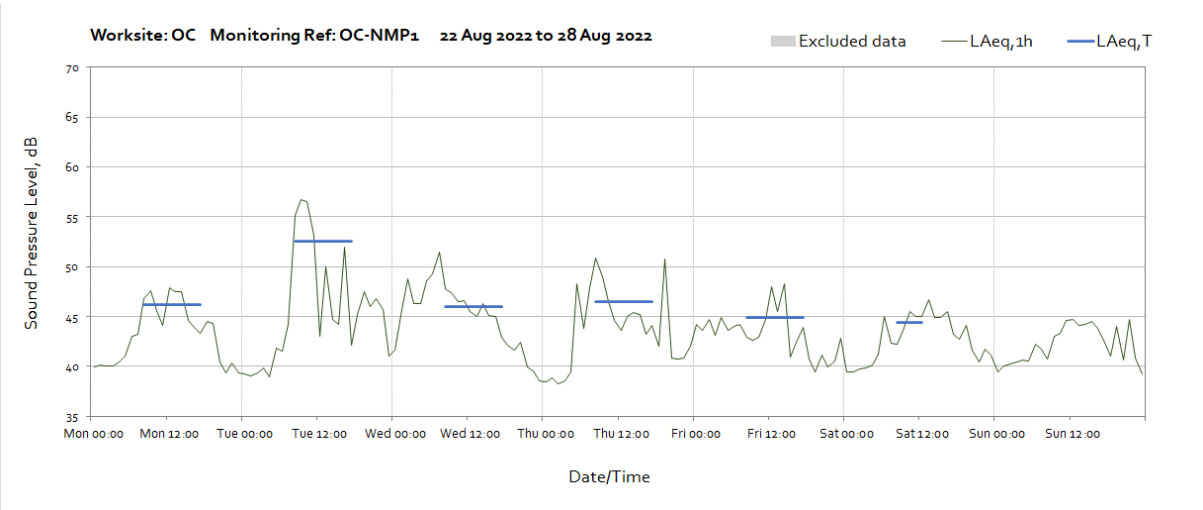
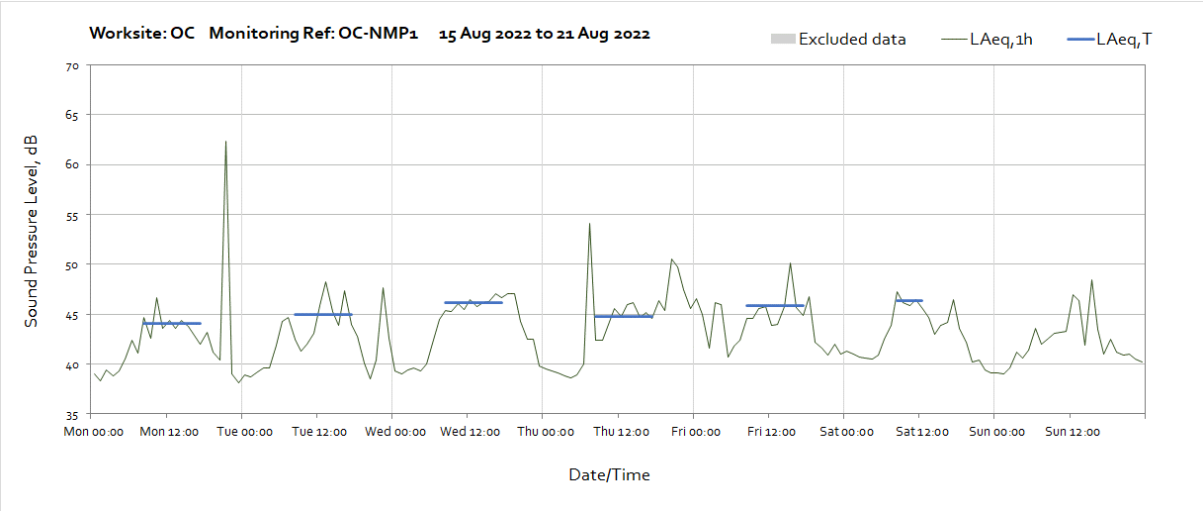
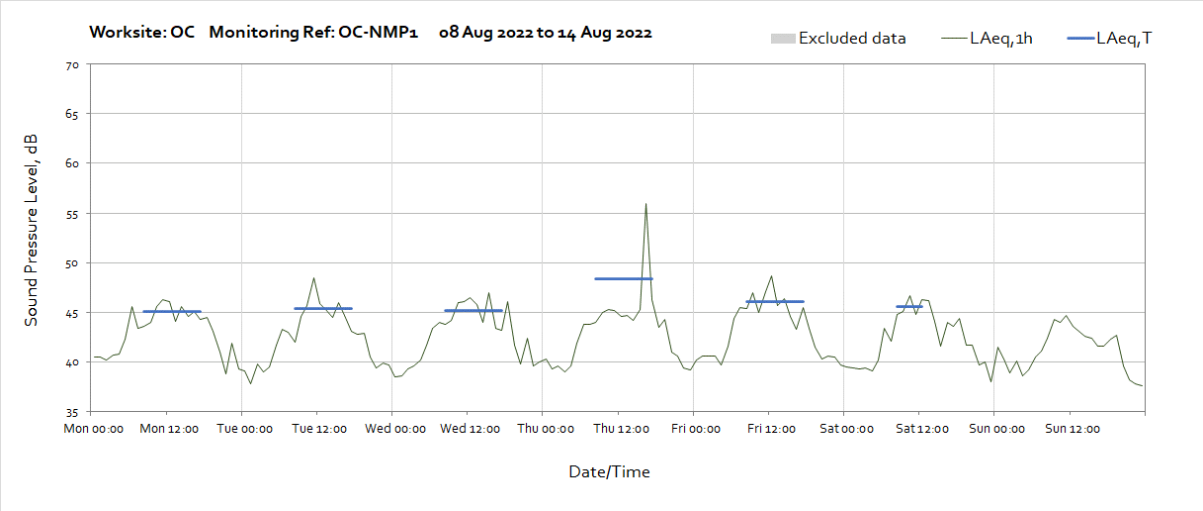
Worksite: MW&GH – Monitoring Ref: MW-NMP1

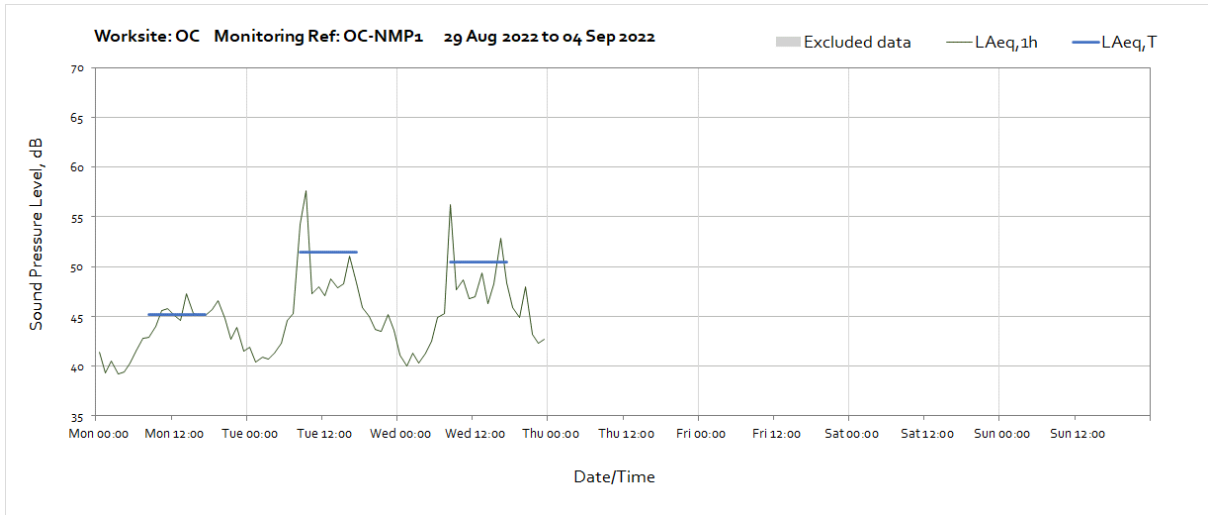




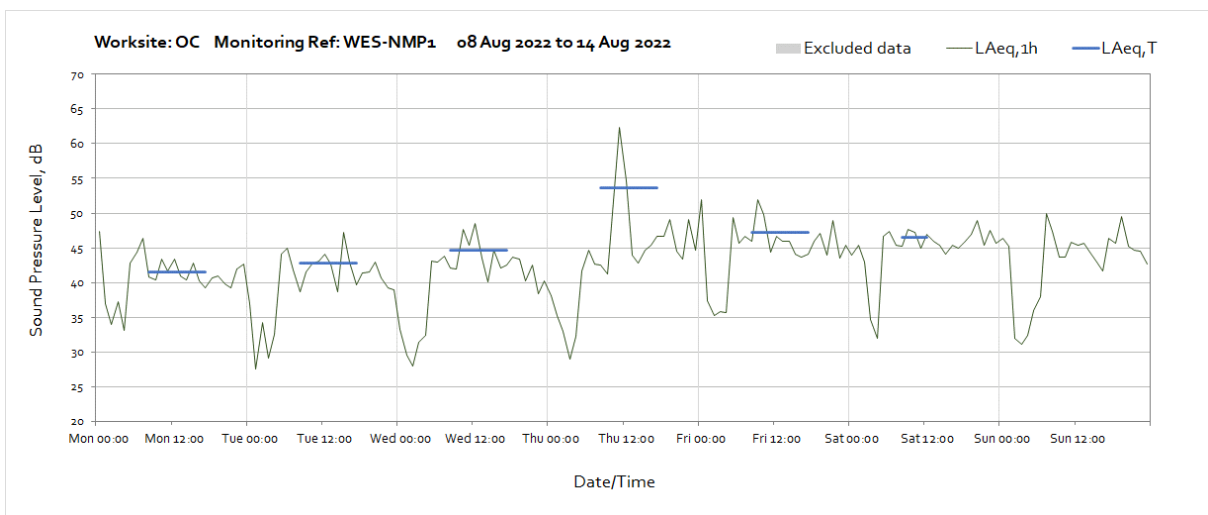
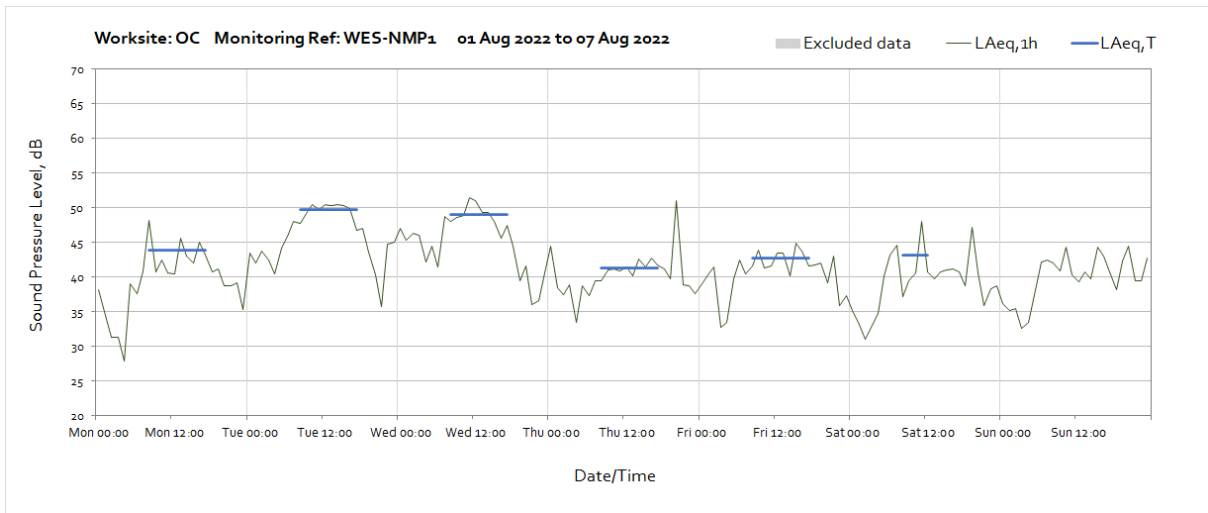
Worksite: OC - Monitoring Ref: OC-NMP1

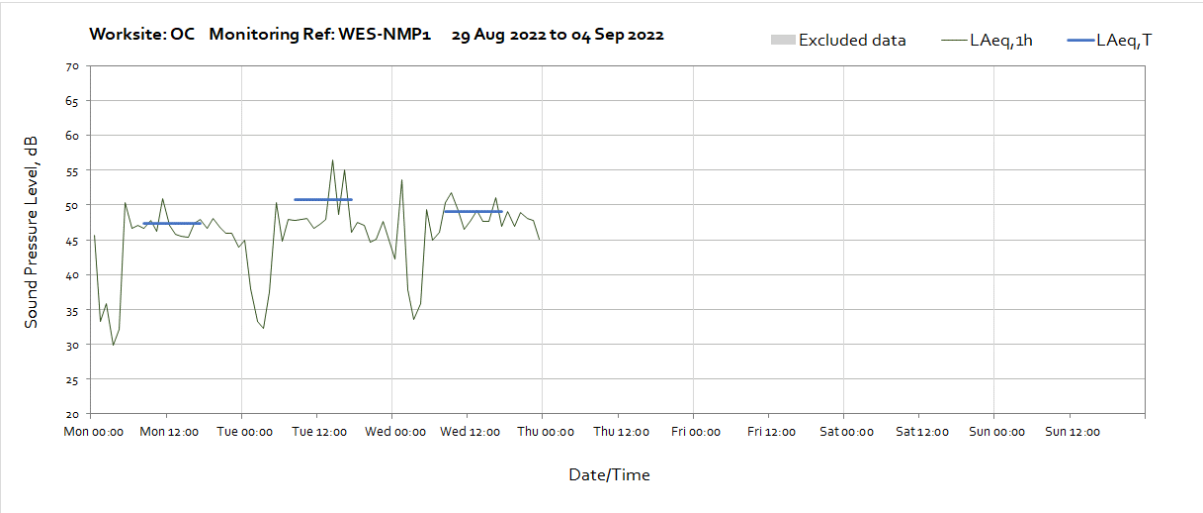
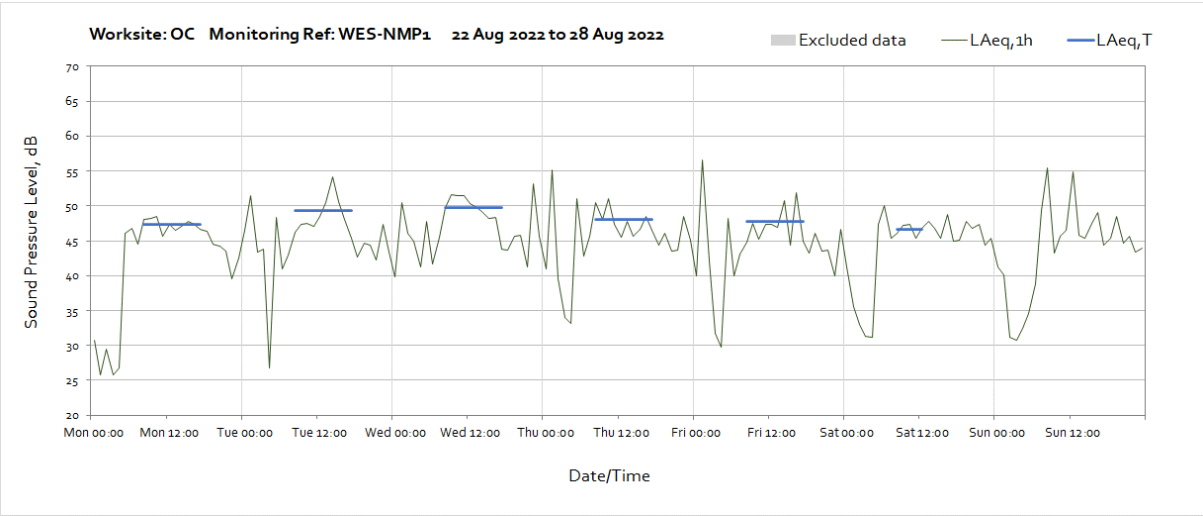
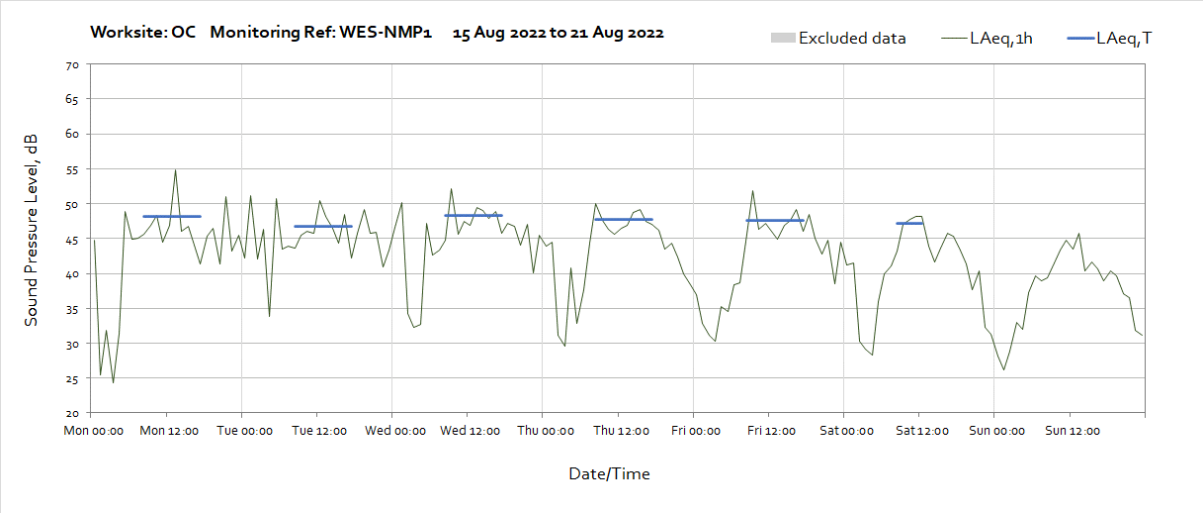




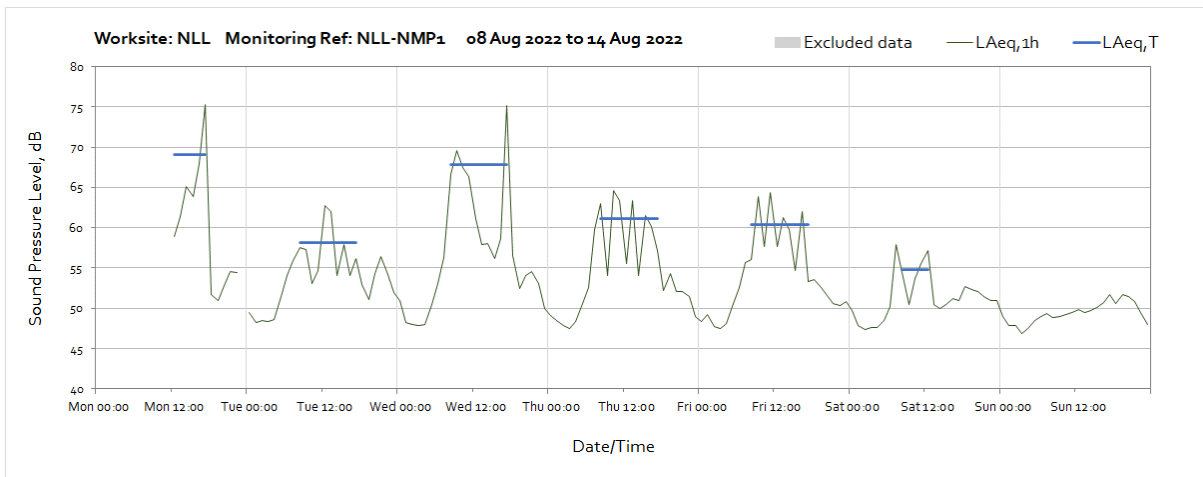


Worksite: OC - Monitoring Ref: WES-NMP1

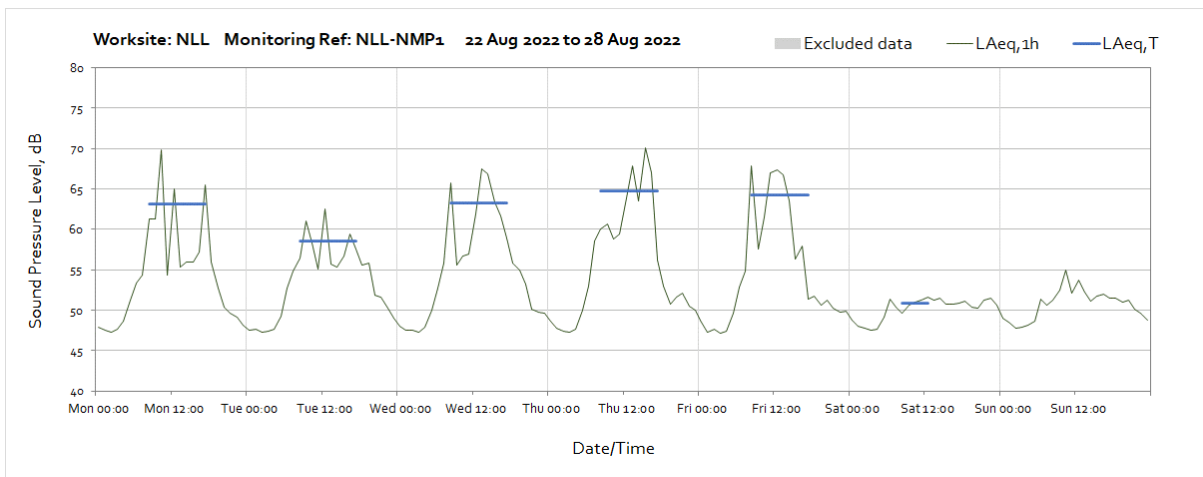
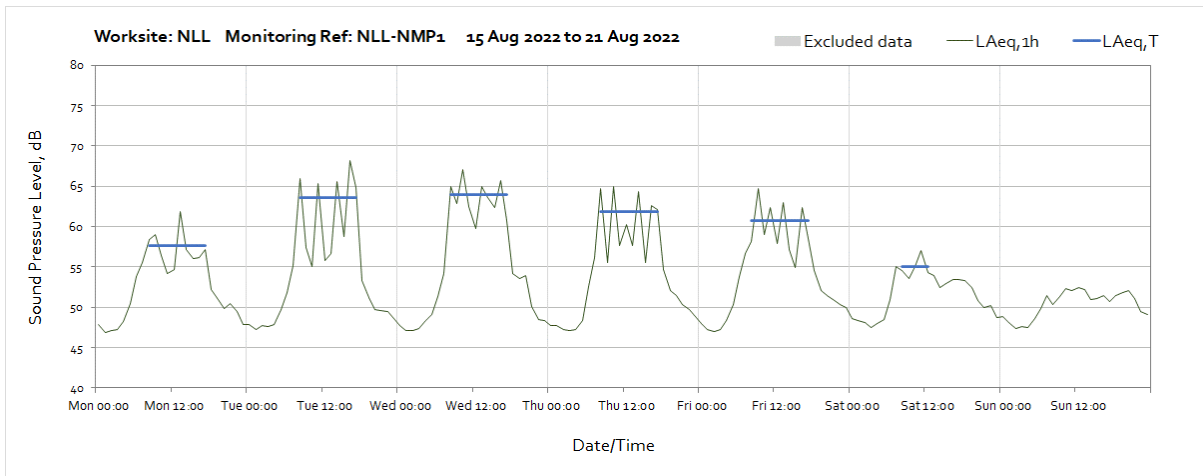


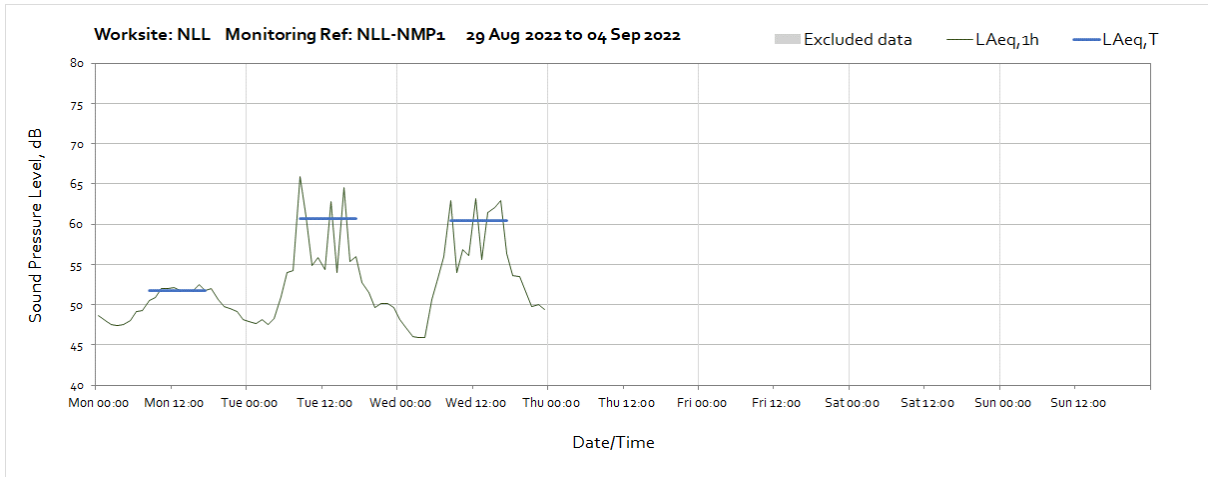


Worksite: NLL – Monitoring Ref: NLL-NMP1

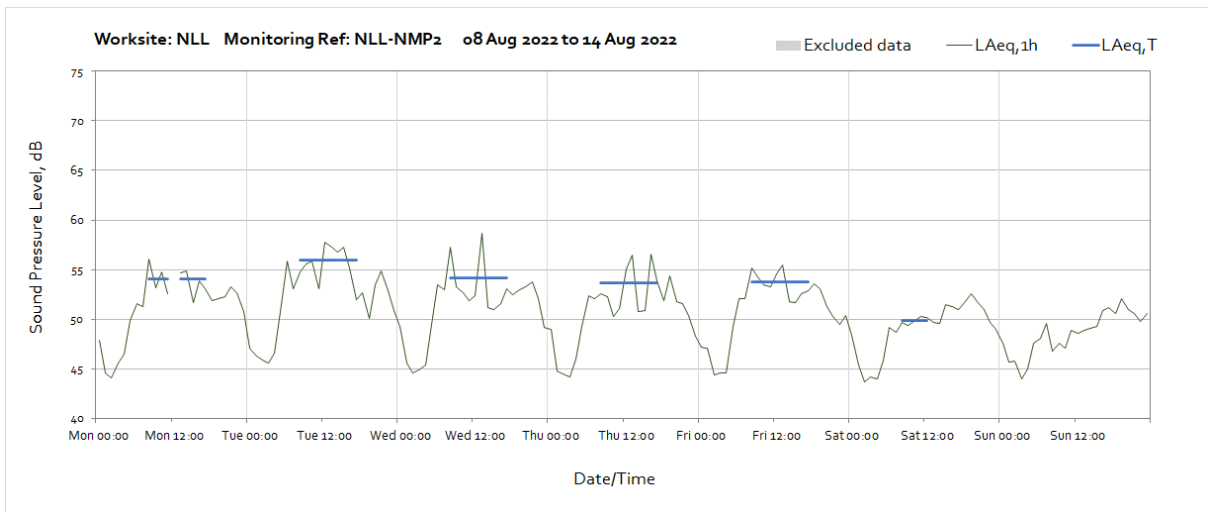
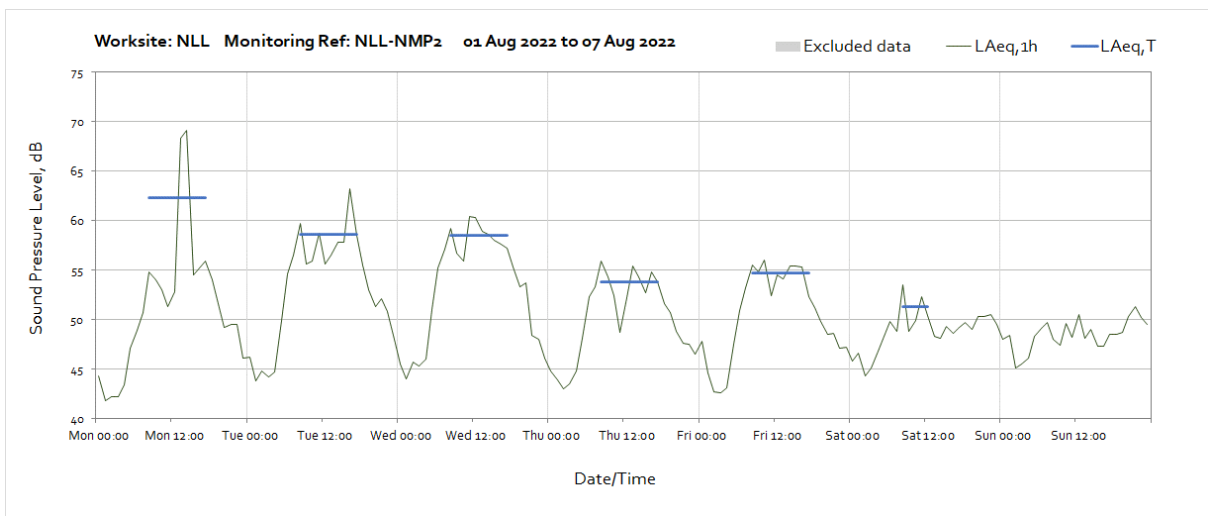


Note: Missing data until the 8th of August were due to power outage.

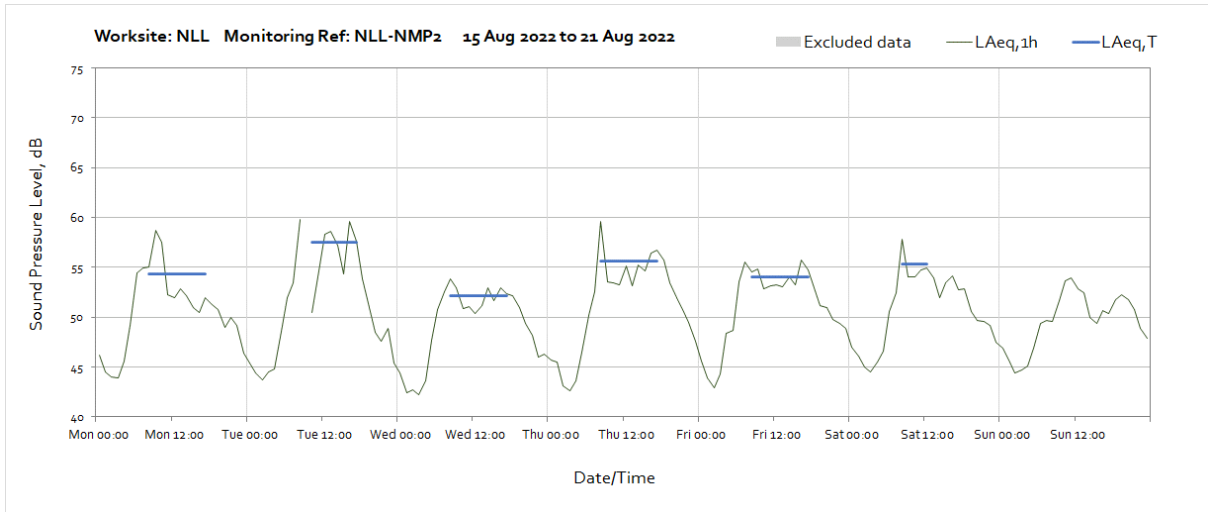




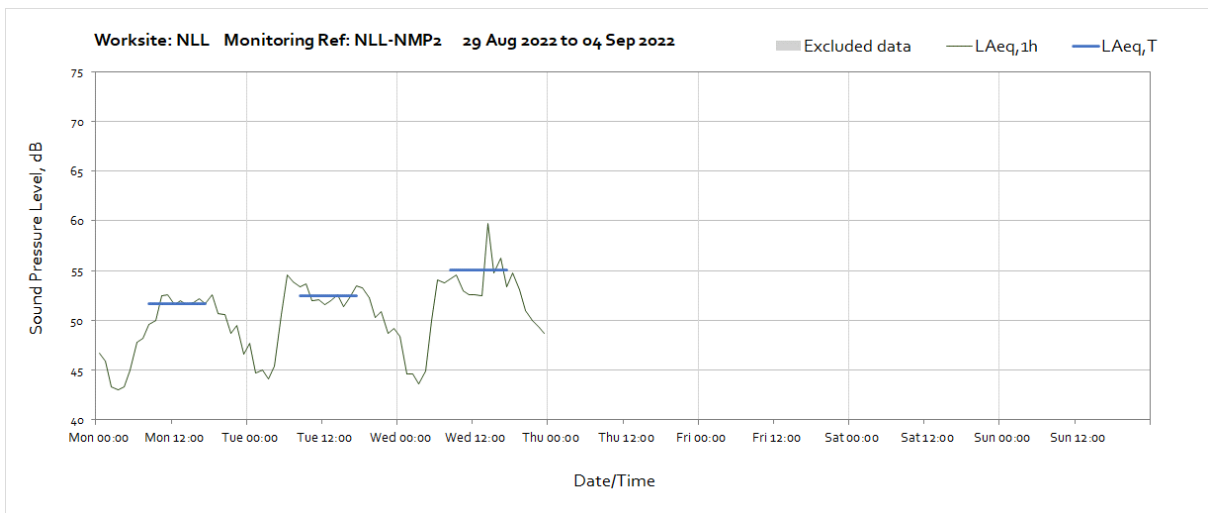
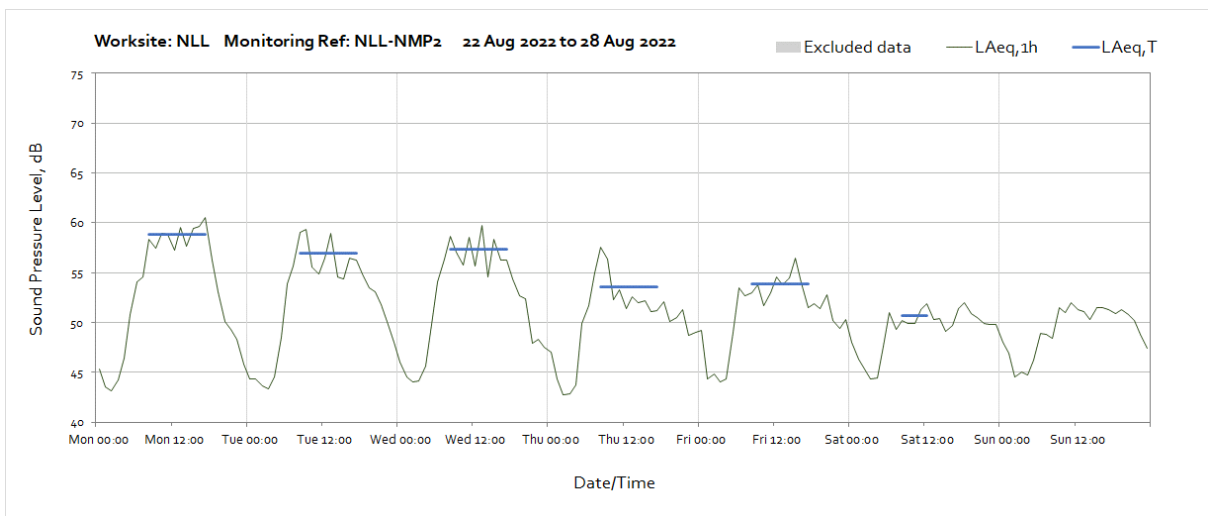
Worksite: NLL – Monitoring Ref: NLL-NMP2



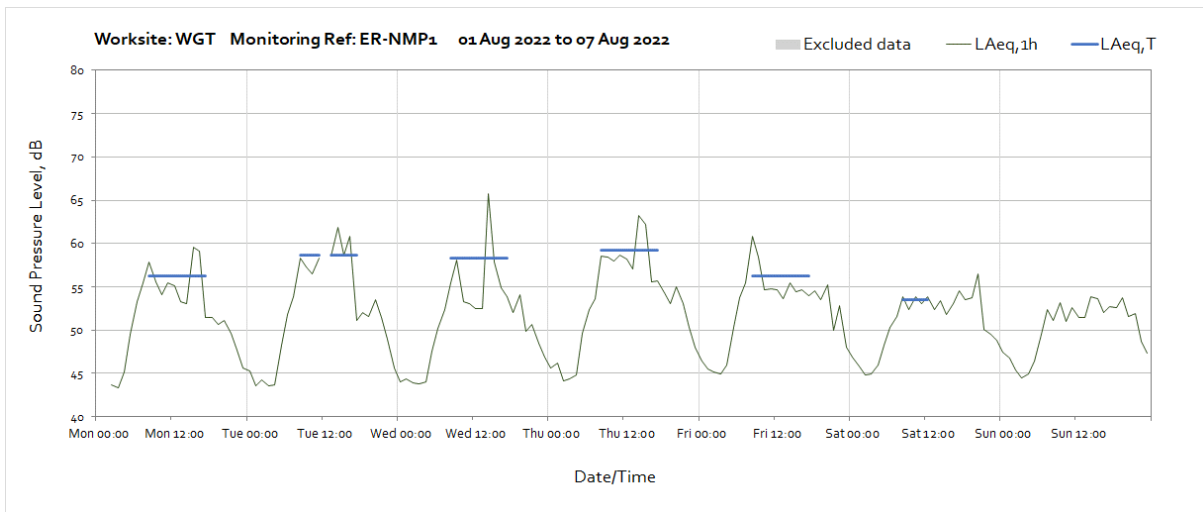
Note: Missing data at 12:00 on Monday 8th August were due to power outage.



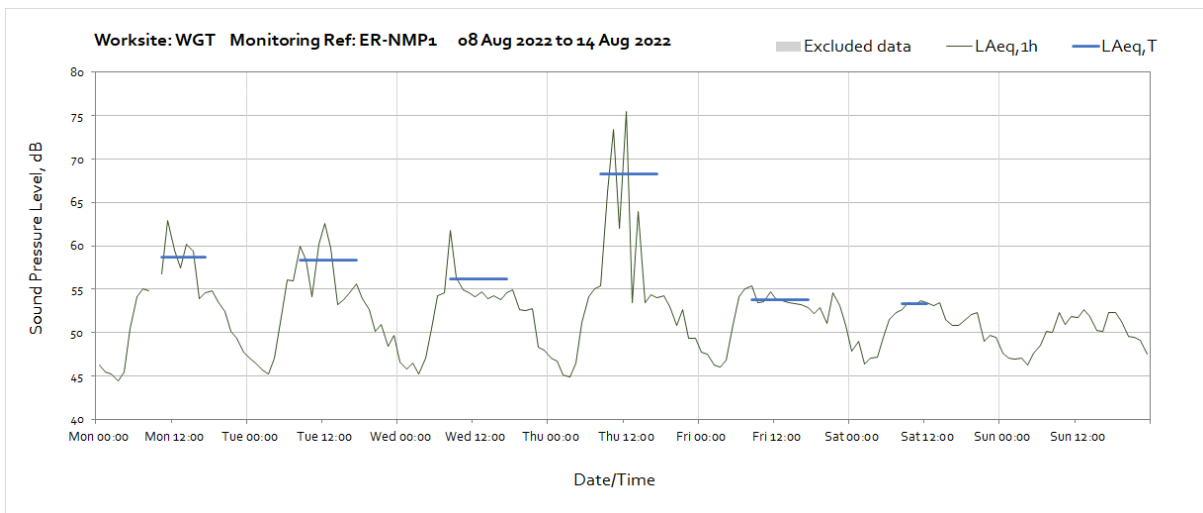
Note: Missing data at 09:00 on Tuesday 16th August were due to power outage.



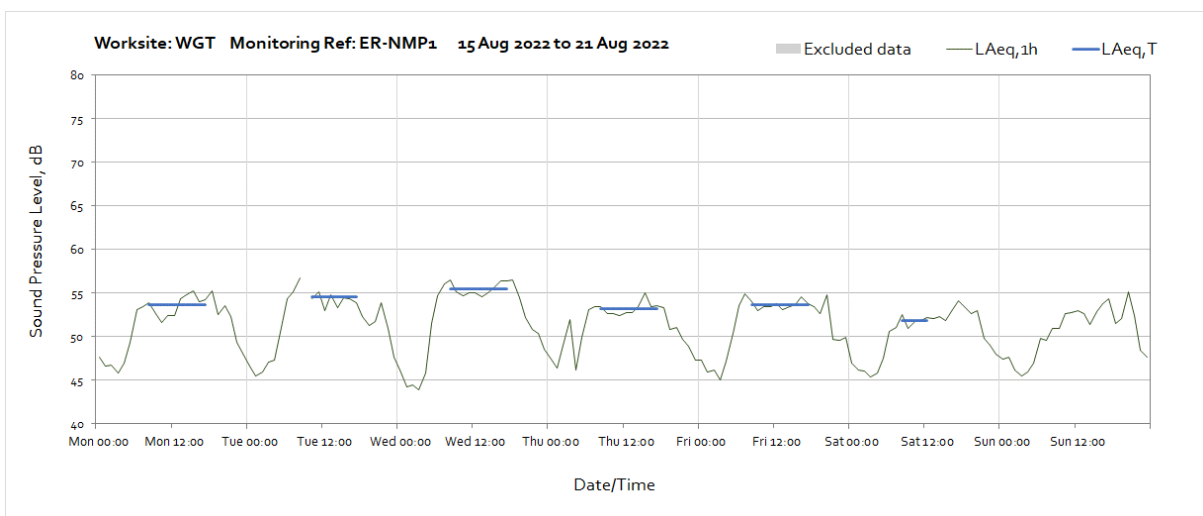
Worksite: WGT – Monitoring Ref: ER-NMP1



Note: Missing data at 00:00 on Monday 1st and at 12:00 on Tuesday 2nd August were due to power outage.

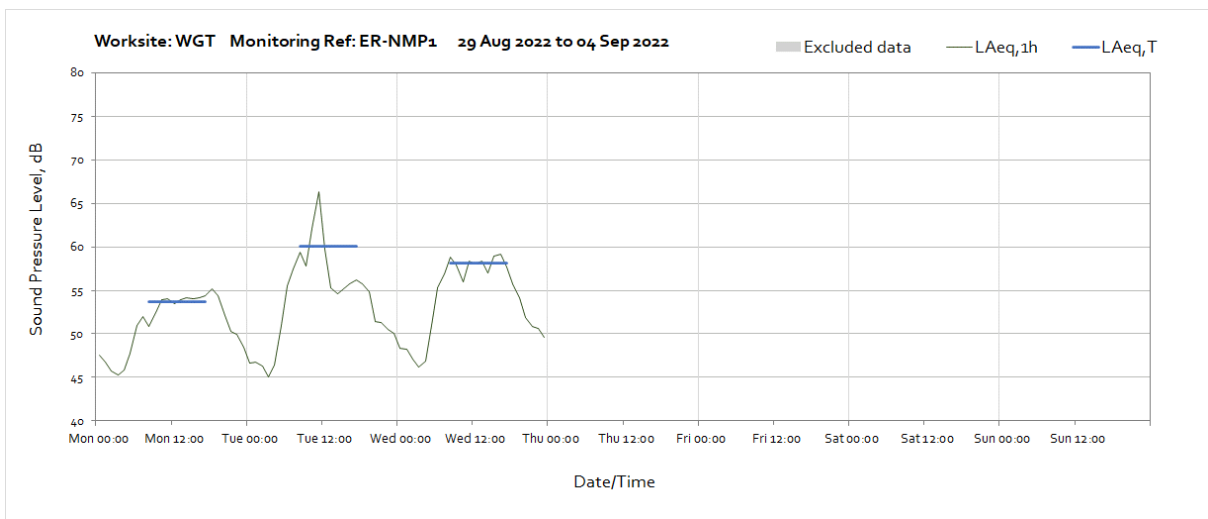
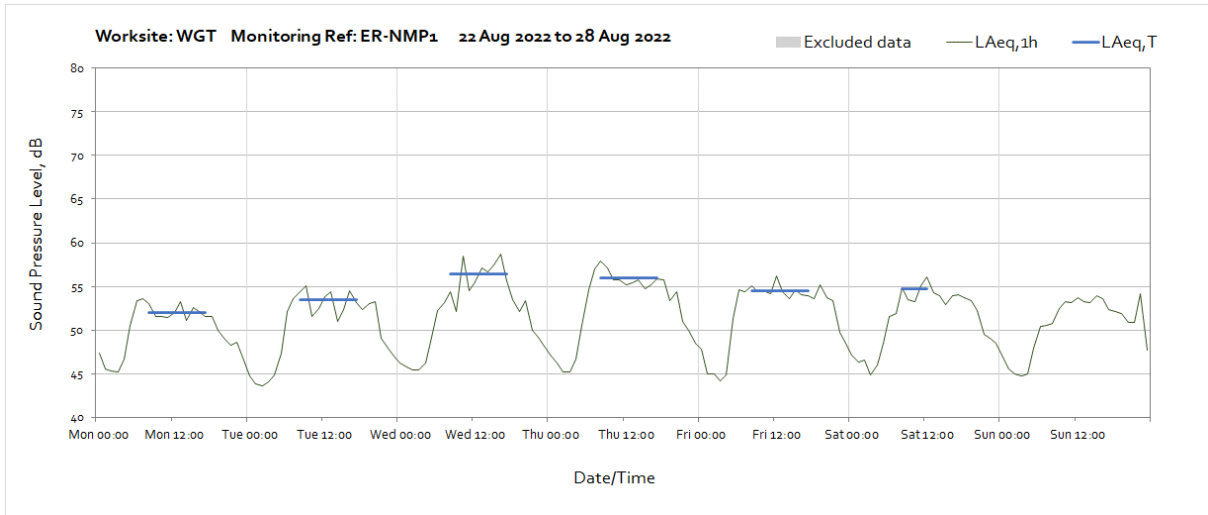


Note: Missing data at 09:00 on Monday 8th August were due to power outage.

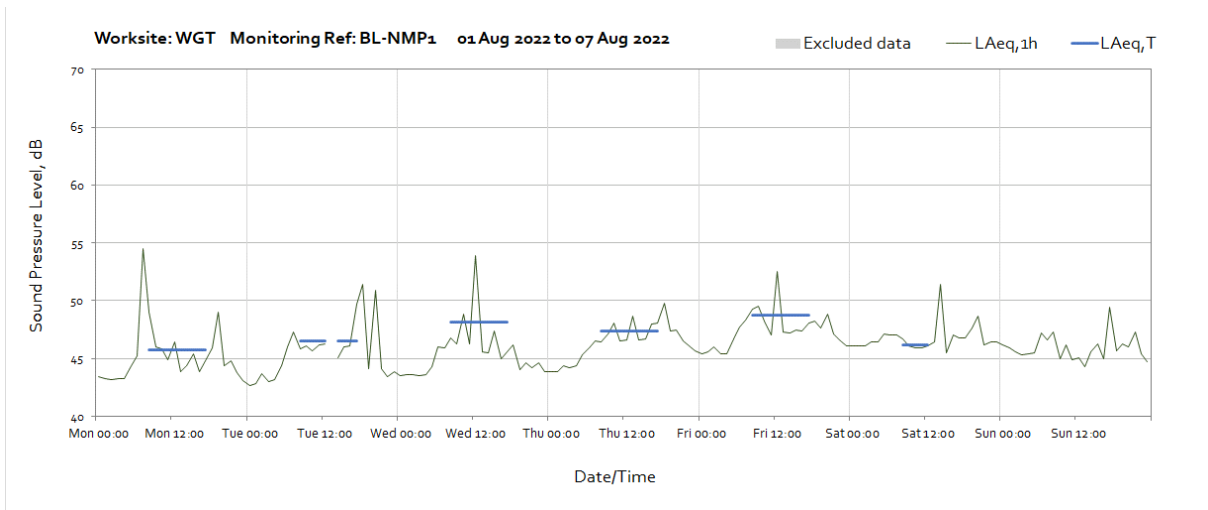


Note: Missing data at 09:00 on Tuesday 16th August were due to power outage.

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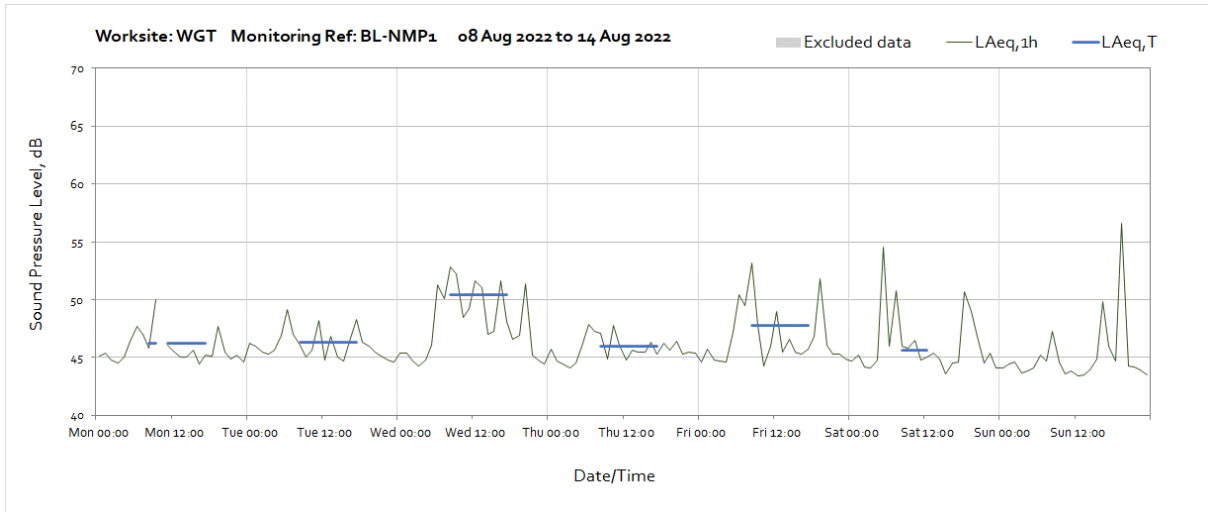


Worksite: WGT - Monitoring Ref: BL-NMP1

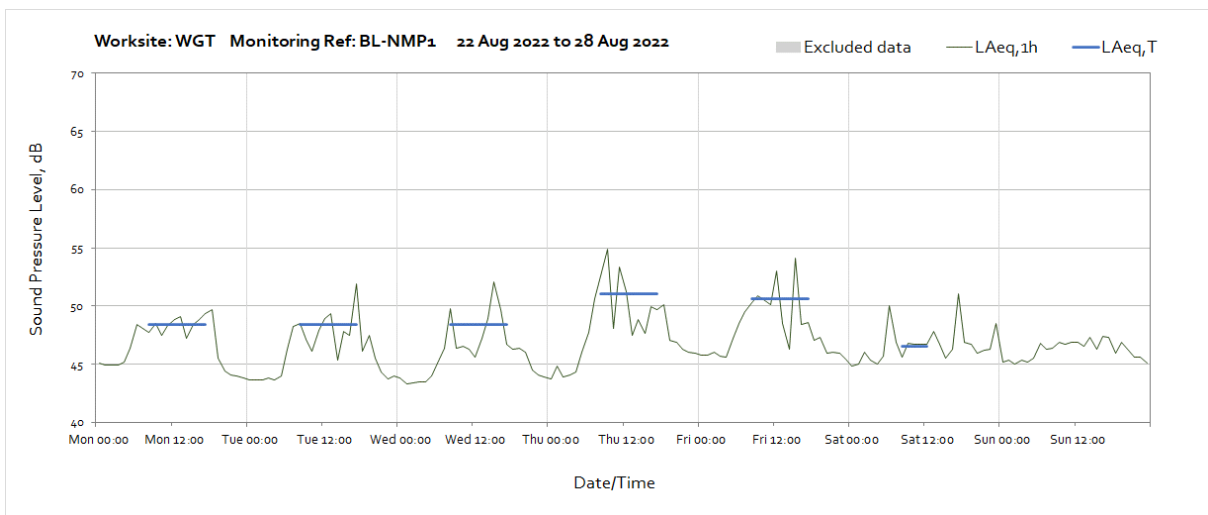
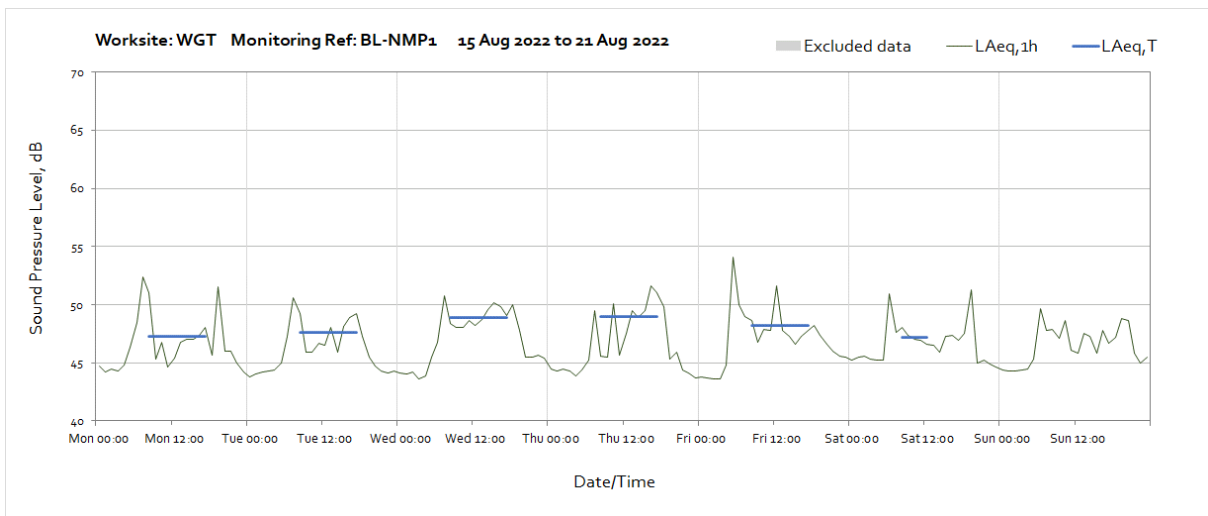


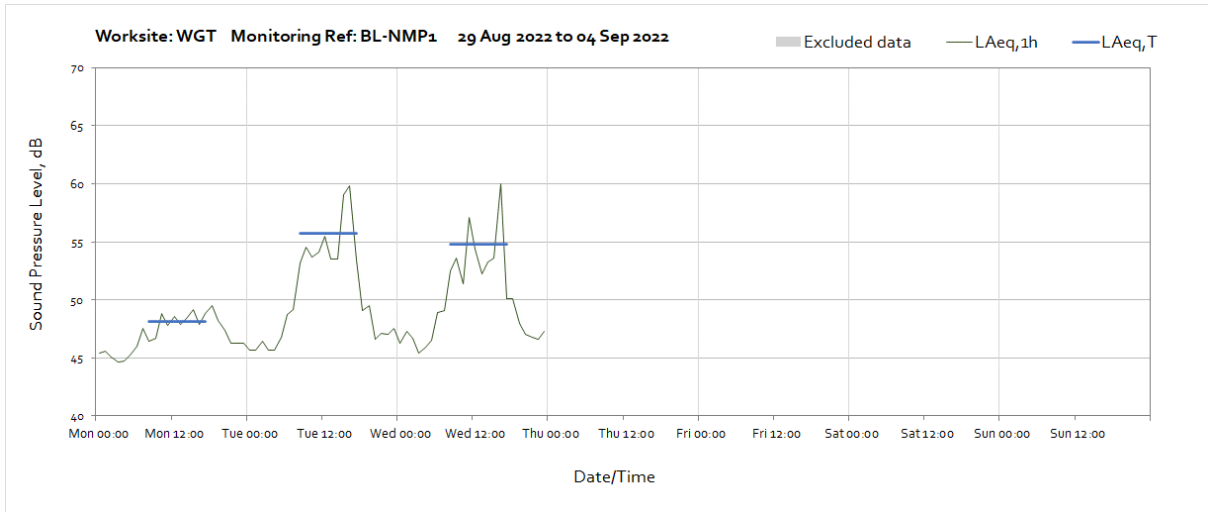
Note: Missing data at 13:00 on Tuesday 2nd August were due to power outage.

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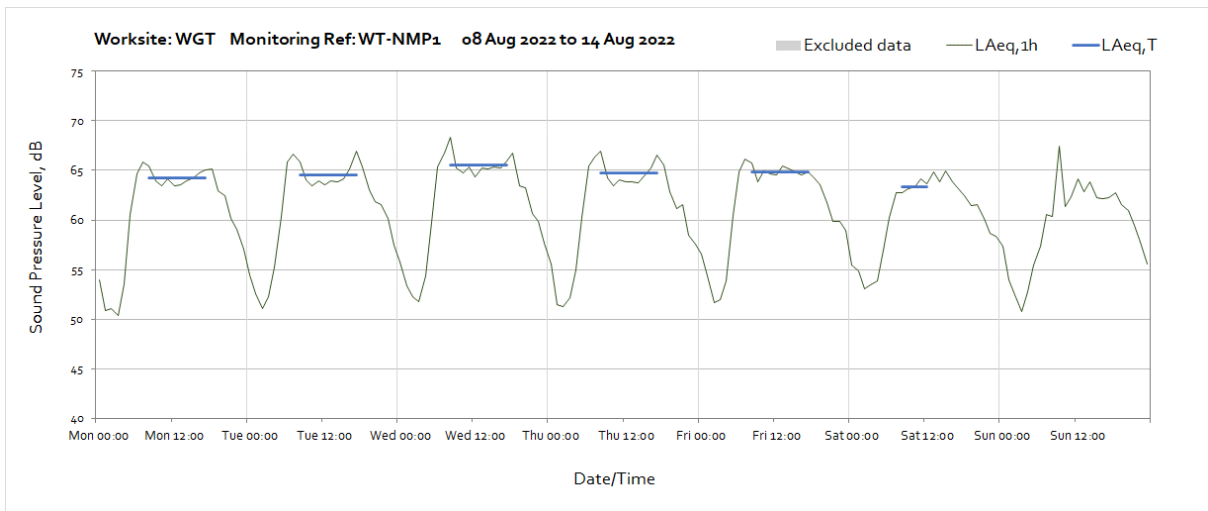
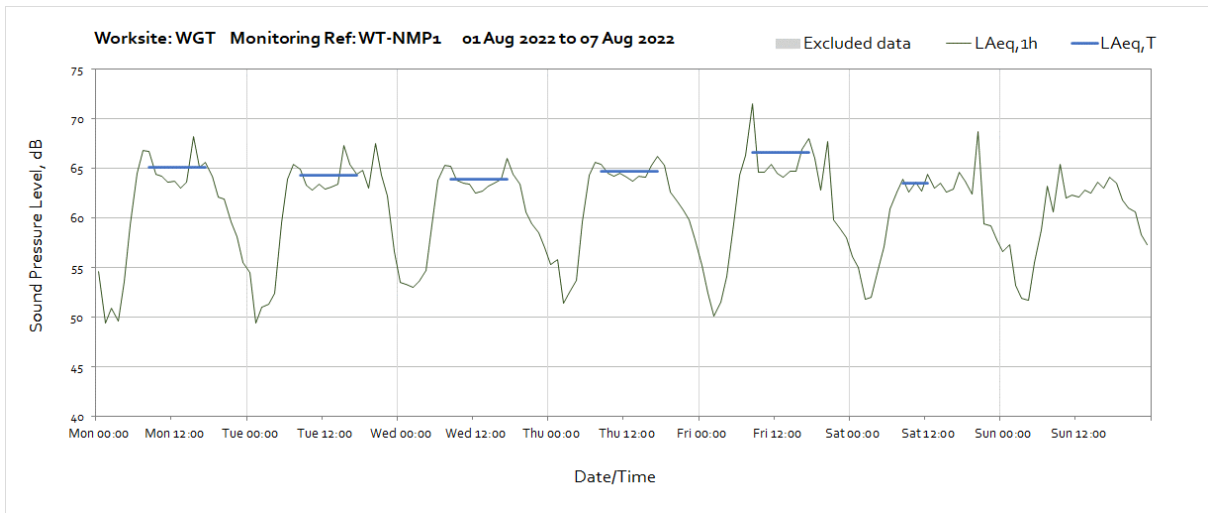


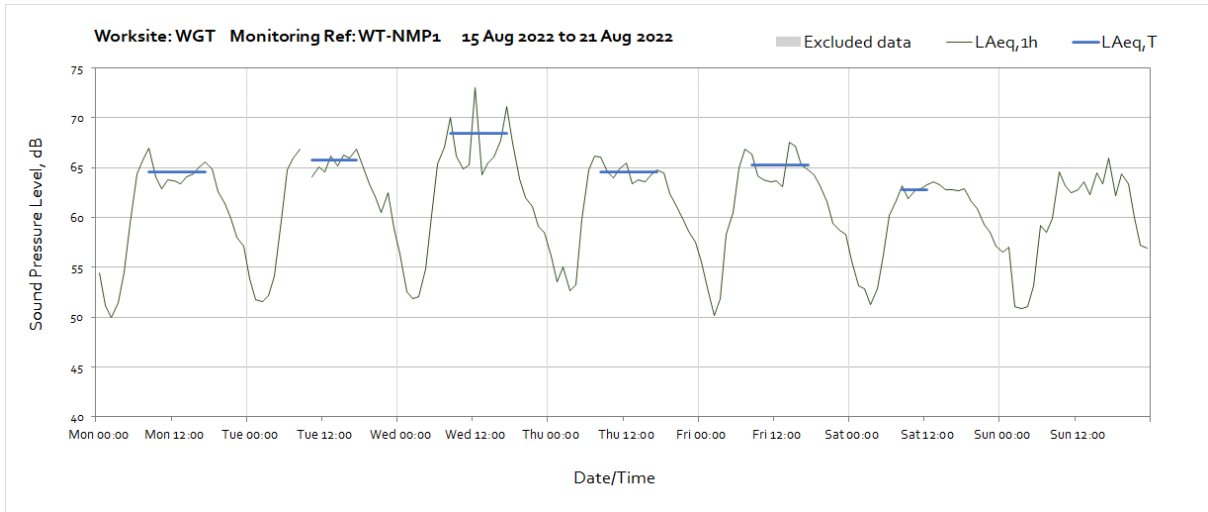
Note: Missing data at 10:00 on Monday 8th August were due to power outage.



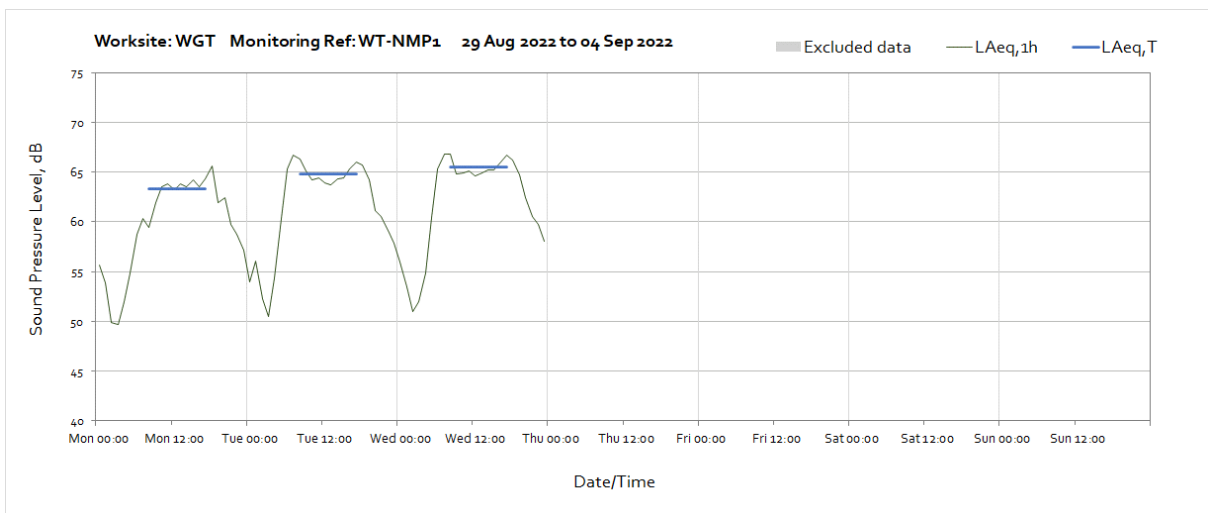
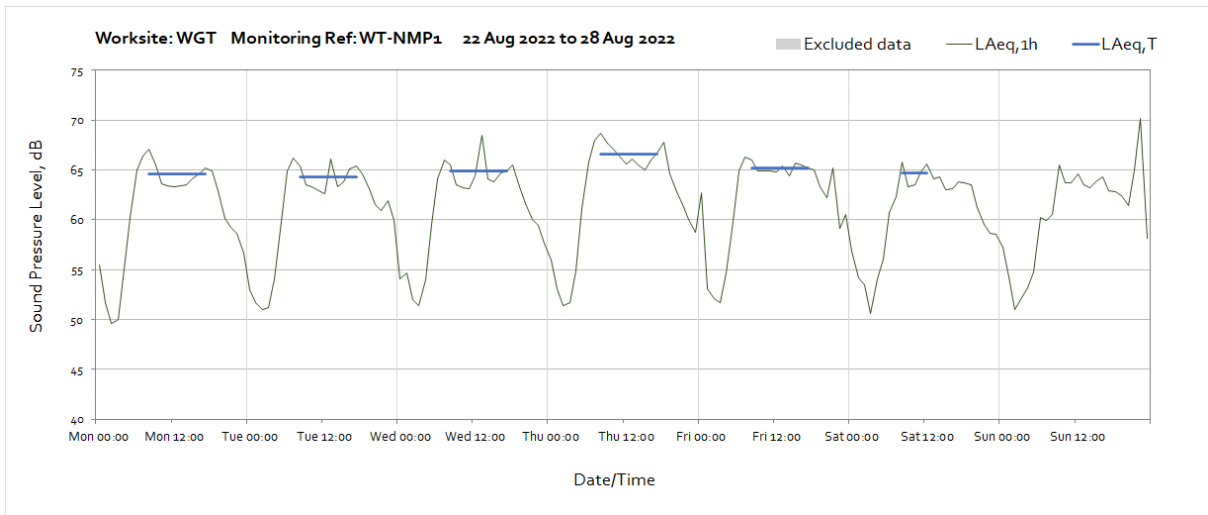


Worksite: WGT - Monitoring Ref: WT-NMP1

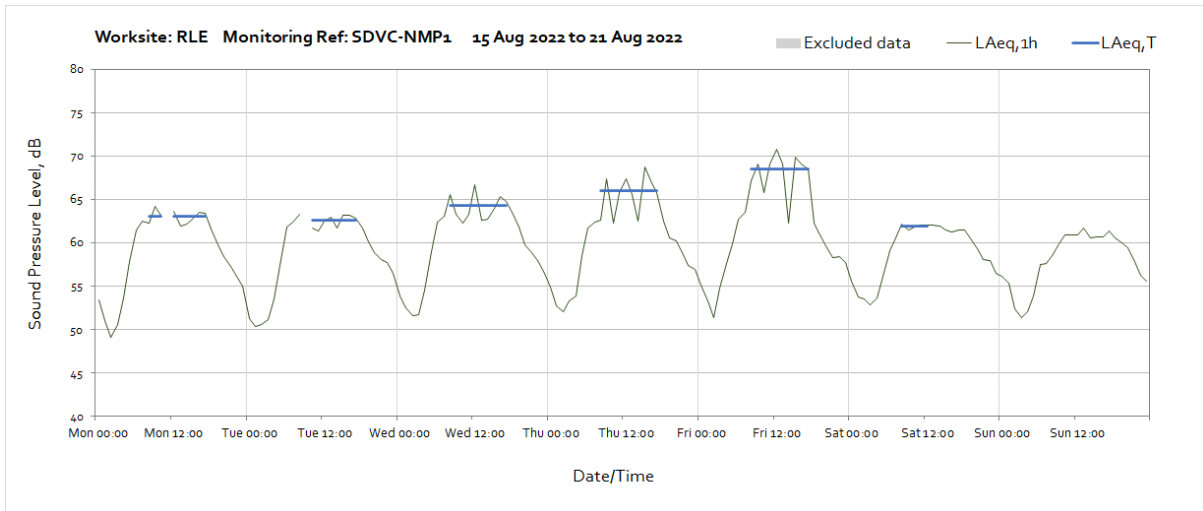
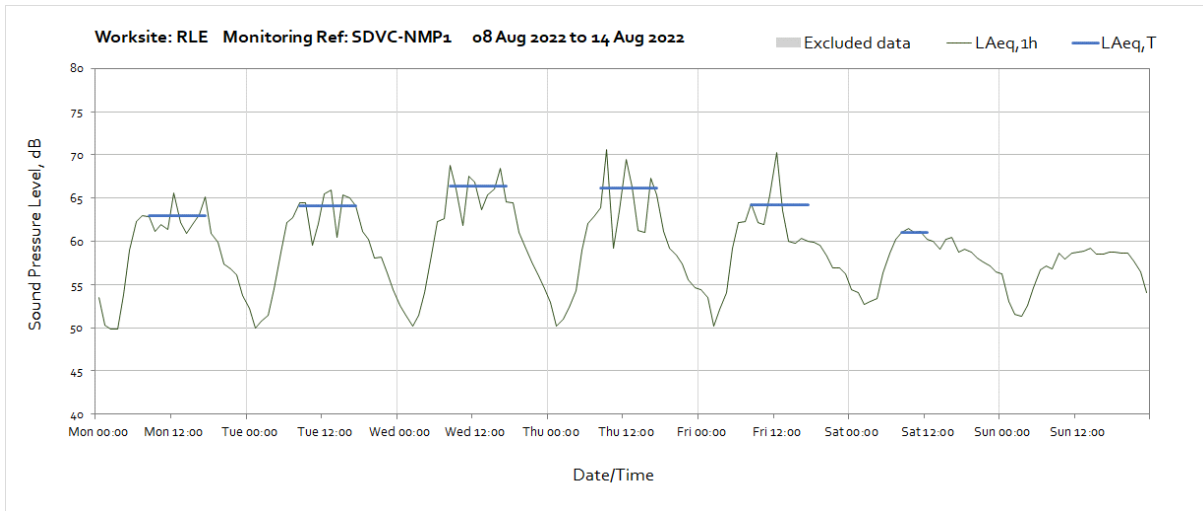
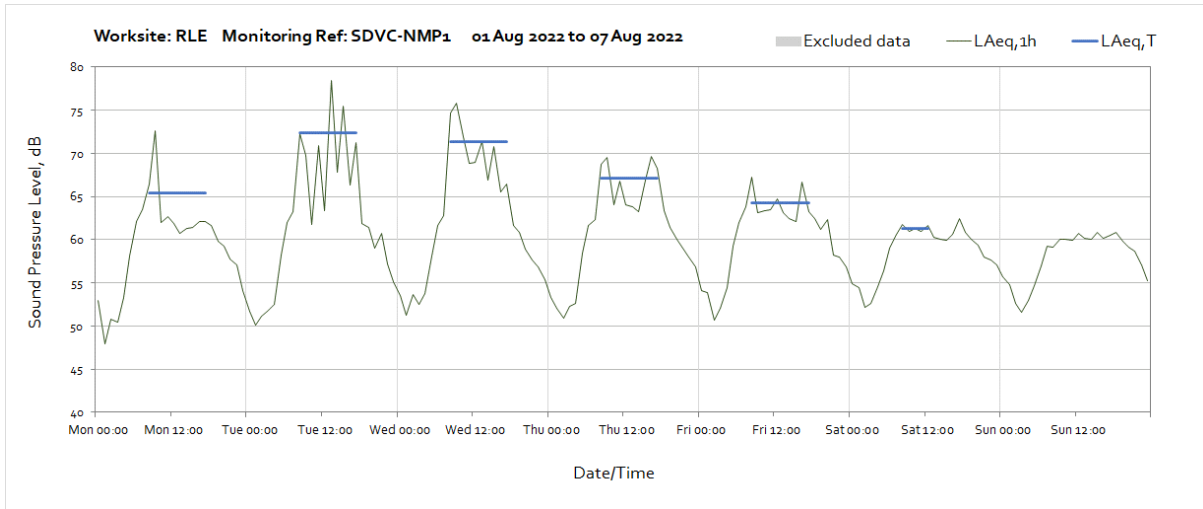




Note: Missing data at 09:00 on Tuesday 16th August were due to power outage.

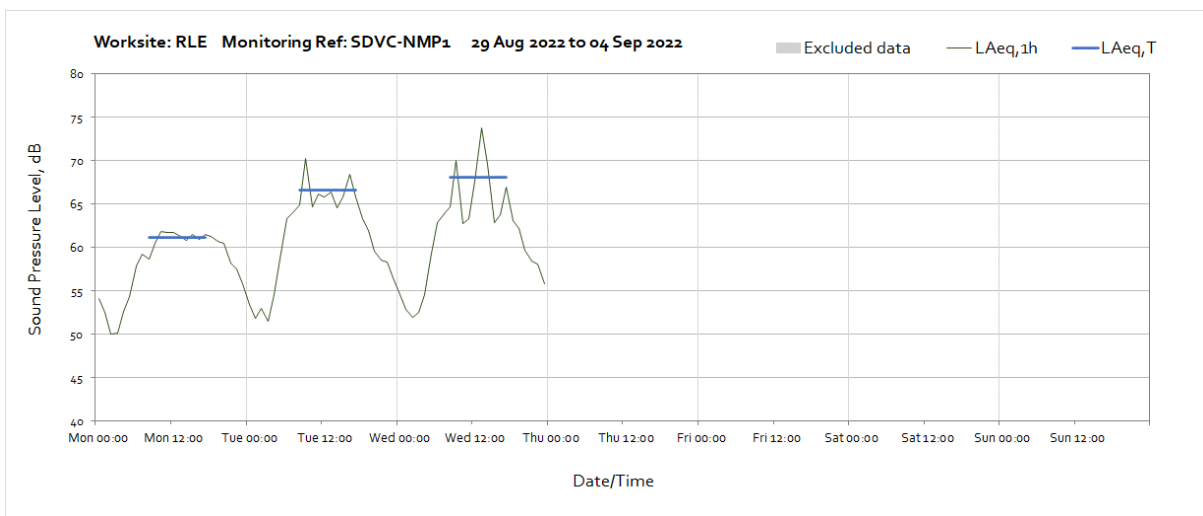
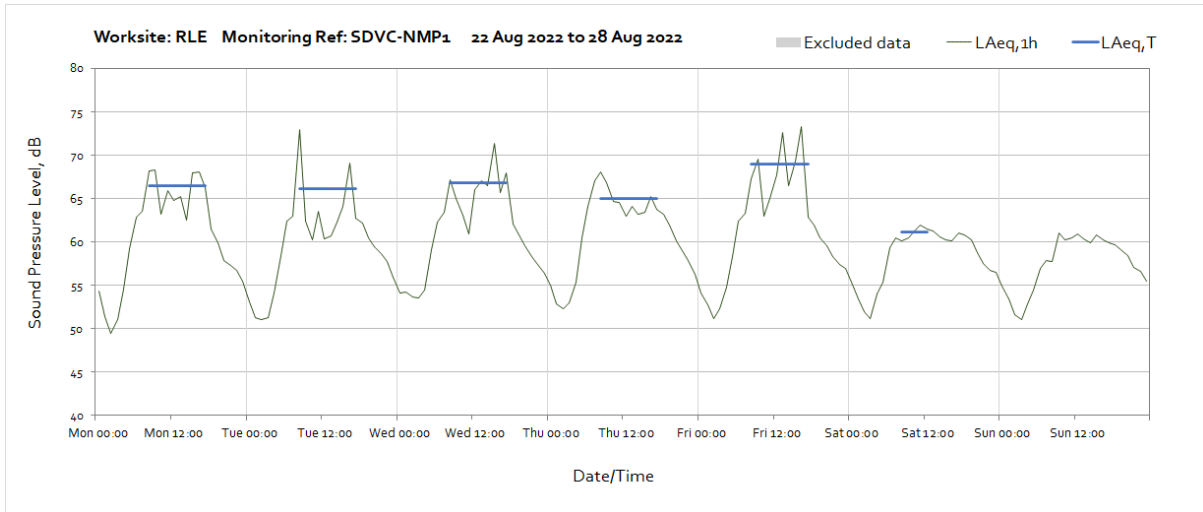


Worksite: RLE – Monitoring Ref: SDVC-NMP1

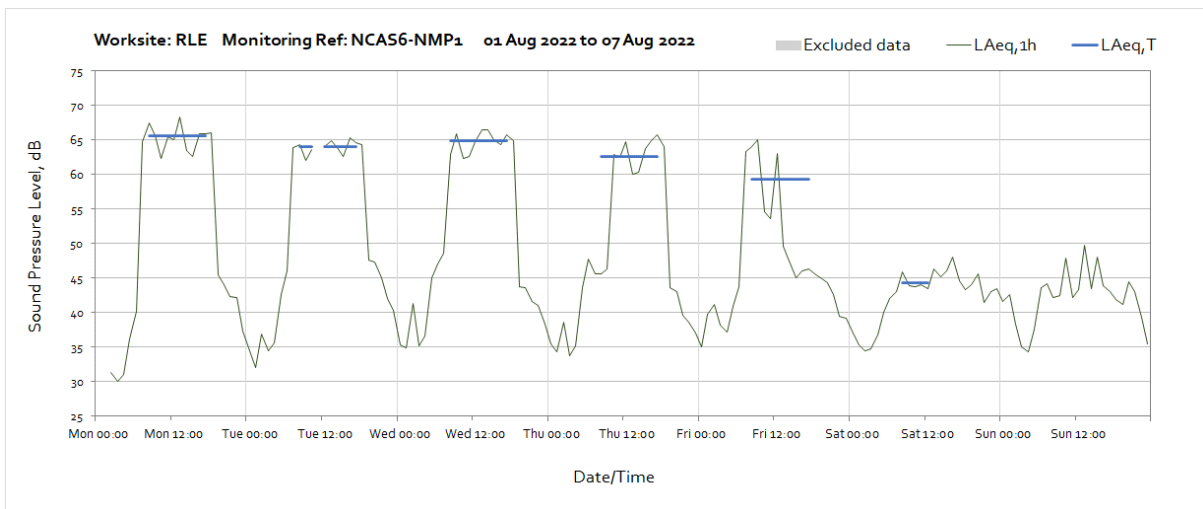


Note: Missing data at 12:00 on Monday 15th and at 10:00 on Tuesday 16th were due to power outage.

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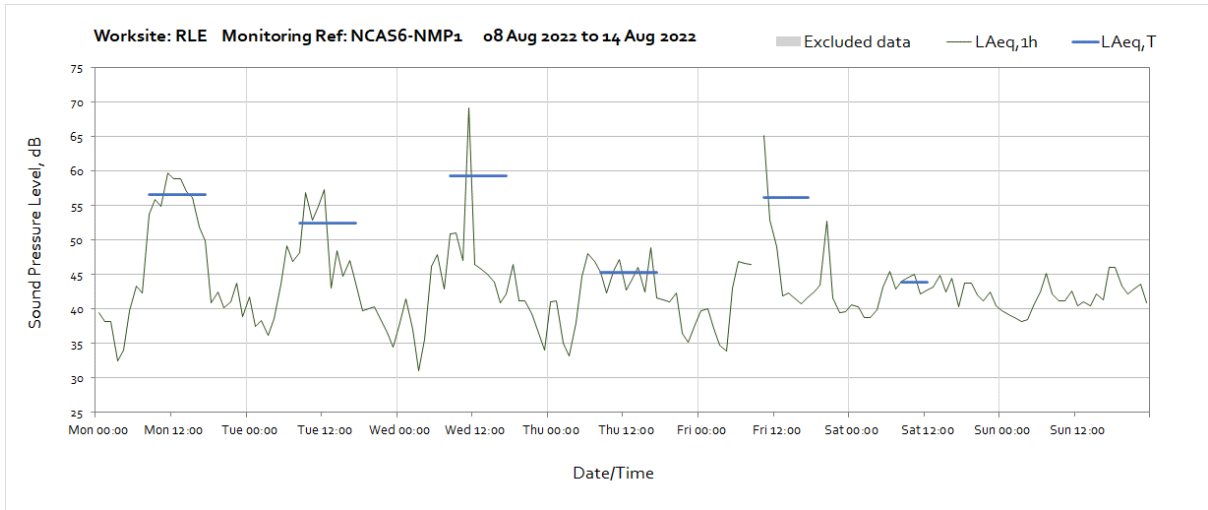


Worksite: RLE - Monitoring Ref: NCAS6-NMP1

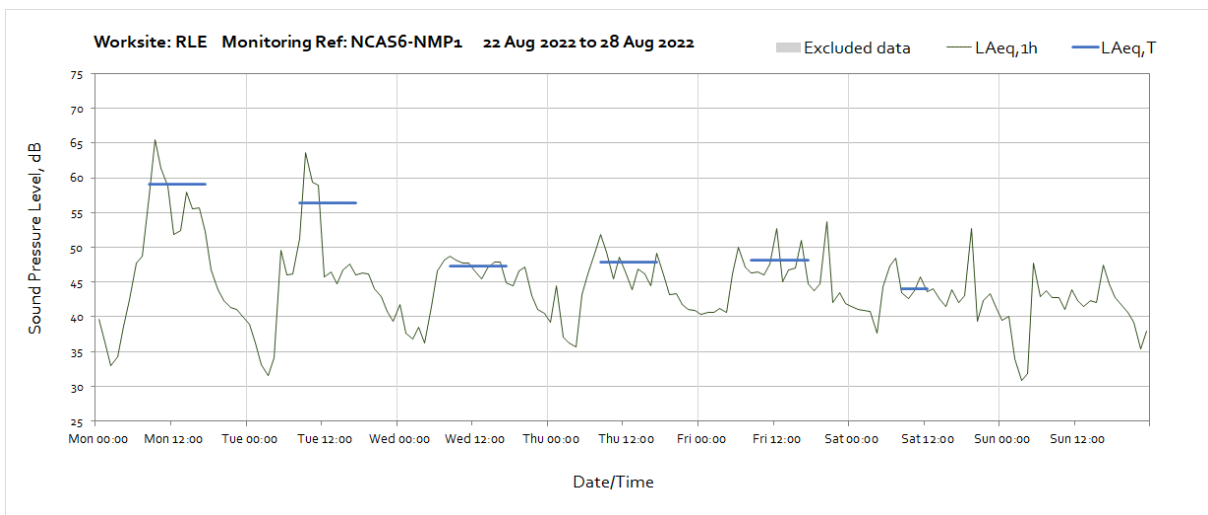
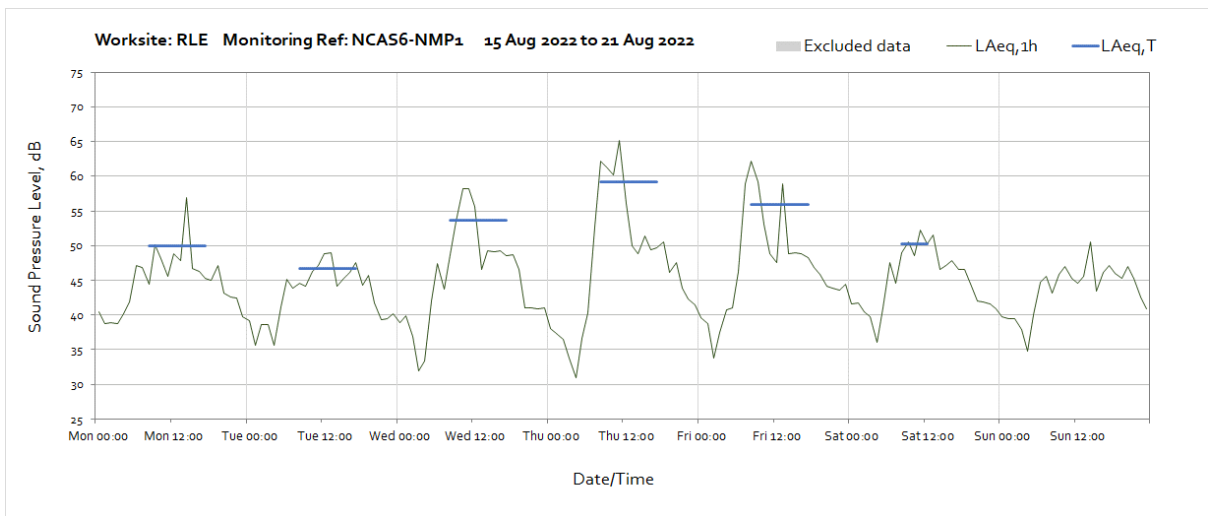


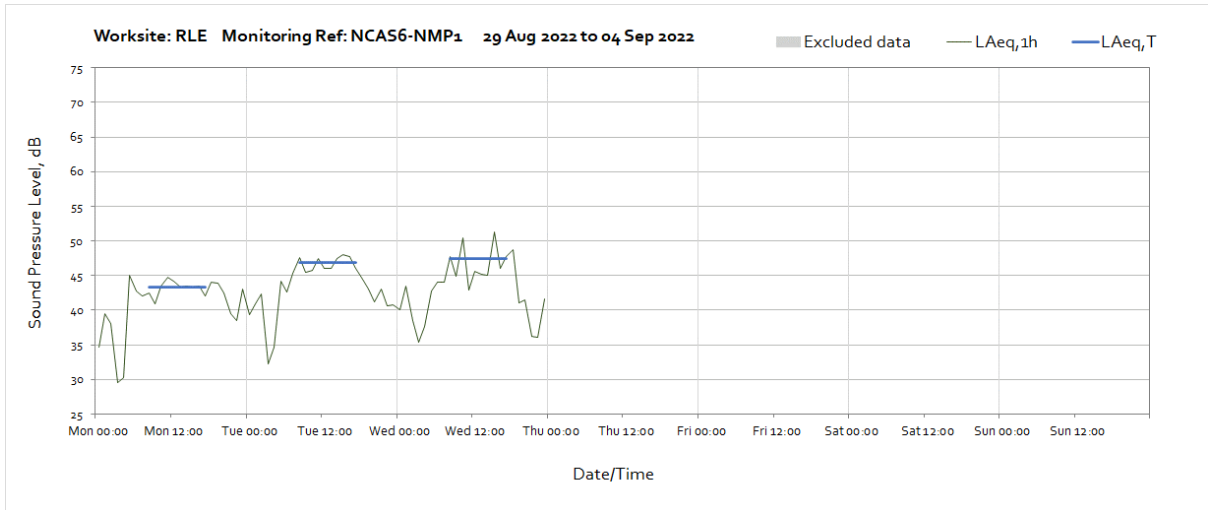
Note: Missing data at 00:00 on Monday 1st and at 12:00 on Tuesday 2nd August were due to power outage.

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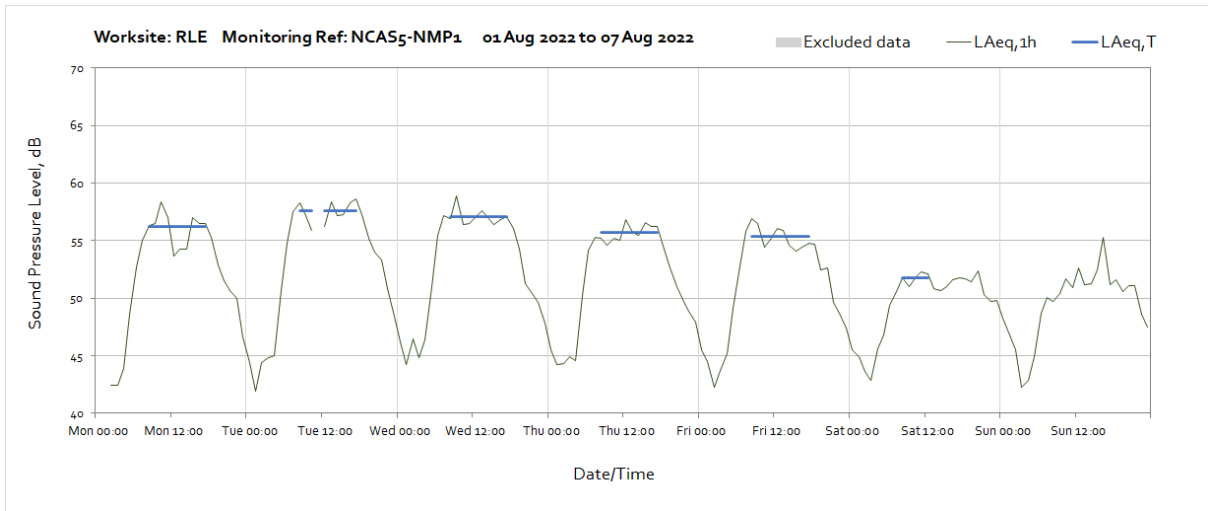


Note: Missing data at 09:00 on Friday 12th August were due to power outage.

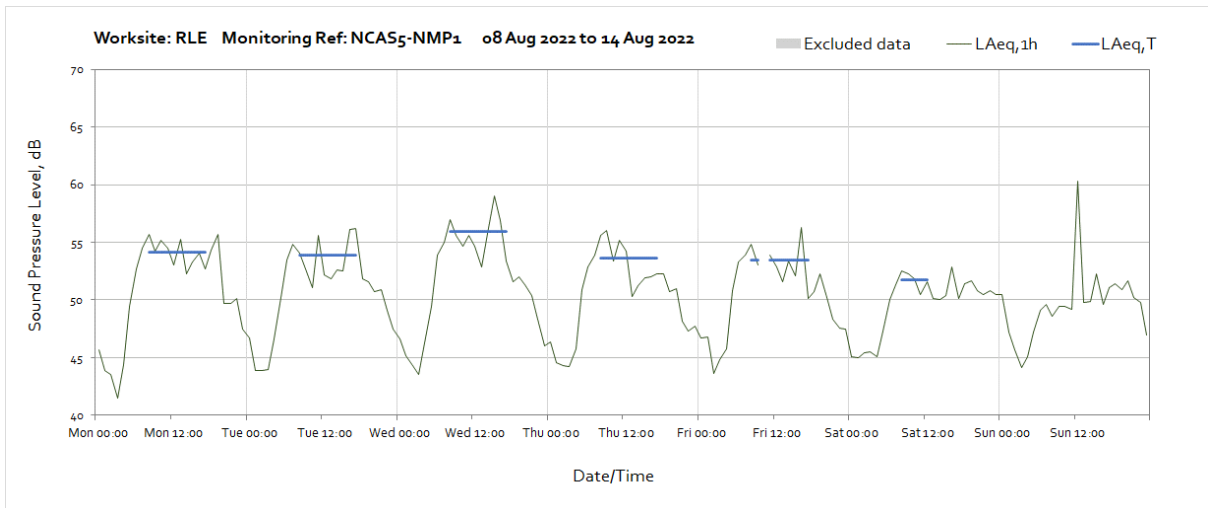




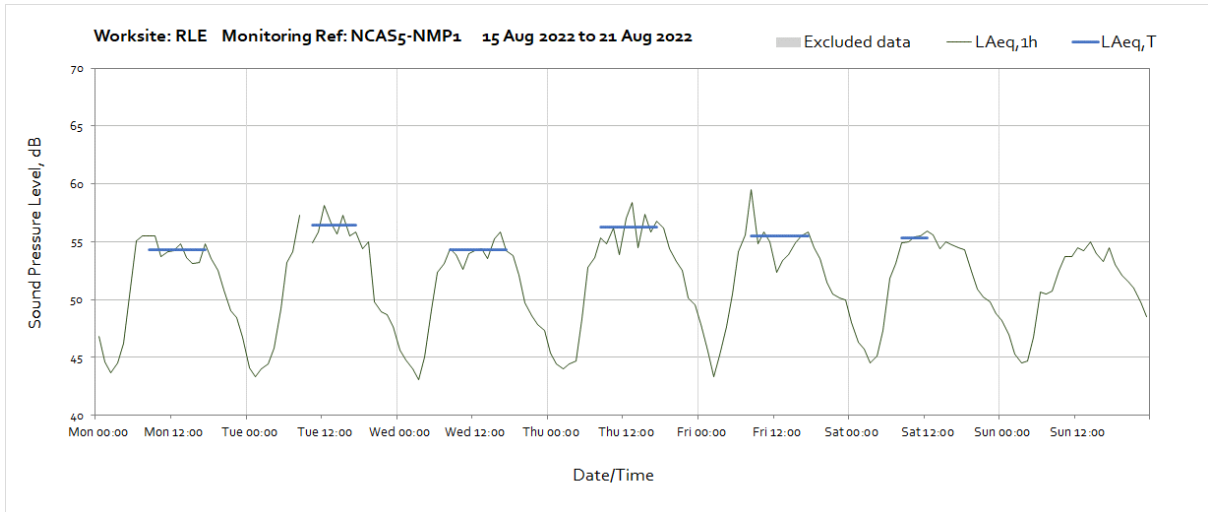
Worksite: RLE – Monitoring Ref: NCAS5-NMP1



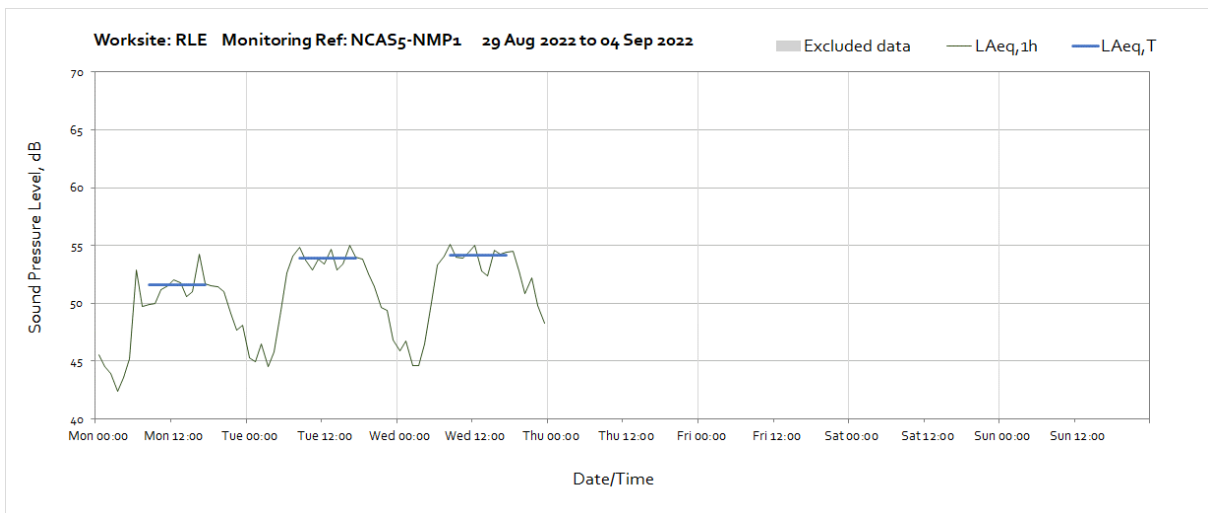
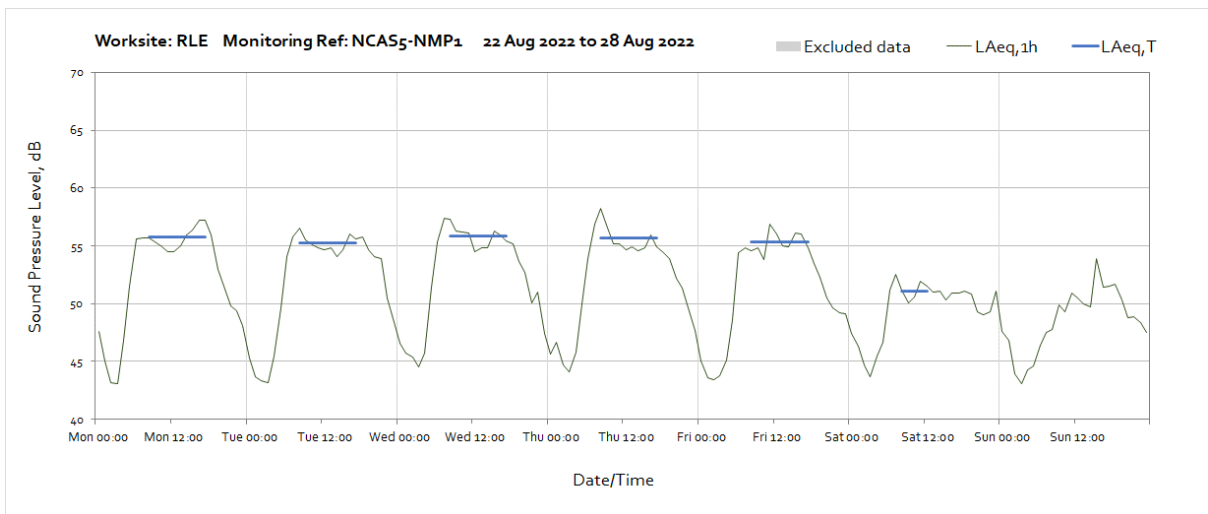
Note: Missing data at 00:00 on Monday 1st and at 12:00 on Tuesday 2nd August were due to power outage.



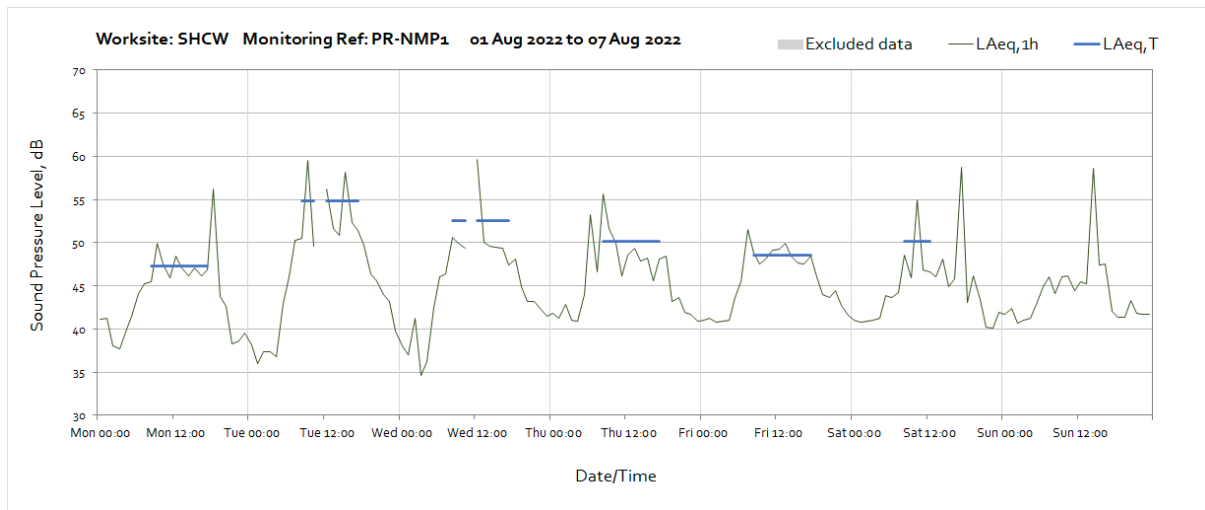
Note: Missing data at 12:00 on Friday 12th August were due to power outage.



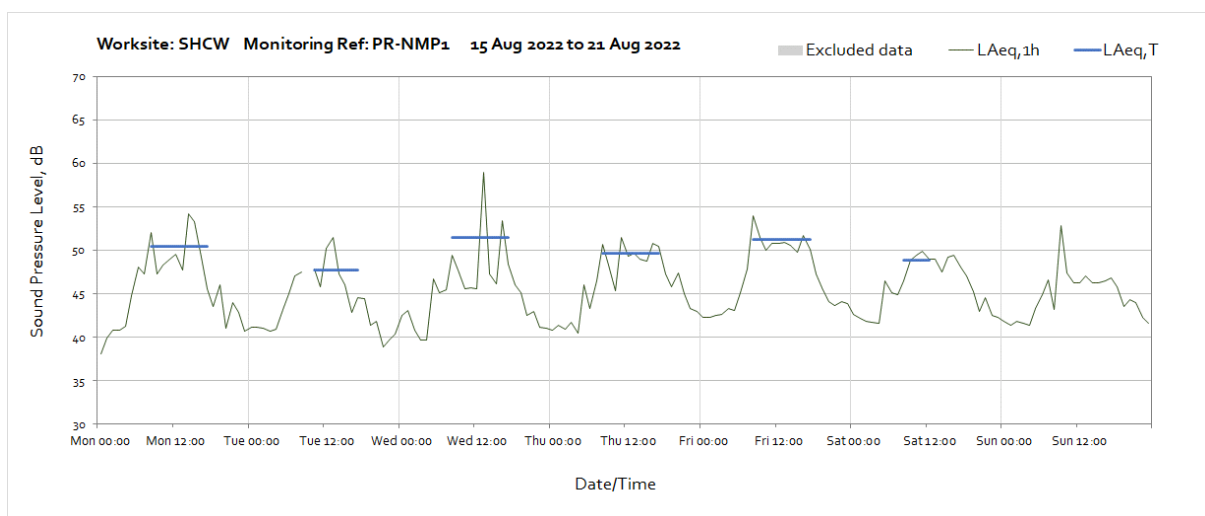
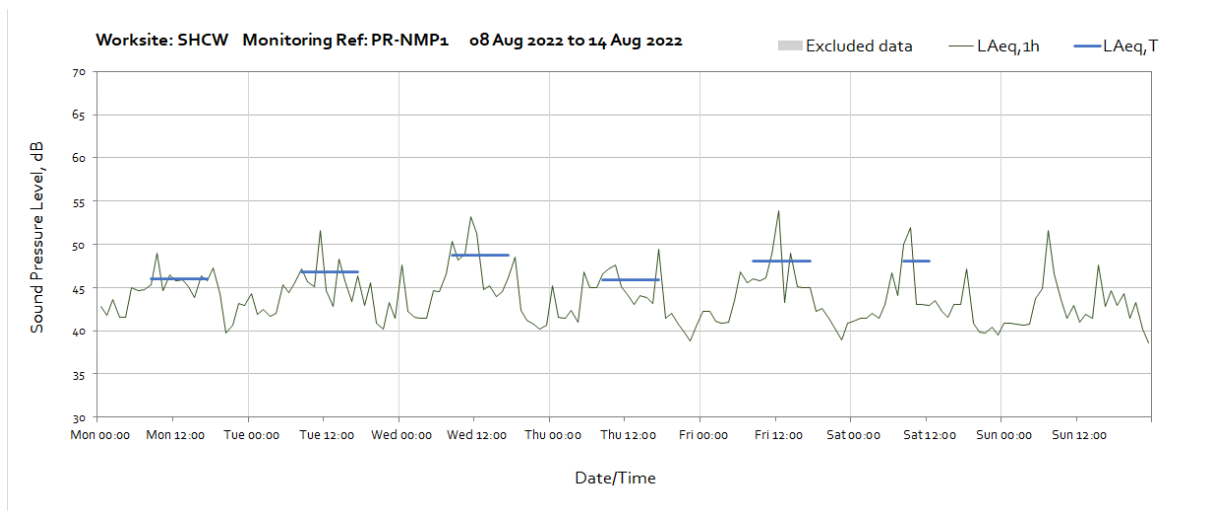
Note: Missing data at 09:00 on Tuesday 16th August were due to power outage.



Worksite: SHCW – Monitoring Ref: PR-NMP1

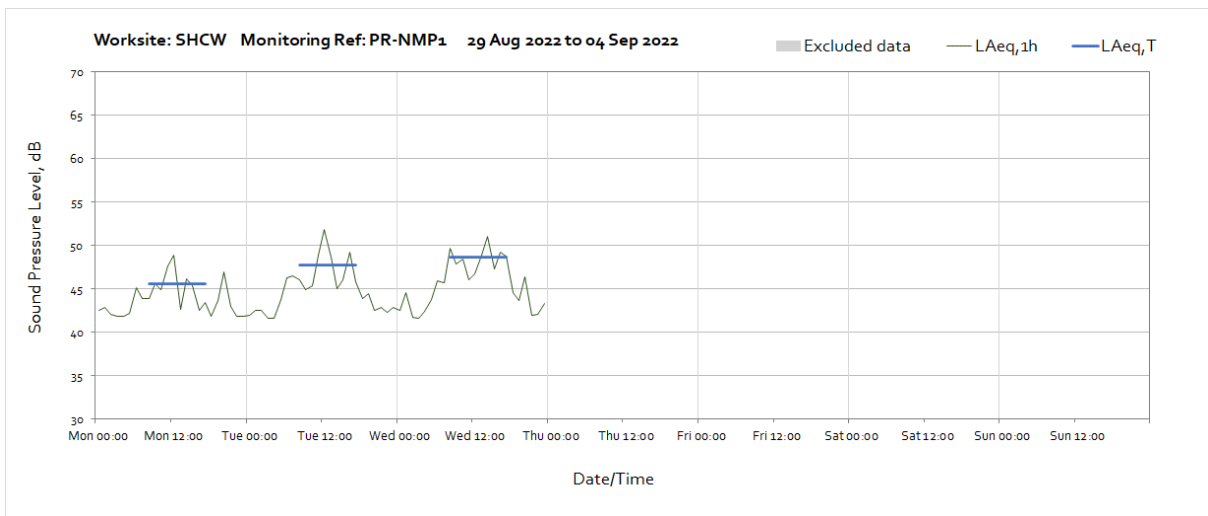
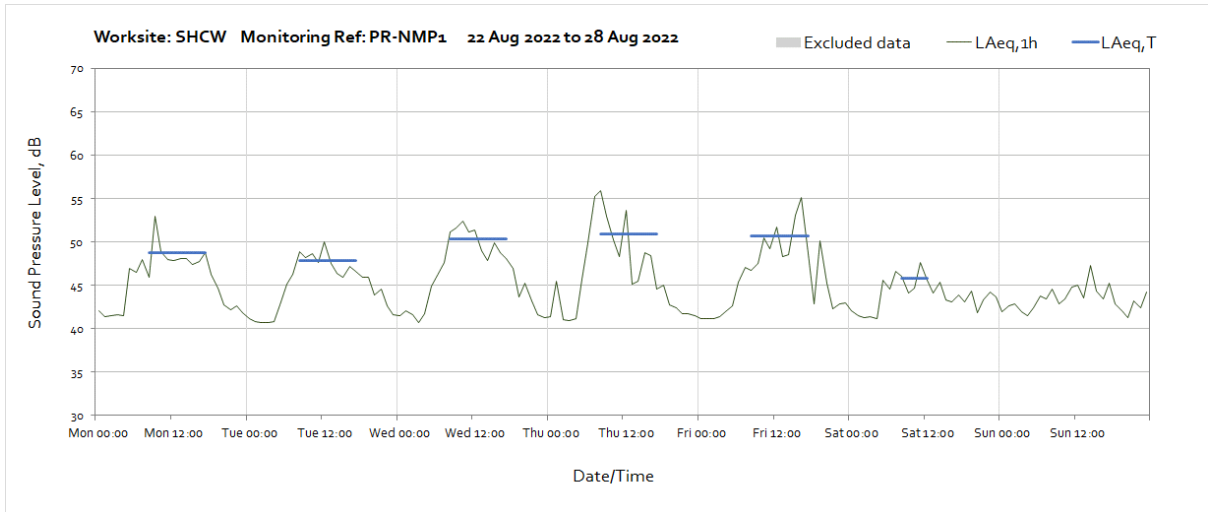


Note: Missing data at 12:00 on Tuesday 2nd and on Wednesday 3rd August were due to power outage.

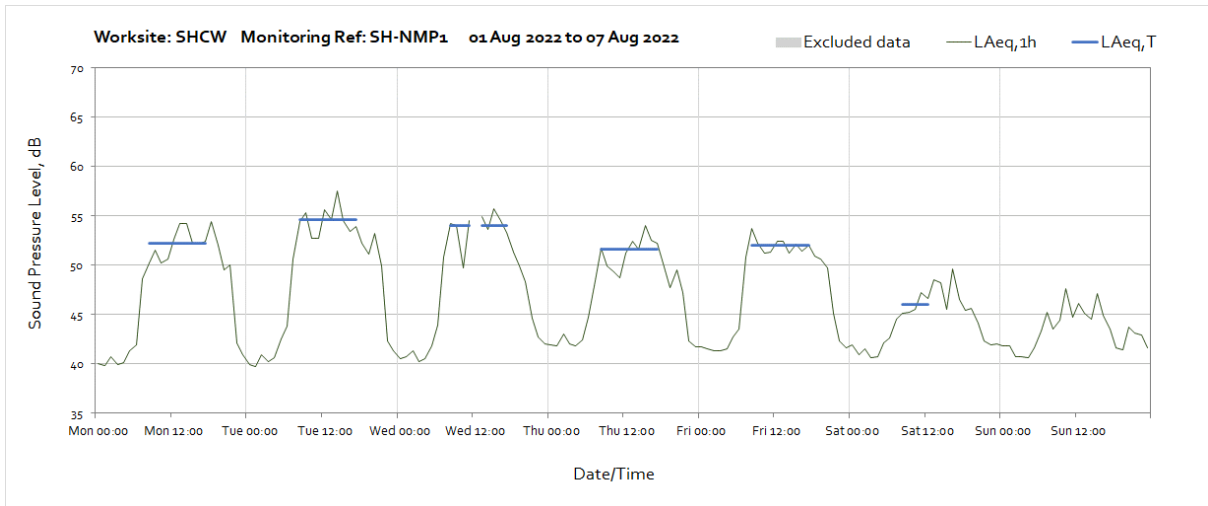


Note: Missing data at 09:00 on Tuesday 16th August were due to power outage.

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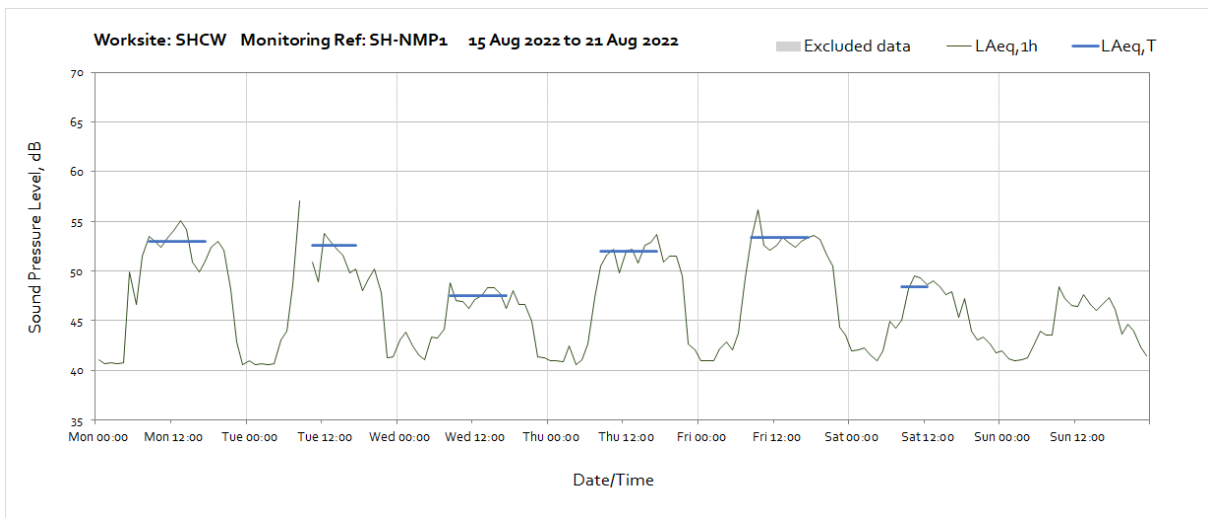
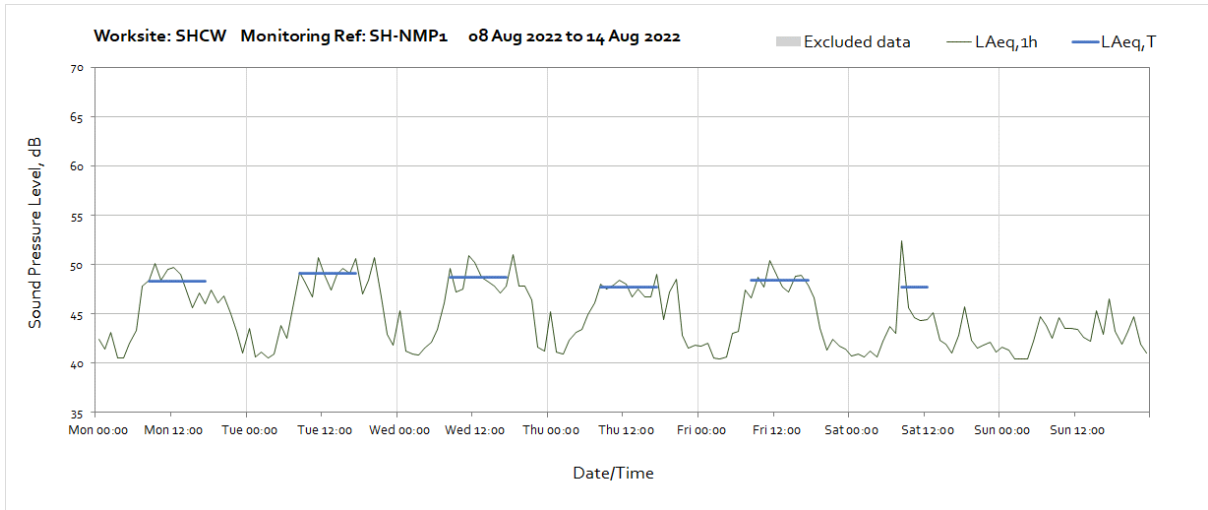


Worksite: SHCW – Monitoring Ref: SH-NMP1

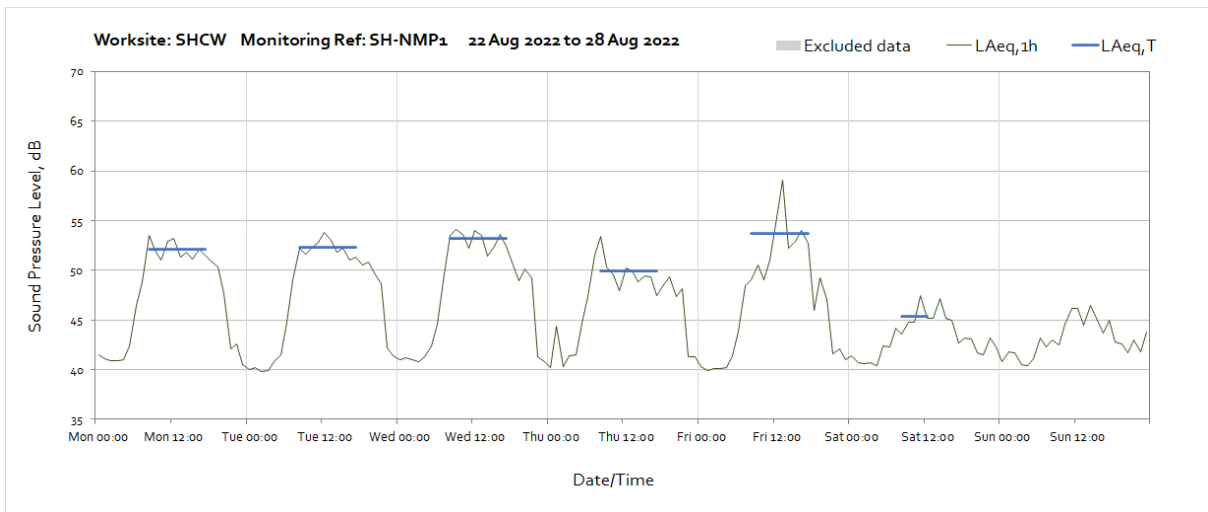


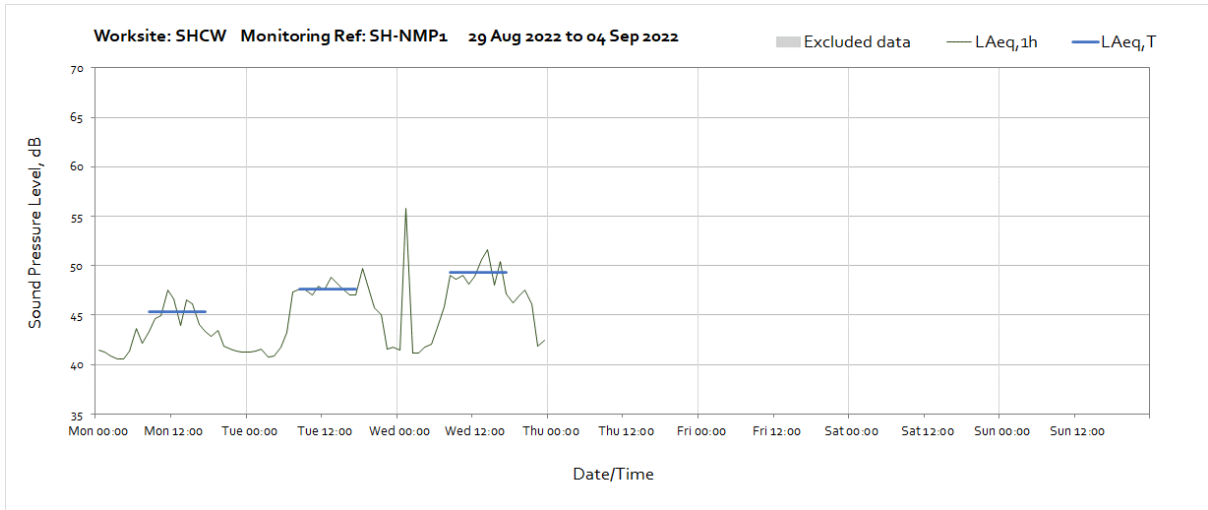
Note: Missing data at 13:00 on Wednesday 3rd August were due to power outage.

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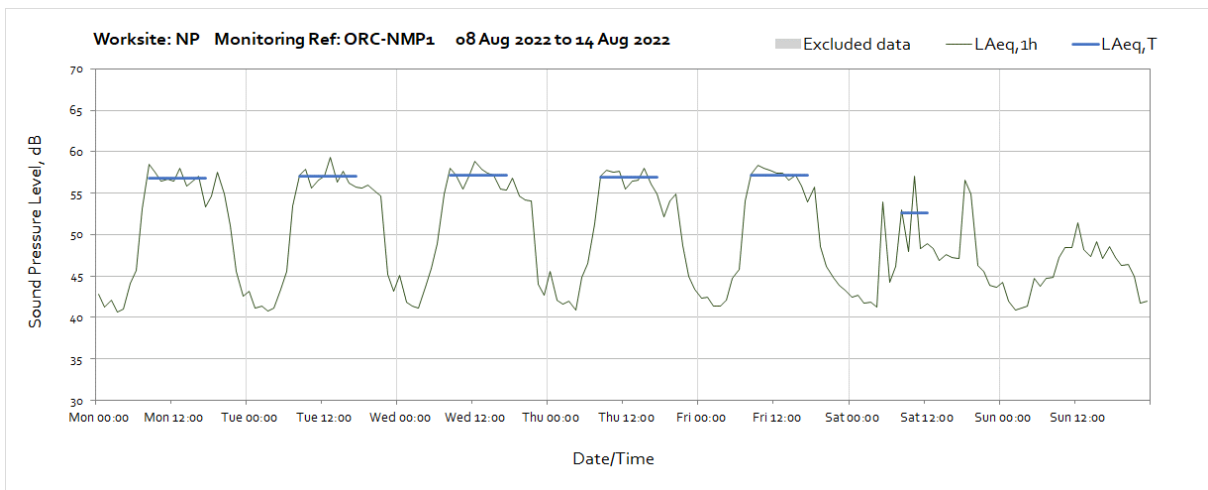
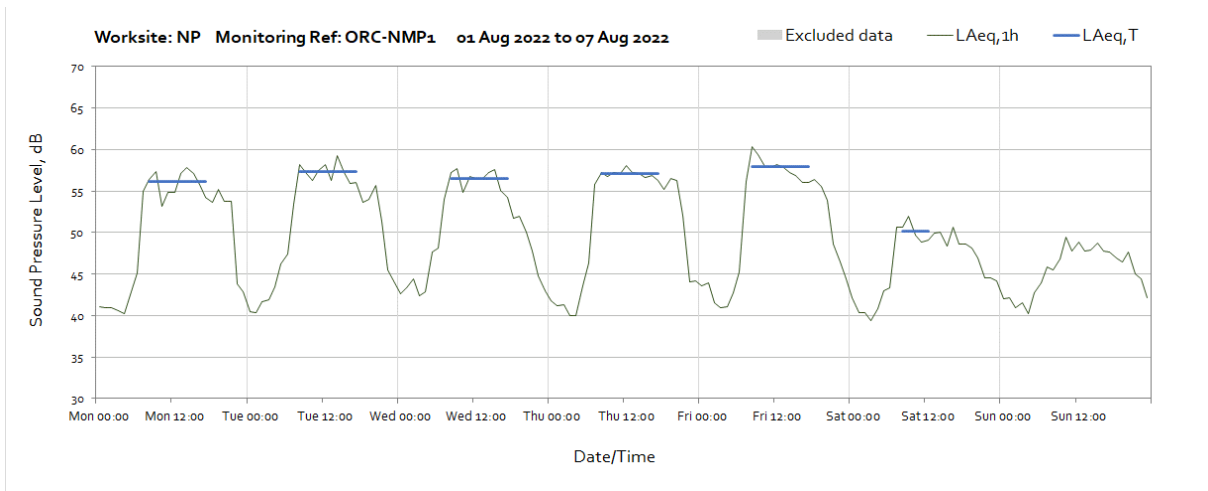


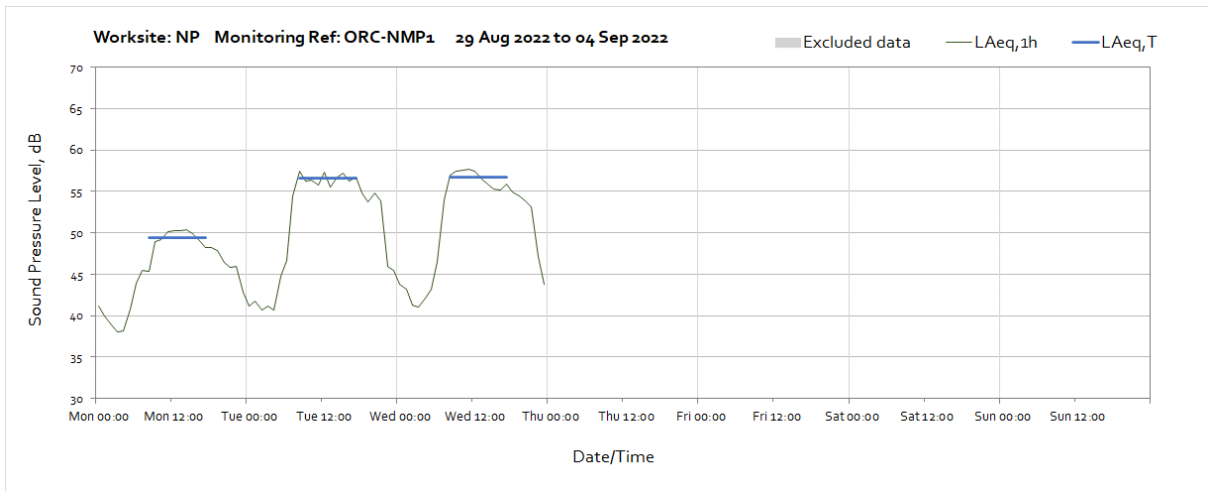
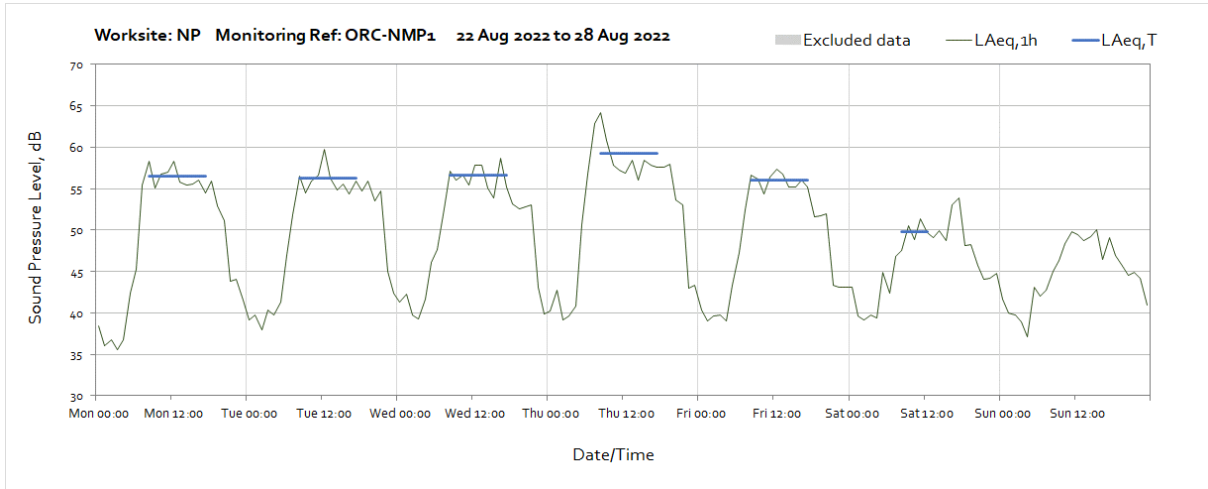
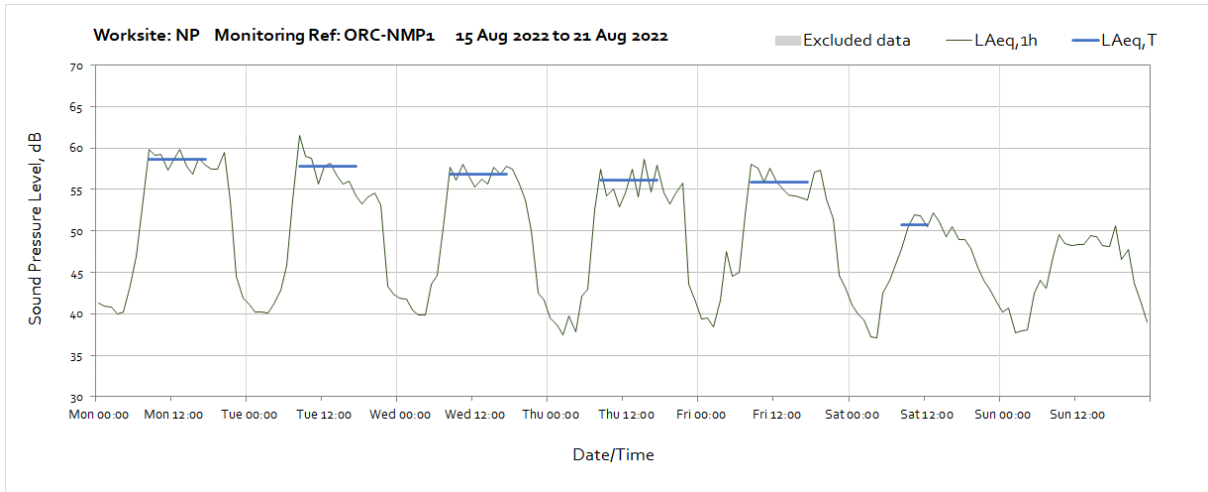
Note: Missing data at 09:00 on Tuesday 16th August were due to power outage.



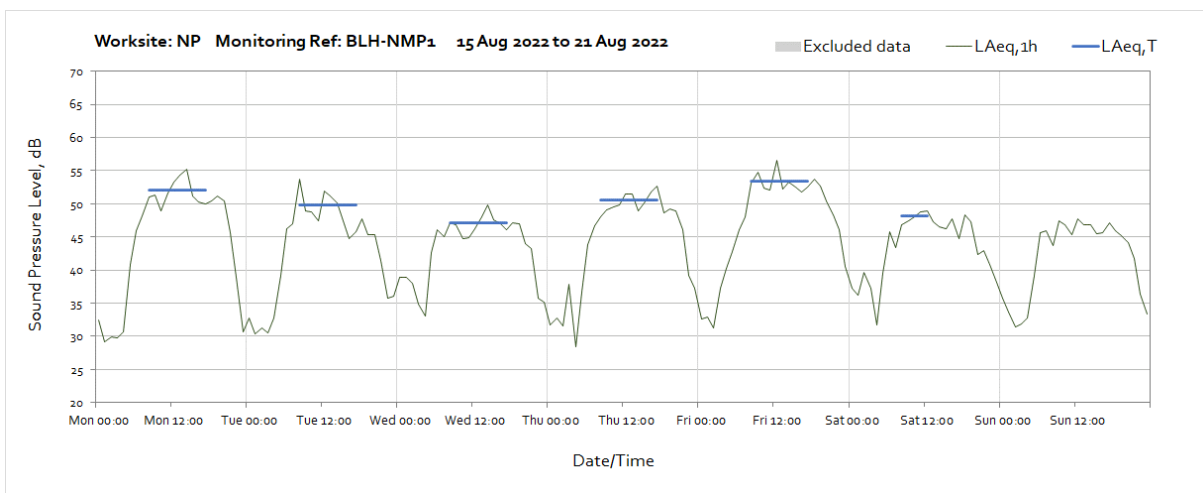
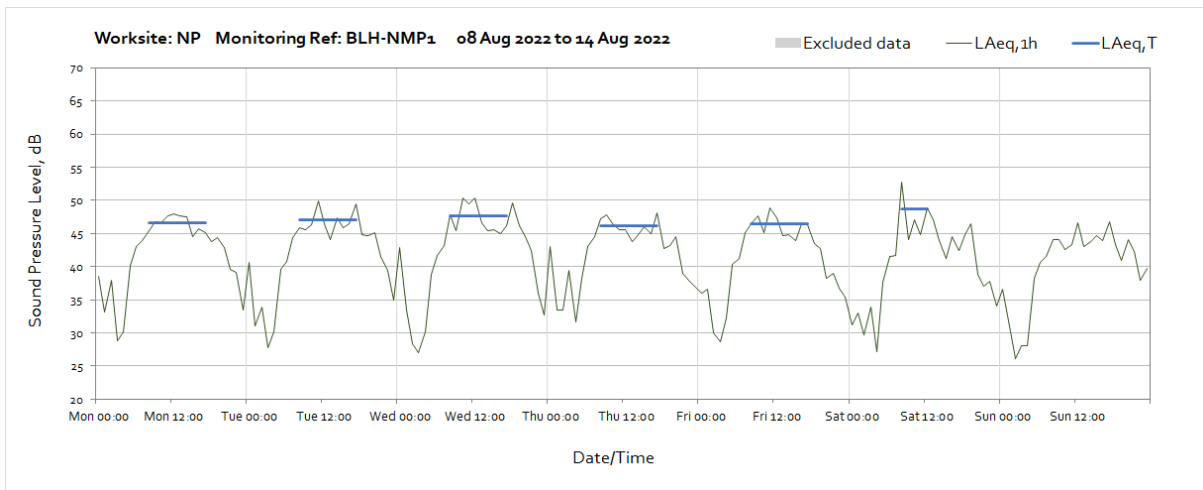
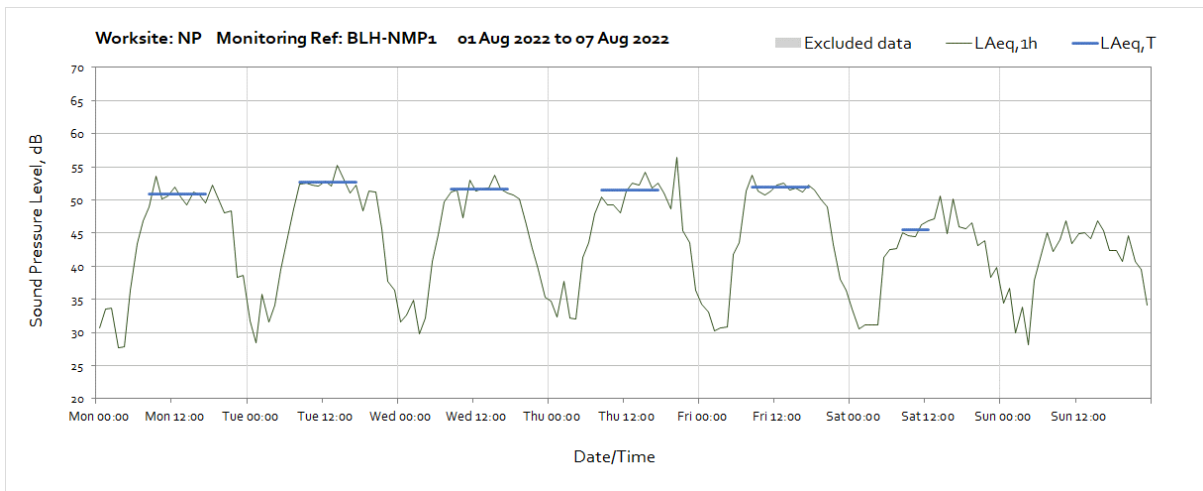


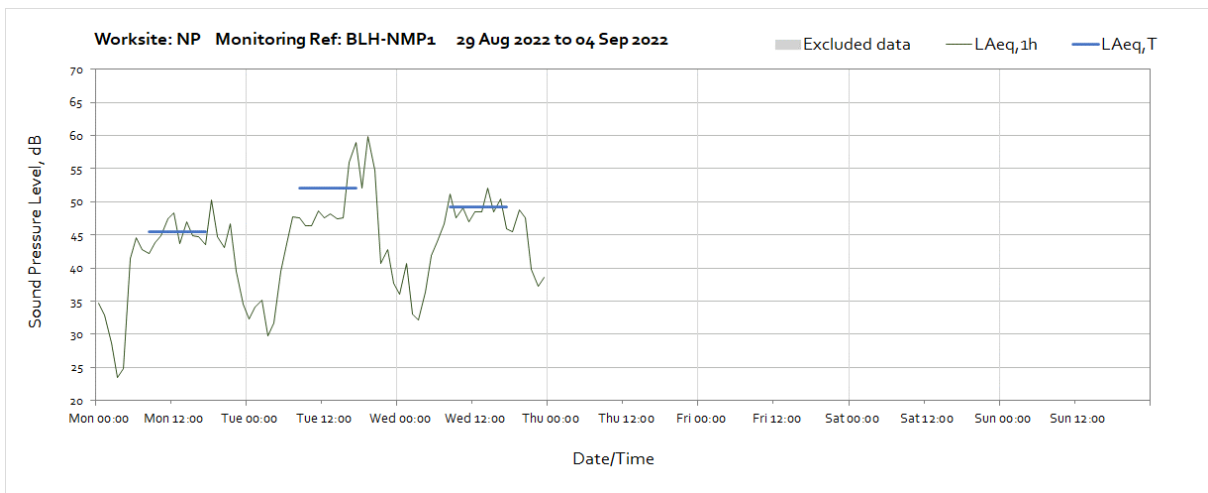
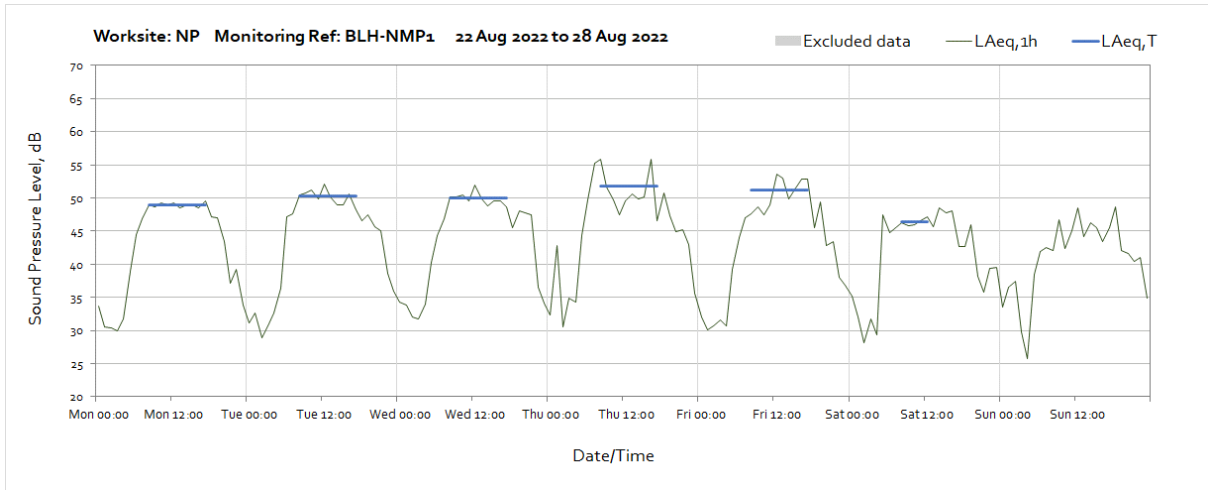
Worksite: NP - Monitoring Ref: ORC-NMP1



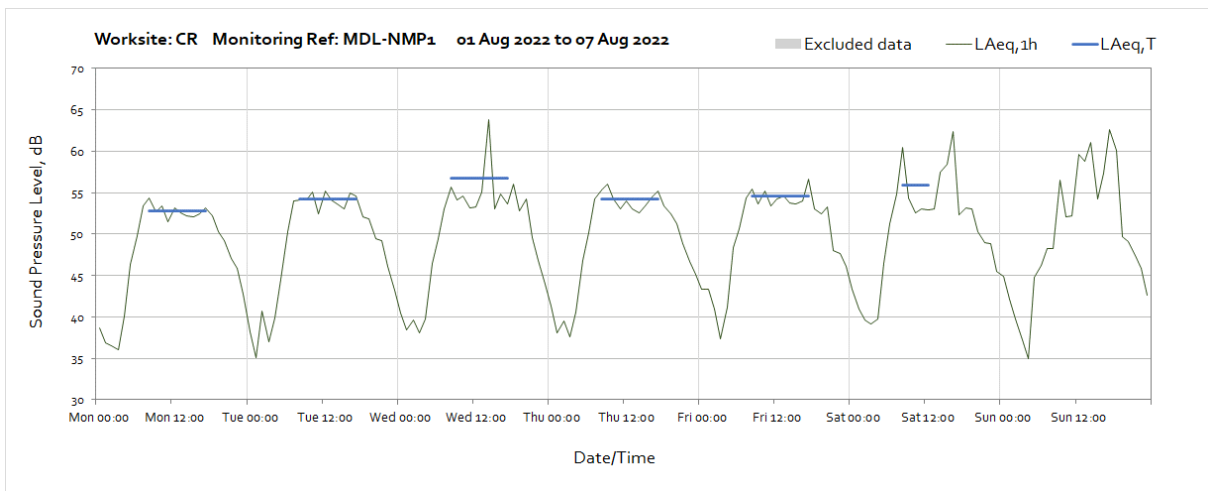


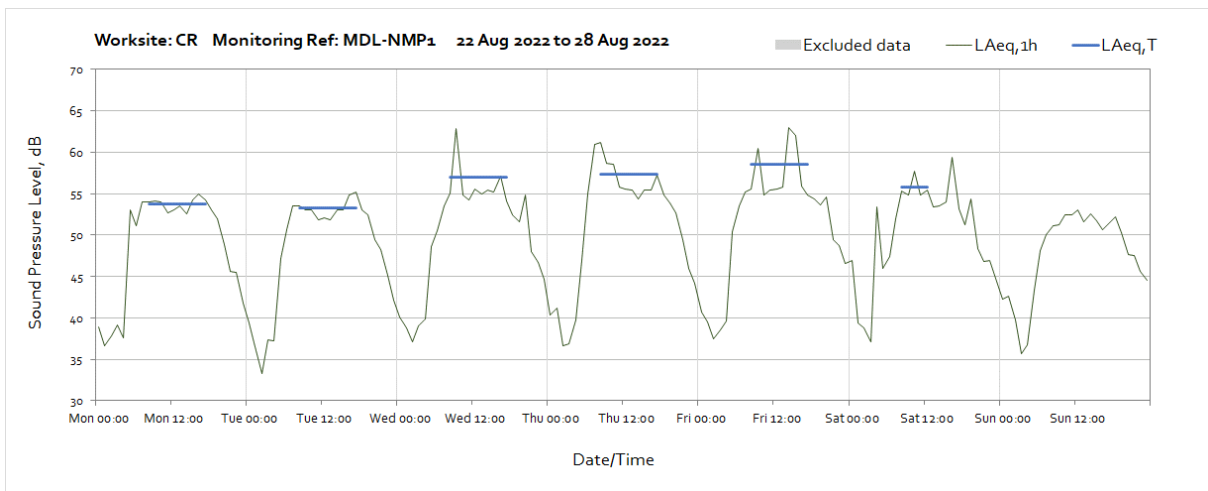
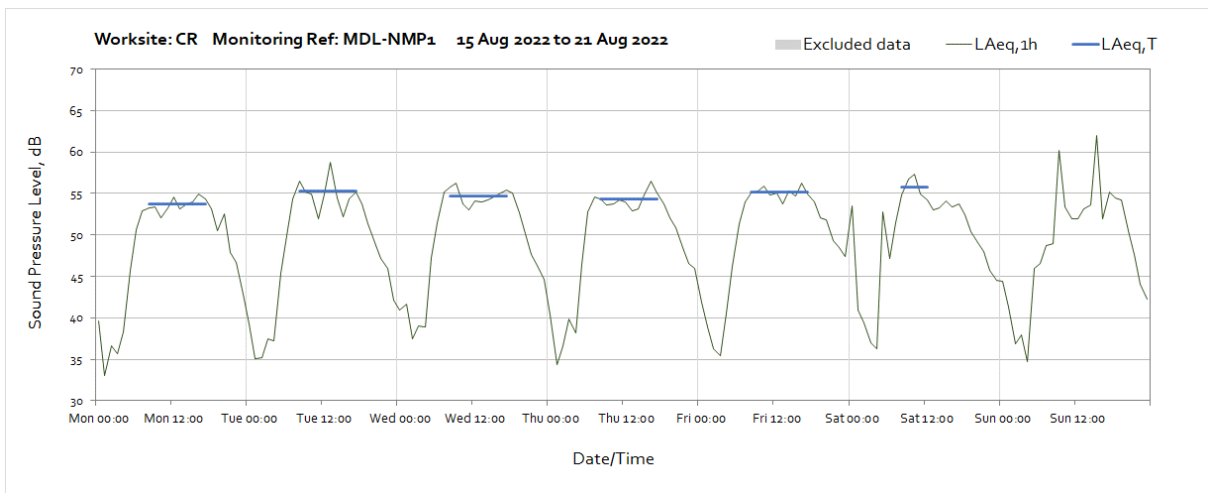
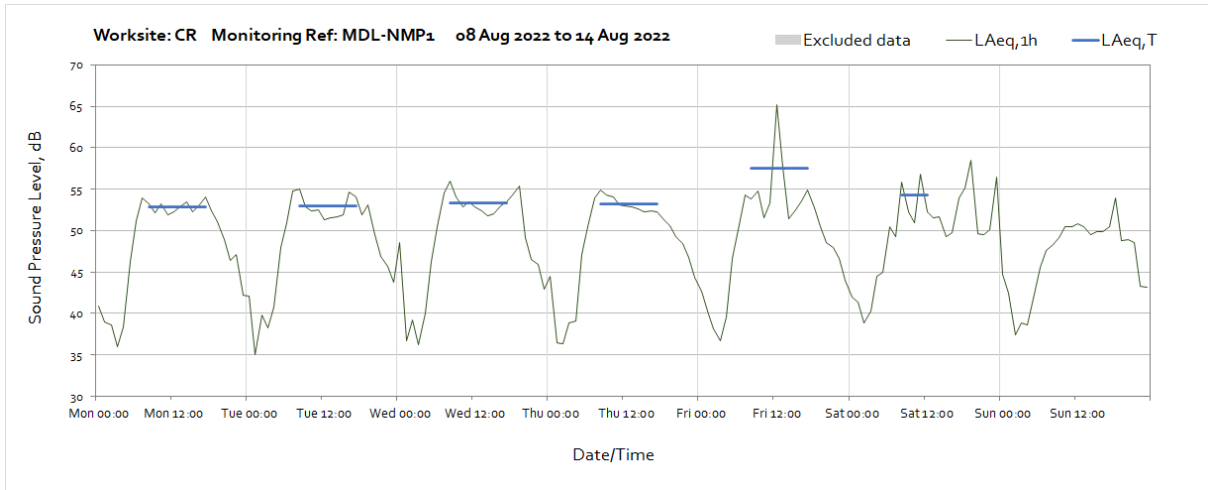
Worksite: NP – Monitoring Ref: BLH-NMP1

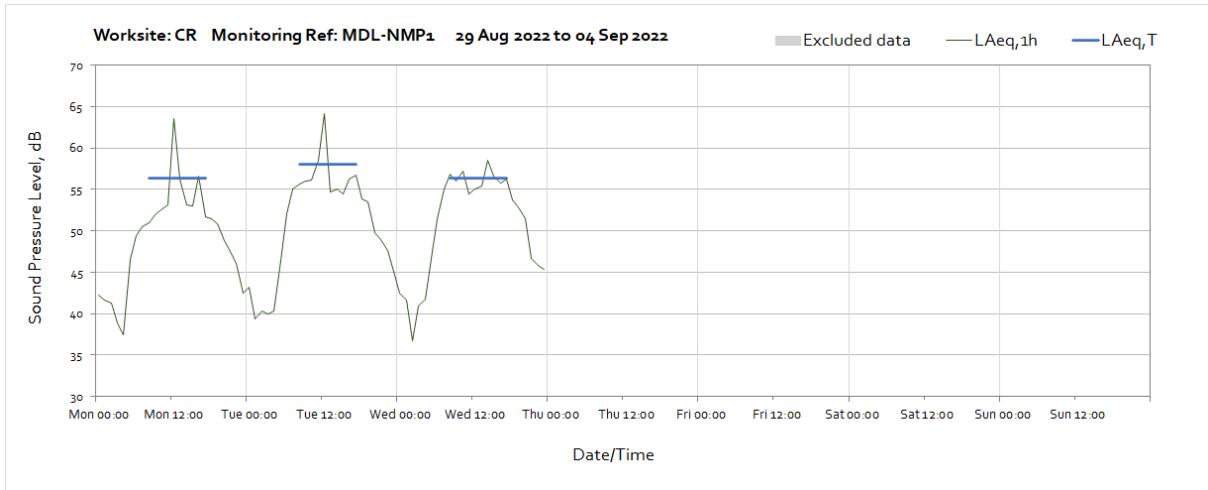




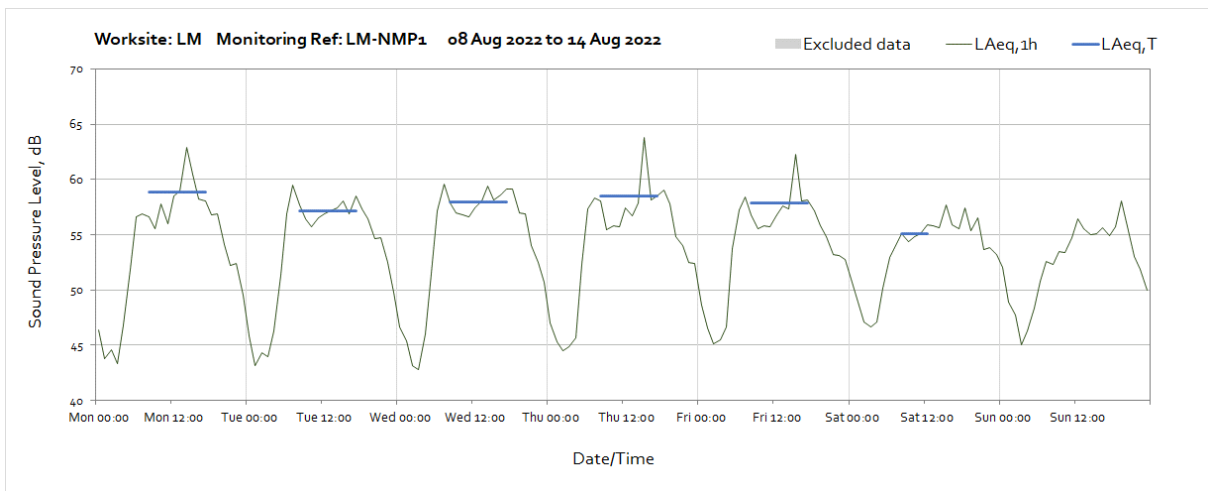
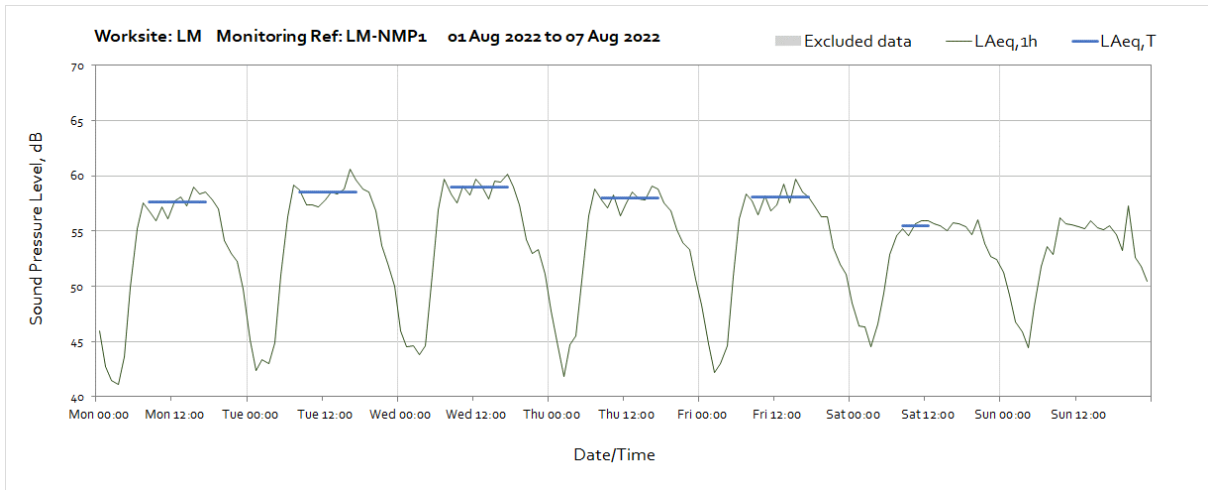
Worksite: CR – Monitoring Ref: MDL-NMP1

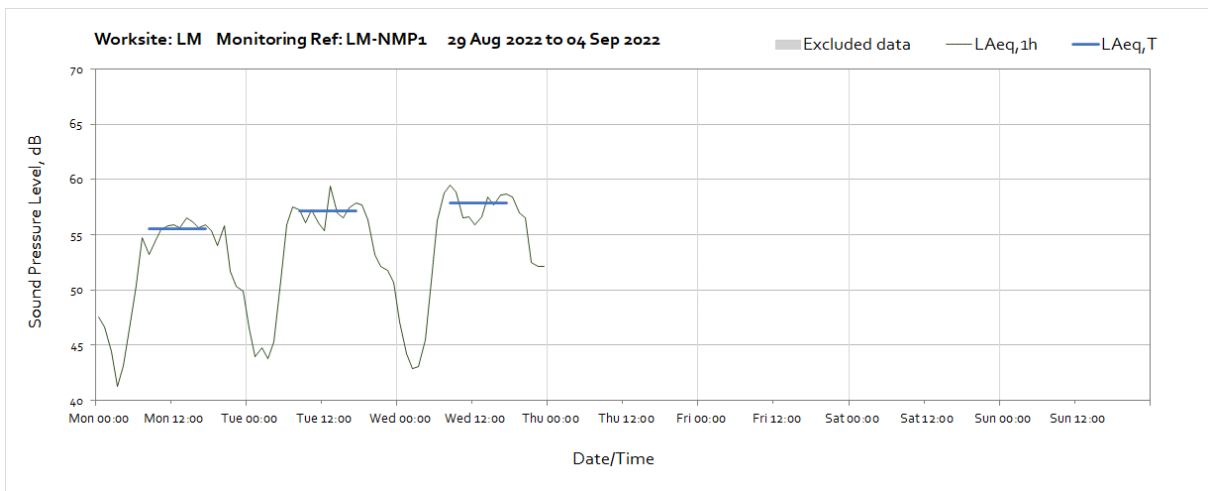
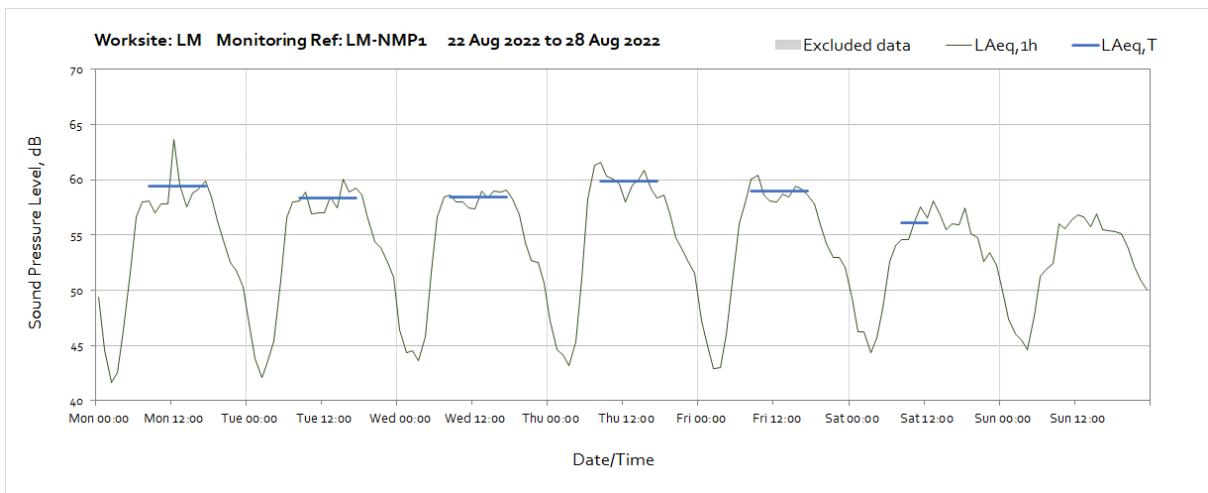
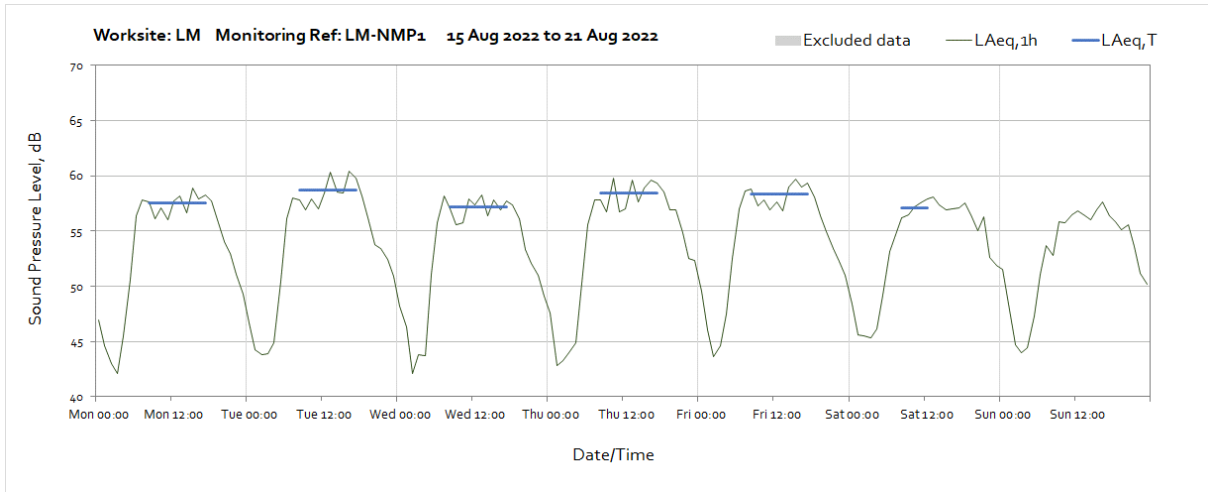




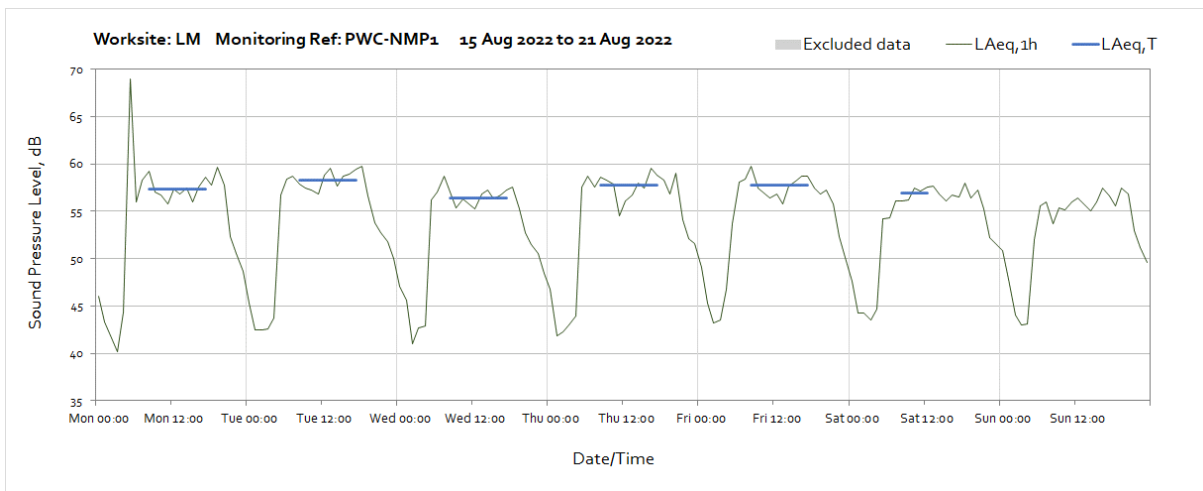
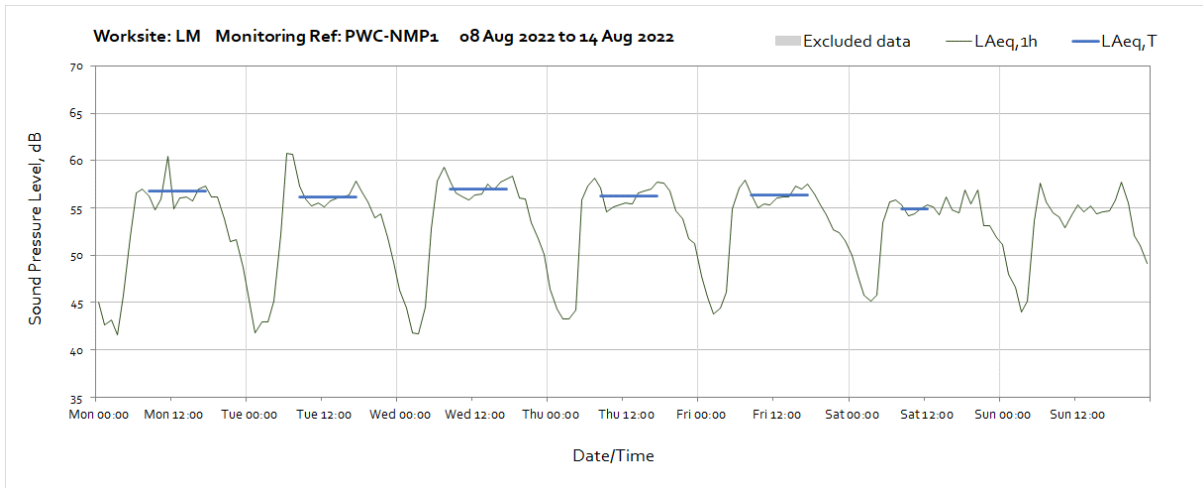
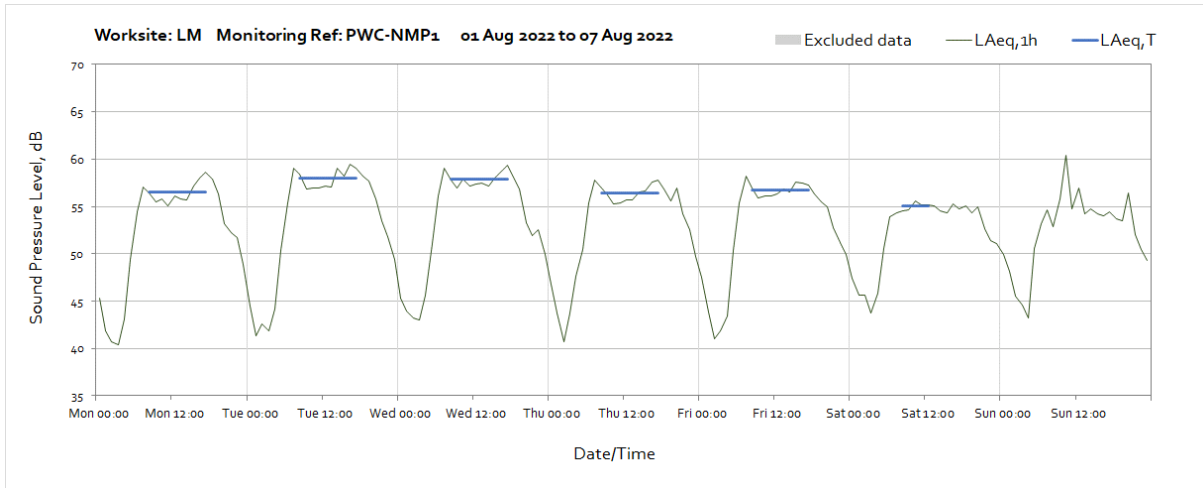


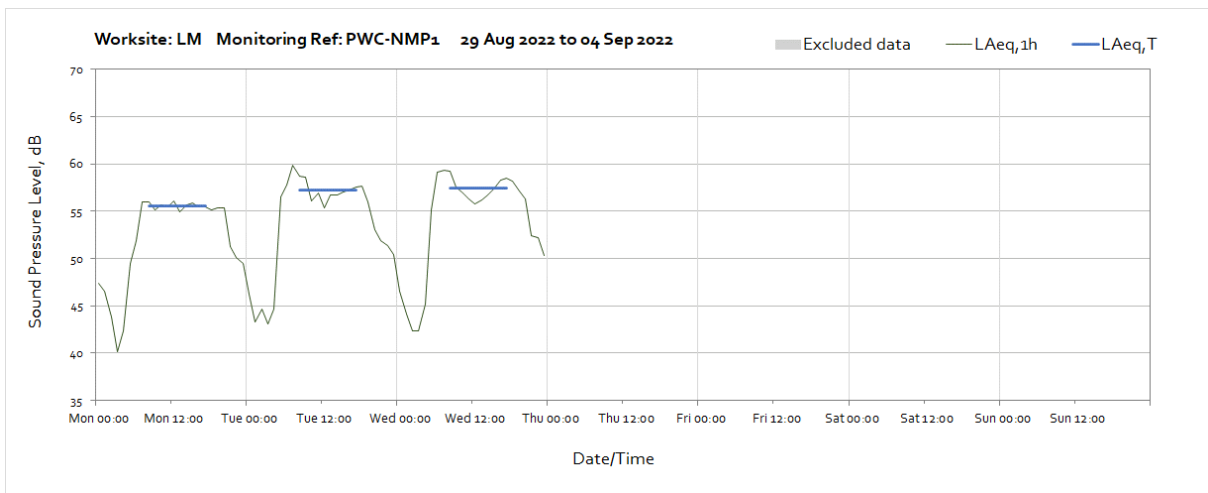
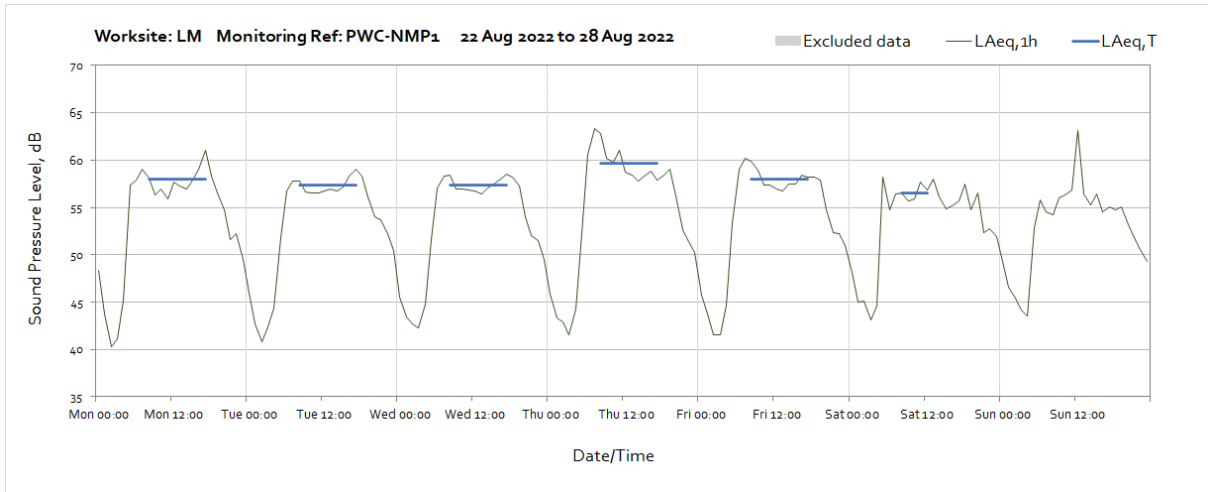
Worksite: LM – Monitoring Ref: LM-NMP1



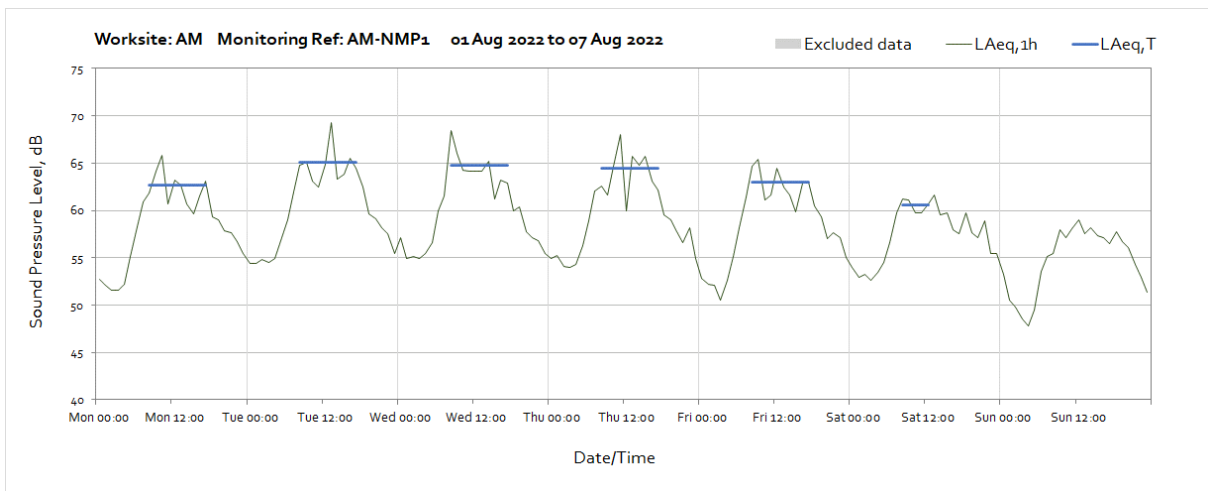


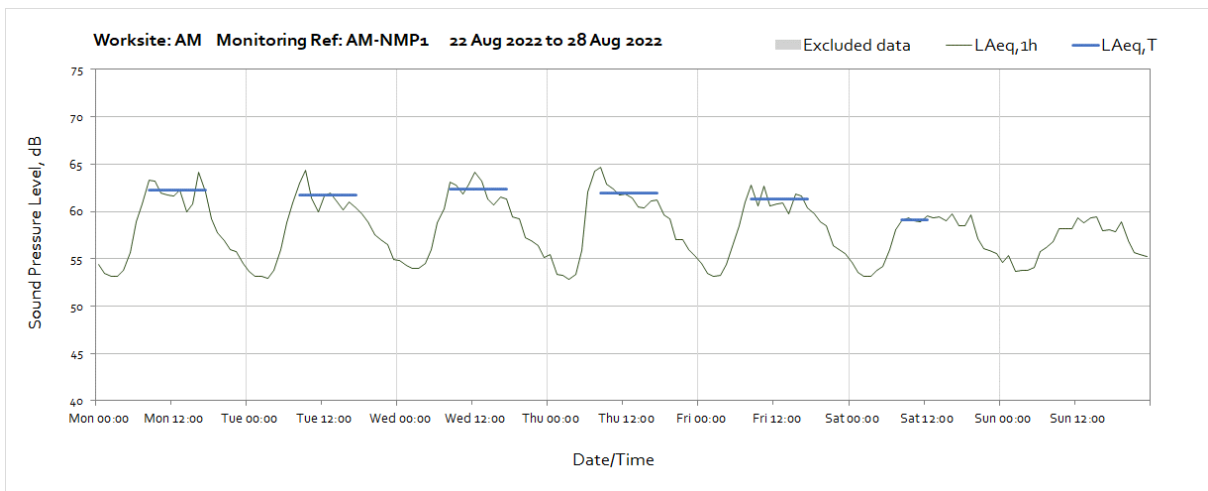
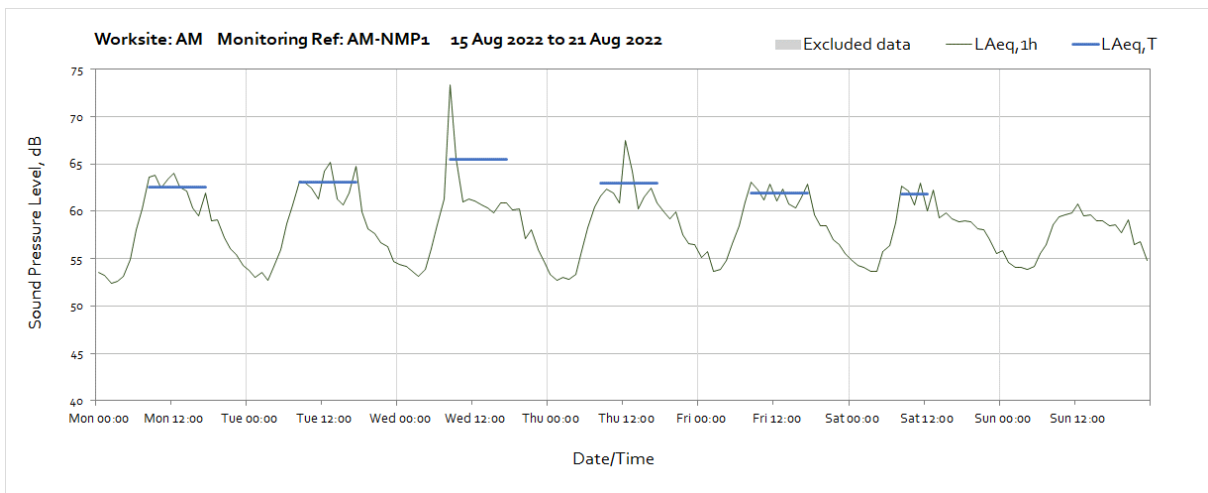
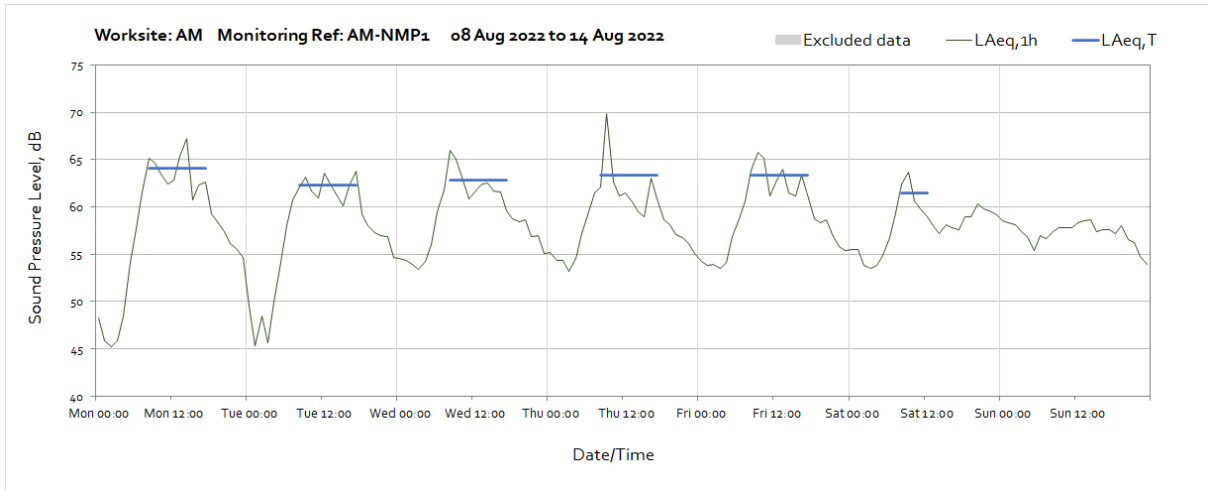
Worksite: LM – Monitoring Ref: PWC-NMP1

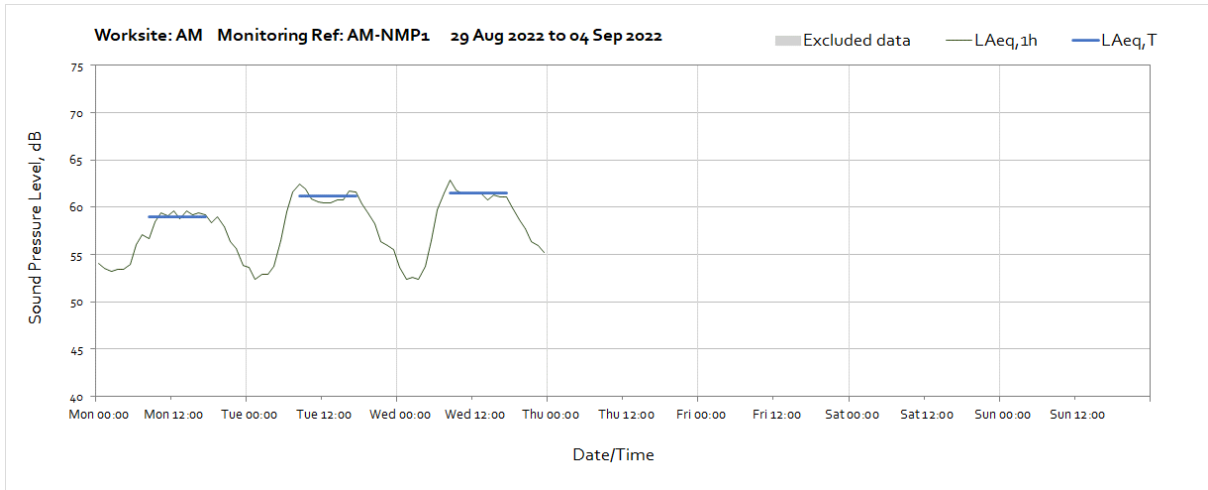




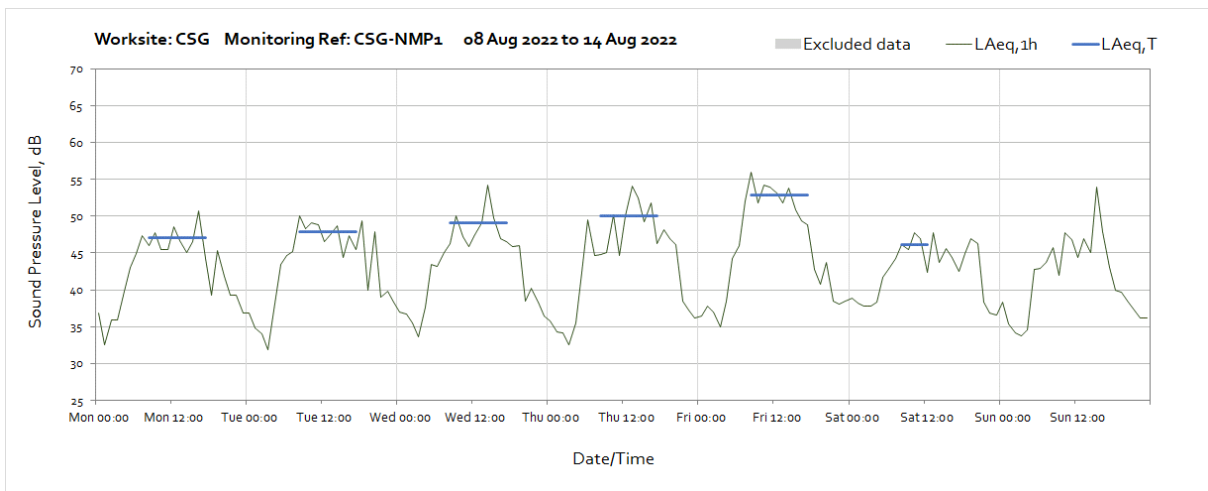
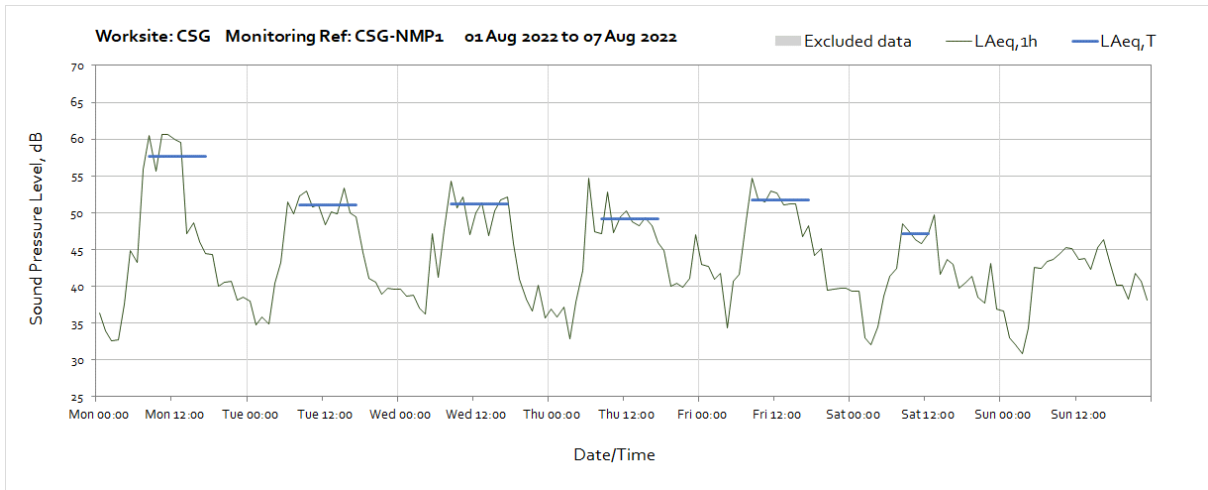
Worksite: AM - Monitoring Ref: AM-NMP1

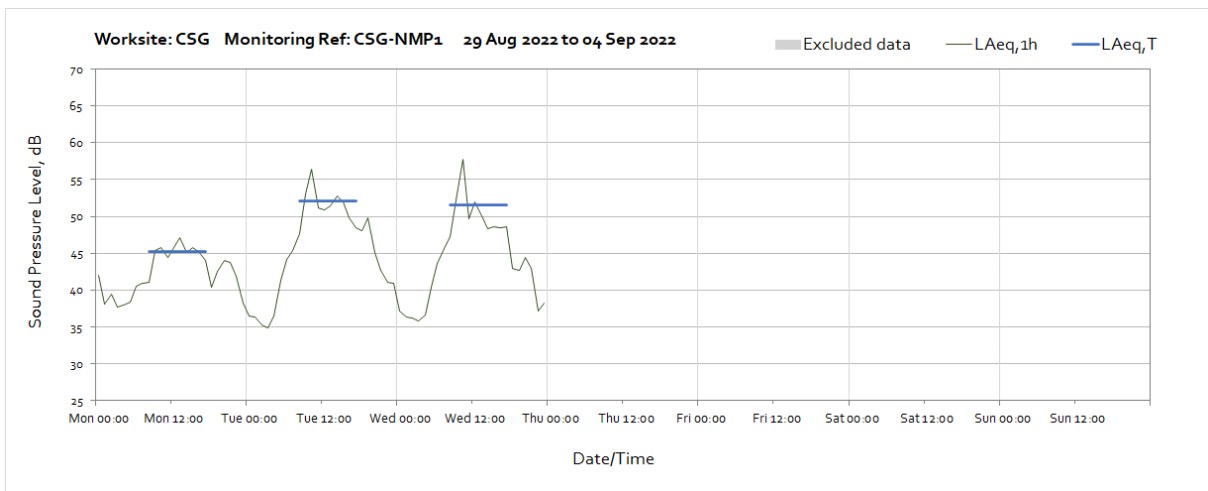
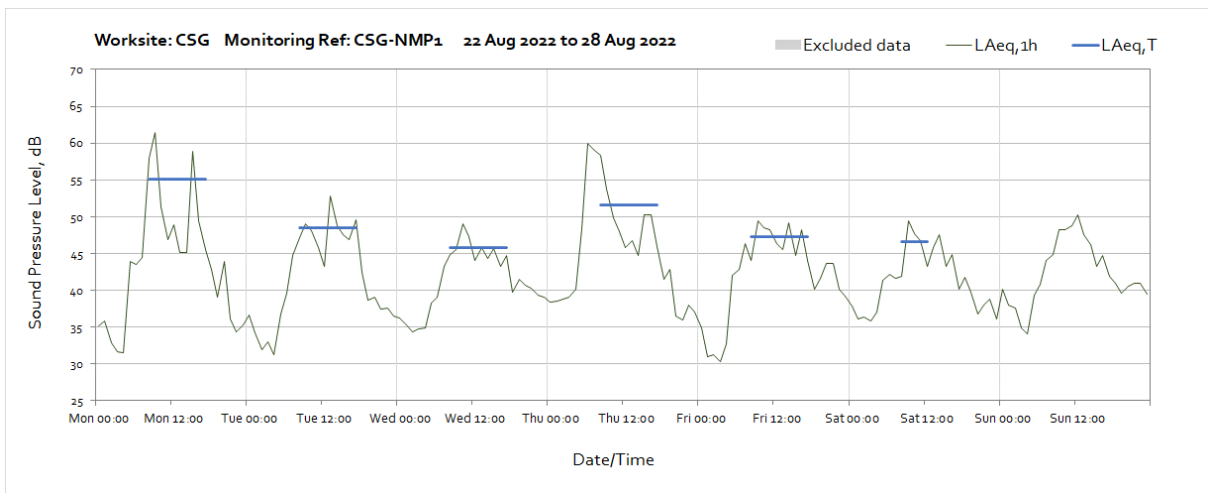
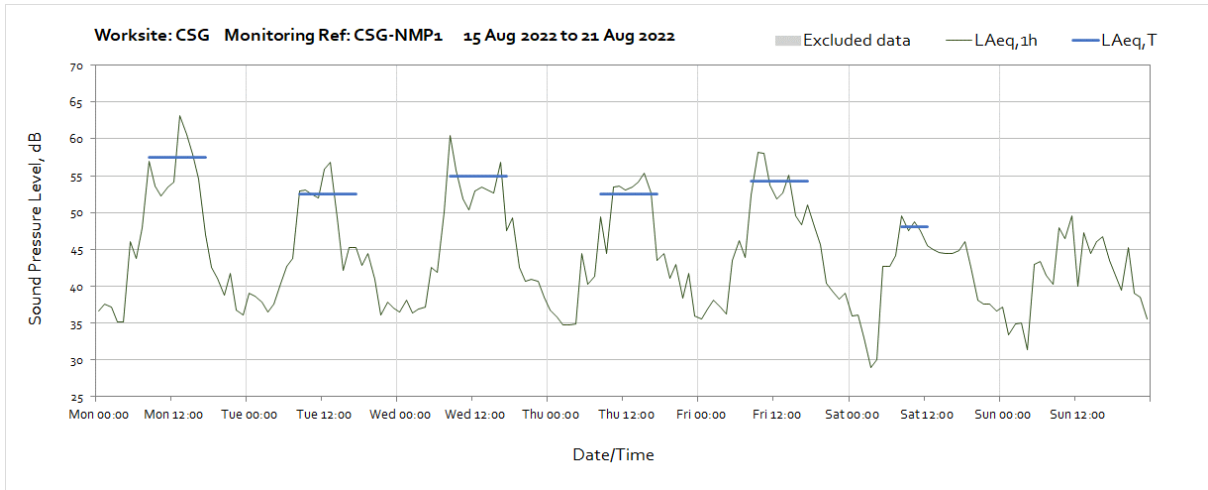




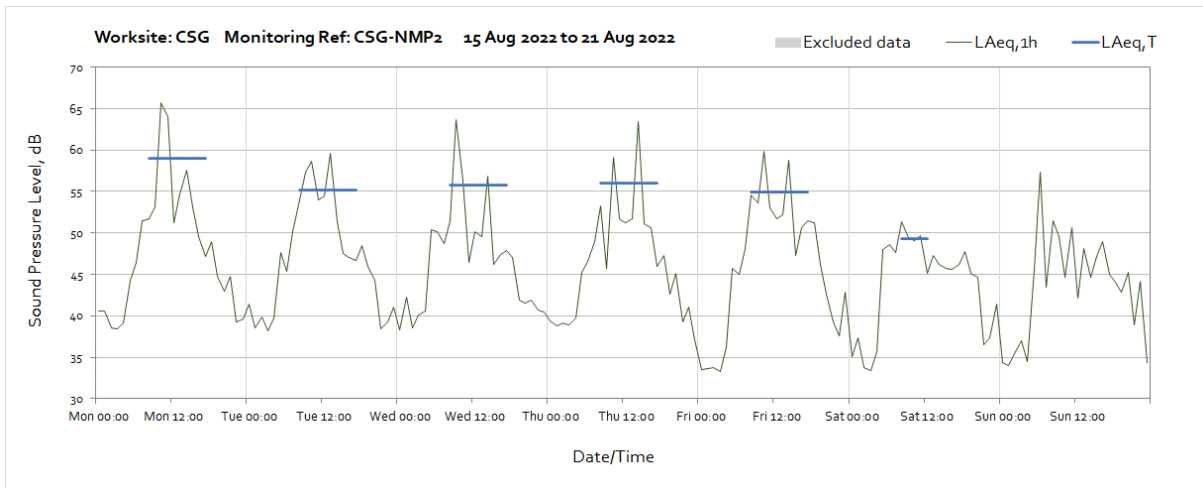
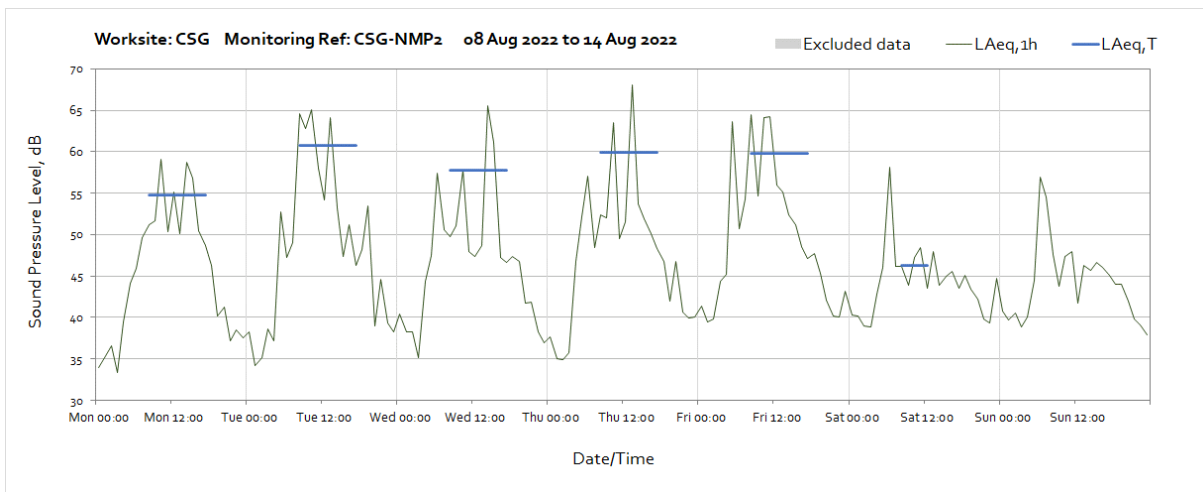
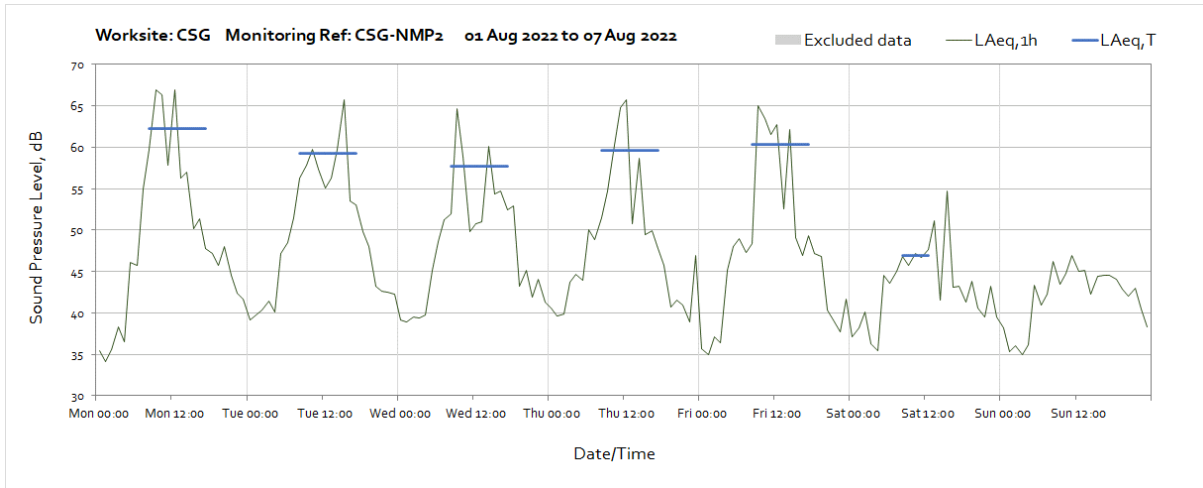


Worksite: CSG – Monitoring Ref: CSG-NMP1

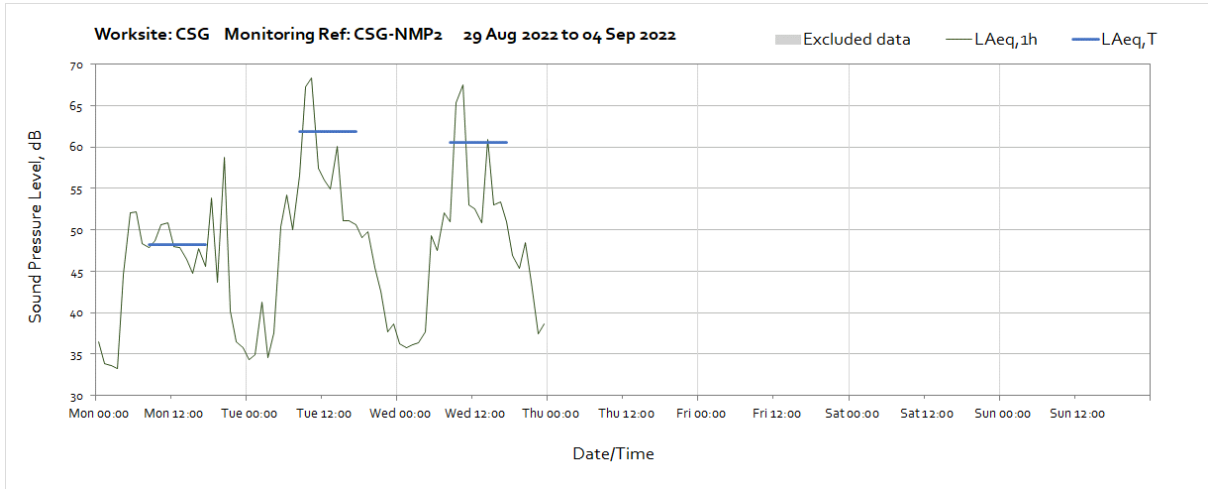
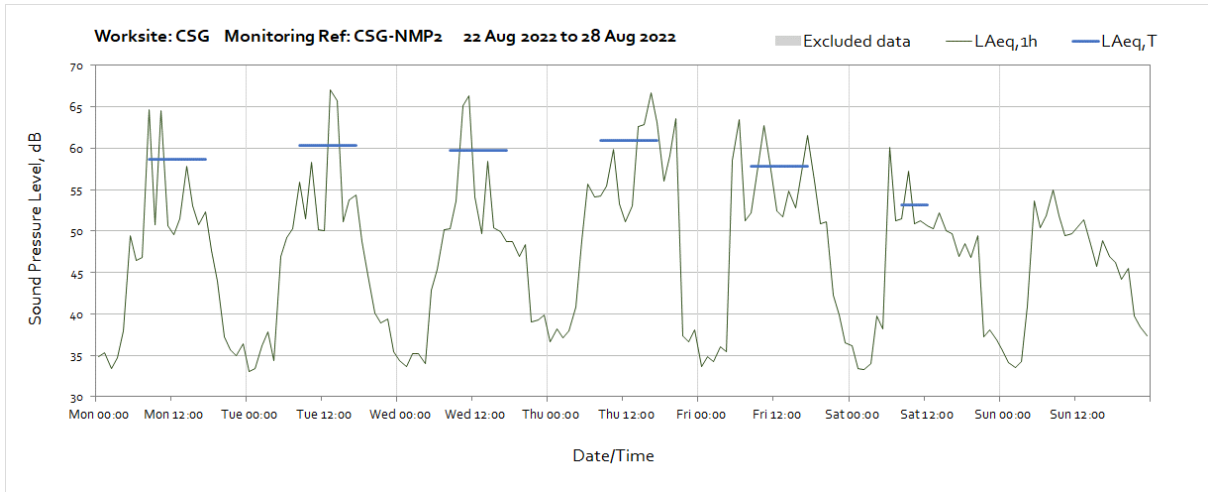




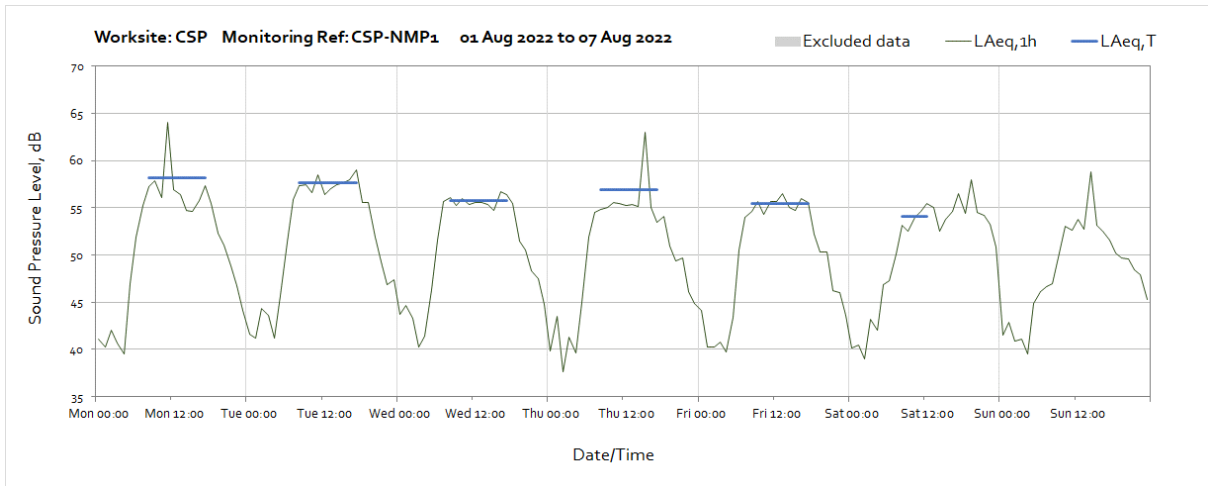
Worksite: CSG – Monitoring Ref: CSG-NMP2

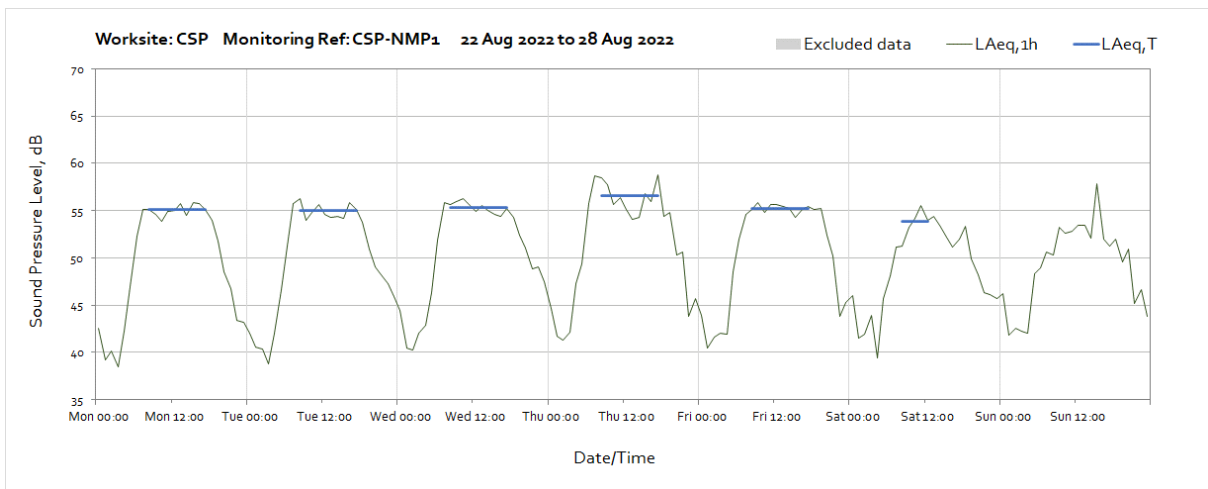
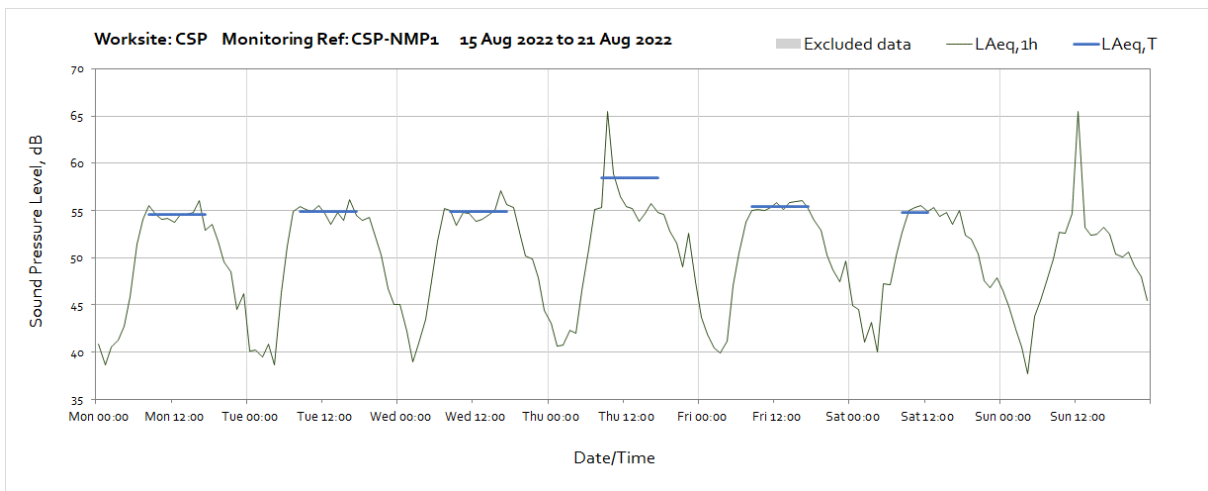
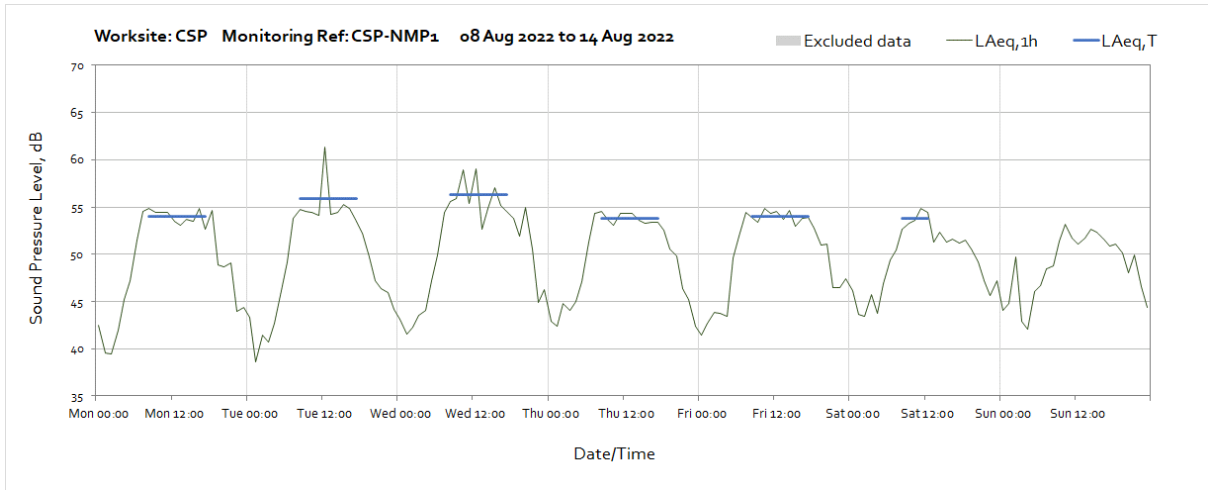


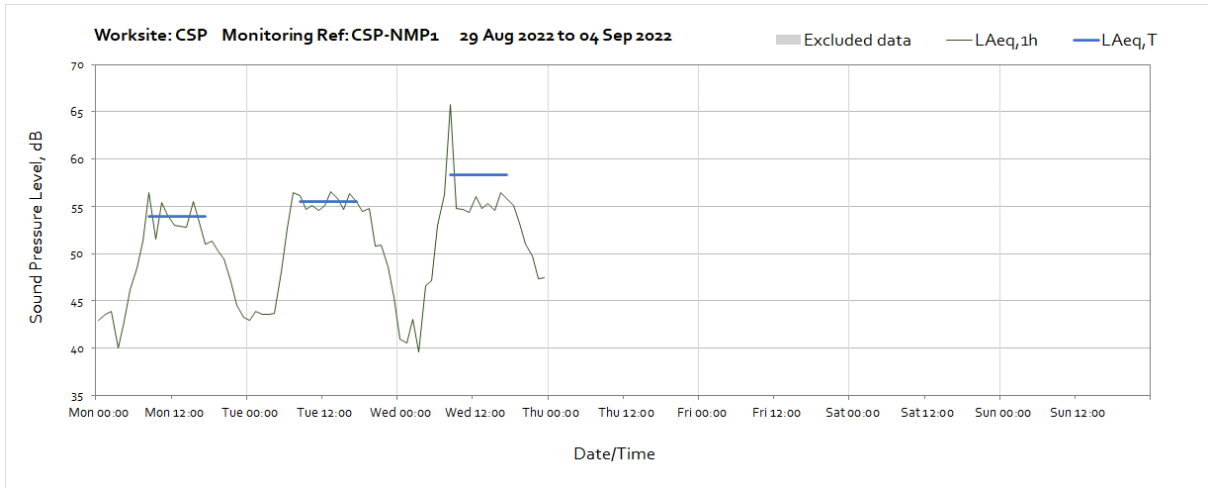
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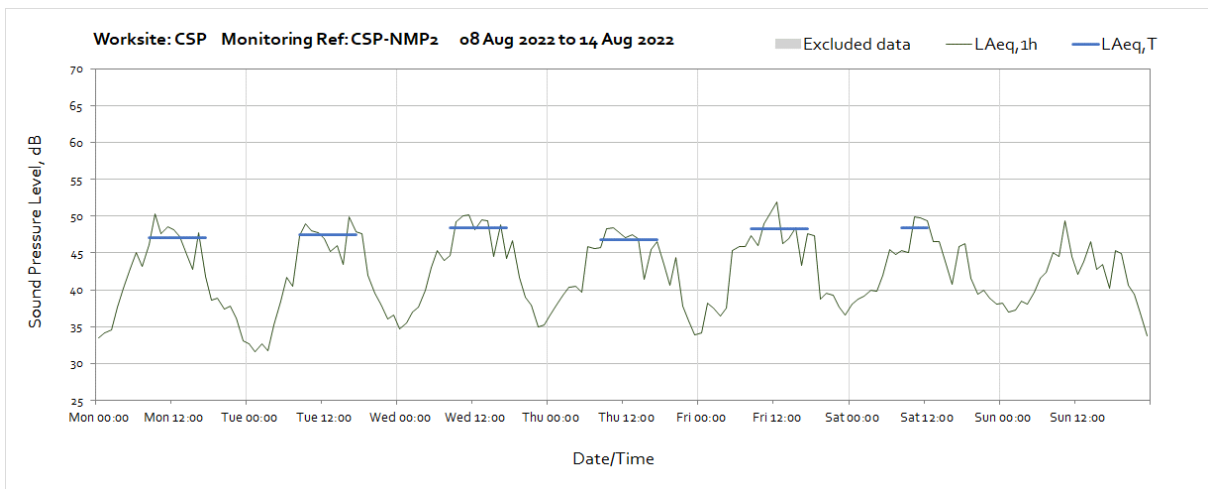
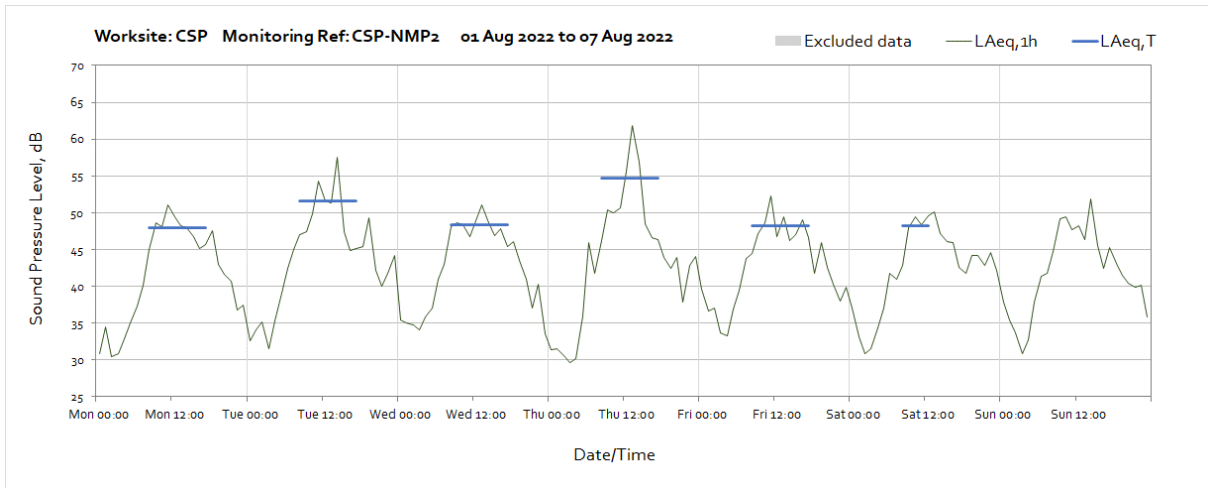
Worksite: CSP – Monitoring Ref: CSP-NMP1

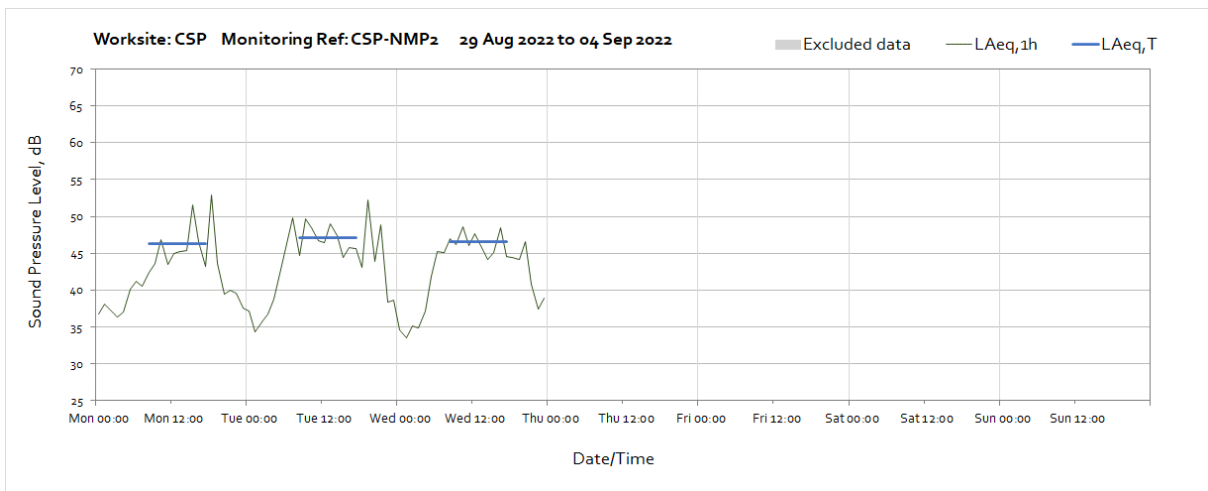
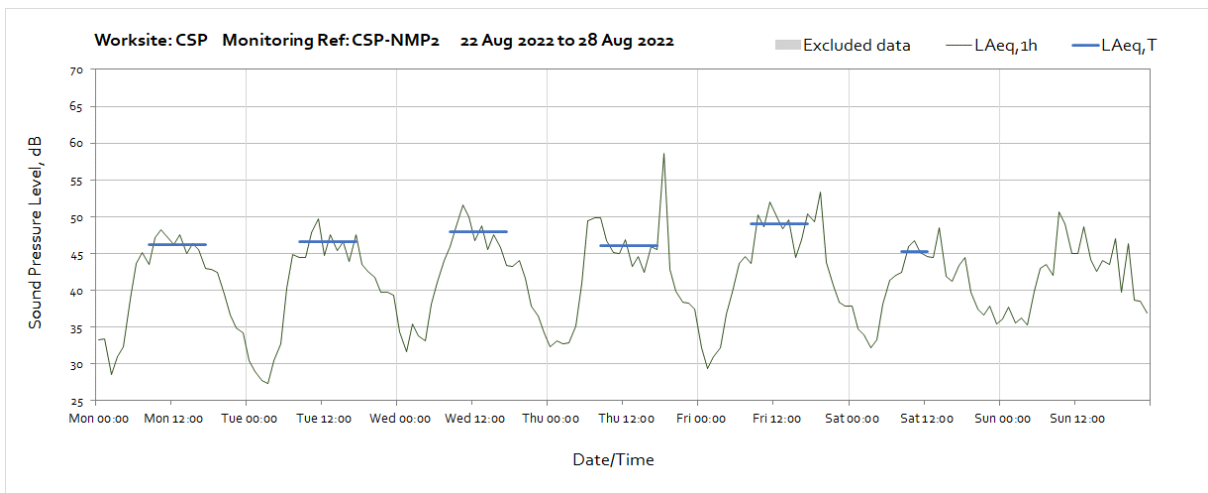
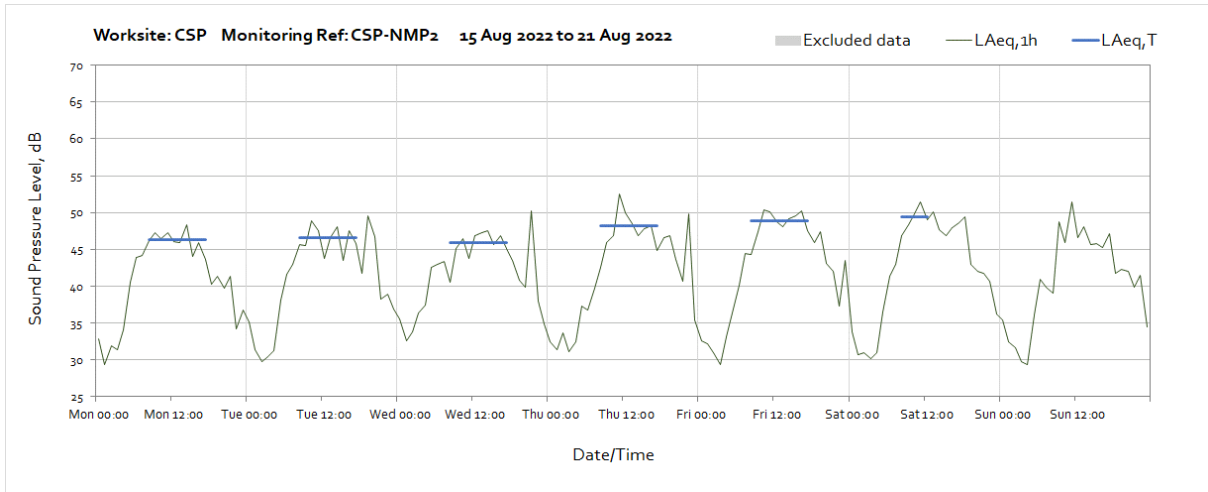




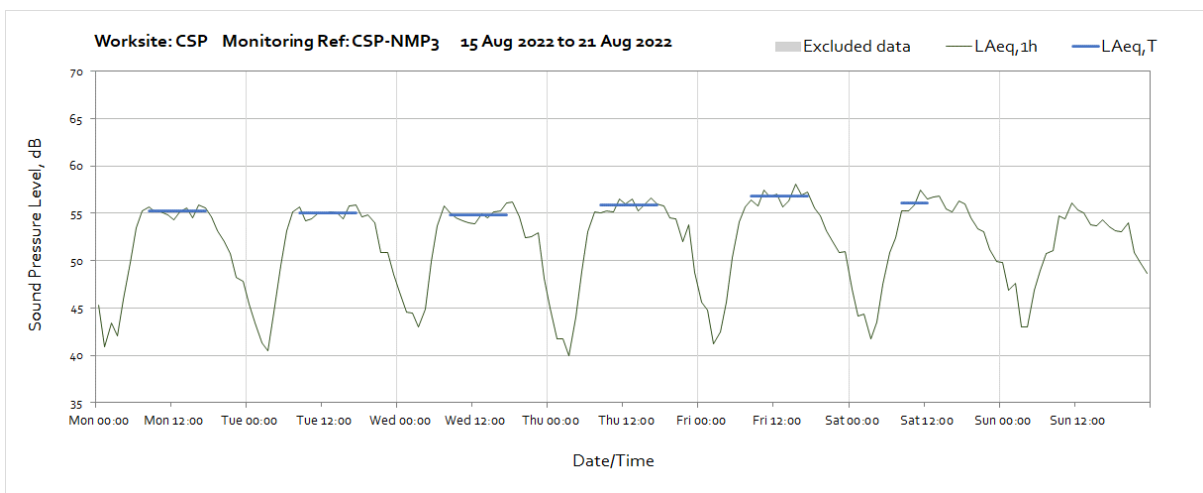
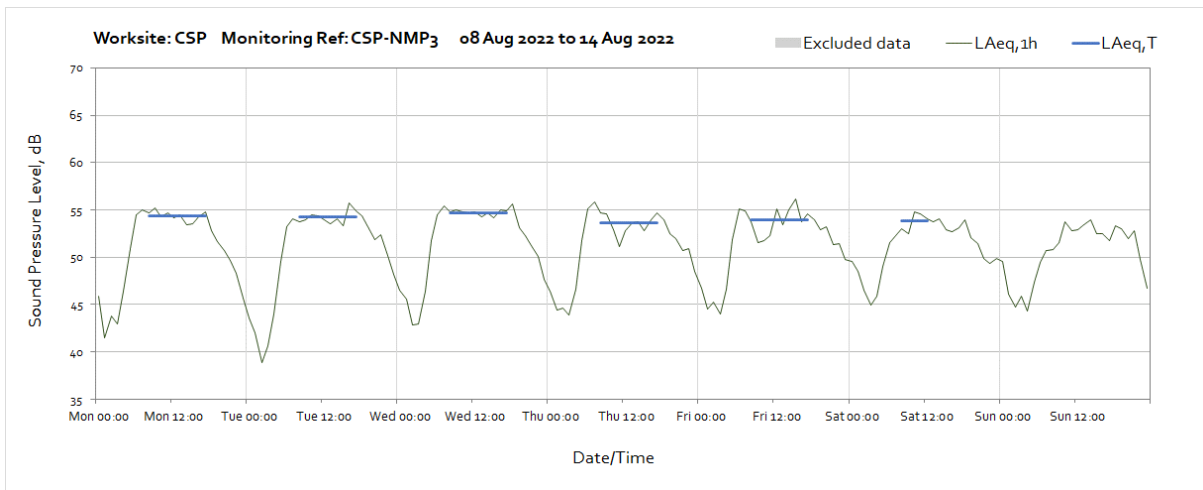
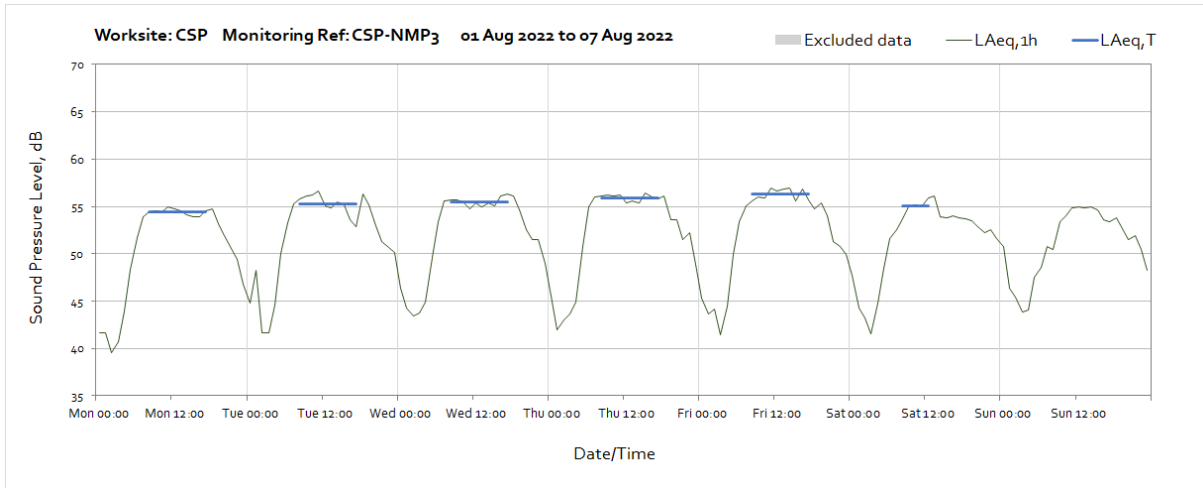


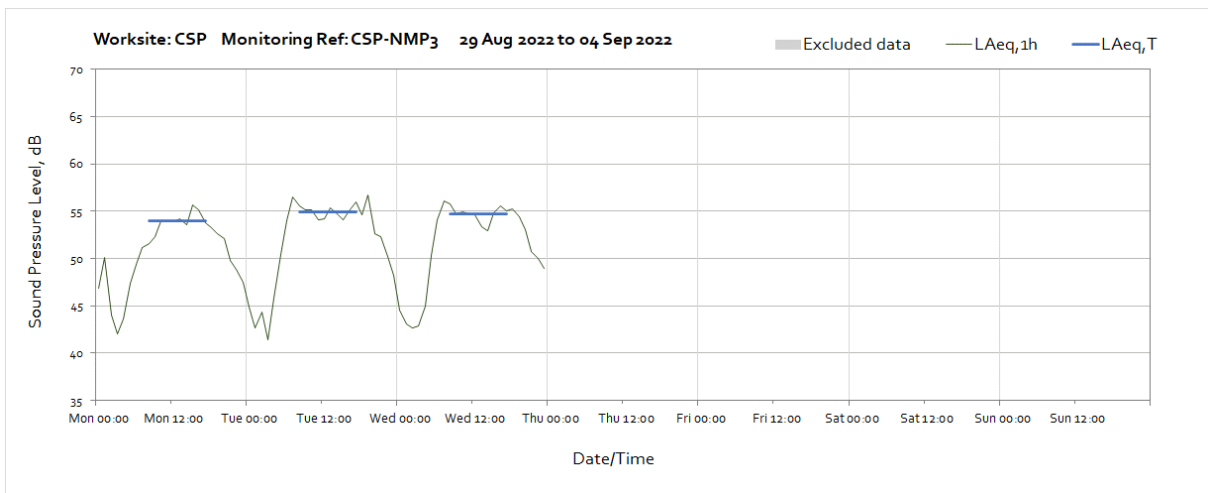
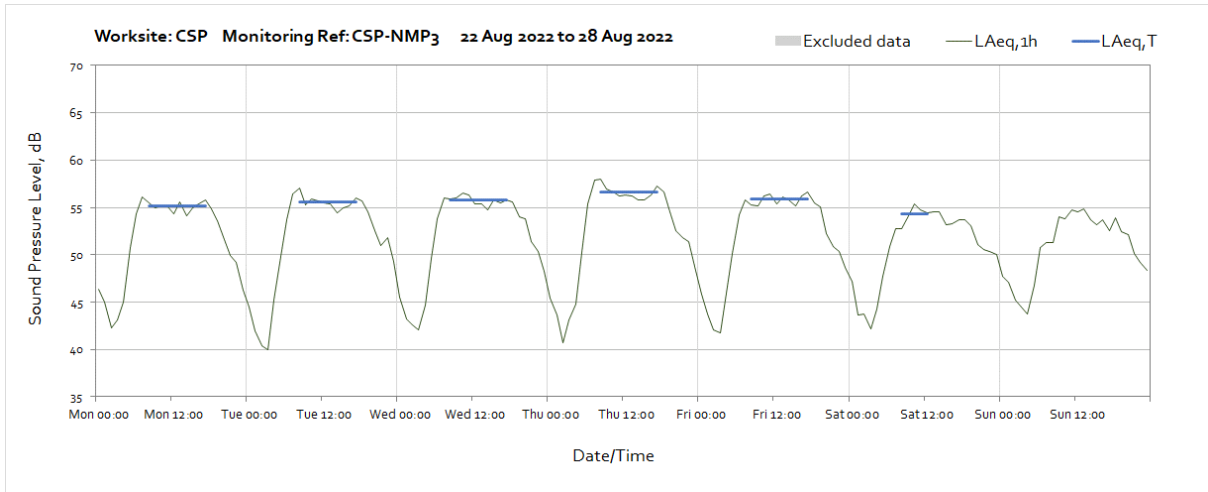
Worksite: CSP – Monitoring Ref: CSP-NMP2



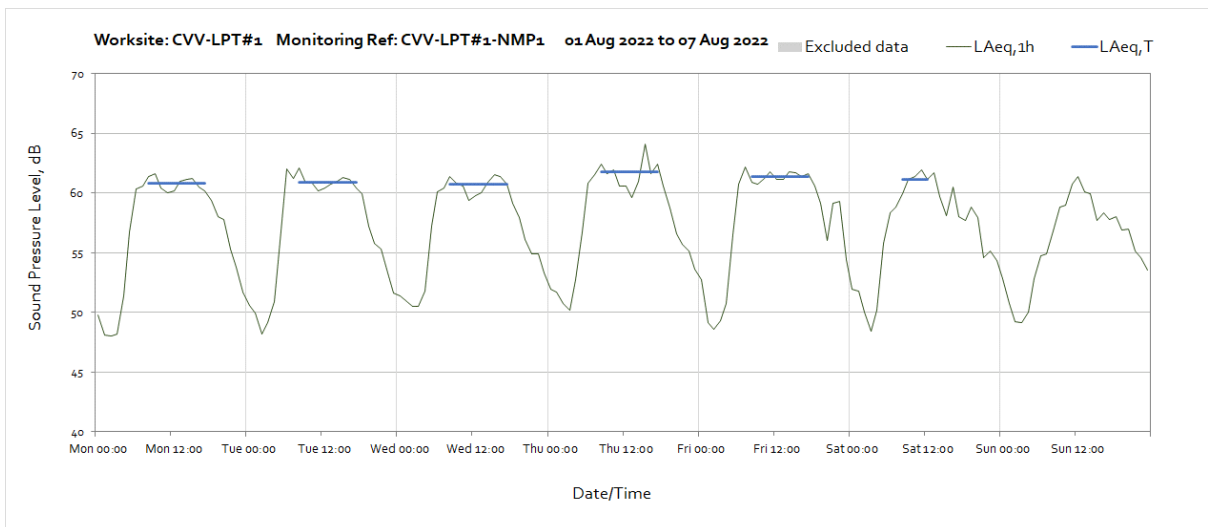


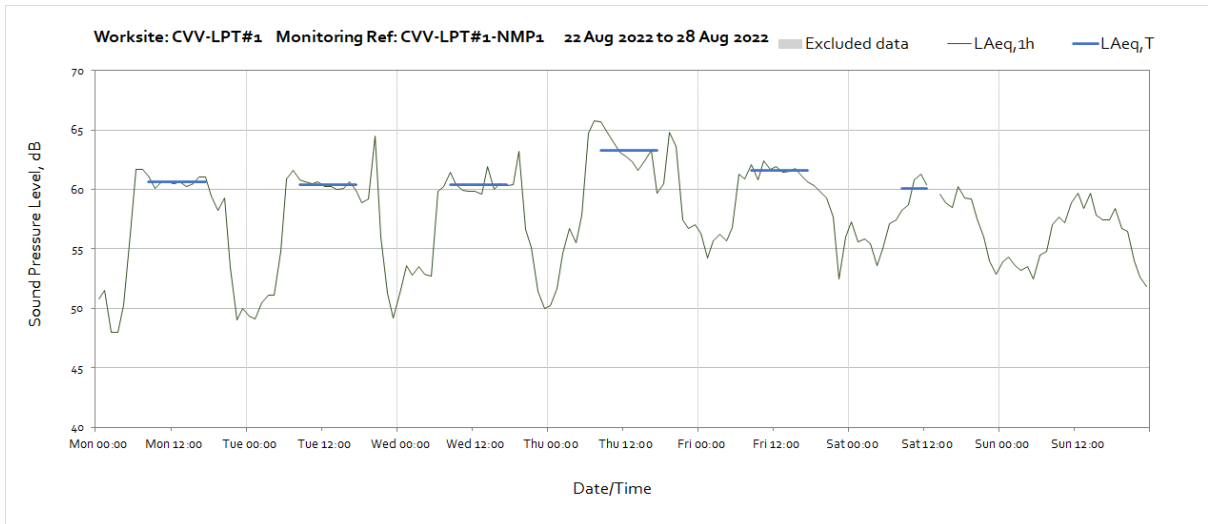
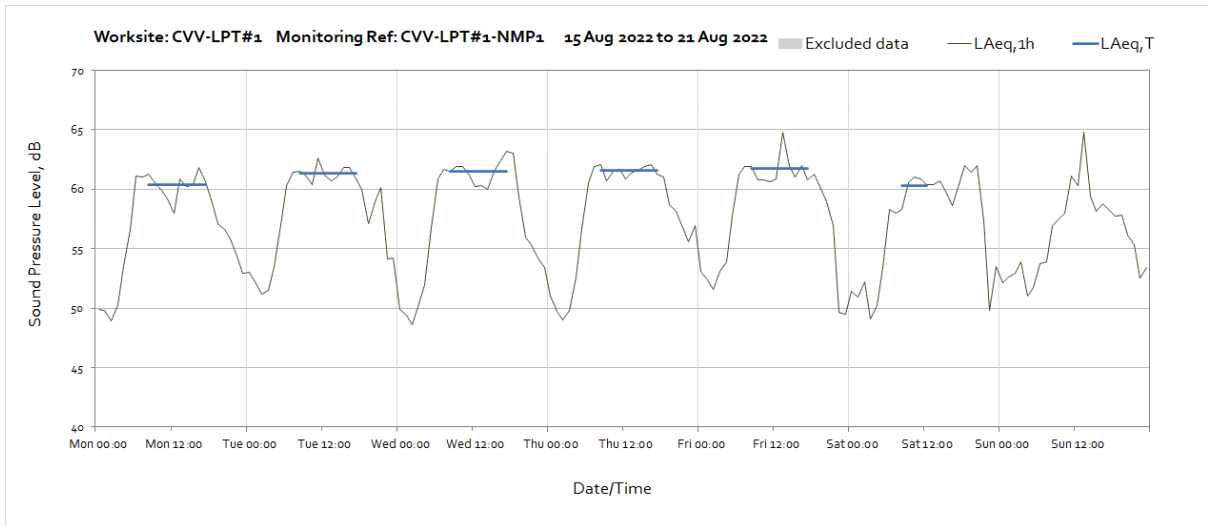
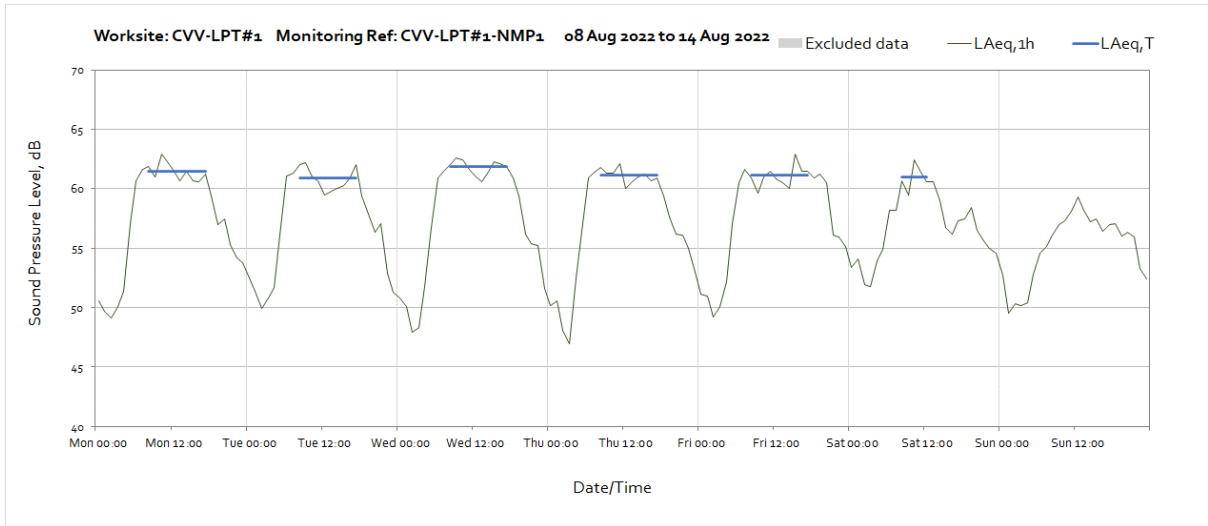
Worksite: CSP – Monitoring Ref: CSP-NMP3





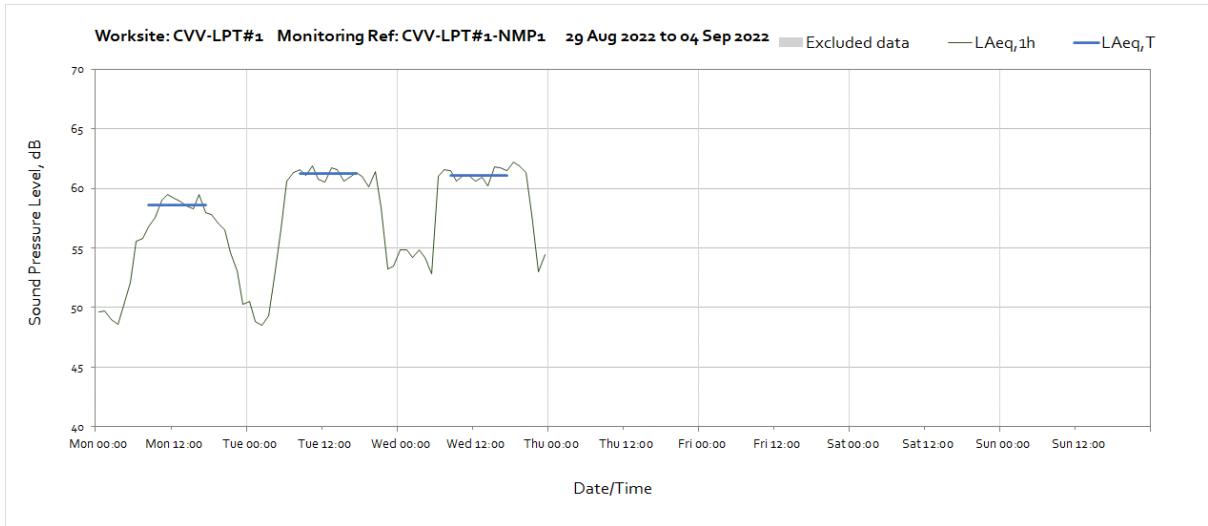
Worksite: CVV-LPT#1 – Monitoring Ref: CVV-LPT#1-NMP1



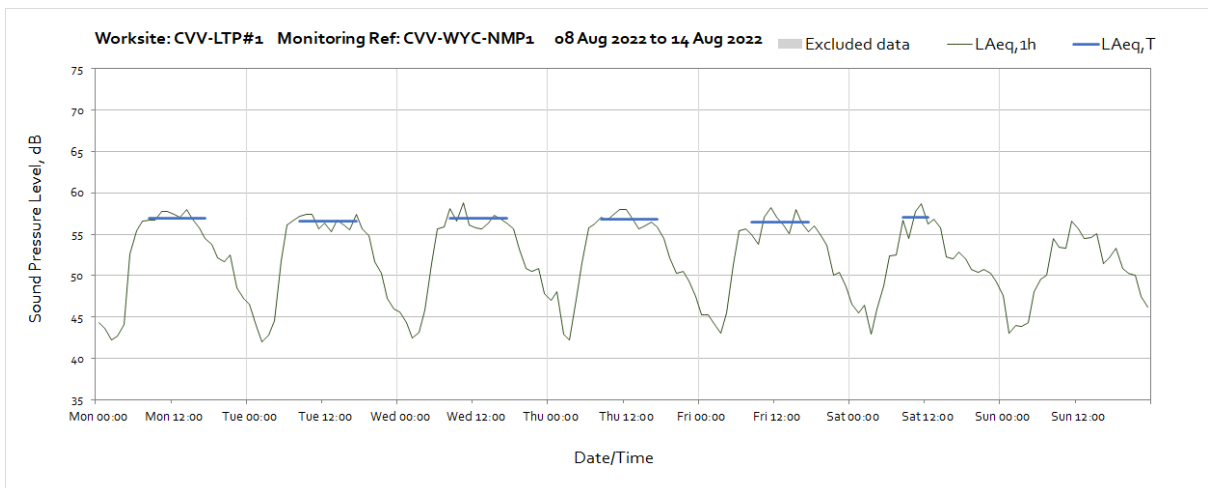
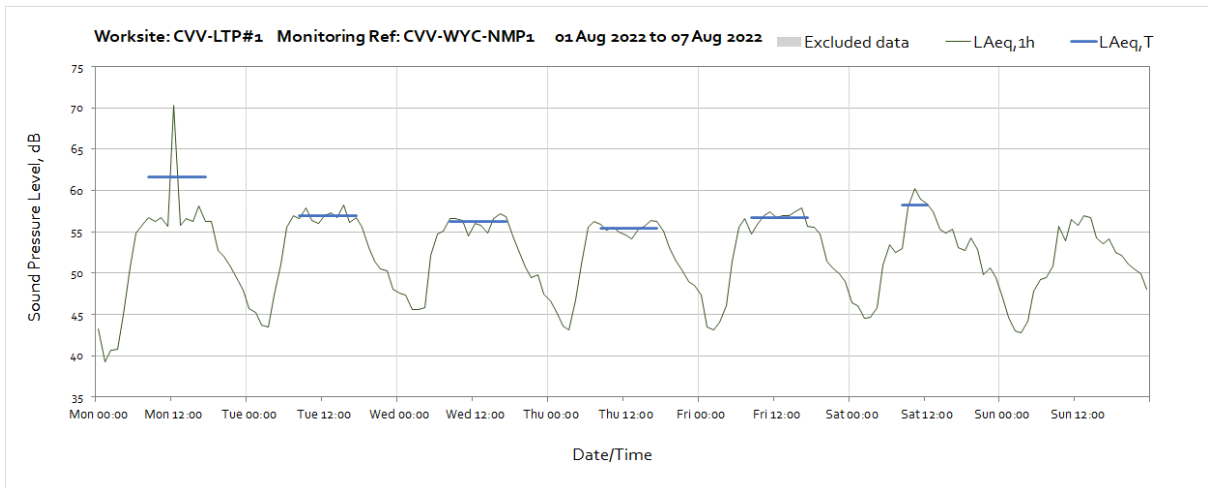


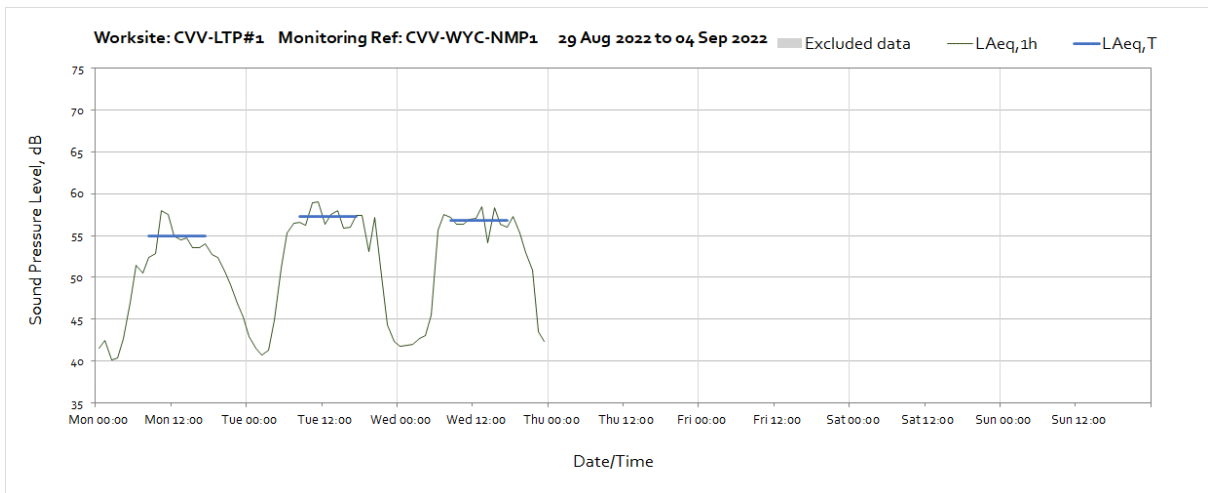
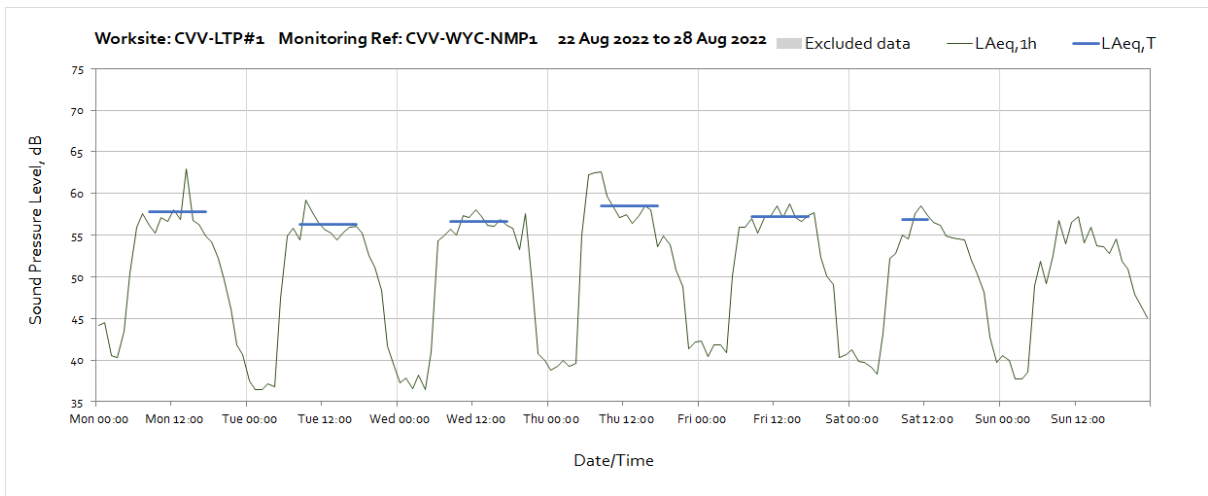
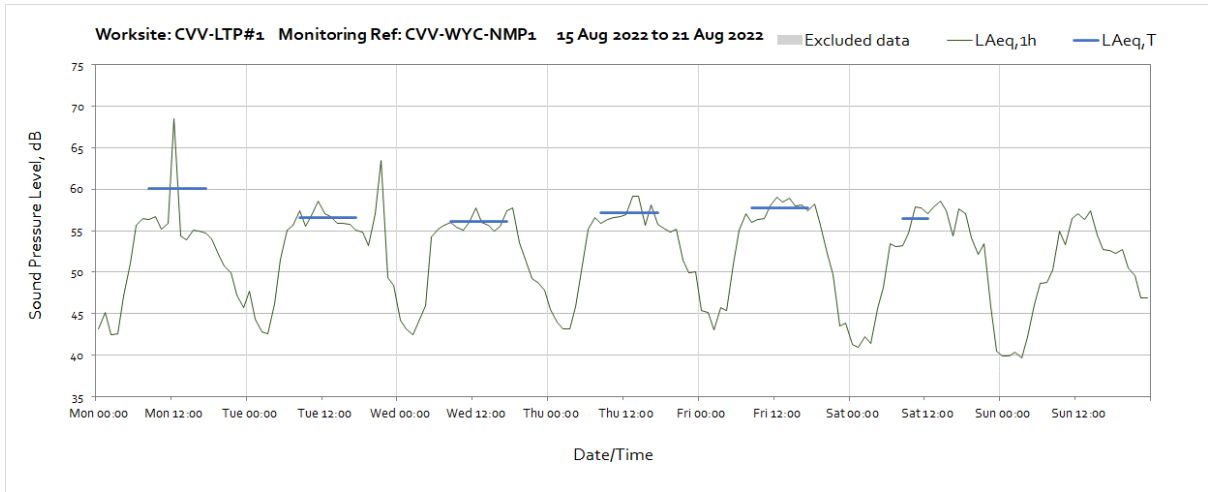
Note: Missing data between 13:00 and 14:00 on the 27th August was due to monitor settings update.

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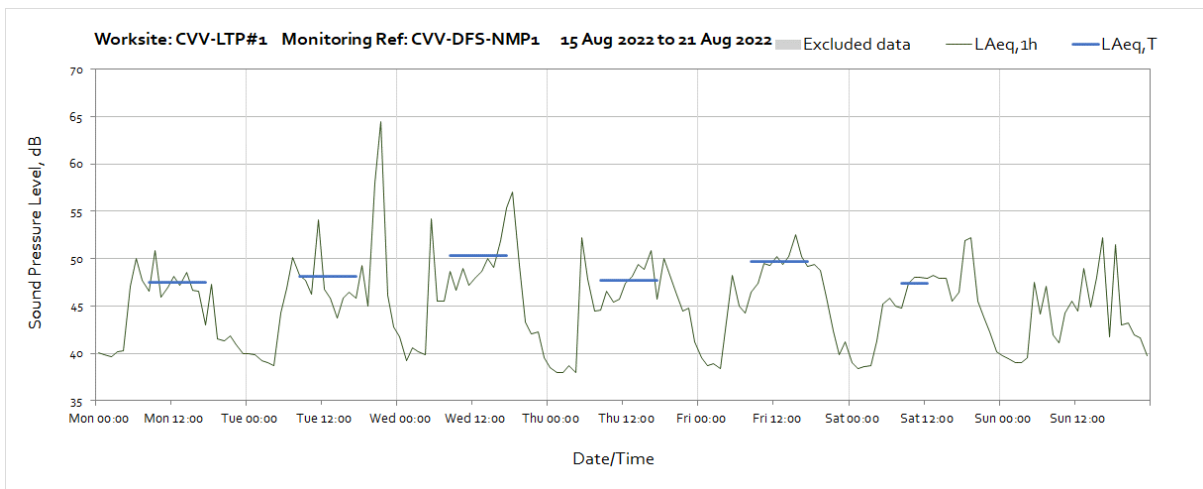
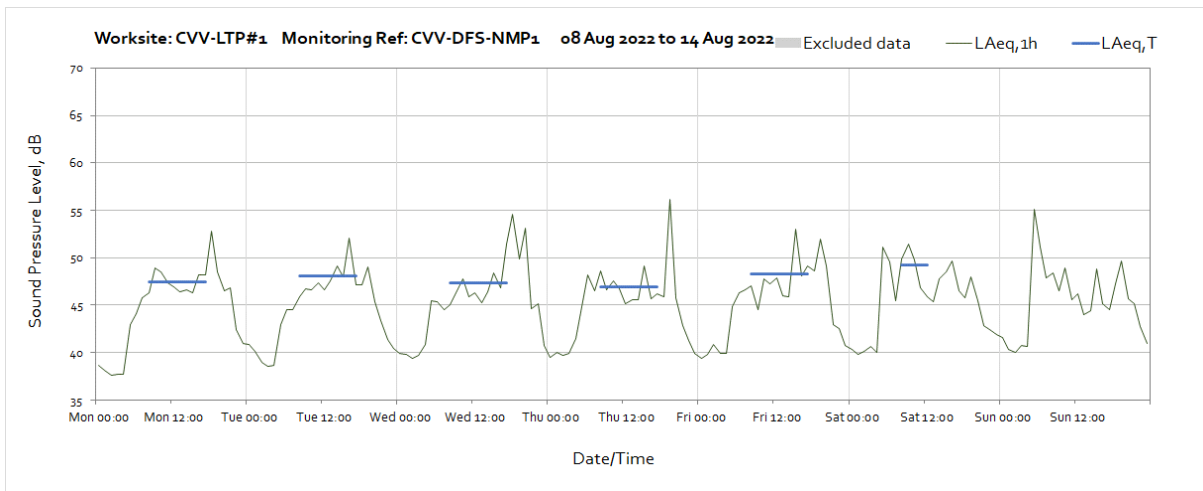
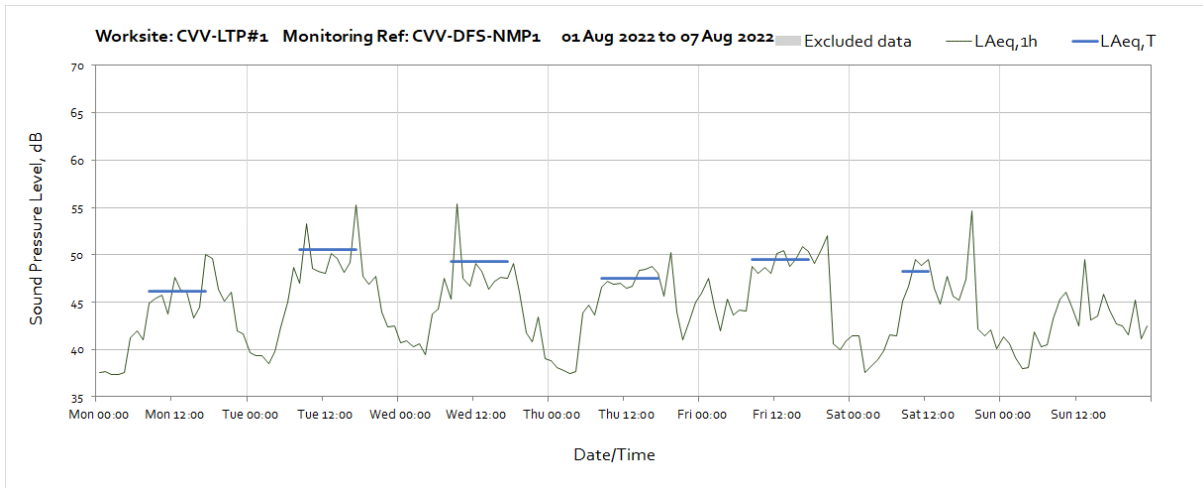


Worksite: CVV-LPT#1 - Monitoring Ref: CVV-WYC-NMP1

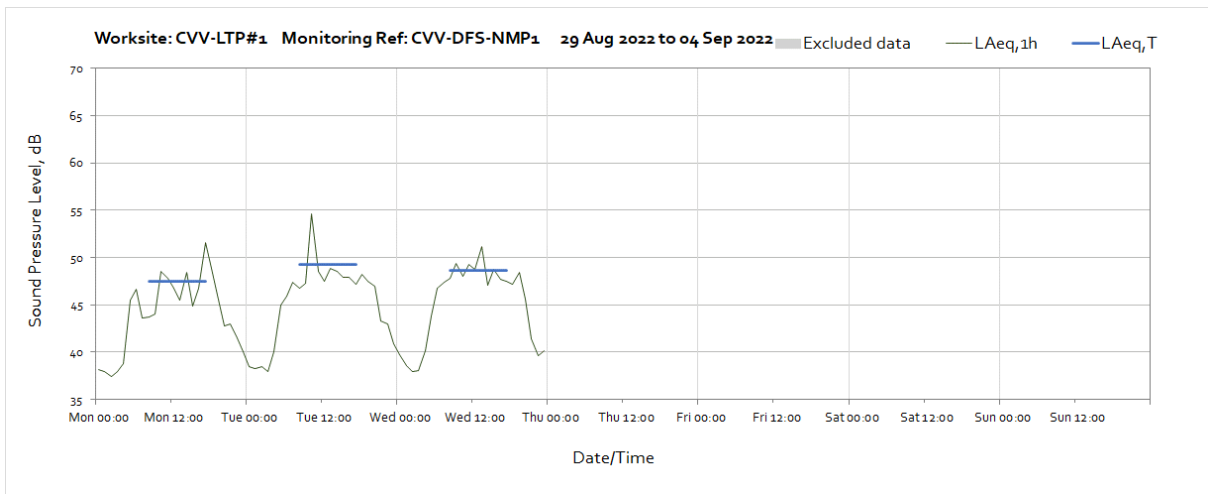
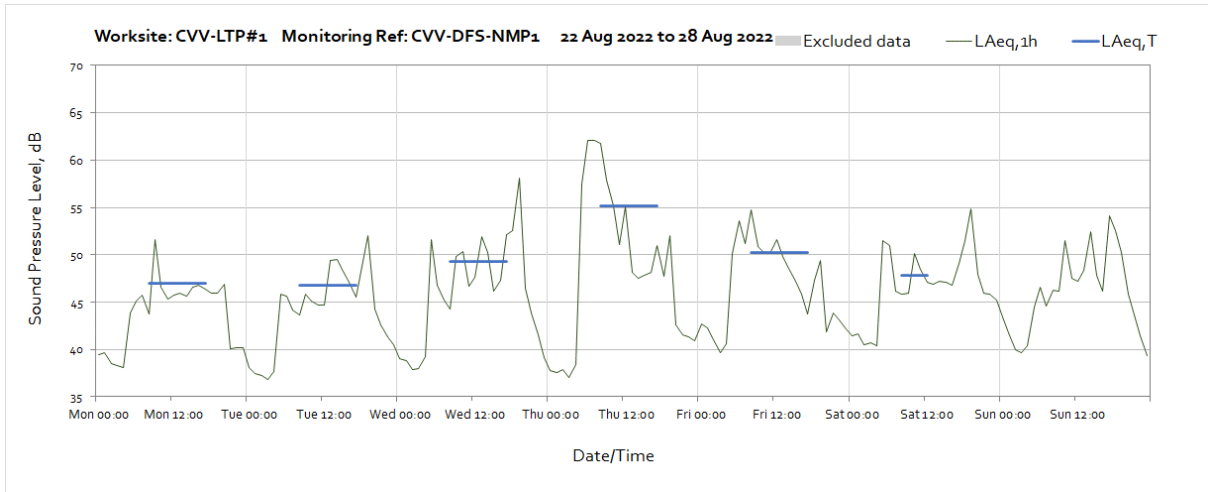




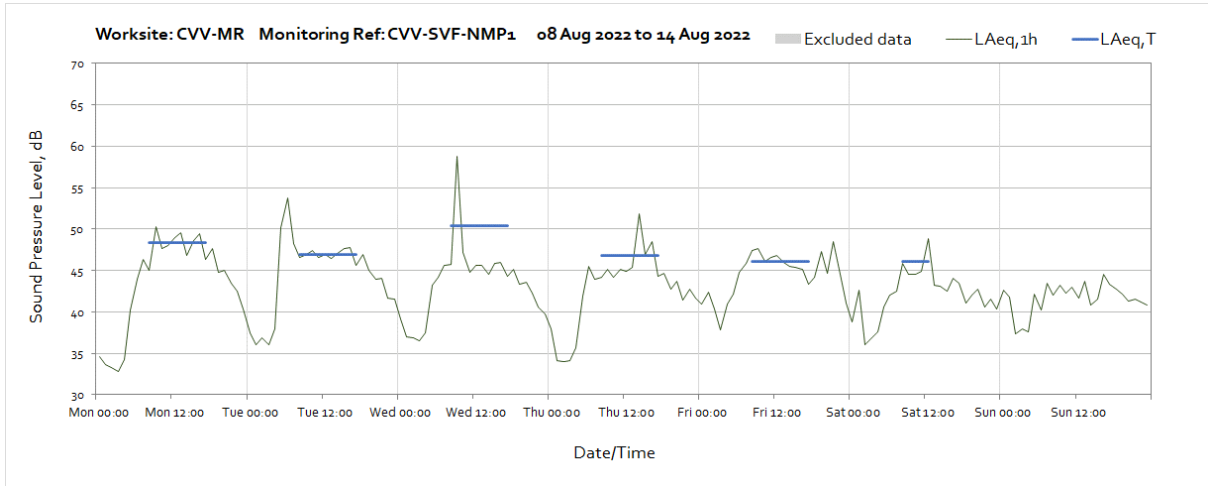
Worksite: CVV-LTP#1 – Monitoring Ref: CVV-DFS-NMP1

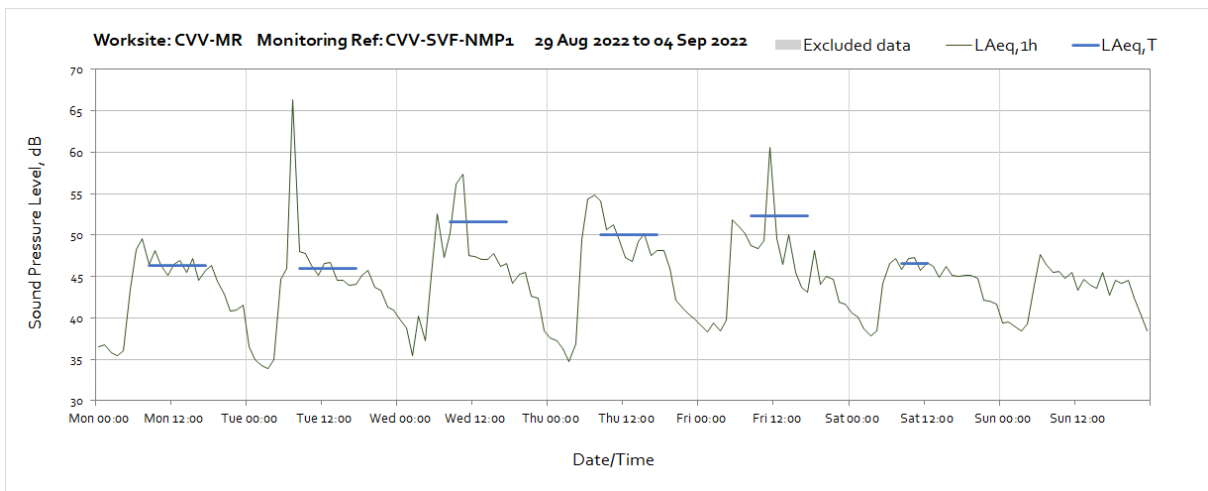
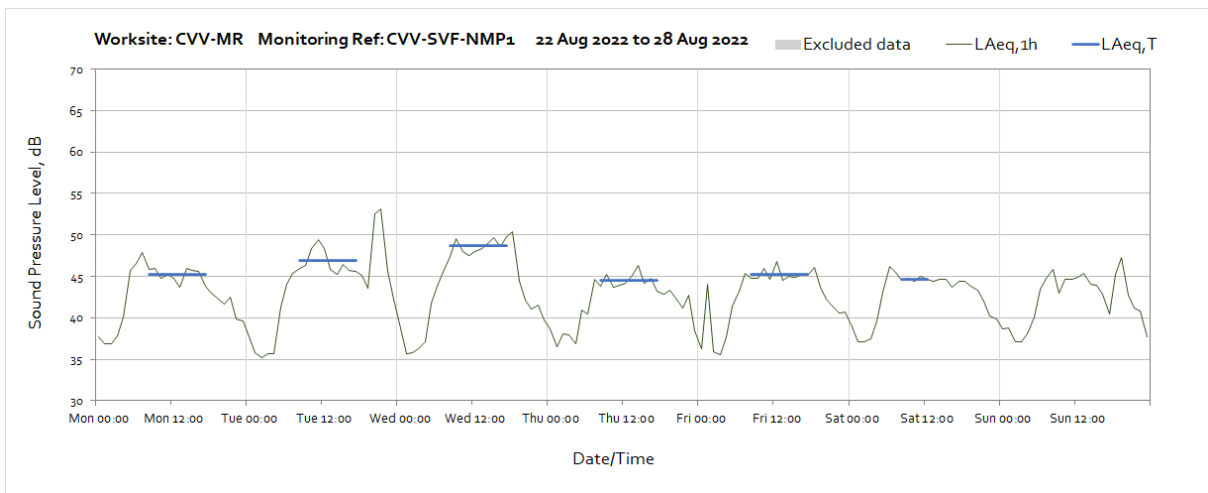
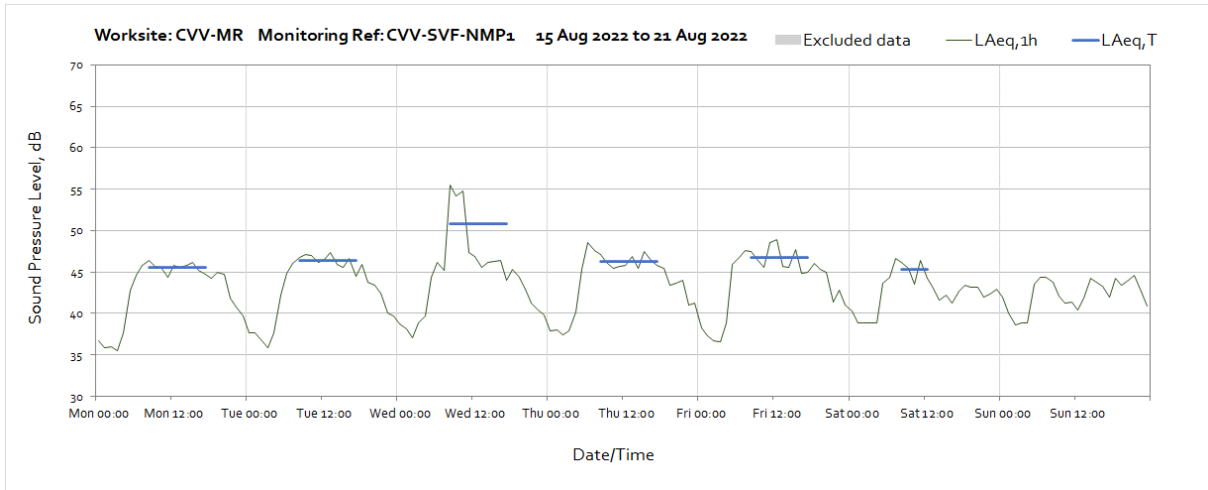


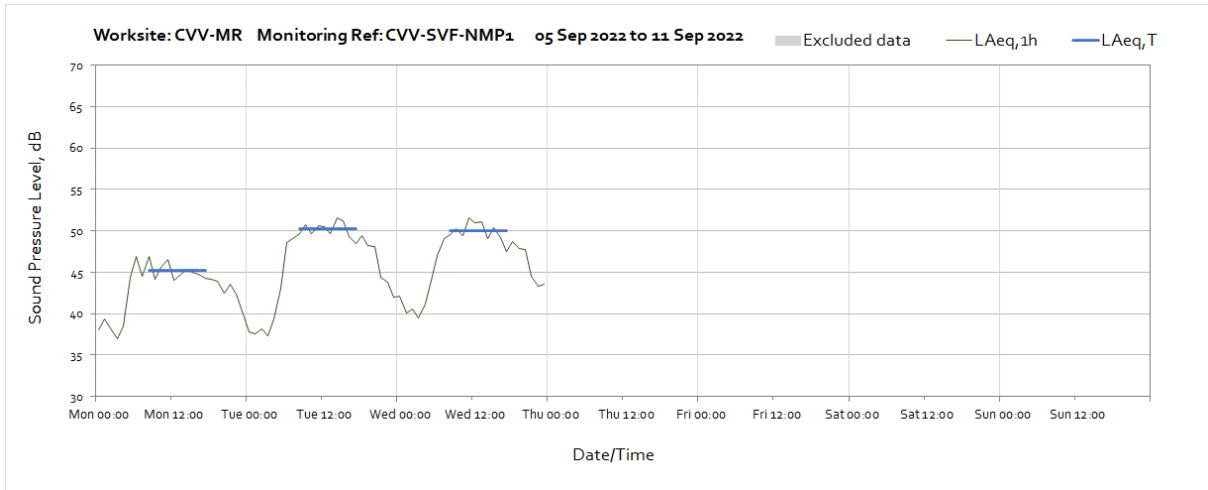
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Worksite: CVV-MR - Monitoring Ref: CVV-SVF-NMP1



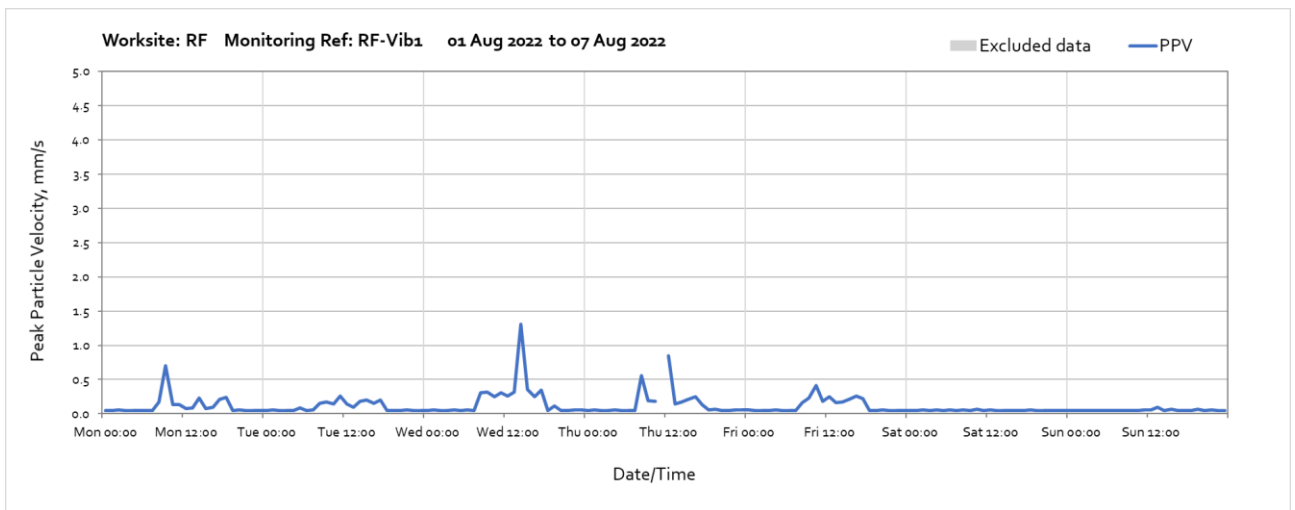




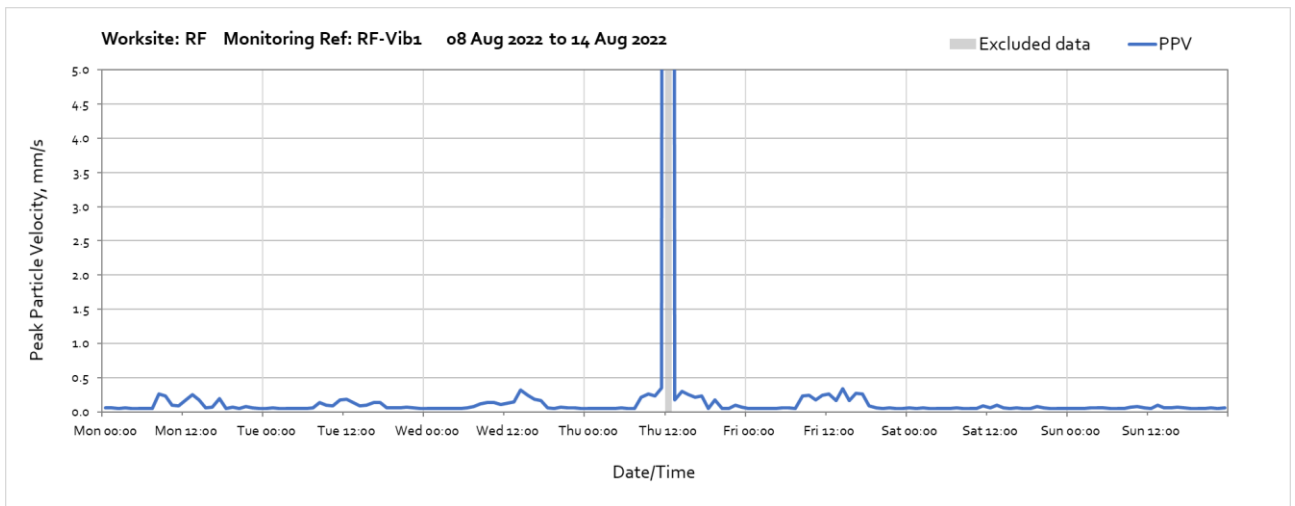
Vibration

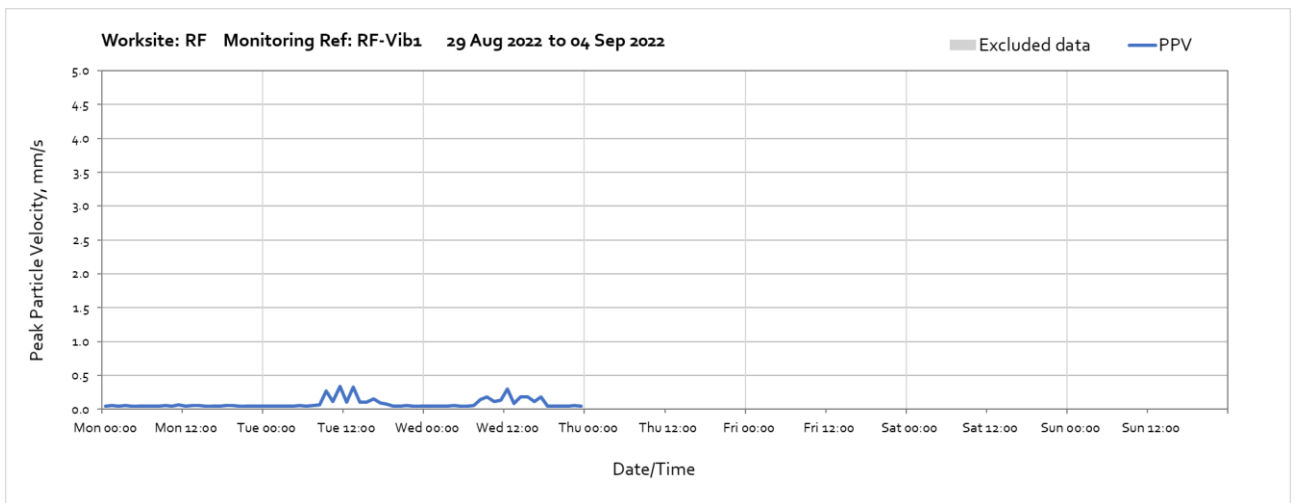
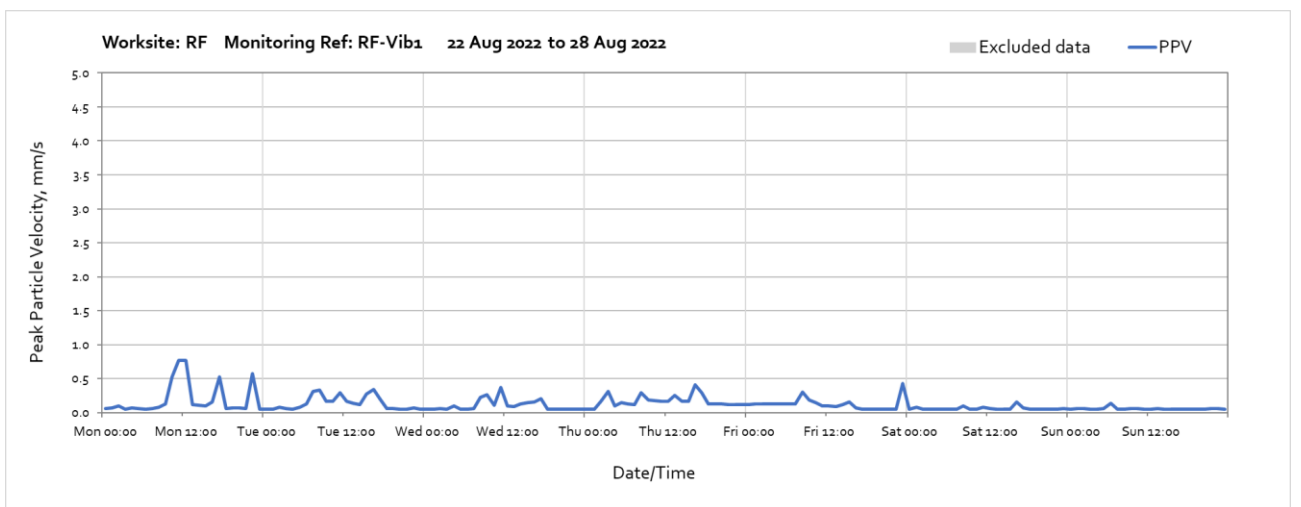
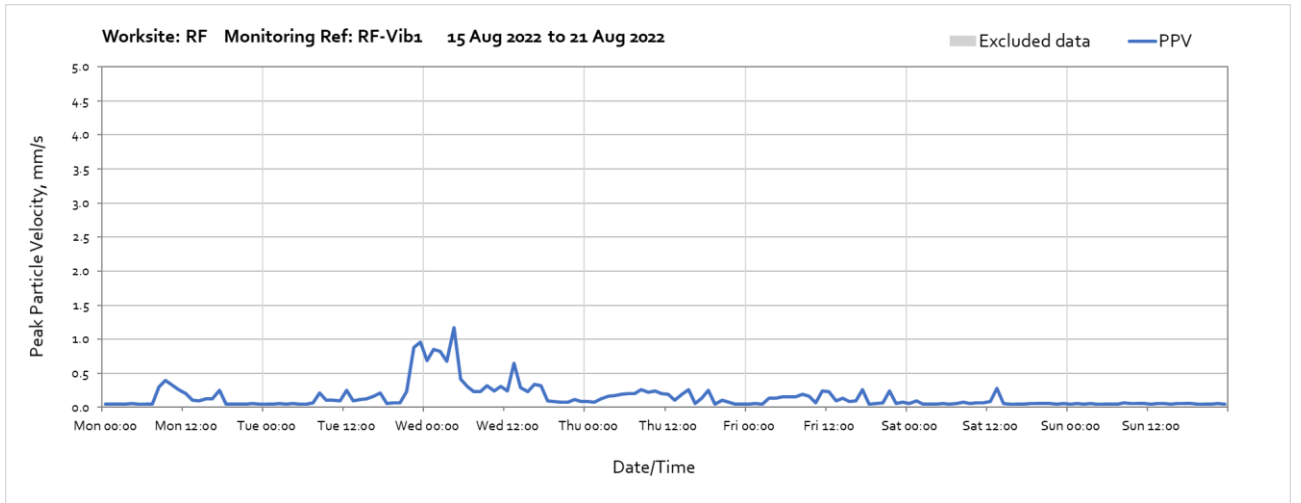
The following graphs show the hourly measured peak particle velocity PPV recorded during the monitoring period. The graphs show the highest PPV of the three orthogonal axes x, y and z. Where high values of PPV were caused by local interference with the vibration monitor, which are not representative 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: RF – Monitoring Ref: RF-Vib 1

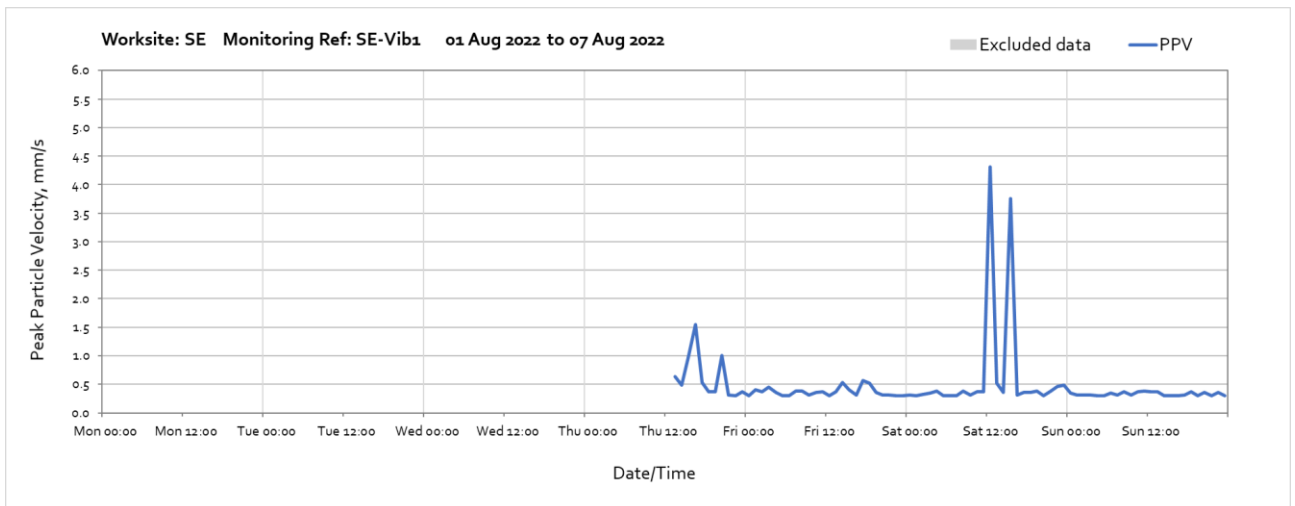


Note: Missing data at 11:00 on Thursday 11th August was due to power outage.

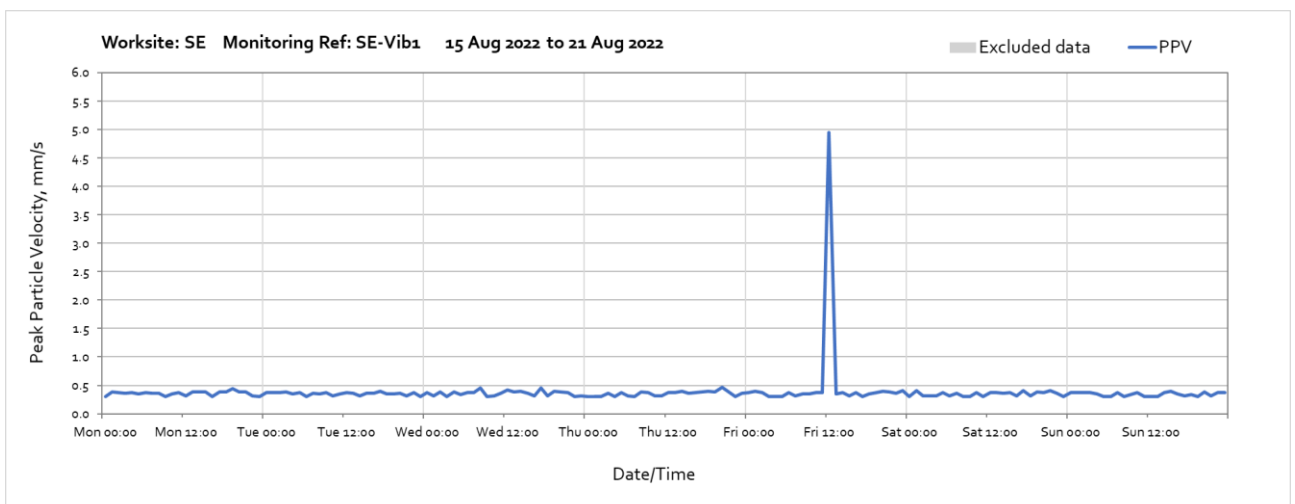
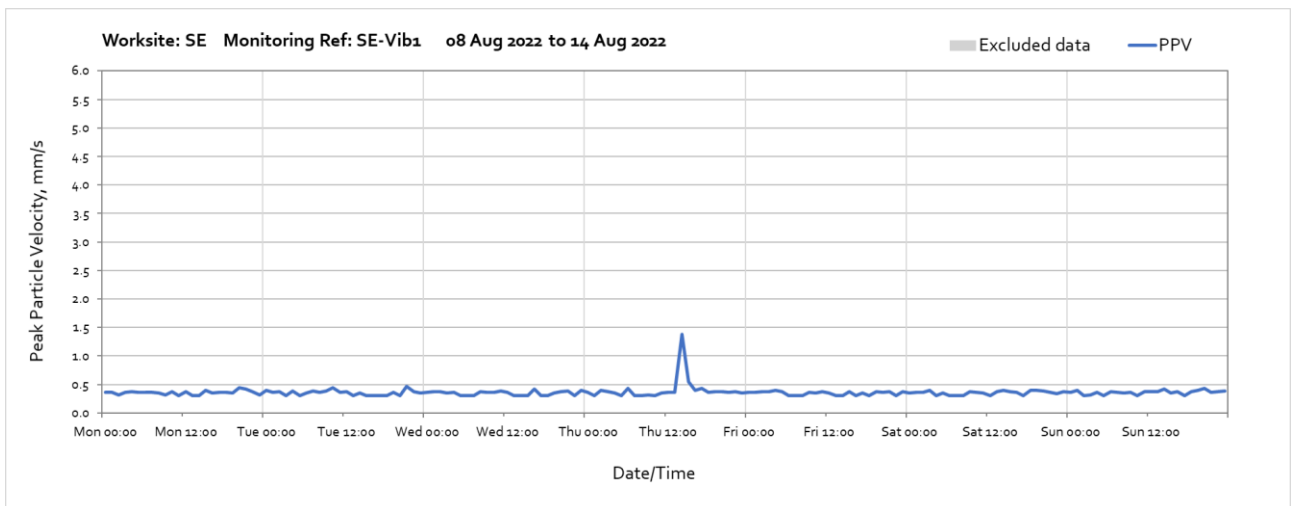




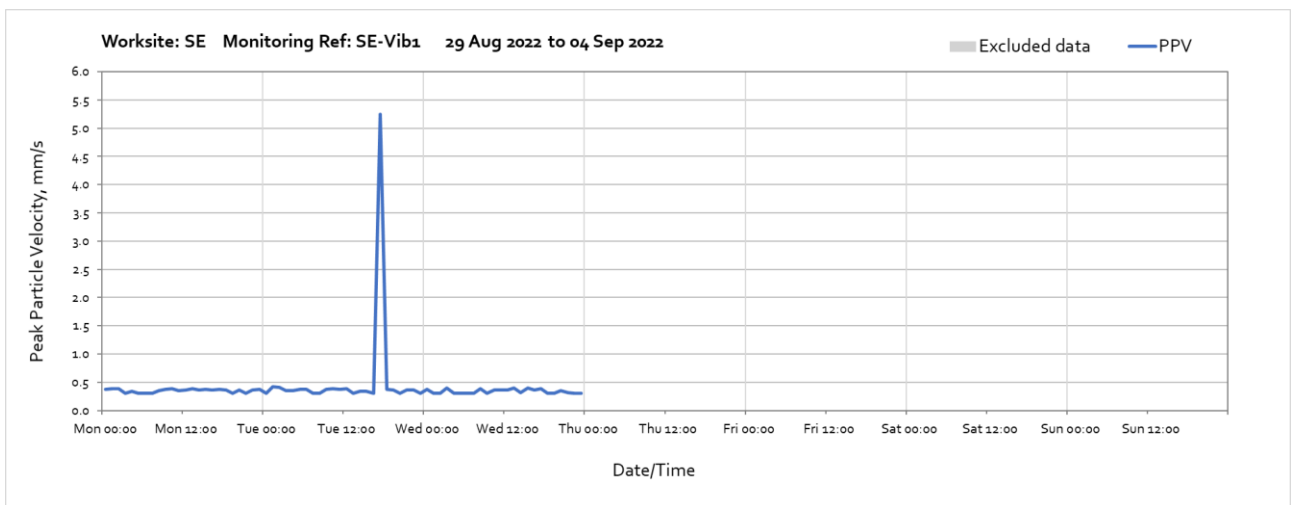
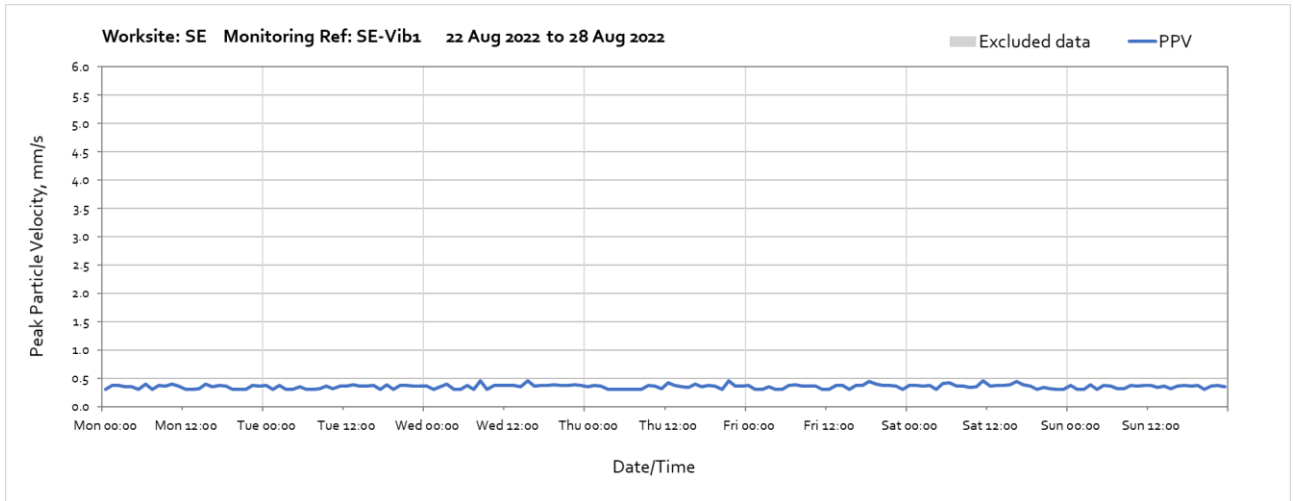
Worksite: SE – Monitoring Ref: SE-Vib 1



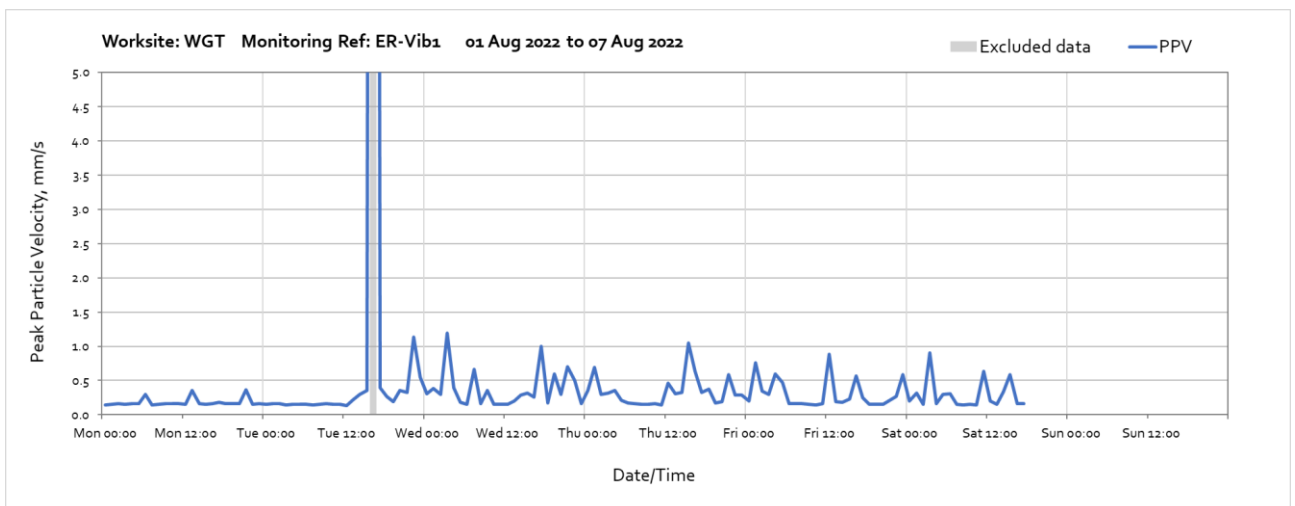
Note: The monitor, that was retrieved due to possible water ingress, has been repaired and re-installed on Thursday 4th August



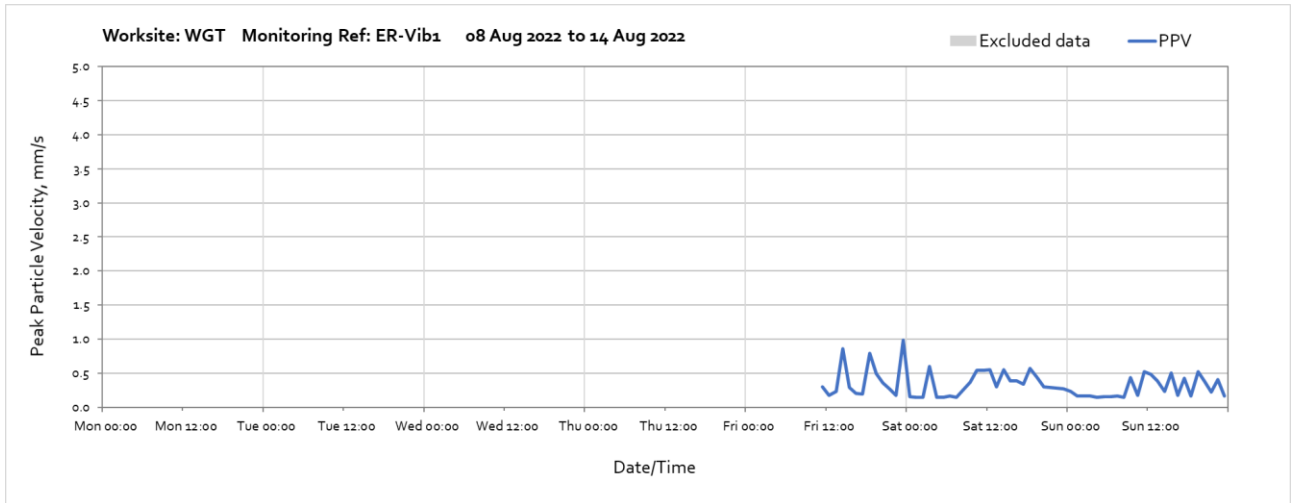
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Worksite: WGT – Monitoring Ref: ER-Vib 1



Note: Missing data from 18:00 on Saturday 6th August to 11:00 on Friday 12th August were due to power outage.



Note: Missing data from 18:00 on Saturday 6th August to 11:00 on Friday 12th August were due to power outage.

