Rampion 2 WIND FARM

Rampion 2 Wind Farm

Category 6: Environmental Statement

Volume 4, Appendix 21.1: Baseline sound report (tracked changes)

Date: January 2024

Revision B

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Document revisions

Revision	Date	Status/reason for issue	Author	Checked by	Approved by
A	04/08/2023	Final for DCO Application	WSP	RED	RED
B	16/01/2024	Additional survey data added; Corrections to receptor numbers	WSP	RED	RED

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1. Introduction

1.1 Background

1.1.1 Rampion Extension Development Limited (RED) (the 'Applicant') is in the process of submitting a Development Consent Order (DCO) application for the Rampion 2 offshore wind farm.

1.1.2 Rampion 2 comprises of new offshore and onshore energy infrastructure. A summary description of the Proposed Development is provided in **Chapter 21: Noise and vibration, Volume 2** of the ES (Document Reference: 6.2.21) which this Appendix supports, and a more detailed description is provided in **ES Chapter 4: The Proposed Development, Volume 2** of the ES (Document Reference: 6.2.4)

1.2 Purpose of this Appendix

1.2.1 The purpose of this Appendix is to present the results of the baseline sound level surveys that were conducted between 06 – 20 February 2023, 27 – 29 March 2023, ~~and~~ 3 – 4 May 2023, and 15 – 17 November 2023. Due to land access constraints prior to the DCO submission, the fourth set of surveys (15 – 17 November 2023) were undertaken post-DCO Application submission. Further detail on the application of the data obtained post-DCO Application submission is provided in **Section 4.3**.

1.2.2 The purpose of the baseline sound level surveys was to determine robust and accurate baseline data to inform the noise assessment within the Environmental Statement (ES) accompanying the DCO Application.

1.2.3 There is potential for noise effects during the construction, operation and maintenance and decommissioning phases of the Proposed Development. This Appendix sets out the measured baseline data used to inform the assessment of likely significant noise effects.

1.2.4 All personnel contributing to the baseline surveys, analysis of data and the preparation of this Appendix were appropriately qualified.

1.2.5 This Appendix includes the following sections:

- **Section 1: Introduction** which outlines an overview of the Appendix;
- **Section 2: Terminology** which outlines relevant terminology pertaining to noise;
- **Section 3: Technical guidance** which presents technical guidance relevant to the sound and noise baseline;
- **Section 4: Methodology** which outlines the methodology adopted in data collection and the categories of noise receptors where baseline information is required;

- **Section 5: Results** which outlines the specific baseline results for the Proposed Development, namely the results of the ambient and background sound and noise monitoring at several locations;
- **Section 6: Summary;**
- **Section 7: Glossary of terms and abbreviations;**
- **Section 8: References**
- **Annex A: Calibration certificates**;
- **Annex B: Baseline monitoring results**.

2. Terminology

2.1.1 Throughout this Appendix, the term ‘noise’ is used to describe an ‘unwanted sound’ and is generally applied when describing assessment methodologies or the predictions of emissions at receptors for the purpose of assessment. In keeping with relevant policy, standards, and guidance, calculated or measured emissions associated with the existing acoustic environment (such as ambient or background levels), and not associated with road or rail traffic, will be described as ‘sound’.

2.1.2 Whilst it is recognised that road or rail traffic noise is not always considered ‘unwanted’, the term ‘noise’ will be applied when describing their measurement.

2.1.3 The term ‘noise’ refers to airborne noise and ‘vibration’ to ground-borne vibration. For all other terminology, the full technical description is used, such as ‘ground-borne noise’. Additional technical terminology relevant to the noise assessment is presented in **Section 7**.

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3. Technical guidance

3.1.1 For the purposes of defining the scope of the baseline including the methodology for the sound and noise surveys for the Project, the planning policy, guidance, and standards listed in **Table 3-1** are of specific relevance.

Table 3-1 Planning Policy, Technical Standards, and Guidance

Guidance reference	Summary
National Planning Policy Framework (NPPF) (Ministry of Housing, Communities and Local Government, 2021)	The NPPF advises (para 185) that significant adverse impacts on health and the quality of life as a result of noise from new developments should be avoided. It also advises that other adverse impacts on health and quality of life arising from noise from new developments should be mitigated and reduced to a minimum. Paragraph 174 of the NPPF states that planning systems should contribute to and enhance the natural and local environment by (amongst other considerations): “Preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability.”. The NPPF further states in Paragraph 185 that “*Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:* *a) mitigate and reduce to a minimum, potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life; and* *b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are*

Guidance reference	Summary
	prized for their recreational and amenity value for this reason..." Paragraph 187 advises that "*Planning policies and decisions should ensure that new development can be integrated effectively with existing businesses and community facilities (such as places of worship, pubs, music venues and sports clubs). Existing businesses and facilities should not have unreasonable restrictions placed on them as a result of development permitted after they were established. Where the operation of an existing business or community facility could have significant adverse effects on new development (including changes of use) in its vicinity, the applicant (or 'agent of change') should be required to provide suitable mitigation before the development has been completed.*" This should be taken into account when considering whether the Project is an acceptable use of land.
BS 5228-1:2009 + A1:2014 Code of practice for noise and vibration control on construction and open sites. Part 1: Noise (British Standards Institution (BSI), 2014)	Provides a recommended scope for construction and demolition noise assessment (the ABC Method) presented in Annex E, and also gives example threshold values for potential significant effects at noise sensitive receptors based upon the results of ambient sound monitoring.
Transport and Road Research Laboratory (1986) Research Project 53 – Ground vibration caused by civil engineering works	Guidance into factors affecting the input and propagation of ground vibration from civil engineering works.
Design Manual for Roads and Bridges LA111: Noise and vibration (Highways England, 2020)	Presents a methodology for determining impacts upon noise sensitive receptors from changes in road traffic noise due to road projects.
Calculation of Road Traffic Noise (CRTN) (Her Majesty's Stationary Office (HMSO), 1988)	Provides a calculation methodology for road traffic noise.
Transport and Road Research Laboratory (2002) – Converting the UK traffic noise index LA10, 18hr to EU noise indices for noise mapping	A method for converting the road traffic noise indexes described in CRTN to produce outputs in the form of European Union indices, in particular TRL Method 3 which outlines the

Guidance reference	Summary
	conversion of the $L_{A10,18hr}$ noise indices to the $L_{Aewg,16hr}$ and $L_{Aeq,8hr}$ indexes.
Calculation of railway noise source terms for Calculation of Railway Noise 1995 (Department for Transport (1995)	A methodology for obtaining and calculating rail traffic noise indexes that is additional to the methodology set out within CRN.
BS 4142:2014 + A1:2019 Methods for rating and assessing industrial and commercial sound (BSI, 2019)	BS 4142:2014 + A1:2019 describes methods for rating and assessing sound of an industrial nature (using outdoor sound levels), such as from factories, industrial premises, or fixed installations affecting people who might be inside or outside a dwelling. BS 4142:2014 + A1:2019 does not apply to noise associated with the passage of vehicles on public roads and railway systems.
Noise and vibration management: environmental permits (Environment Agency, 2022)	Describes the principles of noise prediction and measurement, in addition to suggested methods of noise control. The guidance recommends that whenever possible, an assessment of noise should follow a recognised method of assessment, such as the methods presented within the relevant and current British Standards e.g. BS 4142:2014 + A1:2019.
International Standards Organization (ISO) 9613-2:1996 Acoustics – Attenuation of sound during propagation outdoors. Part 2: General method of calculation (ISO, 1996)	Defines a method for calculating the attenuation of sound during propagation outdoors in order to predict the levels of environmental noise at distances from a source.
Guidelines for Environmental Noise Impact Assessment (Institute of Environmental Management and Assessment (IEMA), 2014)	Presents guidelines on how the assessment of noise effects should be presented within the EIA process. The IEMA guidelines cover aspects such as scoping, baseline, prediction, and example definitions of significance criteria.
BS 7445-1:2003 Description and measurement of environmental noise. Part 1: Guide to quantities and procedures (BSI, 2003)	Provides guidance on the measurement and description of environmental noise.
BS EN 61672-1:2013 Electroacoustics – Sound level	Provides specifications for different sound level meters.

Guidance reference	Summary
meters. Part 1: Specifications (BSI, 2013)	
BS EN 60942:2018 Electroacoustics - Sound calibrators (BSI, 2018)	Provides specifications for different sound calibrators.

4. Methodology

4.1 Agreed methodology

4.1.1 The methodology and monitoring locations were agreed through non-statutory consultation with Environmental Health Officers from the following Local Authorities:

- Arun District Council;
- Horsham District Council;
- Mid-Sussex District Council;
- South downs National Park Authority; and
- West Sussex County Council.

4.1.2 Further detail on the relevant assessment methodologies agreed with each Local Authority are provided in **Section 21.3** of **Chapter 21: Noise and vibration, Volume 2** of the ES (Document Reference: 6.2.21).

Identification of receptor locations

4.1.3 Noise monitoring locations were selected to be representative of Noise Sensitive Receptors (NSRs) with the greatest potential to be affected by noise from the construction and operation of the Proposed Development. The NSRs and noise monitoring locations were identified using aerial imagery, Ordnance Survey (OS) mapping and local knowledge.

4.1.4 **Chapter 21: Noise and vibration, Volume 2** of the ES (Document Reference: 6.2.21) identifies NSRs where baseline levels are required and have been taken forward when selecting monitoring locations. The receptors for temporary construction activity, and operational and maintenance activity are shown in **Table 4-1** and **Table 4-2** respectively. **Figure 21.2, Volume 3** of the ES (Document Reference: 6.3.21) presents all the receptors within OS mapping.

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Table 4-1 NSRs construction

NSR Reference	Receptor Address / Location Description	British Grid Reference	
		X	Y
HDD01-N	CROOKTHORN BYRE, BROOKPIT LANE, BN17 5QU	500868	101435
HDD01-S	THE MILL, CLIMPING STREET, BN17 5RN	501530	101241
HDD01A-S	THE MILL, CLIMPING STREET, BN17 5RN	501530	101241
HDD02-S	THE MILL, CLIMPING STREET, BN17 5RN	501530	101241
HDD03-S	FLAT 1, MARDEN HOUSE, HIGHFIELD, BN17 7EU	501768	103236
HDD03-E	8, BENJAMIN GRAY DRIVE, BN17 7FA	501605	103387
HDD03-S Industrial	UNIT 9, THORGATE ROAD, BN17 7LU	501722	103168
HDD03-NE	6, BONIFACE AVENUE, BN17 7AD	501550	103622
HDD04-E (Farm building)	BROOK BARN HOUSE, COURTWICK LANE, BN17 7PE	501465	104053
HDD04-S	32, BONIFACE AVENUE, BN17 7AD	501501	103883
~~**HDD06-S**~~	~~BROOK BARN HOUSE, COURTWICK LANE, BN17 7PE~~	~~501465~~	~~104053~~

NSR Reference	Receptor Address / Location Description	British Grid Reference	
		X	Y
HDD057-N	KEYMERS, ORCHARD LANE, BN17 7GL	502603	104613
HDD057-SW	LYMINSTER ROAD, BN17 7QE	502542	104473
HDD057-S	PADDOCKS END, WOODCOTE LANE, BN17 7PT	502717	104296
HDD057-E	LYMINSTER NURSERY, LYMINSTER ROAD, BN17 7QF	502817	104626
HDD068-W	LYMINSTER NURSERY, LYMINSTER ROAD, BN17 7QF~~PINDARS, LYMINSTER ROAD, BN17 7QF~~	502828	104630
HDD068-S	12, NEAL CRESCENT, LITTLEHAMPTON, BN17 7TH~~WOODCOTE HOUSE, WOODCOTE LANE, BN17 7PT~~	502858	104294
HDD068-N	THE OLD VICARAGE, LYMINSTER ROAD, BN17 7QF	502907	104762
~~**HDD18and19-SW**~~	~~3 SETTATREES, LONDON ROAD, RH20 4AL~~	~~512231~~	~~113044~~
HDD07-S	ROWANDENE, POLING STREET, ARUNDEL, BN18 9PS	504644	105282
HDD07-N	HARVEST VIEW, POLING STREET, ARUNDEL, BN18 9PS	504617	105497
HDD08-S	THE DECOY, DECOY LANE, ARUNDEL ROAD, BN18 9QA	505857	105393

NSR Reference	Receptor Address / Location Description	British Grid Reference	
		X	Y
HDD08-N (Hospice)	DOVER LANE, BN18 9PX	505966	105833
HDD08-W	4, ELLA TERRACE, BN18 9QE	505377	105638
HDD-09-EHDD18and19-S	200, ARUNDEL ROAD, BN16 4ESWALNUT TREE COTTAGE, THE PIKE, RH20 4AA	506339512583	105541112940
HDD-09-SHDD18and19-E	THE DECOY, DECOY LANE, ARUNDEL ROAD, BN18 9QAGREEN FARMHOUSE, THE PIKE, RH20 4AA	505857512828	105393113310
HDD-09-NHDD18&19-N	CHESTNUT TREE HOUSE, DOVER LANE, BN18 9PXWASHINGTON PADDOCKS, LONDON ROAD, RH20 4AJ	505966512300	105833113326
HDD10-SHDD20-E	202, ARUNDEL ROAD, BN16 4ESSHIRLEY HOUSE, STEYNING ROAD, BN44 3DD	506363514191	105559113430
HDD10-EHDD20-N	SOUTHVIEW, HAMMERPOT, BN16 4EU1 POLECAT COTTAGES, STEYNING ROAD, BN44 3DE	506634514298	105751113558
HDD10-WHDD21-N (Church)	1 ANGMERING PARK COTTAGES, ANGMERING PARK, BN16 4EX1 LONGBACK COTTAGES, WATER LANE, BN44 3DX	506194514505	105787113903

NSR Reference	Receptor Address / Location Description	British Grid Reference	
		X	Y
HDD10-NHDD21-N	COLT BUNGALOW, ANGMERING PARK, BN16 4EX1 LONGBACK COTTAGES, WATER LANE, BN44 3DX	506247514505	106014113903
HDD11-EHDD21-S	COLT BUNGALOW, ANGMERING PARK, BN16 4EXBUNCTON MANOR FARM, STEYNING ROAD, BN44 3DD	506247514567	106014113645
HDD11-SHDD21-E	THE OLD COTTAGE, HAMMERPOT, BN16 4EUSCHOOL HOUSE, STEYNING ROAD, BN44 3DD	506676514986	105821113752
HDD12-E	DWELLING SOUTH OF MICHELGROVE HOUSE, MICHELGROVE LANE, PATCHING, ARUN, BN13 3XQ	508193	108475
HDD12-SE	MICHELGROVE HOUSE, MICHELGROVE LANE, PATCHING, ARUN, BN13 3XQ	508152	108367
HDD16and17-S	WALNUT TREE COTTAGE, THE PIKE, RH20 4AA	512583	112940
HDD16and17-E	GREEN FARMHOUSE, THE PIKE, RH20 4AA	512828	113310
HDD16and17-N	WASHINGTON PADDOCKS, LONDON ROAD, RH20 4AJ	512300	113326
HDD18-E	SHIRLEY HOUSE, STEYNING ROAD, BN44 3DD	514191	113430
HDD19-N (Church)	1 LONGBACK COTTAGES, WATER LANE, BN44 3DX	514505	113903

NSR Reference	Receptor Address / Location Description	British Grid Reference	
		X	Y
HDD19-N	1 LONGBACK COTTAGES, WATER LANE, BN44 3DX	514505	113903
HDD19-S	BUNCTON MANOR FARM, STEYNING ROAD, BN44 3DD	514567	113645
HDD19-E	SCHOOL HOUSE, STEYNING ROAD, BN44 3DD	514986	113752
HDD1921-SW	BUTCHERS FARM, WATER LANE, BN44 3DW	514361	113668
HDD202-N	BEGGARS BUSH, SPITHANDLE LANE, BN44 3DY	517214	115249
HDD202-W	DOVES FARM, SPITHANDLE LANE, BN44 3DY	516925	114860
HDD213-E	SMALLWOOD HOUSE, STEYNING ROAD, BN44 3AN	517976	115575
HDD213-N	SOUTHVIEW, WELLENS FARM, STEYNING ROAD, BN44 3AN	518000	115906
HDD213-S	BERGEN-OP-ZOOM, HORSEBRIDGE COMMON, BN44 3AL	518028	115249
HDD224-N	MERRION HOUSE, BINES GREEN, RH13 8EH	518647	117088
HDD224-S	1 MERRION FARM COTTAGES, BINES GREEN, RH13 8EH	518751	116783
HDD224-W	LONG COTTAGE, BINES GREEN, RH13 8EH	518457	116912
HDD235-S	MERRION HOUSE, BINES GREEN, RH13 8EH	518647	117088
HDD235-W	HOLLY TREE COTTAGE, BINES GREEN, RH13 8EH	518649	117217

NSR Reference	Receptor Address / Location Description	British Grid Reference	
		X	Y
HDD235-NW	MARTINSLAND FARM, BINES GREEN, RH13 8EH	518721	117444
~~**HDD27-N**~~	~~DRAGONS LANE, HENFIELD ROAD, RH13 8DX~~	~~521784~~	~~121008~~
~~**HDD27-S**~~	~~LOWER BARN, HENFIELD ROAD, RH13 8HL~~	~~521490~~	~~120237~~
HDD246-S	2 MORLEYS COTTAGES, BRIGHTON ROAD, RH13 8HQ	520810	119926
HDD246-E	MONKSWOOD, HANGERWOOD, RH13 8HJ	520921	120003
HDD246-W	GREENTREES FARM, BRIGHTON ROAD, RH13 8HQ	520590	120200
HDD246-N	MARYLAND, HENFIELD ROAD, RH13 8HL	520919	120215
HDD25-N	DRAGONS LANE, HENFIELD ROAD, RH13 8DX	521784	121008
HDD25-S~~**HDD28-W**~~	LOWER BARN, HENFIELD ROAD, RH13 8HL~~DRAGONS LANE, HENFIELD ROAD, RH13 8DX~~	521490~~521784~~	120237~~121008~~
HDD268-E	MOATFIELD FARM, KINGS LANE, RH13 8BD	522442	121124
HDD268-N	OAK COTTAGE, MOATFIELD LANE, RH13 8BF	522277	121424
HDD279-W	TAINTFIELD FARMHOUSE, KINGS LANE, RH13 8BD	522639	121855
HDD279-S	WESTRIDGE, KENT STREET, RH13 8BB	523226	121884
HDD2830-N	SOUTHLANDS, KENT STREET, RH13 8BA	523197	122655

NSR Reference	Receptor Address / Location Description	British Grid Reference	
		X	Y
HDD2830-NW	OAKENDENE MANOR, BOLNEY ROAD, RH13 8AZ	522766	122607
HDD2931-N	EASTRIDGE LODGE, WINEHAM LANE, RH17 5SD	524086	121814
HDD2931-W	WESTRIDGE PLACE, WINEHAM LANE, RH17 5SD	523811	121559
HDD2931-E	DAWES FARM, WINEHAM LANE, RH17 5SD	524425	121757
HDD2931-S	OLD DOCTORS, WINEHAM LANE, BN5 9AZ	523850	121311
~~**HDD32-S**~~	~~THE DECOY, DECOY LANE, ARUNDEL ROAD, BN18 9QA~~	~~505857~~	~~105393~~
~~**HDD32-N (Hospice)**~~	~~DOVER LANE, BN18 9PX~~	~~505966~~	~~105833~~
~~**HDD32-W**~~	~~4, ELLA TERRACE, BN18 9QE~~	~~505377~~	~~105638~~
~~**HDD-33 E**~~	~~200, ARUNDEL ROAD, BN16 4ES~~	~~506339~~	~~105541~~
~~**HDD-33-S**~~	~~THE DECOY, DECOY LANE, ARUNDEL ROAD, BN18 9QA~~	~~505857~~	~~105393~~
~~**HDD-33-N**~~	~~DOVER LANE, BN18 9PX~~	~~505966~~	~~105833~~
~~**HDD34-S**~~	~~202, ARUNDEL ROAD, BN16 4ES~~	~~506363~~	~~105559~~
~~**HDD34-E**~~	~~SOUTHVIEW, HAMMERPOT, BN16 4EU~~	~~506634~~	~~105751~~

NSR Reference	Receptor Address / Location Description	British Grid Reference	
		X	Y
~~HDD34-W~~	~~1 ANGMERING PARK COTTAGES, ANGMERING PARK, BN16 4EX~~	~~506194~~	~~105787~~
~~HDD34-N~~	~~COLT BUNGALOW, ANGMERING PARK, BN16 4EX~~	~~506247~~	~~106014~~
~~HDD35-E~~	~~COLT BUNGALOW, ANGMERING PARK, BN16 4EX~~	~~506247~~	~~106014~~
~~HDD35-S~~	~~THE OLD COTTAGE, HAMMERPOT, BN16 4EU~~	~~506676~~	~~105821~~
AA01-E (a)	FIELD PLACE, CHURCH LANE, BN17 5RR	500394	102246
AA01-N (a)	FIELD PLACE, CHURCH LANE, BN17 5RR	500394	102246
AA01-N (b)	CHURCH FARM HOUSE EAST, CHURCH LANE, BN17 5RB	500301	102349
AA01- SE	1, CLIMPING PARK, BOGNOR ROAD, BN17 5DW	500934	102068
AA01-S - School	BROOKPIT LANE, BN17 5QU	500452	101796
AA01-S (a)	3 KENTS COTTAGES, BROOKPIT LANE, BN17 5QU	500695	101833
AA01-W	5, CROPTHORNE DRIVE, BN17 5GG	500117	102153
AA01-S (b)	BARN END, BROOKPIT LANE, BN17 5QT	500839	101954

NSR Reference	Receptor Address / Location Description	British Grid Reference	
		X	Y
AA04-N	CHURCH FARM HOUSE, CHURCH LANE, BN17 7QJ	502307	104636
AA04-S	17, PENARTH GARDENS, THORNLEA PARK, BN17 7QA	502409	104456
AA04-NE	LULLYNG COTTAGE, LYMINSTER ROAD, BN17 7QE	502495	104626
AA05-N	OLD VICARAGE COTTAGE, LYMINSTER ROAD, BN17 7QF	502872	104753
AA05-W	PINDARS, LYMINSTER ROAD, BN17 7QF	502828	104630
AA09-S	THE BUNGALOW, MICHELGROVE, BN13 3XQ	508245	108481
AA09-W (a)	MICHELGROVE BARN, MICHELGROVE, BN13 3XQ	508262	109073
AA09-W-(Brewery)	THE HAYLOFT, BN13 3XW	507356	109653
AA10-S	2 TOLMARE FARM COTTAGE, LONG FURLONG, BN14 0RJ	510838	108884
AA11-W (a)	SANDGATE COTTAGE, BARNS FARM LANE, RH20 4AH	510697	113230
AA11-W (b)	CHANCTONBURY LODGE, WASHINGTON ROAD, RH20 4AF	510749	113683
AA11-E (a)	NETHERDOWN, STORRINGTON ROAD, RH20 4AG	510961	113599
AA11-E (b)	NETHERDOWN, STORRINGTON ROAD, RH20 4AG	510961	113599
AA11-N (a)	WEST CLAYTON FARM, STORRINGTON ROAD, RH20 4AG	510995	113644

NSR Reference	Receptor Address / Location Description	British Grid Reference	
		X	Y
AA11-N (b)	2, JOHN IRELAND WAY, RH20 4EP	510895	113699
AA12-E	WARREN HILL LODGE, STORRINGTON ROAD, RH20 4AQ	511780	113486
AA12-W	ROWDELL LODGE, STORRINGTON ROAD, RH20 4AG	511333	113520
AA12-N	BRADBURY COURT, EAST CLAYTON FARM, STORRINGTON ROAD, RH20 4AG	511437	113585
AA14-W	OLD SCHOOL HOUSE, STEYNING ROAD, BN44 3DD	515009	113762
AA14-S	PAYGATE LODGE, STEYNING ROAD, BN44 3DD	515273	113484
AA14-W	THE FORSTAL, STEYNING ROAD, BN44 3DD	515322	113549
AA16-E	1, LILIAN TERRACE, BN18 9QF	505367	105696
AA18-W (Hospice)	DOVER LANE, BN18 9PX	505966	105833
AA18-S	THE DECOY, DECOY LANE, ARUNDEL ROAD, BN18 9QA	505857	105393
AA18-N	1 ANGMERING PARK COTTAGES, ANGMERING PARK, BN16 4EX	506194	105787
AA21-N	306 MICHELGROVE COTTAGES, MICHELGROVE, BN13 3XQ	508182	108358

NSR Reference	Receptor Address / Location Description	British Grid Reference	
		X	Y
AA22-S	THE BUNGALOW, MICHELGROVE, BN13 3XQ	508245	108481
AA22-W	MICHELGROVE BARN, MICHELGROVE, BN13 3XQ	508262	109073
AA24-E	BLACK PATCH COTTAGE, LONG FURLONG FARM, LONG FURLONG LANE, BN13 3YN	509385	108532
AA24-W	GREEN PASTURES, MYRTLE GROVE, BN13 3XL	509199	108348
AA25-S	2 TOLMARE FARM COTTAGE, LONG FURLONG, BN14 0RJ	510838	108884
AA29-S	KEEPERS COTTAGE, ANGMERING PARK, BN16 4EX	506407	108121
AA30-S	1 ANGMERING PARK COTTAGES, ANGMERING PARK, BN16 4EX	506194	105787
AA30-W	SOUTHVIEW, HAMMERPOT, BN16 4EU	506634	105751
AA30-E	COLT BUNGALOW, ANGMERING PARK, BN16 4EX	506247	106014
AA30-N	KEEPERS COTTAGE, ANGMERING PARK, BN16 4EX	506407	108121
AA31-W	HIGHLAND COTTAGE, ANGMERING PARK, BN16 4EX	506738	108930
AA31-E	HIGHLAND COTTAGE, ANGMERING PARK, BN16 4EX	506738	108930
AA31-N	LEE FARM HOUSE, BN13 3XJ	507369	110399

NSR Reference	Receptor Address / Location Description	British Grid Reference	
		X	Y
AA31-N (b)	2 LEE FARM COTTAGES, BN13 3XJ	507637	110422
AA32-N (a)	LEE FARM HOUSE, BN13 3XJ	507369	110399
AA32-N (b)	2 LEE FARM COTTAGES, BN13 3XJ	507637	110422
AA32-W	HIGHLAND COTTAGE, ANGMERING PARK, BN16 4EX	506738	108930
AA32-E	HIGHLAND COTTAGE, ANGMERING PARK, BN16 4EX	506738	108930
AA33-E	185, SWILLAGE LANE, BN13 3TX	507167	106117
AA33-W	NORFOLK HOUSE, SWILLAGE LANE, BN13 3TX	507167	106317
Compound 1 - S	BARN END, BROOKPIT LANE, BN17 5QT	500839	101954
Compound 1 - E	4, CLIMPING PARK, BOGNOR ROAD, BN17 5DW	500916	102127
Compound 1 - N	FIELD PLACE, CHURCH LANE, BN17 5RR	500394	102246
Compound 1 - W	5, CROPTHORNE DRIVE, BN17 5GG	500117	102153

NSR Reference	Receptor Address / Location Description	British Grid Reference	
		X	Y
Compound 1 - W (Village Hall)	CROOKTHORN LANE, BN17 5SN	500569	102019
Compound 2 - SW	3 SETTATREES, LONDON ROAD, RH20 4AL	512231	113044
Compound 2 - S	TILLEYS COTTAGE, THE PIKE, RH20 4AA	512343	112918
Compound 2 - E	GREEN FARMHOUSE, THE PIKE, RH20 4AA	512828	113310
Compound 2 - NW	WASHINGTON PADDOCKS, LONDON ROAD, RH20 4AJ	512300	113326
Compound 2 - N (Caravan Park)	WASHINGTON PADDOCKS, LONDON ROAD, RH20 4AJ	512300	113326
~~**Compound 3 - E**~~	~~LOWER CHANCTON FARM, STEYNING ROAD, BN44 3DD~~	~~513542~~	~~113288~~
~~**Compound 3 - S**~~	~~1 POPLARS COTTAGE, THE PIKE, RH20 4AA~~	~~513014~~	~~112978~~

NSR Reference	Receptor Address / Location Description	British Grid Reference	
		X	Y
~~Compound 3 - W~~	~~ANNEXE, GREEN FARM BARN, THE PIKE, RH20 4AA~~	~~512897~~	~~113349~~
Compound 3 - NW	ALLFREY HOUSE, BOLNEY ROAD, HORSHAM, RH13 8AZ	522073	122557
Compound 3 - N	COOPERS COTTAGE, BOLNEY ROAD, HORSHAM, RH13 8AZ	522337	122573
Compound 3 - NE	1 OAKENDENE FARM COTTAGES, BOLNEY ROAD, HORSHAM, RH13 8AZ	522432	122551
Compound 3 - S	BANKFIELD GRANGE, KINGS LANE, HORSHAM, RH13 8BD	522506	122023
Compound 4 - E	SOUTHLANDS, KENT STREET, RH13 8BA	523197	122655
Compound 4 - N	BARNFIELD LODGE, PICTS LANE, RH13 8AT	523335	123066
Compound 4 - NW	APPLECROSS, BOLNEY ROAD, RH13 8AZ	522877	122997
Compound 4 - W	OAKENDENE MANOR, BOLNEY ROAD, RH13 8AZ	522766	122607

NSR Reference	Receptor Address / Location Description	British Grid Reference	
		X	Y
SS1-NE	SOUTHLANDS, KENT STREET, RH13 8BA	523197	122655
~~**Substation N**~~	~~APPLECROSS, BOLNEY ROAD, RH13 8AZ~~	~~522877~~	~~122997~~
~~**Substation S**~~**SS2-SE**	WESTRIDGE, KENT STREET, RH13 8BB	523226	121884
~~**Substation SW**~~**SS3-SW**	BANKFIELD GRANGE, KINGS LANE, HORSHAM, RH13 8BD~~TAINTFIELD FARMHOUSE, KINGS LANE, RH13 8BD~~	522506~~522639~~	122023~~121855~~
~~**Substation W**~~**SS4-NW**	OAKENDENE MANOR, BOLNEY ROAD, RH13 8AZ	522766	122607
~~**Oakendene Industrial Estate N**~~	~~OAKENDENE INDUSTRIAL ESTATE NORTH, RH13 8AZ~~	~~522629~~	~~122499~~
~~**Oakendene Industrial Estate S**~~	~~OAKENDENE INDUSTRIAL ESTATE SOUTH, RH13 8AZ~~	~~522604~~	~~122338~~

Table 4-2 NSRs operational (substation)

NSR Reference	Location description	British Grid Reference	
		X	Y
SS1-NE	SOUTHLANDS, KENT STREET, RH13 8BA	523192	122665
SS2-SE	WESTRIDGE, KENT STREET, RH13 8BB	523178	121957
SS3-SW	TAINTFIELD FARMHOUSE, KINGS LANE, RH13 8BD	522530	121990
SS4-NW	OAKENDENE MANOR, BOLNEY ROAD, RH13 8AZ	522770	122614

4.2 Details of monitoring undertaken

Data collection methods

4.2.1 Sound monitoring was undertaken to determine the existing acoustic environment. Surveys were undertaken at receptor locations most likely to be affected by construction activity and operational activity.

4.2.2 Noise monitoring equipment was set to measure for intervals of 15 minutes in accordance with BS 4142:2014 + A1:2019 (BSI, 2019), which states:

> *"8.1.3 Ensure that the measurement time interval is sufficient to obtain a representative value of the background sound level for the period of interest. This should comprise continuous measurements of normally not less than 15 min intervals, which can be continuous or disaggregated."*

4.2.3 All sound level measurements were undertaken in accordance with BS 4142:2014+A1:2019 (BSI, 2019) and BS 7445-1:2003 (BSI, 2003), i.e. with microphones mounted to a height of 1.2 to 1.5m above ground level and no less than 3.5m from any reflecting surface other than the ground.

4.2.4 At each location sound levels were measured using integrating averaging sound level meters (SLMs) conforming to Class 1 as defined by BS EN 61672-1:2013 (BSI, 2013). The SLMs were field calibrated before and at the end of each survey period by applying an acoustic calibrator, conforming to BS EN 60942:2018 (BSI, 2018), to the microphone to check the sensitivity of the measuring equipment. Any drift in calibration levels was noted at the end of the survey period. No significant deviation was found at any location.

4.2.5 All SLMs used during the monitoring had undergone laboratory calibration within a period not exceeding two years prior to use. All acoustic calibrators used had undergone laboratory calibration within a period not exceeding one year prior to

use. See **Annex A** for a summary of laboratory calibrations and calibration certificates.

4.2.6 Meteorological measurement equipment was deployed to monitor local wind speeds and direction, precipitation, air temperature and relative humidity during the surveys. The logged meteorological data have been used in the analysis of the sound level data to ensure that only data collected during appropriate weather conditions has been used when determining representative sound levels to be used in the assessment.

4.3 Data collection locations

Construction Phase

4.3.1 Partially attended sound monitoring equipment was installed at locations representative of the nearest NSRs to:

- trenchless crossing compounds; and
- temporary construction compounds.

4.3.2 The sound monitoring equipment measured sound levels for approximately 24-hours.

4.3.3 1-hr attended sound monitoring was undertaken at proposed heavy construction access locations where existing road traffic flows were unlikely to be suitable to calculate baseline noise levels to inform the construction traffic assessment.

4.3.4 All measurements were undertaken during local schools' term-time.

4.3.5 The 24-hour monitoring equipment was unattended for the majority of the survey period. Observations of the sound environment were made during equipment deployment and collection to contextualise the monitoring location.

4.3.6 Sound monitoring was proposed to be undertaken at 31~~25~~ locations. To date, sound monitoring has been completed at 25~~18~~ locations between 27 - 29 March 2023~~and~~, 3 – 4 May~~,~~ and 15 – 17 November 2023. Monitoring has not been undertaken at all 31~~25~~ proposed locations due to land access restrictions.

4.3.7 Where baseline data is not available to inform the assessment, the approach has subsequently defaulted to using Category A significance thresholds based on Table E.1 from BS-5228-1 (BSI, 2014a). This is the most conservative assessment category as it assumes the lowest existing ambient noise levels at the assessment location in accordance with the assessment methodology. In addition, further detail on the assessment approach is provided in the **ES Chapter 21: Noise and vibration, Volume 2** of the ES (Document Reference: 6.2.21). Furthermore, all additional data obtained after DCO Application submission (i.e. surveys undertaken between 15 – 17 November 2023, has been incorporated into the **ES Chapter 21: Noise and vibration, Volume 2** of the ES (Document Reference: 6.2.21) which has been updated at the Procedural Deadline A submission.

4.3.8 The monitoring comprised 24-hour partially attended measurements to determine ambient and background noise levels at receptors in proximity to trenchless crossing compounds and temporary construction compounds.

4.3.9 Attended 1-hour measurements have been undertaken to characterise road traffic noise levels at construction access locations where existing traffic data is unlikely to be sufficient to calculate the corresponding road traffic noise,

4.3.10 Partially attended 24-hour monitoring locations are presented in **Table 4-3.**

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Table 4-3 24-hour monitoring locations

Monitoring Location ID	Location description	British Grid		Monitoring period/ Comment	Representative of NSR(s)
		X	Y		
HDD-01-NML1	The Sound Level Meter (SLM) was deployed along the eastern boundary of a hedge bounding garden. The SLM was located approximately 2.5m above ground in a free-field position, approximately 30m from the closest acoustically reflective façade.	500903	101643	27/03/2023 - 28/03/2023	HDD01-N, HDD01-S, HDD01A-S
HDD-02-NML2	The SLM was deployed along the north of a fence/bund bounding garden. The SLM was located approximately 2.5m above ground in a free-field position, approximately 30m from the closest acoustically reflective façade.	501533	101302	27/03/2023 - 28/03/2023	HDD02-S
HDD-03-NML3	No access to monitoring location.	501529	103384	N/A	HDD03-S, HDD03-E, HDD03-S Industrial, HDD03-NE
HDD-07-NML5	The SLM was deployed along the northern boundary of an agricultural field directly to the west of Lyminster Road, and to the north of Brookside Caravan Park. The SLM was located approximately 1.5m above ground in a free-field position.~~No access to monitoring location.~~	502583	104621	16/11/2023 - 17/11/2023 ~~N/A~~	HDD057~~7~~-N, HDD057~~7~~-SW, HDD057~~7~~-S, HDD057~~7~~-E, HDD068~~8~~-W, HDD068~~8~~-S, HDD068~~8~~-N

Monitoring Location ID	Location description	British Grid X	British Grid Y	Monitoring period/ Comment	Representative of NSR(s)
HDD-18-NML14	The SLM was deployed west of the Memorial Hall, at the southeastern corner of a recreational field directly to the north of St Marys C of E Primary School. The SLM was located approximately 1.5m above ground in a free-field position, approximately 13m from the closest acoustically reflective façade.~~No access to monitoring location.~~	512215	113056	16/11/2023 - 17/11/2023~~N/A~~	HDD16and17-S, HDD16and17-N~~HDD18and19-SW~~, Compound 2 – SW, Compound 2 – S
HDD-19-NML15	No access to monitoring location.	512579	112943	N/A	~~HDD18and19-S,~~ HDD1~~8~~6and1~~9~~7-E, ~~HDD18&19-N~~
HDD-20-NML16	No access to monitoring location.	514213	113464	N/A	HDD18~~20~~-E~~, HDD20-N~~
HDD-21-NML17	No access to monitoring location.	514560	113648	N/A	HDD19~~21~~-N (Church), ~~HDD21-N,~~ HDD19~~21~~-N, HDD19~~21~~-S, HDD19~~21~~-E, HDD19~~21~~-SW
HDD-22-NML18	The SLM was deployed on a fence post to the south of the nearby property. The SLM was located approximately 2.5m above ground in a free-field position, approximately 30m from the closest acoustically reflective façade.	516961	114872	28/03/2023 - 29/03/2023	HDD20~~2~~-N, HDD20~~2~~-W
HDD-23-NML19	The SLM was deployed approximately 20m east of the B2135. The SLM was located	517967	115606	28/03/2023 - 29/03/2023	HDD21~~3~~-E, HDD21~~3~~-N, HDD21~~3~~-S

Monitoring Location ID	Location description	British Grid X	British Grid Y	Monitoring period/ Comment	Representative of NSR(s)
	approximately 1.5m above ground in a free-field position, approximately 1m from the closest acoustically reflective façade.				
HDD-24-NML20	The SLM was deployed in the southeast corner of the field. The SLM was located approximately 1.5m above ground in a free-field position.	518752	116794	28/03/2023 - 29/03/2023	HDD224-N, HDD224-S, HDD224-W
HDD-25-NML21	The SLM was deployed in the northwest corner of the field. The SLM was located approximately 1.5m above ground in a free-field position.	518725	117193	28/03/2023 - 29/03/2023	HDD235-S, HDD235-W, HDD235-NW
HDD-26-NML22	The SLM was deployed in the tree line to the west of the A281. The SLM was located approximately 1.5m above ground in a free-field position.	520940	120032	27/03/2023 - 28/03/2023	HDD246-S, HDD246-E, HDD246-W, HDD246-N
HDD-27-NML23	The SLM was deployed in the field to the north of the nearby property. The SLM was located approximately 2.5m above ground in a free-field position, about 1.5m away from the closest acoustically reflective façade.	521503	120246	28/03/2023 - 29/03/2023	~~HDD27-N,~~ HDD275-S
HDD-28-NML24	No access to monitoring location.	521841	121061	N/A	HDD25-N, HDD268-W, HDD268-E, HDD286-N
HDD-31-NML25	The SLM was deployed on the southern boundary of the nursing home. The SLM was located approximately 1.5m above ground in a	523896	121808	27/03/2023 - 28/03/2023	~~HDD29-W, HDD29-S, HDD30-N, HDD30-NW,~~

Monitoring Location ID	Location description	British Grid X	British Grid Y	Monitoring period/ Comment	Representative of NSR(s)
	free-field position, approximately 50m from the closest acoustically reflective façade.				HDD2931-N, HDD2931-W, HDD2931-E, HDD2931-S
HDD-32-NML26	The SLM was deployed on a fencepost adjacent to the A27. The SLM was located approximately 1.5m above ground in a free-field position, approximately 50m from the closest acoustically reflective façade.	505422	105641	03/05/2023 - 04/05/2023	HDD0832-S, HDD3208-N (Hospice), HDD0832-W
HDD-33-NML27	No access to monitoring location.	505865	105425	N/A	HDD09-33 E, HDD09-33-S, HDD09-33-N
HDD-34-NML28	The SLM was deployed on a fencepost to the north east of the closest property. The SLM was located approximately 2.5m above ground in a free-field position, approximately 6m from the closest acoustically reflective façade.	506227	105856	28/03/2023 - 29/03/2023	HDD1034-S, HDD1034-E, HDD1034-W, HDD1034-N
HDD-35-NML29	The SLM was deployed on a fencepost to the north west of the closest property. The SLM was located approximately 2.7m above ground in a free-field position, approximately 20m from the closest acoustically reflective façade.	506686	105839	27/03/2023 - 28/03/2023	HDD1135-E, HDD1135-S
HDD-38 - NML30*	~~The SLM was deployed on a.~~ The SLM was located approximately 1.5m above ground in a free-field position.	501529	103384	27/03/2023 - 28/03/2023	Initially used to represent HDD12-E, HDD12-SE but daytime superseded by TC-12-NML41

Monitoring Location ID	Location description	British Grid X	British Grid Y	Monitoring period/ Comment	Representative of NSR(s)
TC-07-NML40	No access to monitoring location.	504598	105496	N/A	HDD07-N, HDD07-N
TC-12-NML41	The SLM was deployed adjacent to a grassed area approximately 50m west of Michelgrove Lane, 90m south of Michelgrove House, and 11m southwest of Michelgrove Cottages. The SLM was located approximately 1.5m above ground in a free-field position, approximately 11m from the closest acoustically reflective façade.	508174~~5~~ 09553	108438~~1~~ 08601	16/11/2023 14:00 - 16/11/2023 16:30	HDD12-E, HDD12-SE
CC-1-NML31	The SLM was deployed on the northern boundary of an agricultural field directly to the east of Church Lane, and to the north of Climping Village Hall and playing fields. The SLM was located approximately 1.5m above ground in a free-field position. ~~No access to monitoring location.~~	500414~~5~~ 00414	102216~~1~~ 02216	16/11/2023 17/11/2023 ~~N/A~~	Compound 1 – S, Compound 1 – E, Compound 1 – N, Compound 1 – W, Compound 1 - W (Village Hall), Climping C of E Primary School
CC-3-NML32	The SLM was deployed in the southeast corner of Washington Caravan and Camping Park adjacent to the southern boundary hedgerow. The SLM was located approximately 1.5m above ground in a free-field position. ~~No access to monitoring location~~	512308~~5~~ 12308	113335~~1~~ 13335	15/11/2023 16/11/2023 ~~N/A~~	~~Compound 2 – SW, Compound 2 – S,~~ Compound 2 – E, Compound 2 – NW, Compound 2 - N (Caravan Park)

Monitoring Location ID	Location description	British Grid		Monitoring period/ Comment	Representative of NSR(s)
		X	Y		
CC-4-NML33**	No access to monitoring location	512909	113352	N/A	N/A
CC-~~5~~4-NML3~~4~~3	The SLM was deployed at the northern boundary of the recreational field directly to the west of Oakendene Industrial Estate, and approximately 45m south of the A272. The SLM was located approximately 1.5m above ground in a free-field position. ~~No access to monitoring location~~	5224505 ~~12909~~	1225581 ~~13352~~	15/11/2023 16/11/2023 ~~N/A~~	Compound 3 – ~~E~~N, ~~Compound 3 – S,~~ Compound 3 – NW, Compound ~~4~~3 - NE
OP-NML1***	The SLM was located approximately 10m west of Kent Street and 80m south of the A272. The SLM was deployed at a height of 1.5m above ground in a free-field position.	523149	122672	13/02/2023 - 20/02/2023	Compound 4 - E
OP-NML3***	The SLM was located approximately 200m south of the Oakendene Industrial Estate and was deployed at a height of 1.5m above ground in a free-field position.	522572	122055	13/02/2023 - 20/02/2023	Compound 3 – S
OP-NML4**	The SLM was located approximately 200m south of the A272 and 160m east of the Oakendene Industrial Estate and was deployed at a height of 1.5m above ground in a free-field position.	522798	122562	06/02/2023 - 13/02/2023	Compound 4 – W, Compound 4 – NW, Compound 4 - N

*** This survey location has been superseded during the daytime, by Position TC-12-NML41, which is more representative of the assessment receptors.**

Monitoring Location ID	Location description	British Grid X	British Grid Y	Monitoring period/ Comment	Representative of NSR(s)
**This monitoring location was initially proposed to be representative of the NSRs to the eastern Washington Construction Compound. However, this compound is not part of the Proposed Development and the associated receptors are not part of the assessment. ***Operational monitoring locations associated with the onshore substation operational surveys have been used as representative monitoring locations for receptors associated with the Oakendene Substation Compound, and Oakendene West Compound.					
~~CC-5-NML34~~	~~No access to monitoring location~~	~~522450~~	~~122558~~	~~N/A~~	~~Compound 4 – N, Compound 4 – NW, Compound 4 - W~~

Table 4-4 1-hour monitoring locations

Monitoring Location ID	Location description	British Grid		Monitoring period/ Comment
		X	Y	
CA-2-NML36	The SLM was located approximately 1.6m above ground in a free-field position.	500903	101643	27/03/2023 - 28/03/2023
CA-3 NML37	No access to monitoring location	501533	101302	27/03/2023 - 28/03/2023
CA-4 NML38	The SLM was located approximately 1.5m above ground in a free-field position.	501529	103384	27/03/2023 - 28/03/2023
CA-5-NML39	The SLM was located approximately 1.5m above ground in a free-field position.	502583	104621	27/03/2023 - 28/03/2023
CA-6 NML40	The SLM was located approximately 1.5m above ground in a free-field position.	512215	113056	27/03/2023 - 28/03/2023
CA-7-NML41	The SLM was located approximately 1.5m above ground in a free-field position.	512579	112943	27/03/2023 - 28/03/2023
CA-8-NML42	The SLM was located approximately 1.5m above ground in a free-field position.	514213	113464	27/03/2023 - 28/03/2023

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Meteorological conditions

4.3.11 A data logging meteorological station was deployed at NML30 (3 March 2023 to 4 March 2023) during the survey period. The meteorological station logged concurrently with the sound level surveys to allow adverse weather conditions (i.e. wind speeds in excess of 5ms^{-1} or rainfall) to be identified and corresponding sound levels excluded from the data analysis.

4.3.12 Specific details about the location of the monitoring equipment and observations made during deployment and collection of the long-term measurements are detailed in **Annex B**.

4.3.13 **Table 4-5** presents the total time monitored at each 24-hour location alongside the total time excluded from the data analysis.

Table 4-5 Time monitored at each 24-hr monitoring location

Monitoring Location ID	Total no. 15-minute samples	Total duration of dataset (HH:MM)	No. samples excluded due to adverse weather	Duration of dataset, with exclusions (HH:MM)
HDD-01-NML1	88	22:00	2	21:30
HDD-02-NML2	88	22:00	2	21:30
HDD-07-NML5	80	20:00	2	19:30
HDD-18-NML14	80	20:00	7	18:15
HDD-22-NML18	76	19:00	1	18:45
HDD-23-NML19	92	23:00	4	22:00
HDD-24-NML20	86	21:30	3	20:45
HDD-25-NML21	86	21:30	2	21:00
HDD-26-NML22	89	22:15	2	21:45
HDD-27-NML23	68	17:00	2	16:30
HDD-31-NML25	93	23:15	2	22:45
HDD-32-NML26	87	21:45	3	21:00
HDD-34-NML28	86	21:30	3	20:45
HDD-35-NML29	88	22:00	1	21:45

Monitoring Location ID	Total no. 15-minute samples	Total duration of dataset (HH:MM)	No. samples excluded due to adverse weather	Duration of dataset, with exclusions (HH:MM)
HDD-38-NML30*	91	22:45	3	22:00
TC-12-NML41**	11	02:45	0	02:45
CC-1-NML31	80	20:00	2	20:00
CC-3-NML32	80	20:00	10	19:30
CC-5-NML34	8091	20:00	83	18:00

* This survey location has been superseded, during the daytime, by Position TC-12-NML41 which is more representative of the assessment receptors

**This survey location was constrained due to shooting activity. Consequently, only a small window of survey opportunity was available. Therefore, evening and night-time sound data was not obtained.

Operation and maintenance phase

4.3.14 Long term monitoring equipment was left to measure sound levels at the closest receptors to the proposed onshore substation at Oakendene.

4.3.15 The long-term monitoring equipment was unattended for the majority of the survey period. Observations of the sound environment were made during equipment deployment and collection to contextualise the monitoring location.

4.3.16 Sound monitoring was undertaken at four locations around the proposed onshore substation at Oakendene location between 6 - 20 February 2023. This consisted of long-term monitoring to determine ambient and background noise levels at receptors in proximity to the proposed onshore substation at Oakendene.

4.3.17 The long-term monitoring locations are presented in **Table 4-6** and **Figure 21.2, Volume 3** of the ES (Document Reference: 6.3.21).

Table 4-6 Long-term monitoring locations (operation)

Monitoring Location ID	Location description	British Grid		Monitoring period	Representative of NSR(s)
		X	Y		
OP-NML1	The SLM was located approximately 10m west of Kent Street and	523149	122672	13/02/2023 - 20/02/2023	SS1-NE

Monitoring Location ID	Location description	British Grid X	British Grid Y	Monitoring period	Representative of NSR(s)
	80m south of the A272. The SLM was deployed at a height of 1.5m above ground in a free-field position.				
OP-NML2	The SLM was located approximately 40m west of Kent Street and was deployed at a height of 1.5m above ground in a free-field position.	523126	122085	13/02/2023 - 20/02/2023	SS2-SE
OP-NML3	The SLM was located approximately 200m south of the Oakendene Industrial Estate and was deployed at a height of 1.5m above ground in a free-field position.	522572	122055	13/02/2023 - 20/02/2023	SS3-SW
OP-NML4	The SLM was located approximately 200m south of the A272 and 160m east of the Oakendene Industrial Estate and was deployed at a height of 1.5m above ground in a free-field position.	522798	122562	06/02/2023 - 13/02/2023	SS4-NW

Meteorological conditions

4.3.18 Meteorological conditions were measured at OP-NML4. Meteorological conditions varied throughout the survey. Monitoring periods where average wind speeds exceeded 5ms^{-1} and / or rainfall occurred have been removed from the analysis to ensure that adverse weather conditions had no influence on the monitoring results.

4.3.19 **Table 4-7** presents the total time monitored at each location alongside the total time excluded from the data analysis.

Table 4-7 Time monitored at each monitoring location (operation)

Monitoring Location ID	Total no. 15-minute samples	Total duration of dataset (HH:MM)	No. samples excluded due to adverse weather	Duration of dataset, with exclusions
OP-NML1	679	7 Days 1 Hours and 45 Minutes	6	7 Days 0 Hours and 15 Minutes
OP-NML2	679	7 Days 1 Hours and 45 Minutes	6	7 Days 0 Hours and 15 Minutes
OP-NML3	677	7 Days 1 Hours and 15 Minutes	4	7 Days 0 Hours and 15 Minutes
OP-NML4	647	6 Days 17 Hours and 45 Minutes	3	6 Days 17 Hours and 0 Minutes

5. Results

5.1 Summary

5.1.1 **Annex B** contains detailed results for each monitoring location, including site photos and monitoring location. For each assessment period, different parameters have been calculated along with the statistics for the number of periods excluded from the analysis due to adverse weather.

5.1.2 The different assessment periods are presented in **Table 5-1**.

Table 5-1 Summary of assessment periods

Assessment Period	Time
Construction daytime	Monday – Sunday: *0700 – 1900*
Construction evenings	Monday – Sunday: *1900 – 2300*
Construction night-time	Monday – Sunday: *2300 – 0700*
Operational daytime	Monday – Sunday: *0700 – 2300*
Operational night-time	Monday – Sunday: *2300 - 0700*

Construction

5.1.3 A summary of the 24-hour logarithmically averaged ambient noise levels is presented in **Table 5-2**.

Table 5-2 Summary of 24-hr ambient noise levels (logarithmic average)

Monitoring Location ID	$L_{Aeq,T}$ (dB)		
	Construction daytime	Construction evening	Construction night-time
HDD-01-NML1	49	41	49
HDD-02-NML2	53	41	51
HDD-07-NML5	50	46	46
HDD-18-NML14	67	49	45
HDD-22-NML18	49	37	37
HDD-23-NML19	56	50	47

Monitoring Location ID	$L_{Aeq,T}$ (dB)		
	Construction daytime	Construction evening	Construction night-time
HDD-24-NML20	53	51	45
HDD-25-NML21	50	46	42
HDD-26-NML22	57	52	52
HDD-27-NML23	47	38	40
HDD-31-NML25	51	49	46
HDD-32-NML26	65	62	59
HDD-34-NML28	65	59	54
HDD-35-NML29	63	58	54
HDD-38-NML30~~TC-12-NML41~~	46*~~57~~	43-*	45-*
TC-12-NML41~~HDD-38-NML30~~	57~~46~~	-**	-**
CC-1-NML31	57	52	51
CC-3-NML32	51	47	43
CC-5-NML34	62	56	53
CA-2-NML36	51	-	-
CA-4-NML38	46	-	-
CA-5-NML39	57	-	-
CA-6-NML40	59	-	-
CA-7-NML41	70	-	-
CA-8-NML42	47	-	-

* This survey location has been superseded during the daytime, by Position TC-12-NML41, which is more representative of the assessment receptors.

**This survey location was constrained due to shooting activity. Consequently, only a small window of survey opportunity was available. Therefore, evening and night-time sound data was not obtained and previously obtained levels from HDD-38 should be used.

Operation and maintenance

5.1.4 A summary of the long-term logarithmically averaged ambient noise levels is presented in **Table 5-3.**

Table 5-3 Summary of long-term ambient noise levels (logarithmic average)

Monitoring Location ID	$L_{Aeq,T}$ (dB)	
	Operational daytime	Operational night-time
OP-NML1	61	55
OP-NML2	47	40
OP-NML3	46	46
OP-NML4	50	46

5.1.5 A summary of the statistical background levels are provided **Table 5-4**. **Graphic 5-1** to **Graphic 5-8** provide graphs illustrating the number of occurrences of each $L_{A90,15min}$ measurement at each operational monitoring location.

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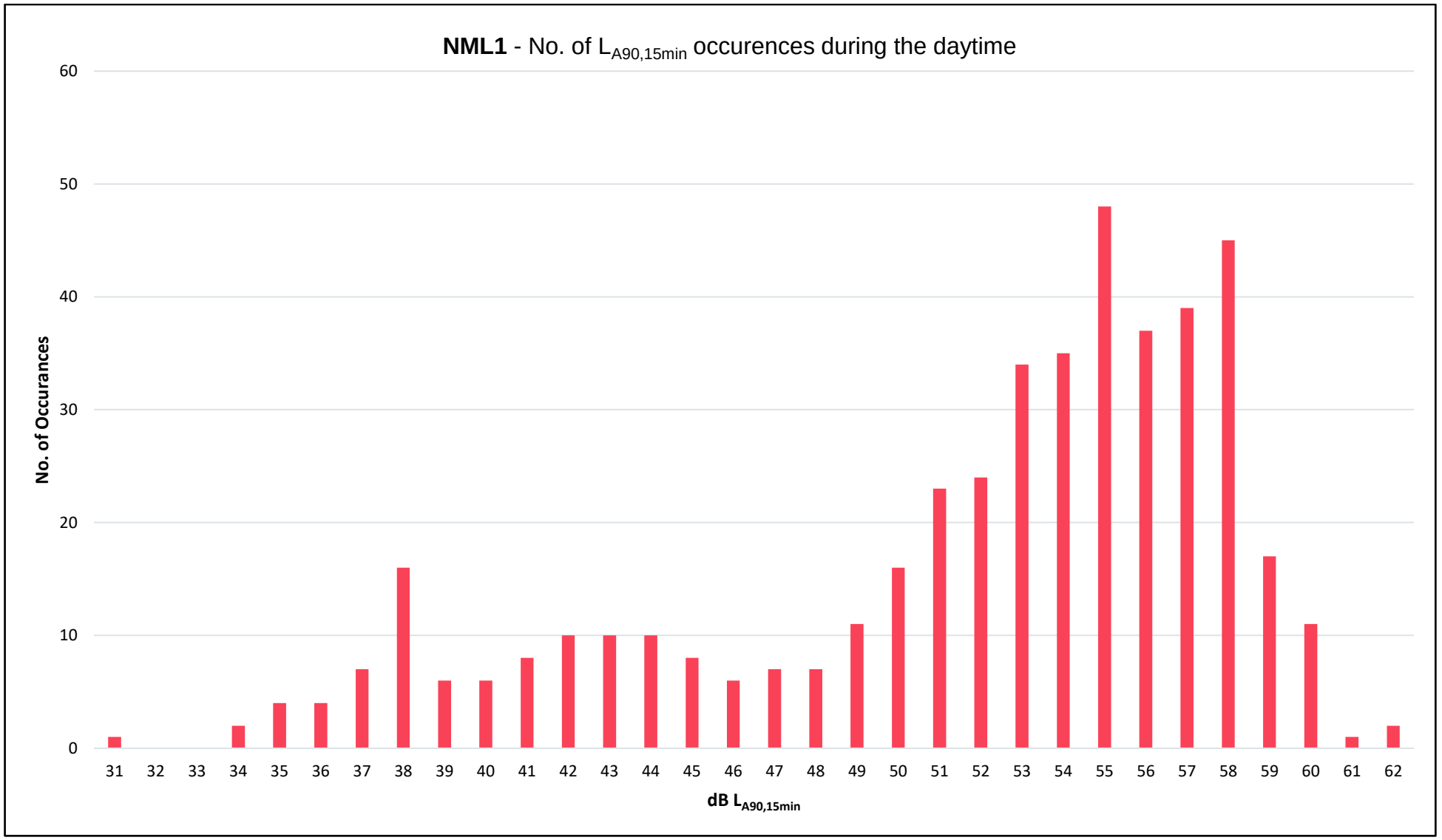
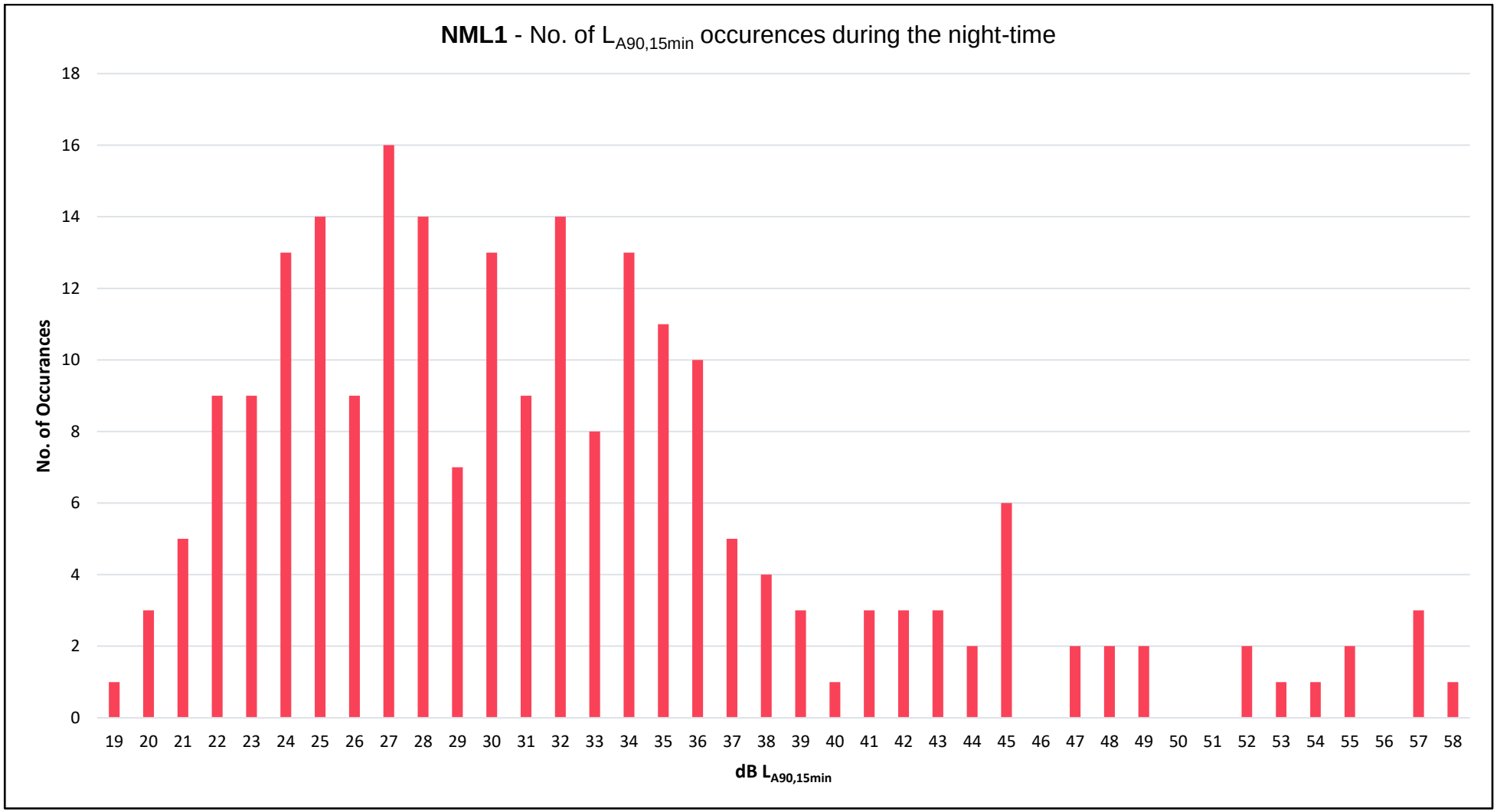
Table 5-4 Summary of statistical background sound levels

	Background Sound Level, $L_{A90,T}$ (dB)							
	Operational Daytime				Operational Night-time			
	OP-NML1	OP-NML2	OP-NML3	OP-NML4	OP-NML1	OP-NML2	OP-NML3	OP-NML4
Min	31	28	31	30	19	20	22	19
25th Percentile	49	34	36	44	26	25	29	26
Median	54	38	40	45	30	28	31	30
75th Percentile	57	40	42	48	35	31	35	36
Max	62	46	48	54	58	44	46	53
Mode	58	39	44	45	24	29	29	28
Arithmetic Mean	52	37	39	45	32	29	32	32

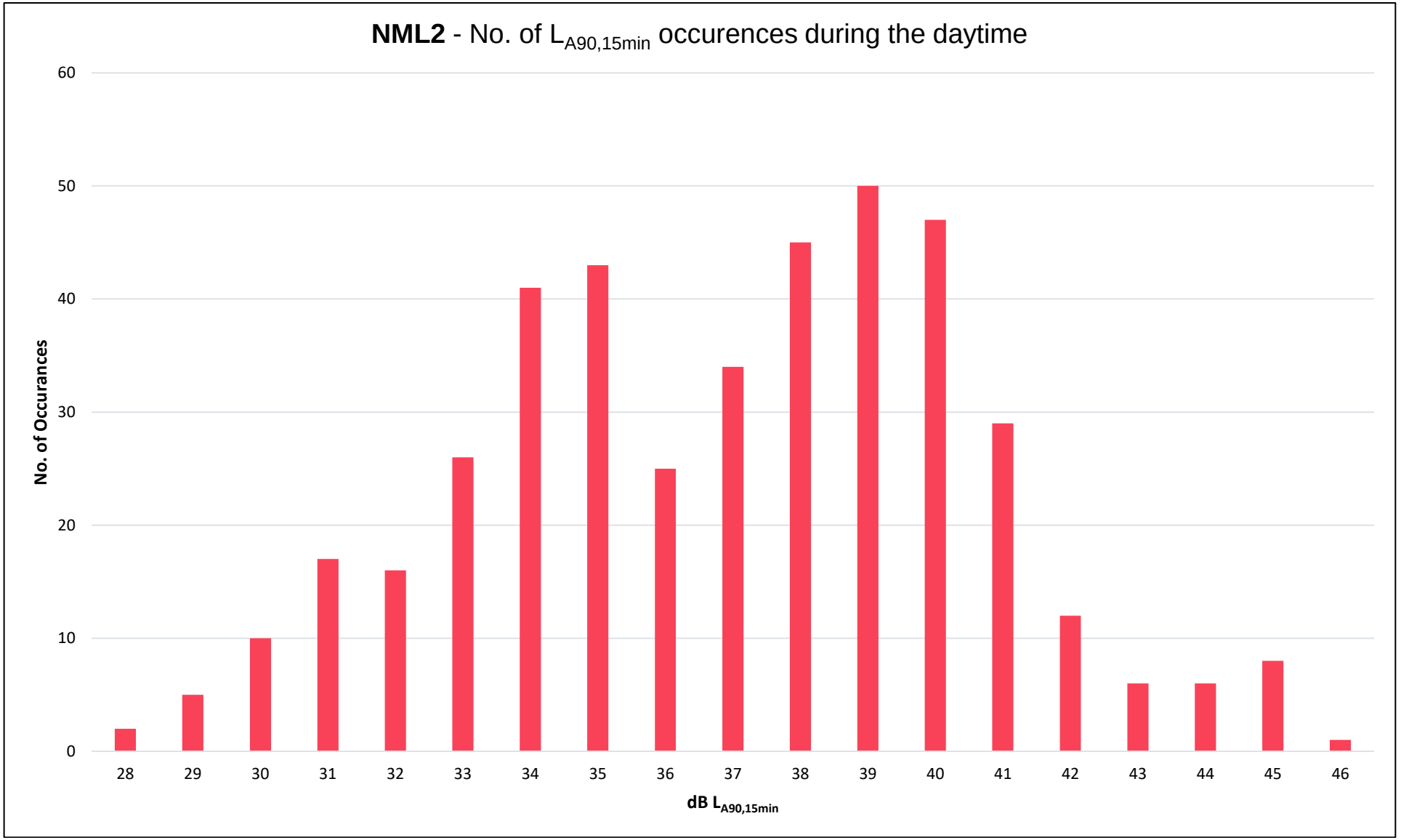
Graphic 5-1 OP-NML1 – Daytime



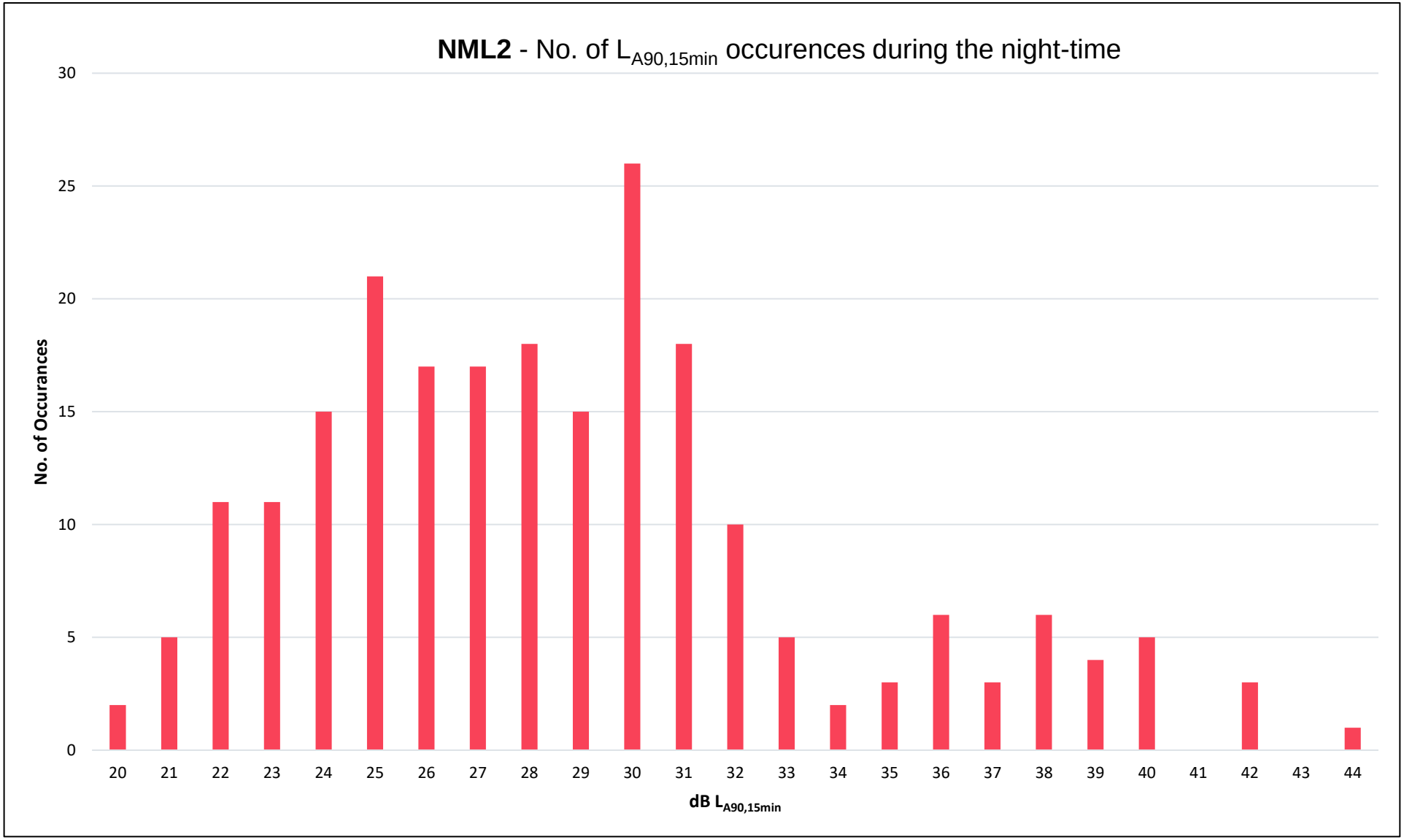
Graphic 5-2 OP-NML1 – Night-time



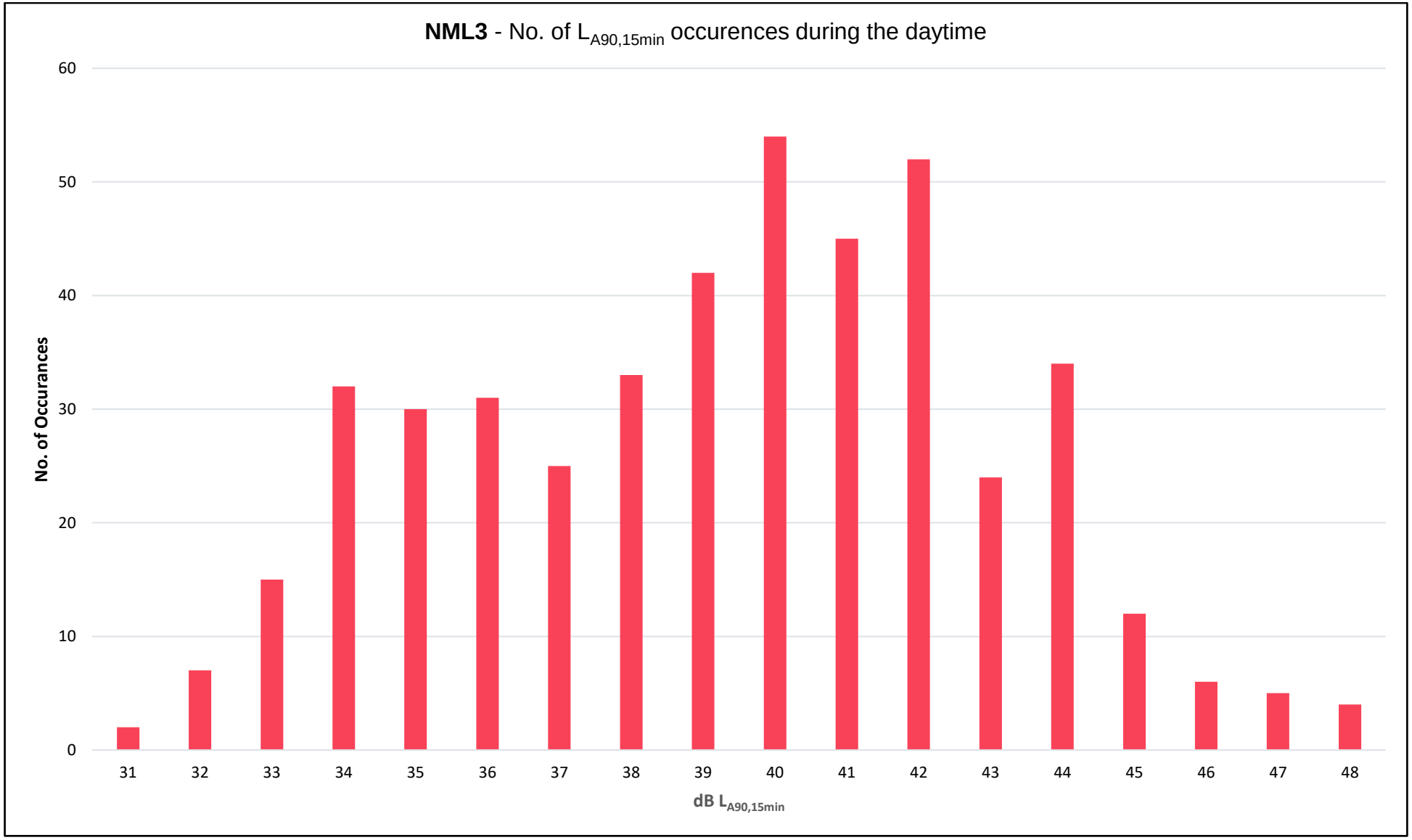
Graphic 5-3 OP-NML2 – Daytime



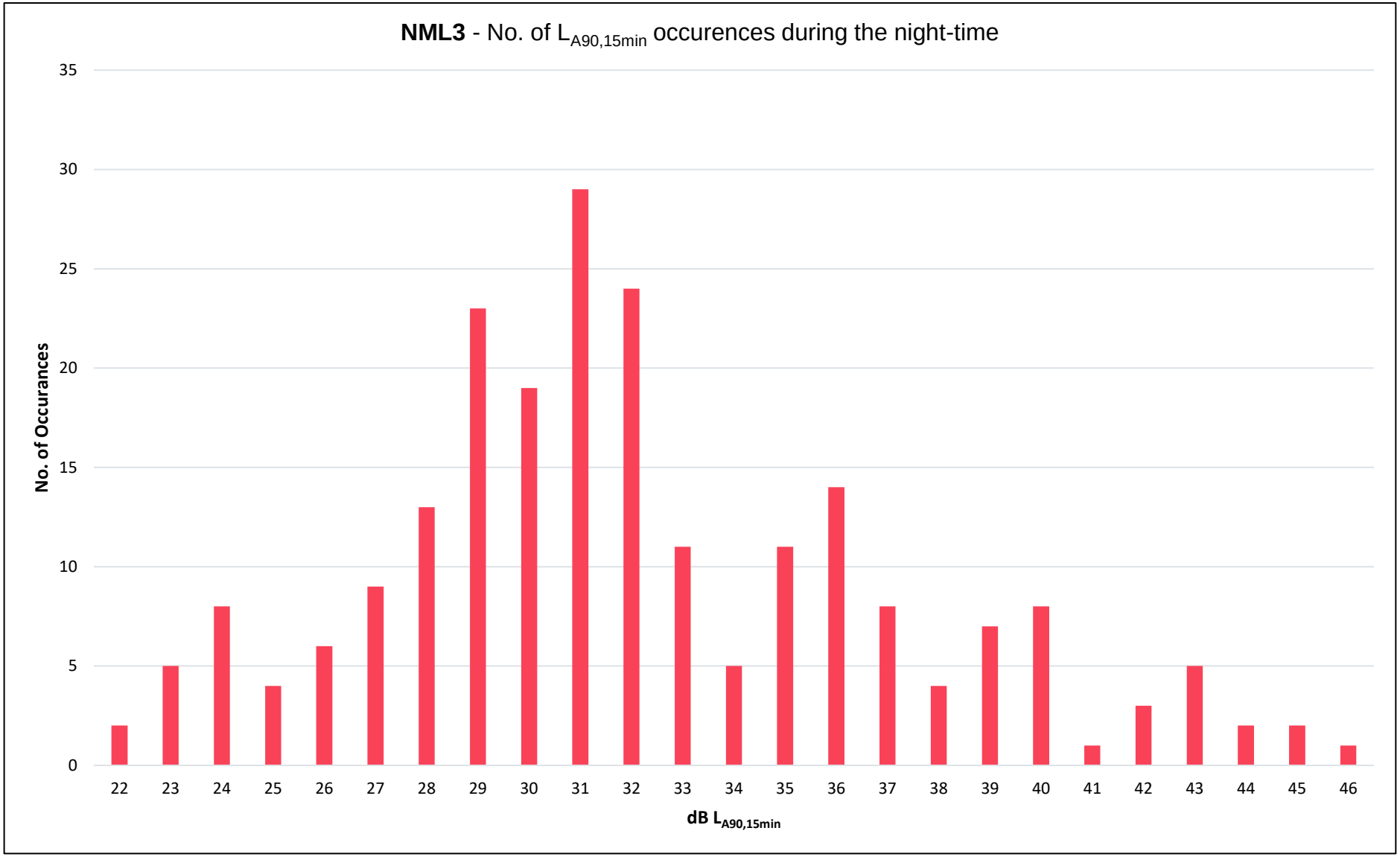
Graphic 5-4 OP-NML2 – Night-time



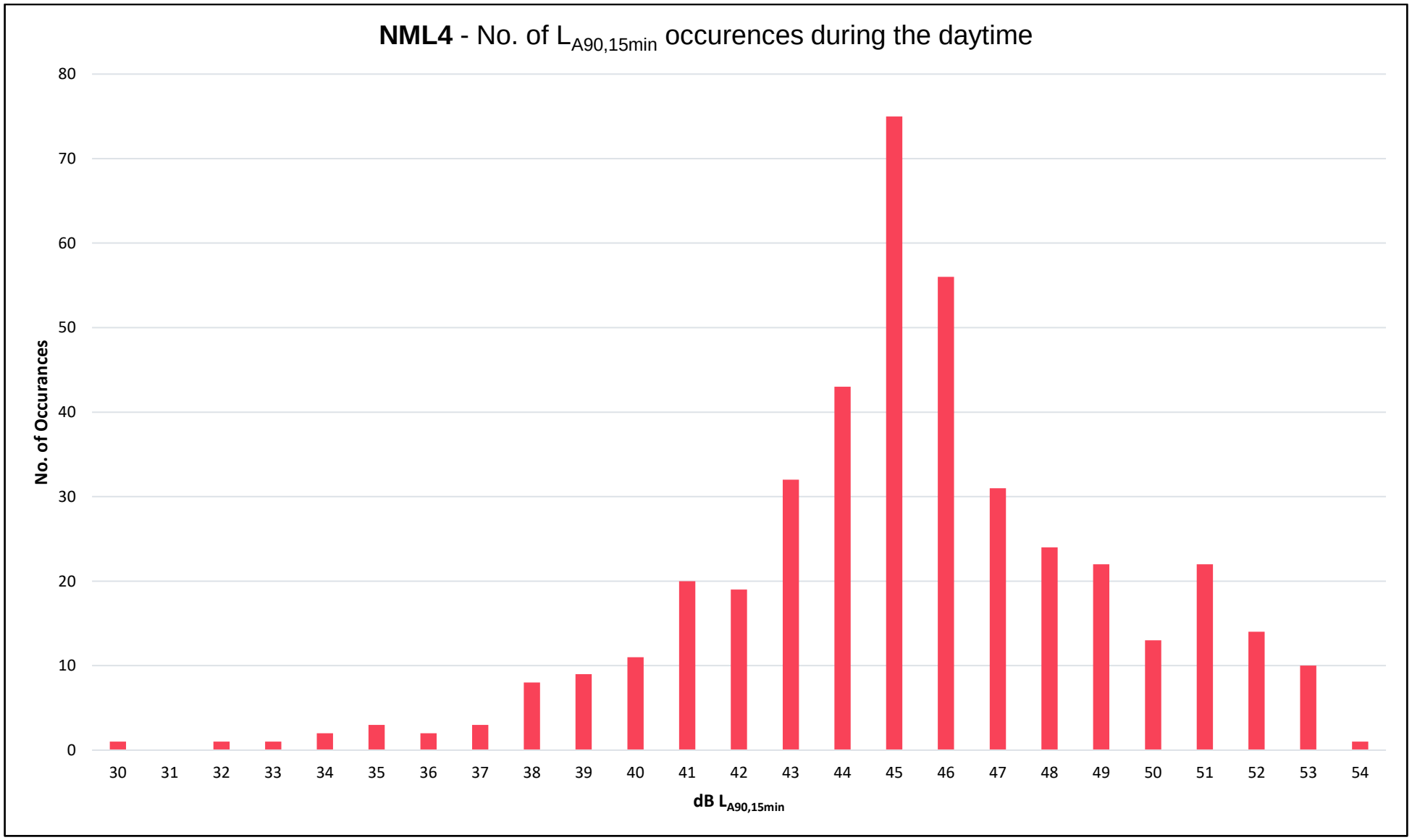
Graphic 5-5 OP-NML3 – Daytime



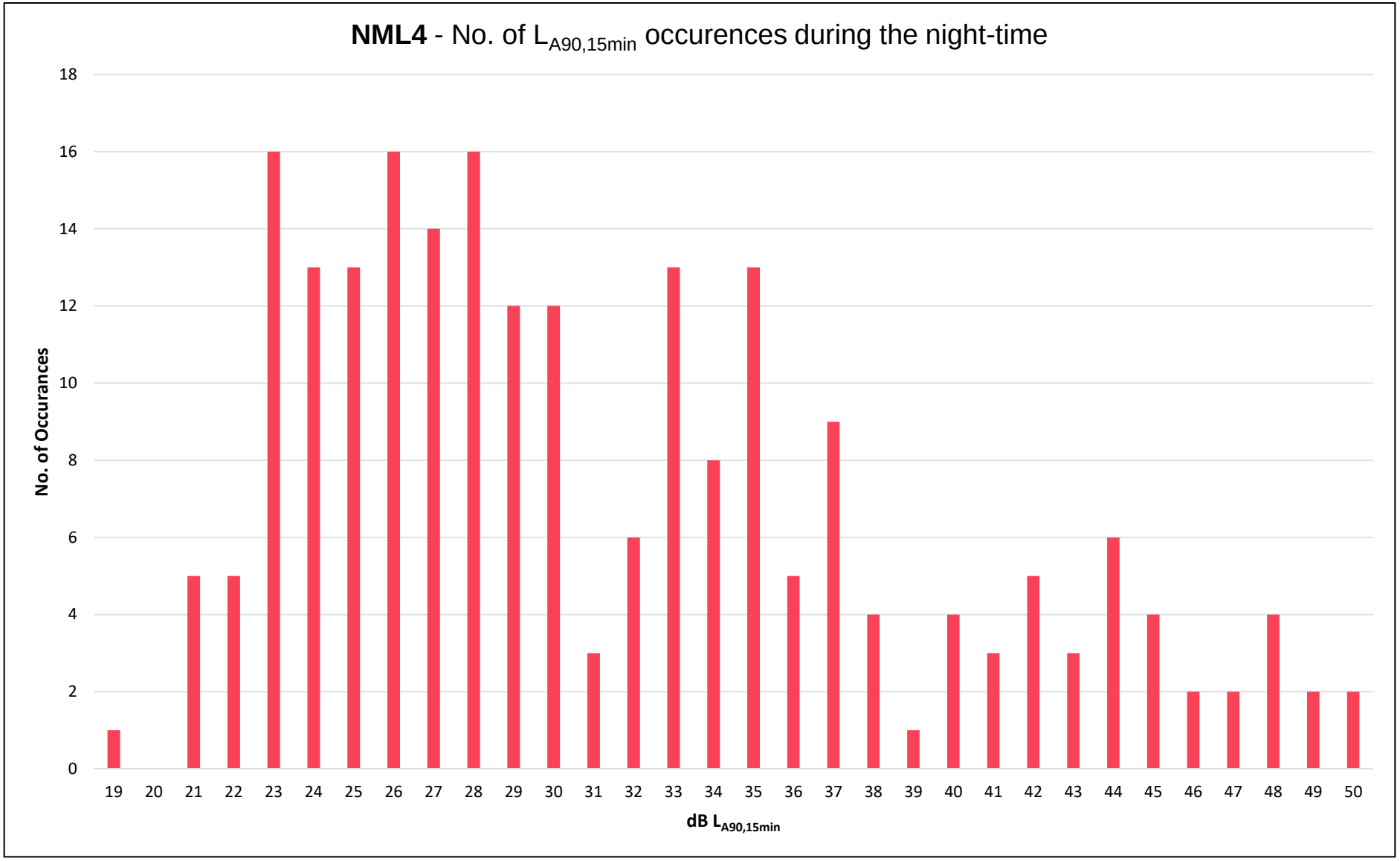
Graphic 5-6 OP-NML3 – Night-time



Graphic 5-7 OP-NML4 – Daytime



Graphic 5-8 OP-NML4 – Night-time



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6. Summary

6.1.1 Baseline sound surveys have been undertaken to inform the assessment in **Chapter 21: Noise and vibration, Volume 2 Rev B** of the ES (Document Reference: 6.2.21) This Appendix presents the results of the baseline sound surveys which were conducted.

6.1.2 All monitoring and subsequent data processing, analysis and reporting was undertaken in accordance with the relevant British Standards and the agreed methodology.

6.1.3 The measured sound levels are typical of the locations where the data were acquired. Any unrepresentative events / data have been removed from the datasets (periods with wind speeds greater than 5m/s or periods with rain, for example).

6.1.4 Based on the above, the measured sound levels are considered representative of the NSRs in proximity to each measurement location, and the representative sound levels to be used in the noise assessment in **Chapter 21: Noise and vibration, Volume 2** of the ES (Document Reference: 6.2.21) and are provided in **Table 6-1** to **Table 6-3**.

Table 6-1 Summary of construction baseline ambient sound levels (logarithmic average)

~~Monitoring Location~~Receptor ID	$L_{Aeq,T}$ (dB)		
	Construction daytime	Construction evening	Construction night-time
HDD01-N	49	41	49*
HDD01-S	49	41	49*
HDD01A-S	49	41	49*
HDD02-S	53	41	51*
HDD05-E	50	46	46
HDD05-N	50	46	46
HDD05-S	50	46	46
HDD05-SW	50	46	46
HDD06-N	50	46	46
HDD06-W	50	46	46

~~Monitoring Location~~Receptor ID	$L_{Aeq,T}$ (dB) Construction daytime	Construction evening	Construction night-time
HDD06-S	50	46	46
HDD08-N (Hospice)	65	62	59
HDD08-S	65	62	59
HDD08-W	65	62	59
HDD10-E	65	59	54
HDD10-N	65	59	54
HDD10-S	65	59	54
HDD10-W	65	59	54
HDD11-E	63	58	54
HDD11-S	63	58	54
HDD12-E	57	-	-
HDD12-SE	57	-	-
HDD16and17-S	67	49	47
HDD16and17-E	67	49	47
HDD16and17-N	67	49	47
HDD22-N	49	37	37
HDD22-W	49	37	37
HDD23-E	56	50	47
HDD23-N	56	50	47
HDD23-S	56	50	47
HDD24-N	53	51	45
HDD24-S	53	51	45
HDD24-W	53	51	45
HDD25-S	50	46	42
HDD25-W	50	46	42

~~Monitoring Location~~Receptor ID	$L_{Aeq,T}$ (dB) Construction daytime	Construction evening	Construction night-time
HDD25-NW	50	46	42
HDD26-S	57	52	52*
HDD26-E	57	52	52*
HDD26-W	57	52	52*
HDD26-N	57	52	52*
HDD27-N	47	38	40
HDD27-S	47	38	40
HDD29-W	51	49	46
HDD29-S	51	49	46
*Data identified as anomalous. The assessment will consequently utilise Category A thresholds of significance from the BS 5228-1 'ABC method' (BSI, 2009) for these NSRs.			

Table 6-2 Summary of operational baseline ambient sound levels (logarithmic average)

NSR Location reference	$L_{Aeq,T}$ (dB) Operational daytime	Operational night-time
SS1-NE	61	55
SS2-SE	48	40
SS3-SW	47	46
SS4-NW	51	47

Table 6-3 Summary of operational baseline background sound levels (median)

NSR Location reference	$L_{A90,T}$ (dB) Operational daytime	Operational night-time
SS1-NE	55	30
SS2-SE	39	28

NSR Location reference	$L_{A90,T}$ (dB)	
	Operational daytime	Operational night-time
SS3-SW	41	31
SS4-NW	46	30

6.1.5 BS 4142 (BSI, 2019) requires that the background sound levels adopted for the assessment be representative for the period being assessed. BS 4142 (BSI, 2019) recommends that the background sound level should be derived from continuous measurements of normally not less than 15-minute intervals, which can be contiguous or disaggregated. However, BS 4142 (BSI, 2019) states that there is no 'single' background sound level that can be derived from such measurements. It is particularly difficult to determine what is 'representative' of the night-time period because it can be subject to a wide variation in background sound levels between the 'shoulder' night periods, i.e. 23:00 – 00:00 and 06:00 – 07:00 when the greatest increase or decrease in background sound levels are likely to occur. The accompanying note to paragraph 8.1.4 states that:

> *'a representative level ought to account for the range of background sounds levels and ought not automatically to be assumed to be either the minimum or modal value'*.

6.1.6 It is considered that the median is suitably representative of the typical background sound level at each operational monitoring location and have subsequently been used to inform the assessment.

7. Glossary of terms and abbreviations

Table 7-1 Glossary of terms and abbreviations

Term	Definition
Acoustic environment	Sound from all sources as modified by the environment.
Ambient sound	Totally encompassing sound in a given situation at a given time, usually composed of sound from many sources near and far.
Ambient sound level	The $L_{Aeq,T}$, of the totally encompassing sound in a given situation at a given time, usually from many sources near and far, at the assessment location over a given time interval, T.
Baseline	Refers to existing conditions as represented by latest available survey and other data which is used as a benchmark for making comparisons to assess the impact of development.
Background sound level	The underlying level of sound over a period, T, and is represented by $L_{A90,T}$, the level exceeded for 90% of the measurement interval T.
dB	A unit used to measure the intensity of a sound or the power level of an electrical signal by comparing it with a given level on a logarithmic scale.
Development Consent Order (DCO)	This is the means of obtaining permission for developments categorised as Nationally Significant Infrastructure Projects, under the Planning Act 2008.
Façade level	A correction factor (addition of 3dB to the free field level when calculated using BS 5228:2009 + A1:2014) to take into account reflections from a building.
Free-field level	Resulting level from a measurement that is undertaken away from the acoustic influence of a reflective façade (i.e. at least 3.5m away from any reflective source, not including the ground).
Frequency in Octave Bands	A range of frequencies where the upper frequency limit is twice that of the lower frequency limit. For example, the 1000 Hertz octave band contains acoustic energy at all frequencies from 707 to 1414 Hertz.
Frequency in One Third Octave Bands	Octave bands that are sub-divided into three parts, equal to 23% of the centre frequency. Used when octave analysis does not provide sufficient detail. Divides the audio spectrum into 33 or more equal parts where the cut-off frequencies have a ratio of 21/3, which is approximately 1.26. For example, a 1 kHz third-octave band filter has

Term	Definition
	a centre frequency of 1000 Hz with lower and upper frequencies of 891 Hz and 1112 Hz, respectively.
Hertz (Hz)	The number of waves per second. The unit of measurement for frequency of a sound wave.
Impulsive	A sound described as being impulsive will be characterised by a sudden onset rate of sound. In BS 4142:2014 + A1:2019 the onset rate of a sound must exceed a slope gradient of 10 dB per second on the positive slope for a sound to be characterised as impulsive. A penalty of up to 9 dB can be applied to an impulsive sound dependent on impulse prominence.
Intermittent	An intermittent sound will come from a source that has on and off conditions that are readily distinguishable against the residual acoustic environment. In BS 4142:2014 + A1:2019 a penalty of 3 dB can be applied to a sound where it is determined to be intermittent.
$L_{A10, 18h}$	The $L_{A10, 18h}$ is the A-weighted sound pressure level that is exceeded for 10% of an 18-hour measurement.
$L_{A90, T}$	The A-weighted sound pressure level that is exceeded for 90% of a given time interval, T. Known as the 'background sound level'.
$L_{Aeq, T}$	The A-weighted equivalent continuous sound level. It is the notional continuous level that, over the defined time period, T, contains the same sound energy as the actual fluctuating sound that occurred over the same time period.
$L_{Aeq, 16hr}$ / $L_{Aeq, 8hr}$	The L_{Aeq} over 16 hour and 8 hour periods respectively
$L_{Aeq, 18hr}$ / $L_{Aeq, 6hr}$	The L_{Aeq} over 18 hour and 6 hour periods respectively.
$L_{AFmax,T}$	The maximum recorded sound level within a given time period, T, measured using a fast time weighting.
$L_{AN,T}$	The level of A-weighted noise exceeded for N% of the measurement time T. Note that the time weighting (usually Fast) is sometimes included, denoted by 'F' (e.g. $L_{AFN,T}$)
$L_{ASmax,T}$	The maximum recorded sound level within a given time period, T, measured using a slow time weighting.
Mean (average)	The arithmetic average of a set of numbers, e.g. add up the numbers and divide by the number of numbers.

Term	Definition
Modal (average)	The mode is the number in a dataset that is repeated more often than any other number in the same set.
Noise	A term used to describe 'unwanted sound' or any sound that is undesired by the recipient.
NSIP	Nationally Significant Infrastructure Projects are major infrastructure developments in England and Wales which are consented by DCO under the Planning Act 2008. These include proposals for offshore wind farms with an installed capacity over 100MW.
Rating level, $L_{Ar,T}$	The specific sound level, plus any adjustments for the characteristic features of the sound, (such as tonality, impulsivity or intermittency).
Root mean square (rms)	Root Mean Square of a time-varying quantity is obtained by squaring the amplitude at each instant, obtaining the average of the squared values over the interval of interest, and then taking the Square Root of this average.
Sound	A term used to describe airborne waves that can be heard.
Sound level meter (SLM)	SLM is the instrument used for acoustic (sound that travels through air) measurements. It is commonly a hand-held instrument with a microphone. The diaphragm of the microphone responds to changes in air pressure caused by sound waves.
Sound pressure level (L_p)	Sound pressure level is the RMS value of the Instantaneous Sound Pressures measured over a specified period of time, measured in decibels (dB) to a given reference pressure level.
Specific sound level	An equivalent continuous A-weighted sound pressure level produced by the specific sound source at the assessment location over a given reference time interval, Tr.
Time weighting	Time weightings determine how quickly the sound level meter responds to changes in sound pressure level. Fast time weighting: the sound level meter samples over a few discrete 125ms periods, with all parameters calculated from these 125ms measurements. E.g. a 15-minute measurement period is actually 432,000 individual measurements. Slow time weighting: the sound level meter samples over several discrete 1 second periods, with all parameters calculated from these 1 second measurements.
Tonal	A sound described as being tonal will be characterised as a sound that contains one or more distinct tones. In BS 4142:2014 + A1:2019 a tone can be identified where a frequency band contains more energy and is shown to have a certain level difference over its neighboring

Term	Definition
	bands. A penalty of up to 6 dB can be applied to a tonal sound dependent on tonal prominence.
Weighting network	An electronic filter in a sound level meter, which approximates, under defined conditions, the frequency response of the human ear. The A-weighting network is most commonly used.

8. References

British Standards Institution (2003). *Description and measurement of environmental noise. Part 1: Guide to quantities and procedures*. BSI, London

British Standards Institution (2013). *Electroacoustics – Sound level meters. Part 1: Specifications*. BSI, London.

British Standards Institution (2018). *Electroacoustics – Sound calibrators*. BSI, London.

British Standards Institution (2019). *BS 4142:2014 + A1:2019 Methods for rating and assessing industrial and commercial sound*. BSI, London.

British Standards Institution (BSI), (2014). *BS 5228-1:2009 + A1:2014 Code of practice for noise and vibration control on construction and open sites*. Part 1: Noise.

Department for Transport (DfT), (1995). *Calculation of Railway Noise in 1995*. DfT, London.

Environment Agency (2022). *Noise and vibration management: environmental permits.* [Online] Available at: https://www.gov.uk/government/publications/noise-and-vibration-management-environmental-permits/noise-and-vibration-management-environmental-permits [Accessed 27 June 2023].

Highways England (2020). *Design Manual for Roads and Bridges LA111: Noise and vibration*. [Online] Available at: https://www.standardsforhighways.co.uk/tses/attachments/cc8cfcf7-c235-4052-8d32-d5398796b364?inline=true [Accessed 27 June 2023].

Her Majesty's Stationary Office (HMSO), (1988). *Calculation of Road Traffic Noise*. [Online] Available at: https://www.bradford.gov.uk/Documents/Hard%20Ings%20Road%20improvement%20scheme/2b%20Compulsory%20Purchase%20Order%20and%20Side%20Road%20Order/5%20Supporting%20documents/Calculation%20of%20Road%20Traffic%20Noise%201988.pdf [Accessed 27 June 2023].

Institute of Environmental Management & Assessment (2014). Guidelines for Environmental Noise Impact Assessment. [Online] Available at: https://www.bing.com/ck/a?!&&p=00ad37f9caa18be3JmltdHM9MTY4NzkxMDQwMCZpZ3VpZD0zN2E1OGM2YS03ZmRiLTZlZTAtM2Q4Ny05ZjUyN2ViODZmYjYmaW5zaWQ9NTE4Ng&ptn=3&hsh=3&fclid=37a58c6a-7fdb-6ee0-3d87-9f527eb86fb6&psq=Guidelines+for+Environmental+Noise+Impact+Assessments+IEMA+2014&u=a1aHR0cHM6Ly93d3cuaWVtYS5uZXQvZG93bmxvYWQtZG9jdW1lbnQvMjM2Njc4&ntb=1 [Accessed 28 June 2023].

International Standards Organization (ISO), (1996). *ISO 9613-2:1996 Acoustics – Attenuation of sound during propagation outdoors. Part 2: General method of calculation.* ISO, Geneva.

Ministry of Housing, Communities & Local Government (MHCLG), (2021). *National Planning Policy Framework*. [Online] Available at:

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1005759/NPPF_July_2021.pdf [Accessed 27 June 2023].

Transport and Road Research Laboratory, (1986). *RR 53 Ground vibration caused by civil engineering works.* TRL, Wokingham.

Transport Research Laboratory, (2002). *Converting the UK traffic noise index LA10,18h to EU noise indices for noise mapping*. [Online] Available at: https://webarchive.nationalarchives.gov.uk/ukgwa/20130402151656/http:/archive.defra.gov.uk/environment/quality/noise/research/crtn/documents/noise_crtn.pdf [Accessed 27 June 2023].

Annex A
Calibration Certificates

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CERTIFICATE OF CALIBRATION

0653

Date of Issue: 30 March 2021 **Certificate Number: UCRT21/1421**

Calibrated at & Certificate issued by:

[redacted]

[redacted]

Customer [redacted]

Order No.	26006559			
Description	Sound Level Meter / Pre-amp / Microphone / Associated Calibrator			
Identification	*Manufacturer*	*Instrument*	*Type*	*Serial No. / Version*
	Rion	Sound Level Meter	NL-52	01143535
	Rion	Firmware		2.0
	Rion	Pre Amplifier	NH-25	43552
	Rion	Microphone	UC-59	07396
	Rion	Calibrator	NC-74	34251554
		Calibrator adaptor type if applicable		NC-74-002
Performance Class	1			
Test Procedure	TP 2.SLM 61672-3 TPS-49			
	Procedures from IEC 61672-3:2006 were used to perform the periodic tests.			
Type Approved to IEC 61672-1:2002	YES	Approval Number	21.21 / 13.02	
	If YES above there is public evidence that the SLM has successfully completed the applicable pattern evaluation tests of IEC 61672-2:2003			
Date Received	25 March 2021	ANV Job No.	UKAS21/03211	
Date Calibrated	30 March 2021			

The sound level meter submitted for testing has successfully completed the class 1 periodic tests of IEC 61672-3:2006, for the environmental conditions under which the tests were performed. As public evidence was available, from an independent testing organisation responsible for approving the results of pattern evaluation tests performed in accordance with IEC 61672-2:2003, to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1:2002, the sound level meter submitted for testing conforms to the class 1 requirements of IEC 61672-1:2002.

Previous Certificate	*Dated*	*Certificate No.*	*Laboratory*
	12 December 2019	UCRT19/2347	0653

CERTIFICATE OF CALIBRATION

Certificate Number
UCRT21/1421

UKAS Accredited Calibration Laboratory No. 0653

Sound Level Meter Instruction manual and data used to adjust the sound levels indicated.

SLM instruction manual title	Sound Level Meter	NL-42 / NL-52
SLM instruction manual ref / issue		11-03
SLM instruction manual source		Manufacturer
Internet download date if applicable		N/A
Case corrections available		Yes
Uncertainties of case corrections		Yes
Source of case data		Manufacturer
Wind screen corrections available		Yes
Uncertainties of wind screen corrections		Yes
Source of wind screen data		Manufacturer
Mic pressure to free field corrections		Yes
Uncertainties of Mic to F.F. corrections		Yes
Source of Mic to F.F. corrections		Manufacturer
Total expanded uncertainties within the requirements of IEC 61672-1:2002		Yes
Specified or equivalent Calibrator		Specified
Customer or Lab Calibrator		Customers Calibrator
Calibrator adaptor type if applicable		NC-74-002
Calibrator cal. date		26 March 2021
Calibrator cert. number		UCRT21/1408
Calibrator cal cert issued by		0653
Calibrator SPL @ STP	94.03 dB	Calibration reference sound pressure level
Calibrator frequency	1001.00 Hz	Calibration check frequency
Reference level range	25 - 130 dB	

Accessories used or corrected for during calibration - Extension Cable & Wind Shield WS-15
Note - if a pre-amp extension cable is listed then it was used between the SLM and the pre-amp.

Environmental conditions during tests	Start	End	
Temperature	23.55	23.40	± 0.30 °C
Humidity	36.5	39.9	± 3.00 %RH
Ambient Pressure	101.80	101.80	± 0.03 kPa

Response to associated Calibrator at the environmental conditions above.

Initial indicated level	94.4	dB	Adjusted indicated level	94.0	dB
The uncertainty of the associated calibrator supplied with the sound level meter ±				0.10	dB

Self Generated Noise — This test is currently not performed by this Lab.

Microphone installed (if requested by customer) = Less Than			N/A	dB	A Weighting
Uncertainty of the microphone installed self generated noise ±			N/A	dB	

Microphone replaced with electrical input device - UR = Under Range indicated

Weighting	A			C			Z		
	11.6	dB	UR	15.8	dB	UR	22.7	dB	UR
Uncertainty of the electrical self generated noise ±						0.12		dB	

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor $k=2$, providing a coverage probability of approximately 95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

For the test of the frequency weightings as per paragraph 12. of IEC 61672-3:2006 the actual microphone free field response was used.

The acoustical frequency tests of a frequency weighting as per paragraph 11 of IEC 61672-3:2006 were carried out using an electrostatic actuator.

END

Calibrated by: [redacted] R 2

Additional Comments The results on this certificate only relate to the items calibrated as identified above.
None

CERTIFICATE OF CALIBRATION

0653

Date of Issue: 12 June 2023 **Certificate Number: UCRT23/1766**

Calibrated at & Certificate issued by:

[redacted]

[redacted]

Customer [redacted]

Order No. 20163316

Test Procedure Procedure TP 1 Calibration of Sound Calibrators

Description Acoustic Calibrator

Identification	*Manufacturer*	*Instrument*	*Model*	*Serial No.*
	Rion	Calibrator	NC-74	34251553

The calibrator has been tested as specified in Annex B of IEC 60942:2003. As public evidence was available from a testing organisation (PTB) responsible for approving the results of pattern evaluation tests, to demonstrate that the model of sound calibrator fully conformed to the requirements for pattern evaluation described in Annex A of IEC 60942:2003, the sound calibrator tested is considered to conform to all the class 1 requirements of IEC 60942:2003.

ANV Job No. UKAS23/06393

Date Received 09 June 2023

Date Calibrated 12 June 2023

Previous Certificate		
	Dated	11 May 2022
	Certificate No.	UCRT22/1632
	Laboratory	0653

Measurements

The sound pressure level generated by the calibrator in its WS2 configuration was measured five times by the Insert Voltage Method using a microphone as detailed below. The mean of the results obtained is shown below. It is corrected to the standard atmospheric pressure of 101.3 kPa (1013 mBar) using original manufacturers information.

Test Microphone	*Manufacturer*	*Type*
	Brüel & Kjær	4134

Results

The level of the calibrator output under the conditions outlined above was

94.01 ± 0.10 dB rel 20 µPa

Functional Tests and Observations

The frequency of the sound produced was	1002.91	± 0.12	Hz
The total distortion was	1.14	± 0.08	% Distortion

During the measurements environmental conditions were

Temperature	22	to	23	°C
Relative Humidity	39	to	46	%
Barometric Pressure	100.4	to	100.5	kPa

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a coverage probability of approximately 95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

The uncertainties refer to the measured values only with no account being taken of the ability of the instrument to maintain its calibration.

A small correction factor may need to be applied to the sound pressure level quoted above if the device is used to calibrate a sound level meter which is fitted with a free-field response microphone. See manufacturers handbook for details.

…… END ……

Note:

Calibrator adjusted prior to calibration?	NO	
Initial Level	N/A	dB
Initial Frequency	N/A	Hz

Additional Comments The results on this certificate only relate to the items calibrated as identified above.

None

Calibrated by: [redacted]

R 1

CERTIFICATE OF CALIBRATION

0653

Date of Issue: 16 June 2023 **Certificate Number: UCRT23/1794**

[redacted]

[redacted]

Customer [redacted]

Order No. 20163436

Description Sound Level Meter / Pre-amp / Microphone / Associated Calibrator

Identification

Manufacturer	*Instrument*	*Type*	*Serial No. / Version*
Rion	Sound Level Meter	NL-52	01021290
Rion	Firmware		2.0
Rion	Pre Amplifier	NH-25	21332
Rion	Microphone	UC-59	04346
Rion	Calibrator	NC-74	35173440
	Calibrator adaptor type if applicable		NC-74-002

Performance Class 1

Test Procedure TP 2.SLM 61672-3 TPS-49

Procedures from IEC 61672-3:2006 were used to perform the periodic tests.

Type Approved to IEC 61672-1:2002 YES Approval Number 21.21 / 13.02

If YES above there is public evidence that the SLM has successfully completed the applicable pattern evaluation tests of IEC 61672-2:2003

Date Received 15 June 2023 ANV Job No. UKAS23/06405

Date Calibrated 16 June 2023

The sound level meter submitted for testing has successfully completed the class 1 periodic tests of IEC 61672-3:2006, for the environmental conditions under which the tests were performed. As public evidence was available, from an independent testing organisation responsible for approving the results of pattern evaluation tests performed in accordance with IEC 61672-2:2003, to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1:2002, the sound level meter submitted for testing conforms to the class 1 requirements of IEC 61672-1:2002.

Previous Certificate	*Dated*	*Certificate No.*	*Laboratory*
	17 May 2021	UCRT21/1642	0653

CERTIFICATE OF CALIBRATION

Certificate Number
UCRT23/1794

UKAS Accredited Calibration Laboratory No. 0653

Sound Level Meter Instruction manual and data used to adjust the sound levels indicated.

SLM instruction manual title	Sound Level Meter	NL-42 / NL-52
SLM instruction manual ref / issue		11-03
SLM instruction manual source		Manufacturer
Internet download date if applicable		N/A
Case corrections available		Yes
Uncertainties of case corrections		Yes
Source of case data		Manufacturer
Wind screen corrections available		Yes
Uncertainties of wind screen corrections		Yes
Source of wind screen data		Manufacturer
Mic pressure to free field corrections		Yes
Uncertainties of Mic to F.F. corrections		Yes
Source of Mic to F.F. corrections		Manufacturer
Total expanded uncertainties within the requirements of IEC 61672-1:2002		Yes
Specified or equivalent Calibrator		Specified
Customer or Lab Calibrator		Customers Calibrator
Calibrator adaptor type if applicable		NC-74-002
Calibrator cal. date		11 August 2022
Calibrator cert. number		UCRT22/1996
Calibrator cal cert issued by		0653
Calibrator SPL @ STP	93.96 dB	Calibration reference sound pressure level
Calibrator frequency	1002.76 Hz	Calibration check frequency
Reference level range	25 - 130 dB	

Accessories used or corrected for during calibration - Extension Cable & Wind Shield WS-15
Note - if a pre-amp extension cable is listed then it was used between the SLM and the pre-amp.

Environmental conditions during tests	Start	End		
Temperature	23.16	23.61	± 0.30	°C
Humidity	44.6	47.5	± 3.00	%RH
Ambient Pressure	101.05	101.04	± 0.03	kPa

Response to associated Calibrator at the environmental conditions above.

Initial indicated level	94.1 dB		Adjusted indicated level	94.0	dB
The uncertainty of the associated calibrator supplied with the sound level meter ±				0.10	dB

Self Generated Noise — This test is currently not performed by this Lab.

Microphone installed (if requested by customer) = Less Than	N/A	dB	A Weighting
Uncertainty of the microphone installed self generated noise ±	N/A	dB	

Microphone replaced with electrical input device - UR = Under Range indicated

Weighting	A			C			Z		
	13.0	dB	UR	16.3	dB	UR	22.0	dB	UR
Uncertainty of the electrical self generated noise ±						0.12		dB	

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor *k* =2, providing a coverage probability of approximately 95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

For the test of the frequency weightings as per paragraph 12. of IEC 61672-3:2006 the actual microphone free field response was used.

The acoustical frequency tests of a frequency weighting as per paragraph 11 of IEC 61672-3:2006 were carried out using an electrostatic actuator.

…… END ……

Calibrated by: [redacted] R 1

Additional Comments The results on this certificate only relate to the items calibrated as identified above.
None

CERTIFICATE OF CALIBRATION

0653

Date of Issue: 15 June 2023 **Certificate Number: UCRT23/1793**

Calibrated at & Certificate issued by:

[redacted]

[redacted]

Customer [redacted]

Order No. 20163436

Description Sound Level Meter / Pre-amp / Microphone / Associated Calibrator

Identification

Manufacturer	*Instrument*	*Type*	*Serial No. / Version*
Rion	Sound Level Meter	NL-52	01021289
Rion	Firmware		2.0
Rion	Pre Amplifier	NH-25	21331
Rion	Microphone	UC-59	04345
Rion	Calibrator	NC-74	34851881
	Calibrator adaptor type if applicable		NC-74-002

Performance Class 1

Test Procedure TP 2.SLM 61672-3 TPS-49

Procedures from IEC 61672-3:2006 were used to perform the periodic tests.

Type Approved to IEC 61672-1:2002 YES Approval Number 21.21 / 13.02

If YES above there is public evidence that the SLM has successfully completed the applicable pattern evaluation tests of IEC 61672-2:2003

Date Received 15 June 2023 ANV Job No. UKAS23/06405

Date Calibrated 15 June 2023

The sound level meter submitted for testing has successfully completed the class 1 periodic tests of IEC 61672-3:2006, for the environmental conditions under which the tests were performed. As public evidence was available, from an independent testing organisation responsible for approving the results of pattern evaluation tests performed in accordance with IEC 61672-2:2003, to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1:2002, the sound level meter submitted for testing conforms to the class 1 requirements of IEC 61672-1:2002.

Previous Certificate	*Dated*	*Certificate No.*	*Laboratory*
	10 May 2021	UCRT21/1592	0653

CERTIFICATE OF CALIBRATION

Certificate Number
UCRT23/1793

UKAS Accredited Calibration Laboratory No. 0653

Sound Level Meter Instruction manual and data used to adjust the sound levels indicated.

SLM instruction manual title	Sound Level Meter	NL-42 / NL-52
SLM instruction manual ref / issue		11-03
SLM instruction manual source		Manufacturer
Internet download date if applicable		N/A
Case corrections available		Yes
Uncertainties of case corrections		Yes
Source of case data		Manufacturer
Wind screen corrections available		Yes
Uncertainties of wind screen corrections		Yes
Source of wind screen data		Manufacturer
Mic pressure to free field corrections		Yes
Uncertainties of Mic to F.F. corrections		Yes
Source of Mic to F.F. corrections		Manufacturer
Total expanded uncertainties within the requirements of IEC 61672-1:2002		Yes
Specified or equivalent Calibrator		Specified
Customer or Lab Calibrator		Customers Calibrator
Calibrator adaptor type if applicable		NC-74-002
Calibrator cal. date		11 August 2022
Calibrator cert. number		UCRT22/1997
Calibrator cal cert issued by		0653
Calibrator SPL @ STP	94.01 dB	Calibration reference sound pressure level
Calibrator frequency	1002.46 Hz	Calibration check frequency
Reference level range	25 - 130 dB	

Accessories used or corrected for during calibration - Extension Cable & Wind Shield WS-15
Note - if a pre-amp extension cable is listed then it was used between the SLM and the pre-amp.

Environmental conditions during tests	Start	End	
Temperature	23.71	23.63	± 0.30 °C
Humidity	35.6	33.9	± 3.00 %RH
Ambient Pressure	100.98	100.96	± 0.03 kPa

Response to associated Calibrator at the environmental conditions above.

Initial indicated level	93.9 dB		Adjusted indicated level	94.0	dB
The uncertainty of the associated calibrator supplied with the sound level meter ±				0.10	dB

Self Generated Noise — This test is currently not performed by this Lab.

Microphone installed (if requested by customer) = Less Than	N/A	dB	A Weighting
Uncertainty of the microphone installed self generated noise ±	N/A	dB	

Microphone replaced with electrical input device - UR = Under Range indicated

Weighting	A			C			Z		
	12.5	dB	UR	15.8	dB	UR	21.5	dB	UR
Uncertainty of the electrical self generated noise ±						0.12		dB	

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor *k* =2, providing a coverage probability of approximately 95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

For the test of the frequency weightings as per paragraph 12. of IEC 61672-3:2006 the actual microphone free field response was used.

The acoustical frequency tests of a frequency weighting as per paragraph 11 of IEC 61672-3:2006 were carried out using an electrostatic actuator.

…… END ……

Calibrated by: [redacted] R 1

Additional Comments The results on this certificate only relate to the items calibrated as identified above.
None

CERTIFICATE OF CALIBRATION

0653

Date of Issue: 21 April 2022 **Certificate Number: UCRT22/1555**

Calibrated at & Certificate issued by:

[redacted]

Customer [redacted]

Order No.	26006559			
Description	Sound Level Meter / Pre-amp / Microphone / Associated Calibrator			
Identification	*Manufacturer*	*Instrument*	*Type*	*Serial No. / Version*
	Rion	Sound Level Meter	NL-52	00331828
	Rion	Firmware		2.0
	Rion	Pre Amplifier	NH-25	21779
	Rion	Microphone	UC-59	04895
	Rion	Calibrator	NC-74	34251554
		Calibrator adaptor type if applicable		NC-74-002
Performance Class	1			
Test Procedure	TP 2.SLM 61672-3 TPS-49			
	Procedures from IEC 61672-3:2006 were used to perform the periodic tests.			
Type Approved to IEC 61672-1:2002	YES	Approval Number	21.21 / 13.02	
	If YES above there is public evidence that the SLM has successfully completed the applicable pattern evaluation tests of IEC 61672-2:2003			
Date Received	20 April 2022	ANV Job No.	UKAS22/04281	
Date Calibrated	21 April 2022			

The sound level meter submitted for testing has successfully completed the class 1 periodic tests of IEC 61672-3:2006, for the environmental conditions under which the tests were performed. As public evidence was available, from an independent testing organisation responsible for approving the results of pattern evaluation tests performed in accordance with IEC 61672-2:2003, to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1:2002, the sound level meter submitted for testing conforms to the class 1 requirements of IEC 61672-1:2002.

Previous Certificate	*Dated*	*Certificate No.*	*Laboratory*
	30 March 2021	UCRT21/1429	0653

CERTIFICATE OF CALIBRATION

Certificate Number
UCRT22/1555

UKAS Accredited Calibration Laboratory No. 0653

Sound Level Meter Instruction manual and data used to adjust the sound levels indicated.

SLM instruction manual title	Sound Level Meter	NL-42 / NL-52	
SLM instruction manual ref / issue		11-03	
SLM instruction manual source		Manufacturer	
Internet download date if applicable		N/A	
Case corrections available		Yes	
Uncertainties of case corrections		Yes	
Source of case data		Manufacturer	
Wind screen corrections available		Yes	
Uncertainties of wind screen corrections		Yes	
Source of wind screen data		Manufacturer	
Mic pressure to free field corrections		Yes	
Uncertainties of Mic to F.F. corrections		Yes	
Source of Mic to F.F. corrections		Manufacturer	
Total expanded uncertainties within the requirements of IEC 61672-1:2002		Yes	
Specified or equivalent Calibrator		Specified	
Customer or Lab Calibrator		Customers Calibrator	
Calibrator adaptor type if applicable		NC-74-002	
Calibrator cal. date		21 April 2022	
Calibrator cert. number		UCRT22/1549	
Calibrator cal cert issued by		0653	
Calibrator SPL @ STP		94.02 dB	Calibration reference sound pressure level
Calibrator frequency		1000.90 Hz	Calibration check frequency
Reference level range		25 - 130 dB	

Accessories used or corrected for during calibration - Extension Cable & Wind Shield WS-15
Note - if a pre-amp extension cable is listed then it was used between the SLM and the pre-amp.

Environmental conditions during tests	Start	End	
Temperature	24.35	24.35	± 0.30 °C
Humidity	42.5	42.0	± 3.00 %RH
Ambient Pressure	100.17	100.15	± 0.03 kPa

Response to associated Calibrator at the environmental conditions above.

Initial indicated level	94.1	dB	Adjusted indicated level	94.0	dB
The uncertainty of the associated calibrator supplied with the sound level meter ±				0.10	dB

Self Generated Noise — This test is currently not performed by this Lab.

Microphone installed (if requested by customer) = Less Than	N/A	dB	A Weighting
Uncertainty of the microphone installed self generated noise ±	N/A	dB	

Microphone replaced with electrical input device - UR = Under Range indicated

Weighting	A			C			Z		
	12.3	dB	UR	16.8	dB	UR	22.5	dB	UR
Uncertainty of the electrical self generated noise ±						0.12	dB		

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor $k=2$, providing a coverage probability of approximately 95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

For the test of the frequency weightings as per paragraph 12. of IEC 61672-3:2006 the actual microphone free field response was used.

The acoustical frequency tests of a frequency weighting as per paragraph 11 of IEC 61672-3:2006 were carried out using an electrostatic actuator.

..... END .....

Calibrated by: [redacted] R 3

Additional Comments The results on this certificate only relate to the items calibrated as identified above.
None

CERTIFICATE OF CALIBRATION

0653

Date of Issue: 10 March 2022 **Certificate Number: UCRT22/1353**

Calibrated at & Certificate issued by:

[redacted]

[redacted]

Customer [redacted]

Order No.	26006559			
Description	Sound Level Meter / Pre-amp / Microphone / Associated Calibrator			
Identification	*Manufacturer*	*Instrument*	*Type*	*Serial No. / Version*
	Rion	Sound Level Meter	NL-52	01143532
	Rion	Firmware		2.0
	Rion	Pre Amplifier	NH-25	43549
	Rion	Microphone	UC-59	07849
	Rion	Calibrator	NC-74	34251551
		Calibrator adaptor type if applicable		NC-74-002
Performance Class	1			
Test Procedure	TP 2.SLM 61672-3 TPS-49			
	Procedures from IEC 61672-3:2006 were used to perform the periodic tests.			
Type Approved to IEC 61672-1:2002	YES	Approval Number	21.21 / 13.02	
	If YES above there is public evidence that the SLM has successfully completed the applicable pattern evaluation tests of IEC 61672-2:2003			
Date Received	09 March 2022	ANV Job No.	UKAS22/03174	
Date Calibrated	10 March 2022			

The sound level meter submitted for testing has successfully completed the class 1 periodic tests of IEC 61672-3:2006, for the environmental conditions under which the tests were performed. As public evidence was available, from an independent testing organisation responsible for approving the results of pattern evaluation tests performed in accordance with IEC 61672-2:2003, to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1:2002, the sound level meter submitted for testing conforms to the class 1 requirements of IEC 61672-1:2002.

Previous Certificate	*Dated*	*Certificate No.*	*Laboratory*
	30 March 2021	UCRT21/1425	0653

CERTIFICATE OF CALIBRATION

Certificate Number	
UCRT22/1353	
UKAS Accredited Calibration Laboratory No. 0653	Page 2 of 2 Pages

Sound Level Meter Instruction manual and data used to adjust the sound levels indicated.

SLM instruction manual title	Sound Level Meter NL-42 / NL-52
SLM instruction manual ref / issue	11-03
SLM instruction manual source	Manufacturer
Internet download date if applicable	N/A
Case corrections available	Yes
Uncertainties of case corrections	Yes
Source of case data	Manufacturer
Wind screen corrections available	Yes
Uncertainties of wind screen corrections	Yes
Source of wind screen data	Manufacturer
Mic pressure to free field corrections	Yes
Uncertainties of Mic to F.F. corrections	Yes
Source of Mic to F.F. corrections	Manufacturer
Total expanded uncertainties within the requirements of IEC 61672-1:2002	Yes

Specified or equivalent Calibrator	Specified		
Customer or Lab Calibrator	Customers Calibrator		
Calibrator adaptor type if applicable	NC-74-002		
Calibrator cal. date	10 March 2022		
Calibrator cert. number	UCRT22/1352		
Calibrator cal cert issued by	0653		
Calibrator SPL @ STP	94.03	dB	Calibration reference sound pressure level
Calibrator frequency	1004.05	Hz	Calibration check frequency
Reference level range	25 - 130	dB	

Accessories used or corrected for during calibration - Extension Cable & Wind Shield WS-15
Note - if a pre-amp extension cable is listed then it was used between the SLM and the pre-amp.

Environmental conditions during tests	Start	End			
Temperature	22.78	23.11	±	0.30	°C
Humidity	40.6	40.9	±	3.00	%RH
Ambient Pressure	100.63	100.62	±	0.03	kPa

Response to associated Calibrator at the environmental conditions above.

Initial indicated level	94.0	dB	Adjusted indicated level	94.0	dB
The uncertainty of the associated calibrator supplied with the sound level meter ±				0.10	dB

Self Generated Noise — This test is currently not performed by this Lab.

Microphone installed (if requested by customer) = Less Than	N/A	dB	A Weighting
Uncertainty of the microphone installed self generated noise ±	N/A	dB	

Microphone replaced with electrical input device - UR = Under Range indicated

Weighting	A			C			Z		
	13.0	dB	UR	17.1	dB	UR	24.3	dB	UR
Uncertainty of the electrical self generated noise ±							0.12	dB	

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor $k=2$, providing a coverage probability of approximately 95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

For the test of the frequency weightings as per paragraph 12. of IEC 61672-3:2006 the actual microphone free field response was used.

The acoustical frequency tests of a frequency weighting as per paragraph 11 of IEC 61672-3:2006 were carried out using an electrostatic actuator.

..... END .....

Calibrated by: [redacted] R 2

Additional Comments The results on this certificate only relate to the items calibrated as identified above.
None

CERTIFICATE OF CALIBRATION

0653

Date of Issue: 22 April 2022

Certificate Number: UCRT22/1560

Calibrated at & Certificate issued by:

[redacted]

[redacted]

Customer [redacted]

Order No.	26006559			
Description	Sound Level Meter / Pre-amp / Microphone / Associated Calibrator			
Identification	*Manufacturer*	*Instrument*	*Type*	*Serial No. / Version*
	Rion	Sound Level Meter	NL-52	01143533
	Rion	Firmware		2.0
	Rion	Pre Amplifier	NH-25	43550
	Rion	Microphone	UC-59	07393
	Rion	Calibrator	NC-74	34251550
		Calibrator adaptor type if applicable		NC-74-002

Performance Class 1

Test Procedure TP 2.SLM 61672-3 TPS-49

Procedures from IEC 61672-3:2006 were used to perform the periodic tests.

Type Approved to IEC 61672-1:2002 YES Approval Number 21.21 / 13.02

If YES above there is public evidence that the SLM has successfully completed the applicable pattern evaluation tests of IEC 61672-2:2003

Date Received 20 April 2022 ANV Job No. UKAS22/04281

Date Calibrated 22 April 2022

The sound level meter submitted for testing has successfully completed the class 1 periodic tests of IEC 61672-3:2006, for the environmental conditions under which the tests were performed. As public evidence was available, from an independent testing organisation responsible for approving the results of pattern evaluation tests performed in accordance with IEC 61672-2:2003, to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1:2002, the sound level meter submitted for testing conforms to the class 1 requirements of IEC 61672-1:2002.

Previous Certificate	*Dated*	*Certificate No.*	*Laboratory*
	30 March 2021	UCRT21/1426	0653

CERTIFICATE OF CALIBRATION

Certificate Number
UCRT22/1560

UKAS Accredited Calibration Laboratory No. 0653

Sound Level Meter Instruction manual and data used to adjust the sound levels indicated.

SLM instruction manual title	Sound Level Meter NL-42 / NL-52		
SLM instruction manual ref / issue	11-03		
SLM instruction manual source	Manufacturer		
Internet download date if applicable	N/A		
Case corrections available	Yes		
Uncertainties of case corrections	Yes		
Source of case data	Manufacturer		
Wind screen corrections available	Yes		
Uncertainties of wind screen corrections	Yes		
Source of wind screen data	Manufacturer		
Mic pressure to free field corrections	Yes		
Uncertainties of Mic to F.F. corrections	Yes		
Source of Mic to F.F. corrections	Manufacturer		
Total expanded uncertainties within the requirements of IEC 61672-1:2002	Yes		
Specified or equivalent Calibrator	Specified		
Customer or Lab Calibrator	Customers Calibrator		
Calibrator adaptor type if applicable	NC-74-002		
Calibrator cal. date	21 April 2022		
Calibrator cert. number	UCRT22/1546		
Calibrator cal cert issued by	0653		
Calibrator SPL @ STP	93.98	dB	Calibration reference sound pressure level
Calibrator frequency	1002.88	Hz	Calibration check frequency
Reference level range	25 - 130	dB	

Accessories used or corrected for during calibration - Extension Cable & Wind Shield WS-15
Note - if a pre-amp extension cable is listed then it was used between the SLM and the pre-amp.

Environmental conditions during tests	Start	End			
Temperature	23.72	24.05	±	0.30	°C
Humidity	43.4	44.1	±	3.00	%RH
Ambient Pressure	99.82	99.76	±	0.03	kPa

Response to associated Calibrator at the environmental conditions above.

Initial indicated level	94.0	dB	Adjusted indicated level	94.0	dB
The uncertainty of the associated calibrator supplied with the sound level meter ±				0.10	dB

Self Generated Noise	This test is currently not performed by this Lab.		
Microphone installed (if requested by customer) = Less Than	N/A	dB	A Weighting
Uncertainty of the microphone installed self generated noise ±	N/A	dB	

Microphone replaced with electrical input device - UR = Under Range indicated

Weighting	A			C			Z		
	13.0	dB	UR	16.9	dB	UR	21.3	dB	UR
Uncertainty of the electrical self generated noise ±							0.12	dB	

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor $k=2$, providing a coverage probability of approximately 95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

For the test of the frequency weightings as per paragraph 12. of IEC 61672-3:2006 the actual microphone free field response was used.

The acoustical frequency tests of a frequency weighting as per paragraph 11 of IEC 61672-3:2006 were carried out using an electrostatic actuator.

..... END .....

Calibrated by: [redacted] R 2

Additional Comments The results on this certificate only relate to the items calibrated as identified above.
None

CERTIFICATE OF CALIBRATION

0653

Date of Issue: 22 April 2022 **Certificate Number: UCRT22/1563**

Calibrated at & Certificate issued by:

[redacted]

[redacted]

Customer

[redacted]

Order No.	26006559			
Description	Sound Level Meter / Pre-amp / Microphone / Associated Calibrator			
Identification	*Manufacturer*	*Instrument*	*Type*	*Serial No. / Version*
	Rion	Sound Level Meter	NL-52	01121394
	Rion	Firmware		2.0
	Rion	Pre Amplifier	NH-25	21438
	Rion	Microphone	UC-59	17214
	Rion	Calibrator	NC-74	34494241
		Calibrator adaptor type if applicable		NC-74-002
Performance Class	1			
Test Procedure	TP 2.SLM 61672-3 TPS-49			
	Procedures from IEC 61672-3:2006 were used to perform the periodic tests.			
Type Approved to IEC 61672-1:2002	YES	Approval Number	21.21 / 13.02	
	If YES above there is public evidence that the SLM has successfully completed the applicable pattern evaluation tests of IEC 61672-2:2003			
Date Received	20 April 2022	ANV Job No.	UKAS22/04281	
Date Calibrated	22 April 2022			

The sound level meter submitted for testing has successfully completed the class 1 periodic tests of IEC 61672-3:2006, for the environmental conditions under which the tests were performed. As public evidence was available, from an independent testing organisation responsible for approving the results of pattern evaluation tests performed in accordance with IEC 61672-2:2003, to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1:2002, the sound level meter submitted for testing conforms to the class 1 requirements of IEC 61672-1:2002.

Previous Certificate	*Dated*	*Certificate No.*	*Laboratory*
	30 March 2021	UCRT21/1427	0653

CERTIFICATE OF CALIBRATION

UKAS Accredited Calibration Laboratory No. 0653

Certificate Number
UCRT22/1563

Sound Level Meter Instruction manual and data used to adjust the sound levels indicated.

SLM instruction manual title	Sound Level Meter NL-42 / NL-52		
SLM instruction manual ref / issue	11-03		
SLM instruction manual source	Manufacturer		
Internet download date if applicable	N/A		
Case corrections available	Yes		
Uncertainties of case corrections	Yes		
Source of case data	Manufacturer		
Wind screen corrections available	Yes		
Uncertainties of wind screen corrections	Yes		
Source of wind screen data	Manufacturer		
Mic pressure to free field corrections	Yes		
Uncertainties of Mic to F.F. corrections	Yes		
Source of Mic to F.F. corrections	Manufacturer		
Total expanded uncertainties within the requirements of IEC 61672-1:2002	Yes		
Specified or equivalent Calibrator	Specified		
Customer or Lab Calibrator	Customers Calibrator		
Calibrator adaptor type if applicable	NC-74-002		
Calibrator cal. date	21 April 2022		
Calibrator cert. number	UCRT22/1547		
Calibrator cal cert issued by	0653		
Calibrator SPL @ STP	94.03	dB	Calibration reference sound pressure level
Calibrator frequency	1001.48	Hz	Calibration check frequency
Reference level range	25 - 130	dB	

Accessories used or corrected for during calibration - Extension Cable & Wind Shield WS-15
Note - if a pre-amp extension cable is listed then it was used between the SLM and the pre-amp.

Environmental conditions during tests	Start	End	
Temperature	24.52	24.49	± 0.30 °C
Humidity	45.6	43.1	± 3.00 %RH
Ambient Pressure	99.75	99.68	± 0.03 kPa

Response to associated Calibrator at the environmental conditions above.

Initial indicated level	94.0	dB	Adjusted indicated level	94.0	dB
The uncertainty of the associated calibrator supplied with the sound level meter ±				0.10	dB

Self Generated Noise — This test is currently not performed by this Lab.

Microphone installed (if requested by customer) = Less Than	N/A	dB	A Weighting	
Uncertainty of the microphone installed self generated noise ±	N/A	dB		

Microphone replaced with electrical input device - UR = Under Range indicated

Weighting	A			C			Z		
	11.5	dB	UR	15.5	dB	UR	19.7	dB	UR
Uncertainty of the electrical self generated noise ±							0.12	dB	

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor $k=2$, providing a coverage probability of approximately 95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

For the test of the frequency weightings as per paragraph 12. of IEC 61672-3:2006 the actual microphone free field response was used.

The acoustical frequency tests of a frequency weighting as per paragraph 11 of IEC 61672-3:2006 were carried out using an electrostatic actuator.

..... END .....

Calibrated by: [redacted]

R 2

Additional Comments The results on this certificate only relate to the items calibrated as identified above.
None

CERTIFICATE OF CALIBRATION

ANV MEASUREMENT SYSTEMS

0653

Date of Issue: 19 April 2022 **Certificate Number: UCRT22/1531**

[redacted]

Customer [redacted]

Order No.	26010435			
Description	Sound Level Meter / Pre-amp / Microphone / Associated Calibrator			
Identification	*Manufacturer*	*Instrument*	*Type*	*Serial No. / Version*
	Rion	Sound Level Meter	NL-52	00331829
	Rion	Firmware		2.0
	Rion	Pre Amplifier	NH-25	21780
	Rion	Microphone	UC-59	21136
	Rion	Calibrator	NC-74	34536109
		Calibrator adaptor type if applicable		NC-74-002

Performance Class 1

Test Procedure TP 2.SLM 61672-3 TPS-49

Procedures from IEC 61672-3:2006 were used to perform the periodic tests.

Type Approved to IEC 61672-1:2002 YES Approval Number 21.21 / 13.02

If YES above there is public evidence that the SLM has successfully completed the applicable pattern evaluation tests of IEC 61672-2:2003

Date Received 13 April 2022 ANV Job No. UKAS22/04272

Date Calibrated 14 April 2022

The sound level meter submitted for testing has successfully completed the class 1 periodic tests of IEC 61672-3:2006, for the environmental conditions under which the tests were performed. As public evidence was available, from an independent testing organisation responsible for approving the results of pattern evaluation tests performed in accordance with IEC 61672-2:2003, to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1:2002, the sound level meter submitted for testing conforms to the class 1 requirements of IEC 61672-1:2002.

Previous Certificate	*Dated*	*Certificate No.*	*Laboratory*
	29 March 2021	UCRT21/1418	0653

CERTIFICATE OF CALIBRATION

UKAS Accredited Calibration Laboratory No. 0653

Certificate Number
UCRT22/1531

Sound Level Meter Instruction manual and data used to adjust the sound levels indicated.

SLM instruction manual title	Sound Level Meter NL-42 / NL-52
SLM instruction manual ref / issue	11-03
SLM instruction manual source	Manufacturer
Internet download date if applicable	N/A
Case corrections available	Yes
Uncertainties of case corrections	Yes
Source of case data	Manufacturer
Wind screen corrections available	Yes
Uncertainties of wind screen corrections	Yes
Source of wind screen data	Manufacturer
Mic pressure to free field corrections	Yes
Uncertainties of Mic to F.F. corrections	Yes
Source of Mic to F.F. corrections	Manufacturer
Total expanded uncertainties within the requirements of IEC 61672-1:2002	Yes
Specified or equivalent Calibrator	Specified
Customer or Lab Calibrator	Lab Calibrator
Calibrator adaptor type if applicable	NC-74-002
Calibrator cal. date	24 March 2022
Calibrator cert. number	UCRT22/1421
Calibrator cal cert issued by	0653
Calibrator SPL @ STP	94.03 dB Calibration reference sound pressure level
Calibrator frequency	1002.05 Hz Calibration check frequency
Reference level range	25 - 130 dB

Accessories used or corrected for during calibration - Extension Cable & Wind Shield WS-15
Note - if a pre-amp extension cable is listed then it was used between the SLM and the pre-amp.

Environmental conditions during tests	Start	End	
Temperature	23.48	23.78	± 0.30 °C
Humidity	44.5	44.1	± 3.00 %RH
Ambient Pressure	101.19	101.19	± 0.03 kPa

Response to associated Calibrator at the environmental conditions above.

Initial indicated level	94.0	dB	Adjusted indicated level	94.0	dB
The uncertainty of the associated calibrator supplied with the sound level meter ±				0.10	dB

Self Generated Noise — This test is currently not performed by this Lab.

Microphone installed (if requested by customer) = Less Than	N/A	dB	A Weighting
Uncertainty of the microphone installed self generated noise ±	N/A	dB	

Microphone replaced with electrical input device - UR = Under Range indicated

Weighting	A			C			Z		
	11.3	dB	UR	15.0	dB	UR	19.9	dB	UR
Uncertainty of the electrical self generated noise ±							0.12	dB	

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a coverage probability of approximately 95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

For the test of the frequency weightings as per paragraph 12. of IEC 61672-3:2006 the actual microphone free field response was used.

The acoustical frequency tests of a frequency weighting as per paragraph 11 of IEC 61672-3:2006 were carried out using an electrostatic actuator.

..... END .....

R 1

Calibrated by: [redacted]

Additional Comments The results on this certificate only relate to the items calibrated as identified above. Prior to calibration, the instrument's microphone has been replaced and the sound level meter has been realigned.

CERTIFICATE OF CALIBRATION

0653

Date of Issue: 21 August 2023 **Certificate Number: UCRT23/2091**

Calibrated at & Certificate issued by:

[redacted]

[redacted]

CUSTOMER [redacted]

ORDER No 20167403 Job No UKAS23/08579

DATE OF RECEIPT 17 August 2023

PROCEDURE Procedure TP 1 Calibration of Sound Calibrators

IDENTIFICATION Sound Calibrator 01dB type CAL21 serial number 34134164(2013) with one-inch housing and adapter type BAC21 for half-inch microphone

CALIBRATED ON 21 August 2023

PREVIOUS CALIBRATION Calibrated on 13 May 2022, Certificate No. UCRT22/1649 issued by this laboratory.

CERTIFICATE OF CALIBRATION

UKAS ACCREDITED CALIBRATION LABORATORY No 0653

Certificate No UCRT23/2091

MEASUREMENTS

The sound pressure level generated by the Sound Calibrator in its half-inch configuration was measured using a B&K type 4134 microphone with the protective grid in position. The microphone sensitivity was traceable to National Standards.

RESULTS

The mean level of the calibrator output, corrected to the standard atmospheric pressure of 101.3 kPa using manufacturers' data, was

93.99 ± 0.10 dB rel 20 µPa

The fundamental frequency of the sound output was 1001.95 ± 0.12 Hz,
and its total distortion was (2.57 ± 0.17) %.

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor *k* =2, providing a coverage probability of approximately 95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

During the measurements the laboratory environmental conditions were:

Temperature: 23 to 24 ºC
Atmospheric pressure: 101.3 to 101.4 kPa
Relative humidity: 34 to 44 %

The tests carried out were based on Annex B of BS EN 60942:2003, but with five determinations of sound pressure level, and limited to the above level(s) & freq(s). This is a subset of the tests specified in Annex B of BS EN 60942:1998. The mean level, frequency and total distortion of the sound output as measured meet the Class 1 requirements of BS EN 60942:1998 for the environmental conditions under which the tests were performed. This does not imply that the sound calibrator meets this standard under any other conditions. However it has successfully undergone pattern evaluation to the earlier Standard IEC 942:1988

The results on this certificate only relate to the items calibrated as identified above.

Calibrator adjusted No END R 1

CERTIFICATE OF CALIBRATION

0653

Date of Issue: 21 August 2023 **Certificate Number: UCRT23/2092**

[redacted]

[redacted]

CUSTOMER [redacted]

ORDER No 20167403 Job No UKAS23/08579

DATE OF RECEIPT 17 August 2023

PROCEDURE Procedure TP 1 Calibration of Sound Calibrators

IDENTIFICATION Sound Calibrator 01dB type CAL21 serial number 34924015(2012) with one-inch housing and adapter type BAC21 for half-inch microphone

CALIBRATED ON 21 August 2023

PREVIOUS CALIBRATION Calibrated on 07 February 2022, Certificate No. UCRT22/1184 issued by this laboratory.

CERTIFICATE OF CALIBRATION

UKAS ACCREDITED CALIBRATION LABORATORY No 0653

Certificate No UCRT23/2092

MEASUREMENTS

The sound pressure level generated by the Sound Calibrator in its half-inch configuration was measured using a B&K type 4134 microphone with the protective grid in position. The microphone sensitivity was traceable to National Standards.

RESULTS

The mean level of the calibrator output, corrected to the standard atmospheric pressure of 101.3 kPa using manufacturers' data, was

94.08 ± 0.10 dB rel 20 µPa

The fundamental frequency of the sound output was 1002.21 ± 0.12 Hz,
and its total distortion was (1.58 ± 0.11) %.

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor *k* =2, providing a coverage probability of approximately 95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

During the measurements the laboratory environmental conditions were:

Temperature: 24 to 25 ºC
Atmospheric pressure: 101.3 to 101.4 kPa
Relative humidity: 37 to 48 %

The tests carried out were based on Annex B of BS EN 60942:2003, but with five determinations of sound pressure level, and limited to the above level(s) & freq(s). This is a subset of the tests specified in Annex B of BS EN 60942:1998. The mean level, frequency and total distortion of the sound output as measured meet the Class 1 requirements of BS EN 60942:1998 for the environmental conditions under which the tests were performed. This does not imply that the sound calibrator meets this standard under any other conditions. However it has successfully undergone pattern evaluation to the earlier Standard IEC 942:1988

The results on this certificate only relate to the items calibrated as identified above.

Calibrator adjusted No END R 1

CERTIFICATE OF CALIBRATION

0653

Date of Issue: 21 October 2021 **Certificate Number: UCRT21/2301**

Calibrated at & Certificate issued by:

[redacted]

[redacted]

CUSTOMER [redacted]

ORDER No	20134892	Job No	UKAS21/10684

DATE OF RECEIPT 18 October 2021

PROCEDURE Calibration Engineer's Handbook, section 25: periodic testing of sound level meters to IEC 61672-3:2006 (BS EN 61672-3:2006) as modified by UKAS TPS 49 Edition 2:June 2009

IDENTIFICATION Sound level meter 01dB type FUSION serial No 10796 connected via an extension lead type RAL135-10M and preamplifier type PRE 22 serial No 10882 to a half-inch microphone type GRAS 40CE serial No 207588 fitted with a 'DMK01' weatherproof outdoor windshield including nosecone type RA 0208. Associated calibrator 01dB type CAL21 serial No 34254632(2015) with a one-inch housing and adapter type BAC21 for half-inch microphone.

CALIBRATED ON 21 October 2021

PREVIOUS CALIBRATION Calibrated on 29 August 2019, Certificate No. UCRT19/1943 issued by this laboratory.

The sound level meter was set up using the type CAL21 sound calibrator supplied; it was set to frequency weighting A, and initially read 94.0 dB. It was then adjusted to read 93.8 dB (corresponding to 93.8 dB at standard atmospheric pressure). This reading was derived from Calibration Certificate no. UCRT21/2295 supplied by this laboratory and manufacturers' information on the free-field response of the sound level meter when fitted with the windshield. The calibration check frequency was 1kHz.

Procedures from IEC 61672-3:2006 (BS EN 61672-3:2006) as modified by UKAS TPS 49 Edition 2:June 2009 were used to perform the periodic tests.

RESULTS

The sound level meter submitted for testing has successfully completed the class 1 periodic tests of IEC 61672-3:2006 (BS EN 61672-3:2006), for the environmental conditions under which the tests were performed. As public evidence was available, from an independent testing organization responsible for approving the results of pattern evaluation tests performed in accordance with IEC 61672-2 : 2003 (BS EN 61672-2 : 2003), to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1 : 2002 (BS EN 61672-1 : 2003), the sound level meter submitted for testing conforms to the class 1 requirements of IEC 61672-1 : 2002 (BS EN 61672-1 2003).

The self-generated noise recorded with the microphone replaced by the electrical input device was:

14.5 dB (A) 15.2 dB (C) 18.1 dB (Z)

The environmental conditions recorded at the start and end of testing were:

Start: 22 to 23 ºC, 31 to 41 %RH and 100.1 to 100.2 kPa
End: 24 to 25 ºC, 38 to 48 %RH and 100.1 to 100.2 kPa

Technical information including adjustment data specified in the manufacturers' User Manual DOC1131 - Feb 2017 J with further clarification from 01dB has been used to carry out this verification. These data include manufacturer-specified uncertainties for case reflections and windshield, but NOT for the microphone response.

Publicly-available evidence has been found that this configuration of the 01dB FUSION sound level meter design has successfully undergone pattern evaluation in accordance with IEC 61672-2:2002 (BS EN 61672-2:2003) by Physikalisch-Technische Bundesanstalt (PTB), an independent testing organisation responsible for pattern approvals.

All measurement data are held at ANV Measurement Systems for a period of at least six years.

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor *k* =2, providing a coverage probability of approximately 95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

CERTIFICATE OF CALIBRATION

UKAS ACCREDITED CALIBRATION LABORATORY No 0653

Certificate No UCRT21/2301

NOTES

Any opinions or interpretations which may be expressed in the following notes are not UKAS Accredited.

1 The high pass filter was set to 10 Hz, the mic correction to 90° and the nosecone usage to "Yes".

2 No suitable microphone frequency response information was supplied with the instrument. It was therefore measured by this laboratory using the electrostatic actuator method. This response in isolation is not UKAS accredited.

3 The instrument was running application firmware version 2.34 and metrology firmware version 2.10 on hardware version LIS006E

4 These periodic tests are valid ONLY for the instrument configuration shown on page 1 of this certificate and for 90° incidence of sound on the microphone.

5 When set up to read correctly in response to the sound calibrator, the sound level meter stored a calibration correction of 0.32 dB and a microphone sensitivity of 37.5 mV/Pa

6 Typical case reflection factors (for the DMK01 unit) specified by the manufacturer have been used for this verification.

The results on this certificate only relate to the items calibrated as identified above.

END

CERTIFICATE OF CALIBRATION

0653

Date of Issue: 22 October 2021 **Certificate Number: UCRT21/2313**

[redacted]

[redacted]

CUSTOMER [redacted]

ORDER No 20134892 Job No UKAS21/10684

DATE OF RECEIPT 18 October 2021

PROCEDURE Calibration Engineer's Handbook section 3: verification of sound level meters to BS 7580:Part 1:1997

IDENTIFICATION Sound level meter 01dB type Blue Solo (Master) serial No 61331 connected via a RAL122-10m extension lead and preamplifier type PRE21S serial No 14575 to a half-inch microphone type MCE212 serial No 92344. Associated calibrator Norsonic type 1251 serial No 31460 with a one-inch housing and adapter type 1443 for half-inch microphone.

CALIBRATED ON 22 October 2021

PREVIOUS CALIBRATION Calibrated on 03 May 2019 Certificate No. UCRT19/1544 issued by this laboratory.

The sound level meter was set to frequency weighting A and adjusted to read 114.0 dB (corresponding to 114.0 dB at standard atmospheric pressure) in response to the sound calibrator supplied. This reading was derived from the Calibration Certificate No. UCRT21/2292 supplied by this laboratory and manufacturers' information on the free-field response of the sound level meter .

The sound level meter was then tested, and its overall sensitivity adjusted, in accordance with clause 5 of BS 7580:Part 1:1997 **

The acoustic calibration at 1kHz specified in subclause 5.6.1 of the standard was performed by application of a standard sound calibrator, whilst the tests at 125Hz and 8kHz (subclause 5.6.2) were performed by the electrostatic actuator method.

At the end of the test, the sound calibrator was reapplied to the sound level meter and the meter reading was recorded. The final sensitivity setting in calibration mode was -0.3 dB.

RESULTS

The sound level meter was found to conform to BS 7580:Part 1:1997 ** for a type 1 meter.

The self-generated noise recorded in the test specified in subclause 5.5.2 was:

9.2 dB (A)	8.0 dB (B)	9.5 dB (C)	13.8 dB (Lin)

The sound level meter reading obtained at the end of the test in response to the sound calibrator was 114.0 dB (corresponding to 114.0 dB at standard atmospheric pressure). This reading, corrected for ambient pressure, should be used henceforth to set up the sound level meter for field use.

The expanded level uncertainty of the Laboratory's 1 kHz sound calibrator used during this verification is ± 0.10 dB; that of the calibrator supplied with the sound level meter is ± 0.10 dB.

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor *k* =2, providing a coverage probability of approximately 95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

All measurement data are held at ANV Measurement Systems for a period of at least six years.

The case reflection factors have been taken as zero, since an extension lead has been used for this verification.

The linearity range and primary indicator range have been obtained from the manufacturer, and are stated to cover the entire measurement range of the instrument, 20 - 137 dB, as given in the handbook (dated 18 June 2003). The maximum level for signals of crest factor 3 has been interpreted from the handbook as 130 dB(A).

The 01dB Solo sound level meter design has successfully undergone pattern evaluation at Physikalisch-Technische Bundesanstalt (PTB). It was found to meet the requirements of BS EN 60651* and BS EN 60804* and was granted pattern approval as a Type 1 sound level meter.

No component of uncertainty for manufacturer-specified corrections has been included in the uncertainty budget and, in accordance with Amendment No 1 to BS 7580:Part 1:1997 ** the measured values obtained during the verification have not been extended by any measurement uncertainty when assessing conformance to the standard.

Conformance as indicated above to BS 7580:Part 1:1997 indicates that the instrument conforms with the relevant accuracy requirements of the testing standard and the expanded measurement uncertainties (*k* =2 for approximately 95% coverage probability) are no greater in magnitude than the accuracy requirements defined in BS 7580:Part 1:1997.

CERTIFICATE OF CALIBRATION

UKAS ACCREDITED CALIBRATION LABORATORY No 0653

Certificate No UCRT21/2313

NOTES

*1 BS EN 60651:1994 and BS EN 60804:1994 were formerly numbered BS 5969:1981 and BS 6698:1986 respectively.

**2 BS 7580:Part 1:1997 was formerly numbered BS 7580:1992.

3 No suitable microphone frequency response information was supplied with the instrument. It was therefore measured by this laboratory using the electrostatic actuator method. This response in isolation is not UKAS accredited.

4 The instrument firmware version was 1.401 2726 01107

5 The verification was carried out in L_p / L_{eq} SLM mode only, and may not be valid for any other mode.

6 The frequency weighting designated Z in the meter has been taken as equivalent to *Lin* weighting of BS EN 60651:1994.

7 The foam windshield supplied with the instrument was not used or taken into account during the verification.

8 Any opinions or interpretations which may be expressed in these notes are not UKAS Accredited.

The results on this certificate only relate to the items calibrated as identified above.

END

CERTIFICATE OF CALIBRATION

0653

Date of Issue: 17 May 2023 **Certificate Number: UCRT23/1674**

Calibrated at & Certificate issued by:

[redacted]

[redacted]

CUSTOMER [redacted]

ORDER No	20161234	Job No	UKAS23/05334

DATE OF RECEIPT 11 May 2023

PROCEDURE Calibration Engineer's Handbook, section 25: periodic testing of sound level meters to IEC 61672-3:2006 (BS EN 61672-3:2006) as modified by UKAS TPS 49

IDENTIFICATION Sound level meter 01dB type DUO serial No 10594 connected via an extension lead type RAL135-10M and preamplifier type PRE 22 serial No 1507076 to a half-inch microphone type GRAS 40CD serial No 224313 fitted with a 'DMK01' weatherproof outdoor windshield including nosecone type RA 0208. Associated calibrator 01dB type CAL21 serial No 34924020(2012) with a one-inch housing and adapter type BAC21 for half-inch microphone.

CALIBRATED ON 17 May 2023

PREVIOUS CALIBRATION Calibrated on 13 April 2021, Certificate No. UCRT21/1488 issued by this laboratory.

CERTIFICATE OF CALIBRATION

UKAS ACCREDITED CALIBRATION LABORATORY No 0653

The sound level meter was set up using the type CAL21 sound calibrator supplied; it was set to frequency weighting A, and initially read 94.1 dB. It was then adjusted to read 93.9 dB (corresponding to 93.9 dB at standard atmospheric pressure). This reading was derived from Calibration Certificate no. UCRT23/1654 supplied by this laboratory and manufacturers' information on the free-field response of the sound level meter when fitted with the windshield. The calibration check frequency was 1kHz.

Procedures from IEC 61672-3:2006 (BS EN 61672-3:2006) as modified by UKAS TPS 49 were used to perform the periodic tests.

RESULTS

The sound level meter submitted for testing has successfully completed the class 1 periodic tests of IEC 61672-3:2006 (BS EN 61672-3:2006), for the environmental conditions under which the tests were performed. As public evidence was available, from an independent testing organization responsible for approving the results of pattern evaluation tests performed in accordance with IEC 61672-2 : 2003 (BS EN 61672-2 : 2003), to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1 : 2002 (BS EN 61672-1 : 2003), the sound level meter submitted for testing conforms to the class 1 requirements of IEC 61672-1 : 2002 (BS EN 61672-1 2003).

The self-generated noise recorded with the microphone replaced by the electrical input device was:

11.8 dB (A) 13.4 dB (C) 18.2 dB (Z)

The environmental conditions recorded at the start and end of testing were:

Start: 22 to 23 ºC, 49 to 59 %RH and 101.7 to 101.8 kPa
End: 22 to 23 ºC, 48 to 58 %RH and 101.7 to 101.8 kPa

Technical information including adjustment data specified in the manufacturers' User Manual DOC1112 - May 2015 H with further clarification from 01dB has been used to carry out this verification. These data include manufacturer-specified uncertainties for case reflections and windshield, but NOT for the microphone response.

Publicly-available evidence has been found that this configuration of the 01dB DUO sound level meter design has successfully undergone pattern evaluation in accordance with IEC 61672-2:2002 (BS EN 61672-2:2003) by Physikalisch-Technische Bundesanstalt (PTB), an independent testing organisation responsible for pattern approvals.

All measurement data are held at ANV Measurement Systems for a period of at least six years.

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor *k* =2, providing a coverage probability of approximately 95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

CERTIFICATE OF CALIBRATION

UKAS ACCREDITED CALIBRATION LABORATORY No 0653

Certificate No UCRT23/1674

NOTES

Any opinions or interpretations which may be expressed in the following notes are not UKAS Accredited.

1 The high pass filter was set to 10 Hz, the mic correction to 90° and the nosecone usage to "Yes".

2 No suitable microphone frequency response information was supplied with the instrument. It was therefore measured by this laboratory using the electrostatic actuator method. This response in isolation is not UKAS accredited.

3 The instrument was running application firmware version 2.49 and metrology firmware version 2.12 on hardware version LIS1005G

4 These periodic tests are valid ONLY for the instrument configuration shown on page 1 of this certificate and for 90° incidence of sound on the microphone.

5 When set up to read correctly in response to the sound calibrator, the sound level meter stored a calibration correction of 0.4 dB and a microphone sensitivity of 49.54 mV/Pa

6 Typical case reflection factors (for the DMK01 unit) specified by the manufacturer have been used for this verification.

The results on this certificate only relate to the items calibrated as identified above.

END

CERTIFICATE OF CALIBRATION

0653

Date of Issue: 18 May 2023 **Certificate Number: UCRT23/1677**

Calibrated at & Certificate issued by:

[redacted]

[redacted]

CUSTOMER [redacted]

ORDER No	20161234	Job No	UKAS23/05333

DATE OF RECEIPT 11 May 2023

PROCEDURE Calibration Engineer's Handbook, section 25: periodic testing of sound level meters to IEC 61672-3:2006 (BS EN 61672-3:2006) as modified by UKAS TPS 49

IDENTIFICATION Sound level meter 01dB type DUO serial No 10616 connected via an extension lead type RAL135-10M and preamplifier type PRE 22 serial No 10180 to a half-inch microphone type GRAS 40CD serial No 154423 fitted with a 'DMK01' weatherproof outdoor windshield including nosecone type RA 0208. Associated calibrator 01dB type CAL21 serial No 34924053(2012) with a one-inch housing and adapter type BAC21 for half-inch microphone.

CALIBRATED ON 18 May 2023

PREVIOUS CALIBRATION Calibrated on 01 June 2021, Certificate No. UCRT21/1686 issued by this laboratory.

The sound level meter was set up using the type CAL21 sound calibrator supplied; it was set to frequency weighting A, and initially read 94.0 dB. It was then adjusted to read 93.9 dB (corresponding to 93.9 dB at standard atmospheric pressure). This reading was derived from Calibration Certificate no. UCRT23/1652 supplied by this laboratory and manufacturers' information on the free-field response of the sound level meter when fitted with the windshield. The calibration check frequency was 1kHz.

Procedures from IEC 61672-3:2006 (BS EN 61672-3:2006) as modified by UKAS TPS 49 were used to perform the periodic tests.

RESULTS

The sound level meter submitted for testing has successfully completed the class 1 periodic tests of IEC 61672-3:2006 (BS EN 61672-3:2006), for the environmental conditions under which the tests were performed. As public evidence was available, from an independent testing organization responsible for approving the results of pattern evaluation tests performed in accordance with IEC 61672-2 : 2003 (BS EN 61672-2 : 2003), to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1 : 2002 (BS EN 61672-1 : 2003), the sound level meter submitted for testing conforms to the class 1 requirements of IEC 61672-1 : 2002 (BS EN 61672-1 2003).

The self-generated noise recorded with the microphone replaced by the electrical input device was:

12.1 dB (A) 14.3 dB (C) 18.9 dB (Z)

The environmental conditions recorded at the start and end of testing were:

Start: 21 to 23 ºC, 47 to 57 %RH and 101.8 to 101.9 kPa
End: 22 to 23 ºC, 45 to 55 %RH and 101.7 to 101.8 kPa

Technical information including adjustment data specified in the manufacturers' User Manual DOC1112 - May 2015 H with further clarification from 01dB has been used to carry out this verification. These data include manufacturer-specified uncertainties for case reflections and windshield, but NOT for the microphone response.

Publicly-available evidence has been found that this configuration of the 01dB DUO sound level meter design has successfully undergone pattern evaluation in accordance with IEC 61672-2:2002 (BS EN 61672-2:2003) by Physikalisch-Technische Bundesanstalt (PTB), an independent testing organisation responsible for pattern approvals.

All measurement data are held at ANV Measurement Systems for a period of at least six years.

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor *k* =2, providing a coverage probability of approximately 95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

CERTIFICATE OF CALIBRATION

UKAS ACCREDITED CALIBRATION LABORATORY No 0653

Certificate No UCRT23/1677

NOTES

Any opinions or interpretations which may be expressed in the following notes are not UKAS Accredited.

1 The high pass filter was set to 10 Hz, the mic correction to 90° and the nosecone usage to "Yes".

2 No suitable microphone frequency response information was supplied with the instrument. It was therefore measured by this laboratory using the electrostatic actuator method. This response in isolation is not UKAS accredited.

3 The instrument was running application firmware version 2.34 and metrology firmware version 2.10 on hardware version 3F2D3D

4 These periodic tests are valid ONLY for the instrument configuration shown on page 1 of this certificate and for 90° incidence of sound on the microphone.

5 When set up to read correctly in response to the sound calibrator, the sound level meter stored a calibration correction of 0.17 dB and a microphone sensitivity of 49 mV/Pa

6 Typical case reflection factors (for the DMK01 unit) specified by the manufacturer have been used for this verification.

The results on this certificate only relate to the items calibrated as identified above.

END

CERTIFICATE OF CALIBRATION

0653

Date of Issue: 23 September 2022 **Certificate Number: UCRT22/2136**

[redacted]

[redacted]

CUSTOMER [redacted]

ORDER No 20151187 Job No UKAS22/09596

DATE OF RECEIPT 22 September 2022

PROCEDURE Calibration Engineer's Handbook section 3: verification of sound level meters to BS 7580:Part 1:1997

IDENTIFICATION Sound level meter 01dB type Black Solo (Master) serial No 65806 connected via a RAL122-10M extension lead and preamplifier type PRE21S serial No 16461 to a half-inch microphone type MCE212 serial No 166412. Associated calibrator 01dB type CAL21 serial No 34323904(2012) with a one-inch housing and adapter type BAC21 for half-inch microphone.

CALIBRATED ON 23 September 2022

PREVIOUS CALIBRATION Calibrated on 20 December 2021 Certificate No. UCRT21/2541 issued by this laboratory.

The sound level meter was set to frequency weighting A and adjusted to read 93.8 dB (corresponding to 93.8 dB at standard atmospheric pressure) in response to the sound calibrator supplied. This reading was derived from the Calibration Certificate No. UCRT22/2131 supplied by this laboratory and manufacturers' information on the free-field response of the sound level meter .

The sound level meter was then tested, and its overall sensitivity adjusted, in accordance with clause 5 of BS 7580:Part 1:1997 **

The acoustic calibration at 1kHz specified in subclause 5.6.1 of the standard was performed by application of a standard sound calibrator, whilst the tests at 125Hz and 8kHz (subclause 5.6.2) were performed by the electrostatic actuator method.

At the end of the test, the sound calibrator was reapplied to the sound level meter and the meter reading was recorded. The final sensitivity setting in calibration mode was 0.4 dB.

RESULTS

The sound level meter was found to conform to BS 7580:Part 1:1997 ** for a type 1 meter.

The self-generated noise recorded in the test specified in subclause 5.5.2 was:

9.7 dB (A)	8.5 dB (B)	9.8 dB (C)	14.5 dB (Lin)

The sound level meter reading obtained at the end of the test in response to the sound calibrator was 93.8 dB (corresponding to 93.8 dB at standard atmospheric pressure). This reading, corrected for ambient pressure, should be used henceforth to set up the sound level meter for field use.

The expanded level uncertainty of the Laboratory's 1 kHz sound calibrator used during this verification is ± 0.10 dB; that of the calibrator supplied with the sound level meter is ± 0.10 dB.

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor *k* =2, providing a coverage probability of approximately 95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

All measurement data are held at ANV Measurement Systems for a period of at least six years.

The case reflection factors have been taken as zero, since an extension lead has been used for this verification.

The linearity range and primary indicator range have been obtained from the manufacturer, and are stated to cover the entire measurement range of the instrument, 20 - 137 dB, as given in the handbook (dated 18 June 2003). The maximum level for signals of crest factor 3 has been interpreted from the handbook as 130 dB(A).

The 01dB Solo sound level meter design has successfully undergone pattern evaluation at Physikalisch-Technische Bundesanstalt (PTB). It was found to meet the requirements of BS EN 60651* and BS EN 60804* and was granted pattern approval as a Type 1 sound level meter.

No component of uncertainty for manufacturer-specified corrections has been included in the uncertainty budget and, in accordance with Amendment No 1 to BS 7580:Part 1:1997 ** the measured values obtained during the verification have not been extended by any measurement uncertainty when assessing conformance to the standard.

Conformance as indicated above to BS 7580:Part 1:1997 indicates that the instrument conforms with the relevant accuracy requirements of the testing standard and the expanded measurement uncertainties (*k* =2 for approximately 95% coverage probability) are no greater in magnitude than the accuracy requirements defined in BS 7580:Part 1:1997.

CERTIFICATE OF CALIBRATION

UKAS ACCREDITED CALIBRATION LABORATORY No 0653

Certificate No UCRT22/2136

NOTES

*1 BS EN 60651:1994 and BS EN 60804:1994 were formerly numbered BS 5969:1981 and BS 6698:1986 respectively.

**2 BS 7580:Part 1:1997 was formerly numbered BS 7580:1992.

3 No suitable microphone frequency response information was supplied with the instrument. It was therefore measured by this laboratory using the electrostatic actuator method. This response in isolation is not UKAS accredited.

4 The instrument firmware version was 1.405 272A 01107

5 The verification was carried out in L_p / L_{eq} SLM mode only, and may not be valid for any other mode.

6 The frequency weighting designated Z in the meter has been taken as equivalent to *Lin* weighting of BS EN 60651:1994.

7 Any opinions or interpretations which may be expressed in these notes are not UKAS Accredited.

The results on this certificate only relate to the items calibrated as identified above.

END

Annex B
Baseline Monitoring Results

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HDD-01-NML1

Monitoring Position:
X: 500883
Y: 101633

What3Words:
Descended.spoon.tour

Location:
Climping

Duration:
27/03/2023 15:00 - 28/03/2023 13:15

Description of monitoring location

The Sound Level Meter (SLM) was deployed along the eastern boundary of a hedge bounding garden. The SLM was located approximately 2.5m above ground in a free-field position, approximately 30m from the closest acoustically reflective façade.

General observations

The noise environment noted during SLM deployment and collection was generally quiet, and typical of a rural location. Noise from distant road traffic movements, along with birdsong, sound of the waves from the sea to the south and noise from tractors in the nearby fields contributed to the overall noise environment.

Monitoring Position

Assessment Period		$L_{Aeq,T}$ (dB)	$L_{A90,T}$ (dB) [mean average]	Total no. of 15-minute periods	Total no. of 15-minute periods affected by weather	Affected by weather %
Construction daytime	**Monday – Sunday** 0700 – 1900	49	42	88	2	2
Construction evenings	**Monday – Sunday** 1900 – 2300	41	37			
Construction night-time	**Monday – Sunday** 2300 – 0700	49	44			

HDD-02-NML2

Monitoring Position:
X: 501610
Y: 101251

What3Words:
Mixed.Monks.Loaf

Location:
Climping

Duration:
27/03/2023 15:00 - 28/03/2023 13:00

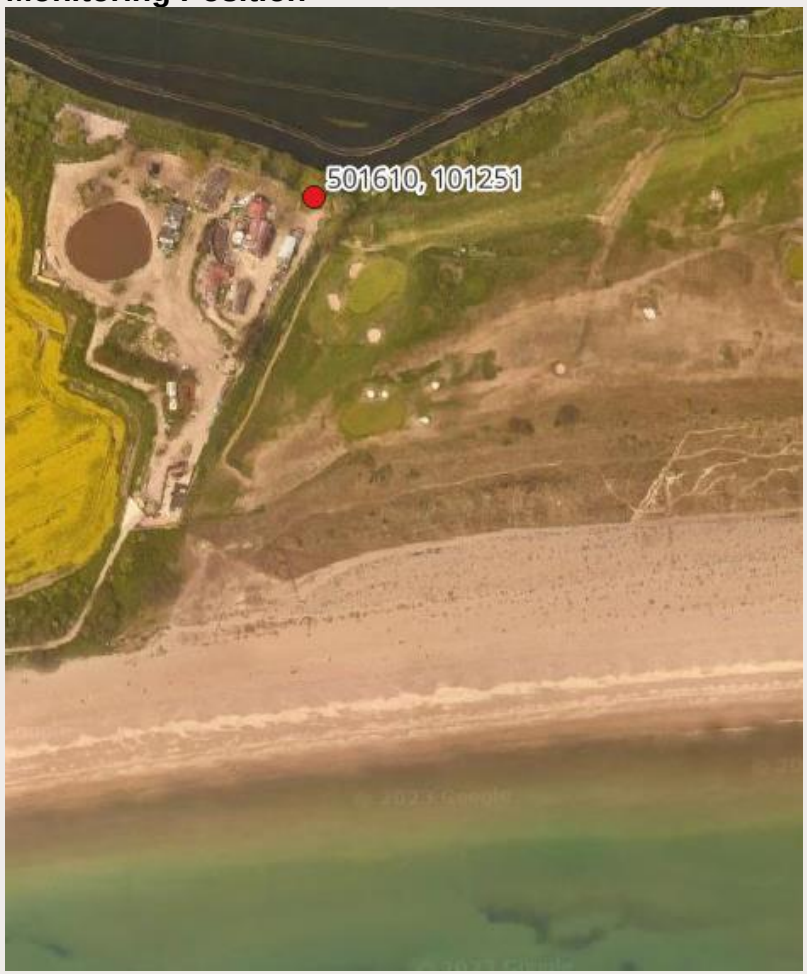
Description of monitoring location

The SLM was deployed along the north of a fence/bund bounding garden. The SLM was located approximately 2.5m above ground in a free-field position, approximately 30m from the closest acoustically reflective façade.

General observations

The noise environment noted during SLM deployment and collection was generally quiet, and typical of a rural location. Noise from activity on golf course 20m to the east, along with birdsong, sound of the waves from the sea to the south contributed to the overall noise environment.

Monitoring Position



Assessment Period		$L_{Aeq,T}$ (dB)	$L_{A90,T}$ (dB) [mean average]	Total no. of 15-minute periods	Total no. of 15-minute periods affected by weather	Affected by weather %
Construction daytime	**Monday – Sunday** 0700 – 1900	53	46	88	2	2
Construction evenings	**Monday – Sunday** 1900 – 2300	41	37			
Construction night-time	**Monday – Sunday** 2300 – 0700	51	48			

HDD-07-NML5

Monitoring Position:
X: 502465
Y: 104611

What3Words:
share.tuck.living

Location:
Lyminster

Duration:
16/11/2023 15:00 - 17/11/2023 10:45

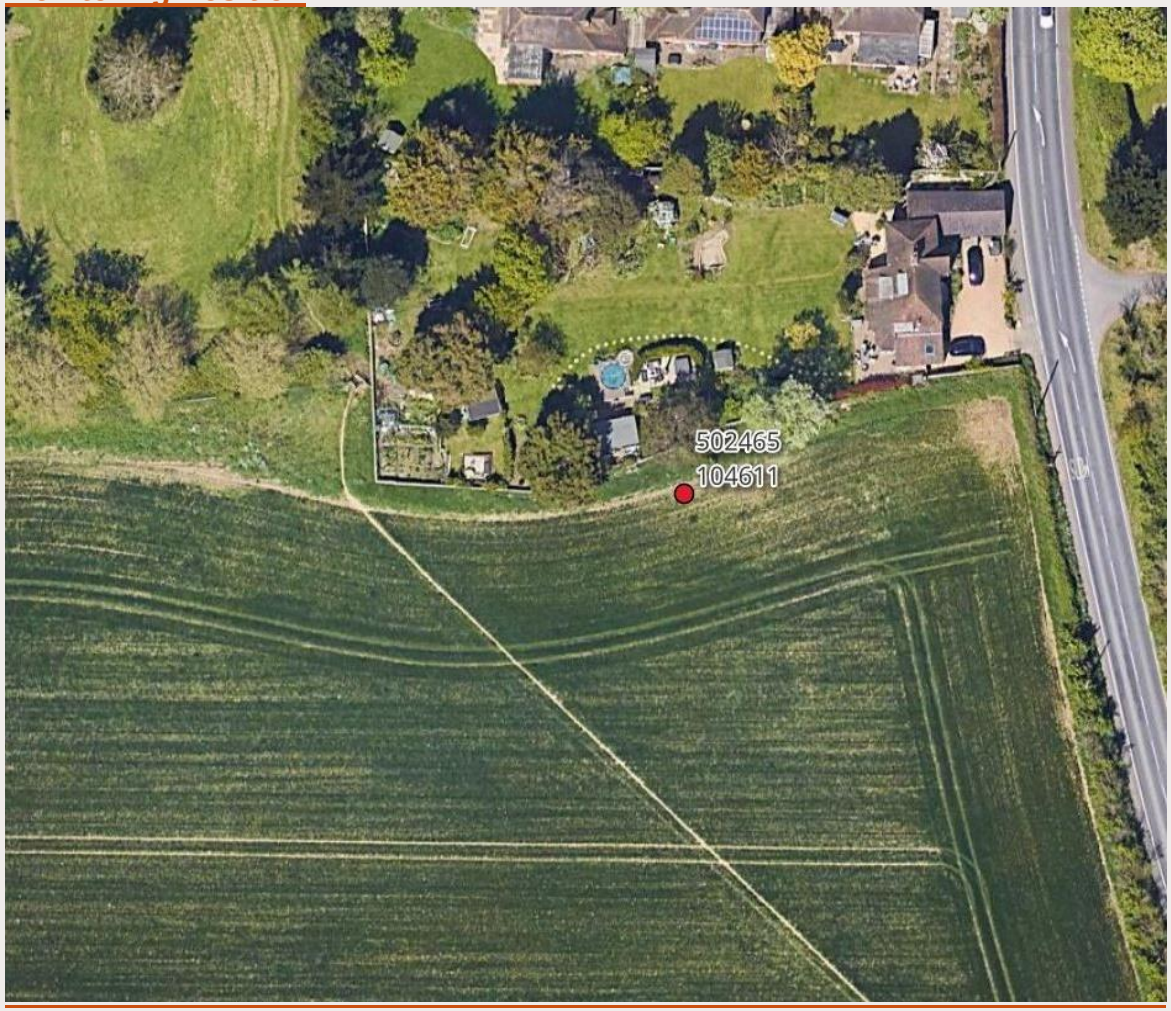
Description of monitoring location

The SLM was deployed along the northern boundary of an agricultural field directly to the west of Lyminster road, and to the north of Brookside Caravan Park. The SLM was located approximately 1.5m above ground in a free-field position.

General observations

The noise environment noted during SLM deployment and collection was dominated by the traffic activity along A 284, and occasional aircrafts. Animal noise from the local dog activity in the area to the north, along with birdsong also contributed to the overall noise environment.

Monitoring Position



Assessment Period		$L_{Aeq,T}$ (dB)	$L_{A90,T}$ (dB) [mean average]	Total no. of 15-minute periods	Total no. of 15-minute periods affected by weather	Affected by weather %
Construction daytime	Monday – Sunday 0700 – 1900	50	44	80	2	3
Construction evenings	Monday – Sunday 1900 – 2300	46	37			
Construction night-time	Monday – Sunday 2300 – 0700	46	34			

HDD-18-NML14

Monitoring Position:
X: 512062
Y: 113021

What3Words:
shorthand.dish.falters

Location:
Washington

Duration:
16/11/2023 12:15 - 17/11/2023 10:00

Description of monitoring location

The SLM was deployed west of the Memorial Hall, at the southeastern corner of a recreational field directly to the north of St Marys C of E Primary School. The SLM was located approximately 1.5m above ground in a free-field position, approximately 13m from the closest acoustically reflective façade.

General observations

The noise environment noted during SLM deployment and collection was generally dominated by road traffic movements from the A24/London Road, and occasional pedestrian activity along the local walkway. Noise from a slight breeze through the trees, and birdsong were also noted in the area.

Monitoring Position

Assessment Period		$L_{Aeq,T}$ (dB)	$L_{A90,T}$ (dB) [mean average]	Total no. of 15-minute periods	Total no. of 15-minute periods affected by weather	Affected by weather %
Construction daytime	Monday – Sunday 0700 – 1900	68	52	80	7	9
Construction evenings	Monday – Sunday 1900 – 2300	49	44			
Construction night-time	Monday – Sunday 2300 – 0700	45	37			

HDD-22-NML18

Monitoring Position:
X: 516958
Y: 114775

What3Words:
Spelling.places.securing

Location:
Horsham

Duration:
28/03/2023 16:00 - 29/03/2023 11:00

Description of monitoring location
The SLM was deployed on a fence post to the south of the nearby property. The SLM was located approximately 2.5m above ground in a free-field position, approximately 30m from the closest acoustically reflective façade.

General observations
The noise environment noted during SLM deployment and collection was generally quiet, and typical of a rural location. Noise from a slight breeze through the trees, occasional noise from activity at stables located 30m north of SLM and very distant road traffic noise contributed to the overall noise environment.

Monitoring Position

Assessment Period		$L_{Aeq,T}$ (dB)	$L_{A90,T}$ (dB) [mean average]		Total no. of 15-minute periods	Total no. of 15-minute periods affected by weather	Affected by weather %
Construction daytime	**Monday – Sunday** 0700 – 1900	49	40	76	1	1	
Construction evenings	**Monday – Sunday** 1900 – 2300	37	32				
Construction night-time	**Monday – Sunday** 2300 – 0700	37	26				

HDD-23-NML19

Monitoring Position:
X: 517984
Y: 115589

What3Words:
Proofread.runner.views

Location:
Horsham

Duration:
28/03/2023 11:00 - 29/03/2023 10:00

Description of monitoring location
The SLM was deployed approximately 20m east of the B2135. The SLM was located approximately 1.5m above ground in a free-field position, approximately 1m from the closest acoustically reflective façade.

General observations
The noise environment noted during SLM deployment and collection was generally dominated by road traffic movements from the B2135. Noise from a slight breeze through the trees, occasional aircraft noise, with some occasional dog barking and birdsong present.

Monitoring Position

Assessment Period		$L_{Aeq,T}$ (dB)	$L_{A90,T}$ (dB) [mean average]	Total no. of 15-minute periods	Total no. of 15-minute periods affected by weather	Affected by weather %
Construction daytime	**Monday – Sunday** 0700 – 1900	56	40	92	4	4
Construction evenings	**Monday – Sunday** 1900 – 2300	50	35			
Construction night-time	**Monday – Sunday** 2300 – 0700	47	34			

HDD-24-NML20

Monitoring Position:
X: 518753
Y: 116794

What3Words:
code.testers.stood

Location:
Horsham

Duration:
28/03/2023 14:00 - 29/03/2023 11:30

Description of monitoring location

The SLM was deployed in the south east corner of the field. The SLM was located approximately 1.5m above ground in a free-field position.

General observations

The noise environment noted during SLM deployment and collection was generally quiet, and typical of a rural location. Noise from distant road traffic movements on the B2135 and occasional aircraft noise.

Monitoring Position

Assessment Period		$L_{Aeq,T}$ (dB)	$L_{A90,T}$ (dB) [mean average]	Total no. of 15-minute periods	Total no. of 15-minute periods affected by weather	Affected by weather %
Construction daytime	**Monday – Sunday** 0700 – 1900	53	44	86	3	3
Construction evenings	**Monday – Sunday** 1900 – 2300	51	31			
Construction night-time	**Monday – Sunday** 2300 – 0700	45	25			

HDD-25-NML21

Monitoring Position:
X: 518726
Y: 117193

What3Words:
deflection.ticked.blotches
Location:
Horsham

Duration:
28/03/2023 13:30 - 29/03/2023 11:00

Description of monitoring location
The SLM was deployed in the northwest corner of the field. The SLM was located approximately 1.5m above ground in a free-field position.

General observations
The noise environment noted during SLM deployment and collection was generally quiet, and typical of a rural location. Noise from distant road traffic movements on the B2135, occasional aircraft noise and birdsong present.

Monitoring Position

Assessment Period		$L_{Aeq,T}$ (dB)	$L_{A90,T}$ (dB) [mean average]	Total no. of 15-minute periods	Total no. of 15-minute periods affected by weather	Affected by weather %
Construction daytime	**Monday – Sunday** 0700 – 1900	50	42	86	2	2
Construction evenings	**Monday – Sunday** 1900 – 2300	46	30			
Construction night-time	**Monday – Sunday** 2300 – 0700	42	24			

HDD-26-NML22

Monitoring Position:
X: 520943
Y: 120032

What3Words:
signature.templates.magic
Location:
Horsham

Duration:
27/03/2023 14:00 - 28/03/2023 12:15

Description of monitoring location
The SLM was deployed in the tree line to the west of the A281. The SLM was located approximately 1.5m above ground in a free-field position.

General observations
The noise environment noted during SLM deployment and collection was generally dominated by road traffic movements from the A281. Noise from a slight breeze through the trees and birdsong present.

Monitoring Position

Assessment Period		$L_{Aeq,T}$ (dB)	$L_{A90,T}$ (dB) [mean average]	Total no. of 15-minute periods	Total no. of 15-minute periods affected by weather	Affected by weather %
Construction daytime	**Monday – Sunday** 0700 – 1900	57	46	89	2	2
Construction evenings	**Monday – Sunday** 1900 – 2300	52	31			
Construction night-time	**Monday – Sunday** 2300 – 0700	52	27			

HDD-27-NML23

Monitoring Position:
X: 521495
Y: 120240

What3Words:
refreshed.triads.flask
Location:
Horsham

Duration:
28/03/2023 17:00 - 29/03/2023 10:00

Description of monitoring location

The SLM was deployed in the field to the north of the nearby property. The SLM was located approximately 2.5m above ground in a free-field position, about 1.5m away from the closest acoustically reflective façade.

General observations

The noise environment noted during SLM deployment and collection was generally quiet, and typical of a rural location. Noise from distant road traffic movements on the A281, occasional aircraft noise.

Monitoring Position

Assessment Period		$L_{Aeq,T}$ (dB)	$L_{A90,T}$ (dB) [mean average]	Total no. of 15-minute periods	Total no. of 15-minute periods affected by weather	Affected by weather %
Construction daytime	**Monday – Sunday** 0700 – 1900	47	36	68	2	3
Construction evenings	**Monday – Sunday** 1900 – 2300	38	26			
Construction night-time	**Monday – Sunday** 2300 – 0700	40	21			

HDD-31-NML25

Monitoring Position:
X: 523897
Y: 121808

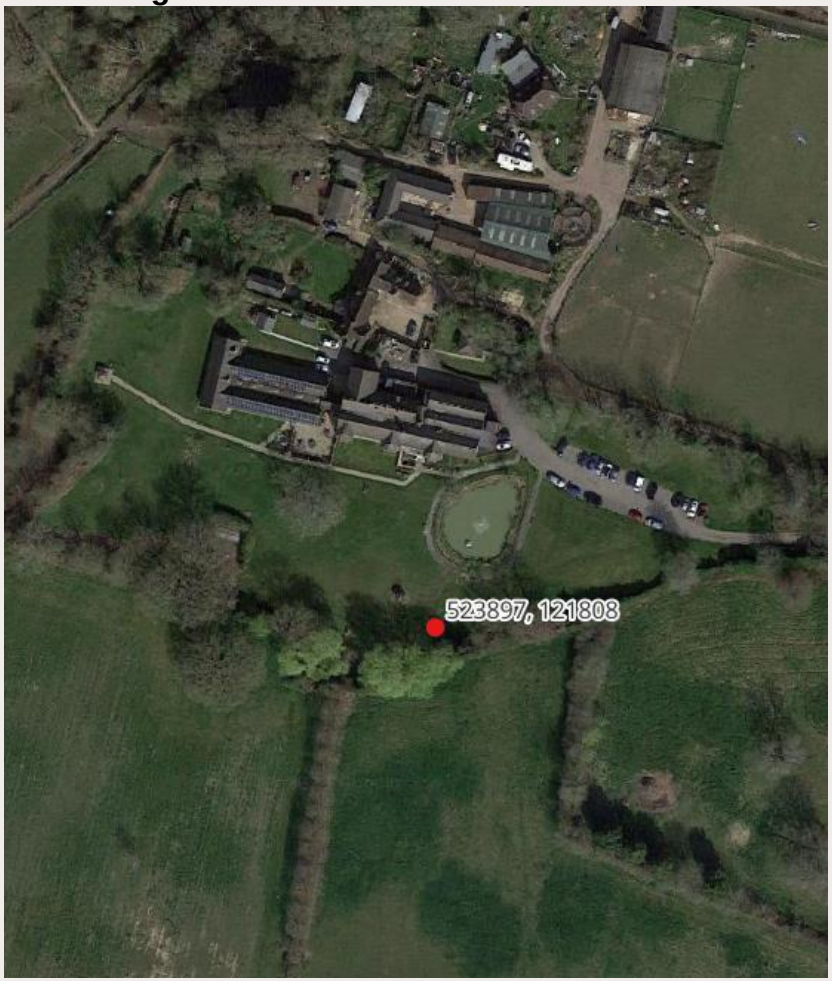
What3Words:
grumbling.stages.steroids
Location:
Horsham

Duration:
28/03/2023 12:30 - 28/03/2023 11:45

Description of monitoring location
The SLM was deployed on the southern boundary of the nursing home. The SLM was located approximately 1.5m above ground in a free-field position, approximately 50m from the closest acoustically reflective façade.

General observations
The noise environment noted during SLM deployment and collection was generally quiet, with fountain noise from the pound being the dominant noise source. Noise from cars using the entrance land and car park, distant road traffic movements on Wineham Lane and birdsong present.

Monitoring Position



Assessment Period		$L_{Aeq,T}$ (dB)	$L_{A90,T}$ (dB) [mean average]	Total no. of 15-minute periods	Total no. of 15-minute periods affected by weather	Affected by weather %
Construction daytime	**Monday – Sunday** 0700 – 1900	51	47	93	2	2
Construction evenings	**Monday – Sunday** 1900 – 2300	49	48			
Construction night-time	**Monday – Sunday** 2300 – 0700	46	31			

HDD-34-NML28

Monitoring Position:
X: 506229
Y: 105876

What3Words:
maker.incorrect.renting
Location:
Arun

Duration:
28/03/2023 12:30 - 28/03/2023 10:00

Description of monitoring location
The SLM was deployed on a fencepost to the north east of the closest property. The SLM was located approximately 2.5m above ground in a free-field position, approximately 6m from the closest acoustically reflective façade.

General observations
The noise environment noted during SLM deployment and collection was generally dominated by road traffic movements from the A27. Noise from a slight breeze through the trees and birdsong present. Potential dawn chorus, geese live in nearby pond to the south west. Roads were wet for the duration of the measurement.

Monitoring Position

Assessment Period		$L_{Aeq,T}$ (dB)	$L_{A90,T}$ (dB) [mean average]	Total no. of 15-minute periods	Total no. of 15-minute periods affected by weather	Affected by weather %
Construction daytime	**Monday – Sunday** 0700 – 1900	65	62	86	3	3
Construction evenings	**Monday – Sunday** 1900 – 2300	59	53			
Construction night-time	**Monday – Sunday** 2300 – 0700	54	38			

HDD-35-NML29

Monitoring Position:
X: 506669
Y: 105838

What3Words:
urban.shadow.argue
Location:
Arun

Duration:
27/03/2023 13:00 - 28/03/2023 11:00

Description of monitoring location
The SLM was deployed on a fencepost to the north west of the closest property. The SLM was located approximately 2.7m above ground in a free-field position, approximately 20m from the closest acoustically reflective façade.

General observations
The noise environment noted during SLM deployment and collection was generally dominated by road traffic movements from the A27. Noise from occasional aircrafts and birdsong present. Roads were wet for the duration of the measurement. Potential noise from horses and chickens in a stable approximately 20m away, although not audible during deployment.

Monitoring Position

Assessment Period		$L_{Aeq,T}$ (dB)	$L_{A90,T}$ (dB) [mean average]	Total no. of 15-minute periods	Total no. of 15-minute periods affected by weather	Affected by weather %
Construction daytime	**Monday – Sunday** 0700 – 1900	63	59	88	1	1
Construction evenings	**Monday – Sunday** 1900 – 2300	58	53			
Construction night-time	**Monday – Sunday** 2300 – 0700	54	40			

HDD-32-NML26

Monitoring Position:
X: 505432
Y: 105689

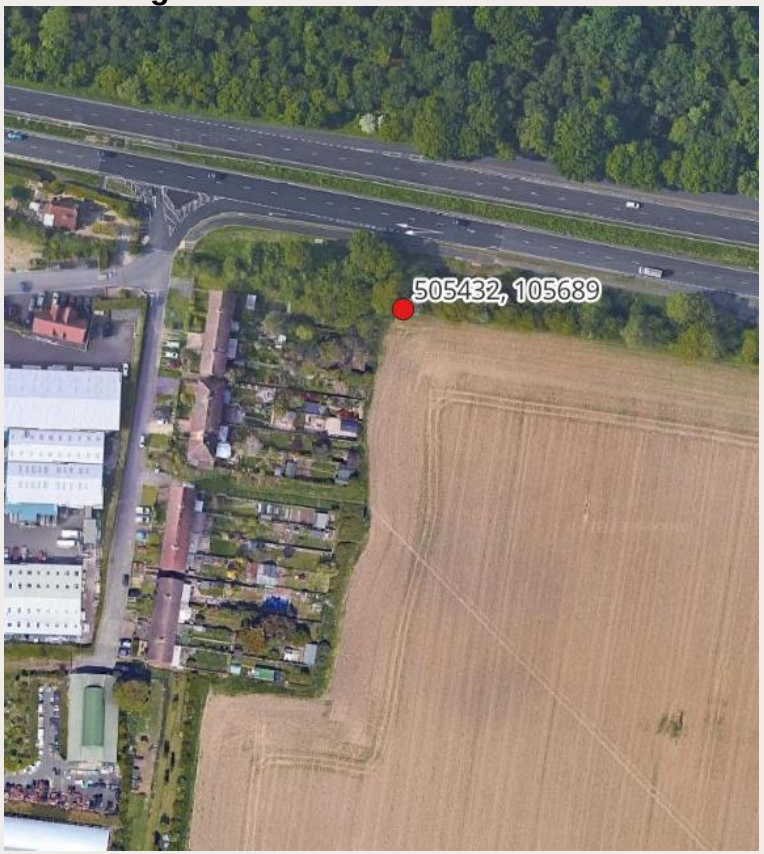
What3Words:
divided.impresses.scar
Location:
Arun

Duration:
04/05/2023 13:45 - 05/05/2023 11:30

Description of monitoring location
The SLM was deployed on a fencepost adjacent to the A27. The SLM was located approximately 1.5m above ground in a free-field position, approximately 50m from the closest acoustically reflective façade.

General observations
The noise environment noted during SLM deployment and collection was generally dominated by road traffic movements from the A27. Noise from occasional dog barks and birdsong present.

Monitoring Position



Assessment Period		$L_{Aeq,T}$ (dB)	$L_{A90,T}$ (dB) [mean average]	Total no. of 15-minute periods	Total no. of 15-minute periods affected by weather	Affected by weather %
Construction daytime	**Monday – Sunday** 0700 – 1900	65	58	87	3	3
Construction evenings	**Monday – Sunday** 1900 – 2300	62	49			
Construction night-time	**Monday – Sunday** 2300 – 0700	59	38			

HDD-38-NML30

Monitoring Position:
X: 509555
Y: 108602

What3Words:
fluctuate.prelude.talker
Location:
Arun

Duration:
04/05/2023 13:30 - 05/05/2023 12:15

This monitoring position was originally used to represent receptors HDD12-E, HDD12-SE, but has been superseded by position TC-12-NML41 for daytime.

Description of monitoring location
The SLM was deployed on a. The SLM was located approximately 1.5m above ground in a free-field position.

General observations
The noise environment noted during SLM deployment and collection was generally quiet, and typical of a rural location. Noise from bird song, distant road traffic breeze through foliage and occasional aircraft.

Monitoring Position

Assessment Period		$L_{Aeq,T}$ (dB)	$L_{A90,T}$ (dB) [mean average]	Total no. of 15-minute periods	Total no. of 15-minute periods affected by weather	Affected by weather %
Construction daytime	**Monday – Sunday** 0700 – 1900	46*	40*	91	3	3
Construction evenings	**Monday – Sunday** 1900 – 2300	43	35			
Construction night-time	**Monday – Sunday** 2300 – 0700	45	31			

***Daytime superseded by TC-12-NML41**

TC12-NML41

Monitoring Position:
X: 508218
Y: 108388

What3Words:
orchestra.riverboat.necklace

Location:
Patching

Duration:
16/11/2023 14:00 - 16/11/2023 16:30

Description of monitoring location
The SLM was deployed adjacent to a grassed area approximately 50m west of Michelgrove Lane, 90m south of Michelgrove House, and 11m southwest of Michelgrove Cottages. The SLM was located approximately 1.5m above ground in a free-field position, approximately 11m from the closest acoustically reflective façade.

General observations
The noise environment noted during SLM deployment and collection was generally quiet, and typical of a rural location. Occasional noise from a human activity to the south, aircraft movement, and birdsong in the area, also contributed to the overall noise environment.

Monitoring Position

Assessment Period		$L_{Aeq,T}$ (dB)	$L_{A90,T}$ (dB) [mean average]	Total no. of 15-minute periods	Total no. of 15-minute periods affected by weather	Affected by weather %
Construction daytime	Monday – Sunday 0700 – 1900	57	35	11	0	0
Construction evenings	Monday – Sunday 1900 – 2300	-	-			
Construction night-time	Monday – Sunday 2300 – 0700	-	-			

CC-1-NML31

Monitoring Position:
X: 500409
Y: 500409

What3Words:
awards.laptop.poet

Location:
Climping

Duration:
16/11/2023 15:45 - 17/11/2023 11:30

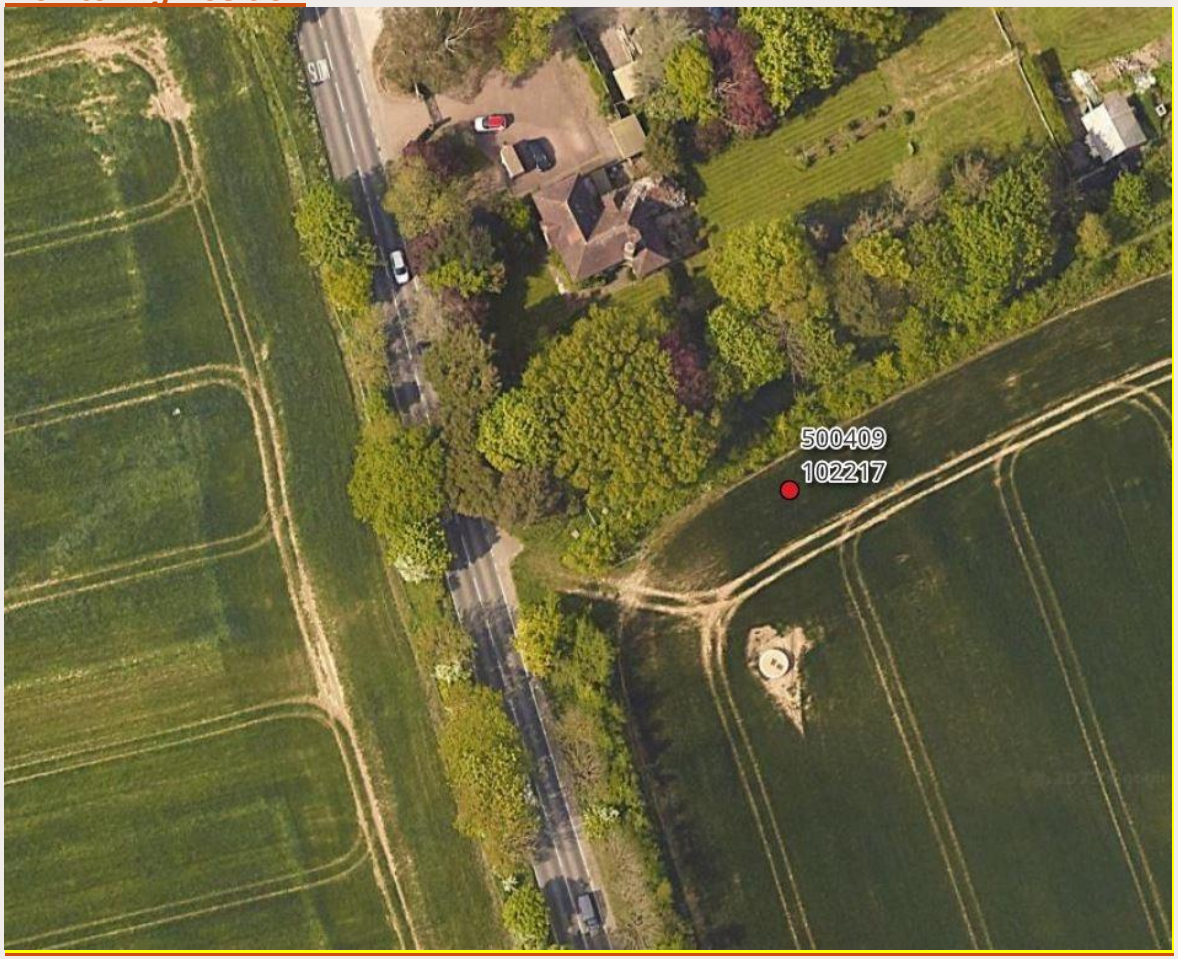
Description of monitoring location

The Sound Level Meter (SLM) was deployed on the northern boundary of a agricultural field directly to the east of Church Lane, and to the north of Climping Village Hall and playing fields. The SLM was located approximately 1.5m above ground in a free-field position.

General observations

The noise environment noted during SLM deployment and collection was generally dominated by the road traffic movements along the Church Lane.

Monitoring Position



Assessment Period		$L_{Aeq,T}$ (dB)	$L_{A90,T}$ (dB) [mean average]	Total no. of 15-minute periods	Total no. of 15-minute periods affected by weather	Affected by weather %
Construction daytime	Monday – Sunday 0700 – 1900	57	50	80	2	3
Construction evenings	Monday – Sunday 1900 – 2300	52	44			
Construction night-time	Monday – Sunday 2300 – 0700	51	40			

CC-3-NML32

Monitoring Position:
X: 512323
Y: 113326

What3Words:
reading.herds.wrist

Location:
Washington

Duration:
15/11/2023 15:15 - 16/11/2023 11:00

Description of monitoring location

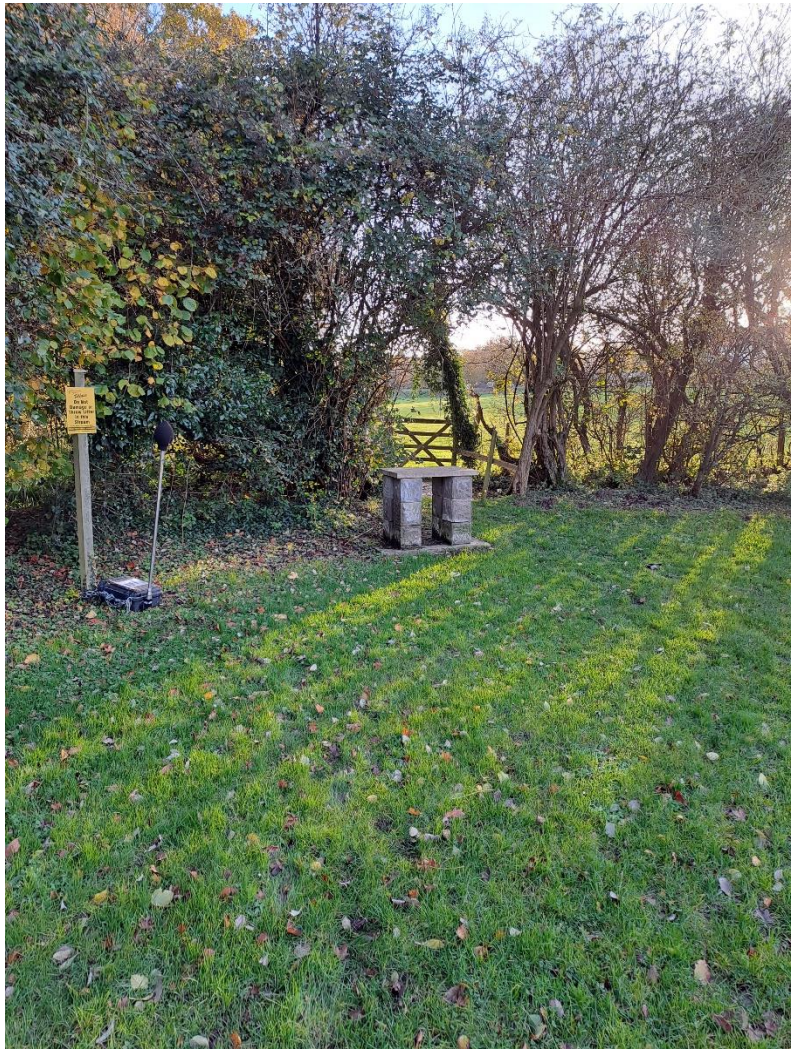
The SLM was deployed in the southeast corner of Washington Caravan and Camping Park adjacent to the southern boundary hedgerow. The SLM was located approximately 1.5m above ground in a free-field position.

General observations

The noise environment noted during SLM deployment and collection was generally quiet, and typical of a rural location. Noise from distant road traffic movements along the A283 and London Road, vegetation movement noise from the wind, and water movement from the nearby channel were noted in the area.

Monitoring Position

Assessment Period		$L_{Aeq,T}$ (dB)	$L_{A90,T}$ (dB) [mean average]	Total no. of 15-minute periods	Total no. of 15-minute periods affected by weather	Affected by weather %
Construction daytime	Monday – Sunday 0700 – 1900	51	49	80	10	13
Construction evenings	Monday – Sunday 1900 – 2300	47	45			
Construction night-time	Monday – Sunday 2300 – 0700	43	41			



CC-5-NML34

Monitoring Position:
X: 522421
Y: 122544

What3Words:
perfectly.estimated.online

Location:
Cowfold

Duration:
15/11/2023 14:00 - 16/11/2023 10:30

Description of monitoring location
The SLM was deployed at the northern boundary of the recreational field directly to the west of Oakendene Industrial Estate, and approximately 45m south of the A272. The SLM was located approximately 1.5m above ground in a free-field position.

General observations
The noise environment noted during SLM deployment and collection was dominated by the traffic movement along the A272 and vehicle activity in and out of the estate. Noise from the wind in vegetation was also noted to be present in the area.

Monitoring Position

Assessment Period		$L_{Aeq,T}$ (dB)	$L_{A90,T}$ (dB) [mean average]	Total no. of 15-minute periods	Total no. of 15-minute periods affected by weather	Affected by weather %
Construction daytime	Monday – Sunday 0700 – 1900	62	55	80	8	10
Construction evenings	Monday – Sunday 1900 – 2300	56	45			
Construction night-time	Monday – Sunday 2300 – 0700	53	33			

CA- 2- NML36

Monitoring Position:
X: 508302
Y: 108534

What3Words:
waddle.ultra.necks
Location:
Arun
Duration:
04/05/2023 15:34 - 04/05/2023 16:34

Description of monitoring location
The SLM was located approximately 1.6m above ground in a free-field position.

General observations
The noise environment noted during the attended survey was generally quiet with the dominant noise source coming from unknown equipment. Road traffic noise from Michelgrove Lane and bird song.

Monitoring Position

Assessment Period		$L_{Aeq,T}$ (dB)	$L_{A90,T}$ (dB) [mean average]	Total no. of 15-minute periods	Total no. of 15-minute periods affected by weather	Affected by weather %
Construction daytime	**Monday – Sunday** 0700 – 1900	51	38	-	-	-
Construction evenings	**Monday – Sunday** 1900 – 2300	-	-			
Construction night-time	**Monday – Sunday** 2300 – 0700	-	-			

CA- 4- NML38

Monitoring Position:
X: 510480
Y: 113071

What3Words:
roadblock.massaged.locker
Location:
Sullington

Duration:
04/05/2023 18:00 -
04/05/2023 19:00

Description of monitoring location
The SLM was located approximately 1.5m above ground in a free-field position.

General observations
The noise environment noted during the attended survey was generally quiet, and typical of a rural location. Noise from distant road traffic, occasional traffic using Barns Farm Lane, bird song, breeze through foliage and occasional aircraft.

Monitoring Position

Assessment Period		$L_{Aeq,T}$ (dB)	$L_{A90,T}$ (dB) [mean average]	Total no. of 15-minute periods	Total no. of 15-minute periods affected by weather	Affected by weather %
Construction daytime	**Monday – Sunday** 0700 – 1900	46	39	-	-	-
Construction evenings	**Monday – Sunday** 1900 – 2300	-	-			
Construction night-time	**Monday – Sunday** 2300 – 0700	-	-			

CA- 5- NML39

Monitoring Position:
X: 518086
Y: 116221

What3Words:
blizzard.switched.blackouts
Location:
Ashurst
Duration:
04/05/2023 16:02 - 04/05/2023 17:02

Description of monitoring location
The SLM was located approximately 1.5m above ground in a free-field position.

General observations
The noise environment noted during the attended survey was generally dominated by noise from road traffic on the B2135, occasional traffic going to Eaton Farm, bird song and occasional aircraft.

Monitoring Position

Assessment Period		$L_{Aeq,T}$ (dB)	$L_{A90,T}$ (dB) [mean average]	Total no. of 15-minute periods	Total no. of 15-minute periods affected by weather	Affected by weather %
Construction daytime	**Monday – Sunday** 0700 – 1900	57	38	-	-	-
Construction evenings	**Monday – Sunday** 1900 – 2300	-	-			
Construction night-time	**Monday – Sunday** 2300 – 0700	-	-			

CA- 6- NML40

Monitoring Position:
X: 520900
Y: 120967

What3Words:
shadow.dorms.lotteries
Location:
Cowfold
Duration:
04/05/2023 14:33 - 04/05/2023 15:33

Description of monitoring location
The SLM was located approximately 1.5m above ground in a free-field position.

General observations
The noise environment noted during the attended survey was generally dominated by road traffic noise from the A281, traffic going to Gratwicke Farm, occasional dog barks, bird song and occasional aircraft.

Monitoring Position

Assessment Period		$L_{Aeq,T}$ (dB)	$L_{A90,T}$ (dB) [mean average]	Total no. of 15-minute periods	Total no. of 15-minute periods affected by weather	Affected by weather %
Construction daytime	**Monday – Sunday** 0700 – 1900	59	47	-	-	-
Construction evenings	**Monday – Sunday** 1900 – 2300	-	-			
Construction night-time	**Monday – Sunday** 2300 – 0700	-	-			

CA- 7- NML41

Monitoring Position:
X: 511024
Y: 108837

What3Words:
computer.anyone.incursion
Location:
Findon
Duration:
05/05/2023 10:37 - 05/05/2023 11:37

Description of monitoring location
The SLM was located approximately 1.5m above ground in a free-field position.

General observations
The noise environment noted during the attended survey was generally dominated by road traffic noise from the A280, bird song and occasional aircraft.

Monitoring Position

Assessment Period		$L_{Aeq,T}$ (dB)	$L_{A90,T}$ (dB) [mean average]	Total no. of 15-minute periods	Total no. of 15-minute periods affected by weather	Affected by weather %
Construction daytime	**Monday – Sunday** 0700 – 1900	70	53	-	-	-
Construction evenings	**Monday – Sunday** 1900 – 2300	-	-			
Construction night-time	**Monday – Sunday** 2300 – 0700	-	-			

CA- 8- NML42

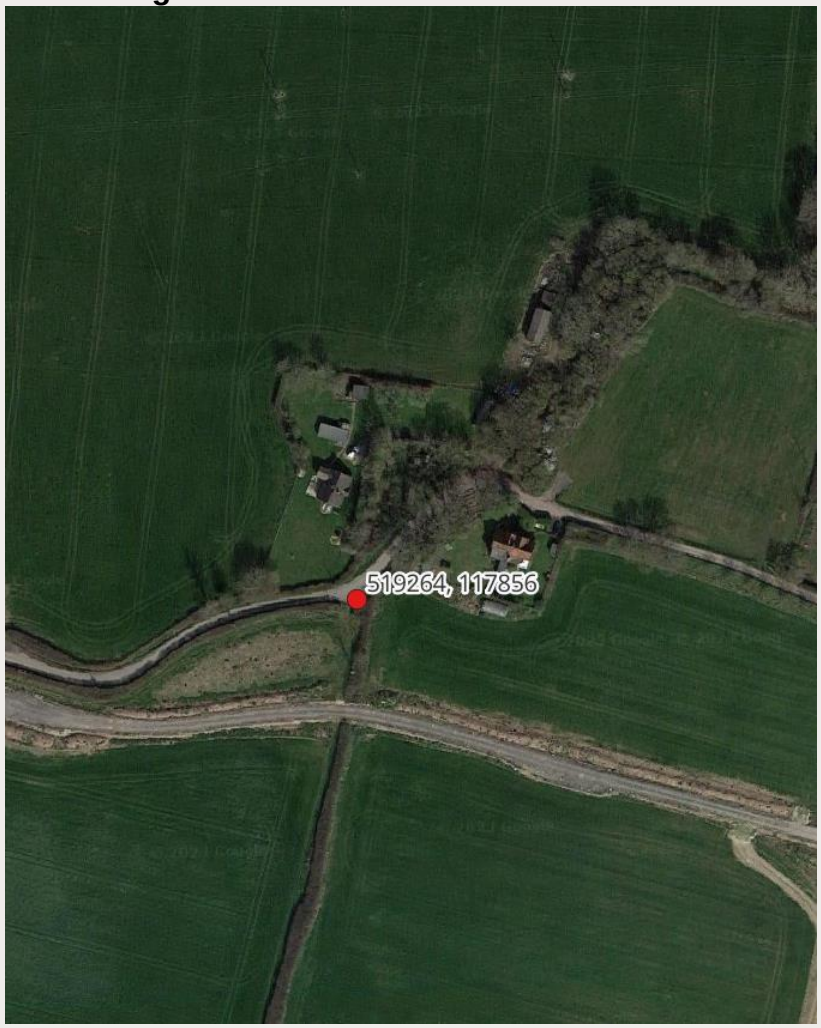
Monitoring Position:
X: 519264
Y: 117856

What3Words:
necklace.spud.drifting
Location:
West Grinstead
Duration:
27/03/2023 16:41 - 27/03/2023 17:47

Description of monitoring location
The SLM was located approximately 1.5m above ground in a free-field position.

General observations
The noise environment noted during the attended survey was generally dominated by road traffic noise from the B2135. Noise from bird song and occasional aircraft.

Monitoring Position



Assessment Period		$L_{Aeq,T}$ (dB)	$L_{A90,T}$ (dB) [mean average]	Total no. of 15-minute periods	Total no. of 15-minute periods affected by weather	Affected by weather %
Construction daytime	**Monday – Sunday** 0700 – 1900	47	41	-	-	-
Construction evenings	**Monday – Sunday** 1900 – 2300	-	-			
Construction night-time	**Monday – Sunday** 2300 – 0700	-	-			

OP-NML1

Monitoring Position:
X: 523149
Y: 122672

What3Words:
paid.deflate.cashiers

Location:
Southlands, Kent Street, RH13 8BA

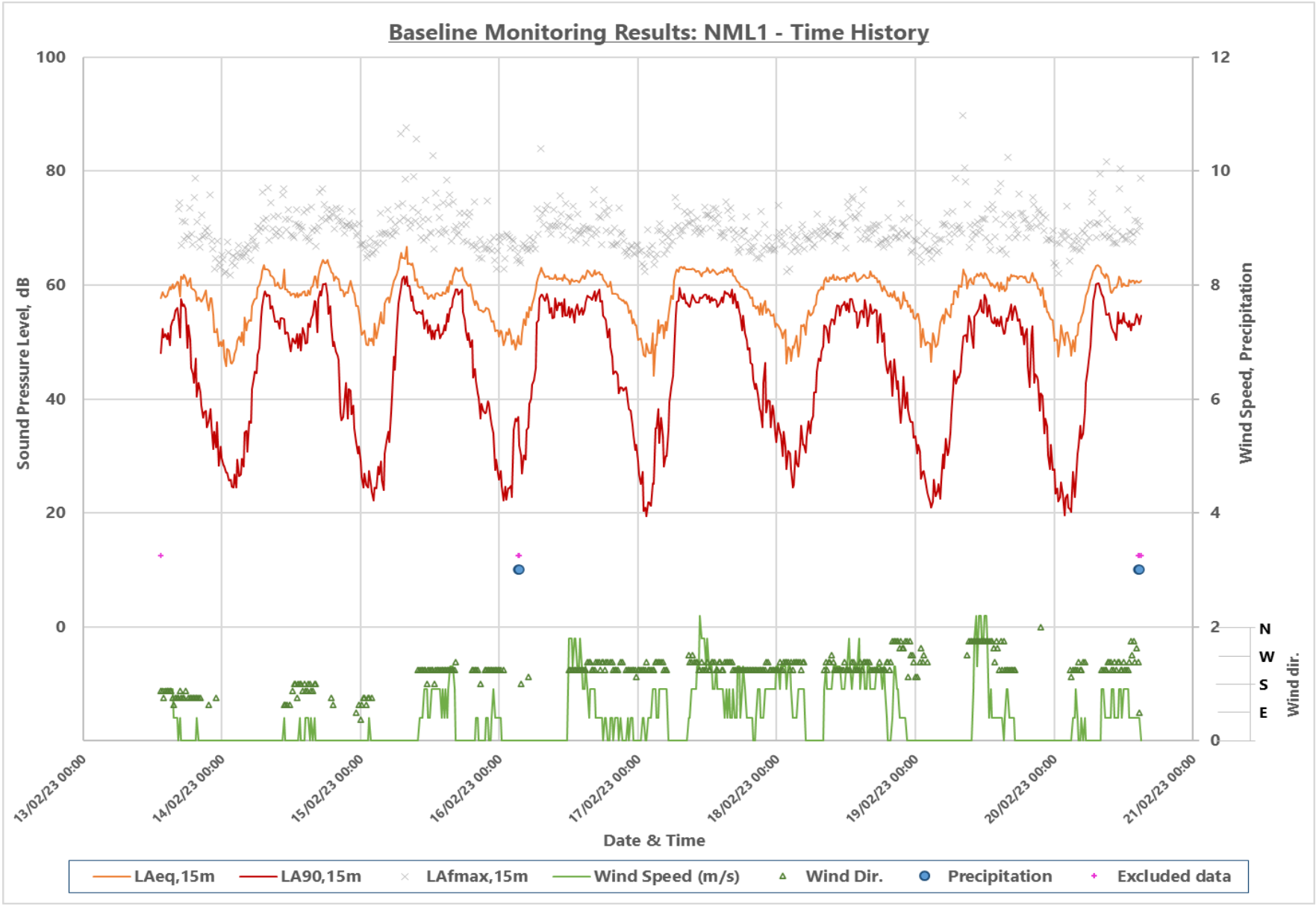
Duration:
13/02/2023 13:30 - 20/02/2023 15:12

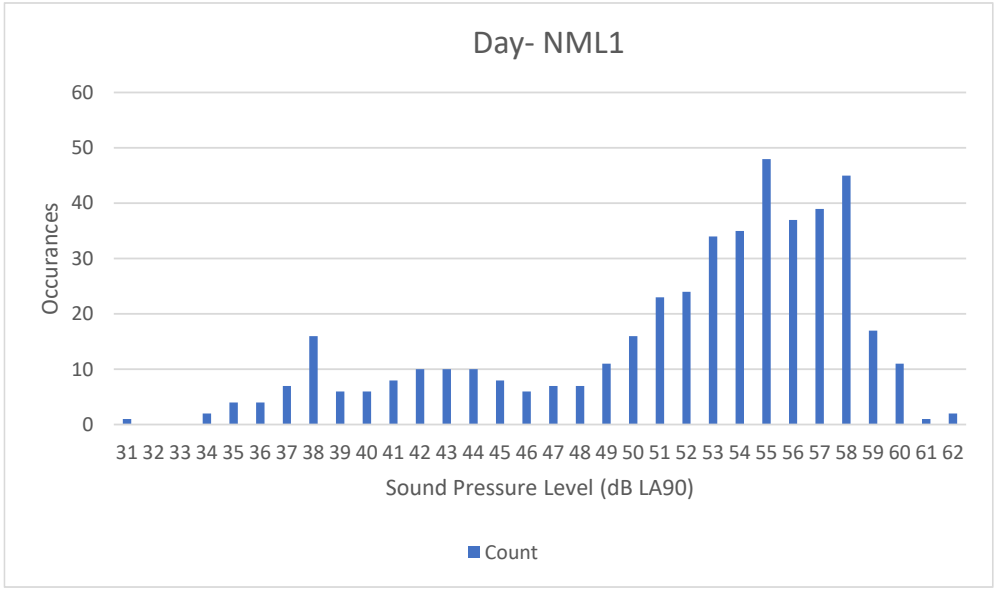
Description of monitoring location
The SLM was located approximately 1.5m above ground in a free-field position.

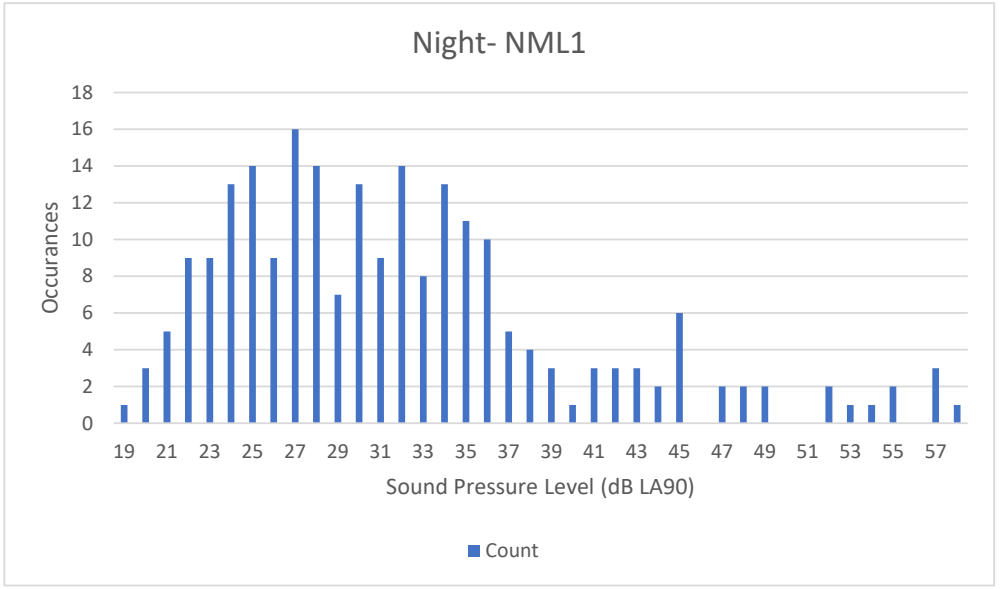
General observations
The noise environment noted during the attended survey was generally dominated by road traffic noise from the A272. Noise from bird song and occasional aircraft.

Monitoring Position

Assessment Period		$L_{Aeq,T}$ (dB)	$L_{A90,T}$ (dB) [mean average]	Total no. of 15-minute periods	Total no. of 15-minute periods affected by weather	Affected by weather %
Operational daytime	**Monday – Sunday** 0700 – 1900	61	55	679	6	1
Operational evenings	**Monday – Sunday** 1900 – 2300	58	42			
Operational night-time	**Monday – Sunday** 2300 – 0700	55	32			







OP-NML2

Monitoring Position:
X: 523126
Y: 122085

What3Words:
thrones.loopholes.only

Location:
Westridge, Kent Street, RH13 8BB

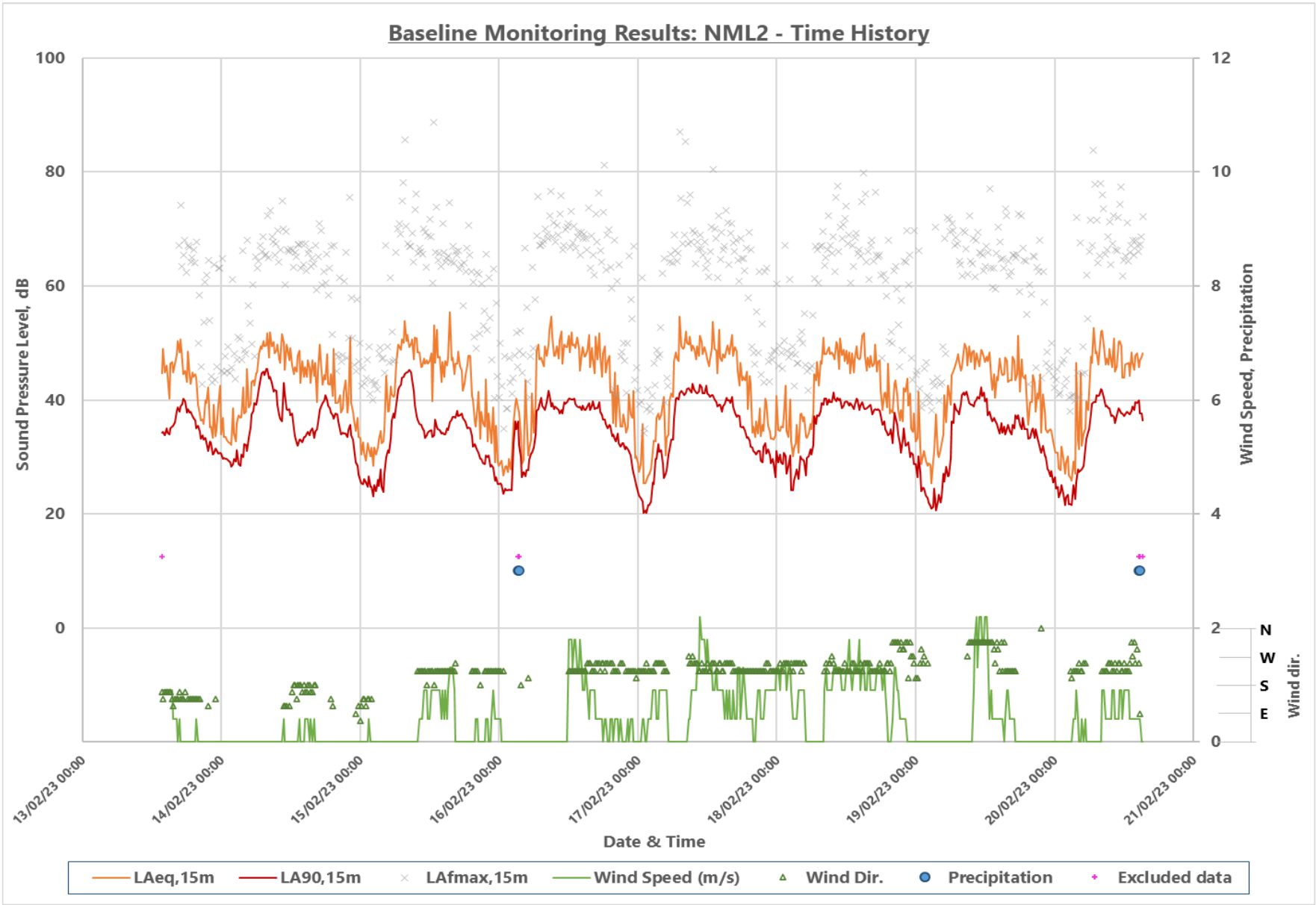
Duration:
13/02/2023 13:30 - 20/02/2023 15:12

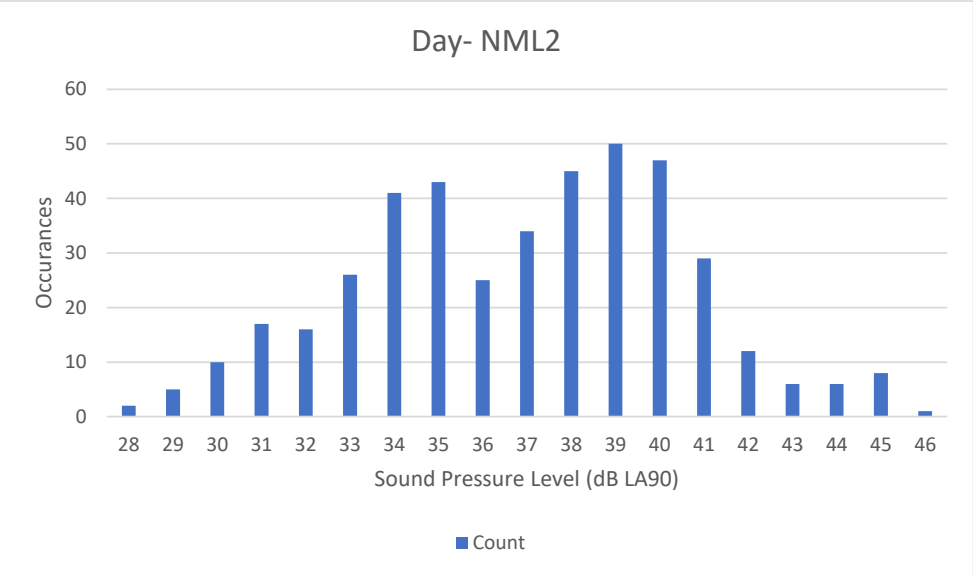
Description of monitoring location
The SLM was located approximately 1.5m above ground in a free-field position.

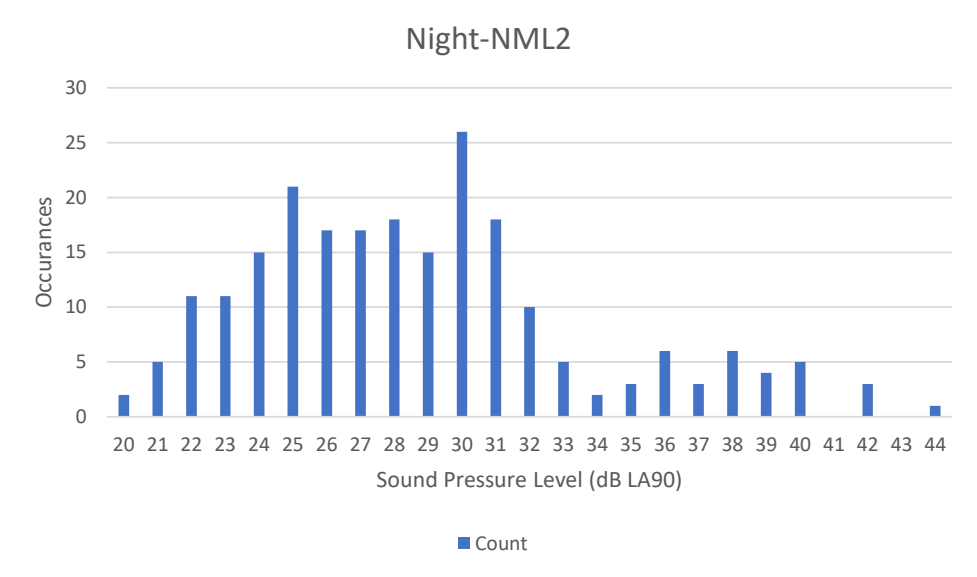
General observations
The noise environment noted during the attended survey was generally dominated by distant road traffic noise from the A272. Noise from bird song and occasional aircraft.

Monitoring Position

Assessment Period		$L_{Aeq,T}$ (dB)	$L_{A90,T}$ (dB) [mean average]	Total no. of 15-minute periods	Total no. of 15-minute periods affected by weather	Affected by weather %
Operational daytime	**Monday – Sunday** 0700 – 1900	48	38	679	6	1
Operational evenings	**Monday – Sunday** 1900 – 2300	41	33			
Operational night-time	**Monday – Sunday** 2300 – 0700	40	29			







OP-NML3

Monitoring Position:
X: 522752
Y: 122055

What3Words:
impeached.profile.trickle

Location:
Taintfield Farmhouse, Kings Lane, RH13 8BD

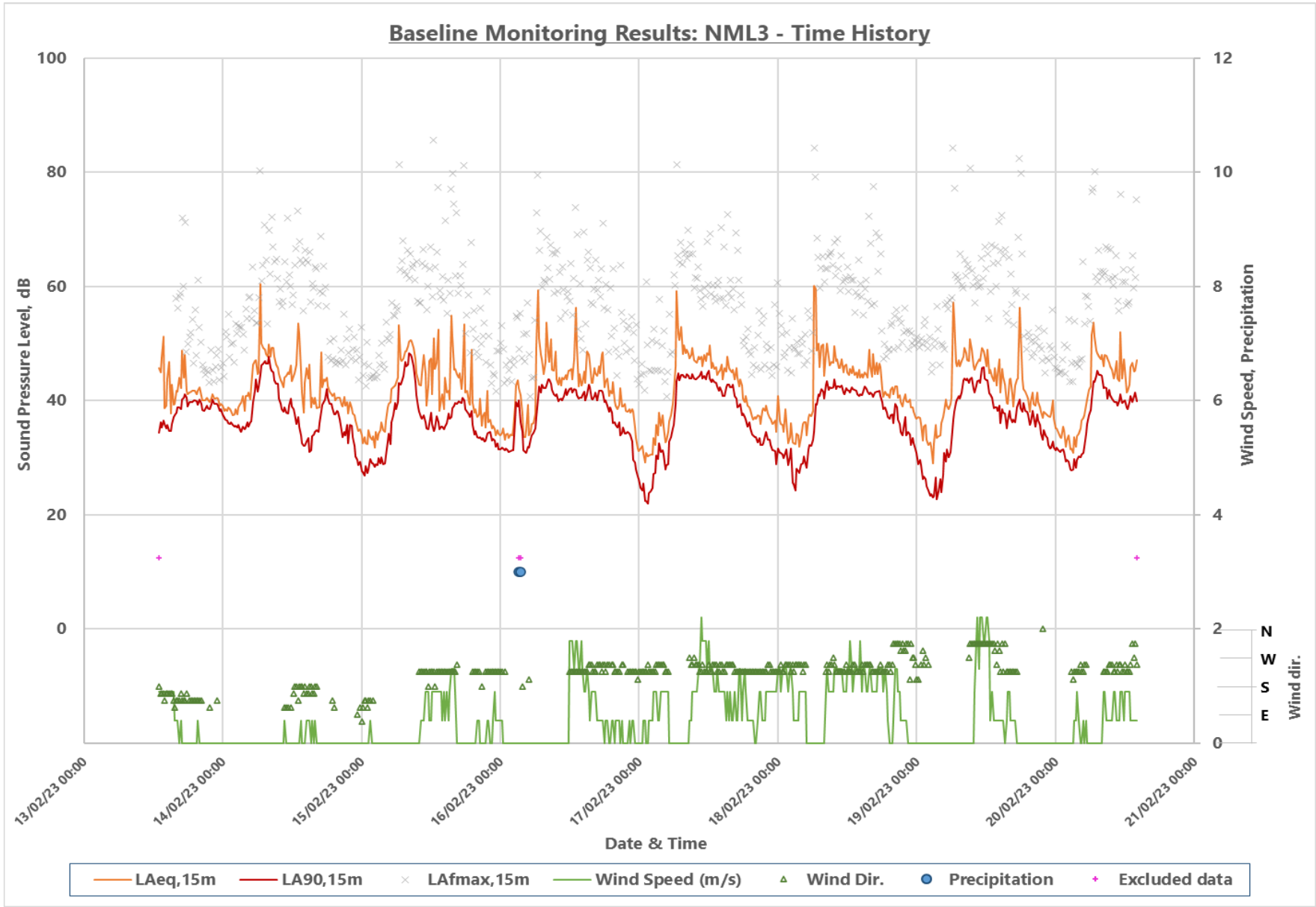
Duration:
13/02/2023 13:00 - 20/02/2023 14:15

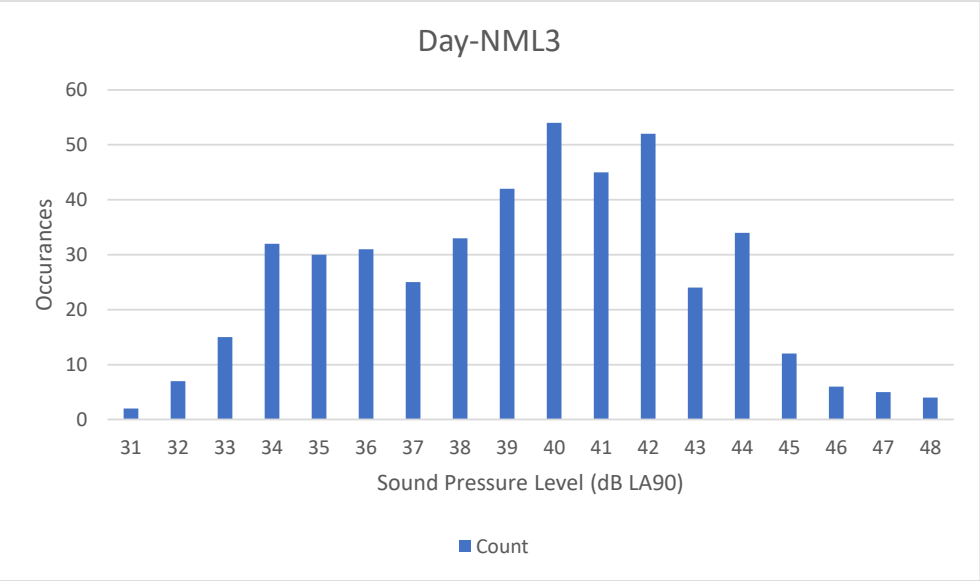
Description of monitoring location
The SLM was located approximately 1.5m above ground in a free-field position.

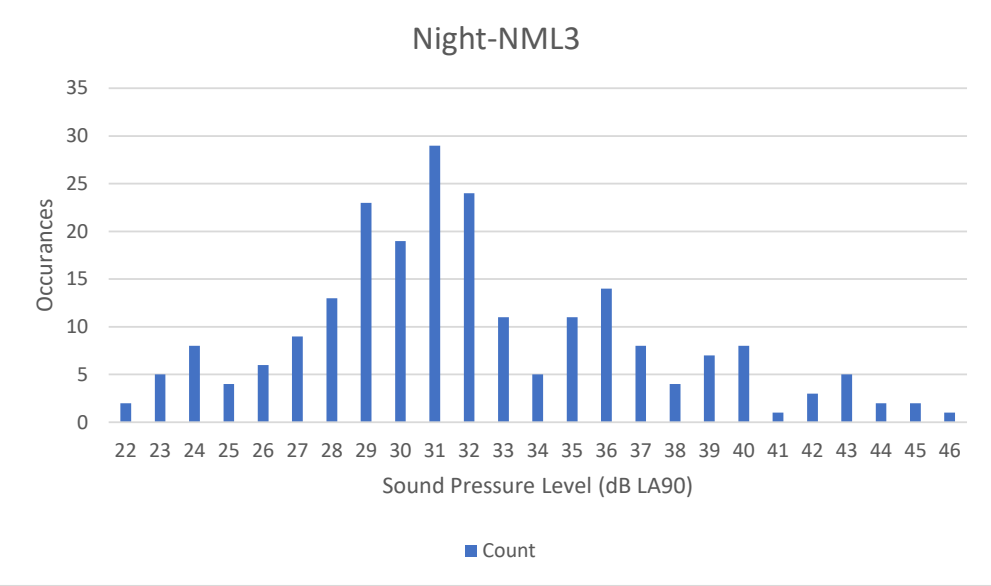
General observations
The noise environment noted during the attended survey was generally dominated by distant road traffic noise from the A272. Noise from bird song and occasional aircraft.

Monitoring Position

Assessment Period		$L_{Aeq,T}$ (dB)	$L_{A90,T}$ (dB) [mean average]	Total no. of 15-minute periods	Total no. of 15-minute periods affected by weather	Affected by weather %
Operational daytime	**Monday – Sunday** 0700 – 1900	47	40	677	4	<1
Operational evenings	**Monday – Sunday** 1900 – 2300	40	36			
Operational night-time	**Monday – Sunday** 2300 – 0700	46	32			







OP-NML4

Monitoring Position:
X: 522798
Y: 122562

What3Words:
petty.repeating.food

Location:
Oakendene Manor, Bolney Road, RH13 8AZ

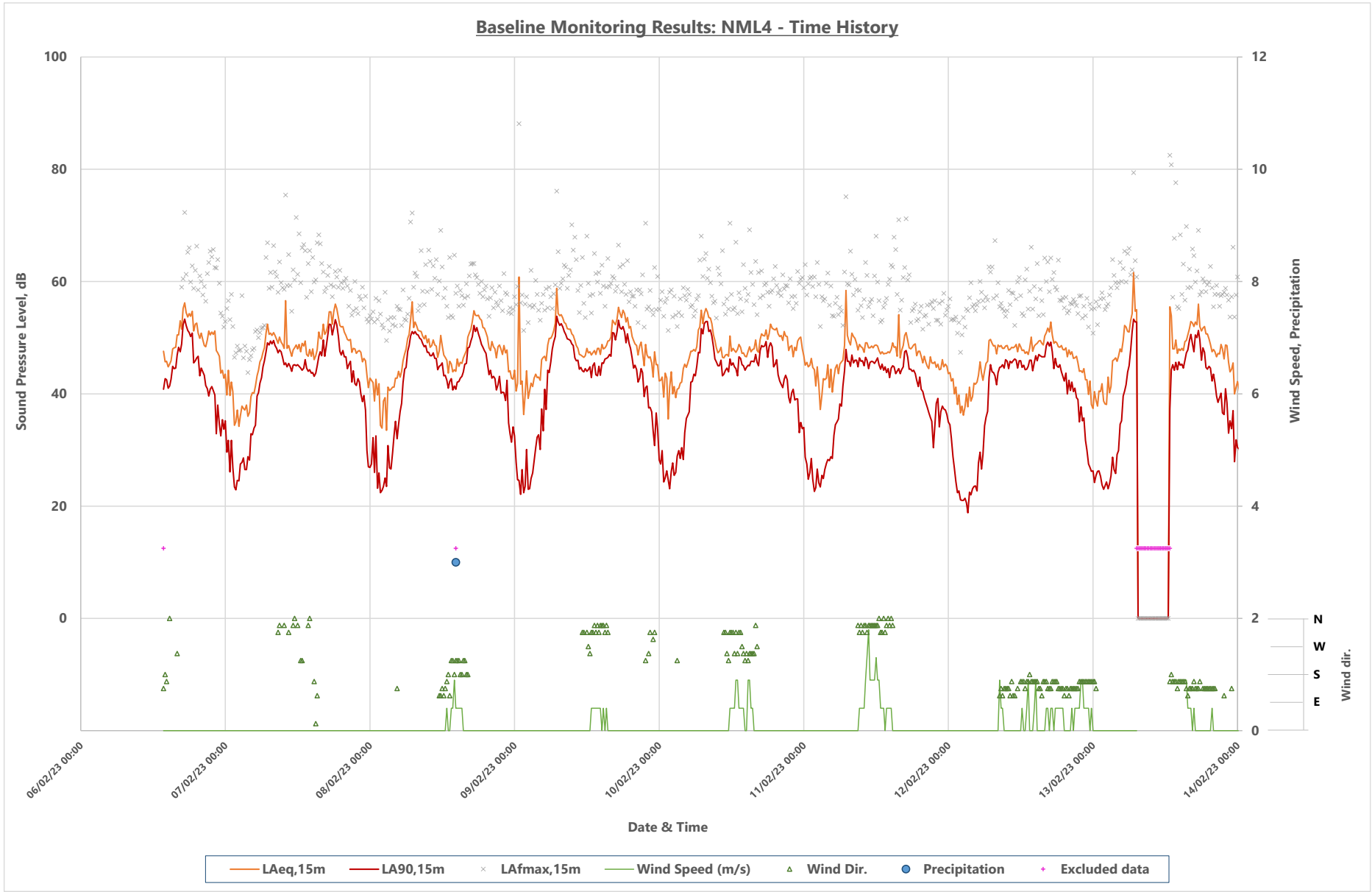
Duration:
6/02/2023 13:45 - 13/02/2023 07:28

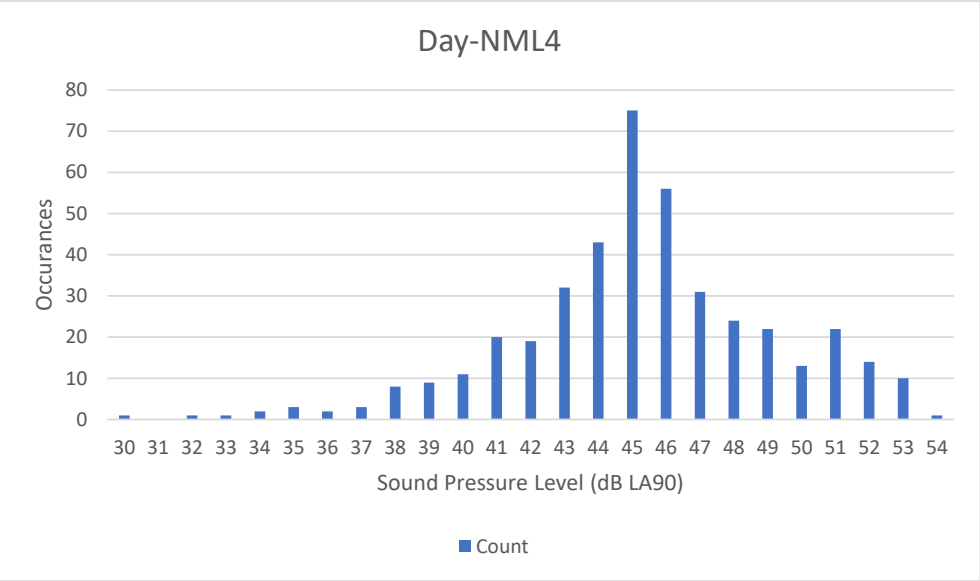
Description of monitoring location
The SLM was located approximately 1.5m above ground in a free-field position.

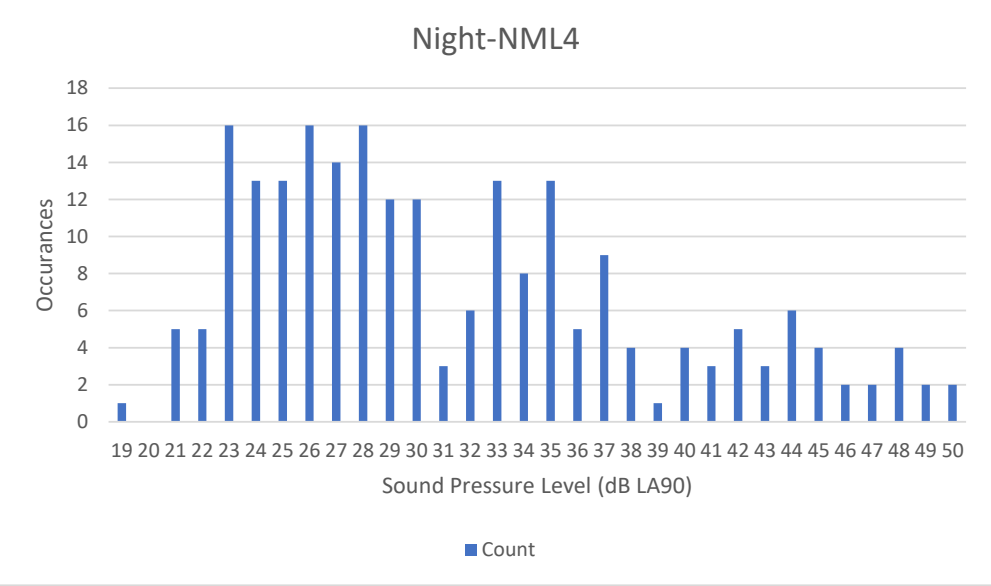
General observations
The noise environment noted during the attended survey was generally dominated by distant road traffic noise from the A272. With occasional noise from the industrial estate approx. 200m west, bird song and occasional aircraft.

Monitoring Position

Assessment Period		$L_{Aeq,T}$ (dB)	$L_{A90,T}$ (dB) [mean average]	Total no. of 15-minute periods	Total no. of 15-minute periods affected by weather	Affected by weather %
Operational daytime	**Monday – Sunday** 0700 – 1900	51	47	647	3	<1
Operational evenings	**Monday – Sunday** 1900 – 2300	49	41			
Operational night-time	**Monday – Sunday** 2300 – 0700	47	32			







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Rampion 2
WIND FARM