# APPENDIX 15.3 – BASELINE SURVEY

## Loddon Garden Village

# 1 INTRODUCTION

1.1.1 This Baseline Survey Appendix presents the methodology and results of the baseline sound survey undertaken for the Loddon Garden Village Project (henceforth referred to as the Proposed Development).

1.1.2 Sound level data was measured at locations representative of the proposed residential dwellings on site, as well as noise sensitive receptors within the Noise and Vibration Study Area to identify baseline noise levels during the daytime, evening and night-time periods.

1.1.3 There are no significant sources of vibration impacting the nearest noise-sensitive receptors which require consideration. As such, no vibration survey was deemed necessary.

1.1.4 The information from this Appendix informs the noise baseline and the assessment of the likely significant effects of the local acoustic environment on the Proposed Development and the effect of the Proposed Development on nearby Noise Sensitive Receptors (NSRs).

1.1.5 The aim of the Baseline Survey is to:

- Quantify baseline noise levels at nearby NSRs to determine the acoustic environment as well as representative background sound levels to inform an assessment of the site's suitability for residential development in line with the guidance contained in British Standard (BS) 8233:2014. It will also inform noise criteria against which operational and construction noise impacts arising from the Proposed Development may be assessed in accordance with BS 4142:2014+A1:2019 and BS 5228-1:2009+A1:2014, respectively.

# 2 METHODOLOGY

2.1.1 The baseline sound surveys comprised of unattended long-term measurements, involving the installation of monitors for up to two weeks in secure locations in February and March 2025. Meteorological equipment including a rain gauge and a mast for monitoring wind were also installed at one of the measurement positions to assess meteorological conditions during the survey period at the development site.

## 2.2 Site-Specific Surveys

2.2.1 A summary of the surveys undertaken to inform the noise baseline is outlined in Table 2.1 below.

**Table 2.1 Survey details**

| Title | Extent of Survey | Overview of Survey | Survey Contractor | Date | Reference to Further Information |
|---|---|---|---|---|---|
| Baseline Sound Survey | Proposed development site, nearby road network and nearby NSRs | Baseline sound survey at locations representative of the proposed on-site buildings and nearby NSRs | RPS | February and March 2025 | N/A |

### Consultation

2.2.2 A summary of the consultation activities undertaken specific to the baseline noise survey is presented in Table 2.2 below. Consultation has focused on the proposed locations of the Baseline Sound Survey.

**Table 2.2 Consultation**

| Date | Consultee and Type of Consultation | Summary of Issue(s) Raised | Response to Issues Raised |
|---|---|---|---|
| September 2024 | WBC EHO – Scoping submission | Proposed noise sensitive receptors and monitoring locations | No comments received |

### Sample Collection

2.2.3 The locations for the long-term sound survey were selected to be representative of the proposed dwellings on-site and the selected NSRs around the site.

2.2.4 The measurement locations are presented in Table 2.3 and visually in Figure 1.

2.2.5 At all locations, measurements were undertaken in the free field, at approximately 1.5 m above local ground level.

**Table 2.3 Survey details**

| Position | X-Coordinate | Y-Coordinate | Description | Representative Receptors |
|---|---|---|---|---|
| LT1 | 474022.12 | 168913.06 | Set up on the side of Cutbush Lane | Background sound levels of residential areas on Cutbush Lane |

| Position | X-Coordinate | Y-Coordinate | Description | Representative Receptors |
|---|---|---|---|---|
| LT2 | 474511.25 | 167740.93 | Northern section of site, approximately 220 m south of M4 | To quantify noise levels from road traffic on M4 as well as background noise levels for this section of the Proposed Development |
| LT3 | 475958.87 | 169031.57 | North-eastern corner of site, approximately 150 m from nearest NSR | Background sound levels of this section of the Proposed Development as well as the nearby NSRs on Betty Grove Lane |
| LT4 | 475444.85 | 167700.82 | On southern edge of site boundary, adjacent to Church Lane | To quantify noise levels from road traffic on M4 as well as background sound levels of nearby NSRs on Church Lane and this section of the Proposed Development |
| LT5 | 476145.17 | 169431.53 | On south-western corner of site, adjacent to the A327 | To quantify noise levels from road traffic on the A327 as well as background sound levels of nearby NSRs on the A327 and this section of the Proposed Development |
| LT6 | 476580.81 | 169307.84 | In the middle of the proposed development site | Background sound levels for this section of the proposed development |
| LT7 | 476946.15 | 169070.69 | On north-eastern edge of site, adjacent to Mole Road | To quantify noise levels due to road traffic on Mole Road as well as background sound levels of the nearby NSRs on Mole Road and this section of the Proposed Development |

2.2.6 The long-term survey equipment was initially deployed between 12:15 and 16:15 on Tuesday 25th February 2025 and was collected between 11:00 and 13:00 on Thursday 6th March 2025. During collection, it was noted that the noise monitor deployed at LT7 had malfunctioned, so a replacement monitor was set up in its place at 13:39 on Thursday 6th March and was collected at 17:04 on Tuesday 18th March 2025.

2.2.7 Measurements of the $L_{Aeq}$ and $L_{A90}$ were undertaken at 100 millisecond (ms) intervals and temporally averaged over 15-minute periods for the duration of the survey. Measurements of the $L_{Amax}$ were undertaken at 100 ms intervals and temporally averaged over 1-minute periods for each night-time period.

## Instrumentation

2.2.8 The equipment listed in Table 2.4 below was used to conduct the baseline sound survey.

**Table 2.4 Survey equipment**

| Position | Make / Model | Serial Number | Calibration at Start (dB) | Calibration at end (dB) | Last Calibration Date |
|---|---|---|---|---|---|
| LT1 | Rion NL-52 | 943366 | 94.0 | 93.9 | 12/10/2023 |
| LT2 | Rion NL-52 | 998563 | 94.0 | 94.0 | 18/3/2024 |
| LT3 | Rion NL-52 | 998566 | 94.0 | 93.9 | 15/3/2024 |
| LT4 | Rion NL-52 | 998567 | 94.0 | 93.9 | 18/3/2024 |
| LT5 | Rion NL-52 | 164422 | 94.0 | 93.9 | 6/2/2024 |
| LT6 | Rion NL-52 | 386736 | 94.0 | 94.0 | 13/10/2023 |
| LT7 | Rion NL-52 | 9493366 | 94.0 | 94.0 | 12/10/2023 |
| Calibrator | Rion NC-74 | 34683836 | N/A | N/A | 19/11/2024 |

2.2.9 The equipment was installed within weatherproof enclosures, the microphone was mounted externally and within a Rion WS-15 Outdoor Noise Monitor Microphone Protection Kit. The equipment was calibrated before deploying the survey equipment and after collecting it to confirm the accuracy of results. As shown in Table 2.4, no significant drift (±0.5 dB) was noted to have occurred.

2.2.10 Measurements were undertaken in accordance with British Standard 7445-2:1991 – *'Description and Measurement of Environmental Noise – Part 2: Guide to the Acquisition of Data'*. All sound level meters used meet the 'Class 1' criteria defined within BS EN 61672-2:2013+A1:2017 – *'Electroacoustics. Sound Level meters – Pattern Evaluation Tests'*. All calibrators used meet the 'Class 1' criteria defined in BS EN IEC 60942 – *'Electroacoustics. Sound Calibrators'*.

## Survey Limitations

2.2.11 The sound level meter at LT2 was intended to be placed adjacent to the M4, however access was restricted due to localised flooding of the field, so it was placed as close to the M4 as possible.

2.2.12 The survey equipment at LT7 failed after installation. As previously stated, another monitor was put in its place and the survey at this location was repeated.

## Meteorological Conditions

2.2.13 A weather station was deployed alongside the survey equipment at LT6 (and LT7 thereafter) to monitor the variation in meteorological conditions throughout the survey period. Data from this weather station was considered representative of each noise monitoring location.

2.2.14 The weather station was synchronised with the sound survey equipment. Any periods where precipitation events greater than 0.1 mm or wind speeds greater than 5 $ms^{-1}$ occurred have been omitted during the analysis of the measured data.

## Atypical Sound Events

2.2.15 Data pertaining to atypical sound events that are considered unlikely to be representative of the typical baseline have also been excluded from the dataset.

## Existing Sound Climate

2.2.16 A subjective description of the prevailing noise climate at each position is presented in Table 2.5.

**Table 2.5 Description of noise climate**

| Position | Subjective Description of Noise Climate |
|---|---|
| LT1 | Dominated by road traffic from the M4 approximately 485 m to the north. Can also hear bird song, wind noise, faint plane noise overhead. There were also some light construction noises coming from a nearby house on deployment which was not audible on collection. Moderate loudness here. |
| LT2 | Dominated by road traffic from the M4 approximately 220 m to the north. Can also hear wind noise and bird song. Reasonably quiet here. |
| LT3 | Dominated by road traffic from the M4 approximately 465 m to the northeast, can also hear wind noise, bird song and the occasional plane overhead. Overall, fairly quiet here. |
| LT4 | Dominated by road traffic on Church Lane, which is approximately 10 m away, close so fairly loud at this location. There is also bird song, wind noise, plane noise audible here as well as traffic on the M4 which is faintly audible to the north. |
| LT5 | Dominated by road traffic on the A327 which is approximately 15 m away, close by and fast moving so fairly loud. Otherwise, can hear bird song, wind noise and plane noise. |
| LT6 | Dominated by road traffic from the M4 approximately 1.12 km to the north, can also hear plane noise, bird song and plane noise overhead. This is probably the quietest location or at least seems so subjectively. |
| LT7 | Dominated by road traffic on Mole Road which is approximately 2 m away. Fairly fast moving and regular so quite loud – probably the single loudest location. There is also bird song faintly audible. |

## Results

2.2.17 The results of the baseline sound survey at the long-term monitoring positions are presented graphically in Figure 2 to Figure 8.

2.2.18 The range of measured sound levels at the long-term monitoring positions is presented in Table 2.6 below.

**Table 2.6 Measured sound levels**

| Survey Position | Measured Sound Level | | | | | |
|---|---|---|---|---|---|---|
| | Day | | | Evening | Night | |
| | $L_{Aeq,16hr}$ (07:00 – 23:00) | $L_{Aeq,12hr}$ (07:00 – 19:00) | $L_{A90,1hr}$ (07:00 – 23:00) | $L_{Aeq,4hr}$ (19:00 – 23:00) | $L_{Aeq,8hr}$ (23:00 – 07:00) | $L_{A90,15min}$ (23:00 – 07:00) |
| LT1 | 41 - 62 | 41 - 62 | 39 - 55 | 41 - 52 | 40 - 58 | 39 - 55 |
| LT2 | 48 - 65 | 48 - 65 | 46 - 63 | 51 - 61 | 46 - 65 | 43 - 64 |
| LT3 | 41 - 60 | 41 - 60 | 38 - 58 | 41 - 56 | 42 - 60 | 39 - 59 |
| LT4 | 41 - 58 | 45 - 58 | 34 - 53 | 34 - 51 | 32 - 60 | 29 - 55 |
| LT5 | 55 - 71 | 59 - 71 | 36 - 68 | 40 - 58 | 40 - 66 | 33 - 60 |
| LT6 | 40 - 62 | 40 - 60 | 37 - 58 | 43 - 56 | 39 - 59 | 38 - 58 |
| LT7 | 65 - 81 | 69 - 81 | 34 - 68 | 38 - 60 | 33 - 79 | 31 - 63 |

2.2.19 The typical sound levels identified from the long-term monitoring data are presented in Table 2.7 below. These are the levels upon which all noise assessments are based.

**Table 2.7 Typical sound levels**

| Survey Position | Typical Sound Level | | | | | | |
|---|---|---|---|---|---|---|---|
| | Day | | | Evening | Night (23:00 – 07:00) | | |
| | $L_{Aeq,16hr}$ (07:00 – 23:00) | $L_{Aeq,12hr}$ (07:00 – 19:00) | $L_{A90,1hr}$ (07:00 – 23:00) | $L_{Aeq,4hr}$ (19:00 – 23:00) | $L_{Aeq,8hr}$ (23:00 – 07:00) | $L_{A90,15min}$ (23:00 – 07:00) | $L_{Amax,1min}$ (23:00 – 07:00)* |
| LT1 | 50 | 51 | 48 | 48 | 48 | 42 | 70 |
| LT2 | 59 | 59 | 60 | 56 | 56 | 50 | 68 |
| LT3 | 54 | 54 | 45 | 54 | 51 | 46 | 73 |
| LT4 | 51 | 52 | 43 | 44 | 46 | 38 | 72 |
| LT5 | 64 | 65 | 59 | 50 | 57 | 39 | 77 |
| LT6 | 53 | 53 | 53 | 54 | 51 | 48 | 66 |
| LT7 | 77 | 77 | 63 | 46 | 69 | 40 | 94 |

* The $L_{Amax}$ value is based on the tenth highest $L_{Amax,1min}$ measured during the night-time period at each monitoring location.

2.2.20 It is noted that the monitor at LT7 was close to the edge of the road and therefore $L_{Aeq}$ and $L_{Amax}$ levels at this location were significantly higher than at other monitoring locations.

# Survey Locations and Results


**Figure 1 Survey Locations**

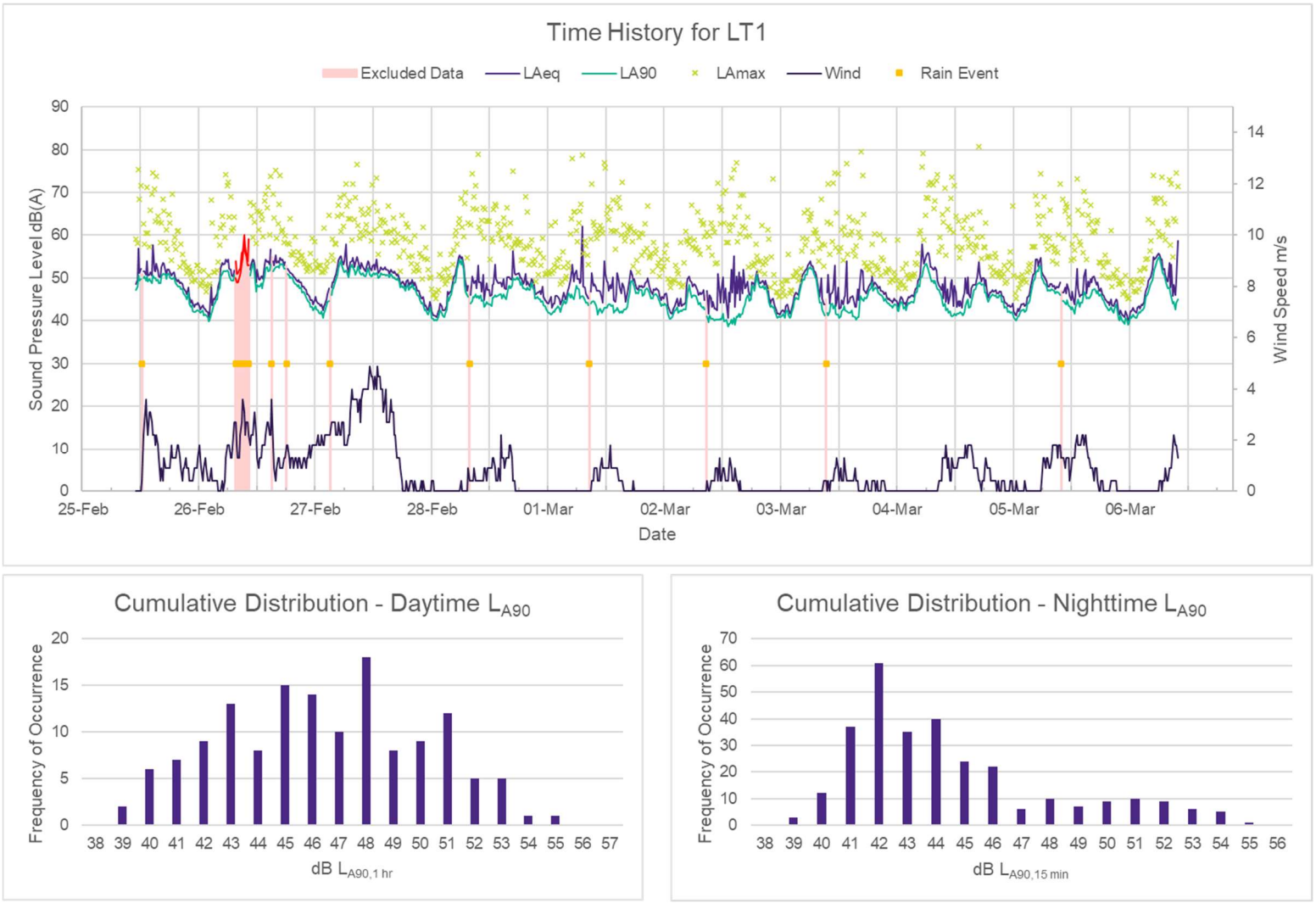



**Figure 2 LT1 time history and background noise statistics**

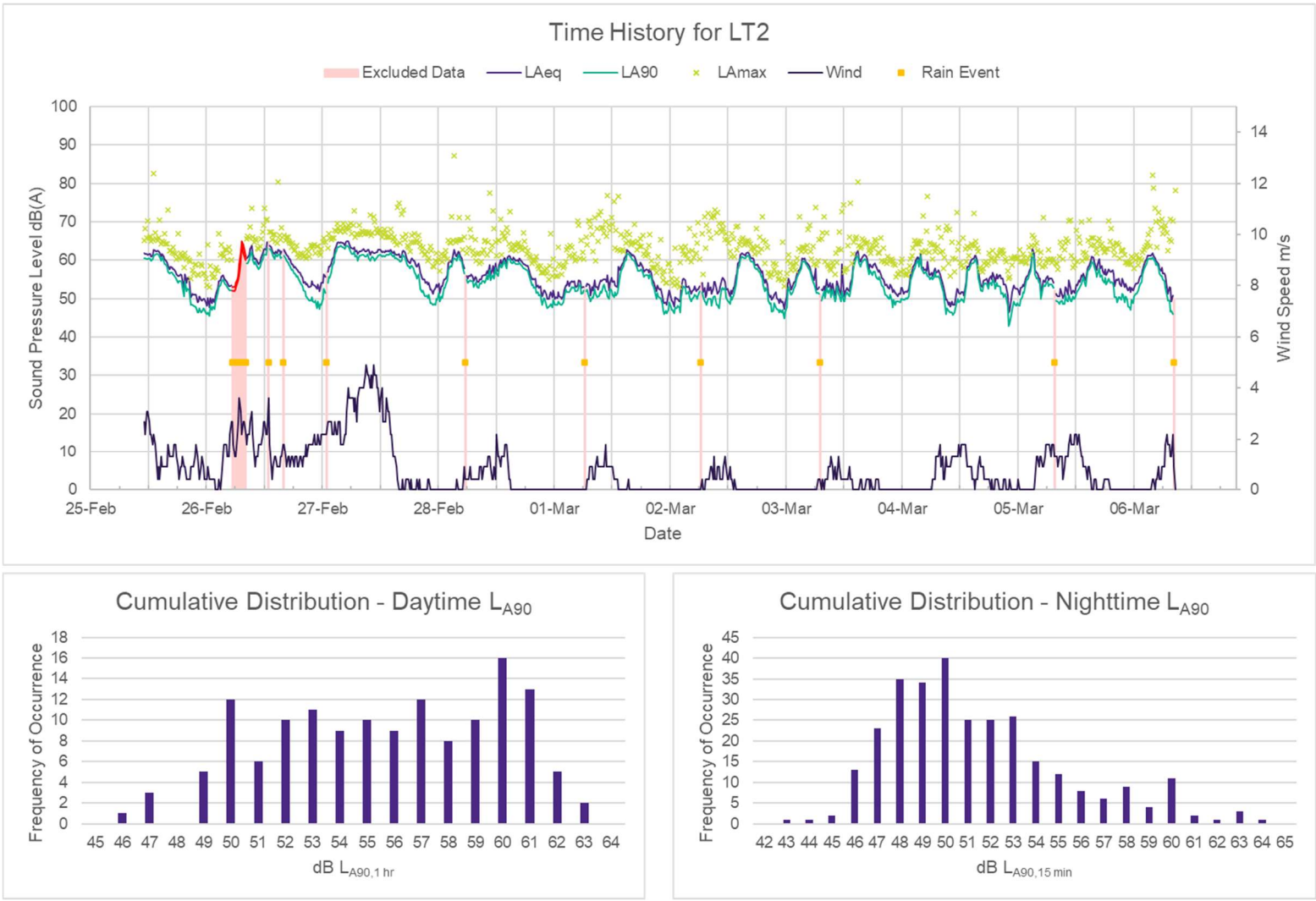



**Figure 3 LT2 time history and background noise statistics**

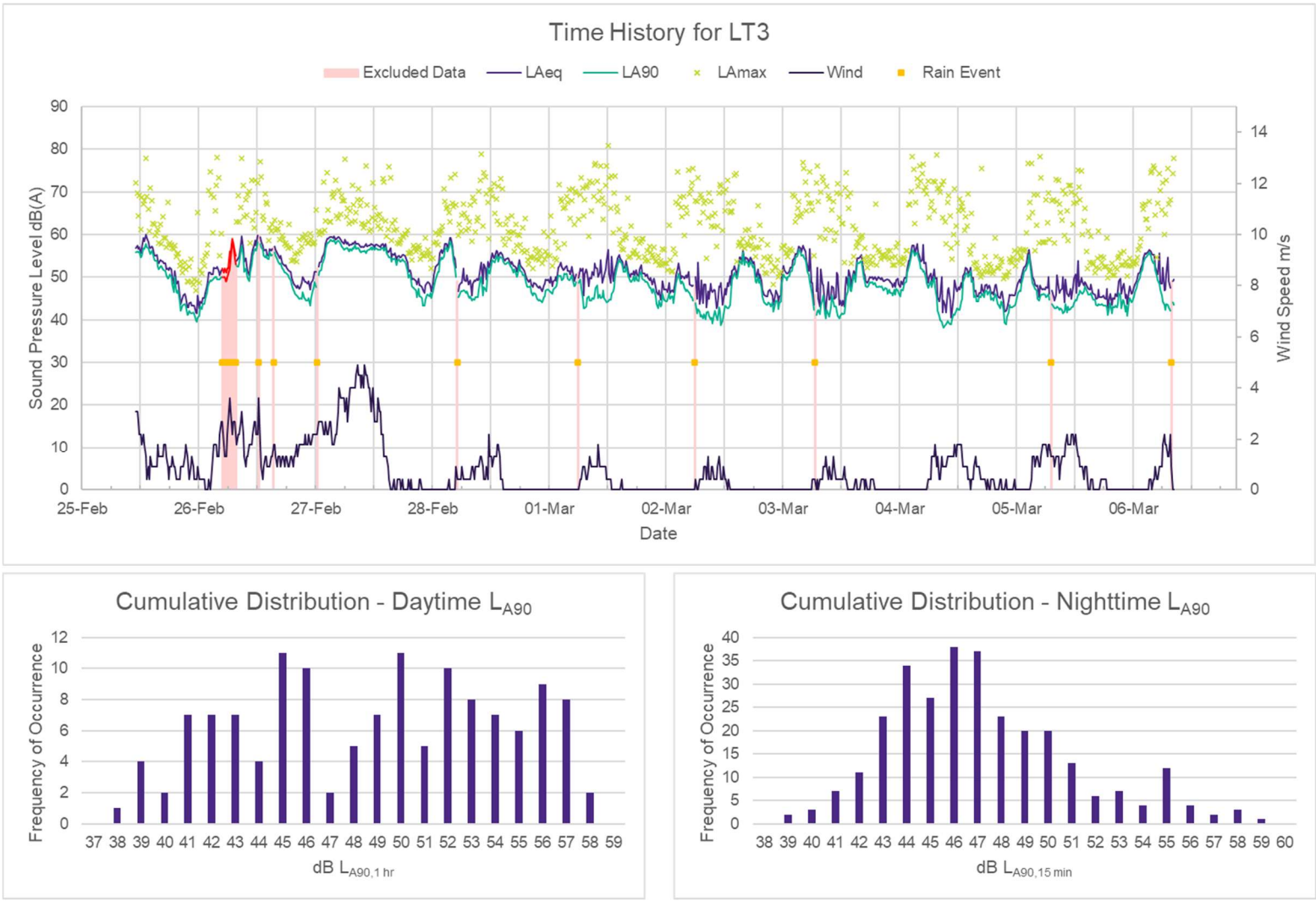



**Figure 4 LT3 time history and background noise statistics**

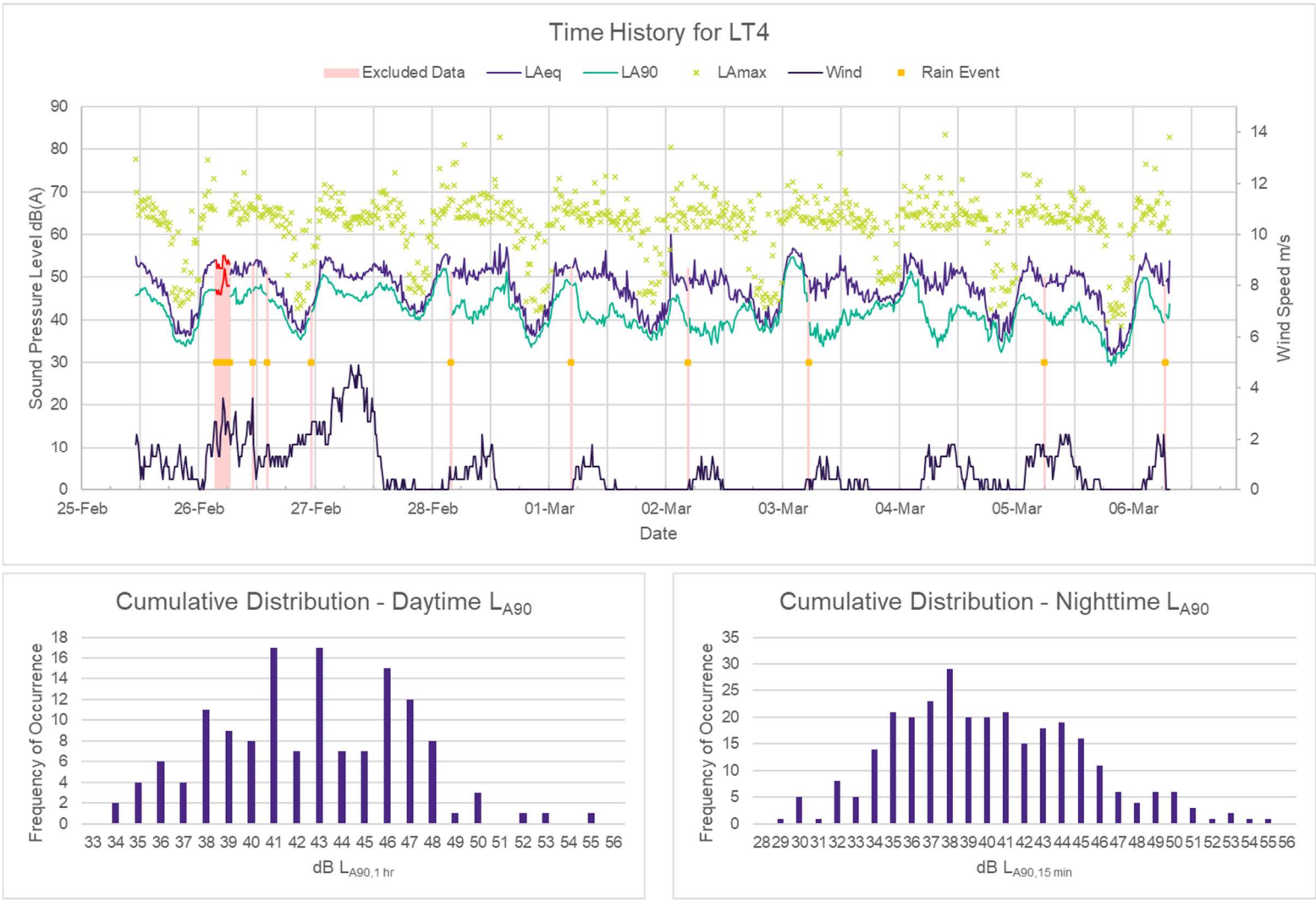



**Figure 5 LT4 time history and background noise statistics**

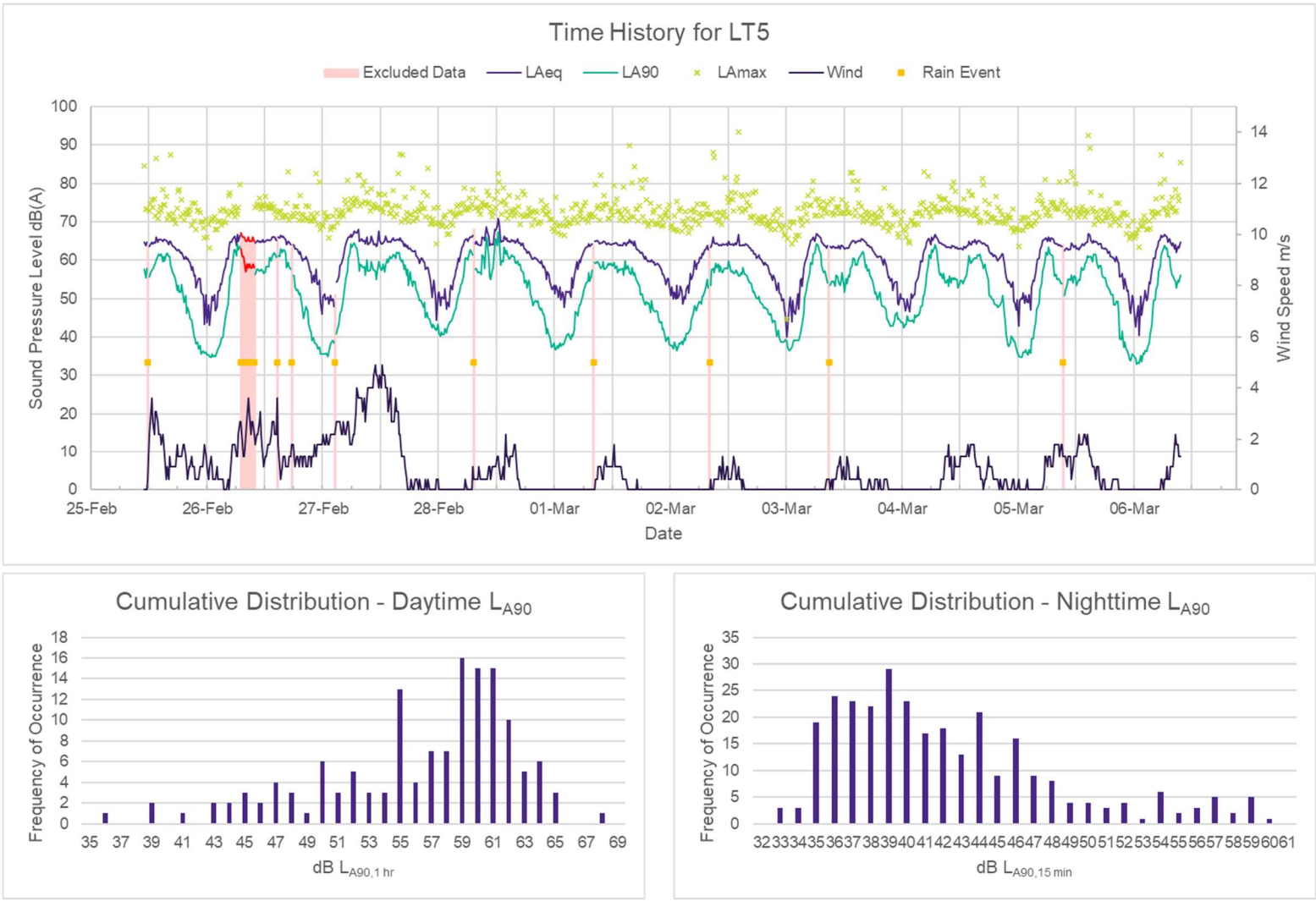
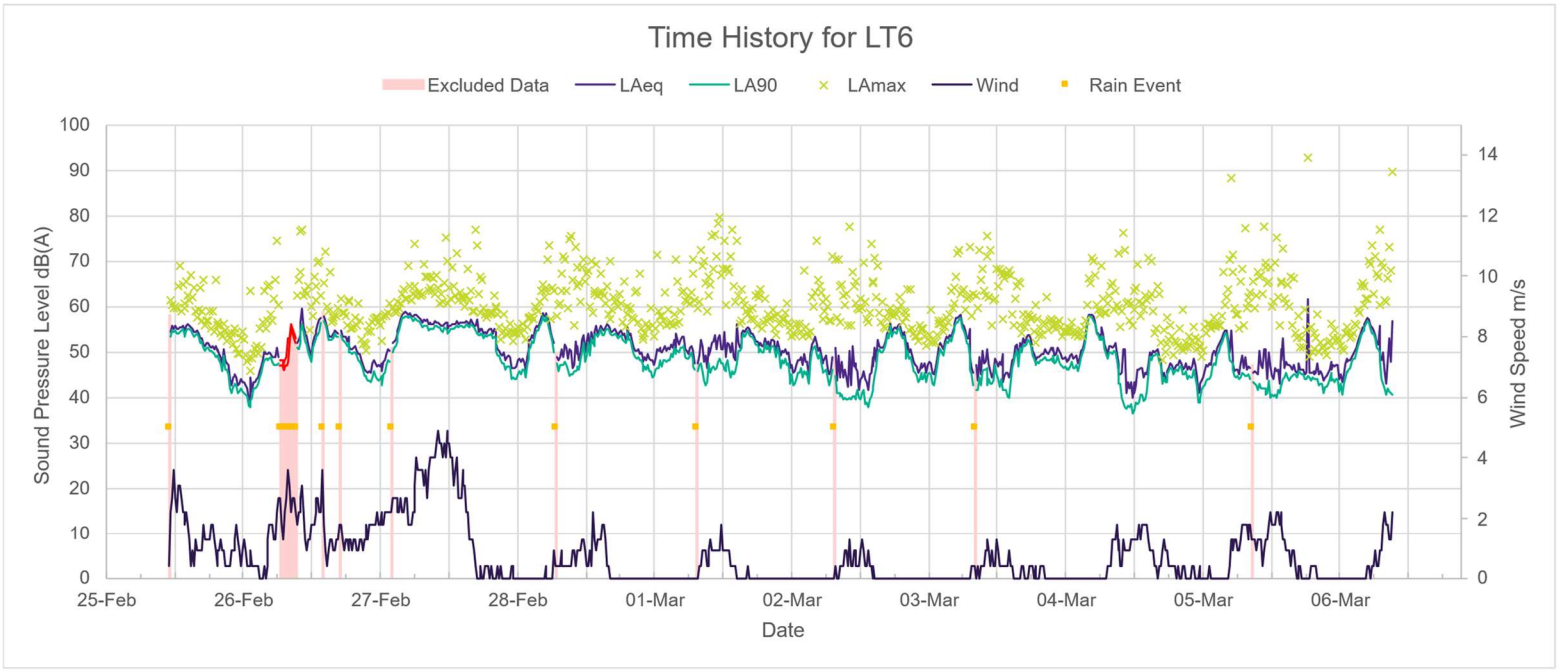
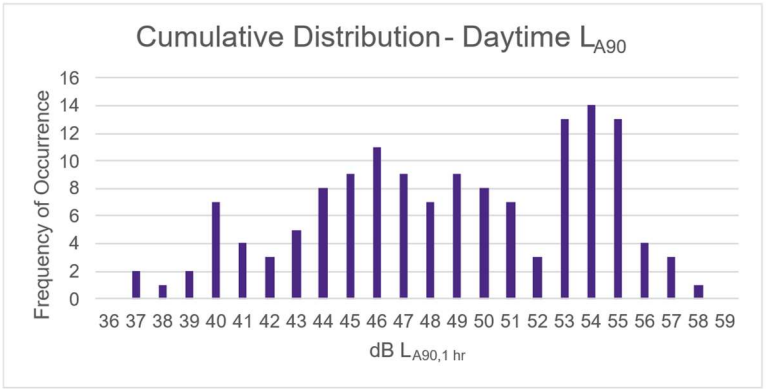



**Figure 6 LT5 time history and background noise statistics**



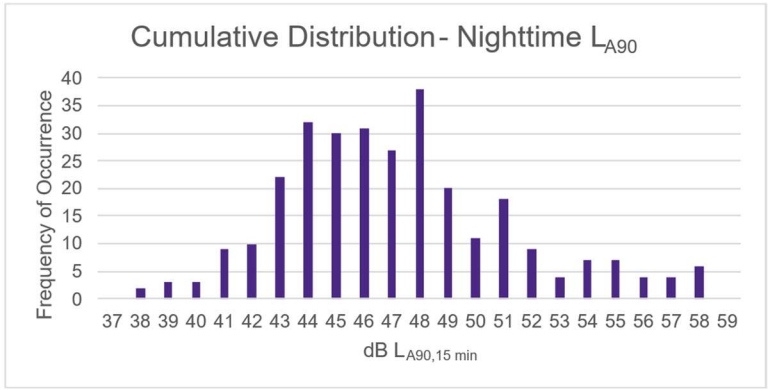
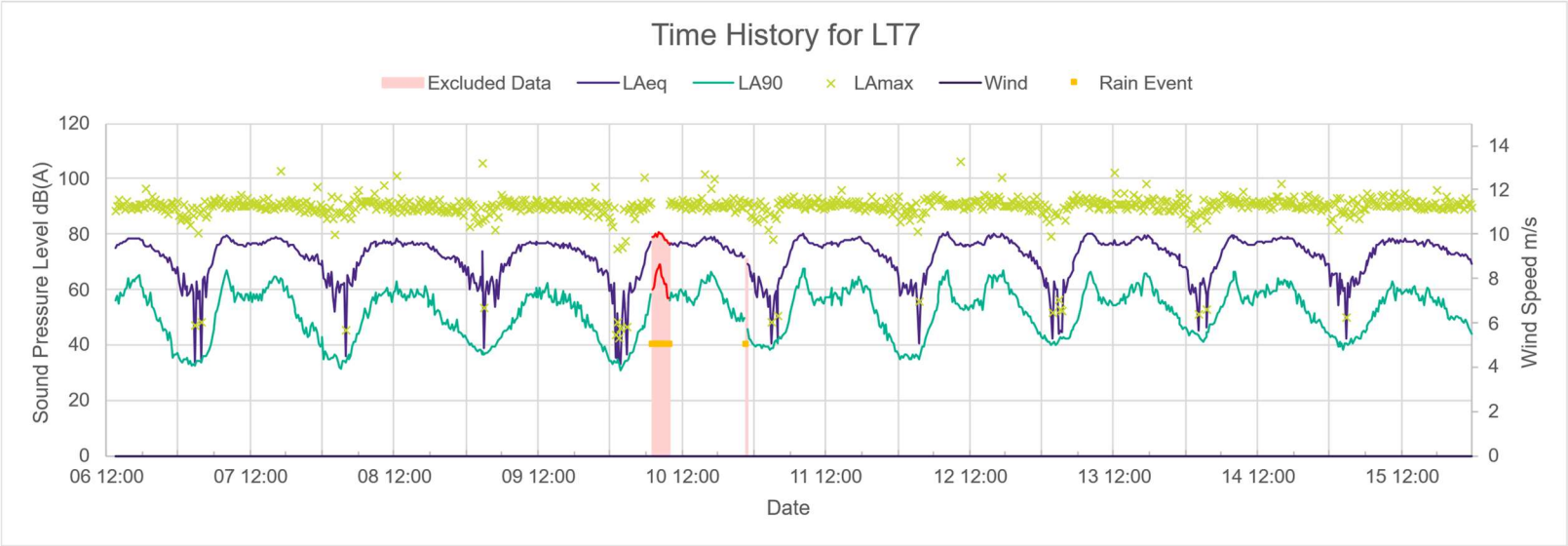
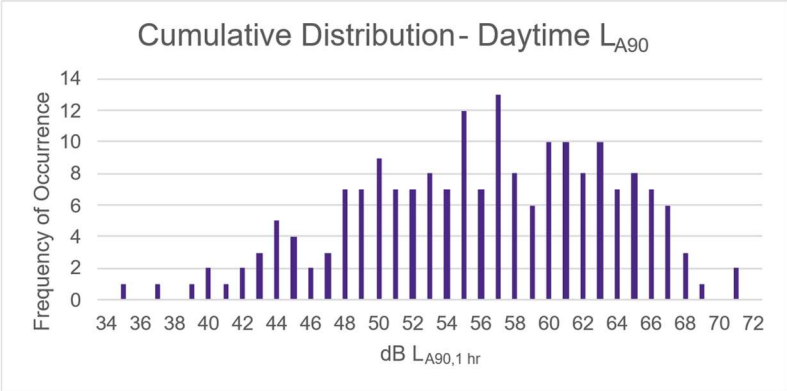




**Figure 7 LT6 time history and background noise statistics**



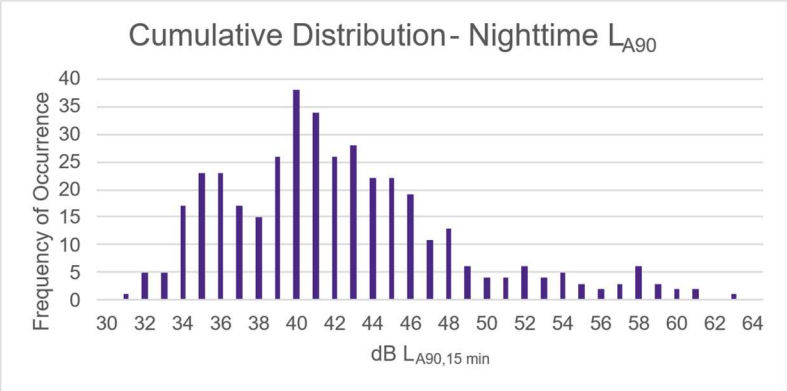




**Figure 8 LT7 time history and background noise statistics**