Preliminary Environmental Information Report

Appendix 13B: Baseline Noise Monitoring

PEIR Appendices [PINS Ref: EN 010171]

Document Reference: EN 010171/PEIR APP/13B

Revision Number: 1

December 2025

Future Energy Llanwern Limited

Contents

13.B Baseline Noise Monitoring

13.1 Methodology

13.1.1 Acoustic monitoring was undertaken from 20 to 30 June 2025 in order to quantify and characterise the existing acoustic environment within the Study Area.

13.1.2 The baseline noise monitoring locations were initially identified to yield a conservative assessment, by being representative of receptors where baseline sound levels were considered likely to be lower and where receptors would be in closest proximity to proposed sources of noise and vibration associated with the construction and operation of the Proposed Development. The proposed monitoring locations were modified where access to locations initially proposed could not be agreed. All baseline monitoring locations were agreed with the Local Authorities.

13.1.3 Unattended long-term monitoring was undertaken at four Noise Monitoring Locations (NMLs) and attended short term measurements were undertaken at one NML (NML4). At one of the agreed long-term monitoring locations, NML1, due to a technical fault with the monitoring equipment, no data was acquired. Long-term monitoring data was therefore only acquired at four monitoring locations (NML2, NML3, NML5 and NML6).

13.1.4 For the purposes of the preliminary assessment presented in the PEIR, baseline data from NML3 has been adopted for the assessment at R02, as NML3 is a similar distance from the A481 Queens Way road as survey location NML1 and R02.

13.1.5 The location of each NML is identified in **Figure 13-1**. Full details of each measurement location are presented in the noise monitoring forms provided in **Annex A**.

13.2 Meteorological Conditions

13.2.1 A meteorological station was co-located with the noise monitoring equipment at NML2 which logged meteorological conditions for the duration of the monitoring period.

13.2.2 During the monitoring period there was no precipitation but there were long periods

when wind speeds were in excess of 5 m/s. In general, noise data collected when wind speeds were in excess of 5 m/s were excluded from the analysis. However, a limited number of noise data samples were retained where inspection of the measured noise levels indicated that meteorological conditions did not significantly affect the measured noise levels.

13.3 Subjective Observations

13.3.1 In general, the acoustic environment was noted to be dominated by transport sources, primarily road vehicle movements on the local highway network and occasional aeroplanes, with contributions from naturogenic sources such as sheep, insects, birds, wind in flora and water in the Severn Estuary on the shore near to the coastal path at NML4. Other sources noted during the monitoring were distant farm machinery, pedestrians and cyclists. At NML1, no sound from the existing substation to the north was noted.

13.4 Long Term Monitoring Results

13.4.1 The following tables, **Table 13B-1** and **Table 13B-2** present the data collected during the long-term noise monitoring at each NML.

Table 13B-1 Long Term Environmental Noise Survey Summary

Location	Period, T	Measured Sound Level, dB*	
		$L_{Aeq, T}$	Representative** $L_{A90, T}$
NML2	Weekday daytime (0700 - 1900 hrs)	48	34
	Weekend daytime (0700 - 1900 hrs)	46	34
	Evening (all days) (1900 - 2300 hrs)	45	29
	Night-time (all days) (2300 - 0700 hrs)	46	28
	Saturday (0700 - 1300 hrs)	45	32
	Saturday (1300 - 1900 hrs)	40	33
NML3	Weekday daytime (0700 - 1900 hrs)	61	41
	Weekend daytime (0700 - 1900 hrs)	60	41
	Evening (all days) (1900 - 2300 hrs)	49	35

Location	Period, T	Measured Sound Level, dB* $L_{Aeq, T}$	Representative** $L_{A90, T}$
	Night-time (all days) (2300 - 0700 hrs)	57	35
	Saturday (0700 - 1300 hrs)	59	41
	Saturday (1300 - 1900 hrs)	54	37
NML5	Weekday daytime (0700 - 1900 hrs)	51	35
	Weekend daytime (0700 - 1900 hrs)	47	33
	Evening (all days) (1900 - 2300 hrs)	45	32
	Night-time (all days) (2300 - 0700 hrs)	44	29
	Saturday (0700 - 1300 hrs)	48	38
	Saturday (1300 - 1900 hrs)	48	41
NML6	Weekday daytime (0700 - 1900 hrs)	47	29
	Weekend daytime (0700 - 1900 hrs)	43	30
	Evening (all days) (1900 - 2300 hrs)	40	28
	Night-time (all days) (2300 - 0700 hrs)	39	25
	Saturday (0700 - 1300 hrs)	44	37
	Saturday (1300 - 1900 hrs)	46	37
* - Excluding periods with unfavourable weather conditions and unrepresentative events. ** - 25th percentile of measured $L_{A90,T}$ sound levels.			

Table 13B-2 Summary of Long Term Ambient Noise Levels

Location	Measured Log. Average Sound Level, All Days $L_{Aeq, T}$ (dB) Daytime (07:00 – 19:00 hrs)	Evening (19:00 – 23:00 hrs)	Night-time (23:00 – 07:00 hrs)
NML2	47	45	46
NML3	61	50	57
NML5	49	45	44
NML6	46	39	39

13.4.2 Upon a review of the results presented for NML3 in Error! Reference source not found., it is noted that the typical diurnal variation is not observed when comparing

the evening and night-time sound levels, with the average night-time levels at NML3 considerably higher than the evening. This is considered likely due to the influence of unrepresentative local activity during the night or early morning hours. Therefore, the measured evening sound level at NML3 is taken to be representative of the night-time ambient sound levels at NML3.

13.5 Short Term Monitoring Results

13.5.1 **Table 13B-3** presents the results of the attended monitoring at NML4.

Table 13B-3 Short Term Monitoring Results: NML4

Start Date & Time	Period	Duration (hh:mm)	Local Weather: Wind Speed, m/s	Local Weather: Wind Direction	Measured Sound Pressure Level, dB: $L_{Aeq,T}$	Measured Sound Pressure Level, dB: $L_{A90,T}$	Subjective Audibility (0 - 4) 0: Inaudible, 1: Just Audible, 2: Audible, 3: Significant source 4: Dominant: Industry	Wind in flora	Road	Other	Comments
20/06/2025 15:45	Day	01:00	4.0	SE	41	29	1	2	0	3	Crickets, birdsong and occasional airplane flyover were clearly audible. Wind in flora and waves crashing against the sea wall could be heard faintly. The sound of distant farm vehicles could be heard very faintly (industrial sound).
30/06/2025 10:00	Day	01:00	3.0	S	36	28					
Average, all samples					40	28					

13.6 Concurrent Analysis – Short and Long Term Measurement Data

13.6.1 Comparisons of concurrent short term survey data from NML4 with NML6 were undertaken to derive a correction that could be applied to the NML6 measurement data to be representative of NML4. NML6 was chosen to be representative of NML4 due to similarities in their noise environment and their relative distance from the coastal path.

13.6.2 This approach has been taken because of the limited sampling duration at NML4 (two hours), and the relatively reduced level of uncertainty in the dataset at NML6 because of the longer sampling period (approximately one week).

13.6.3 There is one concurrent one-hour period that is considered to provide a valid comparison which has been used to derive a correction for the NML6 data to provide representative sound levels at NML4. The comparison is provided in **Table 13B-4**, below.

Table 13B-4 Comparison of concurrent measurement data: NML6 and NML4

Ref	Start Date & Time	NML6		NML4		Difference	
		$L_{Aeq,1hr}$	$L_{A90,1hr}$	$L_{Aeq,1hr}$	$L_{A90,1hr}$	$L_{Aeq,1hr}$	$L_{A90,1hr}$
1	30/06/2025 10:00	41.4	28.9	36.4	27.8	-5.0	-1.1

13.7 Statistical Analysis – Long Term Measurement Data

13.7.1 The following figures present statistical analyses of the measured sound levels at the long term measurement locations.

Plate 13B-1 NML2 Distribution of Ambient Sound Levels

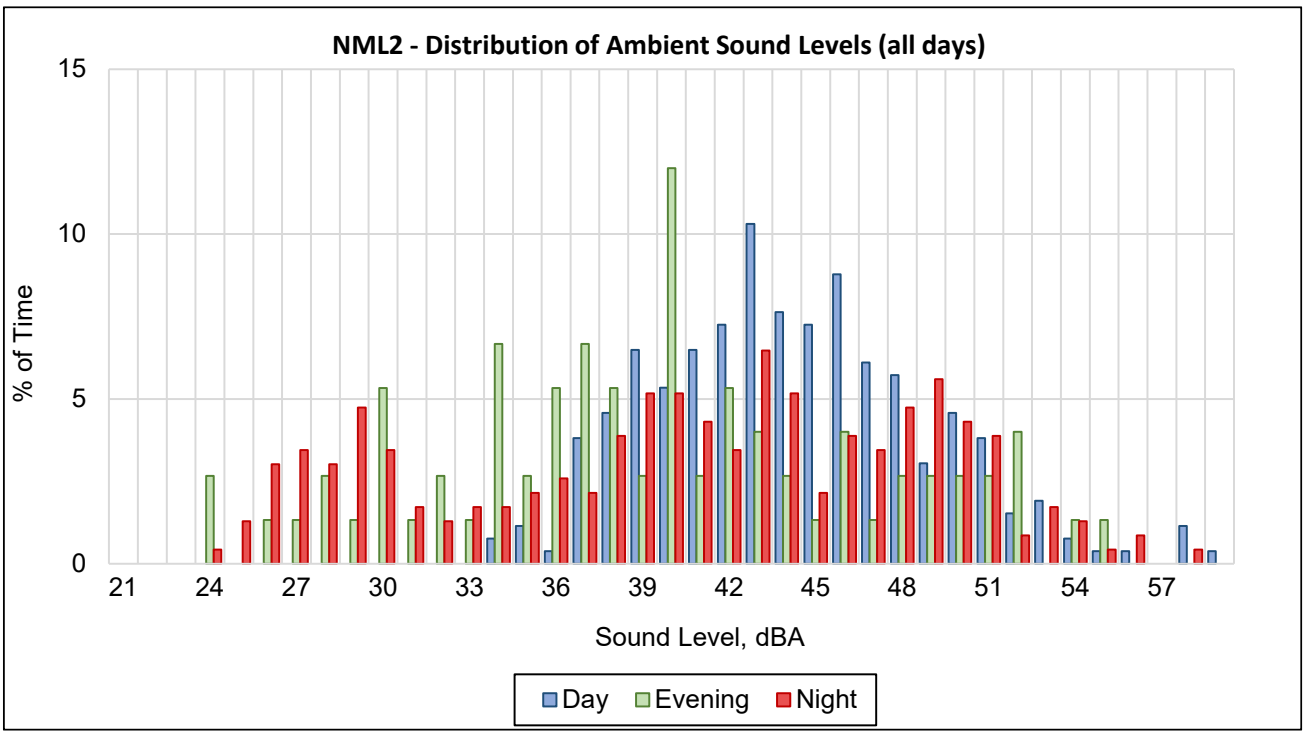


Plate -13B-2: NML2 Distribution of Background Sound Levels

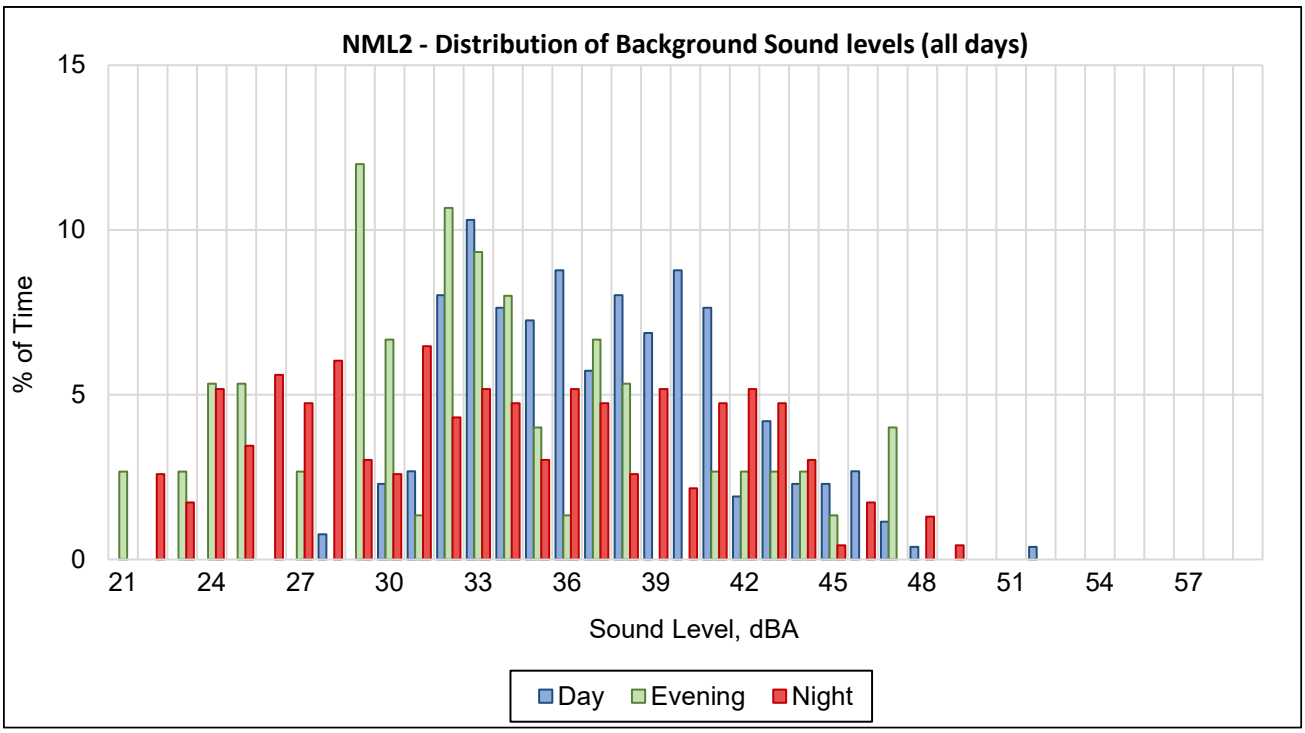


Plate -13B-3: NML2 Daytime Cumulative Percentage

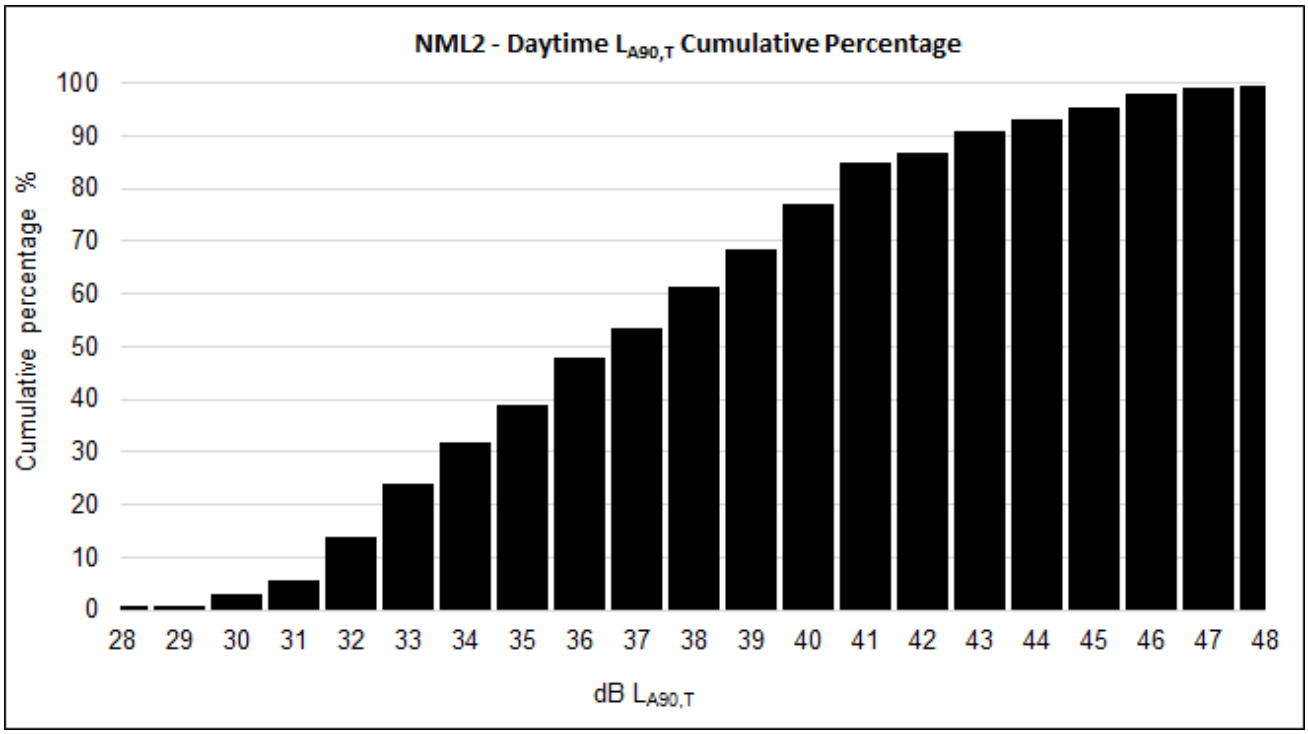


Plate -13B-4: NML2 Evening Cumulative Percentage

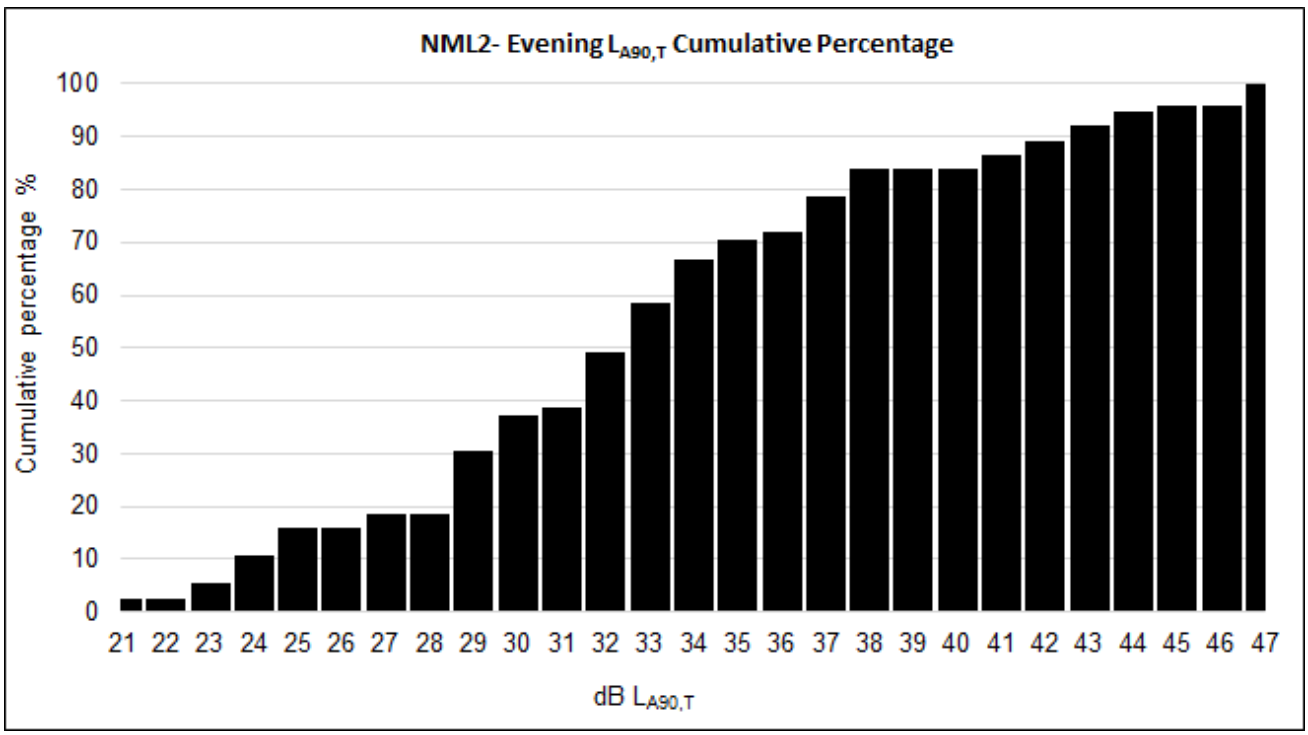


Plate -13B-5: NML2 Night-time Cumulative Percentage

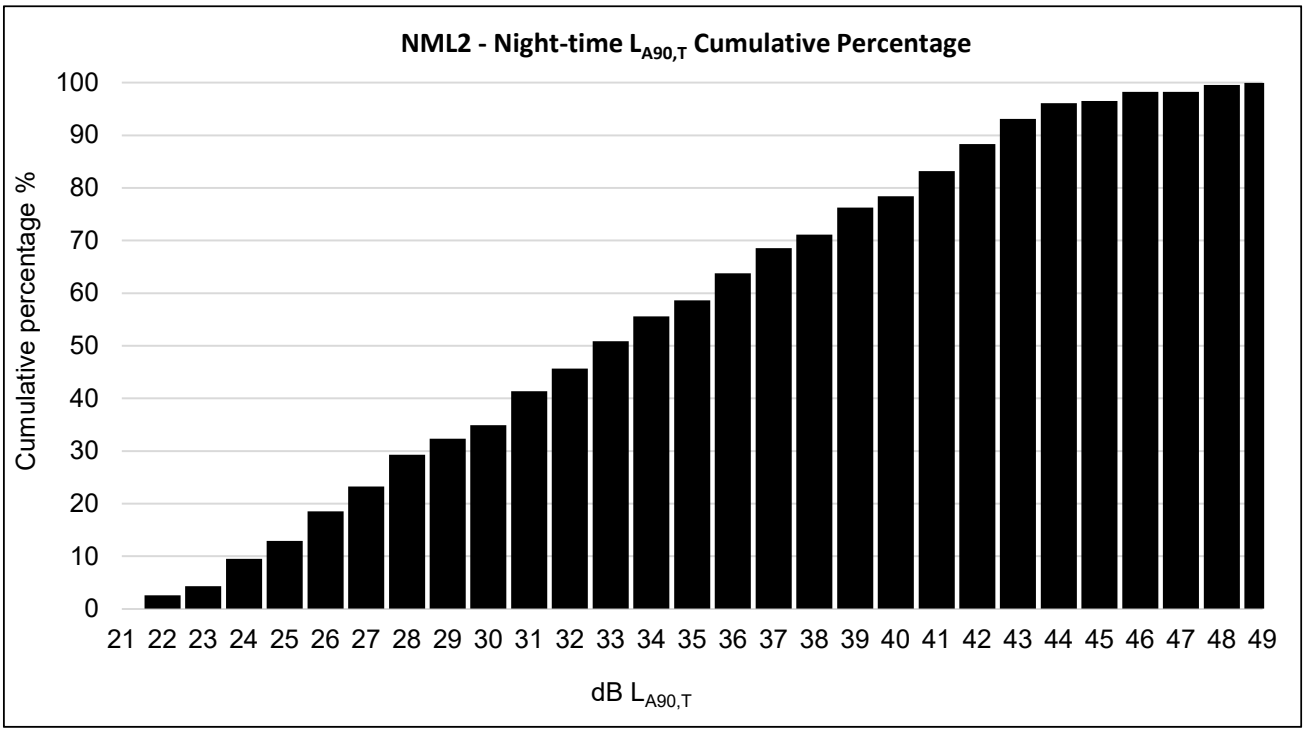


Plate -13B-6: NML3 Distribution of Ambient Sound Levels

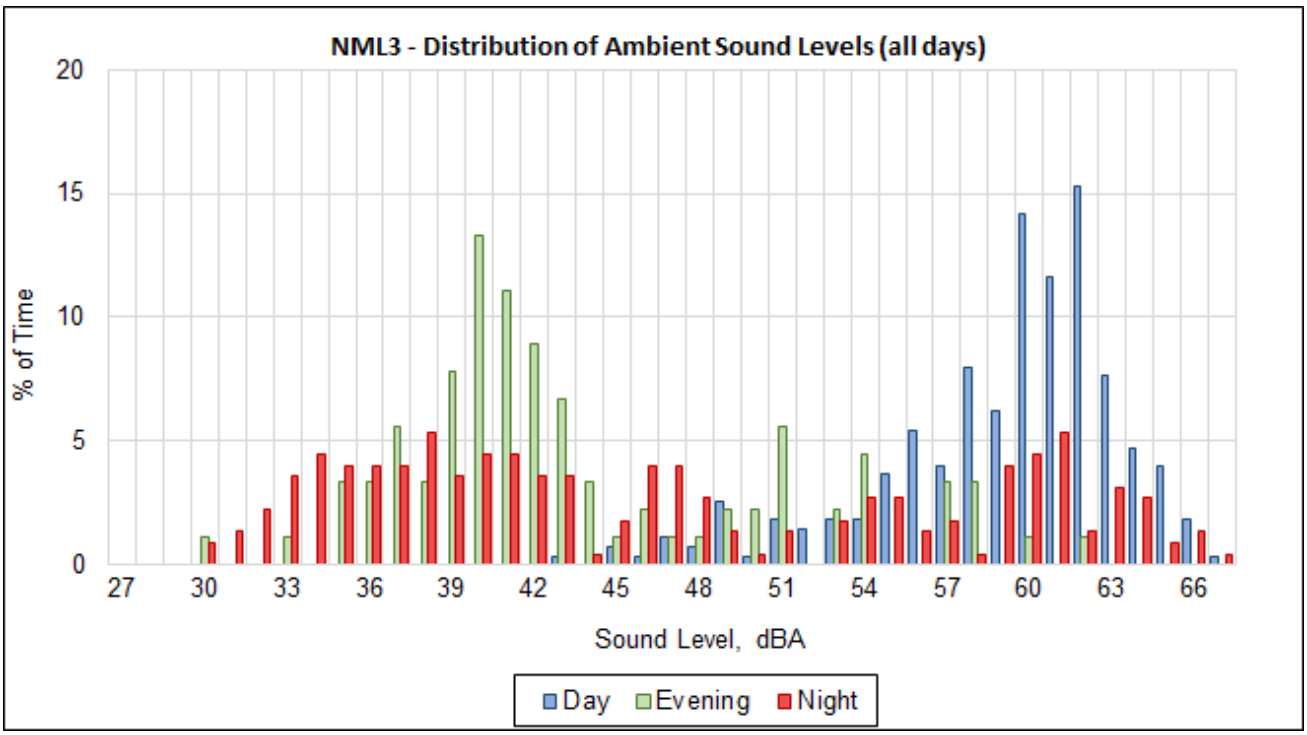


Plate -13B-7: NML3 Distribution of Background Sound Levels

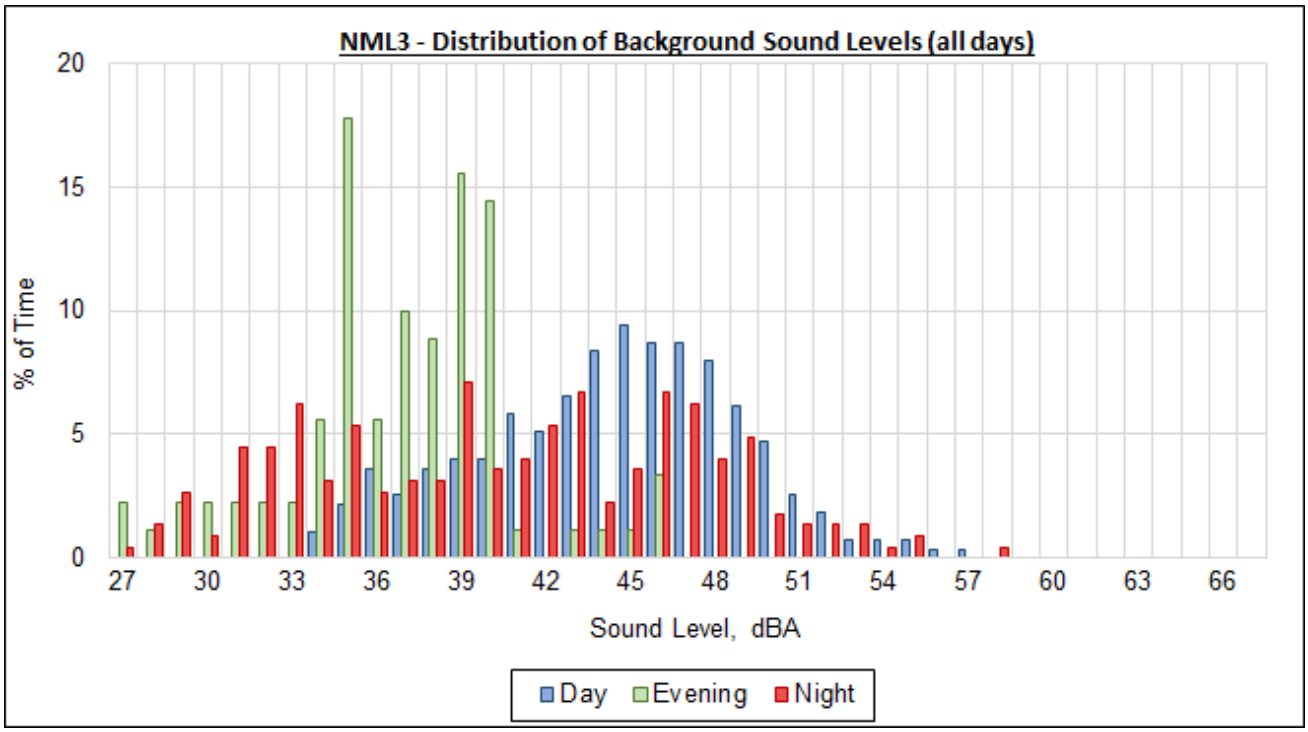


Plate -13B-8: NML3 Daytime Cumulative Percentage

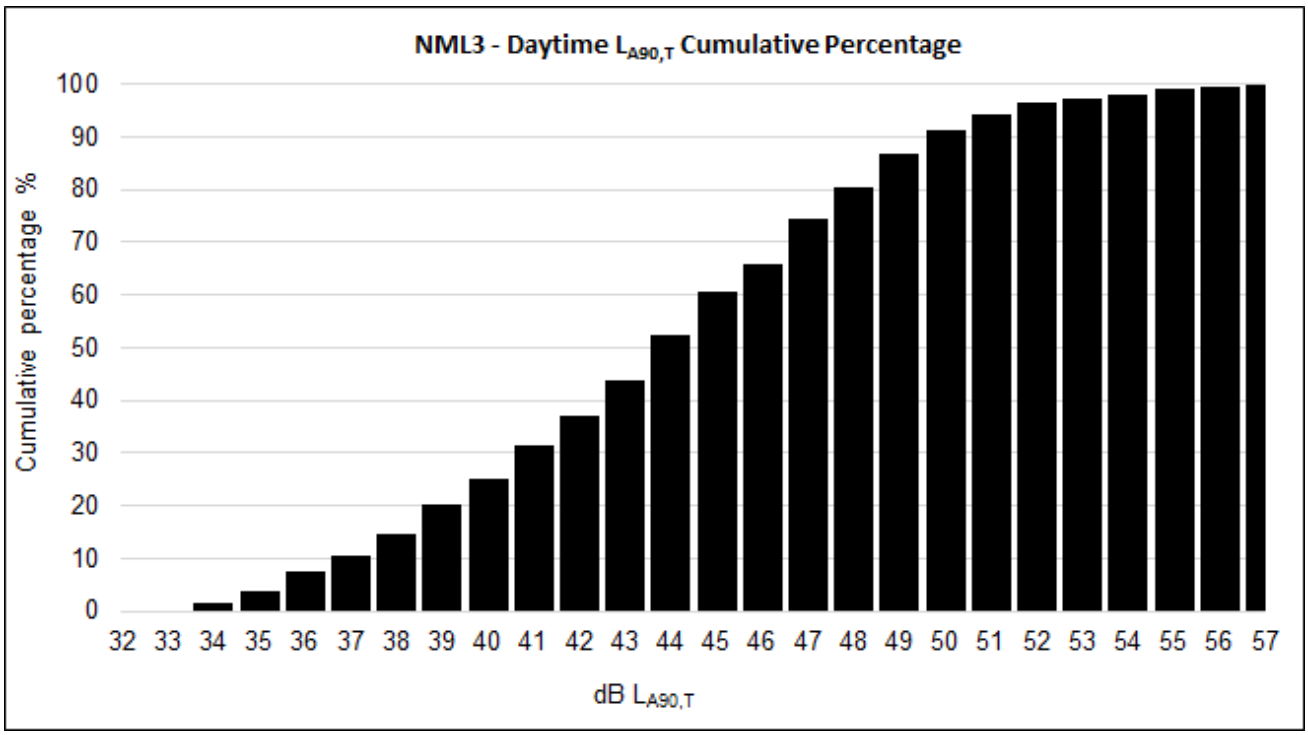


Plate -13B-9: NML3 Evening Cumulative Percentage

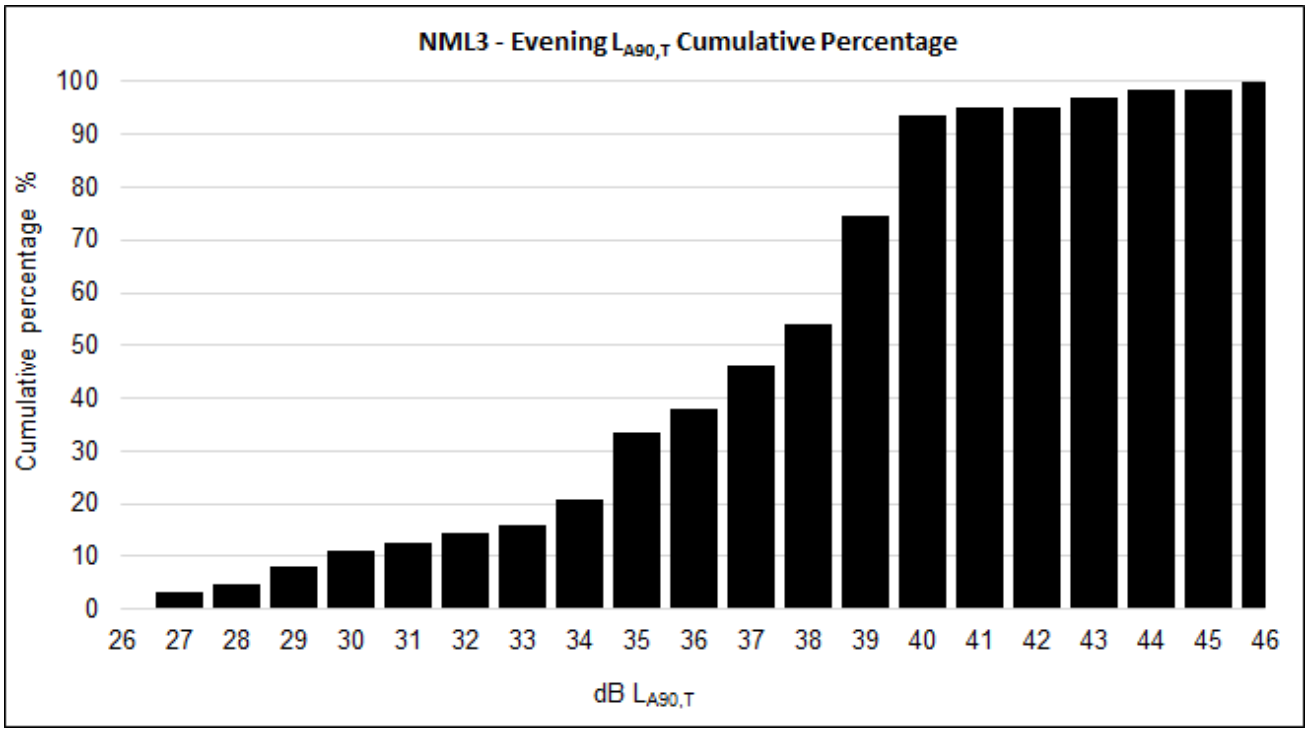


Plate -13B-10: NML3 Night-time Cumulative Percentage

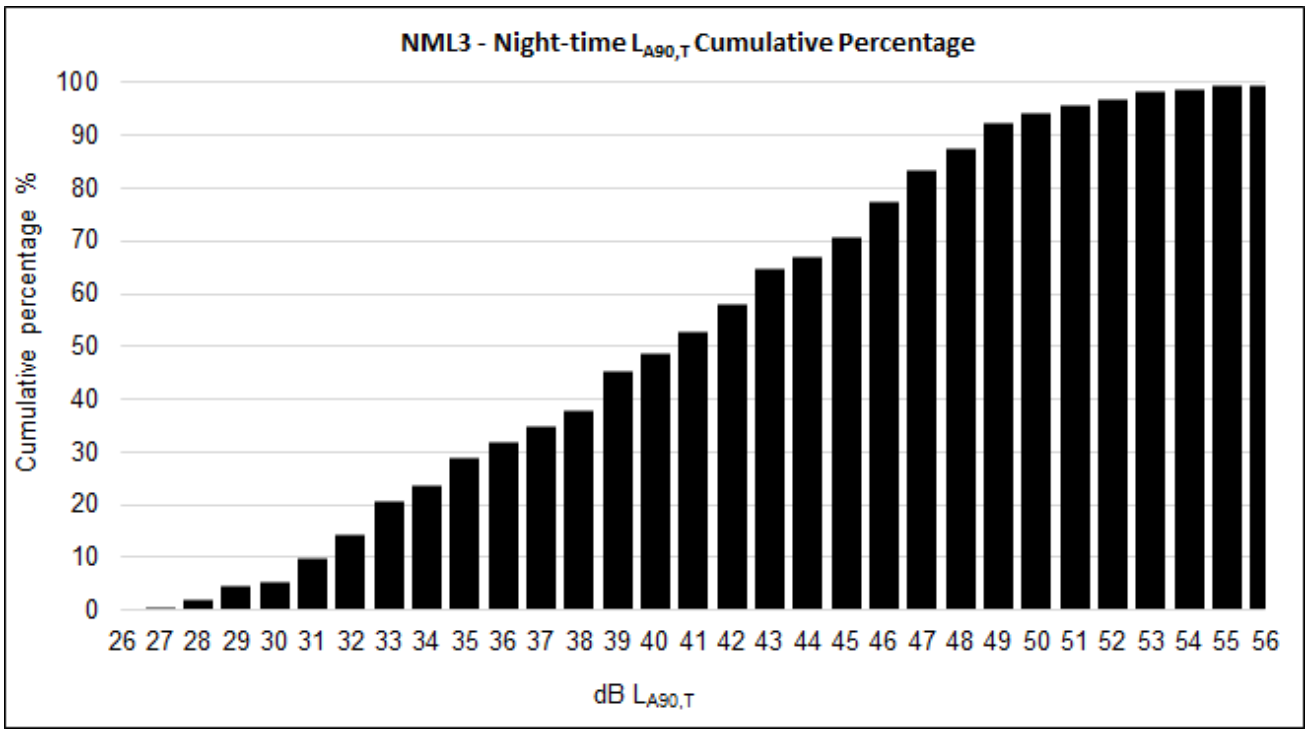


Plate -13B-11: NML5 Distribution of Ambient Sound Levels

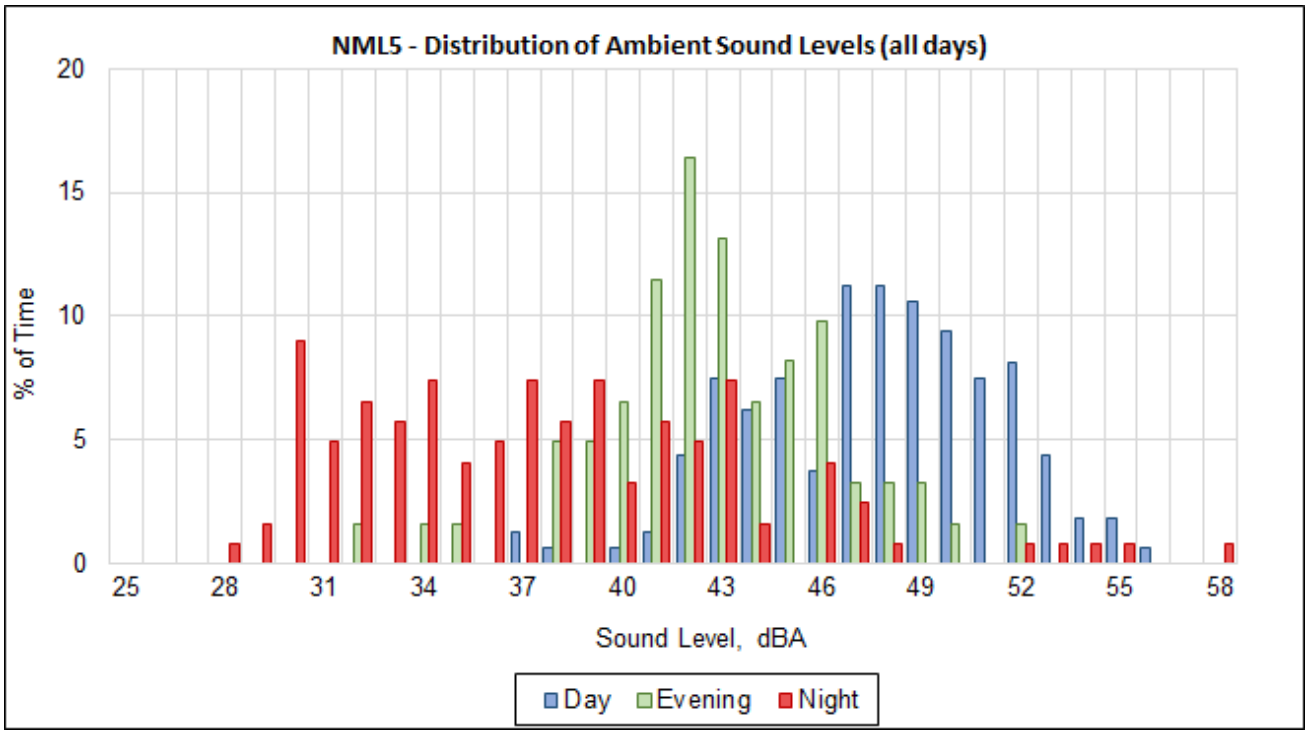


Plate -13B-12: NML5 Distribution of Background Sound Levels

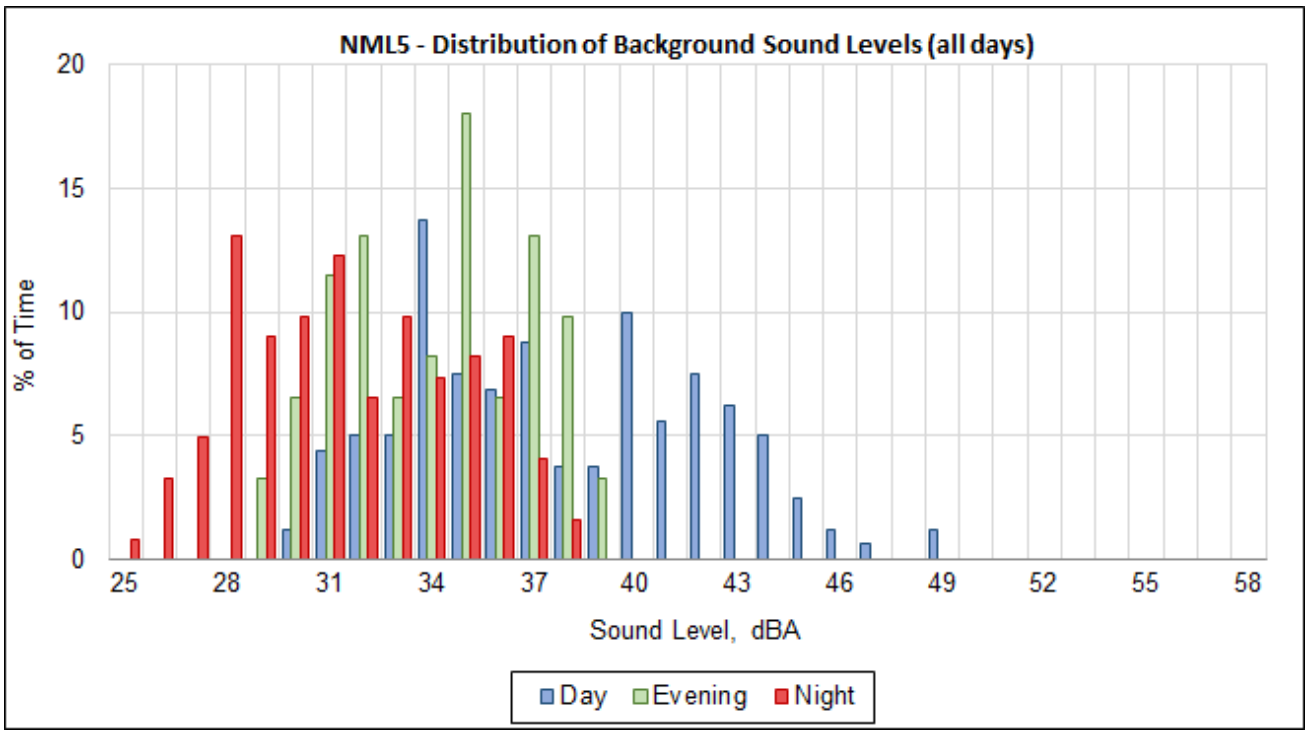


Plate -13B-13: NML5 Daytime Cumulative Percentage

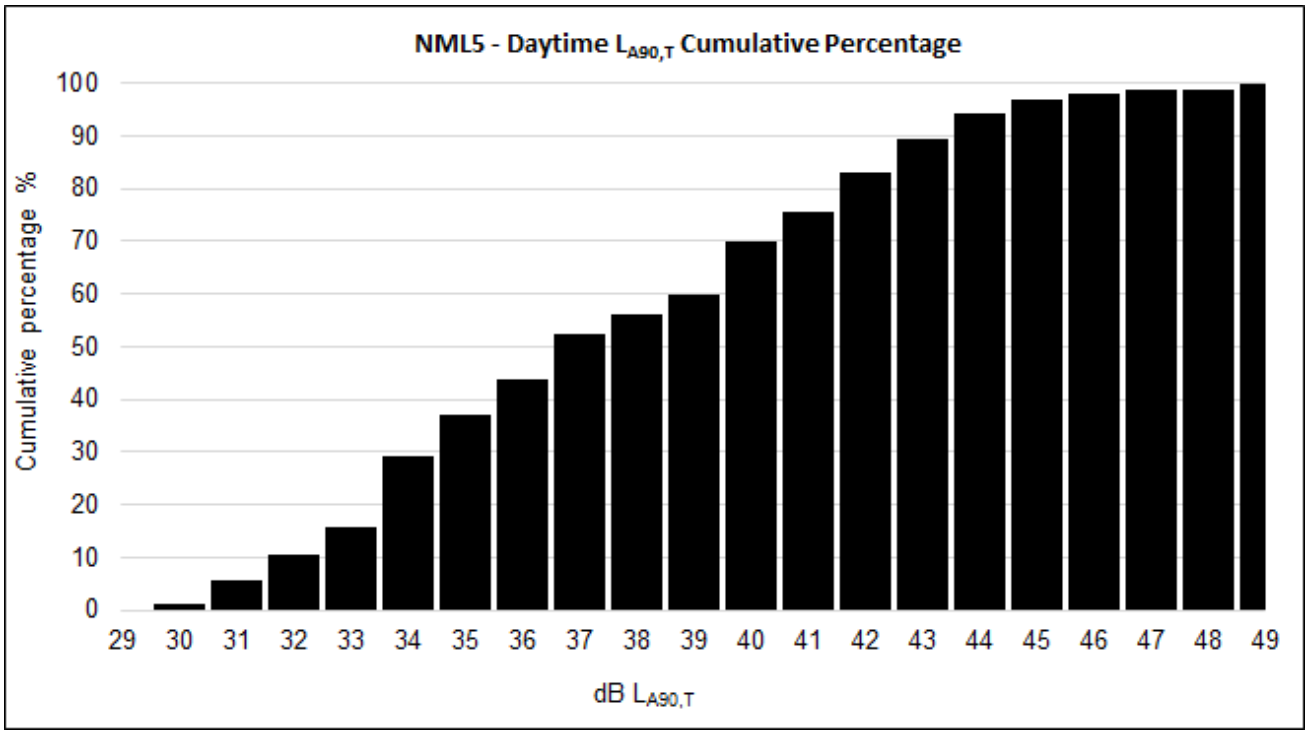


Plate -13B-14: NML5 Evening Cumulative Percentage

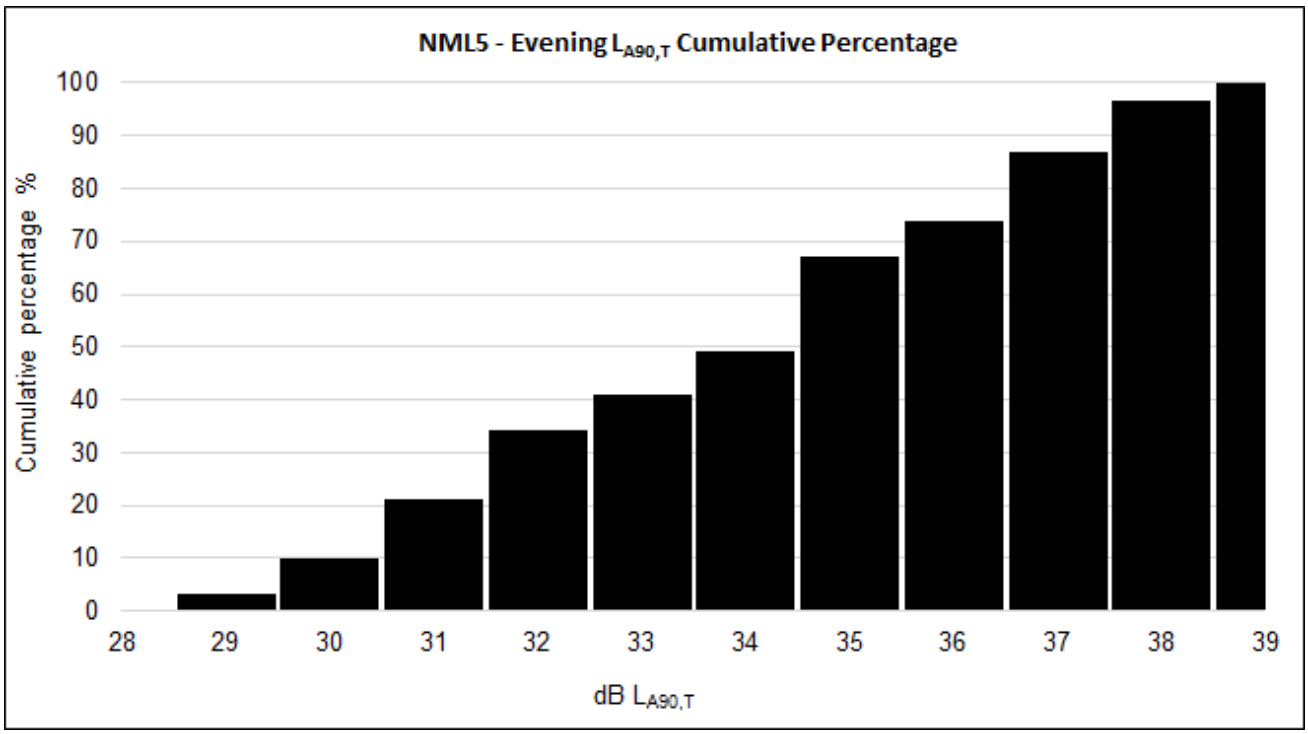


Plate -13B-15: NML5 Night-time Cumulative Percentage

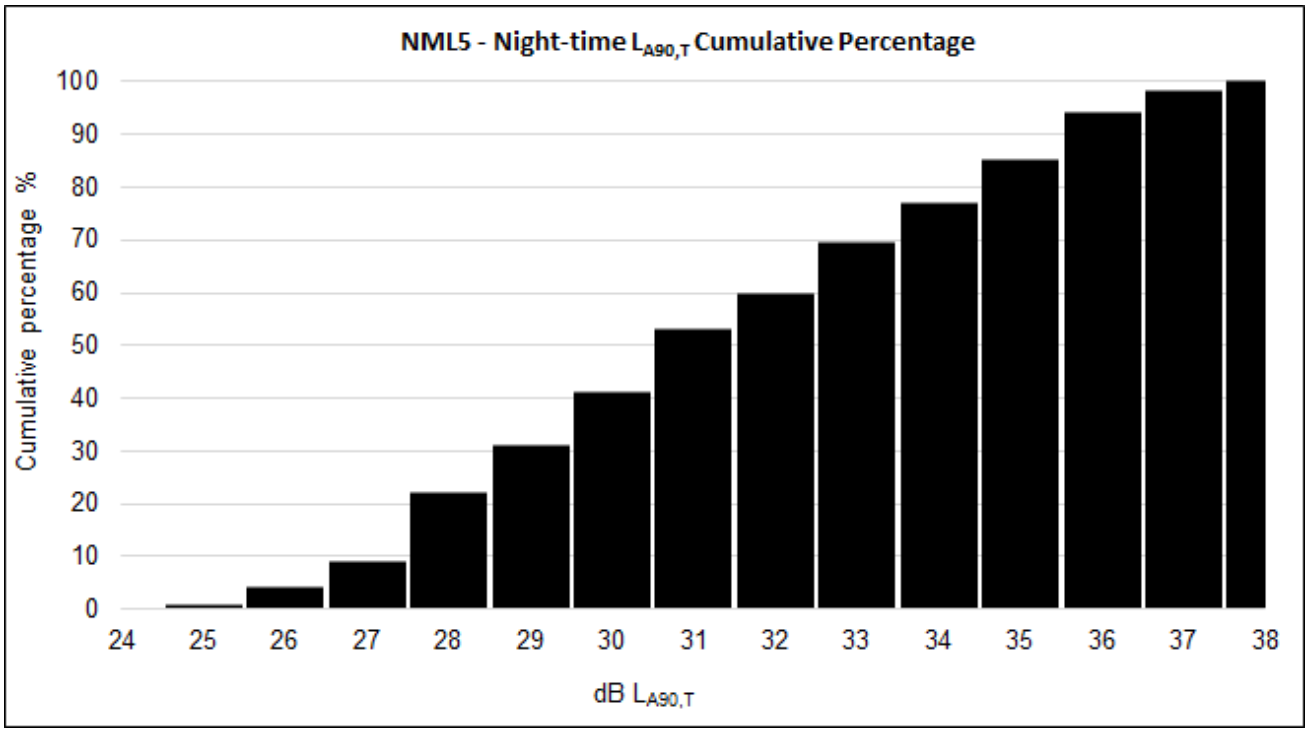


Plate -13B-16: NML6 Distribution of Ambient Sound Levels

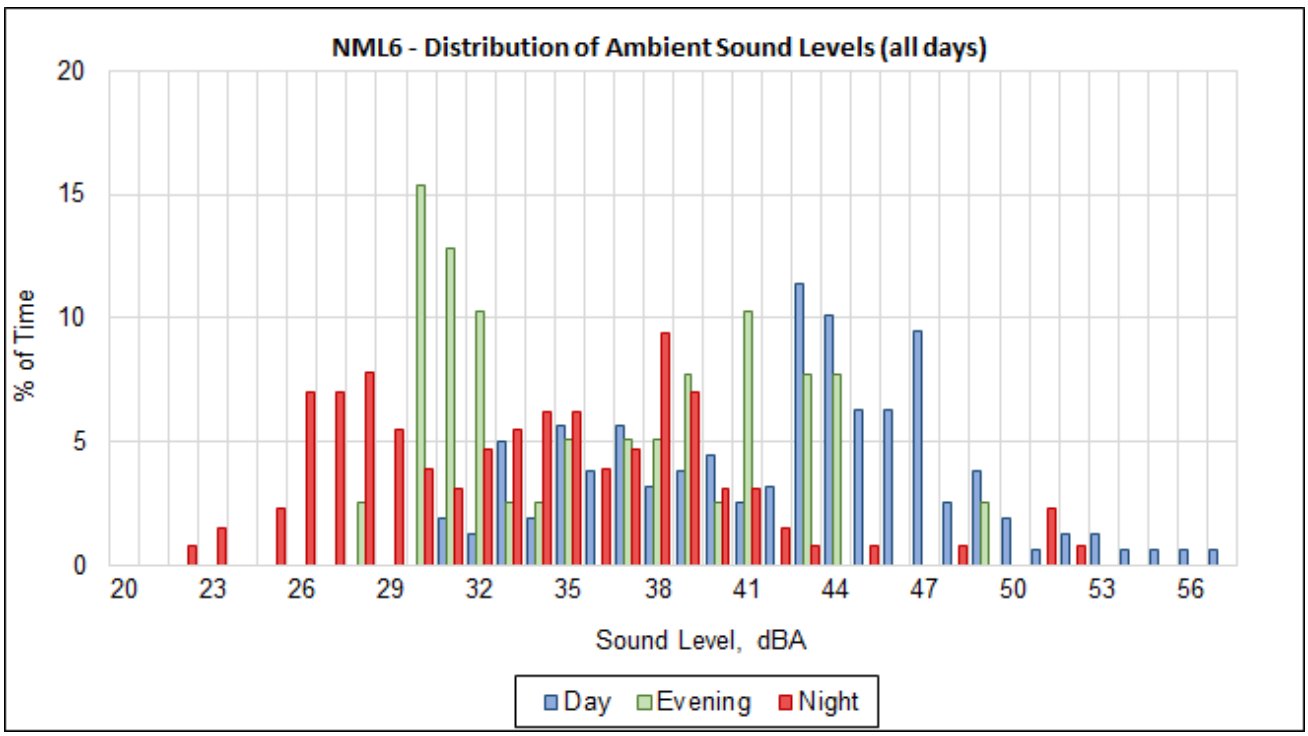


Plate -13B-17: NML6 Distribution of Background Sound Levels

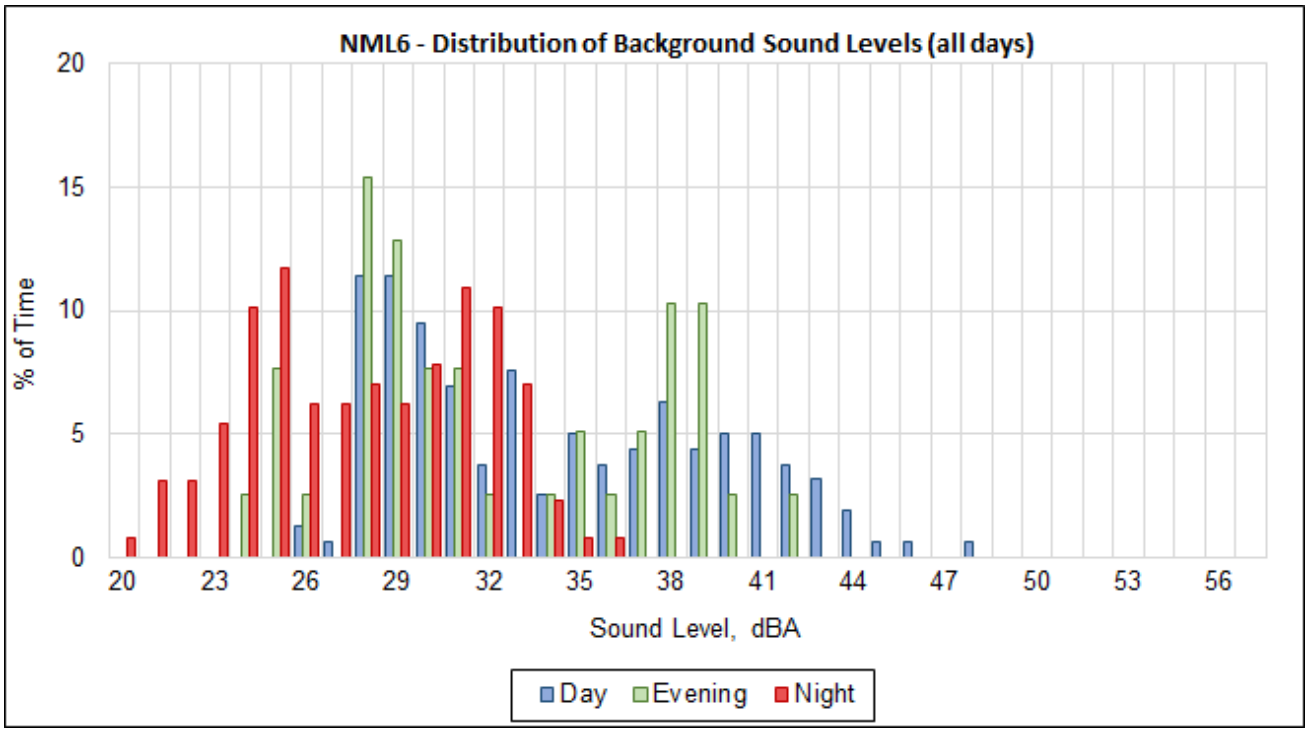


Plate -13B-18: NML6 Daytime Cumulative Percentage

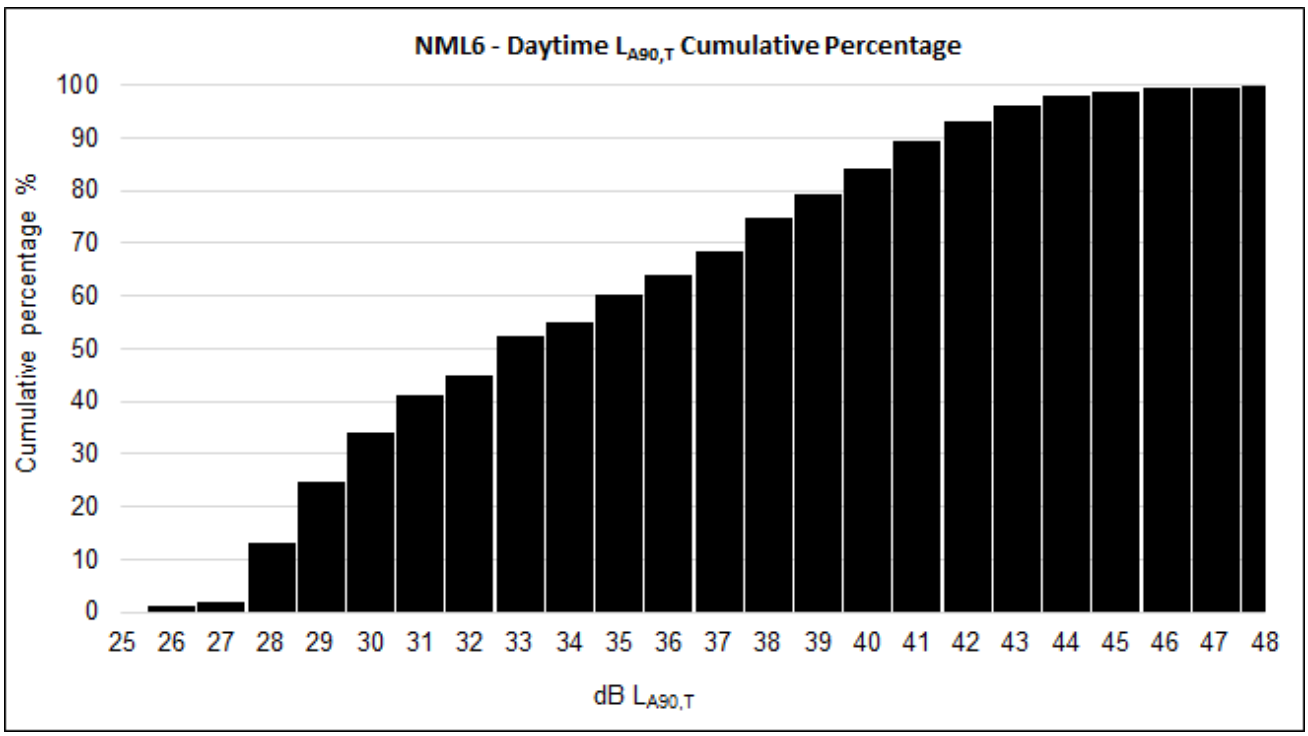


Plate -13B-19: NML6 Evening Cumulative Percentage

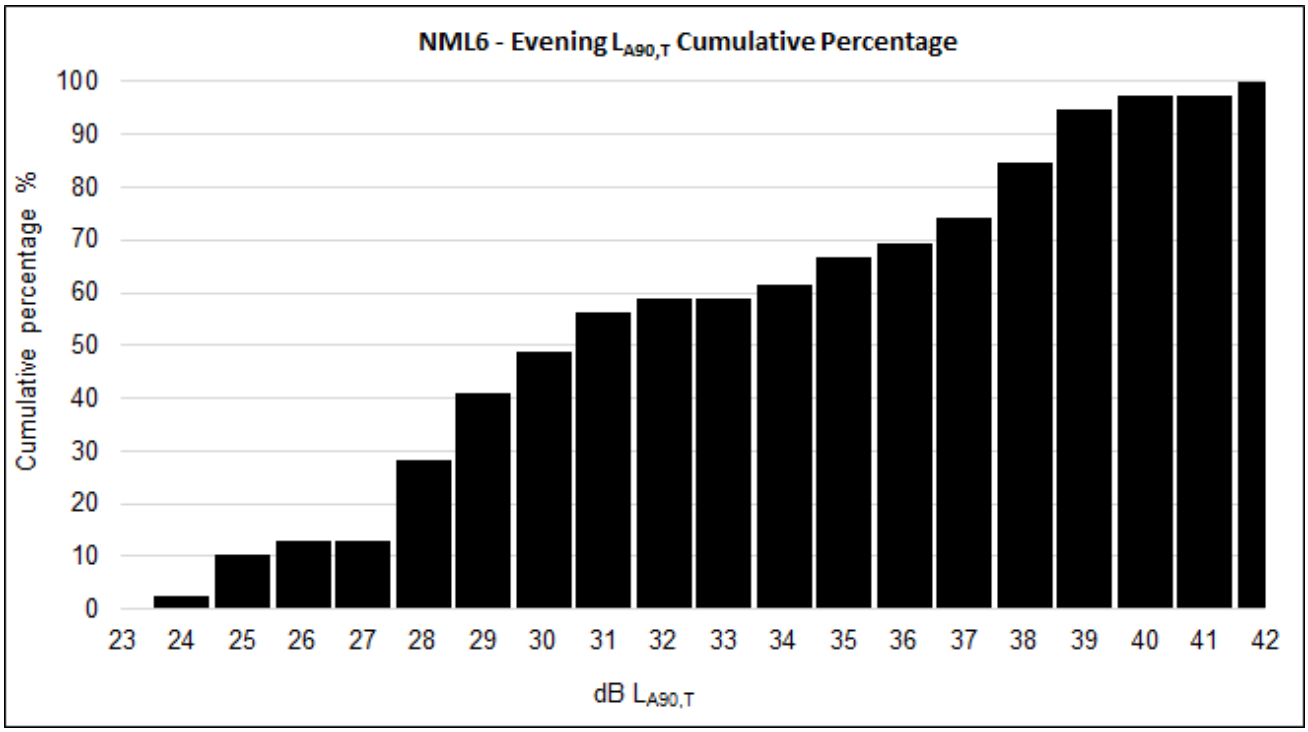
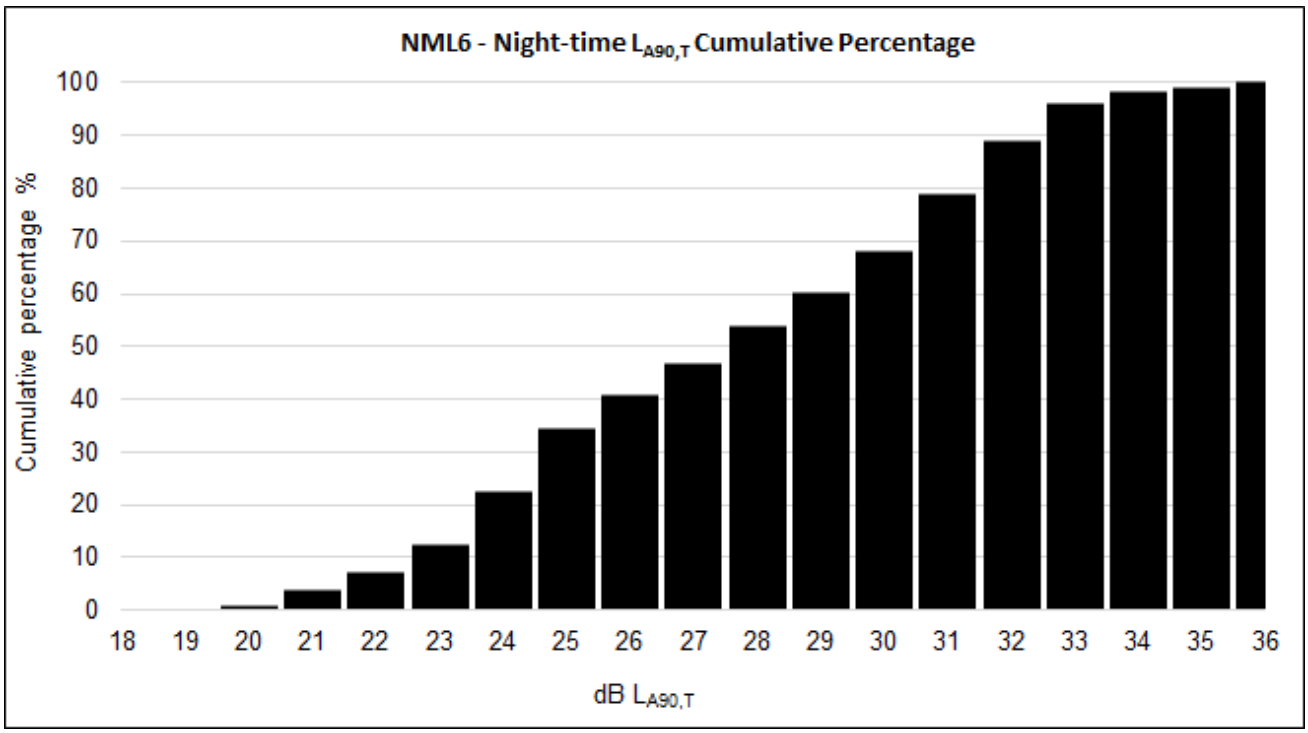


Plate -13B-20: NML6 Night-time Cumulative Percentage



13.8 Representative Sound Levels Used in the Assessment

13.8.1 Based on the results and analysis presented above, the representative sound levels used in the assessment of construction noise impacts to human receptors are presented in **Table 13B-5** overleaf, and the threshold of significance categories are

presented in Table 13B-6. Representative baseline sound levels used in the assessment of operational noise are the background $L_{A90,T}$ sound levels presented in **Table 13B-1** and representative residual sound levels are the 25th percentile of the measured ambient sound levels at each monitoring location.

Table 13B-5 Representative Sound Levels Used in The Assessment of Construction Noise

Baseline dataset	Representative baseline ambient sound levels, dB $L_{Aeq,T}$		
	Day (Weekdays)	Evening (All days)	Night (All days)
NML2	48	45	46
NML3	61	49	49
NML4*	42	35	34
NML5	51	45	44
NML6	47	40	39
*** - Corrected from NML6 based on concurrent measurement data.**			

Table 13B-6 BS 5228-1 Threshold of significance Category

Baseline dataset	BS 5228-1 Threshold of Significance Category			BS 5228-1 Threshold Value, dB		
	Day (Weekdays)	Evening (All days)	Night (All days)	Day (Weekdays)	Evening (All days)	Night (All days)
NML2	A	A	B	65	55	50
NML3	A	A	C	65	55	55
NML4	A	A	A	65	55	45
NML5	A	A	B	65	55	50
NML6	A	A	A	65	55	45

Annex A - Noise Monitoring Forms

13.8.2 The following forms present details of, and time history results, for each noise monitoring location. The forms show the date and time of the surveys and a description of the audible sources whilst the surveyor was on Site.

13.8.3 The forms show periods when data have been excluded from the analysis due to unsuitable weather conditions (wind speeds above 5 m/s and rain) and unrepresentative events.