

March 2025

Glen Earrach Pumped Storage Hydro

Environmental Impact Assessment Report

Volume 5: Appendices
Appendix 14.2: Baseline Sound Monitoring Details

Glen Earrach Energy Ltd

Quality information

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Issue History

Issue	Issue date	Details	Authorized	Name	Position
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1. Baseline Monitoring

1.1 Instrumentation

The following table identifies the instrumentation used to conduct the sound measurements.

Table 1 Sound measurement equipment details

Measurement Location	Equipment Type	Model Number	Serial Number
All locations	Calibrator	Brüel & Kjær 4231	02217876
M1	Sound level meter	Rion NL-52	00386763
M2	Sound level meter	Rion NL-52	00620280 (ANV 01038)
M3	Sound level meter	Rion NL-52	01143567
M4	Sound level meter	Rion NL-52	00386766
M5	Sound level meter	Rion NL-52	01143567
M6	Sound level meter	Rion NL-52	01021284
M7	Sound level meter	Rion NL-52	00386764
M8	Sound level meter	Rion NL-52	00320635 (ANV 01580)
M9	Sound level meter	Rion NL-52	01143567

All the above equipment has in-date factory calibration certificates available on request. The sound level meters (SLMs) were field calibrated before conducting measurements and calibration was checked at the end of the measurements, where the maximum deviation in the calibrated signals was 0.2 dB. All SLMs have been calibrated at a UKAS accredited laboratory within the previous two years.

All monitoring locations were 1.2 to 1.5 m above ground level and free-field i.e. at least 3.5 m away from any reflecting surface except the ground.

The sound level meters were programmed to log L_{Aeq} , L_{Amax} and L_{A90} values, third-octave band spectral levels and audio recordings at 15-minute measurement intervals. Sound pressure levels were also logged every second.

1.2 Weather conditions

The meteorological conditions throughout the monitoring period were variable, and some periods were in excess of the recommended rainfall and wind speeds for sound measurements. The conditions were monitored using a weather station, and logged measurements during periods of rainfall and average wind speeds greater than 5m/s were excluded.

1.3 Baseline Survey - Levels by Measurement Location

The following is a summary of the logged levels grouped by day and night periods at each receptor. NSR5 and NSR9 are attended short-term measurements rather than unattended long-term, this is because operational noise is not a concern at these locations and so background sound level measurements were not needed to characterise day or night-time $L_{A90,T}$ conditions, however at these location day time construction is more of a concern. Furthermore secure monitoring could not be arranged at these locations and therefore short-term attended measurements were considered appropriate. Note that baseline monitoring was not conducted at NSR10, as it is not a concern during the operational phase. Monitoring at NSR4 serves as a reliable proxy.

Table 2. NSR1 – Balmacaan Estate House (22/10/2024: 15:15 – 28/10/2024: 14:15)

	Date	L_{A90}		L_{A90}
		L_{Aeq}	L_{AFMAX}	Mean
Day	22/10/2024	42	87	27
	23/10/2024	44	63	34
	24/10/2024	38	67	24
	25/10/2024	35	77	24
	26/10/2024	48	71	41
	27/10/2024	40	71	26
	28/10/2024	36	72	23
Evening	22/10/2024	32	54	27
	23/10/2024	43	56	41
	24/10/2024	25	48	23
	25/10/2024	24	53	20
	26/10/2024	41	76	28
	27/10/2024	31	51	25
	28/10/2024	n/a	n/a	n/a
Night	22/10/2024	41	58	35
	23/10/2024	44	61	38
	24/10/2024	26	71	24
	25/10/2024	36	65	25
	26/10/2024	36	67	26
	27/10/2024	24	44	24
	28/10/2024	n/a	n/a	n/a

Table 3. NSR2 – Annie's Lodge (22/10/2024: 14:15 – 28/10/2024:13:15)

	Date	L_{A90}		L_{A90}
		L_{Aeq}	L_{AFMAX}	Mean
Day	22/10/2024	43	73	41
	23/10/2024	46	76	41
	24/10/2024	43	68	36
	25/10/2024	37	72	33
	26/10/2024	51	75	37
	27/10/2024	43	76	37
	28/10/2024	39	80	34

	Date	L _{A90}		L _{A90}
		L _{AEq}	L _{AFMAX}	Mean
Evening	22/10/2024	39	67	38
	23/10/2024	47	65	42
	24/10/2024	34	55	33
	25/10/2024	33	56	31
	26/10/2024	44	79	38
	27/10/2024	36	54	35
	28/10/2024	n/a	n/a	n/a
Night	22/10/2024	46	58	41
	23/10/2024	47	62	41
	24/10/2024	33	50	33
	25/10/2024	39	62	34
	26/10/2024	39	64	38
	27/10/2024	35	55	34
	28/10/2024	n/a	n/a	n/a

Table 4. NSR3 – Loch Ness Shore Campsite (23/10/2024: 14:45 - 28/10/2024: 11:45)

	Date	L _{A90}		L _{A90}
		L _{AEq}	L _{AFMAX}	Mean
Day	23/10/2024	48	68	44
	24/10/2024	43	72	38
	25/10/2024	42	74	38
	26/10/2024	50	71	47
	27/10/2024	47	80	41
	28/10/2024	45	69	35
Evening	23/10/2024	45	60	42
	24/10/2024	33	53	30
	25/10/2024	31	52	28
	26/10/2024	43	75	36
	27/10/2024	36	48	34
	28/10/2024	n/a	n/a	n/a
Night	23/10/2024	50	66	46
	24/10/2024	35	63	30
	25/10/2024	41	59	37
	26/10/2024	41	72	37
	27/10/2024	35	52	34
	28/10/2024	n/a	n/a	n/a

Table 5. NSR4 – Primrose Bay (22/10/2024: 10:20 – 28/10/2024: 16:35)

	Date	L _{A90}		L _{A90}
		L _{AEq}	L _{AFMAX}	Mean
Day	22/10/2024	49	80	41

	Date	L _{A90}		L _{A90}
		L _{AEq}	L _{AFMAX}	Mean
	23/10/2024	50	75	44
	24/10/2024	49	83	39
	25/10/2024	49	86	35
	26/10/2024	53	76	47
	27/10/2024	50	83	42
	28/10/2024	63	88	37
	28/10/2024	63	88	37
	28/10/2024	63	88	37
Evening	22/10/2024	44	66	39
	23/10/2024	44	63	38
	24/10/2024	41	68	20
	25/10/2024	42	66	19
	26/10/2024	50	83	28
	27/10/2024	42	66	34
	28/10/2024	n/a	n/a	n/a
	28/10/2024	n/a	n/a	n/a
Night	22/10/2024	47	70	44
	23/10/2024	50	65	45
	24/10/2024	40	73	22
	25/10/2024	41	66	30
	26/10/2024	38	68	30
	27/10/2024	38	66	32
	28/10/2024	n/a	n/a	n/a
	28/10/2024	n/a	n/a	n/a

Table 6. NSR5 – Balnain Farmstead Attended monitoring (23/10/2024)

Period		L _{AEQ}	L _{AFmax}	L _{A90}
10:58	11:03	60	77	47
11:03	11:08	61	75	47
11:08	11:13	64	81	47
11:13	11:18	65	82	47
11:18	11:23	66	79	48
11:23	11:28	63	79	48
11:28	11:33	60	76	47
11:33	11:38	62	79	47
11:38	11:43	61	77	48
11:43	11:48	63	80	47
11:48	11:53	63	77	47
11:53	11:58	65	83	47
Overall	63	83	47	

Table 7. NSR6 – Achindaul House (22/10/2024: 16:15 – 28/10/2024: 08:45)

	Date	L _{A90}		L _{A90}
		L _{AEq}	L _{AFMAX}	Mean
Day	22/10/2024	55	93	48

	Date	L _{A90}		L _{A90}
		L _{AEq}	L _{AFMAX}	Mean
Evening	23/10/2024	55	96	46
	24/10/2024	53	87	45
	25/10/2024	53	86	43
	26/10/2024	54	88	46
	27/10/2024	52	85	46
	28/10/2024	46	70	44
	22/10/2024	48	74	48
	23/10/2024	46	77	46
	24/10/2024	52	86	44
	25/10/2024	53	85	42
	26/10/2024	50	77	48
	27/10/2024	45	60	45
	28/10/2024	n/a	n/a	n/a
	22/10/2024	48	58	47
Night	23/10/2024	48	67	46
	24/10/2024	43	49	43
	25/10/2024	42	55	42
	26/10/2024	49	73	48
	27/10/2024	45	51	44
	28/10/2024	n/a	n/a	n/a

Table 8. NSR7 – Foyers Lodge (23/10/2024: 14:00 – 28/10/2024: 11:15)

	Date	L _{A90}		L _{A90}
		L _{AEq}	L _{AFMAX}	Mean
Day	23/10/2024	57	82	52*
	24/10/2024	56	94	36
	25/10/2024	55	81	34
	26/10/2024	55	82	44
	27/10/2024	54	79	38
	28/10/2024	56	79	34
Evening	23/10/2024	50	79	37
	24/10/2024	48	78	28
	25/10/2024	50	82	32
	26/10/2024	50	78	36
	27/10/2024	50	79	35
	28/10/2024	n/a	n/a	n/a
Night	23/10/2024	49	78	46
	24/10/2024	41	77	27
	25/10/2024	45	80	29
	26/10/2024	44	75	36

Date	L _{A90}		L _{A90}	
	L _{AEQ}	L _{AFMAX}	MODE	Mean
27/10/2024	41	79	29	29
28/10/2024	n/a	n/a	n/a	n/a
* Note: this is the L90 Mode between 14:00 and 19:00 on the first day of monitoring, and is therefore not representative of a typical 12 hour day				

Table 9. NSR8 – Ancarraig House (22/10/2024: 14:00 – 28/10/2024: 13:15)

	Date	L _{A90}		MODE	Mean
		L _{Aeq}	L _{AFMAX}		
Day	22/10/2024	43	79	28	34
	23/10/2024	44	64	35	36
	24/10/2024	43	68	41	35
	25/10/2024	49	81	23	24
	26/10/2024	59	100	37	41
	27/10/2024	41	71	28	32
	28/10/2024	60	107	19	20
Evening	22/10/2024	35	51	29	29
	23/10/2024	46	65	41	41
	24/10/2024	25	49	24	21
	25/10/2024	30	60	22	22
	26/10/2024	39	73	29	31
	27/10/2024	31	48	25	26
	28/10/2024	n/a	n/a	n/a	n/a
Night	22/10/2024	43	59	39	36
	23/10/2024	47	62	40	40
	24/10/2024	25	53	19	20
	25/10/2024	35	60	21	25
	26/10/2024	37	62	27	28
	27/10/2024	24	43	21	22
	28/10/2024	n/a	n/a	n/a	n/a

Table 10. NSR 9 – Divach Farmstead attended monitoring (5 minute logging)

Start	End	L _{Aeq}	L _{AFmax}	L _{A90}
16:35	16:40	41	53	39
16:40	16:45	53	73	39
16:45	16:50	43	54	39
16:50	16:55	44	56	40
16:55	17:00	43	55	40
17:00	17:05	42	54	38
17:05	17:10	50	68	38
17:10	17:15	41	52	38
17:15	17:20	39	52	38
17:20	17:25	41	49	39
17:25	17:30	43	59	39
17:30	17:35	40	51	38
Overall		43	73	39

1.4 Baseline Survey – Unattended Time Histories

Figure 1 NSR1 Monitored Level Time History

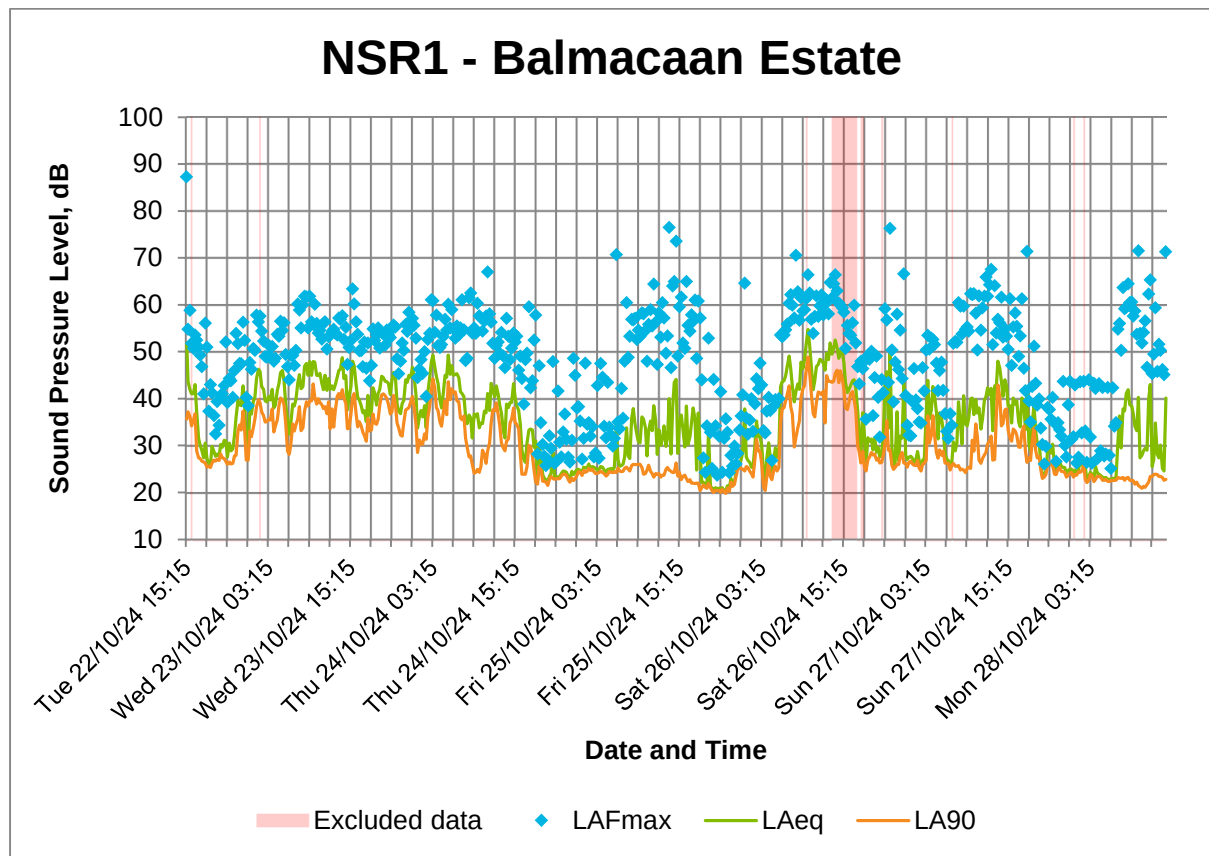


Figure 2 NSR2 Monitored Level Time History

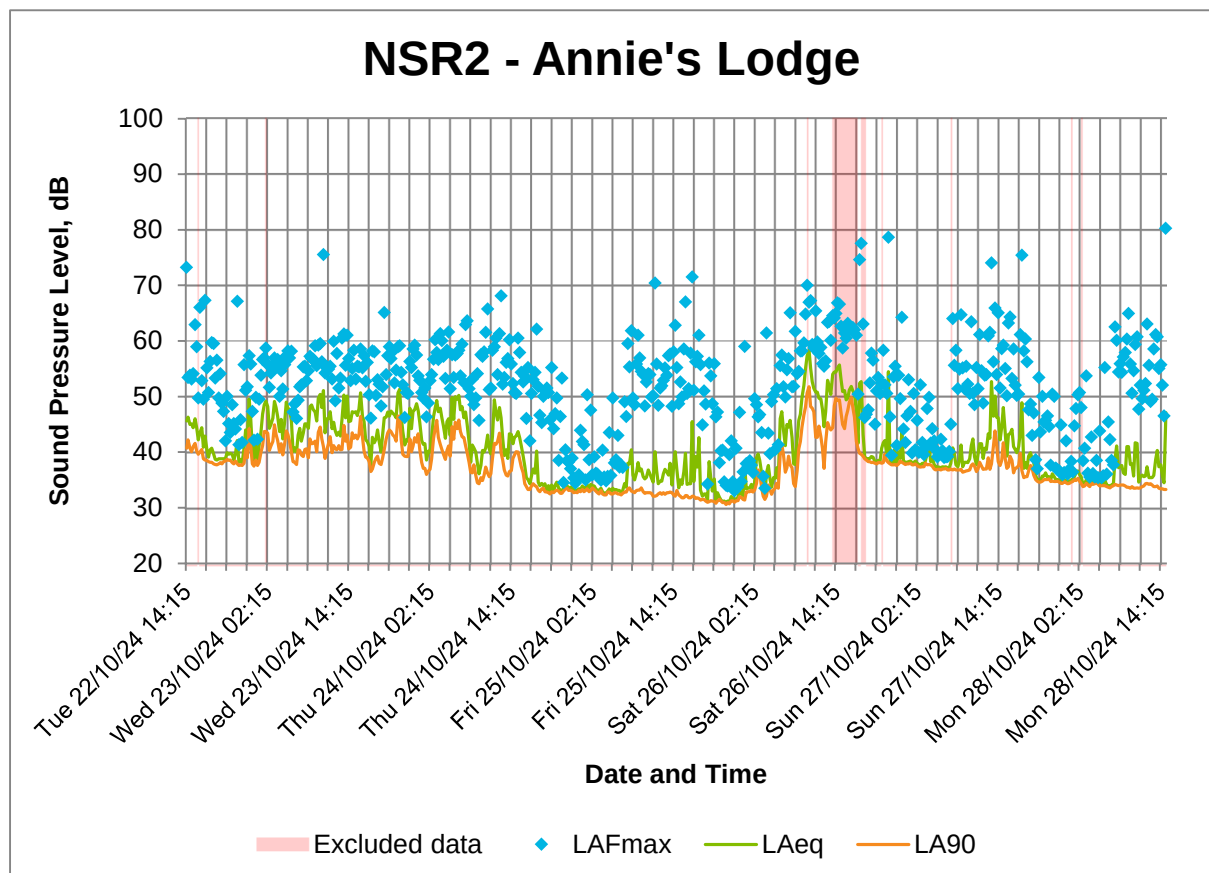


Figure 3 NSR3 Monitored Level Time History

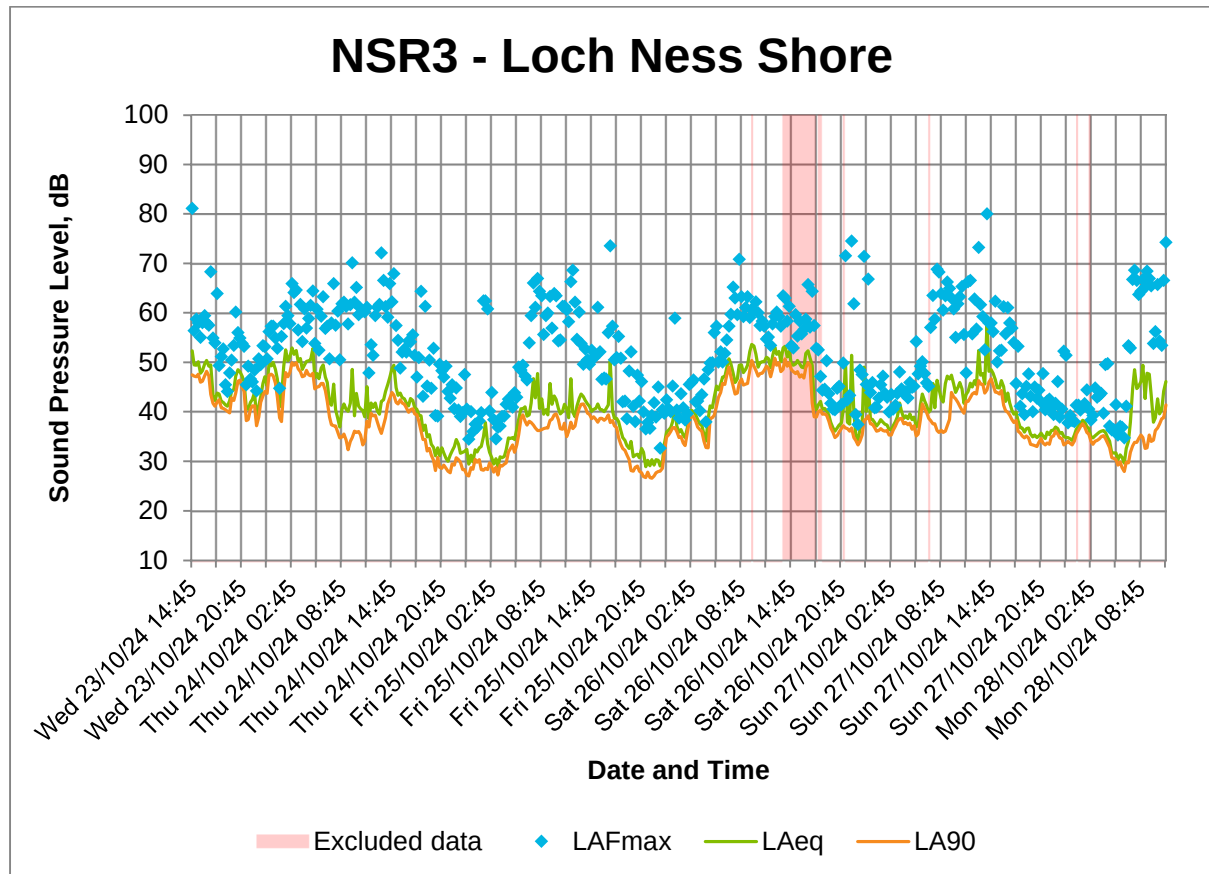


Figure 4 NSR4 Monitored Level Time History

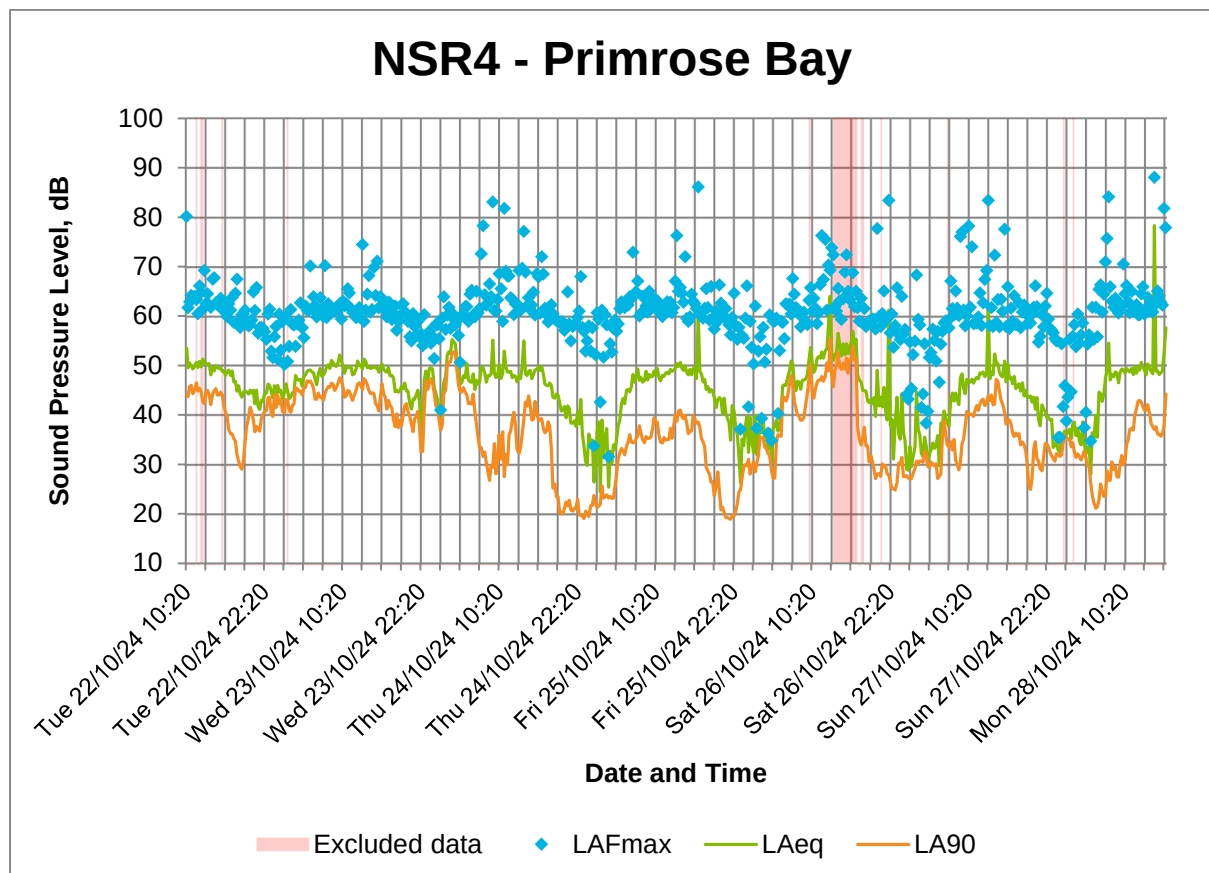


Figure 5 NSR6 Monitored Level Time History

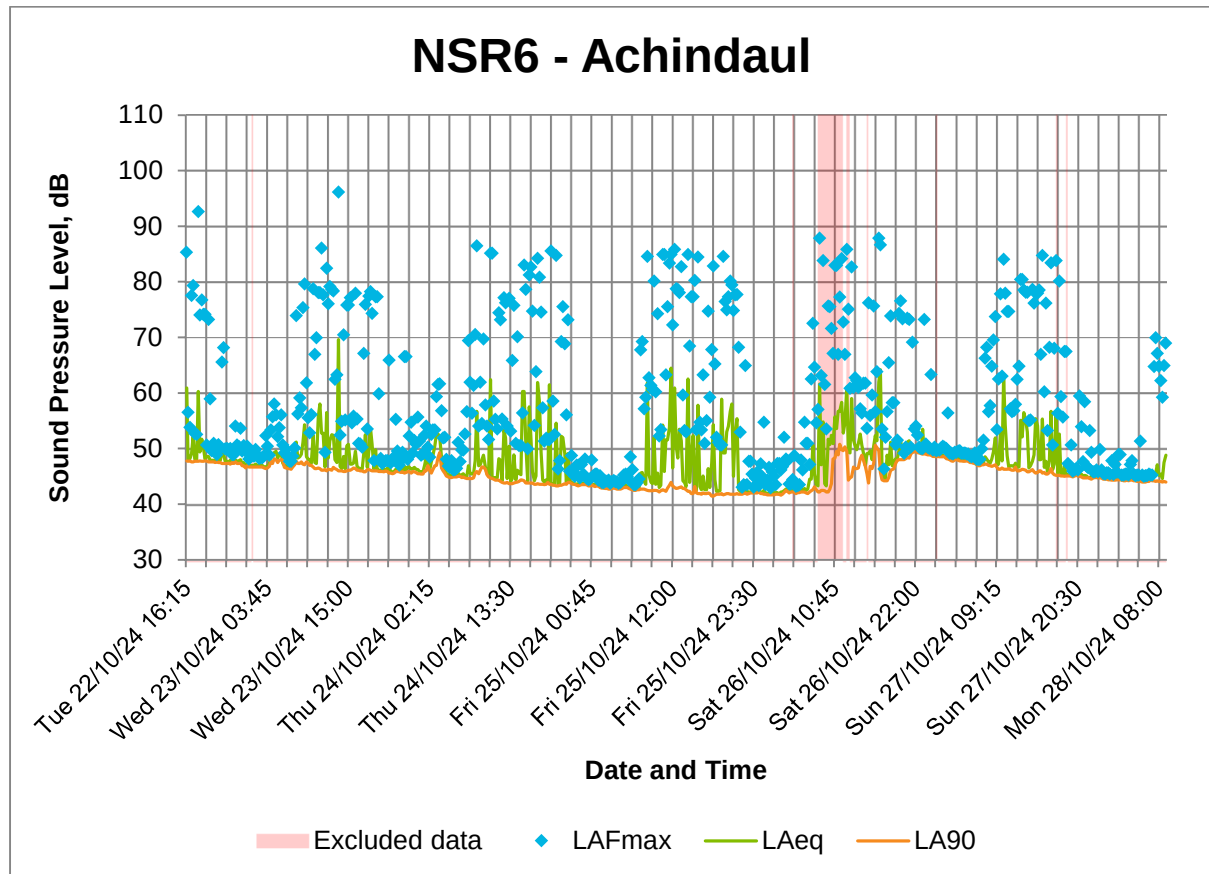


Figure 6 NSR7 Monitored Level Time History

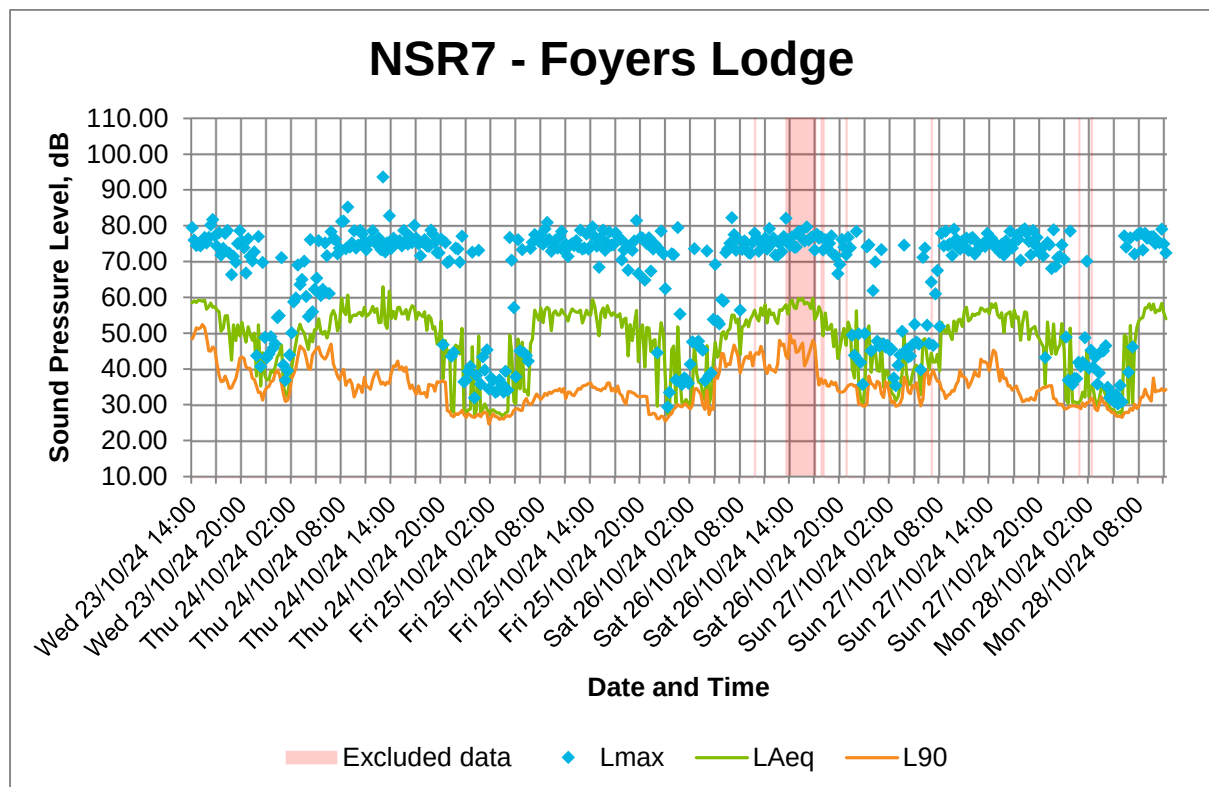


Figure 7 NSR8 Monitored Level Time History

