Loch Kemp Storage - EIA Report

Appendix 17.4: Source Noise Data during Operation

November 2023









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Operating Equipment Sound Power Levels - Loch Kemp Pump Storage

Revision	Date	Comment
0	03/10/2022	Initial
1	03/09/2023	Transformers in powerhouse building. Switching Station separated out



Octave Band Sound Power Level, Lw (Linear)								Overall LwA	Frequency shaping	Line (L)	Length (m) /	aic (m) (if point	Directivity Index (dB) (if point or line	Average Lp at meas.	% On-	No.	Corrected overall LwA	Comments
63Hz 125	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	(dB)	(L/M/H)	Area (A)	Alea (III)	or line source)	source)	surface	time	оп	(dB)	
99	96	95	87	79	70	63	61	89		Α	3200			54	100	1	54 LwA/m2	See notes 1) and 2) below
100	97	96	88	80	71	64	62	90		A	3400			55	100	1	55 LwA/m2	See notes 1) and 2) below
104	104	102	94	89	89	84	79	98		Р					100	2	101 LwA	See note 3)
99	99	97	89	84	84	79	74	93		Р					100	2	96 LwA	See note 4)
85	85	80	78	75	68	65	62	80		P					100	5	87 LwA	See note 5)
95	95	90	88	85	78	75	72	90		P					100	2	93 LwA	See note 5)
97	97	95	87	82	82	82	77	92		Р					100	1	92 LwA	See note 8). Considered as Associated Development
Sound pressure level inside powerhouse 83	86	87	83	80	78	76	74	86										Octave band sound pressure level spectrum in powerhouse
		-																approximately equivalent to 86dBA
16	22	24	28	33	40	45	45											This is typical R values in each octave band for a proprietry
																		wall or roof cladding system enhanced to have a medium
																		sound insulation characteristic of Rw = 34 dB.
																		Ventilation apertures will be attenuated as required os as not
																		to significantly degrade the overall powerhouse insulation.
104	104	102	94	89	89	84	79	98										Taken from typical vendor data for this type of large 175 MVA transformer
99	99	97	89	84	84	79	74	93										Significantly smaller than main transformer.
00	- 00	70	75	70	70	0.5	- 00	70										Generic from database of site data
80	83	/8	/5	/0	70	00	0.2	/8										Generic from database of site data
97	97	95	87	82	82	77	72	91										Generic from database of site data. LpA at 15m from centre of typical substation - 60 dBA (Switching Station will be substantially quieter that this in practice, (around - 8/15 dBA), as no transformers which are the loudest source. The cautious (high) values is assumed in the modelling.
	99 100 104 99 85 95 97 83 16	99 96 100 97 104 104 99 99 85 85 95 95 97 97 83 86 16 22	99 98 95 100 97 98 104 104 102 99 99 97 85 85 80 95 95 90 97 97 95 83 88 87 16 22 24 104 104 102 99 99 97 86 83 78	99 98 95 87 100 97 98 88 104 104 102 94 99 99 97 89 85 85 80 78 95 95 90 88 97 97 95 87 83 88 87 83 16 22 24 28 104 104 102 94 99 99 97 89 86 83 78 75	99 96 95 87 79 100 97 98 88 80 104 104 102 94 89 99 99 97 89 84 85 85 80 78 75 95 95 90 88 85 97 97 95 87 82 83 86 87 83 80 16 22 24 28 33 104 104 102 94 89 99 99 97 89 84	99 96 95 87 79 70 100 97 98 88 80 71 104 104 102 94 89 89 99 97 89 84 84 85 85 80 78 75 68 95 95 90 88 85 78 97 97 95 87 82 82 83 88 87 83 80 78 16 22 24 28 33 40 104 104 102 94 89 89 99 99 97 89 84 84 88 83 78 75 70 70	99 96 95 87 79 70 63 100 97 96 88 80 71 64 104 104 102 94 89 89 84 99 99 97 89 84 84 79 85 85 80 78 75 68 65 95 95 90 88 85 78 75 97 97 95 87 82 82 82 83 86 87 83 80 78 76 16 22 24 28 33 40 45 104 104 102 94 89 89 84 99 99 97 89 84 84 79 86 83 78 75 70 70 65	99 96 95 87 79 70 63 61 100 97 98 88 80 71 64 62 104 104 102 94 89 89 84 79 99 99 97 89 84 84 79 74 85 85 80 78 75 68 65 62 95 95 90 88 85 78 75 72 97 97 95 87 82 82 82 77 83 88 87 83 80 78 76 74 16 22 24 28 33 40 45 45 104 104 102 94 89 89 84 79 99 99 97 89 84 84 79 74 86 83 78 75 70 70 65 62	99 96 95 87 79 70 63 61 89 100 97 98 88 80 71 64 62 90 100 97 89 88 80 71 64 62 90 100 97 80 88 80 71 64 62 90 80 80 80 80 80 80 80 80 80 80 80 80 80	99 96 95 87 79 70 63 61 89 100 97 98 88 80 71 64 62 90 104 104 102 94 89 89 84 79 98 88 85 78 75 72 90 95 95 95 90 88 85 78 75 72 90 97 97 95 87 82 82 82 77 92 88 83 80 78 76 74 86 85 85 86 78 82 82 82 77 92 87 82 82 82 82 82 82 82 82 82 82 82 82 82	99 98 95 87 79 70 63 61 89 A 100 97 98 88 80 71 64 82 90 A 104 104 102 94 89 89 84 79 98 85 85 85 80 78 75 88 85 72 90 P 97 97 98 88 85 78 75 72 90 P 98 98 87 82 82 82 77 92 P 83 88 87 83 80 78 87 82 82 82 82 82 82 82 82 82 82 82 82 82	99 98 95 87 79 70 63 61 89 A 3200 100 97 98 88 80 71 64 82 90 A 3400 104 104 102 94 89 89 84 79 98 85 85 85 80 78 75 88 65 62 80 P 97 97 95 87 82 82 82 77 92 83 88 87 83 80 78 75 76 74 86 10 22 24 28 33 40 45 45 104 104 102 94 89 89 84 79 98 99 99 97 89 84 84 79 98	99 96 95 87 79 70 63 61 89 A 3200 100 97 98 88 80 71 64 62 90 A 3400 104 104 102 94 89 80 84 79 74 93 P 97 97 98 88 85 78 75 72 90 P 98 97 98 87 82 82 82 77 92 P 104 104 102 94 89 89 84 85 78 75 72 90 P 105 95 90 87 82 82 82 77 92 P 106 22 24 28 33 40 45 45 45 107 108 109 99 97 89 84 84 84 79 74 86 108 88 87 88 89 84 84 79 98 86 85 86 85 86 85 86 85 85 85 85 85 87 85 85 85 85 85 87 85 85 85 85 85 85 85 85 85 85 85 85 85	99 96 95 87 79 70 63 61 89 A 3200 100 97 98 88 80 71 64 62 90 A 3400 104 104 102 94 89 84 84 79 74 93 10 99 97 98 88 85 78 75 72 90 P 97 97 98 87 82 82 82 77 92 P 104 104 102 94 89 89 84 85 78 75 72 90 P 105 95 96 87 82 82 82 77 92 P 106 22 24 28 33 40 45 45 107 104 104 102 94 89 89 84 79 98 108 88 87 88 89 84 84 79 98 109 99 97 89 89 84 84 79 74 86 109 99 97 89 89 84 84 79 79 98 100 89 89 89 89 89 89 89 89 89 89 89 89 89	99 98 95 87 79 70 63 61 89 A 3200 54 100 97 98 88 80 71 64 62 90 A 3400 55 104 104 102 94 89 84 79 98 P 99 97 95 87 82 82 82 77 92 P 99 104 104 102 94 89 89 89 84 79 92 P 104 104 102 94 89 89 89 84 79 92 P 105 87 82 82 82 77 92 P 105 87 82 82 82 82 82 82 82 82 82 82 82 82 82	63Hz 125Hz 250Hz 500Hz 1kHz 2kHz 4kHz 8kHz (CS) (CS) (CS) (CS) (CS) (CS) (CS) (CS)	63Hz 125Hz 250Hz 500Hz 1kHz 2kHz 4kHz 8kHz 63-9 (2011) 99 98 95 87 79 70 63 61 89 A 3200 54 100 1 100 97 96 88 80 71 64 62 90 A 3400 55 100 1 104 104 102 94 89 89 84 79 98 P 100 2 99 99 97 89 84 85 78 75 72 90 P 100 2 97 97 95 87 82 82 82 82 77 92 P 100 1 1 100 1 1 100	63Hz 125Hz 250Hz 18Hz 2kHz 4kHz 8kHz 6kHz 6kHz 6kHz 6kHz 6kHz 6kHz 6kHz 6

