



Monthly compliance noise monitoring report

Glebe Island / White Bay

Port Authority of New South Wales

December 2023



→ The Power of Commitment

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1. Introduction

GHD Pty Ltd (GHD) has been engaged by Port Authority of New South Wales (Port Authority) to undertake compliance noise monitoring, as required by the *Port Noise Policy (Port Authority, 2020)*.

This report provides the details of the compliance noise monitoring for all vessels at berth during December 2023, as determined using the noise monitoring system. A detailed description of the permanent noise monitoring system including a map of monitoring locations is provided in the Noise Monitoring Plan, available on Port Authority's website.

2. Noise monitoring details and vessel schedule

Client	Company details	Noise monitor name	Noise monitor location	Noise monitor details / settings	Noise monitor serial numbers	Monthly calibration variance
Port Authority of New South Wales	GHD Pty Ltd Member of the Association of Australasian Acoustical Consultants (AAAC) Lead staff are Members of the Australian Acoustical Society (AAS)	L01	Grafton Street, Balmain	Meter details Norsonic Nor145 Sound Level Meter with Nor1297 Noise Compass	14529646	Initial calibration level 90.6 dBA Min. deviation = 0.0 dB Max. deviation = 0.1 dB
		L02	Maintenance Building on White Bay		14529643	Initial calibration level 91.9 dBA Min. deviation = 0.3 dB Max. deviation = 0.3 dB
		L03	Adjacent to White Bay 2	Meter settings A-weighted Fast time response 15 minute intervals	14529645	Initial calibration level 92.5 dBA Min. deviation = 0.0 dB Max. deviation = 0.1 dB
		L04	Onsite at Glebe Island		14529640	Initial calibration level 93.9 dBA Min. deviation = -0.1 dB Max. deviation = -0.1 dB
Vessel name	Arrival date and time	Departure date and time		Berth location	Applicable noise monitoring location/s	
Bulk vessels						
Kondili	December 5, 2023 / 10:30	December 7, 2023 / 15:21		GLB8	L03	
Adelie	December 7, 2023 / 18:12	December 10, 2023 / 18:03		GLB7	L03	

Vessel name	Arrival date and time	Departure date and time	Berth location	Applicable noise monitoring location/s
Bulk vessels				
Wyuna	December 16, 2023 / 19:04	December 18, 2023 / 02:27	GLB8	L03
Pioneer	December 19, 2023 / 20:06	December 22, 2023 / 20:50	GLB7	L03
Kondili	December 23, 2023 / 00:13	December 26, 2023 / 19:57	GLB8	L03
Cruise vessels				
Pacific Adventure	December 3, 2023 / 07:30	December 3, 2023 / 16:15	WBCT	L01
Viking Orion	December 5, 2023 / 06:50	December 6, 2023 / 17:58	WBCT	L01
Seabourn Odyssey	December 8, 2023 / 06:39	December 8, 2023 / 18:55	WBCT	L01
Noordam	December 10, 2023 / 05:08	December 10, 2023 / 16:09	WBCT	L01
Silver Whisper	December 12, 2023 / 06:14	December 12, 2023 / 19:03	WBCT	L01
Pacific Adventure	December 15, 2023 / 07:07	December 15, 2023 / 16:51	WBCT	L01
Crystal Symphony	December 15, 2023 / 08:29	December 16, 2023 / 13:55	WHT4	L02
Star Breeze	December 17, 2023 / 07:11	December 17, 2023 / 23:18	WBCT	L01
Star Breeze	December 17, 2023 / 23:18	December 18, 2023 / 15:03	WHT4	L02
Pacific Adventure	December 18, 2023 / 07:22	December 18, 2023 / 16:30	WBCT	L01
Silver Muse	December 20, 2023 / 10:06	December 21, 2023 / 19:12	WHT4	L02
Regatta	December 21, 2023 / 06:56	December 21, 2023 / 18:10	WBCT	L01
Seven Seas Explorer	December 22, 2023 / 06:36	December 22, 2023 / 17:58	WBCT	L01
Norwegian Spirit	December 23, 2023 / 05:40	December 24, 2023 / 17:59	WBCT	L01
Disney Wonder	December 28, 2023 / 06:07	December 28, 2023 / 17:35	WBCT	L01
Pacific Adventure	December 30, 2023 / 07:09	December 30, 2023 / 16:24	WBCT	L01
AIDAsol	December 31, 2023 / 06:14	January 1, 2024 / 18:58	WBCT	L01
Azamara Journey	December 31, 2023 / 07:48	January 1, 2024 / 23:58	WHT4	L02

3. Compliance summary

3.1 Bulk vessels

Vessel	Dates at berth	Monitor location	Vessel Noise Level, dBA (inclusive of any modifying factor penalties)			Vessel Noise Trigger Levels, dBA			Compliance ¹	
			Day ² L _{Aeq} (15 hr)	Night ³ L _{Aeq} (1 hr)	Night ³ L _{Amax}	Day ² L _{Aeq} (15 hr)	Night ³ L _{Aeq} (1 hr)	Night ³ L _{Amax}	Day	Night
Kondili	Dec 5 – Dec 7	L03	55	53	66 ⁴	60	55	65	Yes	No ⁴
Adelie	Dec 7 – Dec 10	L03	55	55	74 ⁵	60	55	65	Yes	Yes ⁵
Wyuna	Dec 16 – Dec 18	L03	52	50	65	60	55	65	Yes	Yes
Pioneer	Dec 19 – Dec 22	L03	52	57 ⁶	65	60	55	65	Yes	Yes ⁶
Kondili	Dec 23 – Dec 26	L03	55	57 ⁷	67	60	55	65	Yes	No ^{7,8}

Note: 1) If non-compliance is detected, a detailed investigation of the results will be undertaken and reported separately if required

Note: 2) Daytime period (7 am to 10 pm) – 15 hour logarithmic average

Note: 3) Night-time (10 pm to 7 am) – loudest 1 hour period

Note: 4) A review of the data indicates this is likely to be associated with the vessel, however a 1-2 dB exceedance of the criteria is considered negligible. All other maximum noise level events were below the vessel noise trigger level

Note: 5) A review of the data indicates this is unlikely to be associated with the vessel. All other maximum noise level events were below the vessel noise trigger level

Note: 6) This exceedance occurred between 6 am and 7 am on the 20 December. Given the hourly noise levels preceding and following this hour, it is likely that the noise was from an extraneous source, however this could not be confirmed. The vessel was compliant with the night time vessel noise trigger level at all other times.

Note: 7) This non-compliance was due to a tonal correction being applied to the measured noise level. The Kondili was determined to be tonal at 1000 Hz for four consecutive hours during this night time period. It was also determined to be tonal at several other times on 23 and 24 December, however this didn't result in a non-compliance. The source of the 1000 Hz tonality should be investigated as this was not present during the vessels visit earlier in the month

Note: 8) Note that both night-time L_{Aeq} and L_{Amax} triggers were exceeded during this visit.

3.2 Cruise vessels

Vessel	Dates at berth	Monitor location	Vessel Noise Level, dBA (inclusive of any modifying factor penalties)		Vessel Noise Trigger Levels, dBA		Compliance	
			Day ² L _{Aeq} (15 hr)	Night ³ L _{Aeq} (9 hr)	Day ² L _{Aeq} (15 hr)	Night ³ L _{Aeq} (9 hr)	Day ⁴	Night
Pacific Adventure	Dec 3	L01	58	-	N/A	58	N/A	-
Viking Orion	Dec 5 – Dec 6	L01	55	52	N/A	58	N/A	Yes
Seabourn Odyssey	Dec 8	L01	52	46	N/A	58	N/A	Yes
Noordam	Dec 10	L01	57	54	N/A	58	N/A	Yes
Silver Whisper	Dec 12	L01	53	47	N/A	58	N/A	Yes
Pacific Adventure	Dec 15	L01	57	-	N/A	58	N/A	-
Crystal Symphony	Dec 15 – Dec 16	L02	59 ⁵	58 ⁵	N/A	58	N/A	Yes
Star Breeze (WBTC)	Dec 17	L01	52	50	N/A	58	N/A	Yes
Star Breeze (WHT4)	Dec 17 – Dec 18	L02	60 ⁶	54	N/A	58	N/A	Yes
Pacific Adventure	Dec 18	L01	58	-	N/A	58	N/A	-
Silver Muse	Dec 20 – Dec 21	L02	56	47	N/A	58	N/A	Yes
Regatta	Dec 21	L01	57	-	N/A	58	N/A	-
Seven Seas Explorer	Dec 22	L01	57	-	N/A	58	N/A	-
Norwegian Spirit	Dec 23 – Dec 24	L01	58	57	N/A	58	N/A	Yes
Disney Wonder	Dec 28	L01	59 ⁹	51	N/A	58	N/A	Yes
Pacific Adventure	Dec 30	L01	58	-	N/A	58	N/A	-
AIDA Sol	Dec 31 – Jan 1	L01	52 ⁷	50 ⁷	N/A	58	N/A	Yes
Azamara Journey	Dec 31 – Jan 1	L02	54 ⁸	50 ⁸	N/A	58	N/A	Yes

Note: 1) If non-compliance is detected, a detailed investigation of the results will be undertaken and reported separately if required

Note: 2) Daytime period (7 am to 10 pm) – 15 hour logarithmic average

Note: 3) Night-time (10 pm to 7 am) – 9 hour logarithmic average

Note: 4) Port Authority provides attenuation to a defined area of residences where noise modelling indicates that current noise levels reach or exceed 55 dBA **at night** ('attenuation eligibility trigger'). Under the White Bay Cruise Terminal Noise Restriction Policy, cruise ship noise which causes further residences than those currently identified to exceed the attenuation eligibility trigger is considered to be Excessive Noise. Hence under the Noise Restriction Policy a day time trigger level does not apply. The area of residences currently offered attenuation (ie meeting the 'attenuation eligibility trigger') is based on a reference cruise vessel intrusive noise level of 58 dBA at the nearest residence, which sets the Vessel Noise Trigger Level for assessing compliance at night.

Excessive noise is defined as “any noise including but not limited to engine, generator or ventilation noise which causes further residences than those currently identified to exceed the attenuation eligibility trigger.”

Note: 5) During this visit tonality was observed by the noise monitoring system during 2 hours during the day and 2 hours during the night. As the policy does not require a correction for tonality for cruise vessels, this correction has been removed.

Note: 6) It is likely that this measured value is influenced by extraneous landside noise.

Note: 7) The measured levels were influenced by extraneous noise from the New Years Eve fireworks (both 9 pm and midnight) display in Sydney. As this is not associated with the cruise vessel, this data was excluded from the results.

Note: 8) The measured values had one hour in the daytime and one hour in the night-time which was significantly influenced by extraneous noise which has been excluded from the results.

Note: 9) During this visit tonality was observed by the noise monitoring system during 1 hour during the day. As the policy does not require a correction for tonality for cruise vessels, this correction has been removed.

4. Detailed results – bulk vessels

4.1 Kondili (GLB8) –December 5 – December 7, 2023

4.1.1 Daily noise monitoring results

Date	Time period ¹	Monitor location	Noise descriptor	Vessel noise level dBA ²	Tonal	LFN ³	Vessel Noise Trigger Levels, dBA	Compliance
December 5, 2023	Day	L03	L _{Aeq} , 15 hour ¹	54	No	No	60	Yes
	Night		L _{Aeq} , 1 hour ¹	53	No	Yes	55	Yes
			L _{Amax}	63	-	-	65	Yes
December 6, 2023	Day	L03	L _{Aeq} , 15 hour ¹	55	No	Yes	60	Yes
	Night		L _{Aeq} , 1 hour ¹	48	No	No	55	Yes
			L _{Amax}	66 ⁴	-	-	65	No ⁴
December 7, 2023	Day	L03	L _{Aeq} , 15 hour ¹	55	No	No	60	Yes
	Night		L _{Aeq} , 1 hour ¹	-	-	-	55	-
			L _{Amax}	-	-	-	65	-

Notes

1) Daytime period (7 am to 10 pm) – 15 hours

Night-time period (10 pm to 7 am) – worst case 1 hour

2) Inclusive of any penalties for modifying factors

3) LFN = Low Frequency Noise

4) A review of the data indicates this is likely to be associated with the vessel, however a 1 dB exceedance of the criteria is considered negligible. All other maximum noise level events were below the vessel noise trigger level.

4.1.2 Additional information

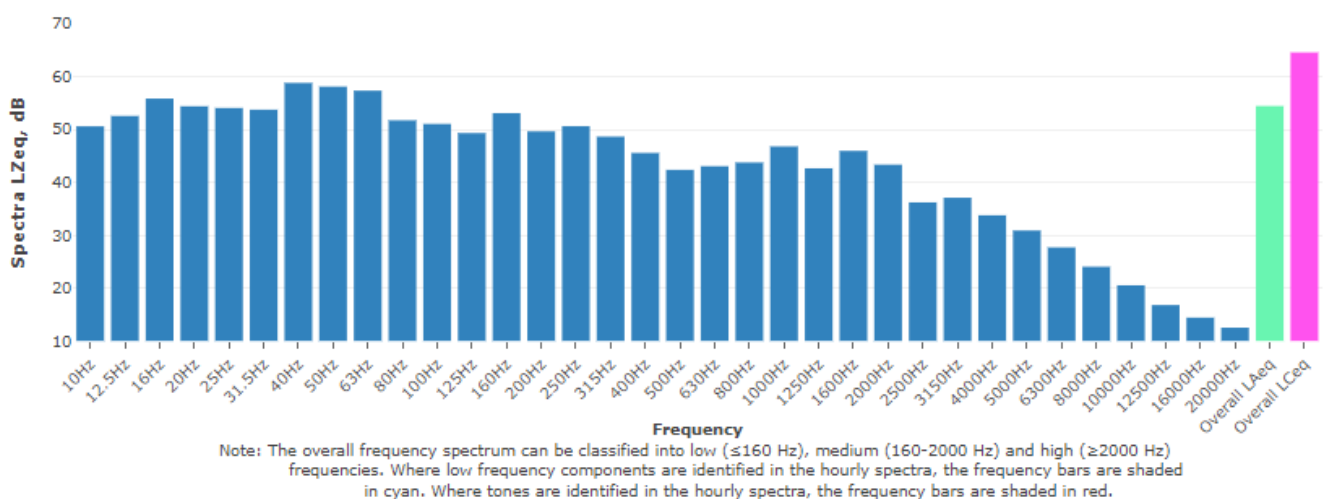


Figure 4.1 Typical vessel spectrum – noise level at L03

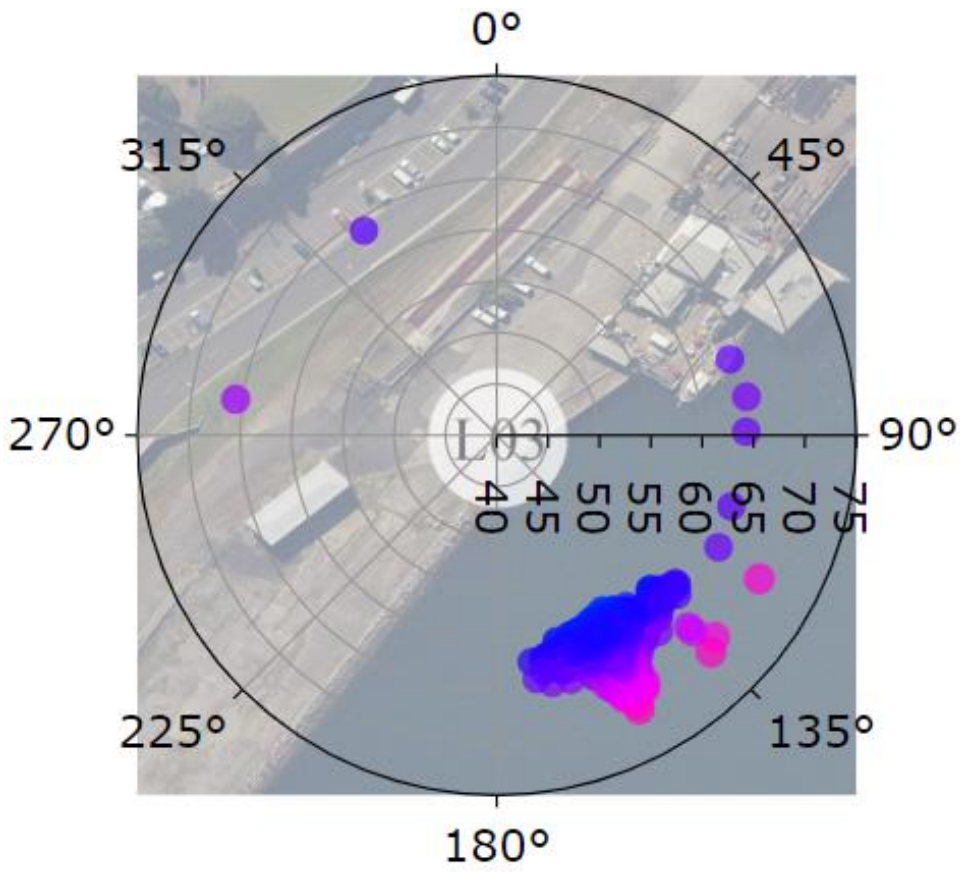


Figure 4.2 Typical vessel polar (directional) plot

4.2 Adelie (GLB7) –December 7 – December 10, 2023

4.2.1 Daily noise monitoring results

Date	Time period ¹	Monitor location	Noise descriptor	Vessel noise level dBA ²	Tonal	LFN ³	Vessel Noise Trigger Levels, dBA	Compliance
December 7, 2023	Day	L03	L _{Aeq, 15 hour} ¹	53	No	Yes	60	Yes
	Night		L _{Aeq, 1 hour} ¹	54	No	Yes	55	Yes
			L _{Amax}	74 ⁴	-	-	65	Yes ⁴
December 8, 2023	Day	L03	L _{Aeq, 15 hour} ¹	55	No	Yes	60	Yes
	Night		L _{Aeq, 1 hour} ¹	55	No	Yes	55	Yes
			L _{Amax}	60	-	-	65	Yes
December 9, 2023	Day	L03	L _{Aeq, 15 hour} ¹	54	No	Yes	60	Yes
	Night		L _{Aeq, 1 hour} ¹	55	No	Yes	55	Yes
			L _{Amax}	65	-	-	65	Yes
December 10, 2023	Day	L03	L _{Aeq, 15 hour} ¹	54	Yes ⁵	Yes	60	Yes
	Night		L _{Aeq, 1 hour} ¹	-	-	-	55	-
			L _{Amax}	--	-	-	65	-

Notes

1) Daytime period (7 am to 10 pm) – 15 hours

Night-time period (10 pm to 7 am) – worst case 1 hour

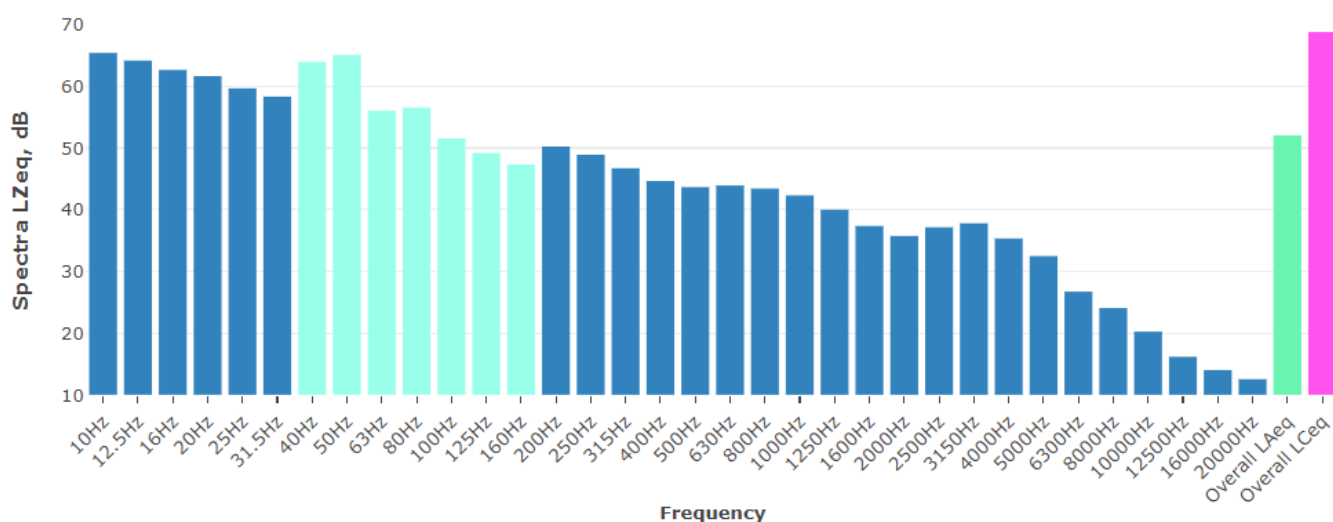
2) Inclusive of any penalties for modifying factors

3) LFN = Low Frequency Noise

4) A review of the data indicates this is unlikely to be associated with the vessel and has been excluded. All other maximum noise level events were below the vessel noise trigger level.

5) The vessel was determined to be tonal for 1 hour during departure. It is possible this is associated with the support vessels used during departure.

4.2.2 Additional information



Note: The overall frequency spectrum can be classified into low (≤ 160 Hz), medium (160-2000 Hz) and high (≥ 2000 Hz) frequencies. Where low frequency components are identified in the hourly spectra, the frequency bars are shaded in cyan. Where tones are identified in the hourly spectra, the frequency bars are shaded in red.

Figure 4.3 Typical vessel spectrum – noise level at L03

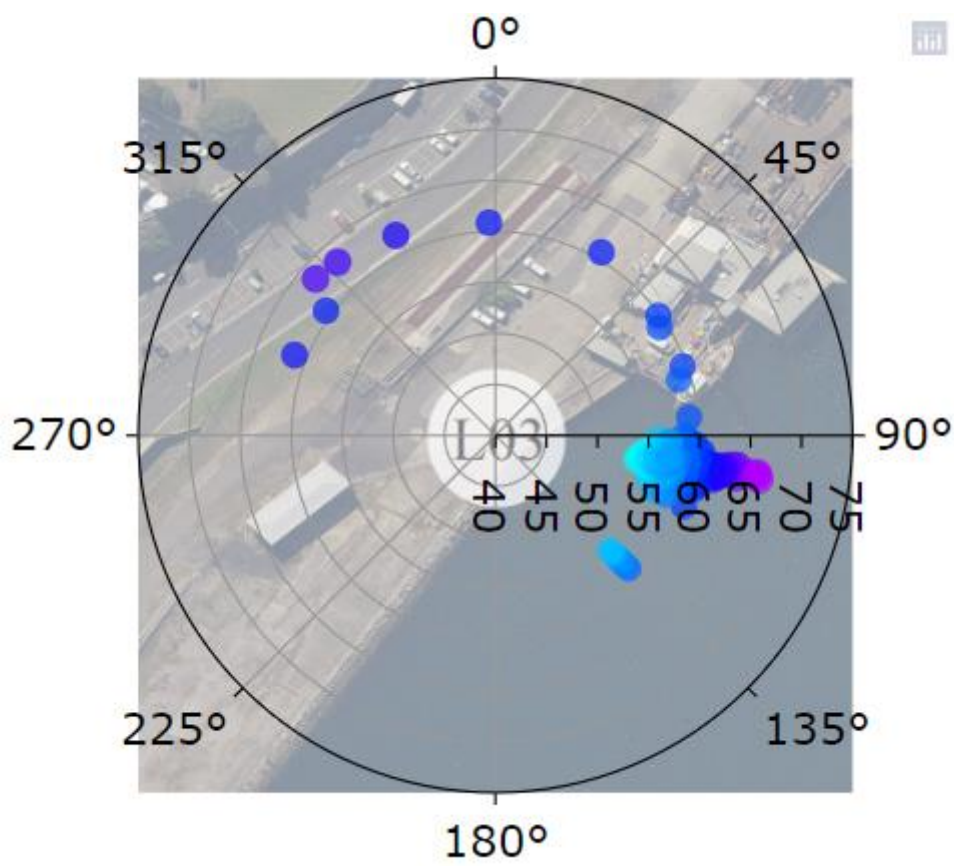


Figure 4.4 Typical vessel polar (directional) plot

4.3 Wyuna (GLB8) –December 16 – December 18, 2023

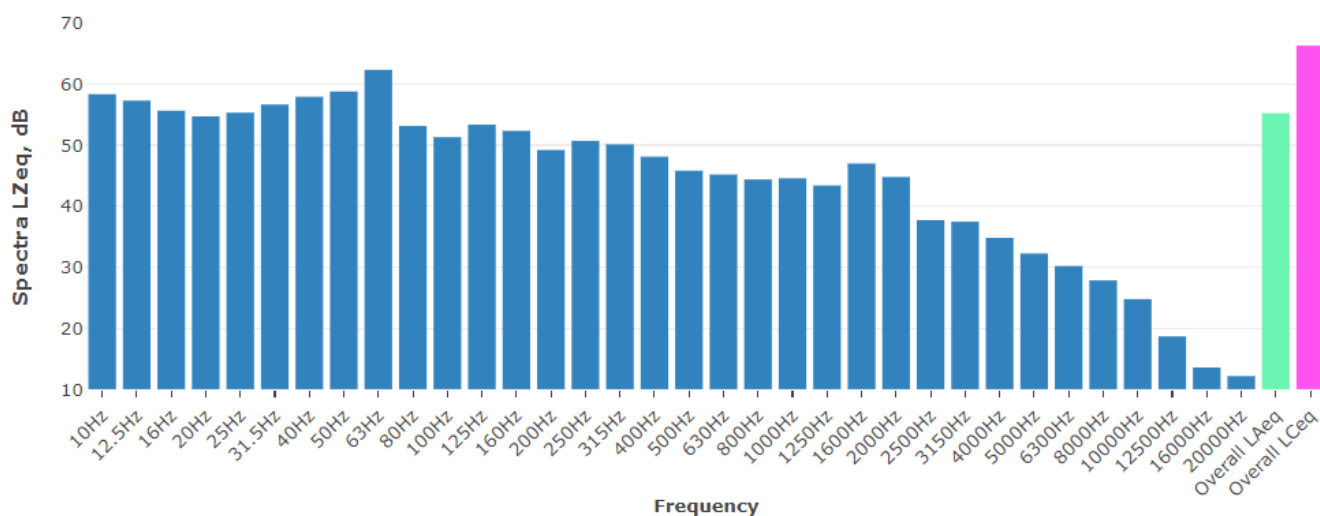
4.3.1 Daily noise monitoring results

Date	Time period ¹	Monitor location	Noise descriptor	Vessel noise level dBA ²	Tonal	LFN ³	Vessel Noise Trigger Levels, dBA	Compliance
December 16, 2023	Day	L03	L _{Aeq, 15 hour} ¹	52	No	Yes	60	Yes
	Night		L _{Aeq, 1 hour} ¹	50	No	Yes	55	Yes
			L _{Amax}	65	-	-	65	Yes
December 17, 2023	Day	L03	L _{Aeq, 15 hour} ¹	52	No	No	60	Yes
	Night		L _{Aeq, 1 hour} ¹	IMS did not process data during this period. Based on the data collected, it was likely the vessel was compliant throughout this visit.				
			L _{Amax}					
December 18, 2023	Day	L03	L _{Aeq, 15 hour} ¹					
	Night		L _{Aeq, 1 hour} ¹					
			L _{Amax}					

Notes

- Daytime period (7 am to 10 pm) – 15 hours
Night-time period (10 pm to 7 am) – worst case 1 hour
- Inclusive of any penalties for modifying factors
- LFN = Low Frequency Noise

4.3.2 Additional information



Note: The overall frequency spectrum can be classified into low (≤ 160 Hz), medium (160-2000 Hz) and high (≥ 2000 Hz) frequencies. Where low frequency components are identified in the hourly spectra, the frequency bars are shaded in cyan. Where tones are identified in the hourly spectra, the frequency bars are shaded in red.

Figure 4.5 Typical vessel spectrum – noise level at L03

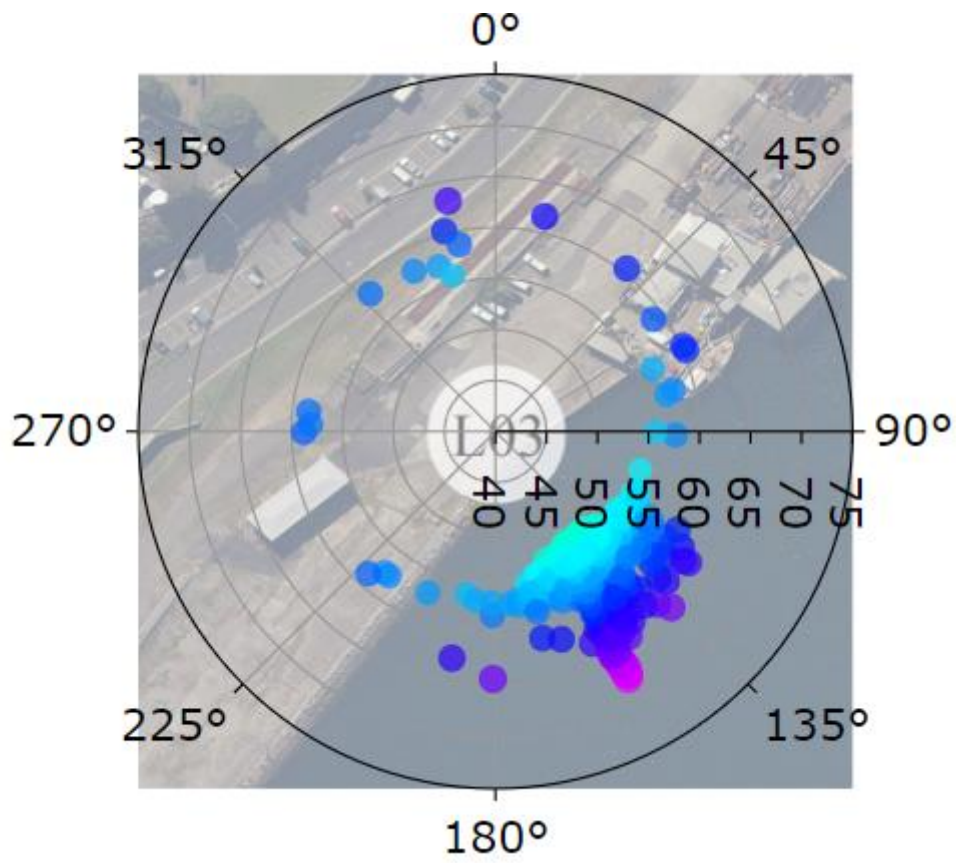


Figure 4.6 Typical vessel polar (directional) plot

4.4 Pioneer (GLB7) –December 19 – December 22, 2023

4.4.1 Daily noise monitoring results

Date	Time period ¹	Monitor location	Noise descriptor	Vessel noise level dBA ²	Tonal	LFN ³	Vessel Noise Trigger Levels, dBA	Compliance
December 19, 2023	Day	L03	L _{Aeq} , 15 hour ¹	52	No	Yes	60	Yes
	Night		L _{Aeq} , 1 hour ¹	57	No	Yes	55	Yes ⁴
			L _{Amax}	65	-	-	65	Yes
December 20, 2023	Day	L03	L _{Aeq} , 15 hour ¹	51	No	Yes	60	Yes
	Night		L _{Aeq} , 1 hour ¹	49	No	Yes	55	Yes
			L _{Amax}	65	-	-	65	Yes
December 21, 2023	Day	L03	L _{Aeq} , 15 hour ¹	50	No	Yes	60	Yes
	Night		L _{Aeq} , 1 hour ¹	48	No	Yes	55	Yes
			L _{Amax}	62	-	-	65	Yes
December 22, 2023	Day	L03	L _{Aeq} , 15 hour ¹	49	No	Yes	60	Yes
	Night		L _{Aeq} , 1 hour ¹	-	-	-	55	-
			L _{Amax}	-	-	-	65	-

Notes

1) Daytime period (7 am to 10 pm) – 15 hours

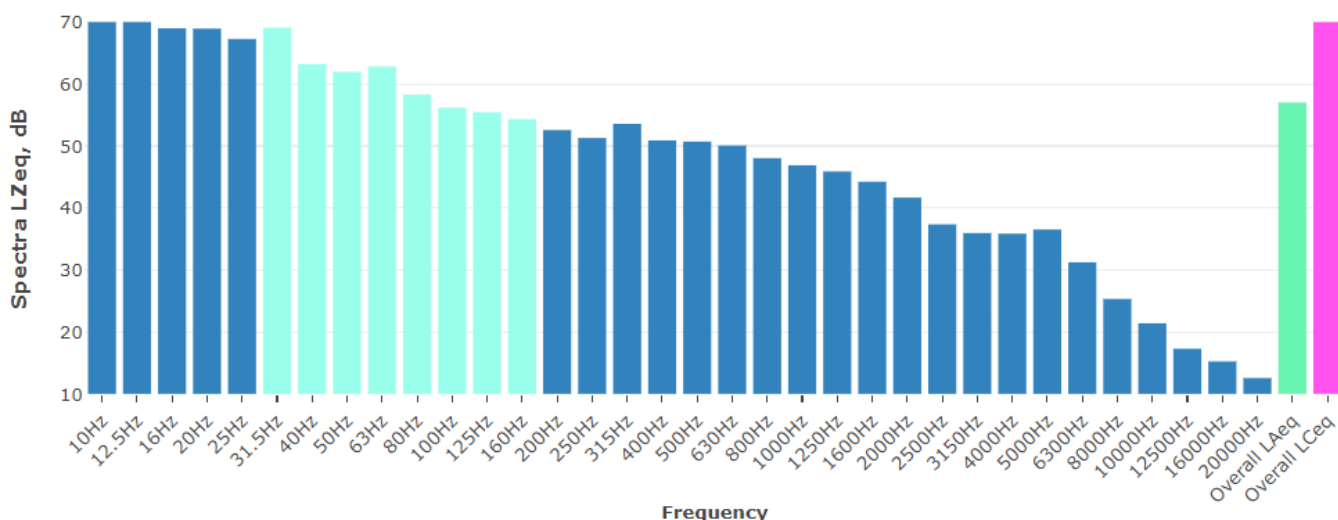
Night-time period (10 pm to 7 am) – worst case 1 hour

2) Inclusive of any penalties for modifying factors

3) LFN = Low Frequency Noise

4) This exceedance occurred between 6 am and 7 am on the 20 December. Given the hourly noise levels preceding and following this hour, it is likely that the noise was from an extraneous source, however this could not be confirmed. The vessel was compliant with the night time vessel noise trigger level at all other times

4.4.2 Additional information



Note: The overall frequency spectrum can be classified into low (≤ 160 Hz), medium (160-2000 Hz) and high (≥ 2000 Hz) frequencies. Where low frequency components are identified in the hourly spectra, the frequency bars are shaded in cyan. Where tones are identified in the hourly spectra, the frequency bars are shaded in red.

Figure 4.7 Typical vessel spectrum – noise level at L03

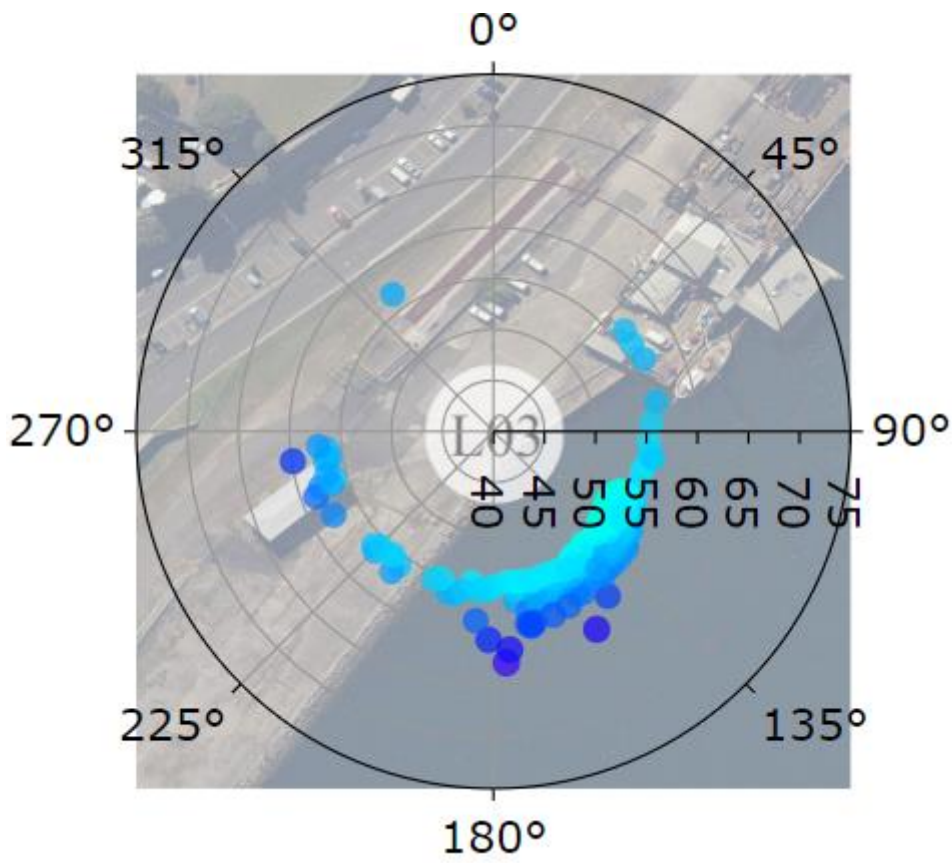


Figure 4.8 Typical vessel polar (directional) plot

4.5 Kondili (GLB8) –December 23 – December 26, 2023

4.5.1 Daily noise monitoring results

Date	Time period ¹	Monitor location	Noise descriptor	Vessel noise level dBA ²	Tonal	LFN ³	Vessel Noise Trigger Levels, dBA	Compliance
December 22, 2023 ⁴	Night	L03	L _{Aeq} , 1 hour ¹	57	Yes	Yes	55	No ⁵
			L _{Amax}	63	-	-	65	Yes
December 23, 2023	Day	L03	L _{Aeq} , 15 hour ¹	55	No	No	60	Yes
	Night		L _{Aeq} , 1 hour ¹	54	No	Yes	55	Yes
			L _{Amax}	67	-	-	65	No
December 24, 2023	Day	L03	L _{Aeq} , 15 hour ¹	54	No	No	60	Yes
	Night		L _{Aeq} , 1 hour ¹	52	No	No	55	Yes
			L _{Amax}	59	-	-	65	Yes
December 25, 2023	Day	L03	L _{Aeq} , 15 hour ¹	48	No	Yes	60	Yes
	Night		L _{Aeq} , 1 hour ¹	47	No	No	55	Yes
			L _{Amax}	55	-	-	65	Yes
December 26, 2023	Day	L03	L _{Aeq} , 15 hour ¹	52	No	No	60	Yes
	Night		L _{Aeq} , 1 hour ¹	-	-	-	55	-
			L _{Amax}	-	-	-	65	-

Notes

1) Daytime period (7 am to 10 pm) – 15 hours

Night-time period (10 pm to 7 am) – worst case 1 hour

2) Inclusive of any penalties for modifying factors

3) LFN = Low Frequency Noise

4) Morning of the 23 December 2023.

5) This non-compliance was due to a tonal correction being applied to the measured noise level. The Kondili was determined to be tonal at 1000 Hz for four consecutive hours during this night time period. It was also determined to be tonal at several other times on 23 and 24 December, however this didn't result in a non-compliance. The source of the 1000 Hz tonality should be investigated as this was not present during the vessels visit earlier in the month.

4.5.2 Additional information

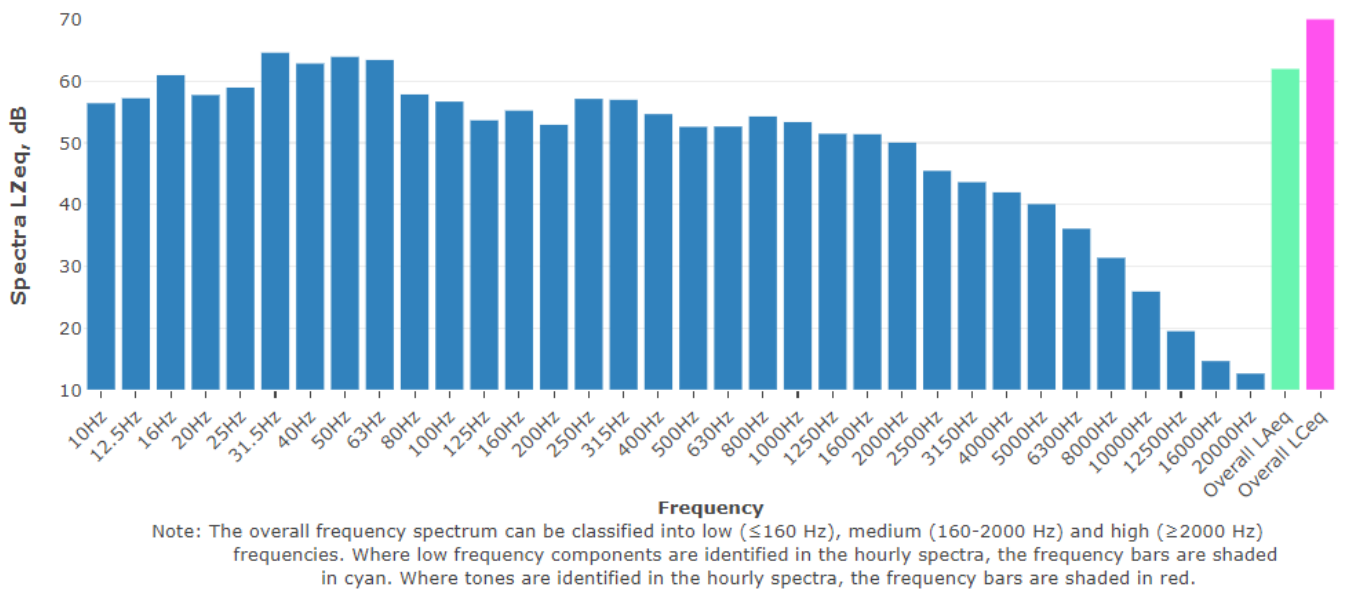


Figure 4.9 Typical vessel spectrum – noise level at L03

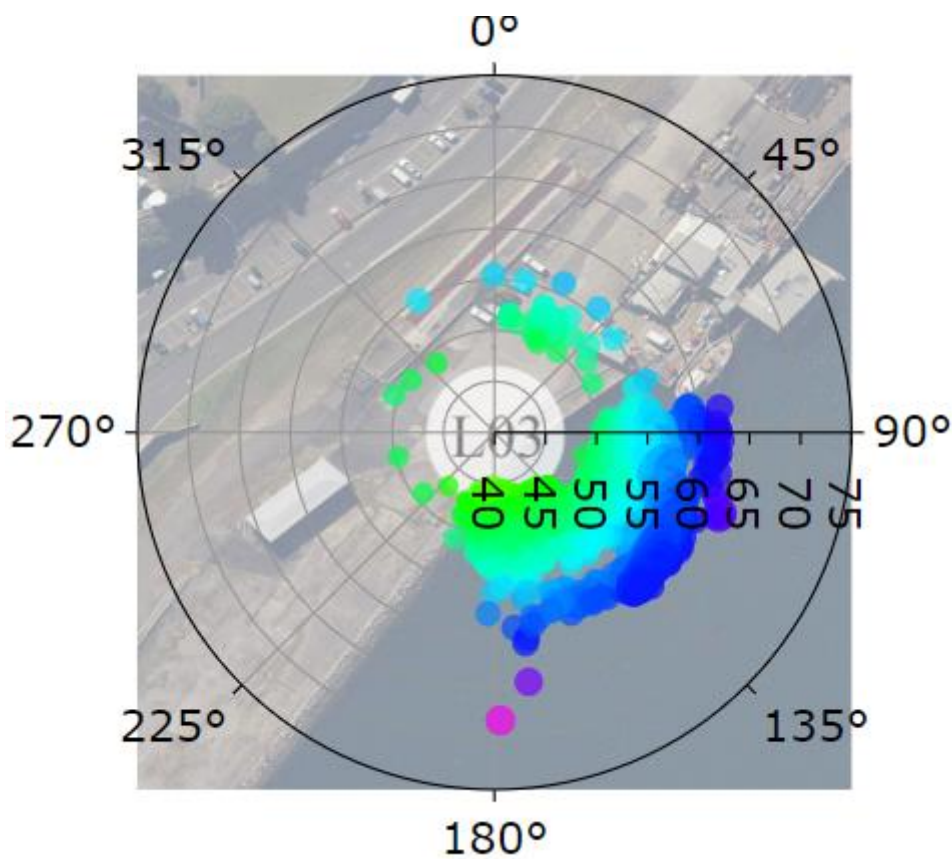


Figure 4.10 Typical vessel polar (directional) plot



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