



# Monthly compliance noise monitoring report

**Glebe Island / White Bay**

Port Authority of New South Wales

April 2022



→ The Power of Commitment

**GHD Pty Ltd | ABN 39 008 488 373**


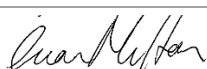
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# 1. Introduction

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 April 2022, 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	L01	Grafton Street, Balmain	<b>Meter details</b> Norsonic Nor145 Sound Level Meter with Nor1297 Noise Compass	14529640	<b>Initial calibration level 92.6 dBA</b> Min. deviation = 0.2 dB Max. deviation = 0.2 dB
	Member of the Association of Australasian Acoustical Consultants (AAAC)	L02	Maintenance Building on White Bay		14529642	<b>Initial calibration level 91.5 dBA</b> Min. deviation = 0.1 dB Max. deviation = 0.2 dB
	Lead staff are Members of the Australian Acoustical Society (AAS)	L03	Adjacent to White Bay 2	<b>Meter settings</b> A-weighted Fast time response 15 minute intervals	14529643	<b>Initial calibration level 91.7 dBA</b> Min. deviation = 0.1 dB Max. deviation = 0.1 dB
		L04	Onsite at Glebe Island		14529644	<b>Initial calibration level 91.4 dBA</b> Min. deviation = 0.3 dB Max. deviation = 0.4 dB
Vessel name	Arrival date and time	Departure date and time		Berth location	Applicable noise monitoring location/s	
AAL Shanghai <sup>1</sup>	April 4, 2022 / 08:00	April 6, 2022 / 18:00		GLB2	Attended monitoring	
Akuna	April 5, 2022 / 01:55	April 7, 2022 / 12:00		GLB8	L03	
Pioneer	April 25, 2022 / 20:28	May 1, 2022 / 17:00		GLB7	L03	
Wyuna	April 28, 2022 / 04:47	April 30, 2022 / 07:00		GLB8	L03	
Note 1) Attended monitoring was undertaken for the AAL Shanghai as this was located at Glebe Island 2. The permanent noise monitoring system is not yet set up to measure vessels at berth in Glebe Island 1 and 2.						

### 3. Compliance summary

Vessel	Dates at berth	Monitor location	Vessel Noise Level, dBA (inclusive of any modifying factor penalties)			Vessel Noise Trigger Levels, dBA			Compliance <sup>1</sup>	
			Day <sup>2</sup> L <sub>Aeq</sub> (15 hr)	Night <sup>3</sup> L <sub>Aeq</sub> (1 hr)	Night <sup>3</sup> L <sub>Amax</sub>	Day <sup>2</sup> L <sub>Aeq</sub> (15 hr)	Night <sup>3</sup> L <sub>Aeq</sub> (1 hr)	Night <sup>3</sup> L <sub>Amax</sub>	Day	Night
AAL Shanghai <sup>4</sup>	Apr 4 – Apr 6	Attended	56	55	-	60	55	65	Yes	Yes
Akuna	Apr 5 – Apr 7	L03	56	53	71 <sup>5</sup>	60	55	65	Yes	Yes
Pioneer	Apr 25 – May 1	L03	54	55	65	60	55	65	Yes	Yes
Wyuna	Apr 28 – Apr 30	L03	56	53	-	60	55	65	Yes	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) – worst case 1 hour period

Note: 4) Attended monitoring report prepared for this vessel is available on the Port Authority website

Note: 5) See Section 4.1.2 below for details on this

## 4. Detailed results

### 4.1 Akuna – April 5- April 7, 2022 (GLB8)

#### 4.1.1 Daily noise monitoring results

Date	Time period	Monitor location	Noise descriptor	Vessel noise level dBA <sup>2</sup>	Tonal	LFN <sup>3</sup>	Vessel Noise Trigger Levels, dBA	Compliance
April 5, 2022	Day	L03	L <sub>Aeq, 15 hour</sub> <sup>1</sup>	51	No	Yes <sup>4</sup>	60	Yes
	Night		L <sub>Aeq, 1 hour</sub> <sup>1</sup>	52	No	No	55	Yes
			L <sub>Amax</sub>	71	-	-	65	Yes <sup>6</sup>
April 6, 2022	Day	L03	L <sub>Aeq, 15 hour</sub> <sup>1</sup>	56	No	No	60	Yes
	Night		L <sub>Aeq, 1 hour</sub> <sup>1</sup>	53	No	No	55	Yes
			L <sub>Amax</sub>	59	-	-	65	Yes
April 7, 2022	Day	L03	L <sub>Aeq, 15 hour</sub> <sup>1</sup>	54	No	No	60	Yes

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) The Port Noise Policy does not currently apply the Noise Policy for Industry (NPI) method modifying factor for low frequency noise. A 2 dB penalty for daytime and a 5 dB penalty for the evening/night-time period would apply when assessed in accordance with Fact Sheet 3 Corrections for annoying noise characteristics from the EPA's Noise Policy for Industry Further investigation is currently being undertaken to determine impacts from low frequency noise from vessels.
- 5) AAL Shanghai was also at berth at GLB2 during this period, however was unlikely to impact the measured noise levels at monitoring location L03
- 6) See Section 4.1.2 below for details on this

#### 4.1.2 Details of max level exceedances

A review of the maximum noise level data for Akuna indicated only a small number of max level criteria exceedances were measured during this visit, with all events occurring between the hours of 5 am and 7 am. Given the maximum noise levels at all other times were significantly less, it's probable that these measured events were from other activities onsite. Nevertheless, if the maximum noise level events were associated with the Akuna, given the small number and times that these occurred, it is unlikely that these maximum noise events would negatively impact the surrounding community.

The L<sub>AFmax</sub> histogram from the night period of 6 April is provided in Figure 4.1, demonstrating that the exceedances of the 65 dBA criteria are rare, with the majority of L<sub>Amax</sub> events between 45 and 55 dBA.

The time trace for the period between 5 am to 6 am on 6 April where the exceedance was observed is provided in Figure 4.2. The time trace shows that the exceedance of the L<sub>Amax</sub> vessel trigger noise level was a single occurrence.

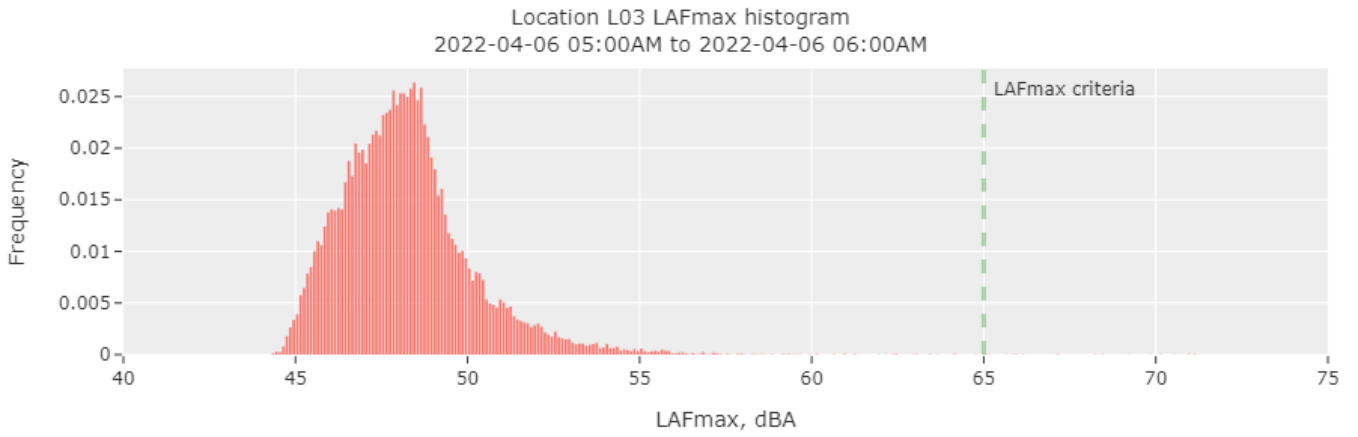


Figure 4.1 LAFmax histogram – Akuna – 6 April 2022

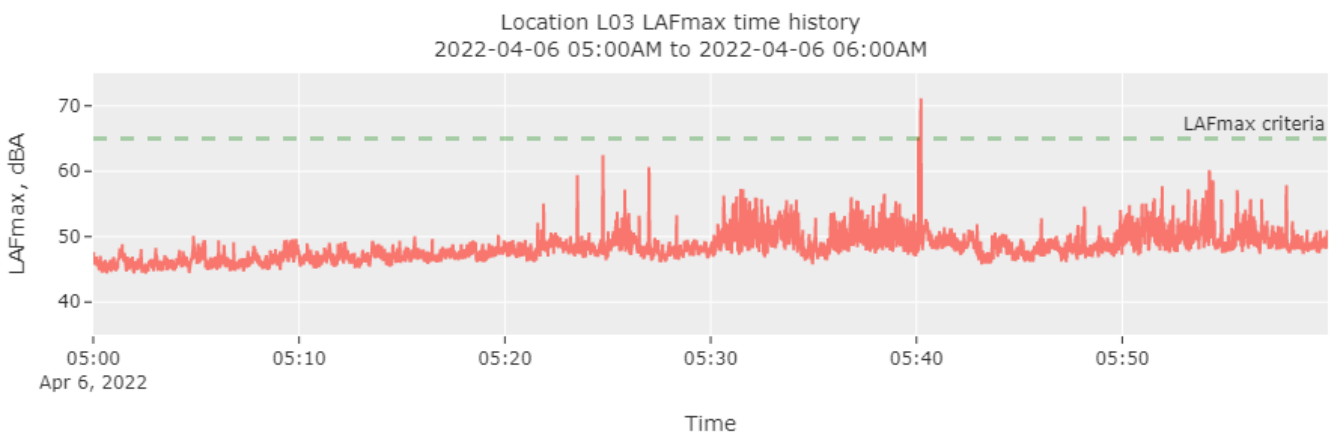
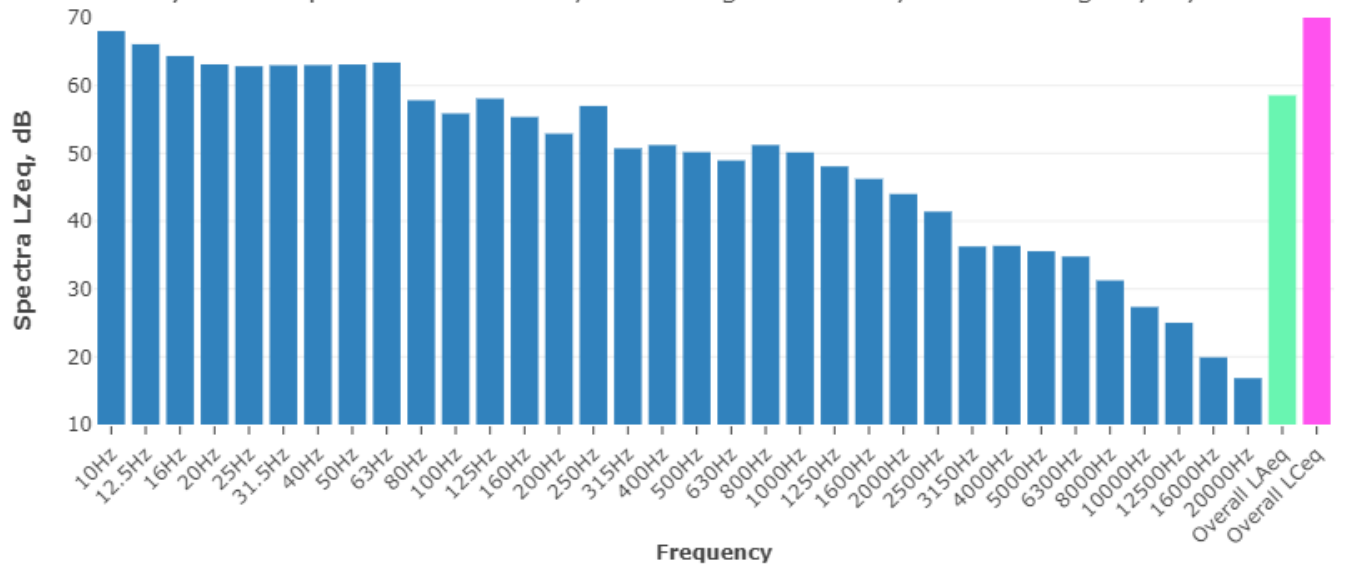


Figure 4.2 LAFmax time history – Akuna – 7 April 2022

### 4.1.3 Additional information

L03 - Hourly vessel spectrum for Akuna, Aal Shanghai on date/time starting 06/04/2022 23:0



Note: The overall frequency spectrum can be classified into low ( $\leq 160$  Hz), medium (160-2000 Hz) and high ( $\geq 2000$  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

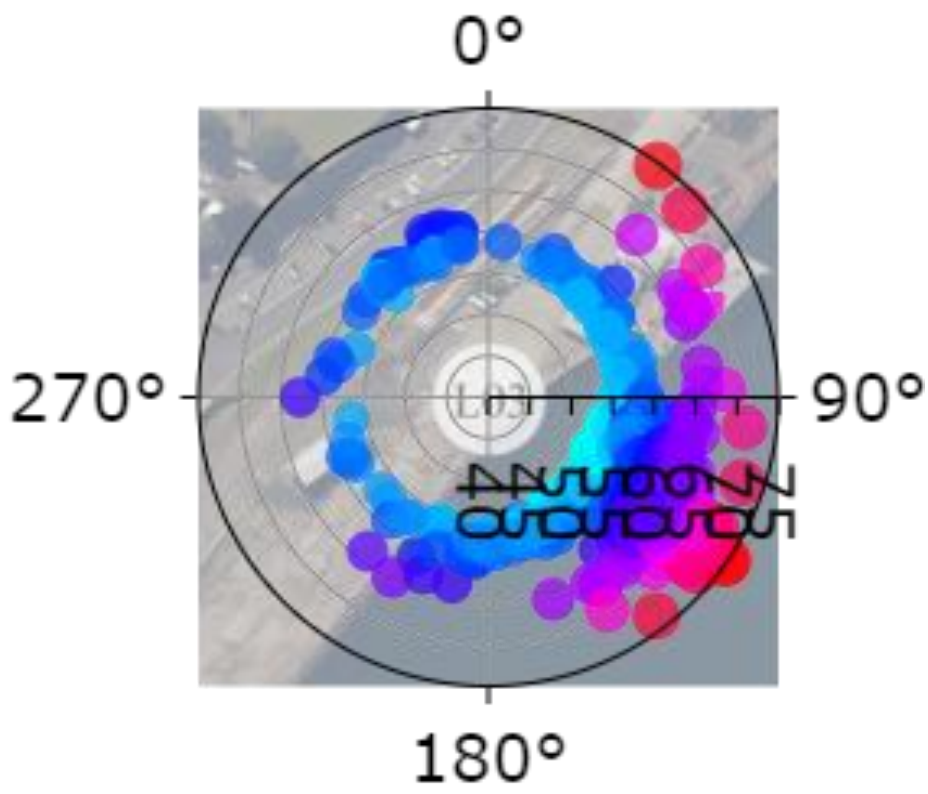


Figure 4.4 Typical vessel polar (directional) plot

## 4.2 Pioneer – April 25 – May 1, 2022 (GLB7)

### 4.2.1 Daily noise monitoring results

Date	Time period	Monitor location	Noise descriptor	Vessel noise level dBA <sup>2</sup>	Tonal	LFN <sup>3</sup>	Vessel Noise Trigger Levels, dBA	Compliance
April 25, 2022	Day	L03	L <sub>Aeq</sub> , 15 hour <sup>1</sup>	53	No	No	60	Yes
	Night		L <sub>Aeq</sub> , 1 hour <sup>1</sup>	58 <sup>5</sup>	Yes <sup>5</sup>	No	55	No <sup>6</sup>
			L <sub>Amax</sub>	56	-	-	65	Yes
April 26, 2022	Day	L03	L <sub>Aeq</sub> , 15 hour <sup>1</sup>	54	No	No	60	Yes
	Night		L <sub>Aeq</sub> , 1 hour <sup>1</sup>	54	No	No	55	Yes
			L <sub>Amax</sub>	57	-	-	65	Yes
April 27, 2022	Day	L03	L <sub>Aeq</sub> , 15 hour <sup>1</sup>	54	No	No	60	Yes
	Night		L <sub>Aeq</sub> , 1 hour <sup>1</sup>	55	No	No	55	Yes
			L <sub>Amax</sub>	60	-	-	65	Yes
April 28, 2022	Day	L03	Pioneer (GLB7) and Wyuna (GLB8) were both present at this time. See discussion in Section 4.4 below. Noise from the Wyuna was dominant at during this period					
Night								
April 29, 2022	Day	L03						
	Night							
April 30, 2022	Day	L03	L <sub>Aeq</sub> , 15 hour <sup>1</sup>	54	No	Ni	60	Yes
	Night		L <sub>Aeq</sub> , 1 hour <sup>1</sup>	54	No	No	55	-
			L <sub>Amax</sub>	56	-	-	65	-
May 1, 2022	Day	L03	L <sub>Aeq</sub> , 15 hour <sup>1</sup>	53	No	No	60	Yes
	Night		L <sub>Aeq</sub> , 1 hour <sup>1</sup>	-	-	-	55	-
			L <sub>Amax</sub>	-	-	-	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) Pacific Explorer was also at berth at WHT4 during this period, however was unlikely to impact the measured noise levels at monitoring location L03
- 5) During this night period, there was one hour where tonal noise was identified. A review of the data shows that this tone is generally present, however the 1/3 octave bands either side are generally high enough to mask this tone. During this one hour, the tones either side were reduced to a level where the 200 Hz was considered tonal according to the Noise Policy for Industry. Tonal noise was not identified at any other time during the visit.
- 6) Due to the tonal noise correction, the vessel was non-compliant for one hour of the 9 hour night time period. The vessel was compliant at all other times of this night-time period and all other periods during this visit



## 4.2.2 Additional information

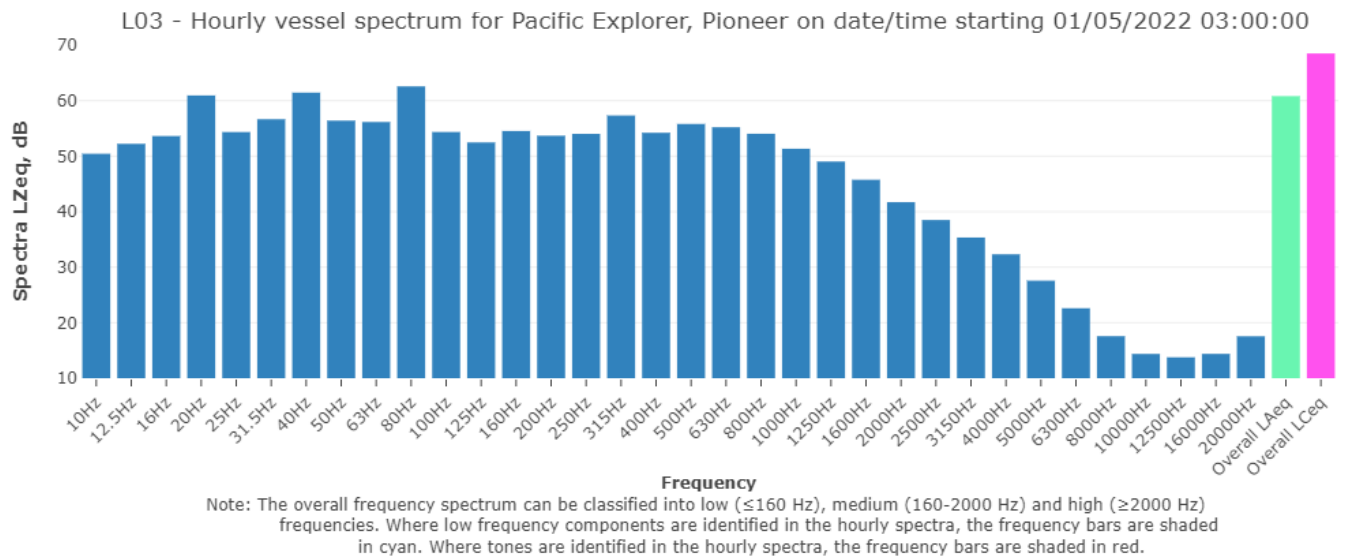


Figure 4.5 Typical vessel spectrum – noise level at L03

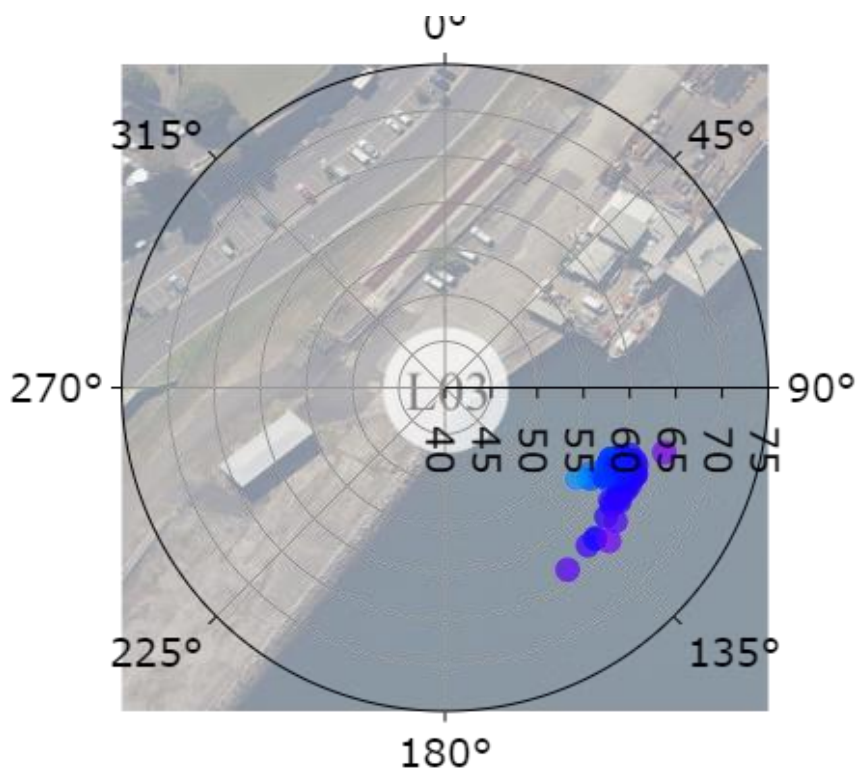


Figure 4.6 Typical vessel polar (directional) plot

## 4.3 Wyuna – April 28– April 30, 2022 (GLB7)

### 4.3.1 Daily noise monitoring results

Date	Time period	Monitor location	Noise descriptor	Vessel noise level dBA <sup>2</sup>	Tonal	LFN <sup>3</sup>	Vessel Noise Trigger Levels, dBA	Compliance
April 28, 2022 <sup>4</sup>	Day	L03	L <sub>Aeq</sub> , 15 hour <sup>1</sup>	56	No	No	60	Yes
	Night		L <sub>Aeq</sub> , 1 hour <sup>1</sup>	57	No	No	55	Yes <sup>4</sup>
			L <sub>Amax</sub>	59	-	-	65	Yes
April 29, 2022 <sup>4</sup>	Day	L03	L <sub>Aeq</sub> , 15 hour <sup>1</sup>	57	No	No	60	Yes
	Night		L <sub>Aeq</sub> , 1 hour <sup>1</sup>	56	No	No	55	Yes <sup>4</sup>
			L <sub>Amax</sub>	58	-	-	65	Yes

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
- Pioneer (GLB7) and Wyuna (GLB8) were both present at this time. See discussion in Section 4.4 below
- Pacific Explorer was also at berth at WHT4 during this period, however was unlikely to impact the measured noise levels at monitoring location L03

### 4.3.2 Additional information

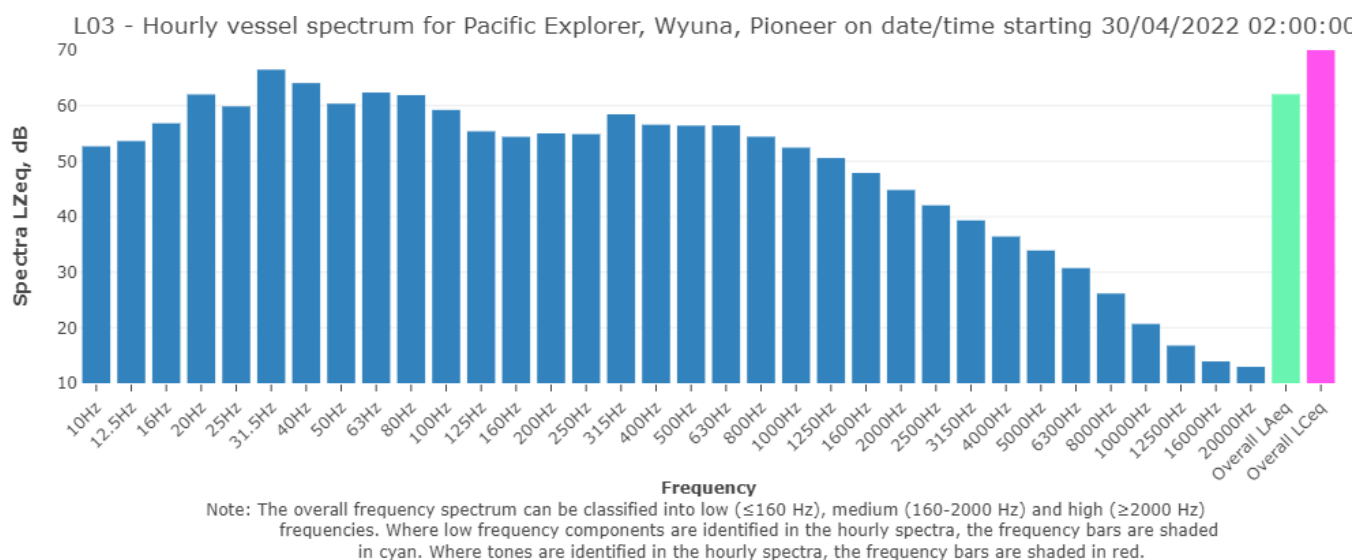


Figure 4.7 Typical vessel spectrum – noise level at L03

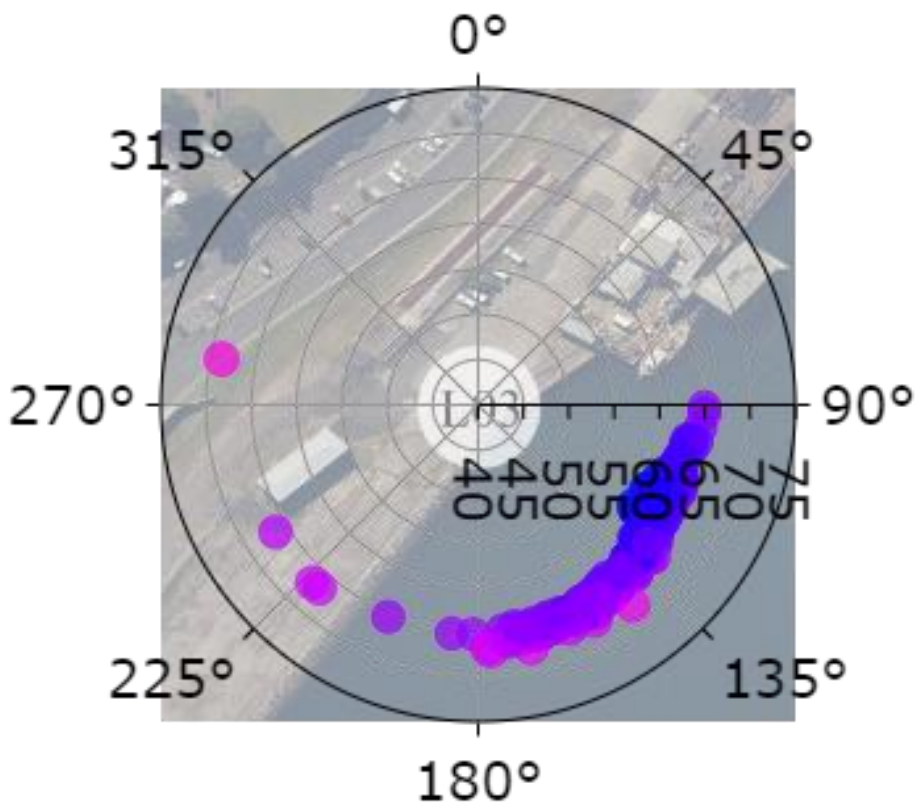


Figure 4.8 Typical vessel polar (directional) plot

## 4.4 Discussion regarding Pioneer and Wyuna

On April 28 and April 29 2022, the Pioneer (GLB7) and Wyuna (GLB8) were simultaneously at berth. During this period, the Wyuna had slightly higher noise levels, therefore the noise monitoring system attributed the measured noise levels to this vessel. The noise monitoring system indicated that there was a potential exceedance of the Vessel Noise Trigger Levels, therefore a detailed analysis was undertaken to determine the contribution from each vessel.

A review of the data was undertaken from this period, along with previously measured data. The Wyuna contribution has been estimated based on the following:

- Analysis of the measured noise levels from historical visits of the Pioneer only
- Analysis of the measured noise levels from 28 April-30 April when both the Wyuna and Pioneer were berthed.

The estimated Wyuna contribution is as follows:

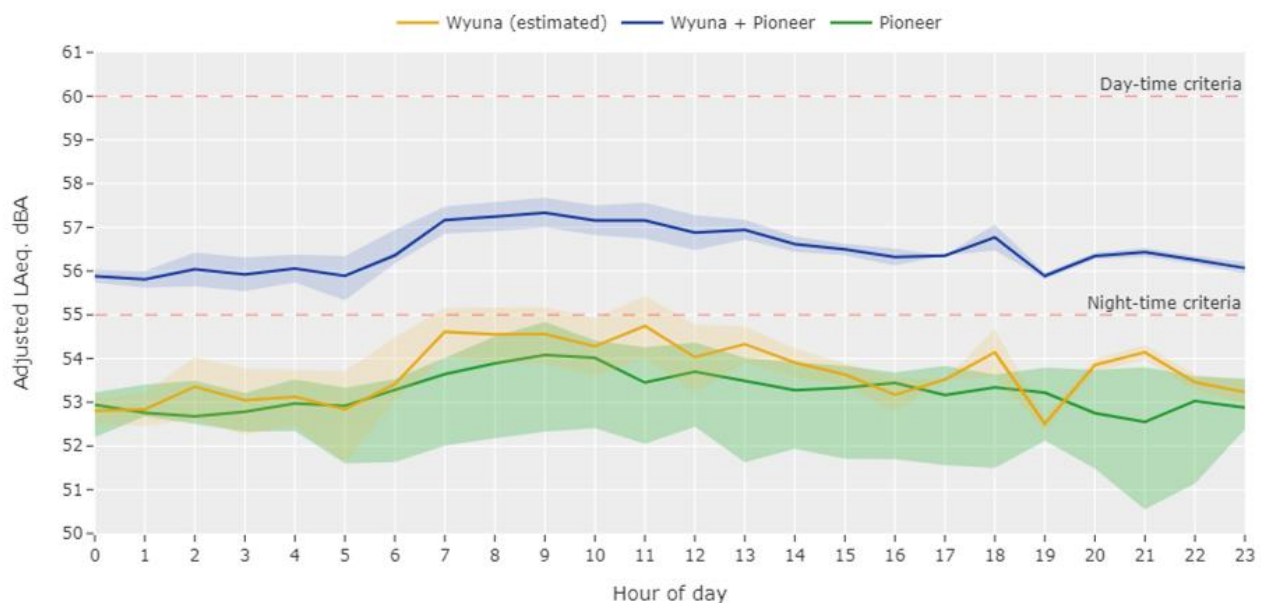
Assessment period	Estimated contribution, dBA
Day	54.0
Night	53.1

The time series plot of all historical Pioneer visits (shown in Green) and the Wyuna plus Pioneer (shown in Blue) visit is provided below. The hourly Wyuna contribution has been estimated based on noise levels measured for historical Pioneer visits and the Wyuna + Pioneer (shown in Blue):

- The solid lines are the 50% (median) measured adjusted noise level for each hour of the day
- The shaded area indicates the 25% to 75% range.

The minimum and maximum values from this plot have been excluded based on the following assumptions:

- Minimum noise levels go down to 48 dBA which likely indicates the vessels were not unloading
- Maximum noise levels are likely to be influenced by extraneous noise not related to the vessels.



Following this analysis, a review of the previous Wyuna report from March 2021 (ref 610.04309-R92-v1.0 prepared by SLR Consulting, dated 17 March 2021) was undertaken, where measured noise levels were:

- Day: 55-56 dBA
- Night: 53 dBA.

These previously measured noise levels further supports the analysis undertaken using IMS measurements.



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