

PIONEER

**Glebe Island Berth 7
Compliance Noise Monitoring Report**

Prepared for:

Port Authority of New South Wales
PO Box 25
MILLERS POINT NSW 2000

SLR Ref: 610.04309-R97
Version No: -v1.1
April 2021

SLR 

PREPARED BY

SLR Consulting Australia Pty Ltd
ABN 29 001 584 612
Tenancy 202 Submarine School, Sub Base Platypus, 120 High Street
North Sydney NSW 2060 Australia

T: +61 2 9427 8100
E: sydney@slrconsulting.com www.slrconsulting.com

BASIS OF REPORT

This report has been prepared by SLR Consulting Australia Pty Ltd (SLR) with all reasonable skill, care and diligence, and taking account of the timescale and resources allocated to it by agreement with Port Authority of New South Wales (the Client). Information reported herein is based on the interpretation of data collected, which has been accepted in good faith as being accurate and valid.

This report is for the exclusive use of the Client. No warranties or guarantees are expressed or should be inferred by any third parties. This report may not be relied upon by other parties without written consent from SLR.

SLR disclaims any responsibility to the Client and others in respect of any matters outside the agreed scope of the work.

DOCUMENT CONTROL

Reference	Date	Prepared	Checked	Authorised
610.04309-R97-v1.1	23 April 2021	Jason Qian	Aaron McKenzie	Aaron McKenzie
610.04309-R97-v1.0	9 April 2021	Jason Qian	Aaron McKenzie	Aaron McKenzie

CONTENTS

1	INTRODUCTION	4
2	SITE DESCRIPTION	4
2.1	Noise Trigger Levels and Criteria	5
3	MEASUREMENT METHODOLOGY AND INSTRUMENTATION	6
4	RESULTS AND ANALYSIS	6
4.1.1	Modifying Factors	7
5	PERFORMANCE ASSESSMENT.....	8
5.1	Operations	8
6	CONCLUSION	8

DOCUMENT REFERENCES

TABLES

Table 1	Vessel Trigger Noise Level (external).....	5
Table 2	Noise Survey Instrumentation.....	6
Table 3	Summary of Measurement Results – 28 March and 29 March 2021	7
Table 4	Compliance Assessment	8

FIGURES

Figure 1	Location of berths and nearest receivers to each berth.....	5
----------	---	---

APPENDICES

Appendix A	Acoustic Terminology	
------------	----------------------	--

1 Introduction

SLR Consulting Australia Pty Ltd (SLR Consulting) has been commissioned by the Port Authority of New South Wales (Port Authority of NSW) to conduct monitoring of noise emissions during the unloading of the “Pioneer” (a bulk carrier vessel) at Glebe Island Berth 7 (GI-7), as required by the Glebe Island and White Bay Port Noise Policy, Port Authority of NSW (2020) which came into effect in January 2021.

Noise measurements have been conducted whilst the ship was berthed at GI-7 and unloading using the onboard equipment at one location considered representative of the potentially most exposed residential receiver adjacent to Batty Street during the daytime period and night-time period as required by the Port Noise Policy. In addition to this location, an additional measurement was undertaken within the White Bay Port during the night-time period.

The measurements were conducted at GI-7 during the night-time between 23:42 on 28 March 2021 and 1:02 on 29 March 2021 and during the daytime between 14:48 and 15:33 on 29 March 2021.

2 Site description

The Glebe Island Port facility is located north of Anzac Bridge between Johnsons Bay and White Bay on Glebe Island. The facility occupies approximately 40 hectares of waterfront land and forms a crescent around Glebe Island, with a water frontage of about 1,400 m in length.

The facility layout comprises the following main elements:

- Two berths on the eastern side of Glebe Island designated GI-1 and GI-2, and two berths on the western side designated GI-7 and GI-8;
- Concrete/asphalt area previously used for vehicle storage; and
- Internal roads continuing from Sommerville Road providing truck access to the storage areas of Berths 1 to 2.
- The adjacent White Bay facility to the west of Glebe Island consists of 5 berths on the northern side of White Bay.

Berth 7 is located towards the western end Glebe Island, as shown in **Figure 1**.

Figure 1 also identifies the nearest receiver locations for each berth as identified in Appendix H – Noise Standard, which forms part of the Port Noise Policy and the measurement locations used.

Figure 1 Location of berths and nearest receivers to each berth



Note: Figure referenced from Appendix H of the Port Noise Policy

2.1 Noise Trigger Levels and Criteria

The noise trigger levels applicable at the worst affected sensitive receiver as outlined in the Port Noise Policy is reproduced in **Table 1**.

Table 1 Vessel Trigger Noise Level (external)

Environmental trigger applied to vessels at berth	Assessment Location	Day LAeq(15hour) ¹ (7am to 10pm)	Night LAeq(1hour) (10pm to 7am)	Night L _{Amax} (10pm to 7am)
Glebe Island 1 and 2	All sensitive receivers near the port	60 dBA	55 dBA	65 dBA
Glebe Island 7 and 8		60 dBA	55 dBA	65 dBA
White Bay 3		60 dBA	55 dBA	65 dBA
White Bay 4 (non-cruise)		60 dBA	55 dBA	65 dBA

Note 1: This includes a 5dBA allowance in the short term for vessels that cannot meet the night time vessel trigger noise level without restrictions to unloading speeds. The 24/7 goal is the median unloading noise level for vessels which is applied as the night time vessel trigger noise level

3 Measurement Methodology and Instrumentation

In accordance with the Port Noise Policy, compliance with the Noise Trigger Levels is required at all sensitive receivers to the port. The nearest receivers to each berth have been identified and measurements have been subsequently undertaken at the closest receiver to assess compliance as identified in the Port Noise Policy and shown in **Figure 1**. The noise measurements were undertaken during unloading operations.

Furthermore, the noise monitoring is required to be undertaken over a period of sufficient duration to ensure representative results from all activities and combinations of activities that would be expected to occur and to satisfy the $L_{Aeq(period)}$ trigger level.

During attended noise monitoring ship noise emissions were observed to be consistent, and as such five 15minute measurements were undertaken during the daytime and three measurements undertaken during the night-time to confirm receiver noise levels.

All acoustic instrumentation employed throughout the monitoring programme has been designed to comply with the requirements of AS IEC 61672.1 – 2013 *Electroacoustics—Sound level meters - Specifications* and carries current National Association of Testing Authorities (NATA) or manufacturer calibration certificates. Instrument calibration was checked before and after each measurement survey, with the variation in calibrated levels not exceeding ± 0.5 dBA.

Noise measurements and assessments in this report have been prepared in accordance with Australian Standard AS 1055-2018 “Acoustics - *Description and Measurement of Environmental Noise*” and with reference to the Noise Policy for Industry (NPI).

The survey instrumentation used during the studies is set out in **Table 2**.

Table 2 Noise Survey Instrumentation

Type	Serial Number	Instrumentation Description
2270	3029485	Brüel & Kjær Modular Precision Sound Level Meter
4189	3260622	Brüel & Kjær 12.5 mm Pre-polarised Condenser Microphone
SV-30A	20604	SVAN Sound Level Calibrator

4 Results and Analysis

The results of the attended noise measurements are summarised in **Table 3**. The measured noise levels presented include noise from the ship unloading activity as well as ambient noise unrelated to GI-7.

Table 3 Summary of Measurement Results – 28 March and 29 March 2021

Location	Period/ Weather	Start Time	LAeq	LCeq	LCeq - LAeq	LA10	LA90	GI-8 Related LAm _{ax}	Comments
Location 1	Night Temp: 20°C Wind: m/s	23:42	49	61	12	49	47	50	<i>Site related noise events:</i> Operation: 47-50 Pioneer Estimated contribution LAeq(1hour) 47dBA LAm_{ax} 50dBA <i>Other noise events:</i> EWP operation : 52 Birds : 51 Impact : 72
		23:57	48	60	13	48	47	49	
		0:12	47	60	13	47	46	49	
Location 2	Night Temp: 20°C Wind: m/s	0:30	48	61	10	48	41	44	<i>Site related noise events:</i> Discharging: 42-44 Pioneer Estimated contribution LAeq(1hour) 42dBA LAm_{ax} 44dBA <i>Other noise events:</i> Vehicle Passby : 63-71
		0:45	44	58	13	44	42	44	
Location 1	Daytime Temp: 26°C Wind: 2m/s	14:48	54	68	15 ^{1,2}	56	51	51	<i>Site related noise events:</i> Operation noise is not measurable. Observed to be <50dBA Pioneer Estimated contribution LAeq(1hour) <50dBA <i>Other noise events:</i> Construction noise : 58-66 Crane on Port : 58-60 Birds : 56-72 Traffic on Anzac Bridge : 50
		15:03	56	69	13	57	53	51	
		15:18	55	69	14	57	52	51	

Note 1: Low frequency noise component identified if compared to NPfl.

Note 2: Low frequency noise was caused by the crane operation on Port not Pioneer.

4.1.1 Modifying Factors

No modification factors for low frequency or tonal noise as defined in the NSW Environment Protection Authority Noise Policy for Industry (EPA 2017) were required to be applied for the measurements undertaken.

The noise levels were also observed to be generally constant and therefore were not considered to be intermittent as defined in the NPfl.

5 Performance Assessment

5.1 Operations

Results of the operator attended noise measurements compared with the Vessel Noise Trigger Levels are given in **Table 4**. Noise from the Pioneer at Location 2 was shielded by a workshop building on the Port. Noise levels at elevated levels of Location 2 were estimated to be 46 dBA based on the night measurement at Location 1.

Table 4 Compliance Assessment

Location	Estimated GI-8 Contribution			Vessel Noise Trigger Levels			Compliance	
	Day LAeq(15hour)	Night LAeq(1hour)	Night LAmax	Day LAeq(15hour)	Night LAeq(1hour)	Night LAmax	Day	Night
Location 1	<50 dBA	47 dBA	50 dBA	60 dBA	55 dBA	65 dBA	Yes	Yes
Location 2	-	Ground 42 dBA Elevated 46 dBA	44 dBA	60 dBA	55 dBA	65 dBA	Yes	Yes

Table 4 indicates that compliance with the Vessel Noise Trigger Level was achieved at the nearest sensitive receiver location during the daytime and night-time periods.

6 Conclusion

Noise measurements were carried out whilst the Pioneer was undertaking unloading activities at GI-7 during the day-time and night-time periods on the 28 March and 29 March 2021 after the ship arrived and had commenced unloading operations.

Noise measurements undertaken at Location 1 and Location 2 indicate that compliance with the Vessel Noise Trigger Levels have been achieved including unloading operations, during the daytime and night-time period at the closest sensitive receivers.

APPENDIX A

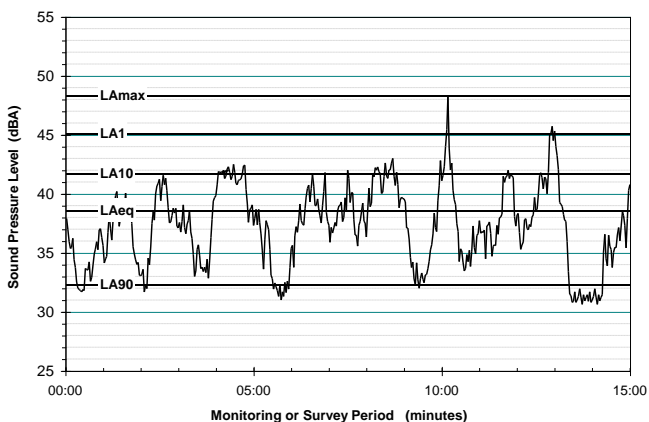
Acoustic Terminology

Typical Noise Indices

This Report makes repeated reference to certain noise level descriptors, in particular the LA10, LA90 and LAeq and LAmax noise levels.

- The LA10 is the A-weighted sound pressure level exceeded 10% of a given measurement period and is utilised normally to characterise typical maximum noise levels.
- The LAeq is essentially the average sound level. It is defined as the steady sound level that contains the same amount of acoustical energy as a given time-varying sound over the same measurement period. The LAeq(period) is the measurement parameter used to describe the average sound level over the period. For daytime the period is 7 am to 6 pm, for evening 6 pm to 10 pm, and for night-time 10 pm to 7 am.
- The LA90 noise level is the A-weighted sound pressure level exceeded 90% of a given measurement period and is representative of the average minimum background sound level (in the absence of the source under consideration), or simply the “background” level.
- The LAmax is simply the maximum noise level and is often represented by the LA1(1min), being the level exceeded 1% of 1 minute, ie the noise level exceeded for 0.6 of a second.

Graphical Display of Typical Noise Indices



Typical Noise Levels

The following table presents examples of typical noise levels.

Typical Noise Levels

Sound Pressure Level (dBA)	Typical Source	Subjective Evaluation
130	Threshold of pain	Intolerable
120	Heavy rock concert	Extremely noisy
110	Grinding on steel	
100	Loud car horn at 3 m	Very noisy
90	Construction site with pneumatic hammering	
80	Kerb side of busy street	Loud
70	Loud radio or television	
60	Department store	Moderate to Quiet
50	General Office	
40	Inside private office	Quiet to Very quiet
30	Inside bedroom	
20	Unoccupied recording studio	Almost silent

A-Weighting or dBA Noise Levels

The overall level of a sound is usually expressed in terms of dBA, which is measured using the “A-weighting” filter incorporated in sound level meters. These filters have a frequency response corresponding approximately to that of human hearing. People’s hearing is most sensitive to sounds at mid frequencies (500 Hz to 4000 Hz), and less sensitive at lower and higher frequencies. Thus, the level of a sound in dBA is a good measure of the “loudness” of that sound. Different sources having the same dBA level generally sound about equally as loud, although the perceived loudness can also be affected by the character of the sound (eg the loudness of human speech and a distant motorbike may be perceived differently, although they are of the same dBA level).

Sensitivity of People to Noise Level Changes

A change of up to 3 dBA in the level of a sound is difficult for most people to detect, whilst a 3 dBA to 5 dBA change corresponds to a small but noticeable change in loudness. A 10 dBA change corresponds to an approximate doubling or halving in loudness.

ASIA PACIFIC OFFICES

BRISBANE

Level 2, 15 Astor Terrace
Spring Hill QLD 4000
Australia
T: +61 7 3858 4800
F: +61 7 3858 4801

CANBERRA

GPO 410
Canberra ACT 2600
Australia
T: +61 2 6287 0800
F: +61 2 9427 8200

DARWIN

Unit 5, 21 Parap Road
Parap NT 0820
Australia
T: +61 8 8998 0100
F: +61 8 9370 0101

GOLD COAST

Level 2, 194 Varsity Parade
Varsity Lakes QLD 4227
Australia
M: +61 438 763 516

MACKAY

21 River Street
Mackay QLD 4740
Australia
T: +61 7 3181 3300

MELBOURNE

Level 11, 176 Wellington Parade
East Melbourne VIC 3002
Australia
T: +61 3 9249 9400
F: +61 3 9249 9499

NEWCASTLE

10 Kings Road
New Lambton NSW 2305
Australia
T: +61 2 4037 3200
F: +61 2 4037 3201

NEWCASTLE CBD

Suite 2B, 125 Bull Street
Newcastle West NSW 2302
Australia
T: +61 2 4940 0442

PERTH

Ground Floor, 503 Murray Street
Perth WA 6000
Australia
T: +61 8 9422 5900
F: +61 8 9422 5901

SYDNEY

Tenancy 202 Submarine School
Sub Base Platypus
120 High Street
North Sydney NSW 2060
Australia
T: +61 2 9427 8100
F: +61 2 9427 8200

TOWNSVILLE

12 Cannan Street
South Townsville QLD 4810
Australia
T: +61 7 4722 8000
F: +61 7 4722 8001

WOLLONGONG

Level 1, The Central Building
UoW Innovation Campus
North Wollongong NSW 2500
Australia
T: +61 2 4249 1000

AUCKLAND

Level 4, 12 O'Connell Street
Auckland 1010
New Zealand
T: 0800 757 695

NELSON

6/A Cambridge Street
Richmond, Nelson 7020
New Zealand
T: +64 274 898 628