

# NOISE LEVEL CERTIFICATE

WHITE BAY CRUISE TERMINAL  
April 2019

## MEASURED NOISE LEVEL SUMMARY

Representative vessel noise levels in April 2019 complied with the 58dBA reference level outlined in the White Bay Cruise Terminal (WBCT) Noise Impact Mitigation Strategy (NIMS). These noise levels for April are presented in the table.

During the period from 1 April to 30 April 2019 there were 7 cruise ship visits to WBCT. Noise levels were recorded for all 7 visits. In total 4 individual vessels visited the berth. The most regular was the Pacific Explorer with 4 visits. Other vessels visited WBCT once in April. During April, 1 cruise ship visited the berth at White Bay 4 which was the Crystal Symphony on 7 April until midnight.

Table – Representative noise levels from WBCT

| Vessel Name      | Representative<br>L <sub>Aeq</sub> noise level<br>(dBA) | Arrival Time    | Departure Time   | Complies with<br>58dBA reference<br>level |
|------------------|---|-----------------|------------------|---|
| Pacific Explorer | 57  | 1/04/2019 7:20  | 1/04/2019 15:59  | Y   |
| Pacific Explorer | 57  | 5/04/2019 7:57  | 5/04/2019 16:07  | Y   |
| Noordam          | 55  | 7/04/2019 4:46  | 7/04/2019 17:11  | Y   |
| Crystal Symphony | 52 <sup>1</sup>   | 8/04/2019 0:15  | 8/04/2019 22:14  | Y   |
| Sea Princess     | 54  | 9/04/2019 6:17  | 9/04/2019 16:21  | Y   |
| Pacific Explorer | 57  | 13/04/2019 6:43 | 13/04/2019 16:11 | Y   |
| Pacific Explorer | 55  | 30/04/2019 6:50 | 30/04/2019 16:05 | Y   |

Note 1: Noise levels for this vessel were measured at WBCT and concur with measurements completed for this vessel at WB4 on 7 April.

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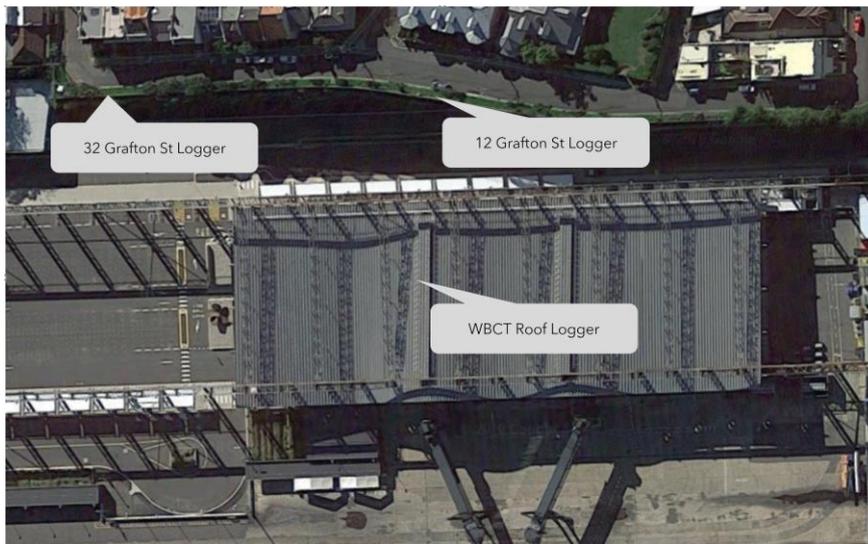
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## MONITORING LOCATIONS

Noise logging was completed with three loggers. The loggers were positioned in the following locations:

- White Bay Cruise Terminal roof top.
- Opposite 32 Grafton Street above the cliff top
- Opposite 12 Grafton Street above the cliff top.

Figure – Logging locations



Source: Google Earth

## MONITORING EQUIPMENT

The noise loggers were Class 1 Svantech type 977 noise and vibration analysers with current National Association of Testing Authorities, Australia (NATA) calibration certificates. Field calibration was also completed for each logger before and after each period of noise measurements with a Pulsar type 105 acoustic calibrator. The calibrator had a current NATA calibration certificate. The pre and post field calibration confirmed there was no significant change in logger calibration over the logging period and that results are representative.

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## METHODOLOGY SUMMARY

The three noise loggers were used to correlate noise levels in the area and establish the representative noise level from each vessel in the absence of noise from other sources. Other sources of noise that can influence an  $L_{Aeq}$  (equivalent energy average) noise level include:

- Road vehicles (nearby and ANZAC Bridge)
- Resident's and council's contractors
- Other vessels
- Aircraft
- Natural ambient noise levels such as wild life and wind in nearby trees and palms.

## ADDITIONAL OBSERVATIONS

A noise complaint was received regarding the Noordam and Crystal Symphony while they were berthed at White Bay on the 7 April 2019. The complainant reported noise levels of 58dBA.

The Noordam arrived at 4:46am with a representative level of 55dBA. Levels increased to 58dBA for a couple of hours upon the arrival of the Crystal Symphony at 8:14am. Representative noise levels then dropped to 55dBA from 10:30am.

Spoke notes the noise logger data concurs with the complainant's measured noise level of 58dBA during the double berth from noise contributions from both vessels. However this combined noise level does not exceed the NIMS 58dBA reference level. We also note the reference level of 58dBA was reached with two vessels and not from an individual vessel at WBCT. Contributions from WB4 should be excluded from the measured noise levels when assessed against the NIMS reference level for WBCT.

Yours faithfully



Dr Simon Kean  
Director

# GLOSSARY

| TERM                       | DESCRIPTION  |
|----------------------------|--|
| Representative noise level | <p>A representative noise level is the typical noise level from a vessel during its visit and excludes short term events which may be louder.</p> <p>The typical noise level from a vessel occurs from a combination of ventilation, air conditioning systems and onboard power generators.</p> <p>Higher short term noise levels may occur during arrival/departure or due to a change in an operational procedure. These are not representative of the longer term noise exposure from the vessel while in port. Where they are unreasonable they may be addressed by amending the vessel's procedures.</p>  |
| dBA                        | <p>The term dBA is an abbreviation which indicates the noise levels have been expressed in decibels (dB) using an A-weighting filter which approximates how the human ear perceives the loudness of complex noise sources with both low frequency (chugging of engines), medium (fans and engine exhaust flow) and higher frequency aspects.</p>   |
| 58dBA reference level      | <p>The approval for the White Bay Cruise Terminal called for the use of feasible and reasonable noise mitigation to manage potential noise impacts. In response the Port Authority of NSW has developed a Noise Impact Mitigation Strategy which considers potential noise impacts for typical vessels with noise levels up to 58dBA.</p> <p>Based on the approach in the Noise Impact Mitigation Strategy, 58dBA has become the baseline or reference level against which all vessels are assessed.</p> <p>Representative noise levels of 58dBA and lower from a vessel are deemed acceptable as the Noise Impact Mitigation Strategy has approaches to manage these noise levels by mitigating houses.</p> <p>Representative noise levels above 58dBA are deemed unacceptable and the vessel operations are reviewed under the Port Authority's three strikes policy.</p>  |
| $L_{Aeq}$                  | <p>In general, noise levels in any location vary continuously and any sound level meter will show this changing decibel level on the display. To make sense of the range in noise levels that may occur within a standard time period, various statistics are used in acoustics.</p> <p>The simplest are the <math>L_{A90}</math>, <math>L_{A50}</math> and <math>L_{A10}</math> descriptors. The number in each of these descriptors indicates the percentage of time that noise levels exceed the indicated value. For example an <math>L_{A90}</math> is the noise level that was exceeded 90% of the time, and <math>L_{A50}</math> is the noise level that was exceeded 50% of the time (also the median) and <math>L_{A10}</math> is the noise level that was exceeded 10% of the time.</p> <p>The <math>L_{Aeq}</math> is more complex to derive from changing noise levels and is an averaging process. The averaging process results in a single equivalent number for the measurement period that has the same total sound energy as the changing noise levels over the time period.</p> |

## GLOSSARY

| TERM                         | DESCRIPTION  |
|------------------------------|--|
| Adverse wind and rain        | Conditions are described as adverse when noise levels from wind or rain are high enough to influence noise measurement. Adverse noise may result from direct noise generation on the microphone or from wind and rain impacting other items such as the ground, pavements, structures, vegetation etc.   |
| Noise logger                 | A noise logger is an automated sound level meter which repeatedly saves noise statistics for defined noise sampling periods. In NSW statistics are usually obtained for every 15 minute period each day starting at midnight.  |
| Class 1                      | Sound level meters are available with different levels of accuracy. A class 1 instrument is a high precision instrument suitable for acoustic measurement of noise levels at the White Bay Cruise Terminal. To achieve a Class 1 rating the meter must comply with Standard IEC61672. Most meters that are available through retail electronics stores (including smartphone apps with claimed calibration curves) are not accurate or stable enough to achieve a class rating. Testing by Spoke Acoustics has found that noise levels measured using smartphone apps may commonly be wrong by 8dBA or more. |
| NATA calibration certificate | The sound level meter must have a current calibration certificate issued by a National Association of Testing Authorities (NATA) accredited laboratory for noise measurements to be valid in Australia. The certificate confirms that the meter is in good working order and complies with Standard IEC61672 and others as relevant.   |
| Field calibration            | A field calibration is conducted with a hand held acoustic calibrator and confirms the meter is working correctly and also permits minor adjustments to account for significant changes in temperature and atmospheric pressure.   |
| Acoustic calibrator          | An acoustic calibrator is used to conduct a field calibration. For the calibration to be valid the calibrator must have a current calibration certificate issued by a National Association of Testing Authorities (NATA) accredited laboratory.  |