Port of Newcastle Operations Pty Ltd
20-Dec-2016
Doc No. 60518192-RPNV-03_C

Mayfield Concept Plan

Annual Noise Verification Review

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Annual Noise Verification Review

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20-Dec-2016

Job No.: 60518192

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Quality Information

Document Mayfield Concept Plan

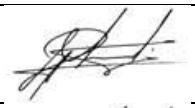
Ref 60518192-RPNV-03_C

Date 20-Dec-2016

Prepared by Angus Leslie

Reviewed by Patrick Martinez

Revision History

Rev	Revision Date	Details	Authorised	
			Name/Position	Signature
A	19-Dec-2016	Draft for review	Patrick Martinez Associate Director - Acoustics	
B	19-Dec-2016	Final issue	Patrick Martinez Associate Director - Acoustics	
C	20-Dec-2016	Final issue	Patrick Martinez Associate Director - Acoustics	

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Abbreviations

AS	Australian Standard
AS/NZS	Australian/New Zealand Standard
CENMT	Cumulative Environmental Noise Management Tool
CoA	The Minister for Planning's Conditions of Approval
DGM	Digital ground model
DP&E	Department of Planning and Environment
EA	Environmental Assessment
EPA	NSW Environment Protection Authority
EPL	Environment Protection Licence
GIS	Geographic Information System
INP	NSW Industrial Noise Policy
MCP	Mayfield Concept Plan
NVMP	Noise Verification Monitoring Plan
OEMP	Operation Environmental Management Plan
ONMP	Operation Noise Management Plan
PON	Port of Newcastle Operations Pty Ltd
SoundPLAN	SoundPLAN noise modelling software

Glossary

Project	An individual development within the MCP and falls part of the MCP approval.
Noise Quota	The noise goals for an individual project site within the MCP.

Document References

Document	Reference Document	Revision
Mayfield Concept Plan Noise Verification Monitoring Plan	60437494-RPNV-01_C	Revision C - 15 October 2015
Mayfield Concept Plan Cumulative Noise Modelling – User Guide	60289391.RPT01.01 MCP Noise User Guide	Revision 01 – 15 July 2015
Stolthaven Bulk Liquids Fuel Storage Facility, Mayfield Operational Noise Compliance Assessment	60326869-RPNV-04_C	Revision A – 20 December 2016

1.0 Introduction

A concept approval (Application 09_0096) under Section 75O of the EP&A Act was granted by the Minister for Planning on 16 July 2012 for the Mayfield Concept Plan (MCP) site (latest modification 12 December 2014). The MCP conditions of approval (CoA) require the consideration of the cumulative noise impacts from existing and future projects. Port of Newcastle Operations Pty Ltd (PON) has developed a Cumulative Environmental Noise Management Tool (CENMT) to assess and manage existing and future noise emission from individual project and cumulative noise impacts from the MCP area.

PON has developed a Noise Verification Monitoring Plan (NVMP) for the MCP, in order to monitor and review both individual project noise emissions against the issued noise quota, and to then review the cumulative of operational noise impacts from the overall MCP area.

AECOM Australia Pty Ltd (AECOM) has been commissioned by PON to undertake this year's (2016) annual noise verification review of the MCP.

This verification review has been prepared to satisfying the MCP concept approval acoustic requirements, specifically condition ***2.20 Noise Verification Monitoring Program***, which requires monitoring and reporting operational noise emissions.

The MCP CoA noise goals are limited to the assessment of noise emissions over NSW Environmental Protection Authority (EPA) NSW Industrial Noise Policy (INP) *amenity* periods. For other regulatory acoustic requirements, e.g. EPA Environment Protection Licence (EPL) noise limits, noise compliance assessments for the individual projects will incorporate these where required in their approval conditions.

Noise emissions as part of the short term 15-minute period INP intrusive noise assessment, sleep disturbance impacts are address at an individual project level, and currently do not form part of PON's noise management of the MCP area.

As per Section 1.6 of the MCP approval, noise emissions associated with the berths, berthing or harbour operations (i.e. shipping activities) are excluded from contributing to the overall MCP noise emissions.

As per Section 1.14 of the MCP approval, Mayfield No. 4 Berth is excluded from the MCP area as it operates under an existing approval (Consent Condition DA-293-08-00 MOD 9, dated 29 August 2013) and has noise limit requirements as part of this consent condition.

Acoustic terminology used in this report is included in **Appendix A**.

2.0 Objectives

As outlined in the MCP NVMP, the individual project tenants are responsible for undertaking the verification noise assessments against the PON issued noise quotas.

PON is then responsible for collating and reviewing the individual project's noise verification and compliance assessments. In addition, PON is responsible for combining the outputs from these compliance assessments to determine the overall noise emission from the entire MCP site.

The MCP CoA requires that the overall operational noise levels associated with the MCP '*must comply with the amenity noise goals at sensitive residential receivers'*. The amenity noise goals applicable to the entire MCP are presented in **Table 1.**

Table 1 Mayfield Concept Plan amenity noise goals at nearby residences

Noise Verification Location	Project Specific Noise Goals (dB(A)) $L_{Aeq(period)}$		
	Day (7.00 am to 6.00 pm)	Evening (6.00 pm to 10.00 pm)	Night (10.00 pm to 7.00 am)
A - 1 Arthur Street, Mayfield (Urban)	60	49	43
B - 2 Crebert Street, Mayfield (Urban)	60	50	43
C – 32 Elizabeth Street, Carrington (Urban)	57	44	45
D – Stockton (Suburban)	55	37	37

The above noise goals apply under winds of up to three metres per second (measured at 10 metres above ground level) and Pasquill stability class from A to F.

The locations of the residential noise verification locations are presented in **Figure 1.**

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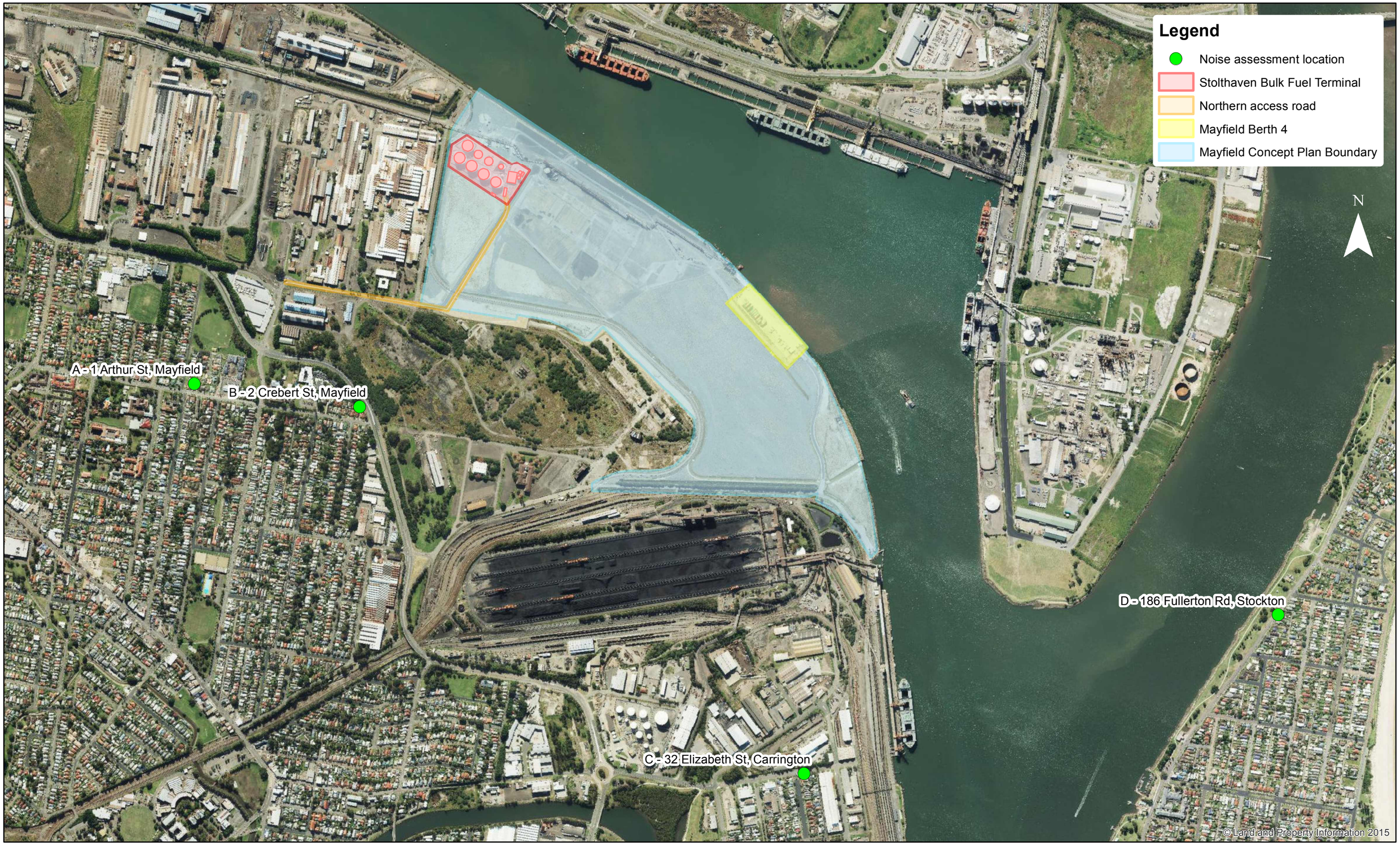

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Individual project site locations, MCP area and noise assessment locations

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0 500 1,000 2,000 m

Figure 1

3.0 Individual Project Review and Results

3.1 Approach

As per the requirements of the MCP NVMP, individual projects have undertaken annual noise verification assessments (through the use of the *SoundPLAN Verification Model*) and these were provided to PON to undertake the annual noise verification review of the MCP.

These noise verification assessments address the operational noise emissions against the project's noise quota levels that were issued and approved by PON. These individual project noise compliance assessments have been reviewed by PON for adequacy against the requirements of the *Mayfield Concept Plan Cumulative Noise Modelling – User Guide (Modelling User Guide).*

All projects have been modelled using the *SoundPLAN Verification Model* issued for the 2016 individual project noise verification assessments. The noise emissions from all projects are based upon 'reasonable' worst case operational scenarios that occurred over the 2016 review period, in accordance with the approach for reviewing the performance of noise emissions from industrial facilities in NSW, as per Chapter 11 of the EPA INP.

3.2 Individual project predicted operational noise levels

PON has developed and implemented a Cumulative Environmental Noise Management Tool (CENMT) to manage individual MCP's project noise emission requirements.

Table 2 presents a summary of the predicted noise emission levels at each of the assessment receiver locations for each of the approved projects within the MCP. The results presented in **Table 2** indicate the projects' noise emission performance against the PON issued noise quotas. These predicted noise levels are for the highest noise impacts under all assessment meteorological conditions.

3.2.1 Project 1 – Stolthaven Bulk Liquids Fuel Storage Facility (Stolthaven)

During this year's (2016) annual noise verification review of the MCP, the Stolthaven Bulk Liquids Fuel Storage Facility (Stolthaven) is the only approved operational project within the MCP. It is noted that project specific noise quotas were not issued as part of the Stolthaven's current approval (SSD 6664 MOD 1), since the CENMT was under development at the time that this project received formal approval. Stolthaven submitted a revised application (SSD 7056 (Stage 3)) for an operating approval which will includes their current operations. The revised Stolthaven application has been approved and noise quotas have been allocated by PON, however existing approval limits remain valid.

For the purposes of assessing Stolthaven's noise emission against the requirements of the MCP; this project will be assessed against the overall MCP amenity noise goals only, refer to **Table 1**. This is deemed appropriate for the 2016 noise verification review, as the Stolthaven is the only approved project within the MCP.

Table 2 Individual project predicted noise emission verification review

Project No. / Description	Noise Verification Location	Projects Compliance Noise Emission Review								
		Compliance Noise Level, $L_{Aeq, period}$ dB(A)			MCP Noise Quota, $L_{Aeq, period}$ dB(A)			Compliance		
		Day	Evening	Night	Day	Evening	Night	Day	Evening	Night
Project 1 Stolthaven	A	**26**	**29**	**26**	-[1]	-[1]	-[1]	N/A	N/A	N/A
	B	**34**	**37**	**35**	-[1]	-[1]	-[1]	N/A	N/A	N/A
	C	**16**	**23**	**17**	-[1]	-[1]	-[1]	N/A	N/A	N/A
	D	**16**	**23**	**17**	-[1]	-[1]	-[1]	N/A	N/A	N/A

Notes:

1. Project specific noise quota was not issued as part of the SSD 6664 MOD 1 approval, refer to Section 3.2.1.

4.0 Overall Mayfield Concept Plan Noise Levels

4.1 Approach

PON has reviewed the noise verification assessment of all the projects within the MCP, and has collated the 2016 operational compliance noise levels. All individual project compliance results have been combined into the MCP *SoundPLAN Master Model,* which includes all individual projects, to determine the cumulative impacts from approved projects within the MCP.

Table 3 presents a summary of the cumulative compliance noise levels from all approved projects within the MCP.

Table 3 Cumulative compliance noise verification review

Noise Verification Location	Cumulative Compliance Noise Emission Review								
	Compliance Noise Level $L_{Aeq\ (Period)}$			MCP Overall Noise Goals $L_{Aeq\ (Period)}$			Compliance		
	Day	Evening	Night	Day	Evening	Night	Day	Evening	Night
A	26	29	26	60	49	43	Yes	Yes	Yes
B	34	37	35	60	50	43	Yes	Yes	Yes
C	16	23	17	57	44	45	Yes	Yes	Yes
D	16	23	17	55	37	37	Yes	Yes	Yes

5.0 Discussion and Recommendations

During this year's (2016) annual noise verification review of the MCP, there was only one approved operational project with the MCP. Noise emissions from Stolthaven have been assessed against the MCP overall amenity noise goals and compliance has been found at all receiver locations, during all assessment periods under all prevailing meteorological conditions. As such, there are no recommendations as a result of the 2016 noise verification review.

AECOM understands that no noise complaints were receiver directly attributable to operations within the MCP over 2016.

6.0 Conclusion

Port of Newcastle Operations Pty Ltd (PON) has commissioned AECOM Australia Pty Ltd (AECOM) to carry out the Annual Noise Verification Review for the Mayfield Concept Plan (MCP), Mayfield, NSW.

PON has developed and implemented a Noise Verification Monitoring Plan (NVMP) for the MCP, in order to monitor and review individual projects noise emissions against the noise quota issued by PON and then collate and review the cumulative of all operational noise impacts from the overall MCP area.

Currently there is only one approved operational project with the MCP. Noise emissions from this project (i.e. Stolthaven Bulk Liquids Fuel Storage Facility (Stolthaven)) have been assessed against the MCP amenity noise goals to determine the overall impact from approved operations within the MCP.

Compliance has been found at all receiver locations, during all assessment periods under all prevailing meteorological conditions.

Appendix A

Acoustic Terminology

Appendix A Acoustic Terminology

The following is a brief description of acoustic terminology that may have been used in this report.

Sound power level	The total sound emitted by a source
Sound pressure level	The amount of sound at a specified point
Decibel [dB]	The measurement unit of sound
A Weighted decibels [dB(A])	The A weighting is a frequency filter applied to measured noise levels to represent how humans hear sounds. The A-weighting filter emphasises frequencies in the speech range (between 1kHz and 4 kHz) which the human ear is most sensitive to, and places less emphasis on low frequencies at which the human ear is not so sensitive. When an overall sound level is A-weighted it is expressed in units of dB(A).
Decibel scale	The decibel scale is logarithmic in order to produce a better representation of the response of the human ear. A 3 dB increase in the sound pressure level corresponds to a doubling in the sound energy. A 10 dB increase in the sound pressure level corresponds to a perceived doubling in volume. Examples of decibel levels of common sounds are as follows:
	0dB(A) Threshold of human hearing
	30dB(A) A quiet country park
	40dB(A) Whisper in a library
	50dB(A) Open office space
	70dB(A) Inside a car on a freeway
	80dB(A) Outboard motor
	90dB(A) Heavy truck pass-by
	100dB(A) Jackhammer/Subway train
	110 dB(A) Rock Concert
	115dB(A) Limit of sound permitted in industry
	120dB(A) 747 take off at 250 metres
Frequency [f]	The repetition rate of the cycle measured in Hertz (Hz). The frequency corresponds to the pitch of the sound. A high frequency corresponds to a high pitched sound and a low frequency to a low pitched sound.
Equivalent continuous sound level [L_{eq}]	The constant sound level which, when occurring over the same period of time, would result in the receiver experiencing the same amount of sound energy.
L_{max}	The maximum sound pressure level measured over the measurement period
L_{min}	The minimum sound pressure level measured over the measurement period
L_{10}	The sound pressure level exceeded for 10% of the measurement period. For 10% of the measurement period it was louder than the L_{10}.

L_{90}	The sound pressure level exceeded for 90% of the measurement period. For 90% of the measurement period it was louder than the L_{90}.
Ambient noise	The all-encompassing noise at a point composed of sound from all sources near and far.
Background noise	The underlying level of noise present in the ambient noise when extraneous noise (such as transient traffic and dogs barking) is removed. The L_{90} sound pressure level is used to quantify background noise.
Traffic noise	The total noise resulting from road traffic. The L_{eq} sound pressure level is used to quantify traffic noise.
Day	The period from 0700 to 1800 h Monday to Saturday and 0800 to 1800 h Sundays and Public Holidays.
Evening	The period from 1800 to 2200 h Monday to Sunday and Public Holidays.
Night	The period from 2200 to 0700 h Monday to Saturday and 2200 to 0800 h Sundays and Public Holidays.
Assessment background level [ABL]	The overall background level for each day, evening and night period for **each day** of the noise monitoring.
Rating background level [RBL]	The overall background level for each day, evening and night period for the **entire length** of noise monitoring.
Weighted sound reduction index [R_w]	A single figure representation of the air-borne sound insulation of a partition based upon the R values for each frequency measured in a laboratory environment.

*Definitions of a number of terms have been adapted from Australian Standard AS1633:1985 *"Acoustics – Glossary of terms and related symbols"*, the EPA's NSW Industrial Noise Policy and the EPA's Road Noise Policy.