

# Moorebank Precinct East - Stage 2 Project

CoC B62/B63 Noise Monitoring Report

(SSD 16-7628)



SIMTA

SYDNEY INTERMODAL TERMINAL ALLIANCE

## MPE STAGE 2 NOISE MONITORING REPORT

REPORT NO. 12186-M2 VERSION D

FEBRUARY 2018

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#### DOCUMENT CONTROL

Version	Status	Date	Prepared By	Reviewed By
Α	Draft	10 January 2018		
В	Draft	12 January 2018		
С	Draft	24 January 2018		
С	Final	30 January 2018		
D	FINAL	1 February 2018		

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**APPENDIX A – Noise Measurement Results** 



#### GLOSSARY OF ACOUSTIC TERMS

Most environments are affected by environmental noise which continuously varies, largely as a result of road traffic. To describe the overall noise environment, a number of noise descriptors have been developed and these involve statistical and other analysis of the varying noise over sampling periods, typically taken as 15 minutes. These descriptors, which are demonstrated in the graph below, are here defined.

**Maximum Noise Level (L**<sub>Amax</sub>) – The maximum noise level over a sample period is the maximum level, measured on fast response, during the sample period.

 $L_{A1}$  – The  $L_{A1}$  level is the noise level which is exceeded for 1% of the sample period. During the sample period, the noise level is below the  $L_{A1}$  level for 99% of the time.

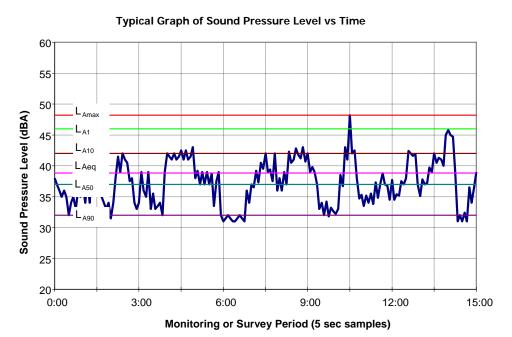
 $L_{A10}$  – The  $L_{A10}$  level is the noise level which is exceeded for 10% of the sample period. During the sample period, the noise level is below the  $L_{A10}$  level for 90% of the time. The  $L_{A10}$  is a common noise descriptor for environmental noise and road traffic noise.

 $L_{A90}$  – The  $L_{A90}$  level is the noise level which is exceeded for 90% of the sample period. During the sample period, the noise level is below the  $L_{A90}$  level for 10% of the time. This measure is commonly referred to as the background noise level.

 $L_{Aeq}$  – The equivalent continuous sound level ( $L_{Aeq}$ ) is the energy average of the varying noise over the sample period and is equivalent to the level of a constant noise which contains the same energy as the varying noise environment. This measure is also a common measure of environmental noise and road traffic noise.

**ABL** – The Assessment Background Level is the single figure background level representing each assessment period (daytime, evening and night time) for each day. It is determined by calculating the  $10^{th}$  percentile (lowest  $10^{th}$  percent) background level ( $L_{A90}$ ) for each period.

**RBL** – The Rating Background Level for each period is the median value of the ABL values for the period over all of the days measured. There is therefore an RBL value for each period – daytime, evening and night time.





#### 1 INTRODUCTION

#### 1.1 Background

The Sydney Intermodal Terminal Alliance (SIMTA) received approval for the construction and operation of Stage 2 (the Project) of the Moorebank Precinct East (MPE) Project, which comprises the second stage of development under the MPE Concept Approval (MP10\_0193) and approved under Development Approval SSD 16-7628.

The MPE site, including the Project site, is located approximately 27 km south-west of the Sydney Central Business District (CBD) and approximately 26 km west of Port Botany and includes the former Defence National Storage and Distribution Centre (DNSDC) site. The MPE site is situated within the Liverpool Local Government Area (LGA), in Sydney's South West subregion, approximately 2.5 km from the Liverpool City Centre.

The MPE Project involves the development of an intermodal facility including warehouse and distribution facilities, freight village (ancillary site and operational services), stormwater, landscaping, servicing and associated works on the eastern side of Moorebank Avenue, Moorebank. It is to be developed in three key stages:

- Stage 1 Construction of the IMEX facility and rail link (received development consent (SSD 14-6766) on 12 December 2016 and commenced construction on 23 June 2017)
- Stage 2 Construction of warehouse and distribution facilities (the subject of this subplan)
- Stage 3 Extension of the IMEX and completion of warehouse and distribution facilities.

Stage 2 of the MPE Project (the Project) involves the construction and operation of warehousing and distribution facilities on the MPE site and upgrades to approximately 1.5 kilometres of Moorebank Avenue from approximately 35 metres south of the northern boundary of the MPE site to approximately 185 metres south of the southern MPE site boundary.

Key components of the Project include:

- Warehousing comprising approximately 300,000m<sup>2</sup> GFA and additional ancillary offices
- A freight village, comprising 8,000m<sup>2</sup> GFA of retail, commercial and light industrial land uses
- Establishment of an internal road network, and connection of the Project to the surrounding public road network
- Ancillary supporting infrastructure within the Project site, including:
  - o Stormwater, drainage and flooding infrastructure
  - Utilities relocation and installation
  - o Vegetation clearing, remediation, earthworks, signage and landscaping
- Subdivision of the Project site
- An upgrade to Moorebank Avenue comprising the following key components:
  - o Modifications to the existing lane configuration, including some widening
  - o Earthworks, including construction of embankments and tie-ins to existing Moorebank Avenue road level at the southern and northern extents of the Project.
  - o Raking of the existing pavement and installation of new road pavement
  - Establishment of temporary drainage infrastructure, including temporary basins and / or swales
  - o Adjusting the vertical alignment by about two metres from the existing levels, including



kerbs, gutters and a sealed shoulder

- Signalling and intersection works
- Upgrading existing intersections along Moorebank Avenue, including:
  - o Moorebank Avenue / MPE Stage 2 access
  - Moorebank Avenue / MPE Stage 1 northern access
  - o Moorebank Avenue / MPE Stage 2 central access
  - MPW Northern Access / MPE Stage 2 southern emergency access

Spatial layout of the Construction area and the Operational area are provided in Figure 1-1.

The following general construction activities will be undertaken across the construction area for the Project:

- Vegetation clearance
- Remediation works
- · Demolition of existing buildings and infrastructure
- Earthworks and levelling of the Project site, including within the terminal hardstand
- · Drainage and utilities installation
- · Establishment of hardstand
- Construction of a temporary diversion road (the Moorebank Avenue Diversion Road) to allow for traffic management along Moorebank Avenue during construction (including temporary signalised intersections adjacent to the existing intersections)
- Construction of warehouses and distribution facilities, ancillary offices and the ancillary freight village
- Construction works associated with signage, landscaping, stormwater and drainage works.

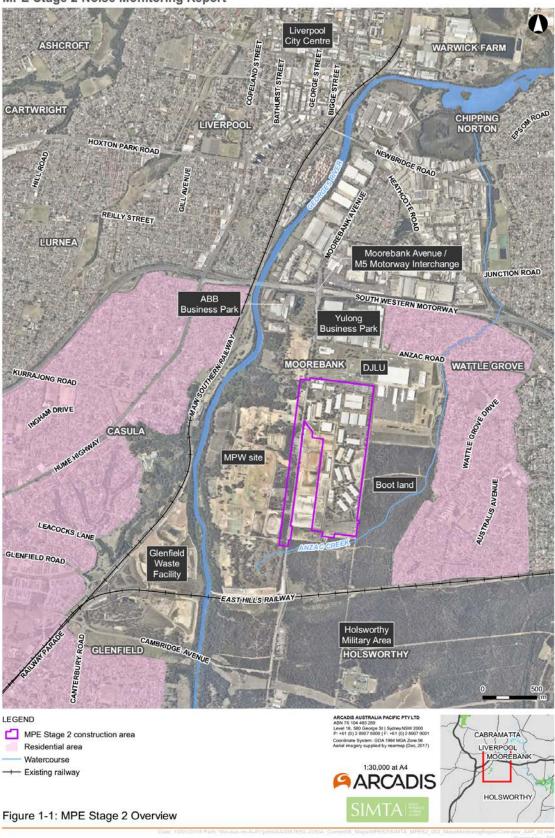
The MPE Stage 2 Project has been assessed by the Department of Planning and Environment (DP&E) under Part 4.1 of the Environmental Planning and Assessment Act 1979 (EP&A Act) as State Significant Development (SSD). The Planning Assessment Commission (PAC) granted Approval for the MPE Stage 2 Project on 31 January 2018 and is subject to the Minister's Conditions of Consent (CoC) (ref SSD 16-7628). The Project, including its potential impacts, consultation and proposed mitigation and management, is documented in the following suite of documents:

- State significant development approval SSD 16-7628
- Moorebank Precinct East Stage 2 Environmental Impact Statement (Arcadis Australia Pacific Pty Limited, December 2016)
- Moorebank Precinct East Stage 2 Response to Submissions (Arcadis Australia Pacific Pty Limited, July 2017)
- Environmental Protection and Biodiversity Conservation Act 1999 (EPBC Act) Approval (No. 2011/6229) granted on March 2014.



Figure 1-1 Site Location

MPE Stage 2 Noise Monitoring Report



#### 1.2 Purpose

The purpose of this technical report is to present the results of background noise monitoring to satisfy conditions B62 and B63 the MPE Stage 2 Development Consent (SSD 16-7628). Table 1-1 below details the requirements of conditions B62 and B63 and where these have been addressed within this review.

Table 1-1 Condition of Consent B62/B63

Condition	Requirements	Where Addressed in this Report
B62	Prior to early works, the Applicant must undertake noise monitoring in accordance with the INP to verify RBLs for the closest sensitive receivers	Section 2
B63	Prior to early works and fill importation, the Applicant must submit a  Noise Monitoring Report detailing:  • the results of background noise monitoring;  • and resulting adjustments of NMLs for the development; and,  • any additional noise mitigation measures to be included in the CEMP required under condition C1.	Section 3 Section 4.2 Section 4.3

#### 1.3 Structure

The structure of this report is as follows:

- **Section 1 Introduction:** introduces the MPE Stage 2 Project and the purpose of this report;
- **Section 2 Methodology:** describes the noise monitoring methodology, including the measurement locations and equipment;
- Section 3 Results: presents the results of the noise monitoring;
- **Section 4 Discussion:** investigates relevant outcomes of the noise monitoring and implications on the Project; and,
- **Section 5 Conclusion**: summarises the outcomes of the noise monitoring and subsequent data analysis and provides recommendations based on the results.



#### 2 NOISE MONITORING METHODOLOGY

#### 2.1 Noise Monitoring Locations

As presented in Table 1-1, Condition B62 requires that background noise monitoring be conducted to verify rating background levels (RBLs) at the closest sensitive receivers. Further, Condition B63 requires that the results of the noise monitoring, conducted to satisfy B62, are used to adjust the construction noise management levels (NMLs) for the development.

In accordance with the *Interim Construction Noise Guideline* (ICNG), RBLs are used to establish construction NMLs at residential receivers. In the detailed Noise and Vibration Impact Assessment (NVIA) prepared for the MPE Stage 2 EIS, four residential noise catchment areas (NCAs) were identified near the Project. Table 2-1 presents the NCAs, and their proximity to the Project.

Table 2-1 Residential Noise Catchment Areas

	<u> </u>	Distance to Project Site (m)			
NCA	NCA Description	Operational area	Construction area		
NCA1	Wattle Grove	390	390		
NCA2	Wattle Grove North	375	350		
NCA3	Casula	800	760		
NCA4	Glenfield	1,550	1,580		

The locations of the NCAs are shown in Figure 2-1.

To satisfy Condition B62, noise monitoring has been conducted at a location in each NCA that is representative of the closest residential receiver in each NCA to the Project site. All reasonable efforts were made to conduct the monitoring at the closest receiver in each NCA, while also giving due consideration to factors with the potential to influence the monitoring results. In particular, each location was carefully selected so that, to the extent possible, sources of extraneous noise were avoided.

The selected noise monitoring locations are identified in Table 2-2 and shown on Figure 2-1.

Table 2-2 Noise Monitoring Locations

Monitoring Location	Address	NCA
M1	16 Corryton Court, Wattle Grove	NCA1
M2	22 Glenelg Court, Wattle Grove	NCA2
M3	11 Buckland Road, Casula	NCA3
M4	26 Goodenough Street, Glenfield	NCA4



Figure 2-1 Noise Catchment Areas and Noise Monitoring Locations



#### 2.2 Noise Monitoring Period

Background noise monitoring was conducted between Tuesday 5 December and Monday 18 December 2017. However, in accordance with the *NSW Industrial Noise Policy* (INP), monitoring data gathered after Friday 15 December was not included in the analysis, as this fell into the school holiday period and may be affected by extraneous noise due to atypical traffic flows.

Construction activities are understood to have been in progress on both the MPE and MPW sites during the monitoring period. However, construction noise from the MPE and MPW sites was not audible during attended noise measurements, as discussed in Section 3.2, and is considered unlikely to have affected the long term unattended noise monitoring results.

#### 2.3 Noise Monitoring Equipment

The unattended noise monitoring equipment used consisted of NGARA environmental noise loggers set to A-weighted, fast response, continuously monitoring at 100 ms sampling periods. This equipment is capable of remotely monitoring and storing noise level descriptors for later detailed analysis. The equipment calibration was checked before and after the survey and no significant drift occurred.

The noise loggers have been laboratory calibrated within the previous two years in accordance with Wilkinson Murray's in-house Quality Assurance Procedures.

#### 2.4 Data Processing and Analysis

From the background noise levels (L<sub>A90</sub>) the Rating Background Levels (RBLs) were determined using the methodology recommended in the INP.

Times when there was rainfall or wind speeds above 5m/s were excluded in accordance with the *INP*, using meteorological data from the Bureau of Meteorology (BoM) automatic weather station (AWS) located at Holsworthy.

Daily plots from the noise monitoring are shown in Appendix A.

#### 2.5 Attended Noise Measurements

At each monitoring location, a 15-minute attended noise measurement was conducted on the day that the noise logger was installed. During the measurement, observations were made of the existing ambient noise environment.

All attended noise measurements were conducted using a Bruel and Kjaer Type 2250 Sound Level Meter. This sound level meter conforms to Australian Standard 1259 Acoustics - Sound Level Meters as a Type 1 Precision Sound Level Meter which has an accuracy suitable for field and laboratory use. The A-Weighting filter of the meter was selected and the time weighting was set to "Fast". The calibration of the meter was checked before and after the measurements with a Bruel and Kjaer Type 4231 sound level calibrator and no significant drift was noted.

The Bruel and Kjaer Type 2250 and Type 4231 have been laboratory calibrated within the previous two years in accordance with Wilkinson Murray's in-house Quality Assurance Procedures.



#### 3 NOISE MONITORING RESULTS

#### 3.1 Long Term Unattended Monitoring Results

The unattended noise monitoring data from each location was processed as described in Section 2.4 to establish the RBLs for each NCA. The established RBLs are summarised in Table 3-1.

The evening RBL in NCA3, based on the monitoring data from M3, was calculated to be higher than that during the daytime. In accordance with the *INP Application Notes*, the evening RBL should not be higher than the daytime RBL, and therefore, the evening RBL in NCA3 has been set equal to the daytime RBL.

Table 3-1 Rating Background Noise Levels

Manifestina Lanatina (NOA)	Rating	Rating Background Level (dBA)			
Monitoring Location (NCA)	Day <sup>1</sup>	Evening <sup>1</sup>	Night <sup>1</sup>		
M1 – 16 Corryton Court, Wattle Grove (NCA1)	39	37	35		
M2 – 22 Glenelg Court, Wattle Grove (NCA2)	43	42	37		
M3 – 11 Buckland Road, Casula (NCA3)	41	43 (41) <sup>2</sup>	37		
M4 – 26 Goodenough Street, Glenfield (NCA4)	45	42	36		

<sup>1.</sup> Day = 7:00am - 6:00pm; Evening = 6:00pm - 10:00pm; Night = 10:00pm - 7:00am.

#### 3.2 Short Term Attended Measurement Results

The results of short term attended noise measurements, conducted during the installation of the noise loggers, are summarised in Table 3-2. It is noted that, while construction activities are understood to have been in progress on both the MPE and MPW sites, construction noise from the MPE and MPW sites was not audible during any of the attended noise measurements.

Table 3-2 Attended Noise Measurement Results

Location	Date &		Levels BA)	Comments /Observations	
	Time	L <sub>A90,15min</sub>	L <sub>Aeq,15min</sub>		
	5/12/2017			Noise dominated by television in neighbouring house.	
M1	0, 12,201,	35	44	Other significant noise sources included dogs, planes,	
	12:42 pm			and birds.	
MO	5/12/2017	40	<b>50</b>	National description of the ME and American	
M2	1:14 pm	40	53	Noise dominated by traffic on M5 and Anzac Road.	
	F /4.0 /004.7			Noise dominated by traffic on M5 and Hume Highway.	
M3	5/12/2017 M3		59	Other significant noise sources included trains, planes	
	11:27 am			and bellbirds.	
	F /10 /0017			Noise dominated by traffic on Railway Parade. Other	
M4	5/12/2017	44 50		significant sources of noise included birds and general	
	12:07 pm			maintenance activities in adjacent property.	



<sup>2.</sup> In accordance with the INP, if the evening RBL is greater than the daytime RBL, it is set to the daytime RBL.

#### 4 DISCUSSION

#### 4.1 Comparison of RBLs with EIS

Noise criteria and NMLs in the NVIA for the MPE Stage 2 EIS were based on RBLs established in the MPE Concept Plan. These RBLs where calculated from noise monitoring data gathered in August 2012 and May 2013.

Table 1-1 summarises the RBLs, which informed the NMLs for the MPE Stage 2 EIS, and the RBLs calculated from the recent noise monitoring.

Table 4-1 Recent Noise Monitoring Results Compared to EIS

	Rating Background Level (dBA)								
NCA	Recent Monitoring		MPE Stage 2 EIS			Difference			
	Day <sup>1</sup>	Evening <sup>1</sup>	Night <sup>1</sup>	Day <sup>1</sup>	Evening <sup>1</sup>	Night <sup>1</sup>	Day <sup>1</sup>	Evening <sup>1</sup>	Night <sup>1</sup>
NCA1	39	37	35	42	37	37	-3	0	-2
NCA2	43	42	37	36	36	36	+7	+6	+1
NCA3	41	41	37	41	37	34	0	+4	+3
NCA4	45	42	36	44	44	37	+1	+5	-1

<sup>1.</sup> Day = 7:00am - 6:00pm; Evening = 6:00pm - 10:00pm; Night = 10:00pm - 7:00am.

In general, the MPE Concept Plan RBLs are lower than those established from the recent monitoring exercise. Contrary to the general trend of higher RBLs, a minor reduction of the daytime RBL is observed in NCA1 and negligible reductions in the night time RBLs are observed in NCA1 and NCA4.

Notwithstanding the differences noted above, the RBLs calculated from recent noise monitoring data are considered generally consistent with those established in the MPE Concept Plan. Some of the differences in RBLs are likely a result of the monitoring locations in each NCA not being identical, since the monitoring for the MPE Concept Plan was undertaken at locations representing the most potentially affected residential receivers, whereas the recent monitoring was undertaken at the closest receivers in each NCA, in accordance with Condition B62. Additionally, the recent monitoring was conducted in December, where ambient noise levels at some locations could foreseeably differ from those during May and August.

#### 4.2 Adjustments to NMLs Based on Monitoring Results

As noted above, the RBLs calculated from the recent noise monitoring data are considered to be generally consistent with those established in the MPE Concept Plan, and subsequently used to inform the NMLs in the MPE Stage 2 EIS. Therefore, no adjustments to the NMLs, as summarised below in Table 4-2, are considered to be warranted.



Table 4-2 Recommended Construction NML at Residential Receivers

	Acceptable L <sub>Aeq, 15 min</sub> Noise Level (dBA)						
NCA	Standard	Outside Standard Construction Hours RBL + 5 dBA					
NCA	Construction Hours						
	RBL + 10 dBA	Day <sup>1</sup>	Evening <sup>1</sup>	Night <sup>1</sup>			
NCA1	52	47	42	42			
NCA2	46	41	41	41			
NCA3	51	46	42	39			
NCA4	54	49	49	42			

<sup>1.</sup> Day = 7:00am - 6:00pm; Evening = 6:00pm - 10:00pm; Night = 10:00pm - 7:00am.

#### 4.3 Additional Mitigation Measures

Since no adjustments to the NMLs are considered to be warranted, no additional measures to mitigate construction noise have been identified. Notwithstanding, a detailed review of construction noise impacts and appropriate mitigation measures will be included in the Construction Noise and Vibration Management Plan (CNVMP) for the Project.

#### 5 CONCLUSION

This technical report has been prepared to present the results of background noise monitoring to satisfy conditions B62 and B63 the MPE Stage 2 Development Consent (SSD 16-7628).

As required by Condition B62, long term unattended background noise monitoring has been conducted at the closest receivers in each NCA to the development. Subsequently, the data has been processed in accordance with the INP to calculate the RBLs in each NCA.

RBLs calculated from recent noise monitoring data are considered generally consistent with those established in the MPE Concept Plan, subsequently adopted in the MPE Stage 2 EIS.

Therefore, no adjustments to the NMLs are considered to be warranted, and no additional measures to mitigate construction noise have been identified. Notwithstanding, a detailed review of construction noise impacts and appropriate mitigation measures will be included in the Construction Noise and Vibration Management Plan (CNVMP) for the Project.

