MOOREBANK INTERMODAL COMPANY

Moorebank Intermodal Terminal Project Environmental Impact Statement

Volume 1a

October 2014

PARSONS BRINCKERHOFF

Moorebank Intermodal Terminal Project – Environmental Impact Statement

Moorebank Intermodal Company

PARSONS BRINCKERHOFF

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A+ GRI Rating: Sustainability Report 2010

Revision	Details	Date	Amended By
A	First consolidated draft (amended with some KPMG comments)	07 February 2013	Kathleen Bunting
B	Second consolidated draft (amended with client comments	12 March 2013	Kathleen Bunting
C	Third consolidated draft (for issue to DP&I and SEWPaC)	30 April 2013	Pamela Morales
D	Final draft for adequacy (for issue to DP&I and SWEPaC)	15 August 2013	Kathleen Bunting Simeon Cumberland Pamela Morales Verity Humble-Crofts Paul Greenhalgh
E	Revised draft for adequacy (for issue to NSW DP&E and DoE)	21 July 2014	Kathleen Bunting Delyth Toghill Emma Lichkus Paul Greenhalgh
F	Environmental Impact Statement (EIS) (for the purposes of the EP&A Act) and 'draft EIS' (for the purposes of the EPBC Act)	3 October 2014	Kathleen Bunting Delyth Toghill Emma Lichkus Paul Greenhalgh

Author: Kathleen Bunting; Emma Lichkus; Delyth Toghill

Signed:

Reviewer: Paul Greenhalgh

Signed:

Approved by: Anthea Sargeant

Signed:

Date: October 2014

Distribution: MIC, PB file

Declaration

Declaration in accordance with Schedule 2, Part 3 of the NSW *Environmental Planning and Assessment Regulation 2000*

Submission of Environmental Impact Statement (EIS)	
Prepared under Part 4.1 of the NSW *Environmental Planning and Assessment Act 1979*	
Environmental Impact Statement prepared by:	
Name:	Paul Greenhalgh on behalf of Parsons Brinckerhoff Australia Pty Ltd
Qualifications:	Master of Science (Town and Country Planning) Bachelor of Science (Hons) Agricultural and Environmental Science
Address:	Level 27, Ernst & Young Centre 680 George Street Sydney NSW 2000
In respect of:	Moorebank Intermodal Terminal (IMT) Project – State Significant Development – Stage 1 development approval
Applicant name:	Moorebank Intermodal Company
Applicant address:	Moorebank Intermodal Company Ian Hunt Suite 2 Level 27 1 O'Connell Street Sydney NSW 2000
Proposed development:	The Moorebank IMT Project ('the Project') involves the development of freight terminal facilities linked to Port Botany and the interstate freight rail network by rail. The Project includes associated commercial infrastructure (i.e. warehousing), a rail link connecting the Project site to the Southern Sydney Freight Line (SSFL), and road entry and exit points from Moorebank Avenue. Full details of the proposal are described in Chapter 7 – *Project built form and operations* and Chapter 8 – *Project development phasing and construction* in Volume 1A of this Environmental Impact Statement (EIS).
Land to be developed:	The Project site comprises: • land to the east of the Georges River legally described as Lot 3001 in Deposited Plan (DP) 1125930 (which is currently occupied by the Department of Defence) and two smaller parcels of land legally described as Lot 100 and Lot 101 DP 1049508, and known as the 'Northern Commonwealth Land' and the 'Northern Council Land' (owned by Liverpool City Council); and • the rail connection (including the Georges River) from the main IMT site to the SSFL, including the three rail access options (northern, central and southern) as proposed within the Project concept. Land affected by the rail access options is identified in Table D1 and Table D2 below.

Table D1 Potentially affected properties – permanent footprint of the rail link

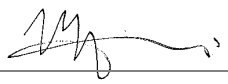
Rail access option	Lot affected	Landowner
Northern rail access option	Lot 10 DP 881265	Liverpool City Council (Northern Powerhouse Land)
	Lot 6 DP 1186254	RailCorp
	Lot 15 DP 881265	RailCorp
Central rail access option	Lot 1 DP 1130937	RailCorp
	Lot 3 DP 1130937	RailCorp
	Lot 4 DP 1130937	Commonwealth (hourglass land)
	Lot 4 DP 1186349	RailCorp
	Lot 102 DP 1143827	RailCorp

Submission of Environmental Impact Statement (EIS)

Southern rail access option	Lot 5 DP 833516	JC and FW Kennett Pty Ltd
	Lot 51 DP 515696	JC and FW Kennett Pty Ltd
	Lot 104 DP 1143827	JC and FW Kennett Pty Ltd
	Lot 103 DP 1143827	Figela Pty Ltd
	Lot 102 DP 1143827	RailCorp
	Lot 4 DP 1186349	RailCorp

Table D2 Potentially affected properties – temporary occupation during construction

Rail access option	Lot affected	Landowner
Northern rail access option	Lot 22 DP 1132574	Liverpool City Council
	Lot 4 DP 746078	NSW Roads and Maritime Services
	Lot 17 DP 881265	NSW Roads and Maritime Services
	Lot 16 DP 881265	NSW Roads and Maritime Services
	Lot 6 DP 1186253	RailCorp
	Lot 1 DP 1070419	Unknown
Central rail access option	Lot 103 DP 1143827	Figela Pty Ltd
	Lot 2 DP 1130937	RailCorp
	Lot 5 DP 1186272	RailCorp
	Lot 1 DP 1115187	Liverpool City Council
	Lot 20 DP 1132574	RailCorp
	Lot 21 DP 1132574	RailCorp
	Lot 22 DP 1132574	Liverpool City Council
	Lot 24 DP 1132574	Liverpool City Council
Southern rail access option	Lot 4 DP 1130937	Commonwealth (hourglass land)
	Lot 1 DP 1130937	RailCorp

Environmental Impact Statement:	An EIS is attached that assesses all matters specified in the Secretary for the NSW Department of Planning and Environment's (NSW DP&E's) Environmental Assessment Requirements (NSW SEARs) issued September 2014, in accordance with Part 4.1 of the NSW *Environmental Planning and Assessment Act 1979* and other relevant legislation.
Declaration:	I certify that I have prepared the contents of the EIS in accordance with Schedule 2 of the NSW *Environmental Planning and Assessment Regulation 2000* and the NSW SEARs, dated 2 September 2014, that the EIS contains all available information that is relevant to the environmental assessment of the development, and that, to the best of my knowledge, the information contained in the EIS is not false or misleading.
Signature:	
Name:	Paul Greenhalgh
Date:	3 October 2014

General information relating to the proposed action under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)

Submission of draft Environmental Impact Statement (EIS) prepared under section 97 of the EPBC Act and Schedule 4 of the Commonwealth *EPBC Act Regulations 2000*

Title of action:	Moorebank Intermodal Terminal (IMT) Project (EPBC identifier 2011/6086)
Full name and postal address of designated proponent:	Moorebank Intermodal Company Ian Hunt Suite 2 Level 27 1 O'Connell Street Sydney NSW 2000
Clear outline of objective of the action:	The Moorebank IMT Project ('the Project') involves the development of freight terminal facilities linked to Port Botany and the interstate freight rail network by rail. The Project includes associated commercial infrastructure (i.e. warehousing), a rail link connecting the Project site to the Southern Sydney Freight Line (SSFL), and road entry and exit points from Moorebank Avenue. Full details of the proposal are described in Chapter 7 – *Project built form and operations* and Chapter 8 – *Project development phasing and construction* in Volume 1A of this Environmental Impact Statement (EIS).
Location of the action:	Moorebank, Sydney, NSW The Project site comprises: • land to the east of the Georges River legally described as Lot 3001 in Deposited Plan (DP) 1125930 (which is currently occupied by the Department of Defence) and two smaller parcels of land legally described as Lot 100 and Lot 101 DP 1049508, and known as the 'Northern Commonwealth Land' and the 'Northern Council Land' (owned by Liverpool City Council); and • the rail connection (including the Georges River) from the main IMT site to the SSFL, including the three rail access options (northern, central and southern) as proposed within the Project concept. Land affected by the rail access options is identified in Table D3 and Table D4 below.

Table D3 Potentially affected properties – permanent footprint of the rail link

Rail access option	Lot affected	Landowner
Northern rail access option	Lot 10 DP 881265	Liverpool City Council (Northern Powerhouse Land)
	Lot 6 DP 1186254	RailCorp
	Lot 15 DP 881265	RailCorp
Central rail access option	Lot 1 DP 1130937	RailCorp
	Lot 3 DP 1130937	RailCorp
	Lot 4 DP 1130937	Commonwealth (hourglass land)
	Lot 4 DP 1186349	RailCorp
	Lot 102 DP 1143827	RailCorp
Southern rail access option	Lot 5 DP 833516	JC and FW Kennett Pty Ltd
	Lot 51 DP 515696	JC and FW Kennett Pty Ltd
	Lot 104 DP 1143827	JC and FW Kennett Pty Ltd

Submission of draft Environmental Impact Statement (EIS) prepared under section 97 of the EPBC Act and Schedule 4 of the Commonwealth *EPBC Act Regulations 2000*

	Lot 103 DP 1143827	Figela Pty Ltd
	Lot 102 DP 1143827	RailCorp
	Lot 4 DP 1186349	RailCorp

Table D4 Potentially affected properties – temporary occupation during construction

Rail access option	Lot affected	Landowner
Northern rail access option	Lot 22 DP 1132574	Liverpool City Council
	Lot 4 DP 746078	NSW Roads and Maritime Services
	Lot 17 DP 881265	NSW Roads and Maritime Services
	Lot 16 DP 881265	NSW Roads and Maritime Services
	Lot 6 DP 1186253	RailCorp
	Lot 1 DP 1070419	Unknown
Central rail access option	Lot 103 DP 1143827	Figela Pty Ltd
	Lot 2 DP 1130937	RailCorp
	Lot 5 DP 1186272	RailCorp
	Lot 1 DP 1115187	Liverpool City Council
	Lot 20 DP 1132574	RailCorp
	Lot 21 DP 1132574	RailCorp
	Lot 22 DP 1132574	Liverpool City Council
	Lot 24 DP 1132574	Liverpool City Council
Southern rail access option	Lot 4 DP 1130937	Commonwealth (hourglass land)
	Lot 1 DP 1130937	RailCorp

Background to the development of the action:	A detailed description of the evolution of the Project is included in Chapter 1 – *Introduction*, Chapter 3 – *Strategic context and need for the Project* and Chapter 6 – *Project development and alternatives*, in Volume 1A of this EIS. Forecast growth in international and interstate freight movements through Sydney's Port Botany, and increased industrial and commercial development in western Sydney, have prompted government and industry to consider new strategies for alleviating constraints on Port Botany and removing freight from Sydney and interstate roads. Insufficient intermodal rail freight capacity is recognised as a key barrier to the future development of Sydney and improvements in national productivity. In response to these pressures, the Australian Government announced in September 2004 that it would consider the development of an IMT at Moorebank (Department of Transport and Regional Services 2006). The Project site at Moorebank was considered suitable for the development of an IMT due to its proximity to road and rail networks, and established and future industrial and commercial centres in western Sydney. This document – the *Moorebank Intermodal Terminal Project Environmental Impact Statement*– has been prepared to support applications for planning approval under both Commonwealth and NSW government legislation.
How the action relates to any other actions (of which the proponent should be reasonably aware) that have	The Moorebank IMT Project is separate from, but has important inter-dependencies with, a number of major projects that are underway or planned by the Australian and NSW governments and private sector entities. A number of these related projects support the strategic need for the Project. Projects

Submission of draft Environmental Impact Statement (EIS) prepared under section 97 of the EPBC Act and Schedule 4 of the Commonwealth *EPBC Act Regulations 2000*	
been, or are being, taken or that have been approved in the region affected by the action:	relating to the Moorebank IMT Project include the Port Botany Expansion (completed), Moorebank Units Relocation (MUR) Project (currently being undertaken) and Southern Sydney Freight Line (completed December 2012). A full list of projects including a description, indicative date and relationship with the Moorebank IMT Project is provided in section 3.5 (Related projects) in Chapter 3 – *Strategic context and need for the Project* of Volume 1A of this EIS and further discussion is provided in Chapter 27 – *Cumulative impacts* of Volume 1B of this EIS. In addition, the site to the east of the Project site (across Moorebank Avenue) is currently subject to a proposal for the construction and operation of an IMT by Sydney Intermodal Terminal Alliance (SIMTA). In January 2012, SIMTA lodged an EIS with NSW DP&E, which was placed on public exhibition between 28 March and 28 May 2012 and then again from 4 September to 21 October 2013. On 29 September 2014, the Planning Assessment Commission of NSW (PAC) determined to approve the SIMTA concept plan, with modifications and subject to further assessment requirements, including further traffic assessment. In addition, in June 2013 a draft EIS was placed on public exhibition under the EPBC Act and this was approved on 6 March 2014, also subject to conditions. Chapter 27 – *Cumulative impacts* identifies and assesses the cumulative impacts of the Project and development of the SIMTA site.
The current status of the action:	Proposed. As is explained further in section 4.1 and section 4.2 in Chapter 4 – *Planning and statutory requirements*, the Project proponent, Moorebank Intermodal Company, is seeking: • approval for the construction and operation of the Project from the Commonwealth Department for the Environment (DoE) under Part 9 of the Commonwealth EPBC Act; and • Stage 1 development consent as State significant development (SSD) from the NSW DP&E under Part 4, Division 4.1 of the NSW EP&A Act for the concept proposal described in the EIS. The exception is the Early Works development phase, for which MIC is seeking approval to commence works in accordance with section 83B(3)(b) of the EP&A Act, as part of this EIS and the associated Stage 1 SSD approval application.
The consequences of not proceeding with the action:	The 'no build' alternative (i.e. not developing an IMT in south-western Sydney) is not considered a viable solution based on extensive studies conducted into rail and road freight capacity and the operations of Port Botany (refer Chapter 3 – *Strategic context and the need for the Project*), as discussed further in section 6.2 (Chapter 6 – *Project development and alternatives*) of the EIS. The detailed business case prepared for the Project confirmed that not proceeding with the Project would have significant economic and social consequences, including: • loss of $1 billion of benefits to the NSW economy and the national economies (largely associated with the bottleneck in container freight movements that would result if the Project did not proceed, which would add substantial costs to the supply chain and wider economic impacts associated with road congestion); • 1,247 jobs (typical workforce) not realised during the construction of the IMEX terminal and warehousing, and 275 jobs (typical workforce) not realised during the construction for the interstate terminal; • increased congestion of the Sydney arterial road network particularly in the Port Botany/airport precinct and the M5 and M4 Motorway corridors; • increased environmental and social impacts on the local community (associated with road transport relative to rail) as well as increased accidents on the arterial road network; and • loss of significant productivity improvements in the road and rail transport sectors which would have a knock-on effect to other economic sectors.

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Glossary and abbreviations

Glossary and abbreviations

µg/m	micrograms per cubic metre
ABB site	Asea Brown Boveri (ABB) Australia Medium Voltage Production Facility is a neighbouring industrial and manufacturing business to the north of the IMT site.
Aboriginal place	Places of special cultural significance to the Aboriginal people in NSW because of their spiritual, ceremonial, historical, social or educational values.
Aboriginal sites	Any material evidence of past Aboriginal activity that remains within a context or place which can be reliably related to that activity. These sites can be stone or shell artefacts situated on or in soil, marks located on or in rock surfaces and scars on trees.
ABS	Australian Bureau of Statistics
ACBPS	Australian Customs and Border Protection Service
ACHAR	Aboriginal Cultural Heritage Assessment Report
ACM	asbestos containing material
ADG Code	Australian Dangerous Goods Code
ADR	Australian Design Rule
ADWF	average dry weather flow
AEMR	Annual environmental management report
AEP	annual exceedance probability
AERMOD	AMS/US EPA regulatory model
AGi32	A lighting design software program
AGO	Australian Greenhouse Office
AHD	Australian height datum
AHIMS	Aboriginal Heritage Information Management System
AHMS	Archaeological and Heritage Management Solutions Pty Ltd
AnaBat	Bat detection equipment manufactured and distributed by Titley Scientific.
ANZECC Guidelines	Australian and New Zealand Environment Conservation Council
AQIA	air quality impact assessment
AQMP	air quality management plan
ARL	action response levels
ARTC	Australian Rail Track Corporation
AS/NZS ISO	Australian Standard/New Zealand International Organisation for Standardisation
ASS	acid sulfate soil
ASSMAC	Acid Sulfate Soils Management Advisory Committee
ASSMP	ASS management plan
AST	aboveground storage tank
A-weighted noise level	A frequency weighting to correlate with human response to sound
AWS	automatic weather station
BACT	best available control techniques
BAL	bushfire attack level
BASG	Base Administration Support Group
BBAM	NSW BioBanking Assessment Methodology
BGL	below ground level

Biofuels	Biofuels are liquid fuels which have been derived from other materials such as waste plant and animal matter. These include biodiesel, ethanol and blends such as E10 and B880.
BITRE	Bureau of Infrastructure, Transport and Regional Economics
BLEVE	boiling liquid expanding vapour explosion
BMP	best management practice
BoM	Bureau of Meteorology
Bomb cart	Inter-terminal vehicle used for the transport and repositioning of dry cargo containers during off-loading activities
BTEX	benzene, toluene, ethylbenzene and xylenes
CALMET	A three dimensional meteorological model
CALPUFF	A gaussian air quality dispersion model
CAMBA	China–Australia Migratory Bird Agreement
Casula Powerhouse Arts Centre	Located within the suburb of Casula, this is a former industrial facility converted to a multi-purpose contemporary arts facility.
CBD	Central Business District
CBNTCAC	Cubbitch Barta Native Title Claimants Aboriginal Corporation
CCC	Campbelltown City Council
CEMP	construction environmental management plan
Central rail access option	For references to the rail access option that crosses the Western Commonwealth Land (Lot 4 DP1130937)
CEP	community engagement plan
CF_4	tetrafluoromethane (greenhouse gas)
CH_4	methane (greenhouse gas)
CHETRE	Centre for Health Equity Training, Research and Evaluation
CHL	Commonwealth Heritage List
cl	clause
Class 3 waterway	A waterway providing minimal fish habitat
cll	clauses
CLM Act	NSW *Contaminated Land Management Act 1997*
CNG	compressed natural gas
CNVMP	construction noise and vibration management plan
CO	carbon monoxide
COs	Commanding Officers
CO_2	carbon dioxide (greenhouse gas)
CO_2-e	Carbon dioxide equivalent values
Container haulage trucks	Trucks transport containerised freight
COPD	chronic obstructive pulmonary disease
CPHCE	Centre for Primary Health and Equity
CPTED	crime prevention through environmental design principles
CSIRO	Commonwealth Scientific and Industrial Research Organisation
CUST Hut	Cullen Universal Steel Trust Hut
DA	Development Approval
DACHA	Darug Aboriginal Cultural Heritage Assessments
DALI	Darug Aboriginal Landcare Incorporated
dB(A)	A-weighted decibels

DCAC	Darug Custodian Aboriginal Corporation
DCP	development control plan
DEC	Former NSW Department of Environment and Conservation (now OEH)
DECC	Former NSW Department of Environment and Climate Change
DECCW	Former Department of the Environment, Climate Change and Water (now OEH)
Decibel [dB]	Unit of measurement of sound pressure level
Defence	Department of Defence
Deposited dust	Any particulate matter that falls out from suspension in the atmosphere. This measurement is expressed in units of mass per area per unit time (e.g. g/m^2/month).
DIPNR	Department of Infrastructure Planning and Natural Resources
DLO	Darug Land Observations
DLTP	Defence Logistics Transformation Program
DMM	Defence Maintenance Management Pty Ltd
DMP	dust management plan
DNSDC	Defence National Storage Distribution Centre
DoE	Commonwealth Department of the Environment (previously SEWPaC)
DoE Guidelines	*Guidelines for the content of a draft Environmental Impact Statement: Moorebank Intermodal Terminal Project, Sydney, NSW*
DoF	Commonwealth Department of Finance, previously the Department of Finance and Deregulation
DoIRD	Commonwealth Department of Infrastructure and Regional Development
DoS	Degree of Saturation
DP	Deposited Plan
DP&E	NSW Department of Planning and Environment
DP&I	NSW Department of Planning and Infrastructure (now NSW DP&E)
DPC	NSW Department of Premier & Cabinet
DPI	NSW Department of Primary Industries
DPM	Diesel particulate matter
DUAP	Department of Urban Affairs and Planning
Early Works	Project phase prior to construction. Commences mid-2015 and is expected to continue for approximately six months.
EC	electrical conductivity
EIS	environmental impact statement
EMME	equilibre multimodal/multimodal equilibrium
EMA	Eric Martin and Associates
EMP	environmental management plan
EMS	environmental management systems
EnHealth	Environmental Health Council of Australia
ERM	Environmental Resource Management
EO	explosive ordnance
EOW	explosive ordnance waste
EP&A Act	NSW *Environmental Planning and Assessment Act 1979*
EP&A Regulation	NSW Environmental Planning and Assessment Regulation 2000
EPA	NSW Environment Protection Authority
EPBC Act	Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*

ERA	environmental risk analysis or assessment
ESA	environmental site assessment
ESCP	erosion and sediment control plan
ESD	ecologically sustainable development
Euro 5	European minimum standards defining the acceptable limits for exhaust emissions of new light vehicles sold in EU members states
Euro 6	European minimum standards defining the acceptable limits for exhaust emissions of new light vehicles sold in EU members states
Euro V	European emissions standards defining the acceptable limits for emission from heavy vehicle engines in EU member states
Euro VI	European emissions standards defining the acceptable limits for emission from heavy vehicle engines in EU member states
EV	environmental values
FDI	fire danger index
FIAB	NSW Freight Infrastructure Advisory Board
FM Act	NSW *Fisheries Management Act 1994*
FMM	freight movement model
FSR	floor space ratio
ft	foot
FTA	US Federal Transit Administration
FTE	Full-time equivalent
Fugitive dust	Dust derived from a mixture of sources (non-point source) or not easily defined sources. Examples of fugitive dust include dust from vehicular traffic on unpaved roads, materials transport and handling, and un-vegetated soils and surfaces.
FVS	field validation survey
Full Build	Operation of IMEX terminal, warehousing and interstate terminal (2030)
FZ	flame zone
GBE	government business enterprise
Georges River REP	Georges River Regional Environmental Plan
GHG	greenhouse gas
Gj	gigajoules
Glenfield Landfill	A large waste facility and refuse disposal site, located south-west of the IMT Project site
GMA	Greater metropolitan area
GMR	greater metropolitan region
GPR	ground penetrating radar
GPT	gross pollutant trap
GRCCC	Georges River Combined Council Committee
ha	hectares
HFCs	hydroflurocarbons
HEC-RAS	A hydraulic modelling software package
HHRA	human health risk assessment
HHRI	human health risks and impacts
HIA	health impact assessment
HIL	Health investigation level
HIPAP	Hazardous Industry Planning Advisory Paper
HML	higher mass limit

HPV	high productivity vehicles
HRC	Healthy Rivers Commission
HRSCTRS	Australian Government, House of Representatives Standing Committee on Transport and Regional Services
HV	heavy vehicle
IAC	impact assessment criteria
IAEA	International Atomic Energy Agency
ICNG	Interim Construction Noise Guideline (DECC 2009)
ICOMOS	International Council on Measurements and Sites
IMEX	import/export
IMT	intermodal terminal
Infrastructure SEPP	*State Environmental Planning Policy (Infrastructure) 2007*
INP	NSW *Industrial Noise Policy*
IRSD	Index of Relative Socio-economic Disadvantage
ITS	intelligent transportation systems
ITVs	in-terminal vehicles
JAMBA	Japan–Australia Migratory Bird Agreement
kL	kilolitres
km	kilometres
km/h	kilometres per hour
kN	kilonewton
KPI	key performance indicator
KWh	kilowatt hour
L	litre
L_{Aeq}	Equivalent sound pressure level: the steady sound level that, over a specified period of time, would produce the same energy equivalence as the fluctuating sound level actually occurring.
$L_{A1,1min}$	Used as the most appropriate descriptor for a source relating to sleep disturbance, the $L_{A1\ (1\ minute)}$ describes the level exceeded for 1% of the specified time period of 1 minute.
$L_{Aeq\ 15\ hr}$	The L_{Aeq} noise level represents the equivalent continuous (energy average) A-weighted sound pressure level of the source over 15 hours. It represents the most conservative noise criteria during the daytime period.
$L_{Aeq\ 15\ min}$	The L_{Aeq} noise level represents the equivalent continuous (energy average) A-weighted sound pressure level of the source over 15 minutes. It represents the most conservative intrusive noise criteria during the night-time period.
$L_{Aeq\ 9\ hr}$	The L_{Aeq} noise level represents the equivalent continuous (energy average) A-weighted sound pressure level of the source over 9 hours. It represents the most conservative noise criteria during the night-time period.
L_{A90}	The A-weighted sound pressure level that is exceeded for 90% of the time over which a given sound is measured. This is considered to represent the background noise e.g. $L_{A90\ (15min).}$
$L/m^2/hr$	litre per square metre per hour
LCC	Liverpool City Council
LCVIA	landscape character and visual impact assessment
LCVM	light commercial vehicle model
LED	light emitting diodes
LEP	Local Environmental Plan

LGA	local government area
Liverpool LEP	*Liverpool Local Environmental Plan 2008*
LMA	Liverpool Military Area
LNG	liquefied natural gas
local air quality	For the purpose of the local air quality assessment in Chapter 17 – *Local air quality*, this is defined as air quality within the extent of the receivers identified in Figure 17.2.
LoS	Level of Service
LPG	liquefied petroleum gas
lux	Lux is a standardised unit of measurement of light intensity.
m	metre(s)
m^2	square metres
m^3	cubic metres
m/s	metres per second
m/day	metres per day
M4 Motorway	The M4 Motorway connects to the M7 Motorway and M2 Motorway linking the Blue Mountains to Sydney.
M5 Motorway	South Western Motorway forming part of the Metroad 5, the main arterial route linking Sydney's city centre to south-western suburbs and beyond.
M7 Motorway	Motorway 7 is part of the Sydney Orbital Network consisting of a tolled ring-road around Sydney, connecting the M5 Motorway, M4 Motorway and M2 Motorway between south-west and north-west Sydney.
MA	Moorebank Aboriginal recording
MAPAD	Moorebank Aboriginal Potential Archaeological Deposit
MCA	multi-criteria analysis
MFN	metropolitan freight network
mg/m^3	milligrams per cubic metre
MH	Moorebank Historical recording
MHPAD	Moorebank Historical Potential Archaeological Deposit
mm/s	millimetres per second
MIC	Moorebank Intermodal Company Limited
MIKE11	A hydraulic modelling software package
MIST	Macarthur Intermodal Shipping Terminal
mm	millimetres
MP	Member of Parliament
MPO	Moorebank Project Office
MRSA	Moorebank representative sample area
MUR Project	Moorebank Unit Relocation
MUSIC	Model for Urban Stormwater Improvement Conceptualisation (software)
N/A	Not applicable
NABERS	National Australian Built Environment Rating System
NEPC	National Environment Protection Council
NEPM	National Environment Protection Measure
NES	Matter of National Environmental Significance as defined under the EPBC Act
NGA	National Greenhouse Account
NMHC	non-methane hydrocarbons

NMLs	noise management levels
NO	nitric oxide
NO_2	nitrogen dioxide
NOHC	Navin Officer Heritage Consultants
NOHSC	National Occupational Health and Safety Commission
Northern Commonwealth Land	Located north of Bapaume Road and west of Moorebank Avenue
Northern Council Land	A small strip of land to the west of Moorebank Avenue, north Bapaume Road and immediately east of the Northern Commonwealth Land
Northern rail access option	For references to rail access option that crosses LCC land at northern end of Project.
NOW	NSW Office of Water
NO_x	oxides of nitrogen
NSFC	Northern Sydney Freight Corridor
NSW	New South Wales
NSW P&I	NSW Planning and Infrastructure (now the NSW Department of Planning and Environment)
NSW SEARs	Secretary for the NSW Department of Planning & Environment's Environmental Assessment Requirements
NT Act	Commonwealth *Native Title Act 1993*
NT NSW Act	*Native Title (New South Wales) Act 1994*
Nuisance dust	Dust which reduces environmental amenity without necessarily resulting in material harm. Nuisance dust comprises particles with diameters nominally from about 1 millimetre to 50 micrometre (microns).
O_3	ozone
OEH	NSW Office of Environment and Heritage
OEHHA	Californian Air Resources Board Office of Environment Health Hazard Assessment
OEMP	operational environmental management plan
OHS	occupational health and safety
OLM	ozone limiting method
ONVMP	operational noise and vibration management plan
Organic compounds	Organic compounds include reactive organics, VOCs, SVOCs (semi), NHMC and PAHs.
OTR	Over the road vehicles which travel outside the IMT site on the public road network.
PAC	Planning Assessment Commission of NSW
PADs	Potential archaeological deposits. A PAD is defined as any location where the potential for subsurface archaeological material is considered to be moderate or high, relative to the surrounding study area landscape.
PAHs	polycyclic aromatic hydrocarbons
PB	Parsons Brinckerhoff Australia Pty Ltd. EIS author and lead technical advisor to the Proponent.
PBLIS	Port Botany Landslide Improvement Strategy
PCB	polychlorinated biphenyl
PCYC	Police Citizens Youth Club
PFM	planning focus meeting
PFOA	perfluorooctanoic acid
PFOS	perfluorooctanesulfonic acid
pH	measure of acidity or alkalinity solution

PHA	preliminary hazard analysis
Phase A	Construction of initial IMEX terminal and warehousing (2015–2018)
Phase B	Operation of initial IMEX terminal and warehousing, construction of additional capacity (2018–2025)
Phase C	Operation of IMEX terminal and warehousing, construction of interstate terminal and additional warehousing (2025–2030)
PHML	Petroleum hydrocarbon management limits
PM	particulate matter
PM_{10}	particulate matter less than or equal to 10 µm in aerodynamic diameter.
$PM_{2.5}$	particulate matter less than or equal to 2.5 µm in aerodynamic diameter.
PEMF	provisional environmental management framework
PMF	probable maximum flood
POEO Act	NSW *Protection of the Environment and Operations Act 1997*
POEO Regulation	NSW Protection of the Environment and Operations Regulation 2010
ppm	parts per million
PPV	peak particle velocity
PRA	preliminary risk assessment
PV	photovoltaic
RAAF	Royal Australian Air Force
RD Act	*Commonwealth Racial Discrimination Act 1975*
RAE	Royal Australian Engineers
RAP	remediation action plan
RBLs	rating background noise levels
Reference Group	An IMT Project working group made up of representatives from agency stakeholders to provide direct feedback and input into the methodology and findings of the health impact assessment
regional air quality	For the purpose of the regional air quality assessment (Chapter 18), this is defined as air quality for the Sydney region as a whole or the Sydney basin. The extent of this region is shown in Figure 6.2 in Technical Paper 8 (which identifies the extent of the model boundary) and Table 7.3 in Technical Paper 8, which lists the local government areas covered by the assessment.
REP	regional environmental plan
RET	Australian Government Renewable Energy Target
RFS	Rural Fire Service
RH	relative humidity
RING	Rail Infrastructure Noise Guideline
RL	Reduced level
RMG	rail-mounted gantry
RMS	NSW Roads and Maritime Services
RNP	RMS Road Noise Policy
ROI	registration of interest
RoKAMBA	Republic of Korea–Australia Migratory Bird Agreement
ROL	road occupancy licence
RPA	Relevant planning authority
SAA	small arms ammunition
SCA	Sydney Catchment Authority
SEARs	see NSW SEARs

SEIFA	Socio-economic indexes for areas
SEPP	State Environmental Planning Policy
SEPP 19	*State Environmental Planning Policy No. 19–Bushland in Urban Areas*
SEPP 33	*State Environmental Planning Policy No. 33–Hazardous and Offensive Development*
SEPP 44	*State Environmental Planning Policy No. 44–Koala Habitat Protection*
SEPP 55	*State Environmental Planning Policy No. 55–Remediation of Land*
SEWPaC	Department of Sustainability, Environment, Water, Population and Communities (now the DoE)
SF_6	sulfur hexafluoride – (a greenhouse gas)
SIA	social impact assessment
Side pick	Specially designed forklift (top or side pick) which is an off-road, inter-terminal cargo handling vehicle.
SIDRA	Modelling program used to assess intersection performance for the Traffic Impact Assessment
SIMTA	Sydney Intermodal Terminal Alliance
SME	School of Military Engineering
SO_2	sulfur dioxide
SoE	State of the Environment
SOHI	Statement of Heritage Impact
SoundPLAN	Software used to generate the noise prediction model
Southern rail access option	For references to rail access option across Glenfield Waste Facility land to south
SPC	Sydney Ports Corporation
SPOS	Measure of potential sulfidic acidity
sq. m	square metres
SRD SEPP	*State Environmental Planning Policy (State and Regional Development) 2011*
SRS	seismic refraction survey
SSD	State significant development
SSFL	Southern Sydney Freight Line
STM	strategic travel model
STP	sewage treatment plant
STRARCH Hangar	The STRARCH hangar is located in the School of Military Engineering and consists of a post-tensioned steel truss roof tied down to large concrete footings. The STRARCH Hangar houses machinery and equipment from the Royal Australian Engineers Museum Collection.
SVE	soil vapour extraction
SVOCs	semi volatile organic compound
SWC	Sydney Water Corporation
SWSLHD	South Western Sydney Local Health District
SWSLHN	South West Sydney Local Health Network
Sydney GMA	Sydney greater metropolitan area
t	tonne
ta	tertiary alluvial clayey quartz sands, salty sands and clays
TAPM	The Air Pollution Model (CSIRO)
tCO_2-e	tonnes of carbon dioxide emissions
TCE	trichloroethene
TCLP	Toxicity Characteristic Leaching Procedure

TCPs	traffic control plans
TDS	total dissolved solids
TEU	twenty-foot equivalent units
TfNSW	Transport for NSW
TIA	transport impact assessment
TLALC	Tharawal Local Aboriginal Land Council
TN	total nitrogen
TP	total phosphorus
TPHs	total petroleum hydrocarbons
TRHs	total recoverable hydrocarbons
TRUs	transportation refrigeration units
TSC Act	NSW *Threatened Species Conservation Act 1995*
TSP	total suspended particulates
TSS	total suspended solids
UNESCO	United Nations Educational, Scientific and Cultural Organisation
UNFCCC	United Nations Framework Convention of Climate Change
USA	United States of America
US EPA	United States Environmental Protection Agency
US FTA	US Federal Transit Administration
USTs	underground storage tanks
UXO	unexploded ordnance
VHT	vehicles hours travelled
VKT	vehicle kilometres travelled
VOCs	volatile organic compounds
W	watt
WHO	World Health Organisation
WHS	work health and safety
WQO	water quality objectives
WMP	waste management plan
WSROC	Western Sydney Regional Organisation of Councils
WSUD	water sensitive urban design
WWII	World War II
XPT	express passenger train