

# GREENHOUSE GAS MANAGEMENT PLAN

Moorebank Precinct East Stage 1, Package 2

11 JANUARY 2019

# SYDNEY INTORMODAL TERMINAL ALLIANCE

## Moorebank Precinct East Stage 1, Package 2

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**Author**

[Redacted]

[Redacted]

**Checker**

[Redacted]

[Redacted]

**Approver**

[Redacted]

[Redacted]

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### Original Author Details

Original Author Details	Qualifications and Experience
<p>[Redacted]</p> <p>Australia Pacific Sustainability Lead – Arcadis</p> <p>Level 5/141 Walker Street, North Sydney</p> <p>Phone: +61 8907 8216</p>	<p>Master of Environmental Planning (Macquarie University, Sydney, NSW, 2013)</p> <p>Bachelor of Arts - Environmental Studies (University of New South Wales, Sydney, NSW, 2010)</p> <p>Over five years of professional experience specialising in greenhouse gas accounting and management, and sustainability management.</p>

## REVISIONS

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1	11/01/16	Draft GHGMP	[REDACTED]	[REDACTED]
2	08/03/17	Final submission for inclusion into CEMP	[REDACTED]	[REDACTED]
3	26/10/2017	Revised construction boundary associated with IMEX RfMA 003	[REDACTED]	[REDACTED]
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5	11/01/2019	Minor updates associated with 'non-conformance,' 'non-compliance' and 'corrective and preventative actions'	[REDACTED]	[REDACTED]

## ACRONYMS AND DEFINITIONS

Term	Definition
CBD	Central Business District
CEMP	Construction Environmental Management Plan
CoC	Conditions of Consent
COP21	21st Conference of the Parties
CO <sub>2</sub>	Carbon dioxide
CO <sub>2</sub> -e	Carbon dioxide equivalents
DNSDC	Defence National Storage and Distribution Centre
DoE	Department of Environment
DP&E	Department of Planning and Environment
EIS	Environmental Impact Statement
EMS	Environmental Management System
EPBC ACT	<i>Environmental Protection and Biodiversity Conservation Act 1999</i>
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i>
ERA	Environmental Risk Analysis
GHG	Greenhouse Gas
GHGMP	Greenhouse Gas Management Plan
ha	hectares
IMEX	<p>Import Export Terminal. Includes the following key components:</p> <ul style="list-style-type: none"> <li>• Truck processing, holding and loading areas - entrance and exit from Moorebank Avenue</li> <li>• Rail loading and container storage areas – installation of four rail sidings with adjacent container storage area serviced by manual handling equipment initially and overhead gantry cranes progressively</li> <li>• Administration facility and associated car parking- light vehicle access from Moorebank Avenue.</li> </ul>
IMT facility	<p>MPE Stage 1 Site including the construction of the following key components together comprising the intermodal terminal (IMT):</p> <ul style="list-style-type: none"> <li>• Truck processing and loading areas.</li> <li>• Rail loading and container storage areas.</li> </ul>

Term	Definition
	<ul style="list-style-type: none"> <li>Administration facility and associated car parking</li> <li>Rail Link.</li> </ul>
km	kilometres
MPE	Moorebank Precinct East as approved by the Concept Plan (MP_10_0913)
MPE Site	The site at Moorebank as approved by the Concept Plan (MP_10_0913)
MPE Stage 1, Package 1	The construction of the Rail Link connecting the Southern Sydney Freight Line to the IMEX, traversing across the Boot land, RailCorp Land, Moorebank Avenue, the MPW Golf Course, Georges River, and Glenfield Waste Facility
MPE Stage 1, Package 2	<p>Construction of the IMEX Terminal (Figure 1) including the following key components:</p> <ol style="list-style-type: none"> <li>Truck processing, holding and loading areas - entrance and exit from Moorebank Avenue</li> <li>Rail loading and container storage areas – installation of four rail sidings with adjacent container storage area serviced by manual handling equipment initially and overhead gantry cranes progressively</li> <li>Administration facility and associated car parking- light vehicle access from Moorebank Avenue</li> </ol>
MPE Stage 1 Project	The whole of the land to which the MPE Stage 1 Project approval SSD 14-6766 relates including both MPE Stage 1 Package 1, and MPE Stage 1 Package 2.
Mt	Mega tonnes
NGA	National Greenhouse Account
NGER	<i>The National Greenhouse and Energy Reporting Act 2007</i>
Non-compliance	An occurrence, set of circumstances, or development that results in a non-compliance or is non-compliant with Development Consent SSD 6766 Conditions of Consent or EPBC Act Approval (EPBC 2011/6229) Conditions of Approval but is not an incident
Non-conformance	Non-conformances are observations or actions that are not in strict accordance with the CEMP and the aspect specific sub-plan.
PAC	Planning Assessment Commission
Project, the (site)	The Project is the MPE Stage 1 Package 2 Project i.e. the IMEX Terminal construction site as depicted in Figure 1.
SIMTA	Sydney Intermodal Terminal Alliance

Term	Definition
SSD	State Significant Development
SSFL	Southern Sydney Freight Line
UNFCCC	United Nations Framework Convention on Climate Change

## COMPLIANCE MATRICES

Table 1 Final Compilation of Mitigation Measures (FCMM)

FCMM	Requirement	Document Reference
FCMM 16A	<p>A Greenhouse Gas Management Plan will be developed for the construction phase of the Proposal and included in the CEMP. Where appropriate, the mitigation measures, management strategies and abatement opportunities presented in the Greenhouse Gas and Climate Change Impact Assessment (Appendix X of this EIS) will be reviewed and considered for incorporation into the Construction Environmental Management Plan (CEMP) The Greenhouse Gas Management Plan will adopt the following measures:</p> <ul style="list-style-type: none"> <li>a. Where possible locally sourced materials will be used to reduce GHG emissions associated with transport</li> <li>b. Construction and demolition waste will be recovered and recycled where possible, and vegetation waste will be composted</li> <li>c. Construction works will be planned to minimise double handling of materials</li> <li>d. Recycled materials will be reused where possible to reduce GHG emissions associated with embodied energy</li> <li>e. Construction/transport plans will be incorporated within the CEMP to minimise the use of fuel during construction</li> <li>f. Fuel efficiency of the construction plant/equipment will be assessed prior to selection, and where practical, equipment with the highest fuel efficiency and which uses lower GHG intensive fuel (e.g. biodiesel) will be used, where practicable</li> <li>g. On-site vehicles will be fitted with exhaust controls in accordance with the <i>Protection of the Environment Operations (Clean Air) Regulation 2010</i> as required</li> <li>h. Regular maintenance of equipment will be undertaken to maintain good operations and fuel efficiency</li> <li>i. Where practicable trucks removing waste from the Proposal site or bringing materials to the Proposal site will be filled to the maximum amount allowable, depending on the truck size and load weight, to reduce the number of traffic movements required</li> <li>j. Consideration will be given to the embodied energy content of construction materials selected</li> </ul>	This Plan Section 5

Table 2 Revised Statement of Conditions (RSoC)

RSoC	Requirement	Document Reference
RSoC Air Quality	The Proponent commits to the preparation of a Greenhouse Gas Management Plan for the three major stages of the development in accordance the provisions of the <i>Greenhouse Gas Assessment</i> .	This Plan





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# 1 INTRODUCTION

The Sydney Intermodal Terminal Alliance (SIMTA) received approval for the construction and operation of Stage 1 of the Moorebank Precinct East (MPE) Project, comprising an Intermodal (IMT) Facility including a rail link (Package 1) and Import Export (IMEX) Terminal (Package 2) on 12 December 2016 (SSD 6766). The construction and operation of the MPE Stage 1 project was subject to an appeal in September 2017 (Appeal Number 2017/00081889). The approval was upheld and the revised Conditions of Consent (CoC) were released on 13 March 2018.

This Greenhouse Gas Management Plan (GHGMP) has been developed to manage Greenhouse Gas (GHG) emissions during the construction of “Package 2 of the MPE Stage 1 Project” (the Project).

Within this plan, a strategy has been established to demonstrate the contractor's approach to the management of GHG emissions. The GHGMP also accounts for requirements of the MPE Stage 1 Project Environmental Impact Statement (EIS) *Appendix X – SIMTA Stage 1 – Greenhouse Gas and Climate Change Impact Assessment*.

This GHGMP addresses the relevant requirements of the Project Approvals, including the EIS, Response to Submissions Report and Minister's Conditions of Consent (CoC), and all applicable guidelines and standards specific to the management of GHG emissions during construction of the Project.

## 1.1 Background and Scope

The MPE Project site is located approximately 27 kilometres (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 (Figure 1).

The MPE Project involves the development of an intermodal facility, including warehouse and distribution facilities, rail link, 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 IMT
- Stage 2 - Construction of warehouse and distribution facilities
- Stage 3 - Extension of the IMT and completion of warehousing and distribution facilities.

Stage 1 of the MPE Project comprises, and will be constructed across, two packages:

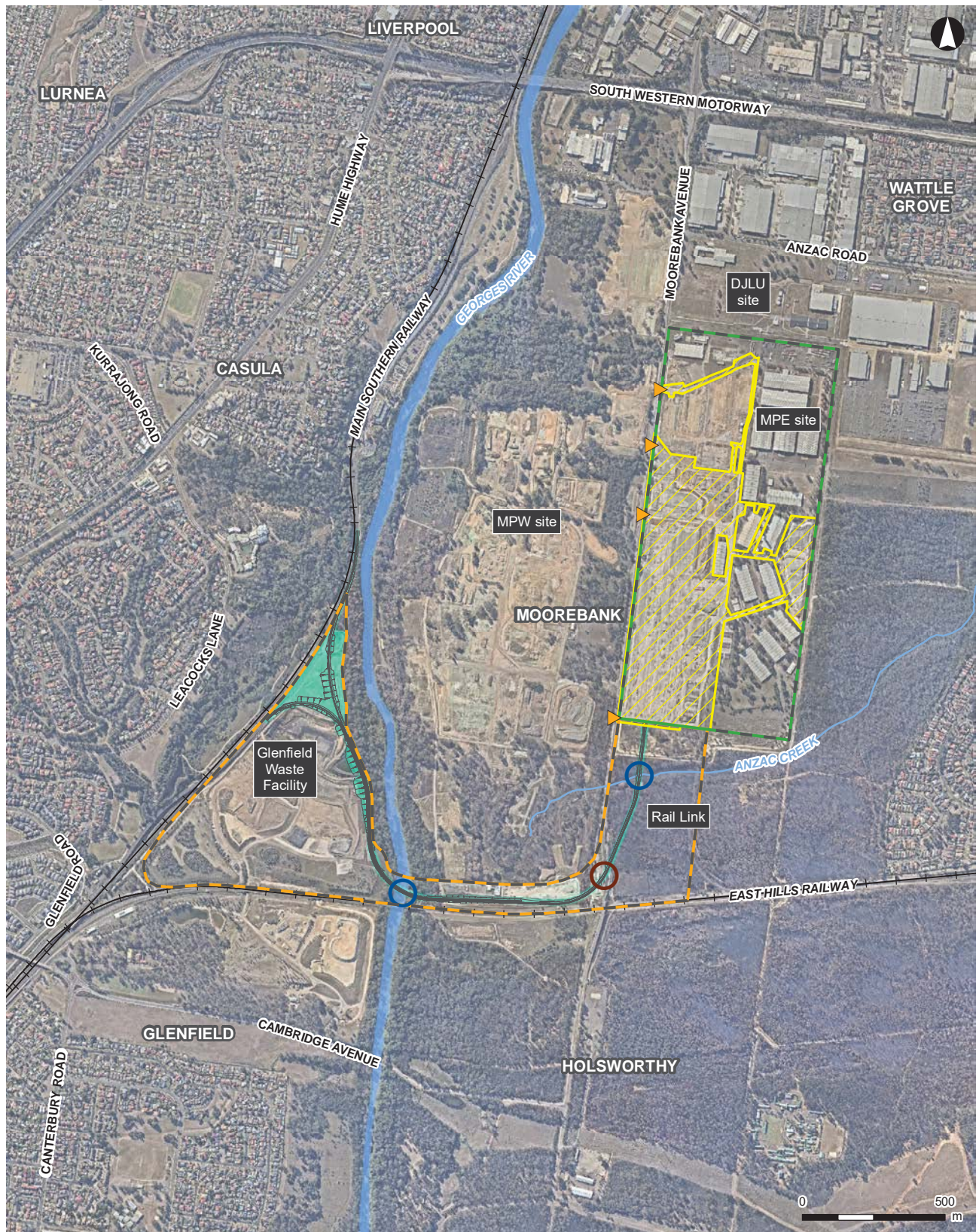
- Package 1: The Rail Link (not included within this GHGMP) includes a connection to the IMEX, and traverses across Moorebank Avenue, Anzac Creek and Georges River prior to connecting to the Southern Sydney Freight Line (SSFL).
- Package 2: The IMEX (subject of this GHGMP) includes the following key components:
  - Truck processing, holding and loading areas - entrance and exit from Moorebank Avenue
  - Rail loading and container storage areas – installation of four rail sidings with adjacent container storage area serviced by manual handling equipment initially and overhead gantry cranes progressively
  - Administration facility and associated car parking- light vehicle access from Moorebank Avenue.

The layout of the IMEX generally comprises operational areas, an administration area, rail sidings, utilities and drainage infrastructure, landscaping and signage. The operational areas of the IMEX consist of the primary and secondary container

loading/unloading areas and container storage areas, and the truck holding area. Within these areas containers would be stacked up to five high.



## MPE Stage 1 CGHGMP



### LEGEND

- |  |                                   |  |                      |
|--|-----------------------------------|--|----------------------|
|  | Project site                      |  | Rail link            |
|  | Rail Corridor                     |  | Creek/river crossing |
|  | MPE site                          |  | Road crossing        |
|  | MPE Stage 1 Package 1 (Rail Link) |  | Existing railway     |
|  | Construction footprint            |  | Watercourse          |
|  | Construction access               |  |                      |

ARCADIS AUSTRALIA PACIFIC PTY LTD  
 ABN 76 104 485 289  
 Level 16, 580 George St | Sydney NSW 2000  
 P: +61 (0) 2 8907 9000 | F: +61 (0) 2 8907 9001  
 Coordinate System: GDA 1994 MGA Zone 56  
 Aerial imagery supplied by nearmap (May, 2018)

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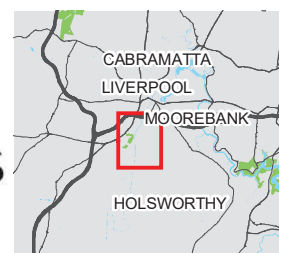


Figure 1: MPE Site Overview



### 1.1.1 Environmental Planning Approval

The MPE Stage 1 Project has been assessed by the Department of Planning and Environment (DP&E) under Division 4.7 (Division 4.1 prior to March 2018) 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 1 Project on 12 December 2016 and is subject to the Minister's Conditions of Consent (CoC, 18 December 2016 (ref SSD-6766)). The MPE Stage 1 Project, its impacts, consultation and mitigation were documented in the following suite of documents:

- State Significant Development Application SSD 6766 (as amended in the Land and Environment Court 13 March 2018)
- SIMTA Intermodal Terminal Facility – Stage 1 – Environmental Impact Statement (Hyder Consulting Pty Ltd, May 2014)
- SIMTA Intermodal Terminal Facility – Stage 1 – Response to Submissions (Hyder Consulting Pty Ltd, September 2015)
- *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) Approval (No. 2011/6229) granted on March 2014.

### 1.2 Purpose and Application

Within the MPE Stage 1 EIS, Arcadis (then Hyder Consulting) undertook a Greenhouse Gas (GHG) and climate change impact assessment. SIMTA have developed this GHGMP based on the initial GHG impact assessment, and to address the Final Compilation of Mitigation Measures (FCMM) within the EIS and Revised Statement of Commitments (RSoC).

This plan aims to demonstrate how GHG emissions will be managed during construction of the Project and provides methods to measure and reduce GHG emissions by the contractor, including all sub-contractor and consultant partners.

Specifically, the purpose of this GHGMP is to:

- Manage GHG emissions in accordance with the Project approval documents
- Review and consider the Greenhouse Gas and Climate Change Impact Assessment (Appendix X of the EIS) during the construction phase of Package 2 of the MPE Stage 1 Project
- Ensure that through the use of best practice, GHG emissions are minimised

### 1.3 Objectives and Targets

The following high level objectives and targets are set for the Project:

- Identify all key GHG emission sources
- Identify activities which contribute a large portion of GHG emissions
- Identify and implement measures to minimise GHG emissions produced.

## 2 ENVIRONMENTAL OBLIGATIONS

In Australia, there are a number of regulations, policies and targets which have been developed to manage and reduce GHG emissions. Those relevant to the construction of the Project are described in Table 3.

Table 3 GHG emissions regulatory and policy context

Level	Type	Name	Description
Commonwealth Government	Regulation	<i>The National Greenhouse and Energy Reporting Act 2007 (NGER)</i>	Introduced in 2007 and requires corporations to register and report emissions, energy consumption or production that meets certain thresholds every year.
	Target	United Nations Framework Convention on Climate Change (UNFCCC) at the 21st Conference of the Parties (COP21) (the Paris Agreement)	Under the Paris Agreement Australia has committed to reduce emissions by 26-28 per cent below 2005 levels by 2030
	Target	Direct Action Plan	Targets set in the Direct Action Plan align to those ratified under the Paris Agreement. It comprises an element to credit emissions reductions, a fund to purchase emissions reductions, and a safeguard mechanism.
NSW Government	Target	<i>NSW Greenhouse Plan 2005</i>	The Plan sets emission reduction targets for NSW, including a 60 per cent reduction in greenhouse gas emissions by 2050 and a return to year 2000 levels by 2025.
	Legislation	<i>Environmental Planning &amp; Assessment Act 1979</i>	The EP&A Act contains a general requirement to address environmentally sustainable principles, including climate change, within development applications.
	Target	NSW State Plan 2021	The NSW Plan 2021 has goals and targets towards climate change.

Methodologies and considerations for the quantification and management of GHG emissions, as relevant to the construction of the Project, are outlined in the following legislation, guidelines and standards:

- National Greenhouse Accounts (NGA) Factors (DoE, 2016a)
- National Greenhouse and Energy Reporting System Measurement: Technical Guidelines for the Estimation of Greenhouse Gas Emissions by Facilities in Australia (DoE, 2014a)
- Australia Standard ISO 14064.2 – Greenhouse Gases Part 2: Specification with guidance at the project level for quantification and reporting of greenhouse gas emission reduction and removal enhancements
- The Greenhouse Gas Protocol – A Corporate Accounting and Reporting Standard Revised Edition (WRI/WBCSD, 2004)
- The Greenhouse Gas Protocol ISO 14064.1 – Specification with Guidance at the Organization Level for Quantification and Reporting of Greenhouse Gas Emissions and Removals
- Materials lifecycle analysis database, Australian and New Zealand Standard.

### 3 EXISTING ENVIRONMENT

Existing accounts of greenhouse gases provided by the Commonwealth Department of the Environment and Energy (DoEE) estimate that approximately 549.4 Mega tonnes (Mt) CO<sub>2</sub>-e were emitted in Australia during the 2012-13 financial year (DoEE, 2016b). Approximately 24.8% of Australia's emissions are produced in NSW (130.2 MtCO<sub>2</sub>-e). A detailed description of the emissions profile relevant to the Project is provided in Section 3 of the Greenhouse Gas and Climate Change Impact Assessment (Appendix X of the EIS).



## 4 ASPECTS, IMPACTS AND RISKS

An Environmental Risk Analysis (ERA) (Hyder Consulting, 2015) was undertaken and documented as part of the MPE Stage 1 EIS. The ERA assessed the environmental risks, including those related to construction based GHG emissions. The methodology and matrices used for determining risks and their likelihood and consequence are described in Section 21 of the MPE Stage 1 EIS.

*Table 4 Construction GHG emissions environmental risk assessment*

Issue	Potential impact	Risk ranking (pre-mitigation)	Mitigation	Risk ranking (post-mitigation)
Greenhouse gas emissions	Increase in greenhouse gas emissions as a result of construction and embodied emissions in materials used.	M	A Greenhouse Gas (GHG) Management Plan would be developed and implemented to include appropriate control measures during the construction and operation of the Proposal. This would include consideration of materials selection to minimise embodied greenhouse gases.	L

In order to quantify the potential impacts and risks the MPE Stage 1 EIS (Appendix X) has quantified the key GHG emissions sources and the projected volume of GHG emission likely to be produced by the Project.

### 4.1 Key emissions sources

Construction of the Project will be undertaken in five key works periods over an 18 month period. Primarily, construction will include the transport of materials on and off the Project site, civil works and construction of buildings and structures. These activities require the use of fuels and electricity which will result in the release of associated GHG emissions. A description of the five key works periods and the potential sources of GHG emissions associated with each is provided in Table 5.

*Table 5 Potential sources of GHG emissions during the construction of the Proposal*

Works period	Activity
<b>Works period 1</b> - Site Preparation Activities	<ul style="list-style-type: none"> <li>Demolition</li> <li>Clearing vegetation</li> <li>Temporary Works</li> <li>Enabling Works</li> </ul>
<b>Works period 2</b> - Earthworks, Drainage and utilities	<ul style="list-style-type: none"> <li>Bulk Earthworks</li> </ul>
<b>Works period 3</b> - Engineering Fill	<ul style="list-style-type: none"> <li>Engineering fill under slab</li> </ul>
<b>Works period 4</b> - Pavement Construction	<ul style="list-style-type: none"> <li>Pavement construction</li> </ul>

Works period	Activity
and rail alignment construction	
<b>Works period 5</b> - Misc. structural construction, utilities, finishing works	<ul style="list-style-type: none"> <li>Misc. structural construction, utilities, finishing works</li> <li>Commissioning</li> <li>Decommissioning/Demobilisation of site</li> </ul>

Emissions were calculated as part of the MPE Stage 1 EIS by estimating fuel use and electricity consumption using available data. Emissions in tonnes CO<sub>2</sub> equivalent (tCO<sub>2</sub>-e) were calculated using factors and methods from the Australian Government National Greenhouse Accounts Factors (NGA) - December 2014. Specific assumptions were made with regard to fuel use, electricity consumption, construction schedules, material quantities, material transport and waste decomposition.

A range of plant and equipment will be required for the construction of the Project. A summary of the plant and equipment that may be utilised is provided in Table 6 for the Project. These machinery types have formed the basis of all fuel consumption estimations associated with machinery use. Assumptions have been made having regard to the number of each machinery type used and the duration it would be used within each works period included in the construction.

Table 6 Indicative construction plant and equipment – Package 2 MPE Stage 1 Project

Equipment	Construction Works Period				
	Works period 1	Works period 2	Works period 3	Works period 4	Works period 5
Loaders		✓	✓		✓
Static and vibratory rollers		✓	✓		
Mobile cranes	✓			✓	✓
Excavators	✓	✓	✓	✓	✓
Excavators with hammers	✓			✓	
Backhoes	✓	✓	✓	✓	
Crushing plant	✓		✓	✓	
Concrete agitators (or similar)				✓	
Concrete pumps				✓	
Concrete saws				✓	
Air compressors	✓	✓		✓	✓
Jackhammers	✓	✓			
Dozers		✓	✓	✓	

Equipment	Construction Works Period				
	Works period 1	Works period 2	Works period 3	Works period 4	Works period 5
Mulchers	✓				
20-40 tonne articulated tipper trucks	✓	✓	✓	✓	
Scrapers		✓			
Graders		✓	✓		
Water trucks	✓	✓	✓	✓	
Piling rigs				✓	
Forklifts	✓	✓	✓	✓	✓

Construction of the MPE Stage 1 Project would generate approximately 4,262 tCO<sub>2</sub>-e over the 18 month construction period. Scope 1 emissions would generate over 87 per cent of total emissions, with Works period 1 generating the greatest proportion of emissions. Table 7 provides a summary of total GHG emissions generated by the construction of the MPE Stage 1 Project. It is noted that the emissions summarised in Table 7 include those that would be generated during the construction of both Package 1 and Package 2 of the MPE Stage 1 Project.

*Table 7 Total Construction GHG emission by Scope (MPE Stage 1 Project)*

Construction Works period	Scope 1 emissions (tCO <sub>2</sub> -e)	Scope 2 emissions (tCO <sub>2</sub> -e)	Scope 3 emissions (tCO <sub>2</sub> -e)
Works period 1	1,545.52	-	270.24
Works period 2	470.88	-	2.47
Works period 3	1,173.32	-	6.43
Works period 4	425.01	58.97	8.44
Works period 5	76.09	-	1.12
Site Offices	-	223.59	-
<b>TOTAL</b>	<b>3,690.82</b>	<b>282.56</b>	<b>288.70</b>

## 5 MANAGEMENT MEASURES

The contractor's objectives for the Project are to reduce waste to landfill, reduce GHG emissions, increase environmental protection, and improve construction efficiency. Several management measures will be implemented for the Project to reduce emissions during the contractor's construction activities (described in Table 8). Table 8 describes the timing and responsibility for the implementation of management measures. Further detail on roles and responsibilities is provided in Section 6.1.

Table 8 Management Measures

Item	Aspect	Action	Timing	Responsibility	Reference
GHG1	Procurement	Materials would be sourced locally where possible for on-site use to minimise GHG emissions associated with transportation of materials.	Construction	Procurement Manager Construction Manager	FCMM 16A (a)
GHG2		Use of local suppliers where possible and ordering of full and bulk loads only.	Construction	Procurement Manager Construction Manager	FCMM 16A (a)
GHG3	Waste Management	The Waste Management Strategy will be implemented during the Project ensuring that the waste hierarchy of avoid, reuse, recycle and dispose will be implemented.	Construction	Project Environmental Manager Construction Manager	FCMM 16A (b)
GHG4		Construction and demolition waste will be recovered and recycled where possible and vegetation waste would be composted at an offsite facility.	Construction	Construction Manager Site Supervisor	FCMM 16A (b)
GHG5		Excavation waste will be reused on site wherever possible	Construction	Construction Manager Site Supervisor	FCMM 16A (b)
GHG6		Trucks removing material off-site to be filled to the maximum amount allowable to reduce the number of truck loads required	Construction	Site Supervisor	FCMM 16A (i)
GHG7	Construction Staging	Construction works will be planned strategically to reduce double handling of materials.	Construction	Construction manager	FCMM 16A (c)
GHG8	Embodied Energy	Recycled material will be considered for use where that material is cost and performance effective in accordance with the NSW Government's Waste Reduction and Purchasing Policy, to reduce GHG emissions associated with embodied energy content.	Construction	Construction Manager	FCMM 16A (d)

Item	Aspect	Action	Timing	Responsibility	Reference
GHG9		Materials with lower embodied energy will be selected over similar materials with higher embodied carbon wherever practicable and feasible.	Pre-construction and Construction	Construction Manager	FCMM 16A (j)
GHG10	Traffic	Construction/transport plans will be incorporated within the CEMP to minimise the use of fuel during construction	Construction	Construction Manager	FCMM 16A (e)
GHG11	Air Quality	On-site vehicles would be fitted with exhaust controls in accordance with <i>Protection of the Environment Operations (Clean Air) Regulation 2010</i> .	Construction	Procurement Manager Construction Manager	FCMM 16A (g)
GHG12	Plant and Equipment	Plant and equipment will be regularly maintained	Construction	Construction Manager	FCMM 16A (h)
GHG13		Plant and equipment will not be left on idle when not in use.	Construction	Site Supervisor	Best Practice
GHG14		Fuel efficient plant and equipment will be selected where practical and feasible, and equipment which uses lower GHG intensive fuel would be used. Consider use of alternative fuels and power such as biodiesel and hybrid technology in plant and equipment.	Construction	Construction Manager	FCMM 16A (f)
GHG15	Site facilities	<p>The use of energy efficient site facilities (such as site offices, lunch rooms etc.) will be investigated. This includes, but is not limited to:</p> <ul style="list-style-type: none"> <li>• Use of on-site renewable energy, such a solar to power site offices</li> <li>• Procurement of green energy from the energy provider</li> <li>• Use of energy efficient lighting in all office/compound facilities</li> <li>• Use of site facility/office equipment which have maximum star energy rating</li> <li>• Use of biodiesel in generators</li> </ul>	Pre-Construction and Construction	Project Environmental Manager	Best Practice
GHG16	Training	The induction, tool-box talks, workshops and pre-start working briefs will include GHG reduction requirements as outlined within this management plan.	Construction	Site Supervisor Project Environmental Manager	Best Practice

Item	Aspect	Action	Timing	Responsibility	Reference
GHG17	Reporting	Each contractor is required to report on GHG emissions, fuel and electricity usage etc. on a monthly basis.	Pre-Construction and Construction	Project Environmental Manager	NGER
GHG18		The contractor will develop a project tracking system to record the total amount of material recycled off-site, re-used on site and the total amount of recycled material imported to site	Construction	Procurement Manager Project Environmental Manager	FCMM 16A (b)

## 6 COMPLIANCE MANAGEMENT

### 6.1 Roles and Responsibilities

Relevant roles and responsibilities associated with this GHGMP are presented in Table 9.

*Table 9 Roles and responsibilities*

Roles	Responsibilities
Construction Manager	<ul style="list-style-type: none"> <li>Ensure that sufficient resources are allocated for the implementation of this GHGMP</li> <li>Ensure that the outcomes of the visual checks/ compliance and conformance construction monitoring/ incident reporting are systematically evaluated as part of ongoing management of construction activities</li> <li>Ensure all management measures are implemented as per Section 5</li> <li>Where management measures are deemed insufficient, undertake reasonable steps to manage adverse impacts</li> <li>Ensure that qualified personnel conduct GHG monitoring</li> </ul>
Project Environment Manager	<ul style="list-style-type: none"> <li>Oversee the overall implementation of this GHGMP</li> <li>Ensure that the CEMP covers the management and mitigation measures presented in this GHGMP</li> <li>Consider and advise senior management on compliance and conformance obligations, including demonstrating and reporting of GHG emissions</li> <li>Ensure construction site records/ monitoring records/ incident reports are kept and maintained on-site (as per Section 4)</li> <li>Ensure audits of construction site records/ monitoring records/ incident reports are undertaken on a monthly basis; findings are shared with relevant site personnel and corrective actions are implemented</li> <li>Ensure all relevant personnel have a copy of, and understand the most up-to-date version of this GHGMP</li> <li>Ensure that all requirements of this GHGMP are effectively implemented</li> <li>Coordinate the implementation of monitoring requirements and corrective actions</li> <li>Ensure all monitoring reporting requirements are met and maintained on site</li> <li>Authorise all monitoring reports and any revisions to this GHGMP</li> </ul>
Construction supervisors/ subcontractors /workers	<ul style="list-style-type: none"> <li>Understand and implement mitigation protocols as required in the GHGMP (as per Section 5) and any other required measures during construction</li> <li>Undertake relevant training to implement the requirements of this GHGMP</li> </ul>
All personnel (Contractor/ sub-contractors)	<ul style="list-style-type: none"> <li>Undertake relevant training to implement the requirements of this GHGMP</li> <li>Undertake all monitoring activities in accordance with this GHGMP</li> <li>Prior to undertaking monitoring, ensure that a detailed monitoring plan is in place which takes into account sampling protocol, health and safety issues, and quality assurance/control considerations during monitoring/analysis</li> <li>Ensure regular maintenance of monitoring equipment</li> <li>Ensure all relevant monitoring quality control/ assurance procedures are effectively implemented</li> <li>Review laboratory results and write monitoring reports.</li> </ul>



Roles	Responsibilities
Procurement Manager	<ul style="list-style-type: none"> <li>Liaise with relevant personnel such as engineers, construction manager and environment manager, to ensure that the requirements as outlined in Section 5, i.e. use of recycled materials, or materials with recycled content, are adhered.</li> </ul>

## 6.2 Training

The contractors project induction will include a component on GHG management to ensure that personnel understand the potential impacts from construction activities, and the proposed mitigation measures to be implemented. This will include:

- GHGMP requirements
- Legislative requirements
- Roles and responsibilities
- Mitigation measures

Toolbox and prestart meetings will be used, as required, to highlight any specific issues that arise on-site including, but not limited to:

- Energy efficiency, and
- Learnings from other projects and incidents.

In addition to the induction, toolbox and prestart meetings, training will be provided as deemed necessary to relevant personnel to provide them with the knowledge, skills and awareness to minimise environmental impact during construction. Records, which detail the attendees, content of the induction/training as well as any additional information provided, will be maintained.

## 6.3 Non-compliances, Non-conformance and Actions

It is the responsibility of all site personnel to report non-compliances and non-conformances to the Site Supervisor and/or the Contractor's EM.

Non-compliances, non-conformances and corrective and preventative actions will be managed in accordance with Section 9.2.1 of the CEMP.

## 6.4 Monitoring, Auditing and Reporting

The contractor will capture data on usage and/or production of resources, including energy, water and waste, in accordance with NGER reporting requirements and report to SIMTA on a monthly basis. Commitment is made to investigate and report GHG emissions on the Project using consultation, monitoring, assessment and analytical methods. To ensure all reports show accurate representation of construction GHG emissions sources all sectors of the Project team, including contractors and consultants, would be required to prepare GHG emissions reports.

Reporting of all emission sources would be determined using the following steps:

1. Assumptions and data to be used in the assessment would be determined and documented
2. Total quantity of materials, electricity, fuel and waste used and/or generated would be estimated
3. Quantity of GHG emissions would be calculated using the '*National Greenhouse Accounts (NGA) Factors*' methods and '*materials lifecycle analysis database*' and reporting in tCO<sub>2</sub>-e

Reporting related to GHG emissions measurement and auditing of the GHGMP will be undertaken in accordance with the MPE Stage 1 CEMP, as well as additional requirements described below.

All energy and GHG data will be collected and provided to SIMTA, and at a minimum will include:

- All sources of energy use and consumption (in kwh/month) and associate GHG emission production, including that which relates to subcontractor activity
- All sources of fuel use and quantity combusted (in litres/month) and associated GHG emission production. Fuel will be reported by type (e.g. diesel, petrol, LPG)
- All sources of materials and material quantity (in tonnes). Materials will be reporting by material type.

The data collected must be at least 95% accurate in line with NGER reporting requirements and must be submitted to SIMTA monthly.

### 6.4.1 Site Record

All supporting documentation (such as sub-contractor reports, supplier invoices, electricity invoices, bill of quantities etc), and relevant records will be retained for seven years by the contractor and audited against in line with the Project auditing schedule as outlined in the CEMP.

## 6.5 Review and Improvement

Continual improvement is achieved through:

- Implementing areas of improvement and corrective actions identified through internal and external audits conducted on the Project.
- Reviewing non-conformances, non-compliances and incidents to determine root causes and implementing preventative actions as per section 9.2.1 of the CEMP.
- Documenting any changes or alterations required to be undertaken to improve the effectiveness of the CEMP and associated sub-plans;
- Ensuring compliance and conformance with objectives and targets as per Compliance Tracking Program
- Constant measurement and evaluation, audit and review of the effectiveness of the plan.

This plan will be updated as required, and/or in response to internal or external audits.

## 7 REFERENCES

DoE (2016a) National Greenhouse Accounts (NGA) Factors, Commonwealth of Australia, Canberra ACT.

DoE (2016b), State and Territory Greenhouse Gas Inventories 2014: Australia's National Greenhouse Accounts, Commonwealth of Australia

Department of the Environment (DoE) (2014a) National Greenhouse and Energy Reporting (NGER) System Measurement, Technical Guidelines for the estimation of greenhouse gas emissions by facilities, Commonwealth of Australia, Canberra.

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